ESSAYS ON THE IMPACTS OF CASH TRANSFERS ON VULNERABLE HOUSEHOLDS: A CASE OF BISP, PAKISTAN

By

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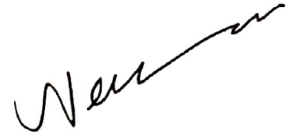Dr. Idrees Khawaja

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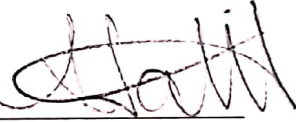
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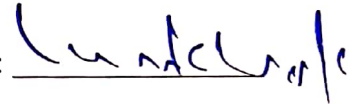Rawalpindi

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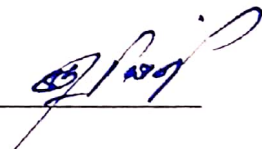PIDE, Islamabad

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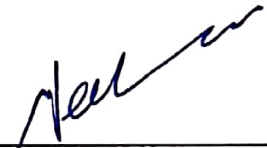Ms. Neelum Nigar

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ABSTRACT

This study analyses the impact of cash transfers on poor households' vulnerability to idiosyncratic and covariate shocks in Pakistan. The analysis is done by examining the role of Benazir Income Support Program (BISP) in protecting households' consumption vulnerability and child labor in times of shocks. We use a panel of poor households identified under BISP Survey (2011-2016). To this end, firstly we estimated logistic regression model of the probability of a shock conditional on independent variables and on households' coping strategies. We then estimated the impacts of BISP's cash transfers on households per adult equivalent consumption expenditure and children working hours in house chores, at farms and work for others using fixed effect model. The estimates reveal that that the targeted households under the program are exposed to idiosyncratic and covariate shocks simultaneously. Moreover, with low level of physical and financial assets owned by these households, they resort to coping strategies which are further damaging in nature i.e compromising on the quality and quantity of food consumption, selling out their assets and pushing their children towards child labor.

In addition to this, the evidence clearly suggests that BISP has an insignificant impact in protecting household's consumption against shocks- both idiosyncratic and covariate. Results mainly for food consumption reveal that BISP cash transfers appear ineffective in protecting the beneficiary households; there is a low change in their non-food consumption as compare to food consumption. The results reject the theories of risk-sharing and permanent income hypothesis in all cases. We also observed the marginal effects of different shock variables on adopting various responses. The results show that beneficiary households rely more on selling assets and less on adjusting food consumption to smooth consumption, while reinforcing the use of assets to cope with the given shocks. This suggests that such costly coping strategies employed by the poor households in response to given shocks have more adverse consequences as it lowers the future consumption, and pushes them further down the poverty line.

 Moreover, we also document evidence for statistically insignificant difference in the effects of shocks on child labor between BISP treatment and control group. However, for households with access to credit other than BISP transfers, we observe significant impact of BISP in mitigating child labor as a shock coping strategy. Findings from the

fixed effect estimates suggest that the income effect of BISP transfers (unless other form of credit access is available) was not sufficient to affect household behavior with respect to the use of child work in response to shocks.

The overall results of this study call for effective public policy efforts to help protect the poor and vulnerable from shocks. Moreover, the goals ought to preserve households' food consumption, human capital and retain their livelihood in the face of shocks. The government needs to formulate public policies such that the poor and vulnerable households have access to formal (non-exploitative) credit along with effective social safety net programs, which would provide basic income support in times of income or non-income shocks.

Keywords: Cash Transfers; Social Protection Programs; Poverty Alleviation; Household Vulnerability

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CHAPTER 1

INTRODUCTION

1.1. Background

Eradication of poverty and hunger are the two main challenges, the world faces today. These have pushed states to make strong commitments in order to deal with these challenges. The first of its kinds was initiated in 2001 under the Millennium Development Goals (MDGs) with a pledge to half the proportion of people with an income level below $1 per day by the year 2015. Moreover, the transition from Millennium to Sustainable Development Goals (SDGs) has once again put poverty and hunger at the forefront, by further pledging to eradicate poverty in all its form by 2030. Although, a significant reduction in poverty has been achieved in the last few decades, yet it is a global issue due to its magnitude and the uneven distribution across regions. Recent statistics show that poverty rate in developing countries fell from 22% in 2008 to 15% in 2015 (World Bank, 2019). However, this significant reduction in poverty masks the large regional differences in poverty reduction; one billion people in the world still live on $1 a day and most of them are from Sub- Saharan Africa and South Asia with many living in rural areas afflicted by chronic poverty.[1]

Equally important is to note that the poor in most of the developing countries are vulnerable to variety of shocks; climatic, economic, financial and others along with lack of an effective insurance mechanism (Morduch, 1994; Dercon, 1998, 2000 2005c, Carter & Barrett, 2006; Krishna 2010; Malena,2011; Genoni, 2012). Numerous of them have asserted that shocks are important determinants of poverty, which are preventing

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[1] People who live poor throughout their lives, while passing poverty to their child and die from preventable diseases.

households to escape from the poverty trap. It is also observed that poor households have limited access to financial markets, which leads to liquidity constrain in times of shock. This further leads them to resort to informal transfer mechanism such as borrowing from friends, family and landlords or force the households, individually or collectively, to rely on self-support or communal support strategies. This includes selling off their productive assets, consuming their savings and coming up with various other income-generating activities [Alderman and Paxson (1994); Bardhan and Udry, (1999); Genoni, (2012); Nguyen et al. (2018)].

Thus, it is essential to understand the role of public intervention programs in mitigating household's vulnerability in times of shocks. Government's social protection programs both-cash and non-cash help the poor to mitigate the effects of risks, when they don't have access to formal financial market. These help them in avoiding potentially damaging risk management and coping strategies, such as withdrawing children from school and disinvesting in school and human capital or selling assets. Thus, effective and well-targeted social protection programs are important to prevent households fall below poverty line in the long run.

1.2. Context and Problem Statement

In Pakistan, a majority lives in a precarious economic environment, with low income and are highly susceptible to economic, climatic and health related shocks. Nearly 39 % which is more than one third of the population, live under multidimensional poverty index with extreme disparities among the provinces; 73% people in KPK and 71% in Baluchistan live in multidimensional poverty compared to 31% in Punjab and 43% in Sindh (GoP, 2018). Most of the factors, which contribute to poverty, are high inflation, unequal distribution of resource, high unemployment and lack of state protection. The Global Hunger Index 2020 shows Pakistan ranks 88th out of 107 countries falling in the

"Serious" category in terms of hunger with a score of 20.4. The National Nutrition Survey 2018-2019shows that 40% of children under the age of five are stunted and another 20 per cent suffer from wasting.

Along with this, people above the poverty line are also vulnerable to poverty when any income or non-income shock hits them. In such state of vulnerability, with weak access to credit from formal insurance institutions, these people resort to such coping strategies for consumption smoothing, which have negative consequences in the long run. According to some recent statistics, from 2010-2015, the growth of incomes of the bottom 40% in Pakistan has been merely 2.7% whereas the growth in incomes of the average population was recorded at 4.3% (World Bank, 2018). Moreover, Pakistan is categorized in low human development countries ranked at 159 out of 189 countries with human development index value of 0.557 (UNDP, 2019).

It is pertinent to note that social protection is a right enshrined in the Constitution of Pakistan *(...the State shall provide basic necessities of life, such as food, clothing, housing, education and medical relief, for all such citizens, irrespective of sex, caste, creed or race, as are permanently or temporarily unable to earn their livelihood on account of infirmity, sickness or unemployment....)* (Article 38(d), Constitution of Pakistan). However, it is observed that Pakistan spends just 2 % of its GDP on social protection, which is quite low in comparison to the global average standing at 11.2% (ILO, 2018). This includes pensions, social security, and contribution to EOBI. According to the Asian Development Bank's report on social protection, out of the total expenditure on social protection in Pakistan, almost 80 % is dominated by spending on social insurance. This primarily includes civilian and military pensions. Less than 1% is spend on contributory social assistance schemes like EOBI, Workers Welfare Funds and provincial employees' social security institutes.

Moreover, more than 60 % of rural households in Pakistan are dependent on agriculture as the main source of livelihood, which makes them vulnerable to covariate shocks, i.e. floods and droughts, displacement, and conflict, in addition to the idiosyncratic shocks like illness, loss of assets and job loss (Haq, 2015)..[2] In the wake of these shocks, majority employ various coping strategies, which include informal arrangement, reducing consumption, drawing assets or increase labor supply in order to attain the welfare maintained prior to the shocks. As pointed out by Heltberg and Niels (2009), there is high incidence of health and other idiosyncratic shocks among households in Pakistan. It also finds that households lack effective coping options and mostly use self-insurance and informal credit, which has led to food insecurity, informal debts, child and bonded labor (Malik *et al*, 2017). Similarly, households hit by the worst flood in 2010, which damaged houses, livestock, crops and other business assets, have shown little recovery despite given aids (Kurosaki *et al*.2012).More importantly, households with fewer assets have shown less recovery from the damages caused by floods.

A growing body of literature focuses on the role of shocks and vulnerability of the poor in perpetuating poverty (Morduch, 1990; Skoufias and Quisumbing, 2003; Dercon, 2004; Santos et.al, 2011; Nygeun, 2018). These studies observe that risks and shocks are fundamental cause of poverty, which lead to chronic poverty (Dercon et.al, 2004). Others argue that shocks along with weak coping strategies lead to low physical and human capital formation, which further makes them vulnerable to the risks in future (Jacoby and Skoufias (1997). It is further argued that households' socioeconomic and demographic characteristics determine the types of strategies to mitigate the adverse effects of a given shock.

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[2] Idiosyncratic shocks represent demographic-economic shocks faced by households, which includes health shocks (illness of household member, death of household head), job loss or business loss. Covariate shocks include shocks faced by the community at large. Examples include rise in prices, displacement or other nature related shocks.

Based on the background, we study a sample of poor households treated under Pakistan's flagship social safety net program, Benazir Income Support Program (BISP). The focus is to broadly address the issues related to households' shocks and their ex post coping mechanism in response to each shock. It also observes households consumption smoothing mechanism and investigate whether the cash transfers under BISP help in smoothing consumption in the face of shocks. In addition, this study observes the issue of child labor and evaluates the role of BISP in displacing the use of child labor as risk coping strategy among poor households in Pakistan. Each question is discussed separately and together they help in understanding the role of social protection programs and their potential impacts in addressing the issue of poverty in the long run.

Before delving into the empirical analysis of the effectiveness or ineffectiveness of BISP, it is important to appreciate that this program marks the first instance of Pakistan's state launching a social protection program for the vulnerable households while acknowledging women as households' heads. By extending income support to ever-married women, BISP recognizes that a households where a widowed mother, wife or a divorced sister co-reside, it is important that each gets distinct cash transfers. This signifies that the state is realizing the fact that women are vulnerable not only in terms of class but also gender wise they are at disadvantageous position and thus they deserve more from the state.

1.3. Objectives of the Study

In the light of proceeding discussion, the specific objectives of this study are:

1. To analyze poor households' vulnerability to idiosyncratic and covariate shocks

    1.1. To analyze households' socio-economic and demographic factors which influence the occurrence or incidence of shocks

    1.2. To examine households' coping strategies adopted to mitigate the

negative effects of these shocks by categorizing the strategies in terms of behavior based, asset based and borrowing strategies

This objective will help us in analyzing the types of shocks-covariate and idiosyncratic shocks faced by the poor households. This is important in order to gauge the frequency and costs of each shock and how households respond and what are their outcomes in terms of their effectiveness as risk coping strategies. This will help in designing effective and shock responsive policy instruments for the poor.

2. To evaluate the impacts of BISP cash transfers on beneficiary households consumption smoothing

    2.1. To examine how households' smooth consumption in the face of idiosyncratic and covariate shocks while observing the change in food and non-food consumption expenditure of households

    2.2. To evaluate if BISP is able to protect households' consumption in the face of each shock

This objective will help us in assessing households' consumption vulnerability, how they adjust their food consumption in terms of reduction in quantity or compromising on the quality of food. Moreover, whether risk-sharing mechanism holds among these households, if not what other informal mechanisms they use to compensate the inflicted loss. Also, how far is BISP effective in providing consumption insurance against each shock. This has strong implications for strengthening and scaling up of BISP in Pakistan.

3. To study the impacts of BISP cash transfers on child labor in times of shock

    3.1. To examine the relationship between shocks and child labor through gauging children working hours in the house, at farm and while working for others

3.2. To assess the impacts of BISP cash transfers in displacing child labor as risk coping strategy for the beneficiary households

This objective will provide us the explanation for prevalence of child labor in Pakistan. While assessing the behavior of credit constraint households, the results of this study will provide confirmation that at household's level, parents rely on child labor and trade-off the current income for future income, which has huge costs in the form of low human capital accumulation and low income in the future as well. This objective will further estimate effectiveness of BISP in displacing costly coping strategies like child labor among the targeted households.

1.4. Contribution and Significance of the Study

Given the persistent nature of shocks in Pakistan, there is still limited literature on the effects of shocks and households' coping strategies [Heltberg and Niels (2009); Karuski (2012); Haque (2015); Malik et al, (2017)]. This calls for further research to explore the issues pertaining to poor households' vulnerability to shocks. While focusing on households' risk coping strategies, the above cited studies have not looked into the role of social protection programs in order to assess their effectiveness in protecting vulnerable households. Of the available literature, Heltberg and Niels (2009) and Malik *et al.*, (2017) ask for an effective role of public intervention programs in order to displace undesirable coping strategies with negative consequences in the long run, but they have not assessed the role of such programs in their studies. This limits the policy conclusions of these studies.

This study thus undertakes an in-depth study of vulnerability of poor in times of shocks and assesses the effectiveness of social protection programs in Pakistan. It focuses on how these households respond to various shocks and what kind of insurance mechanisms are used in order to minimize the negative consequences in the long run.

For this, it examines the effectiveness of BISP, in protecting the poor households in Pakistan.

The empirical findings of this study contribute to the existing literature manifold. First it provides empirical evidence on the determinants of shocks and risk coping strategies of poor households. In doing so, it provides insights on risk patterns of the poor households in Pakistan. Secondly, it empirically examines the effects of observable shocks on consumption and child labor of poor households. It therefore, provides explanation for consumption smoothing under incomplete market model. Thirdly, it goes beyond assessing the usual objectives of BISP and assesses the impacts in other dimensions like informal risk sharing.

B This can help policy makers to assess the costs and benefits of replacing households' informal source of risk-sharing with such public intervention programs. The findings would further help policy makers to make better decisions with regards to the program's size and outreach.

1.5. Thesis Organization

This thesis is organized in six chapters. This chapter provides a brief introduction and background of this study.

Chapter 2 reviews the literature on shocks, households coping strategies while focusing on consumption smoothing theories. Moreover, it also reviews the literature on social protection programs in mitigating the adverse of effects of shocks on households. Chapter 3 reviews BISP as a program, analyzing its methods of targeting and disbursements. It also reviews the existing studies on BISP and focuses on making BISP as a shock responsive program in order to protect poor households in times of shocks.

Chapter 4 examines the nature of shocks experienced by poor households and the type

of coping strategies that are adopted to mitigate the negative effects of these shocks. This chapter specifically analyzes how households' socioeconomic characteristics are significant in reporting the probability of shocks.it is also detail analysis of households' risk coping strategies and their effectiveness. This chapter lays the ground work for analyzing the subsequent chapters of this thesis.

Chapter 5 examines consumption smoothing patterns of poor households during fluctuations in their incomes due to idiosyncratic, as well as, covariate shocks. In addition, the risk coping strategies of such households in case of shocks are also identified in this chapter. Further, it evaluates the role of cash transfer program, BISP in protecting households from such negative income shocks. Chapter 6 examines the relationship between households' shocks and child labor, and whether social protection programs mitigate the effects of these shocks for the given households. Chapter 7 provides the overall conclusion of the thesis.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

In this chapter an attempt has been made to synthesis the studies, which have been conducted by researchers, analyzing shocks, coping strategies along with the role of social protection programs in mitigating the adverse of effects of shocks on households. Shocks are classified into two broad categories; idiosyncratic shocks and covariate shocks. Idiosyncratic shocks represent demographic-economic shocks faced by households, which includes health shocks (illness of household member, death of household head), job loss or business loss. Covariate shocks include shocks faced by the community at large. Examples include rise in prices, displacement or other nature related shocks. Thus, it is important to analyze these shocks individually, as they have different consequences on the living conditions of households and dealing with them requires different strategies. Studies have shown that the frequency and intensity of shocks vary from country to country; In a study of households in Cambodia, Kenjiro (2005) finds that health shocks has more adverse impact on the rural households than the crop loss; Similarly, a study on poor households in Pakistan by Heltberg & Niels (2009) finds that health shocks predominate all other shocks for the poor households. Similarly, while studying the microeconomic behaviors of poor households in Indonesia, Genoni, (2012); Gertler and Gruber, (2002), find that major illness in a poor household causes severe reduction in household consumption, leading to high economic costs to them. For Vietnamese rural households, Nguyen, (2018) also find that these households are exposed to severe covariate and idiosyncratic shocks, but they are able to smooth consumption against idiosyncratic shocks only.

In all such cases, what is important to observe is that coping strategies vary among households. Based on this, the objective of this chapter is to review the literature focusing on households' consumption smoothing strategies in times of shocks. It focuses on both theoretical and empirical literature, which has been undertaken with reference to households' experiences in developing countries. Rest of the chapter is structured as followed; section 2 discusses households risk management and coping strategies; section 3 discusses the theoretical and empirical studies undertaken with regards to various consumption smoothing strategies, while section 4 discusses the literature on the role of government intervention programs in protecting households in times of shocks. Towards the end, section 5 gives conclusion of this chapter.

2.2. Households' Risk Management and Coping Strategies

It is observed that risks and shocks are fundamental causes of creating poverty. However, poor households' socioeconomic characteristics determine the possibility of strategies to minimize adverse effects of such shocks. We review these strategies in two broad categories; risk management and risk coping.

Risk management is an ex-ante management of risks such that households try to minimize the volatility of income. This is also called income-smoothing mechanism, in which the focus is on income diversification. According to Malena,(2011), household diversify sources of income in order to minimize correlation among sources of income due to shocks occurred at individual level as well as at the community level. Example, households may reduce income risk through diversifying between farm and off-farm activities; within the farming activities, farmers may cultivate different crops; increase more labor supply; or through other informal mechanism such having more children (Becker and Lewis, 1976). Similarly, Morduch (1995) finds that in South India, households who are that are exposed to various kinds of shocks, allocate a greater

portion of their land to a safer but less productive variety of rice. In this way, they smooth their consumption by smoothing their income.

When risk management strategies fail to smooth income, households resort to risk coping strategies in order to deal with shocks once they have occurred. The households take actions to smooth consumption against volatile income. These actions are also called ex-post or consumption-smoothing strategies, which include both inter-temporal consumption-smoothing and consumption smoothing cross-sectionally. In case of the former, households minimize the negative effects of the volatility income on consumption over time, while in case of the latter, adverse income shocks are mitigated at point in time. Literature identifies wide ranges of strategies for inter-temporal consumption smoothing; these include borrowing from formal and informal sources, selling assets or store goods for future consumption (Alderman and Paxson, 1992; Harounan and Udry, 2004; Attanasio and Weber, 2010). Risk sharing arrangement through formal mechanism includes financial institutions and public transfers under the ambit of social protection programs.

In risk sharing literature, the presence of informal insurance mechanism is tested by observing the variability of household consumption to income variability. This can be highly perfect risk sharing or imperfect insurance among the households by pooling their resources. While examining the effectiveness of informal transfer mechanism for consumption smoothing, the most commonly cited model is the risk-sharing model, presented by Townsend's (1994). This model fails to provide an evidence for perfect risk sharing; the marginal propensity to consume out of households own income is 0.14, which under perfect-risk sharing must be zero. Following Townsend's (1994) views, Morduch (1991), Ravallion and Chaudhuri (1997) also find weaker evidence of perfect risk sharing using the same data.

These studies suggest that informal insurance exist but it is not perfect risk sharing among households. More critically, these studies reveal that under self-protections strategies, households use borrowing and saving, though not with perfect ability, to smooth consumption, while exchange of gifts between friends and family is another mechanism which drive the informal insurance between households (again, not perfect risk-sharing). Among the two main drivers of informal insurance, Lim and Townsend (1998) show that borrowing and savings are far better coping mechanisms than exchange of gifts.

However, it is important to note that poor households have limited access to financial markets, which causes liquidity constrains in times of shock. This has been explained by Bardhan and Udry (1999) that poor farmers, due to liquidity constraints, resort to informal mechanism via lending and borrowing among friends, family and landlords. Moreover, it is also empirically, known that informal mechanisms are only responsive to 'idiosyncratic' shocks such as illness or death, or job loss. These mechanisms leave the household less resilient in the face of a broader 'covariate' shocks, because such shocks affect the livelihoods and income of the whole community, resulting into the break-down of mutual assistance mechanism between households in a community (Morduch, 1998; Alderman and Haque, 2007, Nyguen, 2018). According to these studies, in times of covariate shocks such as flood, raise in prices or other weather-related shocks, the overall effects are worst for the poor, because the mutual assistance networks fails to exist due to limited resources held by such households. Similarly, Arias et al. (2005), while highlighting the experiences of Latin America, also assert that resource pooling among households is possible under normal conditions, but often fails in case of prolonged economic downturns. Another study shows how civil conflict in Côte d'Ivoire affected informal kinship-based safety nets as individuals preferred to

assist nuclear family members rather than the community, thus reducing coverage (World Bank 2012).

2.3. Theoretical Review of Consumption Smoothing Strategies

We distinguish between two prominent theories; inter-temporal and inter-household consumption smoothing theories. Inter-temporal consumption theory refers to a situation in which households' consumption is linked with time-horizon of income instead of the current income. While inter- household consumption theory is based on risk-sharing, reciprocity or mutual assistance between friends, family and the community.

Ideally, in a perfect market with full information and pareto optimal allocation of consumption (perfect consumption insurance), it is assumed that individual's consumptions vary only with aggregate consumption and do not respond to any idiosyncratic variations in income or wealth. This is in line with the permanent income hypothesis, in which the former explains the theory cross-sectionally while in case of the later, the focus is on inter-temporal consumption growth of households. The assertion is that; marginal utility of consumption must grow at the same rate for all individuals.

The seminal work on Complete Market Hypothesis (CMH) is based on the concept of risk-sharing, initially presented by Mace, (1991) and Cocharane, (1991). The CMH tells us that risk can be shared either through intra-household (sharing risk among the members of the household) or through inter-household (risk is spread across different households). While focusing on inter-household risk sharing, perfect risk-sharing within a community occurs only when the overall resources of the community, in any time period, are distributed in a way which equate the weighted marginal utility of

consumption across households (Alderman and Paxson, 1992).

Empirically, most of the studies have rejected this theory in favor of partial risk sharing; Townsend's (1994) risk-sharing model finds that marginal propensity to consume out of households own income is 0.14, which under perfect-risk sharing must be zero. Following Townsend's (1994) views, Morduch (1991), Ravallion and Chaudhuri (1997) find weaker evidence using the same data.

Thus, the empirical findings suggest that shocks are spread across households and no complete risk sharing takes place. However, in the context of developing countries, most of the studies on consumption smoothing find that smoothing takes place and consumption of the poor is more than income. They do so either by taking precautionary measures in advance (risk management) or after the shocks have occurred (risk coping). For example: households diversify their sources of livelihoods (Rosenzweig and Binswanger (1993), Morduch (1990), Alderman and Paxson (1994)) or employ self-insurance strategies which includes using precautionary savings and selling assets built up in good time. Deaton (1991) has shown that using precautionary savings is an effective way for households to deal with income risk, while Rosenzweig and Wolpin (1993) report about the use of bullocks in India to smooth consumption.

2.4. Empirical Review

2.4.1. Permanent Income Hypothesis

It is also observed that households also smooth consumption through saving, borrowing or by selling assets (Bardhan and Udry, 1999; Dercon, 2005a). Under perfect market assumptions, households have access to credit and with forward-looking approach, households attempt to keep marginal utility of consumption constant over time. In this way, households spread the effects of transitory changes in income over the remaining

period of life-cycle, thus consumption is unaffected by these shocks. This kind of consumption smoothing is defined in permanent income hypothesis (PIH). Under this theory, each agent borrow or save at the interest rate 'r' so that the stock of financial assets grow over time, which makes the basis for consumption plans such that consumption at time t is equal to the expected value of future income (for more detail, see Bardhan and Udry, 1999).

However, Deaton, (1997) notes that poor households in developing countries have limited access to perfect credit market, which makes it difficult to save or borrow in times of shock. Thus the strong assumptions of PIH fail to hold, so it is important to keep these contexts in mind while analyzing households' decisions or strategies in times of shocks.

Again Deaton (1992) has eloquently described how with liquidity constraints and imperfect credit market, poor households, accumulate financial and physical assets and keep the assets above a critical threshold level even in times of shocks. However, they are unable to save if their wealth falls below a critical level, resulting into more negative consequences in future.

2.4.2. Consumption Smoothing via Labor Supply Adjustment

As discussed above, households employ various coping strategies in order to reduce income volatility in the face of shocks (Morduch, 1995; Dercon, 2005a). They may diversify sources of income or choose production techniques that may reduce variation in income. This is important and have long run consequences in terms of households' capability to deal with risk before they occur.

Households also use ex-post coping strategies when shocks occur by diversifying their sources of income. This may be done through labor supply adjustment by increasing

hours of work or pushing more members into labor market. For example: Kochar (1995) finds that labor supply adjustment is main strategy used by households in India to cope with negative idiosyncratic shocks. Moser (1998) reports that in response to economic shocks, households in Ecuador and Zambia increased their labor supply by pushing females and children into labor market. Similarly, Jacoby and Skoufias (1997) find that in response to income shocks, more children were pushed to work in South India, reducing the accumulation of human capital. In Indonesia female labor participation increased along with more child labor in order to help households with stand the crisis (Frankenberg 19 9 9; Thomas and others 2001). In particular, Cameron and Worswick (2003) study the way in which labor supply responses enable Indonesian households to smooth consumption in the face of a crop loss.

Since in our sample of households, more than 60 percent households rely on labor (both casual labor and salary) as their main source of income, therefore, adjustment in labor supply in times of shocks is very crucial for their survival. Thus we analyze this issue more elaborately in chapter 6.

While observing the labor adjustment as a coping strategy, the earlier literature on child labor has focused variety of factors. Few studies proposed that having a child not work is a luxury that poor cannot afford, by asserting that an increase in the family income (due to an extra source of income) may lead the poor to afford for leisure [Basu and Van, (1998)]. Others studies find that liquidity constraints parents are more likely to engage their children in work [Baland and Robinson, (2000); Ranjan (200); Dehejia and Gatti (2002)].

2.4.3. Role of Assets in Protecting Households under Shocks

Literature suggests that in many developing countries, assets contribute directly to income generating process and are taken as a store of wealth also. In a seminal work by Rosenzweig and Wolpin (1993), productive assets are introduced as buffer stock, according to them, assets such as bullock, land and irrigation equipment contribute to agriculture production and income. These farmers make a trade -off between consumption smoothing and asset smoothing, with the view that selling assets today have implications for future sources of income. Therefore farmers are more careful in selling assets in the face of transitory shocks. In more recent literature, this phenomenon is called asset smoothing theory.

Asset smoothing test is a new emerging theory in the literature of risk management, while shifting the focus from consumption smoothing to asset smoothing. This hypothesis was developed in a setting of developing countries characterized with low productivity, with lack of credit and insurance market. Under this hypothesis, asset threshold matters for considering assets as income generating tools or as a buffer stock. So knowing the level of assets is important to assess households' behaviors towards consumption smoothing and asset smoothing.

Using a farmer's production given is budget constraints, Zimmermann and Carter (2003) show how households allocate resources between consumption and assets, and between safe and risky assets. In this particular, they have identified two basic strategies; accumulate safe and less profitable assets to minimize the fluctuations on assets and aim to maintain the assets (asset smoothing), choose risky and profitable assets and use them as buffer against shocks to smooth consumption (consumption smoothing). Their results show that poor pursue asset smoothing instead of consumption smoothing as opposed to the rich who acquire high-return assets, which is

used for consumption smoothing.

The results by Zimmermann and Carter (2003) are consistent with the results of other studies as well; Fafchamps, Udry and Czukas (1998) show that livestock sale compensate only 30% of the village income shock in West Africa; Kazianga and Udry (2004) find that households in rural Burkina Faso preferred asset smoothing over consumption smoothing in times of weather shocks. (Kazianga and Udry, 2004). However, different result is found by Rosenzweig and Wolpin (1993), in which Indian household's sale bullock to smooth consumption; households liquidate assets (bullock) and smooth consumption rather than investing in profitable assets. Literature also suggests that consumption and asset accumulation strategies also depend on the initial level of assets owned by households. In this way households prefer to maintain a minimum level of assets in the face of shock [Barrett and Carter (2005); Hoddinott (2006); Nyguen, (2018)].

2.4.4. Roleof Social Protection Programs in times of Shocks

Several coping strategies reviewed above show that households employ variety of strategies in order to protect consumption in the face of shocks. However, effectiveness of these strategies are highly associated with nature of shocks as well as on the households' characteristics; households with limited access to credit market and poor savings along with exclusion from informal networks are less insured against shocks. Their inability to cope with shocks further pushes them into poverty traps (Decron, 2005b) as the poor may have less resources to overcome, which results into welfare loss pushing them below the poverty threshold.

Also, we discussed that, even if they are able to deal with risk, they adopt inefficient choices such as safe and low-return economic activities. They use assets to smooth consumption, which is costly in terms low future income, which leads to persistent

poverty. Similarly, for ex-post strategies, we discussed how households make labor adjustments in the face of income shocks, for example they withdraw children from school and put into work. This has negative consequences in terms of low human capital accumulation, affecting the overall societal gains. Also, the poor households sell productive assets to smooth consumption, and this leads to low future income.

The inability of the above mentioned strategies in protecting the households from poverty justify the need for public intervention. There is ample evidence to suggest that government interventions are effective both before and after shocks. Decron (2005) has classified these interventions into ex-ante and ex-post measures. In case ex-ante measures, saving behaviors and access to credit market is ensured such that the poor is able to protect themselves in times of shocks. While ex- post measure included proving relief or other social safety nets to protect the household's welfare loss after shocks have occurred. Since our study, the focus is on examining the role of safety nets in protecting the poor from shocks, so the literature reviewed here are focused on ex-post interventions. This is achieved through social protection programs, which help in stabilizing consumption and replace households negative coping strategies during shocks. For example; Morduch (1999) finds that such programs guarantee a minimum insurance for areas where safety- net services are non-existent. Similarly, Cox & Jimenez, (1992), assert that such interventions help in reducing income fluctuations, as it increases income irrespective of shocks. Other studies have also shown that such interventions help in reducing income fluctuations, as it increases income irrespective of shocks [Cox & Jimenez, (1992); Modruch (1999); Tiwari et al. (2016); Hjelm et al.(2017); Kaul, (2018)].

However, there are few other studies who argue that these government intervention programs may not be very effective in securing the poor households from the negative

effects of shocks. Bourguignon (2000) points out that these interventions are effective for households which are already poor but do not necessarily help the same way those households that are stricken by poverty due to various shocks. It however suggests, as do by, de la Brière and Rawlings (2006), de Janvry et al. (2006), and Sadoulet and Vakis (2004), that such intervention programs may be designed in way which include mechanisms for providing income security to households that are at risk of falling into poverty due to various shocks.

Moreover, few researchers have also studied the effectiveness of BISP in Pakistan [Beall (1995); Pasha et al. (2000); Arif (2006); Kabeer (2010); Jamal (2010); and Cheema et al. (2014); & (2016); Ambler and Brauw (2019)]. Most of these studies have looked into the outcomes of such an intervention program, overlooking the channel and factors which push households below the poverty line. One strand of literature argues that social protection programs increase the socio--economic standards of the target households by enhancing investment in health and education [Arif (2006); Cheema et al. (2014; & 2016)]. While others show positive effect on household's food consumption [Naqvi et al. (2014)].

2.5. Conclusion

In reviewing the predominant consumption smoothing theories, we highlight the following key points for subsequent empirical test. First, consumption smoothing under PIH does not hold in case of developing countries, as there is lack of an effective credit market in these countries. Second, under CMH consumption smoothing hold in case of idiosyncratic shocks but failed to hold in case of covariate shocks. These findings suggest that smoothing takes place and consumption of the poor is more than income. They do so either by taking precautionary measures in advance (risk management) or after the shocks have occurred (risk coping). Households can diversify their sources of

livelihoods [Rosenzweig and Binswanger, (1993); Morduch, (1990); Alderman and Paxson, (1994)] or they employ self- insurance strategies which includes using precautionary savings and selling assets built up in good time. Deaton (1991) has shown that using precautionary savings is an effective way for households to deal with income risk, while Rosenzweig and Wolpin (1993) report about the use of bullocks in India to smooth consumption.

Lastly, households also employ informal arrangements in order to deal with shocks. These kinds of arrangements occur between extended families, friends and neighbors. These mechanisms have been studied extensively, both theoretically and empirically [Townsend's, (1994); Morduch, (1991); Ravallion and Chaudhuri, (1997); Kurosaki *et al. (*2012)].

Although, informal insurance mechanism plays a significant role in dealing with shocks, it is however imperfect in mitigating households' vulnerability in the long run. The coping strategies lead to welfare loss in terms of loss of human and physical capital along with having negative social costs for the society. This calls for an effective formal insurance mechanism either through market transfers or public transfers. It is therefore, crucial to consider these points in the empirical analysis in the subsequent chapters.

CHAPTER 3

A CRITICAL REVIEW OF BENAZIR INCOME SUPPORT PROGRAM

3.1. Introduction

Benazir Income Support Program (BISP), a social safety net program run by the Government of Pakistan since 2008, was designed with an aim to develop and implement policies that increase economic resilience of the poor and vulnerable segment of society. This program consists of the unconditional and conditional cash transfers, which are given to ever-married women of the eligible households.

Since the initiation of the program, almost 4.7 million households have been benefited so far.[3] Moreover, size of the transfers has also been increased. Initially, the size of the cash transfer was PKR 1,000 per month, paid in quarterly installments of PKR 3,000. It was increased to 1,200 PKR per month in July 2013, then 1,500 PKR in July 2014 and 1,566 PKR in July 2015. The current monthly payment to a beneficiary is 1,611 PKR, with quarterly value of 5000 PKR from July 2019 onwards. The makes it approximately equal to 20% of the monthly income of an average daily wage worker and equals to 10% of government announced minimum wage for unskilled labors (Saleem, 2019). However, the sum is still relatively meager keeping in view the baseline monthly per capita consumption of the households, which is 2,137 PKR, with an average household size of eight.

It is also important to note that a number of policy makers in Pakistan were skeptical of the continued transfers of cash under BISP, since they thought, it would reduce labor supply and would make the targeted households dependent and lazy. However, these

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[3] The number of beneficiaries was 5.6 million; however, BISP has excluded some 800,000 beneficiaries by cross-checking using administrative data source (BISP).

concerns were unfound in some of the recent studies on BISP. For example, Ambler and de Brauw (2019) found no impact of the BISP grant on household aggregate labor supply. By breaking down the estimates by gender, they found little evidence of a change in female labor supply, strong evidence of male labor supply, and no evidence of changes to child labor. This stereotype about negative impact of cash transfer programs is also being debunked elsewhere in the world. Analyzing data from seven randomized control trials of government-run cash transfer programs in six developing countries throughout the world, Banerjee et al. (2017) find no systematic evidence that cash transfer programs discourage work.

3.2. BISP Targeting Mechanism

In 2008, Pakistan and the world at large witnessed the global recession, which led to high inflation, food insecurity and hunger across the globe. Thus, to deal with these menaces, countries around the world initiated social protection programs as a national strategy to protect vulnerable households. Pakistan also launched its flagship social safety net program, BISP to protect the eroding purchasing power of poor people of Pakistan.

Since its inception, the targeting mechanism of BISP has gone through two major phases of transition. In the first phase, Parliamentarians were tasked to identify poor households keeping in view their economic position. Under this exercise, disbursement of cash transfers was made through postal workers of the Pakistan Postal Services. However, after two years, questions were raised over its transparency and therefore further payments were stopped. So in the second phase, with the recommendations and technical support of the World Bank, a new system was developed with Proxy Means Test (PMT) or Poverty Score Card (PSC) based on household demographic, assets and other socio-economic characteristics. Through this system, around 97% of

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the beneficiaries received cash payments through smart cards and ATMs issued by commercial banks (Cheema at.al, 2014).

During the initial phase, there was no data available to identify poor and vulnerable households. To overcome these constraints, parliamentarians were asked to identify the underprivileged and vulnerable households, with each parliamentarian given equal opportunity to identify the eligible households. Members of National assembly and senate were given 8000 BISP application forms each and the provincial members were given 1000 forms each. To identify poor households, the parliamentarians were issued 13 criteria points issued by the federal government.[4] The forms received were verified through National Database and Registration Authority (NADRA) database, according to which 2.2 million families out of the 4.2 million forms received were found illegible to receive the cash transfers.[5] This phase of BISP targeting mechanism can be called as community-based identification in which political machinery was used in each constituency.

In the second phase, the Government of Pakistan decided to shift from parliamentarian targeting to poverty score card based targeting. Using Pakistan Social and Living Standards Measurement (PSLM) Survey 2007-2008, with 23 variables, a score was generated. For collecting a baseline information, a score was generated with a poverty score (cut-off score) of 16.17 for each household. However few exceptions were made for households with (i) with one disable member (ii) at least one senior citizen (of age 65years or above) (iii) households with 4 or more than 4 children under the age of 12years. Thus for all such households a threshold between 16.17 and 21.17 was kept in

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[4] See Appendix 1 for 13points criteria.
[5] www.bisp.gov.pk.

order to be eligible for the program. Most importantly, in order to protect poorest of the families, cash transfers were made to an ever-married female of the eligible household possessing national ID card. In this way, women register themselves at local BISP office, where their poverty score was verified and they became eligible for transfers in the system.

According to World Bank simulation, the second phase of targeting mechanism improved the targeting performance from poorest 10% to the poorest 30%. Till 2016, BISP administration claimed to reach to 5.6 million households from the 27 million households surveyed, which represented 19% of the poorest households in Pakistan. However, it was observed that there was high under and over-coverage rate; while targeting the 20% poorest of the population, the under-coverage was 61% with 41% leakages and the coverage rate was 13%. This showed that by going with updated targeting mechanism, 61% of the poor will be excluded while 40% beneficiaries are non-poor, who do not belong to the poorest 20% of the targeted population (World Bank, 2009). Similar literature on the World Bank's targeting performance in many developing countries shows high exclusion and inclusion errors which is due to the in-built designing error of the system (Sharif, 2009).

It is important to note that BISP poverty scorecard census which was used to calculate poverty has rich information of household data which is also being used by the federal and provincial governments for rolling out other interventions. For example, the federal government launched a health insurance scheme under which 4.6 million families would be provided with health insurance in 34 districts of the country, which will be scaled up later on.[6] Similarly, the provincial government of Khyber Pakhtunkhwa

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[6] PM's Sehat Sahulat Program is one such program in which BISP poverty scorecard census was used to roll out the program.

launched a health insurance card to ambitiously cover 1.8 million households through which eight individuals per household are entitled to free medical treatment up to a maximum of Rs 54,000. Similarly, in the absence of a regular census in Pakistan since 1998, researchers have been using the BISP census database to find different correlates of household characteristics for better understanding of social indicators (Arif 2015). In cases of natural disasters and conflict, BISP poverty lists are used to reach out to the poorest of the poor amongst those affected.

3.3. Review of Empirical Literature on BISP

In this section, we review the existing literature focusing on the role of BISP in impacting various dimensions ranging from poverty, gender issues or other aspects of households' socio-economic impacts. Studies conducted by Oxford Policy Management (OPM) are quite in detail and focus on multiple aspects of BISP program. These studies are conducted on behalf of the Government of Pakistan, with the purpose to evaluate the performance of BISP program. We will discuss the OPM studies towards the end after discussing some of the independent studies carried out by researchers studying BISP.

Numerous studies have focused on studying BISP's targeting mechanism in order to assess its efficiency and effectiveness in reaching out of the targeting households. In the first of its study, the World Bank in 2009 assessed BISP program and found that the parliamentarian based identification of beneficiaries was pro-poor as 65% of the net benefit had gone to poorest 40% of the population. However, it found higher rate of inclusion and exclusion error in this mechanism and thus the PSC method was recommended, which showed that 70% of the benefits have gone to poorest 40% of the population. This study also found that the PSC method in-built designing error which has led to the prevalence of inclusion and exclusion error. Similarly, Farooq (2014)

studied the targeting efficiency and found that BISP beneficiaries are mostly poor. Using 16 districts, the author classified the households into three categories; 'received', 'attempted' and 'never attempted' and found both the categories of received and attempted were poor households. In a descriptive study of social protection programs in Pakistan, Jamal (2010) suggest to use Proxy Mean Test (PMT) to identify poor households for any public intervention program.

Numerous others have focused on the effects of BISP on poverty while focusing on its impacts on education and health dimensions of households. While examining the role of conditional cash transfers in adult work incentives and poverty in Pakistan, Aneesa *et al.*, (2006) show that cash grant schemes reduced both short and long-term poverty reduction through greater investment in education, health, and nutrition. Similarly, Nasir (2011) used data from Pakistan Bureau of Statistics (PBS), HIES and Labor Force Survey to study the impact of BISP intervention on vulnerable households. This study concluded that the intervention has helped in mitigating the adverse impact of financial crisis on vulnerable households by increasing their consumption expenditure. Discussing the overall structure and effectiveness of BISP, Nabi (2013) conclude that it serves as an unconditional transfer program for the poorest to safeguard them against income loss. Nayab and Farooq (2014) studied the impacts of BISP on poverty alleviation by using PMT model and conclude that although it has not affect the poverty status but it has been able to provide relief to beneficiary households in terms of health and educational expenditure.

Since BISP is a women-centric program aimed to empower women in terms of economic and other household decisions, numerous studies have focused on its gender aspect. Shehzad (2011) while investigating the role of BISP finds that BISP has positive impact on women's empowerment and poverty in Pakistan. This study collected

primary data through a stratified random sampling method from the two provinces namely, Sindh and Punjab. The findings of the study showed that cash transfers under BISP increased daily expenditures on food items, supported in payment of utility bills, health expenditure, children education, and traveling expenses. Moreover, it concludes that BISP has empowered the women to spend the cash on their own, thus improved their bargaining power. Using data from Pakistan, Hau and Ma (2011) argue that if BISP is able to improve women's decision making power, it will actually improve the human development of the given household since women tend to spend more on nutrition and other aspects of households as compare to men. In another study, Hau (2016) finds no clear evidence of improved women decision power enhancing household' nutrition, however it finds a substantial improvement in girls' education in rural localities. In a study by Ambler and De Brauw (2017), using the data set between 2011 and 2013, it is found that BISP transfers have shown statistically significant results for some of the measurement of women decision-making power and empowerment. According to Tahir et al. (2018), although BISP has enabled beneficiaries to start business under 'individually-led' or 'female-male partnership' models, however, it has not been able to alter the patriarchal division of work at household level, which have hindered the economic and social empowerment of women. also find Moreover, it a more recent study, Ambler and De Brauw (2019) have further studied the effects of BISP transfers in labor supply decisions, while stratifying the results on gender dimensions. The results of this study show little evidence of change in female labor, while it finds strong evidence on male labor supply with no evidence on child labor.

In some of the more recent studies on BISP, the focus has been on various other aspects of poor households. Jalal (2017) has evaluated the targeting mechanism and finds that

the PMT based targeting mechanism has some flows as it finds that BISP is subject to under-coverage (exclusion error) of 56% and over-coverage (inclusion error) of 76%. It suggests that the in-built designing error in PMT is due to the fact that it was developed based on 2005-6 PSLM data while the baseline survey was conducted in 2011. This study also evaluated the short term welfare effects of BISP on saving, debt, child labor and women empowerment. Mustafa et al, (2019) have evaluated BISP effects on child nutrition and results show positive and significant results with more significant results on male child's nutrition than the female nutrition. Similarly Iqbal and Nawaz (2020) evaluate the effects of BISP cash transfers on residential demand for electricity among ultra-poor in Pakistan. The results show that BISP transfers have significant positive impacts on electricity demand among the targeted group.

As mentioned earlier, a more detailed analysis of BISP is done by OPM, carried out on behalf of the Government of Pakistan. The purpose of this assessment is to evaluate BISP impacts on various dimensions in order to identify policy changes for possible future interventions. In this a series of studies have been conducted with its baseline report carried out in 2011(Oxford Policy Management, 2011). In this report 11 agreed areas have been identified to evaluate the potential impacts of BISP on these areas. According to this report, around 73% of the potentially eligible households were below the poverty line. Using Regression Discontinuity Design (RDD), significant differences were found between treatment and control groups. The follow-up survey was conducted in 2014 after 3 years of the baseline study. The study found that BISP has reduced poverty by 19 percentage points, reducing the severity of poverty (Oxford Policy Management, 2014). On the depth of poverty, this study found a 3 percentage points reduction while it also found an improvement in women decision making power. Thus study also carried out the qualitative assessment of the program, identifying

administrative weaknesses in the PMT model, which has led to mistargeting of the program.

The final OPM report was published in 2016 using both quantitative and qualitative assessment. Using RDD, this study finds that BISP has been able to increase monthly food consumption of the treatment households, with an improvement seen in their living standards along with an improvement observed in women status within the household (Oxford Policy Management, 2016). More recently, OPM released the latest report of the survey conducted in 2019 with an aim to analyze BISP's eight years of program since its initiation. According to this report, BISP has been able to reduce poverty over the period between 2011 and 2019, however, the real value of transfers has reduced by 9% since 2011 in the wake of high inflation (Oxford Policy Management, 2020). Moreover it finds no evidence of an improvement in child's nutrition while it finds an over increase in women decision making power along with an increase in school enrolment.

3.4. How important is it to make BISP a Shock-Responsive Program

The literature reviewed above show that most of the studies have focused on BISP's PMT targeting mechanism, the role of BISP in reducing poverty, its impacts on gender aspects along with the focus on examining the overall socio-economic status of the targeted households in Pakistan. Most of these studies have looked into the outcomes of such an intervention program, overlooking the channel and factors which push households below the poverty line. The aforementioned studies have not incorporated the factors like idiosyncratic and covariate shocks, which make households vulnerable to poverty. Thus it is important to link these important factors into the study of household behavior towards shocks and the role BISP plays in order to neutralize the adverse impacts of these shocks on poor households.

More recently few studies have focused on the potential and viability of BISP in making it a shock-responsive program. In a preliminary study done by Watson et.al (2017), it is concluded that BISP can be made a program which can cater to numerous national level shocks which affects the entire community, however, this study does not delve into the empirical analyses of BISP to households' shocks responsive strategies in order to give substantial policy direction. According to Bastagli et al, 2019, shocks that affect a wide proportion of society, even if short-lived, have long term consequences on the lives of people, thus providing social assistance to people in es of shocks help in protect their minimum welfare level thus avoiding negative coping strategies by borrowing unsustainable debt and pulling children from school. Based on this, the research report compiled by Ahmad and Seyfert (2020) suggest measures to make BISP a shock-responsive program. According to this report, BISP has potentials to respond to shocks of large magnitude, with some of the recent shock response by BISP with the help of provincial-level social protection actors. In more than one instance, other social protection programs have uses BISP registry, the National Socio-Economic Registry (NSER) to roll out programs in response to disasters or other economic shocks that have struck this country.

Among the few responses, BISP's response to Covid-19, an unprecedented economic shock which hit the world in late 2019, was phenomenal. In response to this shock, BISP was expanded both vertically and horizontally, such that it was decided to pay cash grants to 12 million families with the existing 4.7 million BISP beneficiaries being paid PKR 4,000 once, in addition to their normal PKR 2,000 monthly grant.[7] They were also paid an amount of PKR 12,000 in one installment equal to four months' benefits.

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[7] The details of data are taken from BISP portal' www.bisp.gov.pk.

An additional 4 million poor beneficiaries who previously had not qualified for BISP were selected from the existing database. A further 3 million new families were also enrolled. This shows that BISP has the potential and capacity to respond to vulnerable citizens in times of major shocks. However, it is important that it works in close coordination with provincial actors and institutions for any concerted effort to protect the welfare of households.

3.5. Conclusion

It is observed that households in Pakistan are vulnerable to idiosyncratic and covariate shocks, with the risk of covariate shock being very high. As the country is prone to high risk of natural calamities, environmental degradation and displacement, providing timely social assistance to the wide range of population is very important. Before the initiation of BISP, the two main social assistance programs were Zakat and Pakistan Baitul Mal (PBM), however they are low in coverage and had targeting issues. These programs only covered the formal workers, with most of informal workers left uncovered and health covers lagged in all other initiatives also (Asian Bank Report, 2018). The initiation of BISP has resulted into Pakistan's the single largest cash transfer program, with its beneficiaries increased from 1.7 million to around 5 million between 2009 and 2016. The shift from parliamentarian targeting to PMT method has effectively increased its targeting mechanism while reducing the inclusion and exclusion errors in the system. The e-payment system through debit card has also enhanced the payment mechanism, making it possible for the beneficiaries to access their cash in quick time.

Numerous literature reviewed in the previous section has shown that BISP has been able in reducing poverty, increasing food consumption along with an improvement witnessed in some of the measures of women decision making powers. However, few others suggest to make it shock-responsive in order to neutralize the negative

consequences of both idiosyncratic and covariate shocks on poor households' welfare. As discussed earlier, BISP targets the poorest of the poor households, who do not own substantial physical and financial capital, leaving them with weak and negative coping strategies whenever they are hit by any major shock. Most of the households rely on informal borrowing mechanism, selling off their meager assets or pull children from school and put into work, so that they can sustain their livings in times of crisis and distress. These coping are further damaging in nature as they make it more vulnerable to future shocks. Thus making BISP responsive to covariate shock is very important such that it could substitute the existing coping strategies of the households.

It is also recommended that in order to make BISP shock-responsive, it is important to develop a better coordination mechanism with other disaster and risk management initiatives both at federal and provincial levels. At present the disaster response works separately and is not considered as social protection even though the cash transfer modality is same in both. The existing features of BISP could facilitate disaster responses with its nationally representing data. The NSER is database of all majority households ranked according to their poverty status, which can be updated adding the hazard and disaster vulnerability of households such that BISP could respond to them in times of such shocks. Moreover, it is important to build strong linkages with organization like NADRA and other service providers in order to leverage support for a shock response.

CHAPTER 4

HOUSEHOLDS RISK MANAGEMENT AND COPING STRATEGIES: HOW THE POOR RESPOND TO VARIOUS SHOCKS?

4.1. Introduction

The poor in most of the developing countries are vulnerable to variety of shocks; climatic, economic, financial and others along with a lack of an effective insurance devices. While all households are negatively affected by uninsured shocks, the poor due to lack of physical and human capital are more severely hit by such shocks as they are unable to recover from them (Del Ninno and Marini, 2005). Similarly, some shocks have long lasting effects on poverty with an adverse impact on human capital formation (Foster, 1995; Jacoby and Skoufias, 1997; Jensen, 2000; Dercon, 2004; 2005). Thus it is important to understand the nature of shocks, identifying those who are vulnerable and study how they cope to such shocks in times of distress. These help in designing better policy interventions in order to prevent the poor households from falling further down the poverty line.

A growing body of literature focuses on the role of shocks, risk and vulnerability of the poor in perpetuating poverty (Morduch, 1990; Skoufias and Quisumbing, 2003; Dercon, 2004; Santos *et.al* 2011; Nygeun, 2018). These studies observe that risks and shocks are fundamental cause of poverty. Some shocks have long lasting effects leading to chronic poverty (Dercon, Hoddinott and Woldehanna, 2005), while others lead to low level of physical and human capital formation (Jacoby and Skoufias (1997). However, few others assert that households' socioeconomic characteristics determine the possibility of strategies to mitigate the adverse effects of such shocks.

In Pakistan, people live a vulnerable life with nearly 39 % live under multidimensional

poverty. More than one –third of the population is living below the poverty line with Baluchistan having the highest rate of poverty, followed by Sindh, Khyber Pakhtunkhwa, and Punjab respectively (GoP, 2018). Most of the factors, which contribute to poverty are high inflation, unequal distribution of resource, high unemployment and lack of state protection. Social safety nets are weak; especially those provided by formal institutions, while private transfers based on personal relations are more important safety nets (Kurosaki and Khan, (2001). More than 60 % of rural households in Pakistan depend on agriculture as their main sources of livelihood, and experience floods and droughts, with other adverse events like illness, job loss, displacement and conflict, leading to income and asset loss (Haque, 2015). In the wake of these shocks, majority employ various coping strategies, which include informal arrangement, reducing consumption, drawing assets or increase labor supply in order to attain the welfare maintained prior to the shocks

Studies have shown that such government interventions help in reducing income fluctuations, as it increases income irrespective of shocks [Cox & Jimenez, (1992); Modruch (1999), Tiwari et al. (2016); Hjelm et al. (2017); Kaul, (2018)]. Moreover, few researchers have also studied the effectiveness of BISP in Pakistan [Beall (1995); Pasha et al. (2000); Arif (2006); Kabeer (2010); Jamal (2010); and Cheema et al. (2014; & 2016); Ambler and Brauw (2017)]. Most of these studies have looked into the outcomes of such an intervention program, overlooking the channel and factors which push households below the poverty line. One strand of literature argues that social protection programs increase the socio--economic standards of the target households by enhancing investment in health and education [Arif (2006); Cheema et al. (2014; & 2016)]. While others show positive effect on household's food consumption (Naqvi et al. (2014).

Given the persistent nature of shocks in Pakistan, there is still limited literature on the effects and coping strategies of households faced with shocks [Heltberg and Niels, (2009); Karuski, (2012); Haque, (2015); Malik et al. (2017)]. This calls for further research to explore the issues pertaining to poor households' vulnerability to shocks. It is important to dig further in order to find out the determinants of shocks, how they affect their occurrence and consequently how these factors are associated with the probability of reporting these shocks. Moreover, it is important to focus on various types of shocks-covariate and idiosyncratic shocks-which are important to know in order to examine the effectiveness of risk coping strategies. Without knowing which shock dominates in terms of frequency and costs, how households respond and what are their outcomes (good or bad), designing effective policy instruments remain incomplete. This study, thus adds to the literature of risk and vulnerability by using a panel survey data in order to quantify shocks from all sources, measuring the responses and outcomes for a sample of poorest of the poor households in Pakistan.

This chapter uses household data of poor households identified under BISP and examines the nature of shocks experienced by poor households and types of coping strategies being adopted to mitigate the negative effects of these shocks. The objective of this study is to describe sources of vulnerability by identifying households' characteristics or location factor, which are associated with the probability of reporting a shock- both idiosyncratic and covariate shocks. Moreover, how these factors affect households' behavior in responding to shocks through various coping strategies. Subsequently, the results are used in the proceeding chapters to assess the role of BISP in minimizing the impacts of such shocks on beneficiary households.

There are some limitations of this study, which must be kept in mind while interpreting the results. One, there is limitation in the design of the survey data, as it focuses only

on the ex post coping strategies. The ex-ant adaptation strategies, pertaining to the strategies used before the occurrence of any shock is not covered, thus it underestimates the overall impact of risks on the sample. Secondly, the sampled households are primarily the poor households, so how non poor respond and cope to these shocks is also out of the scope of this study.

This chapter is organized as follows: after introduction, section 4.2 and 4.3 provide details on data and methodology used for this chapter, while section 4.4 describes descriptive analysis of the types of shocks by poor households in Pakistan and the main coping strategies. Section 3.5 &3.6 analyze the results of logistic regression assessing the factors associated with households' shocks and their coping strategies. Section 5 presents conclusion of this chapter.

4.2. Data

In this chapter, we use BISP survey data. The survey was conducted by Oxford Policy Management (OPM). It has a baseline data along with two follow-up rounds conducted between April to July 2011, April to July 2013 and February to May in 2016 respectively. The baseline survey includes households, representatives of the four provinces, i.e. Punjab, Sindh, Khyber Pakhtunkhwa and Baluchistan. The households were selected based on a pre-determined poverty threshold score of 16.17. The eligibility criteria was intentionally created for impact evaluation of the program, so the survey includes both beneficiary and control group.

It is important to note that the baseline survey was conducted at a time when BISP poverty census was still going at various places, as the census was not started at the same time in all districts. This led to disbursement of payments in some districts before census had completed. However, to ensure the inclusion of as many beneficiaries and non-

beneficiaries as possible, various sampling units were made during the survey.

4.2.1. Population, Sample and Sampling

For the baseline sample, the following steps were taken in four phases.[8] In the first phase, using PSLM Survey 2007-2008, primary sampling units (PSUs) or clusters were created at the provincial and rural/urban level. These PSUs were then sampled directly from these strata using simple random sampling. In phase 2, the Federal Bureau of Statistics (FBS) on behalf of OPM conducted the household listing in all evaluation PSUs to form the basis of the sampling frame of households within evaluation PSUs. The household listing exercise was conducted in all sampled clusters, and included the variables necessary to reconstruct the proxy means test (PMT) used for targeting the BISP transfer. In phase 3, using the list households, a predetermined number of households were randomly selected using simple random sampling, on which the PMT was applied. The PMT was based on the model of BISP Poverty Scorecard, and an average of 100 household PMTs were applied per PSU. Finally, in the fourth phase, two groups were created from the list of households, on whom PTM was applied. Group A households are called beneficiaries, with PMT scores equal and below the cut-off score of 16.17. Group B are households with a PMT score greater than the cut-off score of 16.17 and within a predetermined range up to a score of 21.17, making them hypothetically valid counterfactuals for identification strategy. Respective samples of Group A and Group B households were chosen from within each PSU using simple random sampling.

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[8] This part is heavily taken from the data section of Oxford Policy Management reports.

Table 4.1: **Sample Frequency Distribution of Three Rounds of BISP-Household Surveys**

	Baseline Survey (2011)		Follow Up Survey (2013)		Follow Up Survey (2016)	
	Beneficiary	**Control**	**Beneficiary**	**Control**	**Beneficiary**	**Control**
Punjab	819	2198	802	2215	2397	1982
Sindh	1346	981	1303	1024	2235	1355
KPK	833	1075	820	1088	1635	1096
Balochis tan	251	718	251	718	367	328
Pakistan	**4972**	**3249**	**5045**	**3176**	**6634**	**4761**
Total	**8221**		**8221**		**11395**	
Household Panel Distribution						
P-HH-123: (Panel-HH- 2011& 2013 & 2016)			Panel of 3465 Households			

The baseline survey was conducted in 488 PSUs, with average sample sizes per PSU of 19 households per rural cluster and 15 households per urban cluster The baseline survey comprises the final sample size of 8221 households, of 4972 BISP-beneficiaries and 3249 non-beneficiaries. Likewise, the follow up survey (2013) also comprises more or less same final sample size, however, it consists of 5045 beneficiaries and 3176 control households, and follow up survey (2016) contains final sample size of 11395 households. Third round further encompasses the information of *Waseela-Taleem*, a conditional cash transfer program, covering 2348 beneficiary households. Hence a panel of 3465 households is generated, which this study uses for examining its objectives in each of the proceeding chapters.[9]

Since this chapter examines the factors which affect households' behavior in responding to shocks through various coping strategies, we use a panel of 3465 households in order to assess the sampled households' behavior over the years. In all three rounds, separate questionnaires for male and female respondents are prepared. Each round covers the same modules, except with few questions, which were added in

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[9] A substantial number of the households in the original set of OPM surveys could not be matched to the baseline survey. We analyzed the difference between matched and unmatched households in Appendix A.

2016.

Eighteen modules contain information with respect to households' consumption, income, child labor, shocks and coping strategies along with socio-economic characteristics in the male and female survey questionnaire. Module of shocks and coping strategy include list of shocks and coping strategies. Module A contains basic information such as name of the household members and their age, sex, relationship with the head, religion, and marital status. Module B gives information about formal education level each member of the household, with Module C focusing on labor participation of adults and children of each household. Households' consumption, income, child labor and shocks are important pats of this study.

Households consumption is in Module G (male and female questionnaire survey), which has four parts; in female questionnaire, Part-A for weekly food consumption, Part-B for monthly food consumption, while in the male questionnaire, Part-B for monthly non-durable items (including food and nonfood items, both), Part-C for yearly non-durable goods and services, Part-D on annual durable goods and services. Information related to households' income is asked in different modules, which contains earned and unearned income both. Module E of the female questionnaire contains information on child labor, hours spent on paid work, on households' chores and on family farm or in business run by the family. Module P covers information households' shocks and their coping strategies. Specific questions are asked about severity of these shocks, have they caused income loss, asset loss or both to the households and if these shocks are faced by individual households, few or all households in a community.

In short, the scope of BISP's three rounds of panel survey is wide, which can be used to explore variety of social, demographic and economic issues in order to assess the socio-demographic transition of households in the given period.

Shocks: as discussed, this chapter focuses on households' shocks, which have been broadly categorized into two types: idiosyncratic shocks, which include illness or accident of households' main earning member, loss of salaried employment, theft, death of main earning member of household, reduction of regular assistance, aid or remittance from outside household, and household business failure. Similarly, covariate shock include displacement, sharp rise in food prices, dwelling damaged/destroyed due to flood, lower crop yield due to drought/flood/disease and large fall in price of crops.

Copying Strategies: we use ex- post strategies, based on the study carried out by Heltberg & Niels, 2009. These are classified into three broad categories (i) behavior based strategies, which include reducing consumption and increasing labor supply, (ii) asset-based strategies, using saving and assets, and borrowing (iii) assistance from (public) or informal sources.

Similarly we also created dummies for the existing copying strategies employed by households against each shock.

4.3. Methodology

Based on the objective of this study, we employ different methodologies to analyze the occurrence of shocks that have led to loss of household income, reduction in consumption, loss of productive assets along with other concerns which have affected households' welfare level.

4.3.1 Bivariate Analysis

We use bivariate analysis, in which simple cross tabulation of row and column percentages represent the occurrence of different types shocks against different socioeconomic characteristics. We use the following equation to specify the analysis:

$$(X1, Y1),(X2, Y2),......(Xn, Yn) \qquad (4.1)$$

Each observation shows a pair of values, showing the outcomes of shocks against households' different socioeconomic characteristics. The occurrence of each shock is presented in percentage.

4.3.2. Logistic Regression Model

In order to determine the households' determinants, which more likely influence the occurrence and reporting of a shock, we construct a dependent variable. This variable is a dichotomous variable, which shows whether an event of adverse shock has occurred or not, two years preceding the survey. Since our dependent variable is dichotomous, we estimate a logistic regression model, which makes it possible to estimate the probability of a shock conditional on independent variables. Moreover, we have classified the households into two broad categories; households, who have faced idiosyncratic shocks, and those who have faced covariate shocks. Also, under the two broad categories, we have further looked into three types of shocks in each. Thus we have estimated a logistic regression model in each category of shocks. Similarly, the independent variables are classified into individual, households and community level factors for estimation of this model.

4.3.3. Empirical Model

For analyzing the determinants of shocks at household level, which more likely influence the occurrence and reporting of a shock, the following equation is estimated;

$$shocks_i = \alpha_0 + X_i'\alpha_{1i} + \varepsilon_i \qquad (4.2)$$

The dependent variable shocks, is dichotomous, which shows whether an event of adverse shock has occurred or not, two years preceding the survey. We have considered two broad categories of shocks; idiosyncratic shocks and covariate shocks. Idiosyncratic shocks is assigned value 1 if a household has ill earner, salaried loss or livestock stolen/died otherwise 0. Similarly, a covariate shock is assigned value 1 if a household has faced rise in food prices, displacement or damages in dwelling otherwise 0. The above equation is first estimated by considering idiosyncratic shocks and then for each of its component separately, that is ill earner (1, 0), salaried loss (1, 0) and livestock stolen/died (1, 0). Similarly, we have first estimated the above equation for covariate shocks and then for each of its component that is rise in food prices (1, 0), displacement (1, 0) and dwelling damaged (1, 0). X refers the household's socioeconomic and demographic characteristics. As the dependent variable is dichotomous in nature, that's y we have applied logistic regression.

4.3.4. Dependent Variables: Shocks

Using BISP survey data, we construct shock variables for this study. From Module P, we gather information for households' shocks, and their coping strategies. We create dummies for each shock which are broadly categorized into two categories; idiosyncratic and covariate shocks. The survey identifies a number of shocks, which the households face, however for this study we have chosen three shocks in each category based on the severity of each shock confronted by the sampled households. The three severe shocks in each category are presented in the Table 4.2 below.

Table 4.2**Error! Use the Home tab to apply 0 to the text that you want to appear here.: Coding Scheme for Constructing Shock Variables**

Variables	Coding Scheme
Idiosyncratic shocks	
Illness or accident of households' main earning member	
Loss of salaried employment	
Livestock died/stolen	
Covariate Shocks	
Sharp rise in food prices	=1, if the households face any of this shock two years prior to each survey.
Dwelling damaged/destroyed due to flood	
Displacement	0, otherwise

4.3.5. Independent Variables

4.3.5.1. Individual Characteristics

Under individual characteristics, age is one important factor affecting the probability of reporting a shock. Older households' heads have higher probability of confronting a shock, be it health shock or an income shock (Heltberg & Niels, 2009). A younger household head is less vulnerable to shocks like illness, loss of employment and other similar shocks. Those who are 25 years old fall in the category of age less than 25 years and those above 35 years fall in older category. Households' education level has broadly categories into two categories; primary and secondary level, while households' marital status is defined as married, unmarried or divorced.

4.3.5.2. Household Characteristics

Household' characteristics like family size, dependency ratio and number of household members working are also reported to affect the reporting of shocks. Younger household heads are less likely to experience health related shock (illness) as compare to relatively older aged household heads. The level of households' education, both primary and secondary, is positively related to the shocks, particularly to employment loss, however. This can be explained by the fact that individuals with higher level of education have higher employment rate (however informal employment), thus such individuals are more prone to employment/ salary loss shock.

Household size and the dependent ratio in the family directly and strongly affect households' vulnerability to shocks as they change the per capita income of the household. Both factors are expected to increase the likelihood of being exposed to shocks. In this paper, a dependent person is a family member aged under 1or equal 14 or equal and above 65[10], regardless of his/her employment status.

4.4. Empirical Results

Table 4.3. **Descriptive Statistics**

Variables	Mean	SD
Panel A-Household Characteristics		
Household Head age	46.73	11.5
Household Head Education, illiterate omitted		
1, if household head completed primary education	2.1	3.3
1, if household head completed HSSC	0.14	0.35
1, if household head is female	0.08	0.27
1, if household is in urban area	0.21	0.41
Dependency ratio	4.9	2.4
Mother's Education	0.1	0.5
Owner's Occupied House	0.8	0.4
	0.2	0.4
Agriculture*	0.1	0.4
Panel B-Sources of household Income, labor income omitted		
1, if Agriculture	0.15	0.36
1, if Salary	0.16	0.36
1, if Remittances	0.06	0.25
1, if Private Transfers	0.00	0.07
1, if Pension/Social Assistance	0.01	0.08
1, if Business	0.12	0.33
1, if Other Income Sources	0.01	0.12
Panel C- Shocks faced by households		
1, if Rise in Food Prices	0.54	0.50
1, if Job Loss	0.02	0.15
1, if Loss of Livestock	0.05	0.21
1, if Death of Main Earner	0.10	0.30
1, if Displacement	0.00	0.07

Notes: Values are average of the three rounds of survey. Consumption and income are deflated to 2011 CPI in

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[10] Article 11.3 of the Constitution of Pakistan says " No child below the age of fourteen years shall be engaged in any factory or mine or any other hazardous employment." Similar safeguards have been provided in Article 37of Constitution. Section 50 of Factories Act 1934 reads as under: "Prohibition of employment of young children. - No child who has not completed his fourteenth year shall be allowed to work in any factory." The same criteria is used by Malik (1996).

4.4.1. Shocks and Impacts: Descriptive Analysis

This section presents the types, frequency and severity of shocks confronted by the sampled households. As described in previous sections, households have informed about the shocks they faced two years prior to each survey. The sampled households also informed about their coping strategies and several other details of the shocks, which include whether certain shocks have affected individual households (idiosyncratic shocks) or the entire community (covariate shocks).

The effects of shocks on households' behavior can be gauged using two approaches; the direct approach and an indirect approach. The direct approach uses shocks as determinants of households' income, risk sharing mechanism, ex-post coping strategies and consumption smoothing behaviors. The indirect approach uses the income effects of these shocks in order to observe the above mentioned behaviors. For this study we use the direct approach for examining the effects of shocks on the behaviors of our sampled households.

4.4.2. Types, Frequency and Cost of Shocks

While analyzing the spread of the shocks identified, it is observed that most of the shocks have emanated from two main sources; idiosyncratic and covariate For the sampled households of this study, we have chosen three covariate shocks, which include rise in food prices, dwelling destroyed or damaged due to floods and displacement. Similarly, under the idiosyncratic shocks, three most reported shocks have been observed, which includes illness of main earning member of the household, loss of salaried employment and loss of livestock. All these shocks have been observed contributing to high income volatility of the households. Generally, these kinds of shocks are due to limited access to medical services, unhygienic living conditions along with limited means income sources. Moreover, these difficulties are compounded by

lack of formal insurance facility and lack of access to credit market.

Table 4.3 presents that our sampled households experienced numerous types of shocks, with covariate shocks dominating the idiosyncratic shocks. Among the covariate shocks, rise in food prices (54.38 %) dominates all followed by dwelling being damaged by floods (4.34%) and displacement (1.92%). Moreover, among the idiosyncratic shocks, illness of main earning member dominates among other shocks in the sampled households; illness of member (10.48%) followed by livestock stolen/died (4.51%) and employment/job loss (2.9%). Households have also reported that most of the shocks have caused income loss; both covariate and idiosyncratic shocks have caused more than 90 % loss to the households, while the asset loss is less than half of the income loss (36%).

The fact that BISP was designed in a time when the world was hit by global recession in 2008, effects of this shock appears to be the most prominent one in the list of shocks experienced by the samples households of our study. Moreover, during the period of recession, there were also concerns of a drop in remittance income; however, the survey data suggest that among the sampled households, it is not a major concern. When asked the households about the set of concerns, only 2% has experienced a shock pertaining to the loss or reduction in remittance income. This must be due to the reasons that the sampled households is based on poorest of the poor, who are casual labors as reported above.

Table 4.4: **Distribution of Shocks Types by Households, and loss inflicted (%)**

Events	Household affected	Income Loss	Asset Loss	Loss of both
Covariate Shocks	60.70	92.42	51.18	97.41
Sharp rise in food prices	54.38	63.36	22.41	22.76
Dwelling damaged/destroyed due to flood	4.34	9.46	21.88	36.52
Displacement	1.92	19.99	6.89	37.86
Idiosyncratic Shocks	20.44	92.42	36.22	94.14
Illness or accident of households' main earning member	10.48	44.12	4.65	28.92
Loss of salaried employment	2.9	38.76	2.76	28.67
Livestock died/stolen	4.15	9.99	28.79	36.55

Note: Values are averages of the three rounds of BISP data, 2011, 2013 &2016

4.4.3. Impacts of Shocks

It is observed that most shocks have wider consequences, which go beyond immediate coping costs. As reported in Table 4.5, conditional on a shock (illness of main earning member), 18.43% sold their major assets; 9% put their children in the labor market; 26% borrowed money from friends and relatives; and 13 % reduced food consumption.

Table 4.5: **Adverse Effects of Shocks (% of households reporting shocks)**

	Selling Assets	Child Labor	Reduced food consumption
Idiosyncratic Shocks			
illness of earning member	18.43	9.73	13.19
Crop Loss	26.21	10.59	12.62
Livestock lost	6.62	4.83	4.34
Covariate Shocks			
Rise in Food prices	70.66	55.58	94.77
Dwelling damaged	14.67	5.33	6.72
Displacement	12.08	12.08	3.99

Note: Values are averages of the three rounds of BISP data, 2011, 2013 &2016

Households seem to face hardships when faced with covariate and idiosyncratic shocks both. The overwhelming share of covariate shocks stems from rise in food prices, accounting for two-third of the total shock. As noted, rise in food prices is also

associated with large reduction in food consumption, which is not surprising given most of the sampled households livelihood depends on casual labor and salary.[11] Thus rise in food prices erodes households' capacity in meeting their food needs, despite using other self-protection strategies like selling assets and putting children to work. While idiosyncratic shocks, particularly health related shock and crop loss seem to take a heavy toll in drawing down assets (18% and 26%), putting children to work and reducing food consumption. It is important to note that community risk pooling fails in protecting households from idiosyncratic shocks, as have also be confirmed in other studies [Morduch,(1991); Ravallion and Chaudhuri,(1997)].

4.5. Determinants of Shocks: Logistic Regression

In this section, we explore factors which influence the incidence or occurrence of various types of shocks. Logistic regressions on determinants confirm many of the trends described above. Table 4.5.and Table 4.6 present results of logistic model with dependent variable taking the value of 1 if faced with or more than one shock two years prior to the survey; and zero, otherwise. Explanatory variables include household sources of income; family size; economically active household members; gender and education level of household head; household occupancy status; and household's urban/rural status.

Before carrying out the estimations, we tested for the issues of multicollinarity and occurrence of extreme outliers in our dataset.

(1) Multicollinearity test: observing the correlation coefficient, we found that the correlation between independent variables is less than 0.80, suggesting that there is no correlation between independent variables of our model.

(2) Problem of extreme outliers: there is no presence of atypical observation in our

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[11] For the sampled households, 60% of their income comes from salary and casual labor.

data, which could harm the model's fit.

Table 4.5 presents probability of households experiencing idiosyncratic shocks and results are quite consistent with our earlier description of data.[12] With respect to household level characteristics, younger household heads (household head aged less than or equal to 25years) are less likely to experience health related shock (illness) as compare to relatively older aged household heads (household head aged 50years). The level of households' education, both primary and secondary, are positively related to the shocks, particularly to employment loss, however, secondary level education seems to be more significant at 5% level of significance. This can be explained by the fact that individuals with higher level of education have higher employment rate (however informal employment), thus such individuals are more prone to employment/ salary loss shock. Female-headed household is less likely to face any of the idiosyncratic shock, with more significant results for livestock loss and loss of employment. Mud floored house represents the economic status, which is positively related to each shock (except in case of salaried loss).

Similarly households with more economically active members are less vulnerable to any of the shocks. Households whose main source of income is agriculture are less likely to experience individual specific shocks as compared to households with other sources of income. Moreover, urban households are more likely to experience the first two categories of shocks, except for livestock died. This can be explained by the fact that live stocks are reared by rural households so these households are more prone to any loss inflicted to their livestock due to flood or theft.

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[12] Estimation with log values are shown in Appendix IV, Table C-1 & C-2.

Table 4.6: **Logistic Regression of Socioeconomic factors on Idiosyncratic Shocks**

	Illness earner	**Salaried Loss**	**Livestock died/stolen**	**Idiosyncratic Shocks**
Household Characteristics				
HH Age_between 25 &49	-0.0333*	0.0016	-0.0168	-0.00558
	(0.0198)	(0.0095)	(0.0176)	(0.0251)
HH Age_ 50 and above	-0.0281***	-0.00947***	0.00843*	-0.0190*
	(0.0071)	(0.0035)	(0.0049)	(0.0097)
HH Education_Primary Level	0.0116	0.0136***	0.0002	0.0206*
	(0.008)	(0.003)	(0.006)	(0.0123)
HH Education_ HSSC Level	0.0021	0.0088**	-0.0022	0.0088
	(0.0095)	(0.0042)	(0.007)	(0.0131)
Female Household Head	-0.025	-0.0233**	-0.0256*	0.00159
	(0.0157)	(0.0101)	(0.0140)	(0.0200)
Urban	0.0049	0.0032	-0.0367***	-0.00293
	(0.008)	(0.003)	(0.0076)	(0.011)
Mud Floored House	0.0171**	-0.0069*	0.0055	0.00291
	(0.007)	(0.003)	(0.005)	(0.010)
Mother's Education	-0.0003	0.004*	0.00326	0.005
	(0.006)	(0.002)	(0.003)	(0.008)
Active household Members	-0.003**	-0.0014*	0.0015*	-0.0009
	(0.001)	(0.0008)	(0.0009)	(0.0020)
Major Source of Household Income				
Agriculture	-0.0606***	-0.0331***	0.0274***	-0.0329***
	(0.0107)	(0.008)	(0.005)	(0.012)
Salary	-0.0392***	0.00150	-0.003	-0.0603***
	(0.009)	(0.0039)	(0.006)	(0.013)
Other income	-0.0405	-0.0126	0.0449***	0.00619
	(0.0302)	(0.0152)	(0.0137)	(0.0354)
Constant	-2.237***	-3.429***	-3.951***	-1.370***
	(0.147)	(0.332)	(0.227)	(0.0989)
Observations	9,151	9,151	9,151	9,151
Hosmer and Lemeshow on goodness-of-fit test	5.50			
Log likelihood	-4897.3663			
Pseudo R2	0.20			

Note: Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

As observed from the descriptive analysis, natural/climatic shocks like flood, drought and earth quake affect the whole community at large. This results into substantial welfare loss in terms of damage to their livestock and other infrastructure. In Table 4.6, we explore the factors which make households to experience more from any or all of the covariate shocks that have resulted into loss of income, loss of asset or both. Male-head household is more likely to suffer from an event of shock as compared to female-headed household, while households with education level, both primary and higher secondary, have low probability of experiencing covariate shocks in general. Moreover, community level characteristics such as rural area are more vulnerable to shocks. Agricultural dependent households, as compare to others, are more prone to covariate shocks. The level of significance shows that these factors had high impact on households' loss of welfare.

Table 4.7: **Marginal Effects of the Socioeconomic Factors on Covariate shock**

	Rise in Food Price	Displacement	Dwelling damaged	Covariate Shocks
Household Characteristics				
HH Age_between 25 &49	0.0291	-0.000492	0.0256***	0.0438
	(0.0302)	(0.0148)	(0.00966)	(0.0292)
HH Age_ 50 and above	0.0517***	0.000352	0.0133***	0.0486***
	(0.0117)	(0.00528)	(0.00444)	(0.0114)
HH Education_Primary Level	-0.0532***	0.00186	0.0173***	-0.0167
	(0.0148)	(0.00747)	(0.00479)	(0.0144)
HH Education_HSSC Level	-0.0877***	0.0330***	0.0181***	-0.0564***
	(0.0157)	(0.00728)	(0.00547)	(0.0150)
Female-Headed Household	-0.0304	-0.0314**	-0.0289**	-0.0547**
	(0.0241)	(0.0153)	(0.0123)	(0.0229)
Urban	0.0419***	-0.0157**	-0.0198***	0.00978
	(0.0136)	(0.00687)	(0.00621)	(0.0132)
Mud Floored House	0.146***	0.100***	0.0410***	0.155***
	(0.0119)	(0.00948)	(0.00629)	(0.0114)
Mother's Education	-0.00605	0.00418	-0.0109*	-0.000440
	(0.0105)	(0.00371)	(0.00585)	(0.0103)
Active household Members	0.00237	-0.00296***	-0.00293***	0.00216
	(0.00242)	(0.00114)	(0.00102)	(0.00237)
Major Source of Household Income				
Agriculture dependent	-0.0389***	0.0214***	0.0176***	0.0999***
	(0.0149)	(0.00565)	(0.00417)	(0.0151)
Salaried Income	-0.0273*	-0.0119	0.00103	-0.0150
	(0.0147)	(0.00738)	(0.00528)	(0.0141)
Other income	-0.0810*	-0.0395	-	-0.0386
	(0.0435)	(0.0348)	-	(0.0408)
Constant	-0.409***	-4.576***	-4.959***	-0.263***
	(0.0928)	(0.226)	(0.293)	(0.0968)
Observations	9,151	9,151	9,028	9,151
Hosmer and Lemeshow on goodness-of-fit test	1.90			
Log likelihood	-6418.9012			
Pseudo R2	0.25			

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, *p<0.1

4.6. Households Coping Mechanisms and their Impacts

In this section, we explore different coping mechanisms used by households in response to various shocks and discuss their effectiveness. BISP survey respondents were asked how they responded to various shocks and what coping strategies were employed.

4.6.1. Various Coping Strategies

Based on literature (e.g see Heltberg & Niels, 2009), ex- post strategies are classified into three broad categories (i) behavior based strategies, which include reducing consumption and increasing labor supply, (ii) asset-based strategies, using saving and assets, and borrowing (iii) assistance from (public) or informal sources.

Table 4.8 presents the most important strategies used against each type of shock by our sampled households. Based on the statistics, in response to idiosyncratic shocks, asset-based strategy was used more often. Borrowing constituted round 60% of asset based strategy, while few sold assets to deal with such shocks. Behavior-based strategy were used by 39.3% of households when faced with health related shock, with 13.19% reduced food consumption, while 16.41% and households reportedly increased adjusted their labor supply, with 9.73% rely on child labor. In times of crop loss, reducing food consumption and child labor were the two most prominent strategies employed by households. Moreover, with livestock lost due to flood or being stolen, 14.08% households reportedly have relied on adjusting their labor supply, either by working long hours or pushing more household members into the labor market.

Table 4.8: **Coping Strategies by type of Shock (%, Household)**

| | **Idiosyncratic Shocks** | | |
	Illness of earning member	**Crop Loss**	**Livestock lost**
Behavior-based strategy			
Reduced Food Consumption*	13.19	12.62	4.34
Increased Labor Supply*	16.41	8.22	14.98
Child Labor	9.73	10.59	4.83
Asset-based Strategy			
Sold assets*	18.43	26.21	6.62
Borrowing*	26.19	24.68	7.47
Assistance-based Strategy			
Government Support	0.52	4.84	2.64
BISP	9.85	10.71	4.75
	Covariate Shocks		
	Rise in Food prices	**Dwelling Damaged**	**Displacement**
Behavior-based strategy			
Reduced Food Consumption*	94.77	6.72	3.99
Increased Labor Supply*	9.67	15.45	11.52
Child Labor	55.58	5.33	12.08
Asset-based Strategy			
Sold assets*	70.66	14.67	12.08
Borrowing*	73.35	9.1	3.59
Assistance-based Strategy			
Government Support	1.50	14.63	17.84
BISP	5.35	5.3	2.93

Note: '*' represents an aggregated values of the following:
Adjustment in food consumption= (a) Reduced food consumption, (b) Consumed lower cost foods;
Increased labor Supply= (a) Worked longer hours, (b) Other household members who
were not working, went to work; Sold assets= (a) Spent cash savings, (b)Sold goods
(jewellery, tools, appliances etc), (c)Sold farm land, (d)Sold other land, (e)Sold the
harvest in advance, (f)Sold animals; Borrowing= (a) Borrowed money from relatives,
(b) Borrowed money from money lenders, (c) Borrowed money from institutions e.g.
banks

However, for covariate shocks, the most preferred coping strategy is behavior-based

strategy in the form of reducing consumption or increase labor supply (including child

labor). It is found that 94.77% households reduced food consumption with the rise in

food price (as reported earlier that half of the sampled households reported it to be the

worst shock). Also, note that this particular shock has resulted into child labor (55%),

selling assets (70.66%) and borrowing (73. 35%). Similarly, with the other two kinds

of covariate shocks (dwelling damaged and displacement), households have reported to

use both behavior-based and asset-based strategies in order to overcome the effects, with severe consequences in the form of selling assets, reducing food consumption along with relying on child labor.

Irrespective of covariate and idiosyncratic shocks, the assistance-based strategy (government support) has been used only in case of natural/ climatic shocks (crop loss, dwelling damaged, and displacement), however, this strategy is not effective in the face of economic shock (rise in food prices) and health shock (illness of main earning member). The results show that in comparison to other strategies, the assistance provided by the state in the form of BISP or any other government-based assistance, provide little support to households in coping with the idiosyncratic and covariate shocks.

4.6.2. Coping Strategies: Logistic Regressions

In this section, we explore the factors that allowed households to cope with shocks. The dependent variable is again dichotomous taking the value of 1 for households who reportedly cope with shocks and zero otherwise. For the independent variables, along with the factors used in the previous section, we use additional dummy variables representing access to services and programs. This includes access to social assistance, pension or other social safety nets like BISP. In this way we hypothesize whether these programs help households cope with shocks.

The results presented in Table 4.8 similar patterns, which are consistent with our earlier description of data. Against each shock, households have employed more than one strategy in order to compensate the loss, which include borrowing, selling assets, adjusting their food consumption or labor supply. Moreover, a significant number of households were not able to cope with the shocks due to absence of strategies available to them, The results here are consistent with previous studies (Del Ninno and Marini,

2005; Santos et al, 2011), which assert that households in developing countries lack physical and human capital to cope with shocks.

The results also highlight the importance of informal assistance or borrowing from friends and relative in case of idiosyncratic shocks, which is consistent with the data in which borrowing constituted round 60% of asset based strategy, while few others sold their assets to compensate for the loss. According to risk-sharing model, informal borrowings collapse in the face of covariate shocks, we see similar patterns in the results also. It is not a significant determinant in case of price shock.

While observing access to public safety nets like BISP and other social assistance program, it is found that they are not significant determinant of households' coping strategies, which is not surprising given the fact that most of these programs are not designed to mitigate the effects of shocks.

The results also show that households whose main source of income is agriculture are not able to cope with the shocks as compare to households with casual income. Similarly, households with mud floor house are not a significant determinant, thus showing poor households' inability to cope with any kind of shock. The results also show that households are able to cope with idiosyncratic shocks as compare to the covariate shocks.

Table 4.9: **Effects of Employing Various Copying Strategies against Cumulative Shocks**

VARIABLES	Asset Sold	Borrowed Money	Food Consumption	Labor Supply	Did Nothing
Idiosyncratic Shocks	0.063***	0.189***	0.086***	0.075***	0.143***
	(0.007)	(0.006)	(0.009)	(0.005)	(0.006)
Covariate Shocks	0.159***	0.204***	0.624***	0.093***	0.164***
	(0.01)	(0.009)	(0.017)	(0.008)	(0.009)
Control variables	Yes	Yes	Yes	Yes	Yes
Major Sources of Household Income					
Agriculture	0.021**	0.049***	-0.034***	0.0166**	0.033***
	(0.008)	(0.01)	(0.012)	(0.007)	(0.008)
Salary	0.011	-0.006	0.002	-0.015*	-0.004
	(0.009)	(0.011)	(0.012)	(0.008)	(0.01)
Remittances	-0.011	0.041**	-0.046**	-0.027**	0.016
	(0.016)	(0.016)	(0.019)	(0.013)	(0.014)
Private Transfers	-0.155	-0.053	0.0091	-0.00322	0.012
	(0.095)	(0.062)	(0.063)	(0.039)	(0.046)
Pension/Social Assistance	-0.009	-0.004	-0.139**	-0.076	0.069
	(0.051)	(0.056)	(0.068)	(0.064)	(0.058)
Business	-0.037***	-0.0024	-0.032**	0.0188**	0.0016
	(0.011)	(0.012)	(0.013)	(0.007)	(0.01)
Other Sources	0.0291	0.015	-0.04	-0.006	-0.028
	(0.022)	(0.033)	(0.042)	(0.024)	(0.033)
Household's Characteristics					
Active Household Members	-0.0029*	0.003*	-0.0105***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female-Headed Household	-0.053***	-0.007	0.002	0.036***	0.009
	(0.018)	(0.012)	(0.021)	(0.012)	(0.017)
Household Head Education Primary	0.046***	-0.004	0.025**	0.005	-0.035***
	(0.009)	(0.011)	(0.012)	(0.007)	(0.011)
Household Head Education HSSC	0.041***	0.0163	-0.0101	-0.0004	-0.008
	(0.009)	(0.01)	(0.013)	(0.008)	(0.007)
Household Head Age 25-49	0.054***	-0.0186	0.0325	0.0159	-0.044**
	(0.0186)	(0.022)	(0.025)	(0.014)	(0.022)
Household Head Age 50 and above	0.00511	-0.009	0.0131	0.00107	0.005
	(0.007)	(0.008)	(0.009)	(0.006)	(0.007)
Mud Floored House	0.023***	0.020**	0.0198*	-0.007	0.031***
	(0.008)	(0.009)	(0.01)	(0.006)	(0.008)

Urban Dweller	0.011	-0.021**	0.041***	0.007	-0.045***
	(0.008)	(0.009)	(0.01)	(0.006)	(0.009)
BISP Transfers	-0.007	-0.0009	0.0085	0.0016	-0.018***
	(0.007)	(0.0082)	(0.009)	(0.005)	(0.007)
Constant	-3.728***	-3.707***	-4.027***	-4.430***	-4.118***
	(0.166)	(0.149)	(0.162)	(0.216)	(0.181)
Observations	9,151	9,151	9,151	9,151	9,151
Number of Households	3,465	3,465	3,465	3,465	3,465
Hosmer and Lemeshow on goodness-of-fit test	6.70				
Log likelihood	-22688.974				
Pseudo R2	0.1158				

We also examine each shock individually and see how households respond to each one of them. Table 4.9 presents the results of marginal effects of each shock against the available coping strategies. Among the covariate shocks, the rise in food prices has hit the households more severely, pushing them to employ all existing strategies to sustain the pressure on their livelihood. Moreover, it is observed that the households do not rely on borrowing (both formal and informal) which is consistent with the risk-sharing theory as under covariate shocks, the internal transfer mechanism collapses and almost all households are equally affected by it. Similarly, for each idiosyncratic shock, households have employed more than one strategy, showing the severity and cost of the confronted shocks. One thing which is important to note is that when we examine the influence households socio-economic factors on reporting of shocks, we observe that while all other factors show similar trend, private transfers

Table 4.10: **Effects of Employing Various Copying Strategies against Each Shock**

VARIABLES	Asset Sold	Borrowed Money	Food Consumption	Labor Supply	Did Nothing
Types of Shocks					
Rise in Food Prices	0.910***	1.057***	3.582***	0.923***	1.030***
	(0.083)	(0.073)	(0.101)	(0.100)	(0.085)
Job Loss	0.0663	1.399***	1.347***	0.0647	0.587***
	(0.232)	(0.174)	(0.200)	(0.278)	(0.223)
Crop Loss/Fall in Crop Price	1.316***	1.524***	0.480***	1.175***	0.824***
	(0.108)	(0.0984)	(0.100)	(0.125)	(0.107)
Loss of Livestock	0.647***	0.884***	0.758**	0.795***	2.242***
	(0.0966)	(0.0872)	(0.0864)	(0.111)	(0.093)
Death of Main Earner	1.125***	1.910***	0.564***	1.296***	0.581***
	(0.0957)	(0.0872)	(0.0872)	(0.106)	(0.103)
Displacement	1.999***	-0.291	1.189***	0.175	-0.246
	(0.160)	(0.182)	(0.186)	(0.221)	(0.175)
Major Sources of Household Income					
Agriculture	-0.176	0.0759	0.102	-0.0903	-0.0048
	(0.113)	(0.0986)	(0.0906)	(0.133)	(0.109)
Salary	0.157	0.00335	0.0524	-0.252*	-0.094
	(0.106)	(0.0981)	(0.0834)	(0.140)	(0.114)
Remittances	-0.0397	0.364**	-0.271**	-0.411*	0.327**
	(0.177)	(0.142)	(0.129)	(0.216)	(0.161)
Private Transfers	1.592**	0.530*	0.0468**	0.0428***	0.523
	(1.034)	(0.543)	(0.407)	(0.628)	(0.486)
Pension/Social Assistance	0.0589	0.0223	-0.716	-1.139	0.619
	(0.551)	(0.482)	(0.459)	(1.029)	(0.456)
Business	-0.357***	0.0903	-0.153*	0.361***	0.079
	(0.132)	(0.105)	(0.0903)	(0.126)	(0.116)
Other Income Sources	0.304	0.109	-0.0965	-0.169	0.059***
	(0.301)	(0.289)	(0.270)	(0.392)	(0.379)
Household Characteristics					
Active Household Members	-0.0342*	0.0217	-0.0709***	0.0598***	0.214
	(0.0180)	(0.0146)	(0.0136)	(0.0181)	(0.183)
Female-Headed Household	-0.528**	-0.0341	-0.00984	0.606***	-0.390***
	(0.208)	(0.161)	(0.141)	(0.190)	(0.118)

Household Head Education Primary	0.477***	-0.0435	0.260***	0.107	-0.502***
	(0.102)	(0.0962)	(0.0854)	(0.126)	(0.130)
Household Head Education HSSC	0.355***	0.0880	-0.00766	-0.0427	-0.102
	(0.113)	(0.102)	(0.0937)	(0.140)	(0.082)
Household Head Age 25-49	0.510**	-0.171	0.200	0.225	-0.534**
	(0.211)	(0.195)	(0.168)	(0.232)	(0.244)
Household Head Age 50 and above	0.0593	-0.0133	0.0582	0.0436	0.0537
	(0.0840)	(0.0730)	(0.0646)	(0.0971)	(0.0817)
Mud Floored House	0.153*	0.153*	0.115	-0.170	0.127
	(0.0922)	(0.0807)	(0.0710)	(0.107)	(0.0940)
Urban Dweller	0.0607	-0.0707	0.205***	0.236**	-0.283***
	(0.0964)	(0.0851)	(0.0710)	(0.107)	(0.101)
BISP Transfers	-0.0873	0.000227	-0.0113	0.0219	-0.259***
	(0.0804)	(0.0709)	(0.0626)	(0.0947)	(0.0779)
Constant	-3.369***	-3.246***	-3.425***	-4.027***	-3.379***
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	9,151	9,151	9,151	9,151	9,151
Number of Households	3,465	3,465	3,465	3,465	3,465
Hosmer and Lemeshow on goodness-of-fit tesr	0.56				
Log likelihood	-6867.9811				
Pseudo R2	0.27				

Note: Standard errors in parentheses *** $p<0.01$, ** $p<0.05$, *$p<0.1$

Moreover, we also examine households coping strategies when they face single and multiple shocks. The results in Table 4.10 show that for households with one shock, the preferred coping strategy is an adjustment in food consumption and selling assets. However, in the case of selling assets, the value of the coefficient is small, which shows that given the sampled households are poor, they hardly have any assets to sell in order to compensate for the shock confronted. Thus the poor mostly rely on making an adjustment in their food consumption, either by cutting the quantity or compromise the

quality of food they consume. Similarly, when households face two kinds of shocks, the results show that they employ all available options to cope, but the preferred strategies are borrowed money and adjusted in food consumption. In the case of both the strategies, the coefficient values are almost equal, suggesting that households have relied on both strategies equally in order to respond to the shocks.

Households with three or more than three shocks have relied on asset sold and borrowed money, both being employed with equal magnitude. The results for adjustment of food consumption have remained the same between households with two or three shocks. This must be due to the fact that the monthly real food consumption of the households is already at or below the poverty line, so any further reduction in food consumption would lead to starvation. This has been described by many studies for developing countries, in which households are defined as risk-averse, and in times of shocks, they employ various strategies to smooth their consumption (Pradhan and Mukherjee, (2018); Porter, C. (2008)). Additionally, when households encounter multiple shocks, they increase their paid labor supply either by increasing their working hours or pushing other members of the household into work.

Table 4.11: **Effects of Employing Coping Strategies for Households with Single and Multiple Shocks**

VARIABLES	(1) Asset Sold	(2) Borrowed Money	(3) Adjusted Food Consumption	(4) Increased Labor Supply	(5) Did Nothing
Household with One Shock	0.210*** (0.067)	0.007 (0.059)	0.859*** (0.048)	0.131 (0.081)	-0.018** (0.007)
Control Variables	Yes	Yes	Yes	Yes	Yes
Two Shocks	0.815*** (0.077)	1.365*** (0.068)	1.278*** (0.064)	0.988*** (0.088)	0.116** (0.007)
Control Variables	Yes	Yes	Yes	Yes	Yes
Three or more than three Shocks	1.358*** (0.094)	1.371*** (0.089)	0.813*** (0.083)	1.124*** (0.110)	0.165** (0.008)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	9,151	9,151	9,151	9,151	9,151
Number of Households	3,465	3,465	3,465	3,465	3,465
Hosmer and Lemeshow on goodness-of-fit test	4.97 -				
Log likelihood	3068.734				
Pseudo R2	0.15				

Note: *** p<0.01, ** p<0.05, * p<0.1

In the face of various shocks, a number of households have turned to formal and informal assistance; 73.55% surveyed households have used borrowings, which constitute both formal and informal assistance, includes borrowing from relatives, money lenders as well as borrowing from institutions (e.g. banks). However, borrowing from formal sources (banks) makes 5% of the totally borrowings, while informal sources constitute major portion of the borrowings (Table 4.11).by analyzing the data on borrowings and find that regardless of the occurrence of shocks, private assistance is

quite generous, and it is not crowded out in the presence of government support programs. However, it is observed that these private transfers are mainly individual transfers between friends or relatives and are reciprocal in nature in the forms of exchange of gifts or loans. Friends and relative accounts for 47% of the giving in comparison to 11% of the assistance received under various government programs. These results are also supported by Heltberg & Niels, (2009), by asserting that private assistance is very wide and significant in magnitude among poor Pakistani households, however, they further find that these transfers are high during religious festivals like Eid and Ramadan.

Table 4.12: **Formal and Informal Assistance Received (% Households reported)**

Welfare Received from Government various Programs	11.82
Formal Financial Institutions	5.22
Micro Lender	2.76
Money Lender	3.53
Family or Friend	47.93
Shop	42.28
Others	2.02

Values are average of BISP 2011, 2013 &2016 survey data

Summing up, we find that informal mechanism especially informal credits from friends and relatives or other community members like shopkeepers are more prevalent mechanism used by the poor households when hit by shocks. Other informal mechanisms include self-insurance strategies, which are mostly relied on when hit by shocks. This included use of savings and assets or adjusting their labor (increase in labor hours or pushing more members into work). However, it is important to note that many of these responses have some adverse consequences in short and long term.

4.7. Conclusion

In this chapter we analyze poor households shock patterns and coping strategies in order to assess their vulnerability to idiosyncratic and covariate shocks in Pakistan. This study also examines the role of BISP in protecting households in times of shock and distress. Using a panel of poor households identified under BISP Survey (2011-2016), we estimated logistic regression model of the probability of a shock conditional on independent variables and on households' coping strategies. Under the idiosyncratic shocks, we choose the first three shocks, which had hit the households more severely. These include illness or accident of households' main earning member, loss of salaried employment and livestock stolen. For covariate shocks, we choose rise in food prices, dwelling damaged by floods, displacement.

Prior to our econometric estimations, an analysis of the survey data was carried out and the results indicate that BISP's targeted households are exposed to both categories of shocks simultaneously. Among the list of covariate shocks, the rise in food prices seems to be a major shock as 54% households of the entire sample report to be affected by this shock. While from the list of idiosyncratic shocks, illness of main earning member is a major shock with 10% households being affected by it. With respect to household's characteristics, household head's average age is 46 years, with 2.1 years of education. The average household size is 7.5 and average dependency ratio is 4.9 with 20 % of the households having ownership of their house.

Estimates of logistic regressions reveal similar patterns of households' behaviors as shown by the data analysis. Results show that the sampled households are characterized with low level of asset ownership and consumption expenditure, which increase their vulnerability to external shocks. We find that sharp rise in food prices dominates all, followed by health shock. Moreover, with low level of physical and financial assets

owned by these households, they resort to coping strategies which are further damaging in nature i.e compromising on the quality and quantity of food consumption, selling assets and pushing children towards child labor. While analyzing the coping strategies of the sampled households, we find that informal mechanism which includes informal credit from friends and relatives or other community members like shopkeepers is more prevalent strategy among the poor households when hit by shocks. Other informal mechanism includes self-insurance strategies, which included use of savings and assets or adjusting their labor in terms of increased labor hours or pushing more members into work. Moreover, households with single and multiple shocks are also observed and the results show that the sampled households rely on more than one strategy implying the severity and cost of the confronted shocks.

Based on the results of this chapter, we conclude that the sampled households are exposed to idiosyncratic and covariate shocks along with weak and costly coping strategies, increasing their vulnerability to future shocks. Moreover, public assistance and other government welfare programs including BISP exist, but they appear ineffective in protecting these households in times of shocks. Thus it is important that these policies are devised such that they substitute other exploitative and costly mechanisms for the poor and vulnerable households. Also the transfers under this program should be generous in size, and responsive to shocks than what they are at present.

CHAPTER 5

CASH TRANSFERS AS CONSUMPTION INSURANCE FOR HOUSEHOLDS IN TIMES OF SHOCKS

5.1   Introduction

As laid out in chapter 4, poor households, in times of shock, employ various ex-post coping strategies in order to secure and smooth consumption. This includes selling off their assets, resorting to child labor, borrowing from friends and relatives. However, neither of these strategies allows the household to secure themselves against the risk, rather it makes them more vulnerable and pushes them further in the trap of poverty.

Equally, it is also important to understand the role of government interventions in mitigating household's vulnerability at the time of shocks. Government's social protection programs both- cash and non-cash help the poor households to mitigate the risk when they don't have access to formal financial market. These help them in avoiding potentially damaging risk management and coping strategies, such as withdrawing children from school and disinvesting in school and human capital or selling assets. Thus, effective and well-targeted social protection programs are important to prevent households fall below poverty line in the long run.

Studies have shown that such interventions help in reducing income fluctuations, as it increases income irrespective of shocks [Cox & Jimenez, (1992); Modruch (1999); Tiwari et al.(2016); Hjelm et al. (2017); Kaul, (2018)]. Moreover, few researchers have also studied the effectiveness of BISP in Pakistan [Beall (1995); Pasha et al. (2000); Arif, (2006); Kabeer, (2010); Jamal, (2010); and Cheema et al. (2014); & (2016); Ambler and Brauw, (2017)]. Most of these studies have looked into the outcomes of such an intervention program, overlooking the channel and factors which push households below the poverty line. One strand of literature argues that social protection

programs increase the socio--economic standards of the target households by enhancing investment in health and education (Arif 2006; Cheema et al. 2014; & 2016). While others show positive effect on household's food consumption (Naqvi et al. 2014). Similarly, numerous others have focused on households' risk coping strategies in case of Pakistan [Alderman et al., (2006); Heltberg and Niels (2009); Karuski, (2012); Haque (2015) Malik *et al*, (2017)] However, these studies look at the end results of cash transfers made to the intended targets. They overlook the channels which push poor households down the poverty line. This calls for more research in addressing households' vulnerability before looking for the intended results any public intervention program. Our work thus fills this gap by linking the literature of households' vulnerability to the few but emerging literature on social protection programs.

Based on the background, this chapter focuses on consumption smoothing behaviors of poor households identified under Benazir Income Support Program (BISP) and investigates if BISP is effective in providing cushion to protect households' consumption households against shocks.

The objective of this chapter is twofold: firstly, we examine how households' smooth consumption in the face of idiosyncratic and covariate shocks while observing the change in food and non-food consumption expenditure of households. Secondly, we evaluate if BISP is able to protect households' consumption in the face of each shock. This will help us in assessing households' consumption vulnerability, how they adjust their food consumption in terms of reduction in quantity or compromising on the quality of food. Moreover, whether risk-sharing mechanism holds among these households, if not what other informal mechanisms they use to compensate the inflicted loss. Also, how far is BISP effective in providing consumption insurance against each shock. In doing so, we

attempt to provide empirical evidences of the effectiveness of public intervention programs in mitigating the risks faced by vulnerable households. This has strong implications for strengthening and scaling up of BISP in Pakistan.

This chapter is organized as follows: after introduction, section 5.2 discusses the theoretical foundations while section 5.3 lays out specifications of the econometric model. Section 5.4 provides details on data and methodology used for this chapter and section 5.5 discusses results of regression. Section 5.6 provides conclusion of this chapter.

5.2. Theoretical Foundations

The households coping strategies against various shocks, are based on the full risk-sharing hypothesis and permanent income hypothesis. The full risk-sharing hypothesis states that growth rate of a household's consumption remains unaffected with fluctuation in their income level (Bardhan & Udry, 1999). However, the households' fail to smooth their consumption during covariate shocks. Theoretically, numerous studies have based their work on the seminal work of Deaton (1999), while testing the famous Permanent Income Hypothesis (Bardhan & Udry, 1999). That is, households tend to smooth consumption in the face of transitory income fluctuations. Here it is pertinent to note that complete access to market is hardly available to the rural households in most of the developing countries.

From our discussion in chapter 2, we find that these hypotheses are repeatedly being rejected in most of the studies based on micro-data. For example, Townsend (1994), Ravallion and Chaudhuri (1997), have tested the hypothesis on rural households in South India. They found a substantial amount of risk sharing, but it's far from perfect risk sharing. Following Townsend's (1994) views, Morduch (1991), Ravallion and

Chaudhuri (1997) find weaker evidence using the same data.

Thus, the empirical findings suggest that shocks are spread across households and no complete risk sharing takes place. However, in the context of developing countries, most of the studies on consumption smoothing find that smoothing takes place and consumption of the poor is more than income. They do so either by taking precautionary measures in advance (risk management) or after the shocks have occurred (risk coping). Households can diversify their sources of livelihoods (Rosenzweig and Binswanger (1993); Morduch (1990); Alderman and Paxson (1994)) or they employ self- insurance strategies which includes using precautionary savings and selling assets built up in good time. Deaton (1991) has shown that using precautionary savings is an effective way for households to deal with income risk, while Rosenzweig and Wolpin (1993) report about the use of bullocks in India to smooth consumption.

Moreover, to test PIH, Deaton, (1997) notes that poor households in developing countries have limited access to perfect credit market, which makes it difficult to save or borrow in times of shock. Thus the strong assumptions of PIH fail to hold, so it is important to keep this context in mind while analyzing households' decisions or strategies in times of shocks.

There is ample evidence to suggest that social assistance programs can have a positive effect by stabilizing consumption and helping households to decrease negative coping strategies during shocks. Decron (2005) has classified these interventions into ex-ante and ex-post measures. In case ex-ante measures, saving behaviors and access to credit market is ensured such that the poor is able to protect themselves in times of shocks. While ex-post measure also include providing relief or other social safety nets to protect the household's welfare loss after shocks have occurred, so the literature reviewed here

are focused on ex-post interventions. This is achieved through social protection programs, which help in stabilizing consumption and replace households negative coping strategies during shocks. For example; Morduch (1999) finds that such programs guarantee a minimum insurance for areas where safety-net services are non-existent. Similarly, Cox & Jimenez, (1992), assert that such interventions help in reducing income fluctuations, as it increases income irrespective of shocks. Moreover, studying Mexico's Conditional Cash Transfer Program- Oportunidades- Sadoulet and Vakis (2004) support the intervention with their findings that transfers from Oportunidades compensate against shocks and protect child schooling in rural households.

Another strand of literature asserts that social insurance can only be beneficial when private transfers are inadequate. While testing the full insurance theory, Townsend (1994) examine fluctuations in consumption as a result of shocks, it finds that full risk sharing does not hold and households' consumption fluctuates with change in come. In such scenario, when there is no social insurance available, households resort to costly consumption smoothing methods (like, child labor). Thus social insurances have welfare benefits, even if consumption volatility may not reduce much, by reducing inefficient income smoothing techniques (Chetty and Looney, 2007).

5.3. Methodology and Empirical Strategy

The empirical test of our work is based on the theories discussed above, which have been tested in most of the prior studies on shocks and consumption in developing countries. The general consensus of these studies is that transitory shocks seldom translate into a significant drop in consumption. This is because households employ costly coping strategies like selling assets or borrowing (Frankenberg, Smith, and Thomas, 2003), reduce investment on child education and health (Frankenberg, Thomas, and Beegle 1999; Thomas et. al. 2004) and adjustment in labor supply (Beegle,

Frankenberg, and Thomas 2000; Cameron and Worswick 2003). While other studies like (Morduch (995); Cameron and Worswick, (2003) imply that economic shocks are not costly, so the scope for publicly provided social insurances for transitory shocks is very small. In our study, we will examine the validity of this conclusion for households' behavioral responses under BISP, Pakistan.

Contemporary literature is suggestive of application of statistical techniques related to impact evaluation of any intervention program which are Regression Discontinuity (RD), Difference-in-Difference (DID), and Difference-in-Discontinuity [e.g. Calonico et al (2018); Uchiyama (2018); Cheema et al. (2016); Gertler et al. (2011); Grembi et al (2011); Angrist and Pischke (2008); Colney and Taber (2005)]. However in our study, BISP survey data does not provide the consumption data on treatment and control group before implementation of the program, which prevents us to assess the pretreatment differences between both groups, as asserted in other studies of impact evaluations.[13] Thus, we apply fixed effect estimates to explore the causal effects of BISP's cash transfers on households' consumption vulnerability and their subsequent responses to shocks in Pakistan.

5.3.1 Full Risk Sharing Model for Idiosyncratic Shocks

Under the full risk sharing model, growth rate of consumption of the household is independent of the growth rate of household income after controlling for aggregate shocks. This specification is commonly used in literature (e.g Cochrane, (1991); Mace,(1991); Townsend, (1994); Ravallion & Chaudhuri, (1997)). In these studies, the full risk-sharing model is based on consumption and income growth relations; however, we base the full risk-sharing model on the relationship between consumption and

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[13] As Skoufias (2003) remarks, "the absence of any reliable consumption data in treatment and control villages before the implementation of Progresa prevent one from applying the difference-in-differences estimator for the evaluation of the impact of PROGRESA on consumption insurance" (pp.638).

occurrence of shocks:

$$= \alpha_0 + \alpha_1 S_{it} + \alpha_2 \, BISP_t * S_{it} + \alpha_3 \, BISP_t + \beta X_{it} + \gamma_i + \mu_t + \varepsilon_{it} \qquad (5.1)$$

Where C_{it} is defined as adult equivalent consumption per capita of household at time t, S_{it} represents idiosyncratic shocks, X_{it} is a set of socioeconomic and demographic characteristics of the household that takes into account the composition of the household by age, sex, and education level of household head; and $\gamma_i \mu_t \varepsilon_{it}$ represent household, time-invariant effects, and the idiosyncratic error term, respectively. For validity of the theory, $\alpha_1 = 0$, which says that idiosyncratic income shock has zero effect on the household consumption changes.

In the equation, BISP is a binary variable which is 1 for households in the treatment group (in both first and second round of survey) and 0 for households in control group (in all the three rounds of survey and for treatment households at the baseline). Further, α_2 measures the spread in vulnerability between treatment and control groups, who have been hit by the same shock. That is, BISP provides insurance mechanism for consumption smoothing of the poor household while reducing the negative impact of shocks on households' consumption level. Here negative and significant α_2 implies that BISP has reduced risk of vulnerability in the treatment group. However, insignificant estimates suggest any significant differences between treatment and control households. Moreover, α_3 represents the effects of BISP on consumption for households in general.

Since, under the BISP intervention, the sample households are not randomly assigned between the treatment and control group, the BISP intervention is an endogenous variable in the consumption equation, which may correlate with many other unobservable factors. However, we found balance between covariates in each

subsample, so we assume that program is uncorrelated with unobservable factors in the consumption equation.[14] Moreover, by using fixed effect estimations, we are able to control for unobservable time invariant characteristics.

5.3.2. Risk Sharing Model for Covariate Shocks

In order to examine consumption smoothing with respect to covariate shocks, we use the same equation by substituting idiosyncratic shocks with covariate shocks

$$C_{it} = \alpha_0 + \alpha_1{}^c S_{it} + \alpha_2{}^c BISP_t * S_{it} + \alpha_3{}^c BISP_t + \beta X_{it} + \gamma_i + \mu_t + + \varepsilon_{it} \qquad (5.2)$$

Here coefficients with superscript 'c' measure the impacts of covariate shocks on households' consumption. Under the Full Risk sharing model, households arrange resources to compensate for variations in income caused by idiosyncratic shocks. However, they fail to do so in case of covariate shocks, as all or almost all households are get affected, which break down their internal transfer mechanism. So we expect $\alpha_1{}^c=1$ under the full risk-sharing model or at least $0 < \alpha_1{}^c < 1$ if households are able to smooth at least some part of the covariate shock through formal or informal insurance mechanisms

Similarly, we also examine the role of BISP in consumption smoothing in the presence of covariate shocks, which is captured by the interactive term with coefficient $'\alpha_2{}^c{}'$. We expect negative $'\alpha_2{}^c{}'$ saying that BISP is able to minimize the negative impacts of shocks on households consumption.

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[14] Covariates are balanced in both the treatment and control group.

5.3.3. Consumption Smoothing Against Idiosyncratic Income Change

The full risk sharing model can also be tested by looking into the changes in household income as a measure of shocks. (Skoufias, 2003; Townsend, 1994; Ravallion & Chaudhuri, 1997). According to Isponia (2010), using income growth instead of negative shock dummies is better as income growth has the same time frame as that of consumption.[15]

$$C_{it} = \alpha_0 + \alpha_1 Y_{it} + \alpha_2\, BISP_t * Y_{it} + \alpha_3\, BISP_t + \beta X_{it} + \gamma_i + \mu_t + +\varepsilon_{it} \qquad (5.3)$$

Where C_{it} and Y_{it} represents, consumption growth per adult equivalent and income growth per adult equivalent, respectively. For the validity of full risk sharing, $\alpha_1 = 0$, but if α_1 is positive and significant, it shows a partial correlation between income and consumption growth in the control group. If BISP's intervention assists beneficiary households to cope with income shocks, we expect a negative estimate of α_1, and the sum $\alpha_1 + \alpha_2$ will show a partial correlation between income and consumption growth in the treatment group. Hence, a lower value of α_1, shows a high degree of consumption insurance and thus a lower vulnerability of consumption to income shocks.

5.4. Data and Variable Description

This chapter focuses on consumption growth per adult equivalent as the main outcome variable along with food and nonfood consumption growth for the two follow up surveys. The independent variables include, idiosyncratic and covariate shocks along with dummy for treatment variable. The description of each variable is given below:

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[15] In BISP survey, the questions asked with regards to the occurrence of shocks is two years prior to the time of survey, while the period of consumption is a month or two weeks before the survey.

5.4.1. Dependent Variables: Households' Consumption Expenditure

BISP evaluation survey contains detail information on food and nonfood expenditure in all three rounds; baseline, first round and second round. With regards to food items, households are asked by the amount of money spent on buying food items like fruits, vegetables, cereals, grains and meat product and other food items like milk, soft drinks and other beverages. In the nonfood expenditure category, there is information on the money spent on clothing, health products and services, house maintenance products, school and educational goods, transportation, utilities, and other nonfood expenditures, like cigarettes, social events, and toys. We have excluded luxury items like furniture and other expensive machinery as they do not represent regular expenditure of the household.

Based on the nature of commodity, households are asked about their consumption expenditure made during the week, month, semester, or year prior to the date of the survey. In order to construct the measure of household consumption expenditure used in this paper, we converted all expenditures into a household's monthly expenditures and then added them up across the corresponding categories: total consumption, food consumption, and nonfood consumption. We also deflated the measures using Consumer Price Index (CPI) and then turned them into adult- equivalent rupees at constant 2011 prices.

For constructing adult-equivalent household consumption expenditure, household monthly expenditures are converted into adult-equivalent household size by applying a weight of 0.8 upon household members that are younger than 18 years, and a weight of 1 upon household members who are 18 or older.[16] This adjustment can be stated as follows:

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[16] This is taken from BISP's evaluation reports, 2011, 2013 & 2016.

Adult equivalent householdsize $=0.8\times$ *Number of household members under* 18

$+1\times$ (*Number of household members over* 18)

After dividing expenditures by the relevant adult equivalent household size, these nominal expenditures are subsequently adjusted to account for inflation. To this end, a regional and intra-survey temporal price deflator is computed using the following Paasche Index:

$$p_i^p = \sum_{i=k}^{n} w_{ik} \left\{ \frac{p_{ik}}{p_{ok}} \right\}$$

Where w_{ik} is the budget share of item k in PSU i, while p_{ik} is the median unit value of item k in PSU i, and p_{ok} is the national median unit value of item k.

5.4.2. Independent Variables

5.4.3. Shocks

Based on the literature reviewed above, we observe that shocks are major variables affecting households' consumption pattern and are a source of vulnerability in the long run. As explained in the data section of previous chapter (Chapter 4, Section 4.2.2.1) using BISP survey data, we have identified a number of shocks, which the households face, however for this study we categorized the shocks into two types: idiosyncratic shocks and covariate shocks. And each category, we chosen three shocks based on the severity of each shock confronted by the sampled households. We use a dummy for each of these shocks and each takes a value of 1 if the households face any of this shock two years prior to each survey. The detail of shocks variables is given in Chapter 3, Section 4.2.2.1.

5.4.4. BISP Treatment Variable

Based on the objective of this chapter, we introduce BISP as a treatment variable in which BISP is introduced as a binary variable with is 1 for households in the treatment group (in both first and second round of survey) and 0 for households in control group (in all the three rounds of survey and for treatment households at the baseline).

5.4.5. Control Variables

There are many explanatory variables affecting households' consumption and shock relations.. Individual's characteristics as well as household characteristics are found to affect this relations. Explanatory variables were selected on the basis of the relevance to the study as well as data availability. The household' socio-economic characteristics include all households' members reported income like wages, salaries, pension, agricultural income, profits and other sources of earned income. It excludes personal income (remittances), non-labor and non-regular income like sale of assets, personal gifts, inheritance or lottery. According to Skofias (2003), personal incomes are excluded because they reflect ex-post adjustment to shocks. The units of reported income varies from weekly, monthly to yearly, we convert them into monthly real income by deflating them by CPI 2011. Rest of the control variables include households' socio economic and demographic characteristics: education dummies, family size, housing status, economically active members in a household etc.

5.5. Results and Analysis

Table 5.1: **Presents descriptive statistics of the explanatory variables**

Variables	Mean	SD
Panel A-Household Characteristics		
Household Head age	46.73	11.5
Household Head Education	2.1	3.3
Dependency ratio	4.9	2.4
Mother's Education*	0.1	0.5
Owner's Occupied House*	0.8	0.4
Urban*	0.2	0.4
Agriculture*	0.1	0.4
Panel B-Consumption, Income		
Monthly per-adult equivalent real food consumption	1175.5	655.9
Monthly per-adult equivalent real nonfood consumption	1833.5	1770.0
Monthly per-adult equivalent total consumption	3022.7	1987.7
Monthly per-adult real income	2121.5	1803.0
Change in real(per adult-equivalent) food consumption	0.2	0.6
Change in real non-food consumption	0.5	1.1
Change in real total consumption	0.2	0.8
Change in real total income	0.1	1.1
Panel C- Shocks*		
Illness of main earning member	0.10	0.30
Salaried loss	0.02	0.15
Rise in food prices	0.54	0.50
Displacement	0.03	0.16
Dwelling damaged/loss due to floods	0.05	0.22

Notes: Values are average of the three rounds of survey. Consumption and income are deflated to 2011 CPI in Pakistani rupees.**The m**ean values of dummy variables represent percentage of households that have been effected by the given shocks

5.5.1. Socio-Demographic and Economic Characteristics

In order to assess the socioeconomic characteristics of beneficiary (treated group) and non-beneficiary (control group) households at the baseline, we established the groups based on the PMT score. For beneficiary, we chose households having score between

11.17 and 16.17 and for non-beneficiary; the households with scores between 16.17 and 21.17 were chosen.

Table 5.2-A displays the socioeconomic characterististics for each group at the baseline and the results show almost homogenous characteristics. Both groups exhibit high vulnerabilities with dependency ratio, with lower level of education and less economically active members in both the groups. The descriptive statistics of the panel households in shown Table (Appendix IV).

Table 5.2-A: **Socioeconomic Characteristics at the Baseline**

Characteristics	Treatment		Control	
	Mean	**SD**	**Mean**	**SD**
Household Head age(Average Yrs)	45.43	11.75	45.93	12.34
Household Head Education	2.19	3.26	2.66	3.54
Dependency ratio	4.84	2.04	4.32	2.13
Mother's Education	0.38	1.50	0.53	1.77
Male Household Head Age	43.83	14.12	44.57	14.45
Male Household Head Education	2.19	3.26	2.64	3.53

Source: Estimated from BISP Dataset of Baseline Period 2011

A comparison of asset ownership between treatment and control groups is provided in Table 5.2-B. The findings reveal that households in both groups are at disadvantage position with poor living conditions. Both the groups have less access to electricity, with difficulty in accessing safe drinking water along with low quality housing facility. Along with this, majority households lack asset ownership like land ownership. Thus, by profiling both groups of households, it is observed that, on average, similar characteristics at the baseline.

Table 5.2B: **Asset Characteristics of Households at the Baseline**

Characteristics	Treatment		Control	
	Mean	**SD**	**Mean**	**SD**
Owner's Occupied House (%)	77.9	6.3	80.7	1.08
No. of Rooms	1.62	0.96	1.68	0.85
Floor Kacha (%)	71.15	0.55	72.57	0.94
Access to Electricity (%)	60.7	0.47	56.34	0.73
Access to Toilets (%)	35.21	2.36	39.32	4.46
Access to Safe Drinking Water (%)	44.22	10.23	48.21	11.21
Owning Agricultural Land (%)	14.62	0.34	13.38	0.35

Source: Estimated from BISP Dataset of Baseline Period 2011

Similarly, we also observed households' monthly real per adult equivalent consumption in order to assess any pre-treatment difference between the treatment and control households. Results in Table 5.2-C reveal that households spend, on average, Rs 3000 per adult equivalent per month on total consumption, and that 60% of these expenditures are on food. Moreover, the amount of expenditures on food, non-food and total consumption is almost similar across both groups of households. Cheema et al., (2014) have shown effectiveness of BISP on households' consumption after two years of the program implementation. The have seen an increase in the monthly per adult equivalent consumption expenditure by PKR 318 as a result of receiving the BISP cash transfers.

Table 5.2-C: **Monthly Real Consumption at Baseline**

Characteristics	Treatment		Control	
	Mean	**SD**	**Mean**	**SD**
Real per adult equivalent monthly consumption (In Rs)	3021.28	1887.13	3233.65	2140.45
Real per adult equivalent monthly food consumption(In Rs)	1601.21	914.86	1616.37	1036.54
Real per adult equivalent monthly non-food consumption(In Rs)	1344.56	1201.29	1480.95	1360.22

Source: Estimated from BISP Dataset of Baseline Period 2011

Among the list of covariate shocks, rise in food prices seems to be a major shock as 54% households of the entire sample report to be affected by this shock. While from the list of idiosyncratic shocks, illness of main earning member is a major shock with 10% households being affected by it. While analyzing the spread of the shocks

identified in Chapter 4 in detail, it is observed that most of the shocks have emanated from two main sources; idiosyncratic and covariate For the sampled households of this study, we have chosen three covariate shocks, which include rise in food prices, dwelling destroyed or damaged due to floods and displacement. Similarly, under the idiosyncratic shocks, three most reported shocks have been observed, which includes illness of main earning member of the household, loss of salaried employment and loss of livestock. All these shocks have been observed contributing to high income volatility of the households. Generally, these kinds of shocks are due to limited access to medical services, unhygienic living conditions along with limited means income sources. Moreover, these difficulties are compounded by lack of formal insurance facility and lack of access to credit market.

Moreover, that the sampled households experienced numerous types of shocks, with covariate shocks dominating the idiosyncratic shocks. Among the covariate shocks, rise in food prices (54.38 %) dominates all followed by dwelling being damaged by floods (4.34%) and displacement (1.92%). Moreover, among the idiosyncratic shocks, illness of main earning member dominates among other shocks in the sampled households; illness of member (10.48%) followed by livestock stolen/died (4.51%) and employment/job loss (2.9%). Households have also reported that most of the shocks have caused income loss; both covariate and idiosyncratic shocks have caused more than 90 % loss to the households, while the asset loss is less than half of the income loss (36%).

The fact that BISP was designed in a time when the world was hit by global recession in 2008, effects of this shock appears to be the most prominent one in the list of shocks experienced by the samples households of our study. Moreover, during the period of recession, there were also concerns of a drop in remittance income, however, the survey

data suggest that among the sampled households, it is not a major concern. When asked the households about the set of concerns, only 2% has experienced a shock pertaining to the loss or reduction in remittance income. This must be due to the reasons that the sampled households is based on poorest of the poor, who are casual labors as reported above.

All these shocks have been observed contributing to high income volatility of the households. Generally, these kinds of shocks are due to limited access to medical services, unhygienic living conditions along with limited means income sources. Moreover, these difficulties are compounded by lack of formal insurance facility and lack of access to credit market.

5.4.2.   Consumption and Idiosyncratic shocks

The results of equation (5.1) are presented in Table 5.3with monthly real per adult-equivalent household consumptions (food, nonfood and total) as dependent variables. Column 1 shows results for food consumption, column 2 for nonfood as dependent variable and column 3 for total consumption. It includes estimations for each shock individually as well as estimates for households hit by two or more than two shocks simultaneously. As discussed earlier, these estimates are ascertained based on the assumption that there already exists an insurance mechanism within the communities. All regressions control for households' characteristics like age, education, gender of household's head, number of members in a household active in labor market, a dummy for owner's occupied house and a dummy for households locating in urban region. We also control for sources of income of the households.

Table 5.3: **Impacts of Idiosyncratic Shocks: Fixed Effect Estimates**

	Food Consumption	Non Food Consumption	Total Consumption
Illness of earner	0.0881	0.0441	0.027
	(0.063)	(0.113)	(0.085)
llness of earner*Treatment	-0.061	0.129	0.0744
	(0.0811)	(0.134)	(0.101)
Control Variables	Yes	Yes	Yes
Number of Observations	5,284	5,284	5,284
Wald test (χ^2)	84.34***	475.66**	495.84**
R-Squared	0.0138	0.0827	0.0875
Employment Loss	-0.316**	-0.646***	-0.553***
	(0.153)	(0.226)	(0.185)
Employment Loss *Treatment	0.208	0.650**	0.518**
	(0.181)	(0.268)	(0.209)
Control Variables	Yes	Yes	Yes
Number of Observations	5,284	5,284	5,284
Wald test (χ^2)	89.63**	505.9***	531.49***
R-Squared	0.0146	0.0875	0.0932
Livestock stolen	-0.0258	0.0705	0.0442
	(0.102)	(0.197)	(0.14)
Livestock stolen *Treatment	0.11	1.537***	1.023***
	(0.124)	(0.211)	(0.15)
Control Variables	Yes	Yes	Yes
Number of Observations	5,284	5,284	5,284
Wald test (χ^2)	85.6**	426.78**	475.38**
R-Squared	0.031	0.067	0.751
One Shock	0.0118	-0.024	0.00883
	(0.0445)	(0.0675)	(0.0516)
One Shock *Treatment	-0.0621	-0.0638	-0.0772
	(0.054)	(0.0819)	(0.062)
Control Variables	Yes	Yes	Yes
Number of Observations	5,284	5,284	5,284
Wald test (χ^2)	95.67**	324.43***	350.6***
R-Squared	0.042	0.052	0.743
Two Shock	-0.0517	-0.144	-0.144**
	(0.0625)	(0.0964)	(0.0706)
Two Shock *Treatment	0.083	0.149	0.128
	(0.0778)	(0.117)	(0.0859)
Control Variables	Yes	Yes	Yes
Number of Observations	5,284	5,284	5,284
Wald test (χ^2)	65.41**	200.1***	250.67*
R-Squared	0.031	0.043	0.054
	-0.0881	-0.2	-0.219*
Three Shock	(0.0957)	(0.157)	(0.124)
	0.0516	0.21	0.185

Three Shock *Treatment	-0.111	-0.184	-0.14
Control Variables	Yes	Yes	Yes
Number of Observations	5,284	5,284	5,284
Wald test (χ^2)	38.77**	123.17*	104**
R-Squared	0.002	0.017	0.008

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Considering each shock at a time, it is found that the Full Risk-sharing Hypothesis is rejected for salaried loss and livestock stolen, that is, loss of employment/salary reduces food consumption by 31.6% and nonfood consumption by 64.6%. This is a sizeable shock to both kind of consumption, given that the average monthly real consumption is at or below the poverty line. [17] This shows that households are unable to smooth their consumption, what is apparently the most significant shock to their income. While loss of livestock reduces food consumption by 2.5%, however it doesn't have any significant effect on overall consumption. The results for illness of main earning member show an increase in consumption expenditure, but are insignificant. It is important to note that households have reported that this particular shock has resulted into an income loss of about 44% [18] For robustness, we also regressed this shock on household's total consumption, which includes consumption in-kind, however, the results remain the same. Positive coefficients for both food and nonfood consumption can also be attributed to the fact that the poor households already live on subsistence level of consumption, so they cannot afford to reduce consumption further. Thus they use informal and other self-protection strategies to smooth consumption. Additionally, an increase in non-food consumption expenditure could be due to cost of visit to hospitals and other related expenses which resultantly increases the overall expenditure of the household.[19]

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[17] In our sample of households, the average household's monthly real consumption is 3022.7 PKR, while the new poverty line defined is 3244PKR
[18] Refer to Chapter 4 for more details.
[19] Nonfood expenditure includes health, clothing, transport and other miscellaneous expenditures.

While examining the impacts of BISP on consumption smoothing of poor households, it is observed that the households are not able to sustain their consumption when hit by each of the shocks. Particularly, in case of loss of employment and lives stock, treated households nonfood consumption is significantly and negatively affected. This shows that consumption of treated households is to some extent insured against shocks as compare to control group households. Thus in each of the three idiosyncratic shocks, illness of main earner, employment loss and livestock loss, there is little evidence for BISP insuring households' consumption when hit by any shock.

Similarly, we look into households hit by single as well as multiple shocks. A single shock reduces nonfood consumption by 2.4%, however it does not affect food and total consumption of the households. While two shocks at time reduce the food consumption by 5% and nonfood and total consumption are reduced by 14% with significant effect on the total consumption. Moreover, the households hit by three shocks at a time, reduce their food consumption by 8% and non-food consumption by 20%, however, the result is significant only in case of total consumption. While looking at BISP cash transfers in each case, there seems an insignificant in protecting households' consumption in each case.

5.4.3. Consumption and Covariate Shocks

In order to examine the effects of covariate shocks on households' consumption, we use four shocks, which have been mostly reported by almost all or all households in each round of BISP survey. We use (1) rise in food prices, (2) displacement, (3) dwelling damaged by flood, (4) crop loss. Results are shown in table (5.4) below:

Table 5.4: **Impacts of Covariate Shocks: Fixed Effect Estimates**

	Food Consumption	Non Food Consumption	Total Consumption
Rise in Food Prices	-0.0956**	-0.309***	-0.251***
	(0.0462)	(0.0693)	(0.0537)
Rise in Food Prices *Treatment	0.024	0.0315	0.032
	(0.062)	(0.104)	(0.0776)
Control Variables	Yes	Yes	Yes
Number of Observations	5,248	5,248	5,248
Wald test (χ^2)	193.36**	857.42*	878.51**
R-Squared	0.0311	0.1398	0.1452
Dwelling Damaged by Flood	-0.283	-0.22	-0.263
	(0.181)	(0.259_	(0.192)
Dwelling Damaged by Flood *Treatment	0.283	0.0157	0.167
	(0.217)	(0.313)	(0.23)
Control Variables	Yes	Yes	Yes
Number of Observations	5,248	5,248	5,248
Wald test (χ^2)	209.89**	724.9**	765.09*
R-Squared	0.034	0.09	0.012
Displacement	-0.478	-0.13	-0.095
	(0.358)	(0.615)	(0.187)
Displacement *Treatment	0.761*	0.835	0.686***
	(0.403)	(0.675)	(0.246)
Control Variables	Yes	Yes	Yes
Number of Observations	5,248	5,248	5,248
Wald test (χ^2)	185.05**	773.36*	811.24**
R-Squared	0.002	0.121	0.135

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

As we observe, rise in food price affects food and nonfood consumption negatively and significantly, however, the change in food consumption seems very small for both groups, decreasing food consumption by 9% for control group and by 7% for the treatment households (0.073=0.0956-0.024).The results here are contrary to economic predictions as the rise in food prices seems not to have substantial reduction in consumption of our sample households. However, these results can be justified by the fact that the monthly real food consumption of the households is already at or below the poverty line, so any further reduction in food consumption would lead to starvation. This has been described by many studies for developing countries, in which households

are defined as risk-averse, and in times of shocks, they employ various strategies to smooth their consumption [Zimmermann and Carter (2003); Rosenzweig and Wolpin (1993)].

While examining if BISP has been able to protect households' consumption from deteriorating further with rise in food prices, it is found that full risk-sharing hypothesis fails to hold, as the coefficients are not equal or close to one in any case. The insignificant coefficients reveal that BISP is ineffective in providing insurance, which can be attributed to the small size of transfers made to the beneficiaries.[20]However, households rely on other informal sources and self- protection strategies to smooth their consumption. Moreover, the results are insignificant for covariate shocks except for crop loss, in which BISP is significant in protecting nonfood consumption only.

5.4.4. Consumption Smoothing against Change in Household Income

As described in the previous section, here we measure shocks in terms of the change in household's real income. Here household's income includes all members earned income, pensions, bonuses, institutional transfers, agricultural and nonagricultural sale. We have excluded personal transfers like gifts, irregular sale of assets or other home appliances. Personal transfers are excluded because they represent ex post adjustment to shocks as Skofias (2007) argues. Later household's income is converted into real monthly income per adult equivalent. Dependent variables are households' food, nonfood and total consumption. Here the parameters of interactive terms should be negative in order to see BISP's impact in reducing household's vulnerability to shock. Results are presented in table 5.4 below:

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[20] The baseline monthly per capita consumption is 2,137 PKR, and the average household size is around 8. Based on this, a monthly transfer under BISP is 1,566 PKR in July 2015.

Table 5.5: **Households Fixed Effects on Change in Idiosyncratic Income on Change in Consumption**

	Food Consumption	Non Food Consumption	Total Consumption
	1	2	3
Interaction with Treatment2013 &Treatment2016 dummies			
Change(ln) Income	0.0237	0.0179	0.176***
	(0.0227)	(0.0177)	(0.0205)
Change(ln) Income*Treatment2013	0.0378	0.142	0.0533
	(0.0314)	(0.0432)	(0.0329)
Change(ln) Income*Treatment2016	-0.0378	-0.122***	-0.0533
	(0.0314)	(0.0432)	(0.0329)
Interaction with Treatment2013 &t2016 dummy			
Change(ln) Income	0.137***	0.0879***	0.0160
	(0.0285)	(0.0210)	(0.0145)
Change(ln) Income *Treatment2013&2016	-0.0198	-0.0188	-0.0153
	(0.0223)	(0.0363)	(0.0272)
Observations	5,504	4,983	4,904
Number of Households	3,064	3,001	2,955

Note: *Treatment refers to interactive of real income with BISP treatment for the treated group. Additional repressors include household characteristics, but not reported. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In the above table, results have been disaggregated for both follow up rounds in order to observe the change in each period. The first panel presents the results while regressing the equation separately for each round. Based on the baseline covariates, a 10% drop in real income leads to 2% drop in food consumption, 1% drop in non-food consumption and a drop of 1.7% in the total consumption. However, insignificant coefficients for the dummy variable-Treatment2013, suggest that there is no significant difference in level of consumption insurance between control and treatment households. Similarly, when we observe the impact for the second follow up year, representing by the dummy variable *Treatment2016*, we find that BISP is able to buffer the change in income, though small in value between control and treatment households (0.142-0.122=0.020), BISP protects the fall in consumption by 2%. The results here infer that longer exposure to BISP results in a better insured household. The significant results for nonfood consumption imply that BISP is effective in securing nonfood

consumption, while it in ineffective in case of food consumption. The results here seem counter-intuitive as households below 16.17 cut-off representing poorest of the poor may have more imminent and unsatisfied needs like food. However, expenditures on food items are of immediate nature, which are incurred on weekly or utmost fortnightly basis. Thus the quarterly nature of BISP payment, with more often delays in payments due to administrative errors enable households to spend on nonfood items like kitchen items, bed sheets or other relatively less expensive good. This also implies that BISP assists households in smoothing consumption along with asset retention in the form of building on more durable items.

When we use a combine dummy for BISP program, *Treatment2013&2016,* all coefficients are negative but insignificant. This implies that such programs have the capacity to protect households' consumption in times shocks, but a relative small size of the transfer is not effective in securing vulnerable households. The results here are in line with studies of Zimmermann and Carter (2003), Nayab & Farooq, (2014) and Cheema et al., (2016), Haushofer and Shapiro (2016), and Uchiyama (2017).

5.5. Risk coping Strategies and Role of BISP

In this section, we examine whether incidence of certain shock increases the likelihood of using various coping strategies; (i) using savings, (ii) selling assets, (iv)receiving transfers from friends or relatives (v) decreasing consumption or (vi) increasing the labor supply of household members. In the survey, households have been asked, how they have responded to shocks. Each household has ranked three most widely used strategies to cope with the shocks confronted.

Although these reflect behavior of individual households, but they give glimpse of how household respond to income shock and how BISP alters their responses. In order to

capture households's coping mechanism, we estimate the following probit model separately for each of the six coping instruments mentioned above:

$$\text{prob}(Yit=1)= \alpha+\beta*Sit+ BISP(\alpha1+\beta1\ Sit) \qquad (4.4)$$

Here Y equals one when the household declares it used each specific instrument to cope with shocks and where S is a vector of dummy variables denoting the incidence of any of the following shocks: (i) Sharp in food prices (ii) death of a household member, (iii) illness of a household member, (iv) crop loss, (v) displacement. X is a vector of household characteristics, such as the age and sex of household head and spouse, whether the household is headed by a female, the education level of the household head and spouse, binary variables for owning the house where they live, if the household works on cropping or harvesting, and age composition of the household. The coefficients of interests are α, β and β_1 , where β denotes whether incidence of a shock increases the likelihood of using the said strategy and to what extent the same shock entails a strong or an opposing reactions in the household benefitted by BISP($\beta+\beta_1$).

Table 5.5 shows the marginal effects of different shock variables on adopting various responses. The results show that beneficiary households rely more on selling assets and less on adjusting food consumption to smooth consumption. In times of death of household head, households sell assets, borrow money from relative and friends, and adjust their food consumption. However, it is noted that the treatment households seem to reduce the likelihood of relying on these copying strategies when hit by shocks and increase the likelihood of relying on adjusting food consumption as a risk coping strategy. .

Rise in food prices and illness shock are more likely to adjust food consumption and borrow money from formal and informal sources, while displacement has forced

households to sell assets and push their children into work. However, the program seems to have no differential impact on these self-reliance strategies.

Results from this section show that BISP has crowding–out effect on adjustment in consumption while reinforcing the use of assets to cope with the given shocks. Selling assets in response to shock have more adverse consequences as it lowers the future consumption, pushing the poor further down the poverty line. Recently, more studies have focused on whether households choose to smooth asset over consumption as Zimmermann and Carter (2003) show how households allocate resources between consumption and assets, and between safe and risky assets. Therefore, future research needs to focus on the tradeoff between asset and consumption smoothing using BISP's updated data.

Table 5.6: **Probability of using the following Risk Coping Strategies for Idiosyncratic Income Shocks and the crowding-out effect of BISP**

	Asset Sold	Borrowed Money	Adjusted Food Consumption	Increased Labor Supply	Did Nothing
Treatment	0.436**	0.0984	-0.033**	0.1216	0.5452**
	(0.0825)	(0.0661)	(0.0108)	(0.0903)	(0.0699)
Death	0.1001**	0.2379**	0.0941**	0.0970**	0.0819**
	(0.0156)	(0.0177)	(0.0279)	(0.0119)	(0.0173)
Death *Treatment	-0.0049	-0.0145	0.0247	-0.0197	-0.0356
	(0.0185)	(0.0213)	(0.0328)	(0.0137)	(0.0210)
Salaried Loss	0.054	0.1380**	0.359 **	0.012	0.0913*
	(0.036)	(0.042)	(0.062)	(0.035)	(0.037)
Salaried Loss *Treatment	-0.546***	0.483	-0.099	0.010	-0.044
	(0.036)	(0.371)	(0.073)	(0.040)	(0.046)
Rise in Food Prices	0.0913**	0.1357**	0.5419**	0.0789	0.1149**
	(0.0132)	(0.0155)	(0.0222)	(0.0171)	(0.0136)
Rise in Food Prices *Treatment	-0.0215	0.0007	-0.0260	-0.0242	-0.0232
	(0.0156)	(0.0185)	(0.0286)	(0.0142)	(0.0164)
Displacement	0.2436**	-0.0202	0.0890	0.0259	0.1429***
	(0.0261)	(0.0495)	(0.0561)	(0.0299)	(0.0301)
Displacement *Treatment	-0.0593	0.0495	0.0086	0.0109	-0.081
	(0.0299)	(0.0552)	(0.0642)	(0.0330)	(0.0357)
No. of Households	3,465	3,465	3,465	3,465	3,465

Notes: Marginal effects of using self-insurance instruments when households have income shocks. Each column represents a separate regression. Robust standard errors, clustered at the municipality level, are in parentheses. Additional repressors included but not reported. Each individual coefficient is statistically significant at the *10%, **5%, or ***1% level.

5.6. Conclusion

In this chapter, we examine consumption smoothing effects of cash transfers under BISP for vulnerable households in Pakistan using a panel of three rounds of BISP survey. First we focus on risk sharing theory by testing the full risk sharing hypothesis and the empirical results confirm that full risk sharing is incomplete, which is consistent with other studies also. Results show that increase in consumption level is because of an increase in income level, but less in magnitude, showing complete lack of risk sharing tools. Complete insurance is failed even in case of idiosyncratic shocks. Nonfood consumption seems better insured than food consumption.

Secondly, while observing the food consumption patterns of these households, this study finds that BISP has insignificant impact on protecting household's consumption against shocks- both idiosyncratic and covariate. Overall, the results show that when the beneficiary households face any idiosyncratic shock, there is a low change in their non-food consumption as compare to food consumption, however, BISP cash transfers appear ineffective in protecting households when faced with shocks like illness of main earning member. Moreover, when faced with covariate shocks, BISP appears to be ineffective in protecting the households in each of the shock identified. While observing the change in growth of households' real income, we find that a reduction in households' income growth reduces food and non-food consumption and the BISP is insignificant in insuring beneficiary households consumption, thus rejecting the theories of risk-sharing and permanent income hypothesis in all cases.

Thirdly, we observed the marginal effects of different shock variables on adopting various responses. The results show that beneficiary households rely more on selling assets and less on adjusting food consumption to smooth consumption. In times of death of household head, households sell assets, borrow money from relative and friends, and

adjust their food consumption. However, it is noted that the treatment households seem to reduce the likelihood of relying on these copying strategies when hit by shocks and increase the likelihood of relying on adjusting food consumption as a risk coping strategy. Results from this section show that BISP has crowing–out effect on adjustment in consumption while reinforcing the use of assets to cope with the given shocks. Selling assets in response to shock have more adverse consequences as it lowers the future consumption, pushing the poor further down the poverty line.

Based on the results of this study, we conclude that for providing consumption insurance through an effective intervention program, it is important to make it shock responsive, which needs to be effective in reaching to poor in times of shocks. The results have strong implications for strengthening and scaling up of BISP program in Pakistan. Given that the primary objective of BISP is to mitigate households' vulnerability to external shocks, it is important to make the transfers targeted and more generous in size in order to provide an effective coping strategy to protect the poor households from shocks like rise in food prices, flood or in times of conflicts and displacement. Moreover, the results of this study raise some serious questions about the mechanism though which households sustain their consumption in the face of shocks. With the invalidity of risk-sharing mechanism, it appears that households mostly rely on self-protection strategies to smooth consumption, which have negative consequences in the long run. Selling off assets, pushing children to work instead of school, compromising on the quantity and quality of food consumption along with relying on informal borrowing are the some of the preferred strategies adopted by the households in this study, which further increases their vulnerability to future shocks. Thus it is important to address how costly are these self-protection strategies for households in terms of their welfare consequences and the results of this study will help policymakers in designing social protection programs such that they substitute poor households.

CHAPTER 6

HOUSEHOLDS SHOCKS, CHILD LABOR AND ROLE OF BISP

6.1. Introduction

It has been extensively discussed that poor households smooth consumption even with less or no access to credit market [Morduch, (1994); Chaudhuri &Paxon, (2001); Sugiyanto et al., (2012); Majid &Nilili, (2016); Kharisma, (2017); Zaki, (2018)]. This shows that these households resort to mechanisms other than borrowing. One such mechanism is child labor, which this chapter aims to study. With households resorting to child labor in the face of shocks, it has broader negative consequences in terms of lower human capital formation and poverty in the long run. Therefore, the role of public intervention programs is very important to provide safety nets to vulnerable households, who resort to child labor as risk coping instrument pushing themselves into poverty trap forever [de Janvry, Finan, Sadoulet, & Vakis, (2006), Kharisma, (2017).

The global trend shows that Worldwide 218 million children between 5 and 17 years are in employment. Among them, 152 million are victims of child labor; almost half of them, 73 million, work in hazardous child labor. Though there seems to be a declining trend in child labor with over 306 million of children employed and doing some kind of labor in 2010 (International Labor Organization report (ILO), 2010). In Case of Pakistan, there is still high prevalence of child labor ranks number three in the world with the highest prevalence of child and forced labor despite a significant decline in the number of child laborers recorded worldwide. According to ILO, 2012 estimates, 12.5 million children in Pakistan are involved in child labor with 264,000 Pakistani children involved in domestic child labor. Besides, 25 million children out of school, out of which 15 million were alarmingly economically active.

A number of policy instruments have been devised to tackle child labor in Pakistan, among the few prominent initiatives, Bait-ul-Maal, the project of Pakistan Bait-ul-Mal School for Rehabilitation of Child Labour has prevented 17,871 children aged 5-14 from hazardous labor and enrolled them in different centers countrywide. Similarly, Pakistan Poverty Alleviation Fund is currently supporting many projects which aim to provide diverse livelihood strategies, universal primary schooling, and women empowerment to the ultra-poor and poor. These include National Poverty Graduation Programs, Program for Poverty Reduction in selected districts of Balochistan, Khyber Pakhtunkhwa and ex-FATA, The Livelihood Support and Promotion of Small Community Infrastructure (LACIP) in KP, and the Interest Free Loan program. However, these programs are more focused on reducing poverty and creating employment opportunities for the poor, which may indirectly limit the exposure of children to work in Pakistan. Current programs under the PPAF do not provide any evidence of direct transfer of resources aimed at reducing child labor in Pakistan. A component of the BISP program, Waseela-e-Taleem, provides conditional cash transfer to support primary education of children aged 4-12 of BISP beneficiary families. The program is currently being implemented in 50 districts. It aims to increase primary school enrolment and reduce drop out. However, it does not shed light on the children who never attended school for various reasons, including child labour.

Social protection programs have been popular in fighting poverty and issues related to child labor in many developing countries [Sugiyanto et al., (2012); Majid &Nilili, (2016); Kharisma, (2017); Zaki, (2018)]. In case of Pakistan, few studies have focused on the effects of social protection programs on child labor, however they do so quite crudely; e.g. Sayeed, 2015 has examined the effects of BISP on adult labor supply effects, but has not focused on the mechanisms, which push poor parents to rely on

child labor for their livelihood. Moreover, Ambler, K., & de Brauw, (2019) have examined labor supply effects of BISP along with the effects on probability of child labor. However, these studies have not examined the effects in the presence of shocks and credit constraints, which poor households face. In this chapter we try to fill this gap in examining poor households' behaviors when confronted with shocks and how BISP has helped in reducing the negative consequences while displacing child labor as coping strategy. Our study helps in contributing to the literature while focusing the three distinct, yet interrelated issues of shocks, coping strategies and safety net programs in Pakistan.

The organization of this chapter is as follows: after the introduction, section 6.2 reviews the theoretical foundation of the issue while section 6.3 lays down the econometric model. Section 6.4 discusses the results and their analysis while section 6.5 gives conclusion of this chapter.

6.2. Theoretical Foundations

The use of child labor as risk coping strategy in times of shock has been tested and studied by earlier literature [Krueger (1996); Basu and Ven,(1998); Fallon and Tzannatos (1998); Jacoby & Skoufias, (1997); Dehejia and Gatti (2002) and Chaudhuri &Paxon, 2001); Sugiyanto *et al*., (2012); Kharisma, (2017)]. The theoretical underpinnings are important in order to study this relationship and the recommendations for any policy discourse would hinge upon the context which would be taken in this study. There has been a focus on highlighting the determinants of child labor, along with identifying the mechanisms to address it. For example, one of the devastating consequences of child labor is poverty, to which literature has also pointed out since long. Some of the stylized facts shown by Krueger (1996) and Dehejia and Gatti (2002) and point to this assertion that incidence of poverty across countries have

resulted into emergence of child labor; in 1995, the incidence of child labor was 2.3% among countries in the upper quartile of GDP per capita, and 34% among countries in the lowest quartile of GDP per capita. Based on this, the incidence of child labor must have reduced, as countries' GDP grow, however it has not been the case as pointed out by Canagarajah and Nielsen (1999), Boozer and Suri (2001) and others. They find no relationship between a country's poverty level and incidence of child labor. Rather, other factors, like imperfection in financial market, labor market along with other constraints have been identified as the root causes of child labor in many developing countries.

In the theoretical model of Jacoby & Skoufias, (1997), lack of access to credit has been termed as one of the main constraints, which results into the prevalence of child labor. At household's level, child labor trade- offs between current income and long run cost in the form of low human capital accumulation resulting into low income in the future as well. Thus credit constraints compromise child's human capital accumulation and give rise to inefficiently high child labor. So the key economic variables, shocks and access to credit are important drivers of household's decision with regards to child labor.

Numerous theoretical literature highlight income shock and borrowing constraints as an important source of inefficiency in households resources allocation, and in particular high child labor the model [for example: Basu and Ven,(1998); Baland and Robinson, (2000); Ranjan 2001; Dehejia and Gatti (2002)]. They propose that having a child not work is a luxury that poor cannot afford, with having an increase in the family income may lead the poor to afford for leisure, 'luxury axiom'. when parents are faced with liquidity constraints, particularly in the absence of functioning capital they are more likely to engage their children in work, despite their preference for having children not work at all or only in certain types of activities. These studies directly or indirectly

argue that parents would be willing to borrow against the children's future earnings to potentially fulfill their preference of increasing the human capital acquisition of their children today, but in the absence of credit markets, they are forced to remove their kids from school (or reduce their study-leisure time) and in most cases have children work. Despite the direct links between income shock, borrowing constraints and child labor, few studies have explored this empirically.

As discussed by Zeldes, (1989); Gerlach-Kristen and Merola (2013); Majid &Nilili, (2016);Zaki,(2016), credit constrained households are unable to smooth consumption over time, however, a seminal work by Townsend (1994) finds that such households still smooth consumption despite not having smooth flow of income. To this, Morduch (1994, 1995); Chaudhuri &Paxon, (2001); Sugiyanto *et al*., (2012), document that if households succeed in smoothing consumption profile, they are likely resorting to mechanisms other than borrowing to cope with shocks. One such mechanism is child labor, which this chapter focuses on in order to examine how far poor households in Pakistan resort to child labor to buffer shocks and smooth the current period consumption. Our work is related to the work of Jacoby & Skoufias, (1997), in which the focus is on parental decision with regards to their children work in times of shock.

Lastly, our work links the literature of shocks, consumption smoothing and credit constraints to the few but emerging literature on social protection programs. Most of the studies have focused on conditional cash transfer programs in examining whether these programs serve as safety nets preventing income shocks from causing children to drop out of school and enter work (De Janvry et al. 2006, Fitzsimons and Mesnard, 2013).

6.3. Methodology and Empirical Strategy

In this section, we investigate the effects of shocks on child labor and how BISP's interventions are helpful in preventing poor households from using their children as risk coping instruments.

First, we examine the effects of shocks on child labor hours with the basic specification as;

$$y_{ijt} = \beta_1 + \beta_2 S_{ijt} + \delta_1 C + \delta_2 S_{ijt} * C + \theta X_{ijt} + \epsilon_{ijt} \qquad (6.1)$$

Here, in the equation (1), the dependent variable is ' y_{ijt}' indicates whether children have spent more than one hour in an activity within or outside the house, with subscripts representing the child i, household j, and time t. 'S' is our measure of the income shock; 'C' measures households' access to credit; and X contains a set of controls including individual, household, and community characteristics. We anticipate transitory shocks to lead to an increase in child labor with $\beta_2 > 0$ in Equation (6.1).

To investigate if the effect of shocks on child labor is due to credit constraints, we examine whether the effect of shocks varies with households' access to credit. The effect of interest is δ_1, which captures the differential impact of a shock among households with access to credit. To the extent that we believe $\beta_2 > 0$ in Equation (6.1) is due to credit constraints, we expect access to credit to mitigate the effect of shocks, i.e., $\delta_2 < 0$.

As the second objective of this study is to examine if being beneficiary of a program has any impact on child labor under imperfect market model.

$$y_{ijt} = \propto_0 + \beta_1 C_{ijt} + \beta_2 S_{ijt} + \beta_3 BISP_t + \beta_4 C_{ijt} * S_{it} + \beta_5 BISP_t * S_{ijt}$$

$$+ \beta_6 C_{ijt} * BISP_t * S_{ijt} + \theta X_{ijt} + \mu_{ijt} + \varepsilon_{ijt} \qquad (6.2)$$

The dependent variable represents the dummy if the child works with the subscripts representing the child, 'j' represents the households and 't' the time period. S_{it} is our

measure of shocks at household levels for the year prior to the survey; $BISP_t$ is a

dummy variable indicating whether the child lives in a treatment household; C_{ijt}

measures households' access to credit; ; and X_{ijt} contains a set of controls including

individual, household, characteristics. There are two error terms μ_{it}, which captures all

observed and unobserved household or individual level time invariant factors, and ε_{ijt}

, which captures the unobserved idiosyncratic household or individual and time varying

error.

In Equation (6.2), we expect $\beta_2 > 0$, while β_4, β_5 and $\beta_6 < 0$. This shows that credit

access along with BISP's income act to minimize the cost of shocks in terms of reducing

child labor for the given households.

In order to examine the impacts of shocks and BISP transfers on child labor, there using

equation (1) and (2), there are some challenges in this empirical strategy. The main

challenge in implementing this approach is the potential simultaneity between child

labor and parental income. Shocks like weather related and price rise can increase both

parent's and children's labor hours. The second challenge is related to omitted bias

related to some specific shocks and child labor, i.e, agriculture related shock might be

linked to a household that may favor an increase in child labor.

In order to deal with these challenges, we use the following strategies. First, rather than

regressing child labor on parental labor (labor income), we use parental education as a

proxy to parental income, the advantage being predetermined and highly unlikely to be

simultaneously determined by child labor. Second, in order to deal with omitted bias,

we use a range of control variables, which include, household size, parental education,

and other sources of income (in order to control for households income). Third, we

empirically investigate whether households' shocks correlate with child or parental

characteristics, since we assume these shocks to be of random nature, it increases the

plausibility of randomness in it. Fourth, we also include time-invariant characteristics, while presenting fixed effects specification.

6.4. Data and Methodology

6.4.1. Data and Variable Description

BISP dataset provides detailed information about individual and household characteristics, including information on time use of all household members aged five and older. This includes time spent working for wages at household businesses and non-household business and working without wages doing household chores. The survey also includes information on different household shocks as well as measures of access to credit in each of the interviews. As a consequence, the survey allowed the creation of a valuable balanced panel dataset to model household behavior under risk. Under this panel, we can observe the same household over a years' time which can help us separate changes of child labor over time that are attributable to exogenous changes such as BISP cash transfer program and other economic environment or labor market changes.

Child Labor: For child labor, we use binary indicators of child's work from time allocation data from BISP survey questions on child labor. The concept of child labor, according to International Labor organization (ILO) standards, is not restricted to only economic activities, so we consider the allocation of children on both economic and non-economic activities. Here we consider child labor as a child spending more than one hour working in economic activities or non-paid work, including household chores and work in family business. We have categorized a child's work into three broad categories; (i) work for others, which includes both all paid and non-paid work (ii) work at home, which includes activities such as shopping, collecting firewood, cleaning, fetching water, or caring for children (iii) work on farm, which includes any other family work on the farm or in a business, or selling goods in the street.

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Shocks: Likewise, shock variables are measured as binary variables that indicate when a household experienced any of the following shocks during the two years prior to the interview: sharp rise in food prices, crop loss due to flood, job loss, illness of a household head, displacement. These shocks are considered as severe shocks/events according to the survey. The details about shocks and their impacts are already discussed in Chapter 4.

Households' Access to Credit: In order to measure the households' access to credit, we construct the dummy of their access to the formal credit market, with the question asked ''If needed could your household gain access quickly (within 1 week) to the following amounts of money?'' Also we observe the credit limit by looking at the maximum amount they can easily gain access to.

6.5. Results and Discussion

6.5.1. Data Analysis and Summary Statistics

According to BISP baseline study, with an overall high poverty status among the eligible households, child labor is an important source of livelihood; 9.6% of children aged 5 to14 years old engaged in child labor, with the highest rates in Baluchistan (16% of children aged to 14 years old), followed by Sindh (13%), Punjab (8%) and Khyber Pakhtunkwha (6%). Similarly, this report also finds evidence that low rates of parental income are a strong driver of child labor, with the income of the mother (but not the father) being positively correlated with a reduction in the probability of engaging in child labor. Consequently, BISP cash transfers to mothers should reduce the pressure on child labor as a means of funding household consumption expenditure.

Descriptive statistics in table 6.1 shows for children aged between 6-13 years, the average number of hours spent working for others is 0.49 for girls and 1.79 for boys. Similarly, among children aged between 14-17years, the average hours spent by boys

is higher than girls. While looking at the work hours spent at home, girls in both the age work more hours in households' chores which include collecting wood, water, washing and clothing. Similarly, on farms, boys spent more hours working than girls, which is according to the social customs and values of this society, where male members of households are preferred to engage in outdoor activities.

While analyzing the spread of the shocks identified, it is observed that most of the shocks have emanated from two main sources; idiosyncratic and covariate. For the sampled households of this study, we have chosen three covariate shocks, which include rise in food prices, dwelling destroyed or damaged due to floods and displacement. Similarly, under the idiosyncratic shocks, three most reported shocks have been observed, which includes illness of main earning member of the household, loss of salaried employment and loss of livestock. Among the list of covariate.

shocks, rise in food prices seems to be a major shock as 54% households of the entire sample report to be affected by this shock. While from the list of idiosyncratic shocks, illness of main earning member is a major shock with 10% households being affected by it. All these shocks have been observed contributing to high income volatility of the households. Generally, these kinds of shocks are due to limited access to medical services, unhygienic living conditions along with limited means income sources. Moreover, these difficulties are compounded by lack of formal insurance facility and lack of access to credit market. With respect to household's characteristics, household head's average age is 46 years, with 2.1 years of education. The average household size is 7.5 and average dependency ratio is 4.9 with 20 percent of the households having ownership of their house.

Table 6.1: **Summary Statistics**

	Mean	SD
Panel A-Child Labor, Hours		
1-Work for others		
Girls, Age 6-13Years	0.42	4.27
Boys, Age 6-13Years	1.79	10.80
Girls, Age 14- 17Years	0.19	2.82
Boys, Age 14-17years	2.19	12.12
2-Work at Home		
Girls, Age 6-13Years	6.31	10.51
Boys, Age 6-13Years	5.27	9.38
Girls, Age 14- 17Years	1.88	6.18
Boys, Age 14-17years	0.27	9.38
3-Work at Farm		
Girls, Age 6-13Years	0.74	5.56
Boys, Age 6-13Years	1.76	8.32
Girls, Age 14- 17Years	3.19	7.47
Boys, Age 14- 17Years	12.19	15.20
Panel B-Household Characteristics		
Household Head age	46.73	11.5
Household Head Education	2.1	3.3
Dependency ratio	4.9	2.4
Mother's Education*	0.1	0.5
Owner's Occupied House*	0.8	0.4
Urban*	0.2	0.4
Agriculture*	0.1	0.4
Panel C- Shocks*		
Illness of main earning member	0.1	0.3
Salaried loss	0.02	0.15
Rise in food prices	0.54	0.5
Displacement	0.03	0.16
Dwelling damaged/loss bt floods	0.05	0.22

Notes: Values are average of the three rounds of survey..**represents**the sample proportion of households that have been effected by the given shocks

6.5.2. Effects of Shocks on Child Labor

Table 6.2 reports results of estimates of shock variables on child labor prior to BISP program using equation 1. Shock variables are measured as binary variables that show households have experienced any of the following shocks during the year prior to the interview. This includes idiosyncratic shocks like illness of household's main earning

member and loss of business failures, while covariate shocks include sharp rise in food prices, displacement, dwelling loss damaged by flood, displacement and conflict. According to BISP survey, these shocks are considered more severe events for the households. Here we estimated regression for each shocks separately along with pooled binary variable of households that experienced one, two or more than three shocks during the year prior to the survey. Child labor is measured as a child spending more than one hour working in economic activities or non-paid work, including household chores and work in family business.

The fixed effects results estimated in Table 6.2 show that a variety of idiosyncratic shocks over the last two years of the survey period did not affect child labor. This indicates that in the events of shocks like loss of job, illness of main earning member or loss of livestock, households do not push their children into the labor market to dampen the effects of shock. Rather, households rely on informal sharing mechanism of social networks, i.e, borrowing from friends and family. These results are also supported by the statistical data of the sampled households, showing that, friends and relative accounts for more than 40% of the net borrowing of the household. The households mainly rely on private transfers which includes individual transfers between friends or relatives and are reciprocal in nature in the forms of exchange of gifts or loans. Similarly, we also observe, how households respond to covariate shocks, which mainly include rise in food prices, dwelling damaged to flood and conflict. Results show that rise in food prices have increased the work hours by 3 percentage points, while the flood shock shows a reduction in child work hours by 4 percentage points. The rise in child labor work due to an increase in prices is consistent with other studies (Townsend,1993; Alderman and Haque, 2007; Nyguen, 2018), which assert that in the face of covariate shocks, households' mutual sharing mechanism collapses, which push

them to rely on self-coping strategies like child labor, compromising on children's human development in the long run. However the result for flood shock showing a reduction in child work is interesting and the possible explanation is that local droughts reduce opportunities for children to work, both because farm work is less available and because adult labor supply is also more abundant.

While observing the parameter of interaction of access to credit with shocks for households, we find that households with access to credit are less likely to increase child labor to buffer shocks; however, the values are insignificant. This is in line with the theory of household's credit constraints, as modeled by Jacoby & Skoufias, (1997), which says that credit constrained households use child labor as buffer against shocks. According to the sample data of this study, 73.55% surveyed households have used borrowings, which constitute both formal and informal assistance, including borrowing from relatives, money lenders as well as borrowing from institutions (e.g. banks). However, borrowing from formal sources (banks) makes 5% of the totally borrowings, while informal sources constitute major portion of the borrowings. It is important to note that an effective social networking enables households to access credit with values with brackets of amount from Rs, 200, Rs, 400 to Rs 1000. Finally, we observe that households living in rural areas and associated with agricultural businesses are strongly associated with child labor.

Table 6.2: **Effects of Shocks on Total Hours of Households Child Labor**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sharp rise in food prices	0.0317***	0.00361					
	(0.00841)	(0.0055)					
Livestock died or stolen	-0.0065		0.0531				
	(0.0187)		(0.0485)				
Loss of salaried employment	0.013			-0.00665			
	(0.0267)			(0.0279)			
Illness of households' main earning member	0.00146				0.00221		
	(0.0144)				(0.00905)		
Dwelling damaged/destroyed due to flood	-0.0489**					0.015	
	(0.0226)					(0.031)	
Conflict	0.0441						-0.103
	(0.078)						(0.0326)
Access to credit	-0,163	-0.0894	-0.184	-0.0152	-0.308	-1.406	-2.063
	(0.4409)	(0.398)	(0.201)	(0.743)	(0.546)	(0.589)	(0.892)
One Shock	0.908***	0.213*	1.354***	0.908***	0.585**	-0.029	2.131*
	(0.2609)	(0.126)	(0.417)	(0.2609)	(0.276)	(0.179)	(0.034)
One Shock* Access to Credit	-2.297	-0.511	-1.786	-1.114	0.343	0.11	2.132
	(2.159)	(1.077)	(1.319)	(0.816)	(0.738)	(0.305)	(1.34)
More than one Shock	0.896*	0.614*	0.950***	1.067**	2.522***	0.896*	1.922**
	(0.477)	(0.343)	(0.365)	(0.498)	(0.746)	(0.477)	(0.211)
More than One Shock* Access to Credit	-1.408	-1.031	-0.376	-2.151*	-1.697*	-0.454	3.624*
	(1.168)	(0.861)	(0.608)	(1.24)	(0.894)	(0.677)	(0.325)
Constant	-0.0622*	-0.0655**	0.0033	0.519***	0.197**	0.0245	0.535
	(0.036)	(0.03)	-0.015	-0.122	-0.085	-0.065	-0.968
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,382	9,382	9,382	9,382	9,382	9,382	9,382
R-squared	0.011	0.011	0.006	0.109	0.05	0.073	0.007
Wald test (χ^2)	89.63**	505.9***	531.49***	309.70	87.90	38.87	34.65

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Results from this section conclude the following (i) that poor households use child labor to cope with income shock, only when the shock is of covariate nature, (ii) the relationship between shocks and child labor is significant, with different types of shocks having heterogeneous impacts on the work hours, (iii) credit-constraint households use child labor to cope with variety of shocks, (iv) that the relationship between access to credit and shocks in most of the cases in insignificant, showing the precarious and acute vulnerability of the sampled households to an occurrence of shock. Based on these empirical results, we examine the impact of BISP cash transfers on child labor in times of shocks.

6.5.3. Effects of BISP on Child Labor under Risk

Estimations of the effects of shocks on child labor are presented in Table 6.3 and 6.4. We report results from the fixed-effects model estimated for the panel households. The BISP effect is here identified by simple difference between the coefficients of control and treatment groups. Each regression is run for age/sex group along with all other specifications control for time specific effects.

Results presented in the first two column of Table 6.3 show the impacts on any kind of work that a boy child does between the age group 6-13 years. It says that in response to any idiosyncratic shock, there is a reduction in child labor hours between treatment and control groups (2.244-1.268=0.9768) and similarly a reduction in work hours is also observed in the other two activities. However, the results are insignificant in all cases, showing that poor households do not resort to child labor whenever faced with shocks like illness of household head, job loss or loss of livestock, rather they use other sources to compensate for their welfare loss. Moreover, for girls in the same age group, show similar trend with smaller change in the magnitudes of coefficients.

However, the impact varies across gender, age group and work activity. In response to

idiosyncratic shock, child labor increases in response to illness of the household head, illness among young siblings, and severe natural disasters in the locality. BISP does not, however, prevent these child labor responses to shocks.

In the last panel of Table 6.3, we observe the effects of access to credit on child labor, we observe that households with credit access reduces the reliance on child labor, showing with a reduction in hours of work in each case. Moreover, we provide evidence that BISP mitigates the adverse effects of shocks on child works for households who have access to credit, other than BISP transfers. The results are more distinct in case of covariate shocks, as we observed that households push their children into labor market, when face shocks like inflation, floods and conflicts. Secondly, it also shows that income effect of BISP transfers (unless other form of credit access is available) is not sufficient to affect household behavior with respect to the use of child work in response to shocks. Our results are consistent with other studies like Progressa Transfers in Mexico, who find similar results. Moreover, our results remain robust after controlling for other sources of wealth and for household fixed effects.

Table 6.3: **Effects of Credit Access and BISP on Child Labor: Age Group-6-13Years**

	Any Kind of Work		Work at Home		Work at Farm	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
Idiosyncratic Shocks	1.268	0.0182	1.547	0.271	-1.081	0.628
	(0.95)	(0.288)	(2.069)	(1.102)	(1.905)	(1.007)
Idiosyncratic Shocks *Treatment	-2.244	-0.526	-2.387	-0.753	3.081	-1.625
	(1.635)	(0.712)	(2.252)	(1.353)	(2.151)	(1.229)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,349	9,349	9,349	9,349	9,349	9,349
Wald test	95.67	324.43	350.6	89.63	505.9	531.49
R-Squared	0.042	0.052	0.743	0.0146	0.0875	0.0932
Covariate Shocks	1.214	0.47	2.197*	-0.655	-0.65	1.647*
	(1.163)	(0.38)	(1.196)	(1.181)	(1.058)	(0.868)
Covariate Shocks *Treatment	-0.847	-0.258	0.806	0.756	-0.0409	0.562
	(1.244)	(0.483)	(0.965)	(1.141)	(1.085)	(0.752)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,349	9,349	9,349	9,349	9,349	9,349
Wald test	193.36	857.42	878.51	85.6	426.78	475.38
R-Squared	0.0311	0.1398	0.1452	0.031	0.067	0.751
Access to Credit	-0.128	0.161	-1.232	-1.187	-0.219	-0.711
	(0.796)	(0.274)	(1.168)	(0.892)	(0.589)	(0.838)
Access to Credit*Treatment*Idyo_Shocks	-2.586	-0.196	-2.979	-0.0664	-2.758	-1.101
	(1.756)	(0.753)	(2.375)	(1.437)	(2.201)	(1.371)
Access to Credit*Treatment*Cov_Shocks	-1.449**	-0.134	-0.997*	-1.559***	-0.57	-0.905
	-1.245	-0.465	-0.968	-1.101	-1.077	-0.745
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,349	9,349	9,349	9,349	9,349	9,349
Wald test	185.05**	773.36*	811.24**	209.89	724.9	765.09
R-Squared	0.002	0.121	0.135	0.034	0.09	0.012

Note: *Treatment refers to interactive of each shock with BISP treatment for the treated group. Additional repressors include household characteristics, but not reported Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

However, for the similar shocks, the magnitude of coefficients decreases as we take into account the second age group, i.e. 14-17 years, (Table 6.4). This is quite counterintuitive, as we expect the work supply of older siblings to be more responsive to shocks as compare to the younger ones, as this cohort group is considered to be more productive and parents tend to be willing to send them to work in times of shocks. Similarly, for other covariate shocks like displacement, dwelling damaged by floods and conflict, an increase is observed in the work hours of children in both the age group. The results for idiosyncratic shocks like business failure and illness of main earner show that the work hours of children in the first age group have reduced while in the latter case the results are insignificant. This is consistent with views that in times of idiosyncratic shocks, households manage to smooth consumption through informal insurance mechanisms like taking help from family, friends and other acquaintances, which protects them from resorting to negative strategies like child labor. This is consistent with work on risk sharing mechanism by Townsend (1993).However, when we further bifurcate the kind of work activities into home and farm based work, done by children; it is found that girls in both age groups show an increase in works hours as compare to boys.

Table 6.4: **Effects of BISP on Child Labor: Age Group-14-17Years**

	Any Kind of Work		Work at Home		Work at Farm	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
Idiosyncratic Shocks	-1.386	0.047	-0.0792	-0.59	0.987	-0.0463
	(0.878)	(0.0726)	(2.138)	(1.511)	(1.234)	(0.183)
Idiosyncratic Shocks *Treatment	1.718	0.373	2.331	1.869	-0.86	0.0956
	(1.444)	(0.475)	(2.30)	(1.824)	(1.332)	(0.324)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,348	9,348	9,349	9,349	9,349	9,349
Wald test	84.34**	475.66**	495.84***	89.63**	505.9***	531.49**
R-Squared	0.0138	0.0827	0.0875	0.0146	0.0875	0.0932
Covariate Shocks	0.744	-0.00813	-0.141	-0.892	-0.514	-0.479
	(1.072)	(0.163)	(1.29)	(0.911)	(0.627)	(0.381)
Covariate Shocks *Treatment	-0.589	-0.115	-0.646	0.406	0.264	0.367
	(1.094)	(0.198)	(1.34)	(0.969)	(0.499)	(0.25)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,348	9,348	9,349	9,349	9,349	9,349
Wald test	85.6**	426.78**	475.38**	95.67*	324.43**	350.6**
R-Squared	0.031	0.067	0.751	0.042	0.052	0.743
Access to Credit	-0.033	-0.0614	-0.78	0.109	-0.507	-0.331
	(0.742)	(0.153)	(0.846)	(0.445)	(0.608)	(0.402)
Access to Credit *Treatment*Idyo_Shock	-2.39	-0.148	-2.771	-1.786	1.881	0.157
	(1.556)	(0.547)	(2.365)	(1.861)	(1.404)	(0.407)
Access to Credit *Treatment*Cov_Shocks	1.315**	-0.0785*	0.46	-0.0869***	-0.118	-0.167
	(1.056)	(0.186)	(1.302)	(0.962)	(0.519)	(0.274)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,348	9,348	9,349	9,349	9,349	9,349
Wald test	5,284*	5,284*	5,284*	38.77**	123.17*	104**
R-squared	0.007	0.007	0.002	0.005	0.003	0.003
Number of IDCODE	3,465	3,465	3,465	3,465	3,465	3,465

Note: *Treatment refers to interactive of each shock with BISP treatment for the treated group. Additional repressors include household characteristics, but not reported Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0

In general, we observe that BISP effectively displaces costly copying strategies like child labor for households under covariate shock and access to credit provides insurance to households for reducing child labor under such shocks. These results are consistent with previous literature, suggesting that social protection programs may not entirely displace child labor, but reduce the working hours. This is due to the fact that for many households in developing countries, schooling is not a substitute for child labor, as many households continue their children's work along with sending them to school.[21]. Until now, child labor as risk copying strategy has not been tested in the social protection literature for Pakistan. This study finds evidence that BISP beneficiaries rely on child labor to buffer shocks especially for the credit constrained households, moreover, it suggest that in order to have sizeable impacts in mitigating costly strategies like child labor, the size of the transfer needs to be increased substantially.

6.6. Conclusion

Cash transfers under public intervention programs have the capacity to displace households' costly copying strategies in times of shocks. This chapter investigated the effects of adverse shocks on household decisions concerning child labor in Pakistan and whether BISP has been able to protect households from using their children as coping strategy in times of shocks.

Using three rounds of BISP panel dataset, we find that shocks- both idiosyncratic and covariate shocks- as proxied by crop loss, rise in food prices, illness of household's main earner displacement and household's business failure significantly increased child labor. Moreover, we find that households with access to credit are able to mitigate the effects on child labor. Similarly, households under BISP treatment group, if taken in isolation seem insignificant in mitigating the effects of shocks on child labor. However, when taken together with access to credit [as an interaction term with access to credit],

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[21] We have not checked the school enrollment for this study, focusing on child labor keeping in view the context of risk copying strategies.

we find that BISP transfers in the presence of credit significantly reduce child labor as a shock coping strategy. This shows that income effect of BISP transfers (unless other form of credit access is available) was not sufficient to affect household behavior with respect to the use of child work in response to shocks

This chapter contributes to the literature of household behavior under uncertainty. This provides insight into the potentialities of BISP in protecting households from using costly risk management strategies under imperfect credit markets. We show that child labor plays a significant role as a self-insurance strategy of poor households in Pakistan. For this, an effective policy response to minimize such actions is to strengthen credit and normal insurance market. Providing insurance schemes to compensate the farmers for unforeseen (agriculture) shocks could have huge mitigating effects along with ensuring sustainability. As observed, parental, especially mother's education could reduce the use of child labor as partial risk copying strategy, it is thus important to invest on education with more focus on reducing gender gap. This further implies that social protection programs needs to be expanded with much emphasis to be paid on protecting children's cognitive and health status. Moreover, it is important to strengthen child welfare related laws to mitigate the adverse child related outcomes. From a policy perspective, results from this research are evident of the significance of BISP in reducing poverty in the longterm.

CHAPTER 7

CONCLUSION AND POLICY IMPLICATIONS

7.1. Major Conclusions

In this study, we assessed the impacts of the unconditional cash transfers under Benazir Income Support Program (BISP) on households' risk coping strategies in times of shocks using BISP's survey data from 2011 to 2016. We observed that BISP sampled households are characterized with large household size, higher dependency ratio, low education level along with low level of asset ownership and living on subsistence level of consumption.. This in turn increases their vulnerability in the face of external shocks (both idiosyncratic and covariate shocks), and with limited physical and financial resources, they resort to coping strategies which are further damaging in nature. The results show that BISP's transfers are effective in protecting the targeted households in times of idiosyncratic shocks; however, the program appears ineffective in protecting them when faced with covariate shocks. Moreover, we also find that the given households also rely on child labor, when faced shocks, and the income effect of BISP transfers is not sufficient to affect household behavior with respect to the use of child work in response to shocks.

Both descriptive and regression analysis confirm that the sampled households are vulnerable to numerous shocks and they resort to informal sharing mechanism in order to cope. Considering different shocks, it is observed that households smooth consumption by employing various strategies.

Based on the first objective of this study, we observed each shock separately and the statistics show that the sampled households experience two main kinds of shocks; covariate and idiosyncratic shocks. Among the covariate shocks, rise in food prices (54.38 %) dominates all followed by dwelling being damaged by floods (4.34%) and displacement (1.92%). Moreover, among the idiosyncratic shocks, illness of main earning member dominates among other shocks in the sampled households; illness of

member (10.48%) followed by livestock stolen/died (4.51%) and employment/job loss (2.9%). Households have also reported that most of the shocks have caused income loss; both covariate and idiosyncratic shocks have caused more than 90 % loss to the households, while the asset loss is less than half of the income loss (36%).

The precarious position of given households can be gauged by the fact that they face both covariate and idiosyncratic shock simultaneously. The overwhelming share of covariate shocks stems from rise in food prices, accounting for two-third of the total shock. As noted, rise in food prices is also associated with large reduction in food consumption, which is not surprising given most of the sampled households' livelihood depends on casual labor and salary. Thus rise in food prices erodes households' capacity in meeting their food needs, despite using other self-protection strategies like selling assets and putting children to work. Moreover, with low level of physical and financial assets owned by these households, they resort to coping strategies which are further damaging in nature i.e compromising on the quality and quantity of food consumption, selling out their assets and pushing their children towards child labor.

We also observed the coping strategies of the sampled households, and the statistics show that, in response to idiosyncratic shocks, asset-based strategy was the most preferred strategy among the households. Borrowing constituted round 60% of asset based strategy, while few sold assets to deal with such shocks. Moreover, behavior-based strategy was used by 39.3% of households when faced with health related shock, with 13.19% reduced food consumption, while 16.41% and households reportedly increased adjusted their labor supply, with 9.73% rely on child labor. In times of crop loss, reducing food consumption and child labor were the two most prominent strategies employed by households. Moreover, with livestock lost due to flood or being stolen, 14.08% households reportedly have relied on adjusting their labor supply, either

by working long hours or pushing more household members into the labor market.

As the second objective of this study was to examine the impacts of BISP transfers on households' consumption, whether this intervention protects households' consumption in the face of shocks. The results show that for each shock at a time, the full risk-sharing hypothesis is rejected for salaried loss and livestock stolen, that is, loss of employment/salary reduces food consumption by 31.6% and nonfood consumption by 64.6%. This is a sizeable shock to both kind of consumption, given that the average monthly real consumption is at or below the poverty line. This shows that households are unable to smooth their consumption, what is apparently the most significant shock to their income. While loss of livestock reduces food consumption by 2.5%, however it doesn't have any significant effect on overall consumption. The results for illness of main earning member show an increase in consumption expenditure, but are insignificant. It is important to note that households have reported that this particular shock has resulted into an income loss of about 44%.

While observing the role of BISP, the results show that the households are not able to sustain their consumption when hit by each of the shocks. Particularly, in case of loss of employment and lives stock, treated households nonfood consumption is significantly and negatively affected.   This shows that consumption of treated households is to some extent insured against shocks as compare to control group households. Thus in each of the three idiosyncratic shocks, illness of main earner, employment loss and livestock loss, there is little evidence for BISP insuring household's consumption when hit by any shock.

Similarly, we look into households hit by single as well as multiple shocks. A single shock reduces nonfood consumption by 2.4%, however it does not affect food and total consumption of the households. While two shocks at time reduce the food consumption

by 5% and nonfood and total consumption are reduced by 14% with significant effect on the total consumption. Moreover, the households hit by three shocks at a time, reduce their food consumption by 8% and non-food consumption by 20%, however, the result is significant only in case of total consumption. BISP seems insignificant in protecting households' consumption in each case.

Similarly, we also observed whether BISP beneficiaries are able to smooth consumption in the face of covariate shocks, and the results show that As we observe, rise in food price affects food and nonfood consumption negatively and significantly, however, the change in food consumption seems very small for both groups, decreasing food consumption by 9% for control group and by 7% for the treatment households. The results here are contrary to economic predictions as the rise in food prices seems not to have substantial reduction in consumption of our sample households. However, these results can be justified by the fact that the monthly real food consumption of the households is already at or below the poverty line, so any further reduction in food consumption would lead to starvation. This has been described by many studies for developing countries, in which households are defined as risk-averse, and in times of shocks, they employ various strategies to smooth their consumption [Zimmermann and Carter (2003); Rosenzweig and Wolpin (1993)].

While examining if BISP has been able to protect households' consumption from deteriorating further with rise in food prices, we observed it is insignificant in providing insurance, which can be attributed to the small size of transfers made to the beneficiaries. However, households rely on other informal sources and self- protection strategies to smooth their consumption. Moreover, the results are insignificant for covariate shocks except for crop loss, in which BISP is significant in protecting nonfood consumption only.

We also assessed if change in income affects households' behavior and if BISP transfers is able to compensate the change in households' income in order to smooth consumption. The results showed that a 10% drop in real income leads to 2% drop in food consumption, 1% drop in non-food consumption and a drop of 1.7% in the total consumption. However, the coefficients are insignificant when we observe in the change for a one year follow-up period.

This suggests that there is no significant difference in level of consumption insurance between control and treatment households. Similarly, when we observed the impact for the second follow up year, the results infer that longer exposure to BISP results to better insured households against shocks. The significant results for nonfood consumption imply that BISP is effective in securing nonfood consumption, while it in ineffective in case of food consumption.

The results here seem counter-intuitive as households below 16.17cut-off representing poorest of the poor may have more imminent and unsatisfied needs like food. However, expenditure on food items are of immediate nature, which are incurred on weekly or utmost fortnightly basis. Thus the quarterly nature of BISP payment, with more often delays in payments due to administrative errors enable households to spend on nonfood items like kitchen items, bed sheets or other relatively less expensive good. This also implies that BISP assists households in smoothing consumption along with asset retention in the form of building on more durable items. Moreover, when we use observe the impact for a two-year followup after the baseline period, the results show negative but insignificant coefficients for both food and non-food consumption expenditures. This implies that such programs have the capacity to protect households' consumption in times shocks, but a relative small size of the transfer is not effective in securing vulnerable households.

The third objective of this study was to examine if BISP is able to substitute child labor as a coping strategy among the beneficiary households. Results show that a variety of idiosyncratic shocks over the last two years of the survey period did not affect child labor. This indicates that in the events of shocks like loss of job, illness of main earning member or loss of livestock, households do not push their children into the labor market to dampen the effects of shock. Rather, households rely on informal sharing mechanism of social networks, i.e, borrowing from friends and family. These results are also supported by the statistical data of the sampled households, showing that, friends and relative accounts for more than 40% of the net borrowing of the household. The households mainly rely on private transfers which includes individual transfers between friends or relatives and are reciprocal in nature in the forms of exchange of gifts or loans. Similarly, we also observe, how households respond to covariate shocks, which mainly include rise in food prices, dwelling damaged to flood and conflict.

Results show that the rise in food prices have increased the work hours by 3 percentage points, while the flood shock shows a reduction in child work hours by 4 percentage points. The rise in child labor work due to an increase in prices is consistent with other studies (Townsend,1993; Alderman and Haque, 2007; Nyguen, 2018), which assert that in the face of covariate shocks, households' mutual sharing mechanism collapses, which push them to rely on self-coping strategies like child labor, compromising on children's human development in the long run. However the result for flood shock showing a reduction in child work is interesting and the possible explanation is that local droughts reduce opportunities for children to work, both because farm work is less available and because adult labor supply is also more abundant.

For households with an access to credit, we observed the parameter of interaction of access to credit with shocks such households are less likely to increase child labor to

buffer shocks, however, the values are insignificant We also examined the heterogeneity impact across age, gender and work of activities among child labor. Results reveal that for each shock under observation, an income shocks in terms of rise in food prices is associated significantly with higher child labor. While observing the results for all children, which includes both girls and boys, positive and significant coefficients show that there is an increase in mean work hours spent in the last week (2.2 mean hours spent). However, for the similar shocks, the magnitude of coefficients decreases as we take into account the second age group, i.e. 14-17 years. This is quite counterintuitive, as we expect the work supply of older siblings to be more responsive to shocks as compare to the younger ones, as this cohort group is considered to be more productive and parents tend to be willing to send them to work in times of shocks.

Similarly, for other covariate shocks like displacement, dwelling damaged by floods and conflict, show an increase in the work hours of children in both the age group. The results for idiosyncratic shocks like business failure and illness of main earner, the work hours of children in the first age group have reduced while in the latter case the results are insignificant. This is consistent with views that in times of idiosyncratic shocks, households manage to smooth consumption through informal insurance mechanisms like taking help from family, friends and other acquaintances, which protects them from resorting to negative strategies like child labor.

We conclude that households employ variety of strategies in order to protect consumption in the face of shocks. However, effectiveness of these strategies are highly associated with nature of shocks as well as on the households' characteristics; households with limited access to credit market and poor savings along with exclusion from informal networks are less insured against shocks. Their inability to cope with shocks further pushes them into poverty traps. In response to various shocks,

households reduce food consumption, sell assets or make labor adjustments, for example, they withdraw children from school and put into work. However, when these households are provided cash transfers under social protection program, the effects of shocks are to an extent mitigated by providing consumption insurance for non-food consumption, but in general these transfers are not impactful enough to smooth households' total consumption. Similarly, we find that households when face covariate shocks, use costly copying strategies like child labor to compensate for the losses, however, the situation is quite grimmer for credit constrained households, who push their children into labor market to compensate for loss incurred by income or non-income shocks.

7.2. Policy Implications

The findings of study lead to some interesting policy implications. Given that the targeted households under BISP program are exposed to idiosyncratic and covariate shocks simultaneously, they resort to coping strategies which are further damaging in nature i.e compromising on the quality and quantity of food consumption, selling out their assets and pushing their children towards child labor. Thus our results call for effective public policy efforts to help protect the poor and vulnerable from shocks. Moreover, the goals ought to preserve households' food consumption, human capital and retain their livelihood in the face of shocks.

The government needs to formulate public policies such that the poor and vulnerable households have access to formal (non-exploitative) credit along with effective social safety net programs, which would provide basic income support in times of income or non-income shocks. There is a need to promote active health status by reducing diseases and accidents, so that these idiosyncratic shocks can be prevented in advance. Although, our study does not cover how to improve public health, it is clear that shocks

like illness, accidents or death of household head or main earning member of a household have huge economic and social consequences for rest of the members. Further, improving access to affordable health care must be ensured in order to prevent and cope with diseases. This has become more pressing issue in the context of Covid-19, which has created public health crisis around the world. And in case of countries like Pakistan, it is more challenging to provide quality and affordable access to public health system in order to reduce the impacts on the vulnerable segment.

While considering the ex-post copying strategies, the focus should be on improved access to formal (non-exploitative) credit, saving, labor market and social assistance. Easy access to credit and saving could help households in smoothing consumption and protects them from entering exploitative debt and bonded labor. However, it is equally important to note that the microcredit sector is not very developed in Pakistan, as well as they have less outreach to the poor households. Moreover, microfinance is provided for productive purpose, so it cannot be used for risk copying and consumption smoothing purposes. It is important that better employment opportunities are ensured through inclusive economic growth to cope with shocks other than breadwinner's death or illness. Considering shocks like loss of employment by the poor, it is important that the government consider some labor market reforms and regulations, such that incentives are being provided to the informal sector to formalize the laws. Since 60% of the households under BISP program rely on casual labor, working in the informal sector, ensuring sustainable employment is very important to avoid job losses. Moreover, it is important to address the regional, socio economic and demographic factors which push labors into informal sector, this includes, internal migration (more people shift from rural to urban centers to seek livelihood opportunities), low physical and human capital, along with more young population seeking jobs. These are

important issues to mitigate risks and reduce households' vulnerability to external shocks.

More importantly, social safety nets are important protection mechanisms used around the globe in developing countries, with targeted social protection programs have proved successful in mitigating households' risks in times of shocks. However, these programs would need to be more generous and responsive to shocks, such that they could replace the informal sharing mechanisms among households. Also, the literature and findings of our study show such mechanisms (borrowing from friends, family and others) collapse in times of covariate shocks, as the whole community gets affected. This suggests that social protection programs, like BISP are very important in times of widespread covariate shocks. Through BISP data, we also observed that the targeted households have more reliance on informal sharing mechanism, which often comes with strings attached and are also exploitative in nature, while public assistance programs like BISP, are not effective copying strategies; with 11% households reported to rely on it in comparison to 45% using private borrowing, This shows that private borrowing constitute major portion of the households borrowing, with low assistance from government welfare programs (including BISP). This implies that government assistance programs need to be scaled up, both in terms of size and outreach, to protect the vulnerable households from employing strategies which have negative consequences in the long run

In terms of consumption smoothing, we observe that full risk sharing hypothesis does not hold and households change consumption in response to shock. Moreover, BISP protects the fluctuation in non-food consumption, implying that the BISP needs to be effective in reaching out to the poor in times of shock such that it proves to be an effective copying strategy among the households. As per BISP evaluation reports,

initially, the beneficiaries used to collect cash through their postal addresses, which naturally delayed the receipts, and many respondents also reported that they collected their installments in lump sum, thus pushing them to spend the money on non-food (relatively less expensive household's item like bed sheets, utensils and others) consumption. This shows that the transfers fails to protect food consumption, which are of immediate needs and the expenses need to be incurred on weekly and monthly basis. However, lately, the transfers are made through banking channel and the beneficiaries can access them more conveniently, thus the effects on smoothing food consumption could be observed in the updated data. These finding indicate that households engage in risk management strategies to insulate their consumption, at least partially, from changes in income. BISP's transfers crowd out copying strategies like adjusting food consumption, and reinforce selling assets to smooth consumption. However, we do not find any evidence whether it crowds out internal transfers among households or not. These results imply that in times of shocks (mostly in the wake of covariate shocks), beneficiary households rely on self-protection strategies, which include selling assets or pushing children into the labor market, which have severe consequences in terms of weak physical and human capital accumulation in the long run. The implications of these results are quite significant. Given that the primary objective of BISP is to mitigate households' vulnerability to external shocks, however, the results show that it is not effective in protecting from external shocks like rise in food prices, flood or in times of conflicts and displacement. These findings strengthen the case for more targeted and generous social protection programs for the poorest of the poor in Pakistan.

This study also finds that poor households use child labor as buffer against shocks and factors such as household poverty, imperfect market imperfections along with some

household characteristics tend to derive this force. Our results imply to various policy implications; effects of shocks (covariate) on child labor and the resulting impacts of future human development; significance of credit market and its role in mitigating the effects on child labor; social protection programs and child labor.

As discussed earlier, our results findings show the tendency for using child labor as an informal risk copying strategy for consumption smoothing in the presence of shocks. An effective policy response to minimize such actions is to strengthen credit and normal insurance market. Providing insurance schemes to compensate the farmers for unforeseen agriculture shocks could have huge mitigating effects along with ensuring sustainability. As observed, parental, especially mother's education could reduce the use of child labor as partial risk copying strategy, it is thus important to invest on education with more focus on reducing gender gap. While observing the effects across gender, it is revealed that with each shock, girls' works hours in household chores increase with severe consequences on her education. This further implies that social protection programs needs to be expanded with much emphasis to be paid on protecting children's cognitive and health status. Moreover, it is important to strengthen child welfare related laws to mitigate the adverse child related outcomes.

The overall results of this study calls for more effective social protection programs for the vulnerable people, who are exposed to numerous shocks ranging from economic, health, financial and climatic shocks. At present, when the world at large is going through a pandemic, Covid-19, which had brought the world economy to a grinding halt, it is important to protect the vulnerable people, who face the direct brunt of this crisis by ensuring food and basic necessities of life for the months ahead. Their vulnerability to this global crisis can be gauged by the fact that even in normal situations, these households are not able to tolerate shocks of individual nature (as

shown in the findings), this makes it even more urgent for the state to be more responsive to a shock of an unprecedented nature. The Government of Pakistan under BISP, has expanded the program to 12 million people along with increasing the cash payments to the vulnerable. However, it needs to devise more policies to protect these households from resorting to strategies, which are costly in nature and might push them down the poverty line further.

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APPENDICES

Appendix I

The Program Eligibility and Ineligibility Criteria in Phase I

The following categories of families were eligible:
1. Possession of CNIC by female applicant/ recipient.
2. Monthly family income is less than Rs.6000/. And subject to the conditions I and II.
3. Widowed/ divorced women, without adult male members in the family.
4. Any physically or mentally retarded person(s) in the family.
5. Any family member suffering from a chronic disease.
 The following families were ineligible to receive any assistance under the Program:
6. Where any of the members of the family is in employment of government/ semigovernment/ authority/ department or armed forces of Pakistan.
7. Where any of the members of the family is drawing pension from government/semi government/authority/department or armed forces of Pakistan.
8. Where any of the members of the family is receiving any post-retirement benefits from any government department/ agency.
9. Where any of the members of the family owns an agriculture land more than three acres or residential house/ plot of more than eighty square yards (3 marlas).
10. Where any member of the family is receiving income support from any other source like Punjab Food Support Scheme etc.
11. Where any member of the family possesses a Machine Readable Passport.
12. Where any member of the family possesses a National Identity Card for Overseas Pakistanis (NICOP).
13. Where any member of the family has a Bank Account (except in NBP, HBL, UBL, MCB, ABL, BOP, Bolan Bank, Khyber Bank, First Women Bank, ZTBL, Khushhali Bank, and all microfinance banks).

Appendix II

Attrition in BISP Panel Sample, 2011, 2013, 2016

Since BISP data has been collected from same households over three points in time- 2010, 2013 and 2016, it is common that some households (participants) drop out from the original sample for variety of reasons, which include geographical movement or they refuse to participate. A major concern is that these households may systematically vary from the households in the panel, which leads to 'attrition bias' (Miller and Holist (2007). However, if the households are not dropped systematically, meaning there is no distinct characteristics among the attriting units, then there is no attrition bias even though the sample has decreased between waves. It is therefore, important to examine the attrition bias in our panel sample.

In order to study attrition, we measure households' basic characteristics among households that are part of the panel and households who have attrited from the baseline data (Table 1) While comparing the means, significant difference is found. Attrited households we find some significant differences. Households that attrited were less likely to own a residence, are more living in the urban areas. Also, households that were attrited in in the two rounds have more economically active members, are less likely to have children in the given age group. Households that attrited were more at baseline than households found in in the panel.

Table A-1: Average Households Characteristics at Baseline, by Attrition Status, Pakistan BISP Survey Data, 2011, and 2016

Variables	Panel	Attrited Households	P-Value
Demographics			
Households Size	6.104	5.534	0.0001
	-0.0392883	-0.0353395	
Children aged:6-13	2.652	2.416	0.001
	-0.0233558	-0.0207617	
Children aged:14-17	0.661	0.599	0.0003
	-0.0135334	-0.010897	
Economically active Members	3.125	3.206	0.0323
	-0.027913	-0.024575	
Age of Households Head(Years)	45.141	45.766	0.0258
	-0.2029182	-0.1850715	
Female headed households(Yes=1)	0.056	0.089	0.001
	-0.0039277	-0.0039248	
Asset Ownership			
Owner's Occupied House (Yes=1)	0.83	0.798	0.0002
	-0.0063916	-0.0055333	
Agri-land Owned (Yes=1)	0.128	0.127	0.8477
	-0.0056903	-0.0045902	
Urban Household (Yes=1)	0.219	0.317	0.0001
	-0.0070332	-0.0064083	

Notes: Standard errors of means in parentheses. The standard errors do not take survey design into account and therefore are likely underestimated.

This shows that a systematic attrition bias exists in our panel data. So in order to examine the impacts of this attrition in the estimates of this study, we then applied the

probit model on the selected variables with significant differences in means. Through this test we found that few variables are strong predictors of attrition. For the attrited households, higher household's size, more economically active members, along with having residence ownership show strong association with attrition (Table A2)

Table A-2: Correlates of Attrition Measured at Baseline, BISP OPM Data, 2013, 2016

	Marginal Effects	Standard Errors
Children aged:6-13	-0.0177038**	0.00636
Children aged:14-17	-0.0260368	0.00839
Economically active Members	0.0171703***	0.00454
Age of Households Head(Years)	0.0011378	0.00053
Female headed household's Education	0.010109**	0.0017
Owner's Occupied House (Yes=1)	-0.0735102*	0.01446

Notes: Number of observations at baseline is 8478; some observations dropped for missing values. Province fixed effects in all regressions. Marginal effects reported are at the average value for continuous variables and are jumps from 0 to 1 for discrete variables. Standard errors clustered at the PSU level. *-indicates significance at the 10 percent level; **- indicates significance at the 5 percent level; ***-indicates significance at the 1 percent level.

The multivariate analysis shows that households with economically active members in the households are 1.7% more likely to attrite from the sample. Similarly, ownership of a residence reduces the probability by 7 percentage points. These results are in conformity to the results shown by Ambler & Brause (2019) in studying BISP's dataset. Other variables do not have significant correlations with attrition, at least at better than the 5 percent level. When

As shown by Ambler and Brauw (2019), households with CNIC but not matched to BISP MIS are wealthier than those not holding CNIC. While basic demographics do not differ substantially, they are less likely to have a thatched roof, less likely to have a mud floor, and have better access to toilets. They are more likely to have almost every

type of consumer durable listed, as well as more livestock. As most of these variables are part of the proxy means test, these households need to be part of the control group, however, it is not clear whether these households have ascertain poverty scores near the threshold to be part of the sample.

Following Arif and Bilquees(2006) and Nayab and Arif(2012), we also applied BGLW test, which is based on Beketti, et al. (1998). This test examines whether those who subsequently leave the sample are systematically different from those who stay in terms of their initial behavioral relationships. We examined the consumption equations and well as poverty equations for two more restrictive subset of participants- all 2011 households and those still in the sample in 2016 (non-attritors-the panel sample).

We applied OLS regression for consumption equations and logit estimates for poverty equations respectively. By regressing households consumption expenditure on basic characteristics like household size, households literacy rate and livestock and land ownership along with the value of 'A'. All equations are significant and are consistent with the widely held perception about households consumption behavior and poverty. Age and literacy of household's head are positively related to consumption while negatively related to poverty. Similarly family size has positive relation with poverty while negative relation with per capita consumption. While calculating the difference between means for both the groups, there is no significant difference between the set of coefficients for attritors and non-attritors. These estimates therefore show that, the basic estimates of this study are not affected by sample attrition.

Table B-1: How widespread is the Shock? (In terms of Percentage, %)

	Own HH only	Some other HHs	Most of the HHs in the Community	All the HHs in the Community
Sharp rise in food prices	28.19	18.20	34.17	13.82
Illness or accident of households' main earning member	24.96	3.91	0.94	0.13
Dwelling damaged/destroyed due to flood	0.28	13.98	32.06	50.00
Crop Loss	4.55	15.59	24.32	40.14
Displacement	0.1	4.00	28.27	34.58
Livestock died/stolen	7.33	10.22	5.96	12.50
Dwelling damaged/destroyed	3.03	20.76	14.49	24.00
Loss of salaried employment	7.94	4.09	3.28	0.60
Sever damage to agriculture land (due to water logging,/flood/earthquake	0.28	15.94	26.92	32.81
Household business failure	4.55	6.05	6.34	5.59
Reduction of regular assistance, aid or remittance from outside household	8.06	9.48	14.58	6.19
Conflict	0.56	3.78	16.34	16.39
Others	9.50	31.12	27.05	21.70

Note: Values are averages of the three rounds of BISP data, 2011, 2013 &2016

Table C-1: Logistic Regression of Socioeconomic factors on Idiosyncratic Shocks

	Illness earner		Salaried Loss		Livestock died		Idiosyncratic Shocks	
	Log Values	Marginal values	Log Values	Marginal values	Log Values	Marginal values	Log Values	Marginal values
Household Characteristics								
HH Age_between 25 &49	-0.415*	-0.0333*	0.0773	0.0016	0.682***	-0.0168	0.133*	-0.00558
	(0.247)	(0.0198)	(0.455)	(0.0095)	(0.131)	(0.0176)	(0.0795)	(0.0251)
HH Age_ 50 and above	-0.351***	-0.0281***	-0.453***	-0.00947***	-0.0893	0.00843*	0.0570	-0.0190*
	(0.0889)	(0.0071)	(0.169)	(0.0035)	(0.173)	(0.0049)	(0.0850)	-0.0097
HH Education_Primary Level	0.145	0.0116	0.650***	0.0136***	1.118***	0.0002	0.133*	0.0206*
	-0.111	-0.008	-0.185	-0.003	-0.338	-0.006	(0.0795)	-0.0123
HH Education_ HSSC Level	0.0262	0.0021	0.424**	0.0088**	0.00533	-0.0022	0.0570	0.0088
	-0.12	-0.0095	-0.201	-0.0042	-0.161	-0.007	(0.0850)	-0.0131
Female Household Head	-0.312	-0.025	-1.118**	-0.0233**	-0.0527	-0.0256*	0.0103	0.00159
	-0.196	-0.0157	-0.476	-0.0101	-0.178	-0.014	(0.130)	-0.02
Urban	0.213**	0.0049	-0.332*	0.0032	0.138	-0.0367***	0.0189	-0.00293
	-0.0939	-0.008	-0.172	-0.003	-0.136	-0.0076	(0.0664)	-0.011
Mud Floored House	0.0622	0.0171**	0.155	-0.0069*	-0.913***	0.0055	-0.0190	0.00291
	-0.101	-0.007	-0.168	-0.003	-0.186	-0.005	(0.0712)	-0.01
Mother's Education	-0.00455	-0.0003	0.202*	0.004*	0.0811	0.00326	0.0370	0.005
	-0.0842	-0.006	-0.104	-0.002	-0.0955	-0.003	(0.0564)	-0.008
Active household Members	-0.0448**	-0.003**	-0.0681*	-0.0014*	0.0392*	0.0015*	-0.00631	-0.0009
	-0.0194	-0.001	-0.0399	-0.0008	-0.0236	-0.0009	(0.0131)	-0.002
Major Source of Household Income								
Agriculture	-0.755***	-0.0606***	-1.586***	-0.0331***	0.682***	0.0274***	-0.213***	-0.0329***

	-0.133	-0.0107	-0.391	-0.008	(0.131)	-0.005	(0.0820)	-0.012
Salary	-0.488***	-0.0392***	0.0716	0.0015	-0.0893	-0.003	-0.390***	-0.0603***
	-0.122	-0.009	-0.188	-0.0039	(0.173)	-0.006	(0.0846)	-0.013
Other income	-0.505	-0.0405	-0.601	-0.0126	1.118***	0.0449***	0.0401	0.00619
	-0.377	-0.0302	-0.725	-0.0152	(0.338)	-0.0137	(0.229)	-0.0354
Constant	-2.237***	-2.237***	-3.429***	-3.429***	-3.951***	-3.951***	-1.370***	-1.370***
	-0.147	-0.147	-0.332	-0.332	(0.227)	-0.227	(0.0989)	-0.0989
Observations	9,151	9,151	9,151	9,151	9,151	9,151	9,151	9,151
Number of Households	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465
Hosmer and Lemeshow on goodness-of-fit test	5.50							
Log likelihood	-4897.3663							
Pseudo R2	0.0009							

Table C-2: Effects of the Socioeconomic Factors on Covariate Shocks

	Rise_food_prices		Dwelling_flood		Displacement		Covariate Shocks	
	Log Values	Marginal values	Log Values	Marginal values	Log Values	Marginal values	Log Values	Marginal values
Household Characteristics								
HH Age_between 25 &49	0.146	0.0291	-0.0102	-0.000492	0.940***	0.0256***	0.237	0.0438
	(0.151)	-0.0302	(0.308)	-0.0148	(0.352)	-0.00966	(0.158)	-0.0292
HH Age_ 50 and above	0.259***	0.0517***	0.00730	0.000352	0.488***	0.0133***	0.263***	0.0486***
	(0.0591)	-0.0117	(0.110)	-0.00528	(0.161)	-0.00444	(0.0622)	-0.0114
HH Education_Primary Level	-0.267***	-0.0532***	0.0386	0.00186	0.637***	0.0173***	-0.0904	-0.0167
	(0.0745)	-0.0148	(0.155)	-0.00747	(0.173)	-0.00479	(0.0780)	-0.0144
HH Education_ HSSC Level	-0.439***	-0.0877***	0.685***	0.0330***	0.664***	0.0181***	-0.305***	-0.0564***
	(0.0793)	-0.0157	(0.150)	-0.00728	(0.198)	-0.00547	(0.0816)	-0.015
Female Household Head	-0.0303	-0.0304	0.0868	-0.0314**	-0.401*	-0.0289**	-0.00238	-0.0547**
	(0.0525)	-0.0241	(0.0771)	-0.0153	(0.214)	-0.0123	(0.0558)	-0.0229
Urban	0.733***	0.0419***	2.079***	-0.0157**	1.507***	-0.0198***	0.837***	0.00978
	(0.0617)	-0.0136	(0.181)	-0.00687	(0.215)	-0.00621	(0.0641)	-0.0132
Mud Floored House	0.210***	0.146***	-0.326**	0.100***	-0.728***	0.0410***	0.0529	0.155***
	(0.0685)	-0.0119	(0.142)	-0.00948	(0.225)	-0.00629	(0.0713)	-0.0114
Mother's Education	-0.296**	-0.00605	-0.152	0.00418	-0.652**	-0.0109*	-1.063**	-0.00044
	(0.125)	-0.0105	(0.121)	-0.00371	(0.316)	-0.00585	(0.450)	-0.0103
Active household Members		0.00237	-0.0241	-0.00296***	0.0119	-0.00293***	-0.0615***	0.00216
		-0.00242	(0.0163)	-0.00114	(0.0121)	-0.00102	(0.0235)	-0.00237
Major Source of Household Income								

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agriculture	-0.195***	-0.0389***	0.443***	0.0214***	0.648***	0.0176***	0.541***	0.0999***
	(0.0745)	-0.0149	(0.116)	-0.00565	(0.150)	-0.00417	(0.0827)	-0.0151
Salary	-0.137*	-0.0273*	-0.248	-0.0119	0.0380	0.00103	-0.0810	-0.015
	(0.0736)	-0.0147	(0.153)	-0.00738	(0.194)	-0.00528	(0.0764)	-0.0141
Other income	-0.405*	-0.0810*	-0.821	-0.0395		-	-0.209	-0.0386
	(0.218)	-0.0435	(0.721)	-0.0348		-	(0.221)	-0.0408
Constant		-0.409***		-4.576***		-4.959***		-0.263***
		-0.0928		-0.226		-0.293		-0.0968
Observations		9,151		9,151		9,028		9,151
Number of Households				3,465				3,465

Hosmer and Lemeshow on goodness-of-fit test	1.90
Log likelihood	-6418.9012
Pseudo R2	0.0067

Note: Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table D-1: Effects of Shocks on Number of Child Labor in a Household (Age Group 14-17)

VARIABLES	Any Kind of Work			Home based Work			Farm based Work		
	All Kids	Boys	Girls	All Kids	Boys	Girls	All Kids	Boys	Girls
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sharp rise in food prices	0.00361	0.0317***	-3.64e-05	0.0246**	0.0384*	0.000141	0.0164***	0.00216	0.00403
	(0.00552)	(0.00841)	(0.00259)	(0.0123)	(0.0202)	(0.00946)	(0.00598)	(0.0108)	(0.00330)
Livestock died or stolen	0.00305	-0.00650	0.00288	-0.00456	0.0531	-0.00520	0.0201	0.00653	0.00641
	(0.0100)	(0.0187)	(0.00448)	(0.0272)	(0.0485)	(0.0214)	(0.0161)	(0.0302)	(0.00986)
Loss of salaried employment	0.0442**	0.0130	0.00971	-0.000746	-0.0241	-0.00665	0.00567	-0.00854	-0.00785*
	(0.0208)	(0.0267)	(0.0124)	(0.0365)	(0.0623)	(0.0279)	(0.0165)	(0.0315)	(0.00459)
Illness of households' main earning member	0.00770	0.00146	0.00464	0.00873	-0.0340	-0.00195	-0.00221	-0.0175	0.00897
	(0.00799)	(0.0144)	(0.00410)	(0.0187)	(0.0306)	(0.0152)	(0.00905)	(0.0149)	(0.00590)
Dwelling damaged	0.0146	-0.0489**	0.00466	-0.0185	0.0968*	-0.0313	0.0324*	0.0150	0.00588
	(0.0128)	(0.0200)	(0.00669)	(0.0262)	(0.0495)	(0.0220)	(0.0165)	(0.0310)	(0.0105)
Displacement	-0.0246	-0.0415*	-0.0120*	0.000571	-0.0874	0.0112	0.0257	-0.0114	0.00582
	(0.0175)	(0.0245)	(0.00677)	(0.0358)	(0.0682)	(0.0288)	(0.0236)	(0.0450)	(0.0136)
Household business failure	0.0113	0.0364	0.00619	0.0180	-0.0768	0.00124	0.0167	-0.103***	0.00998
	(0.0164)	(0.0330)	(0.00670)	(0.0427)	(0.0688)	(0.0326)	(0.0205)	(0.0326)	(0.0129)
Conflict	-0.00864	0.0441	-0.0106	-0.0782	0.0805	0.00343	-0.0611	-0.0407	-0.0144
	(0.0123)	(0.0780)	(0.0115)	(0.0728)	(0.136)	(0.0641)	(0.0454)	(0.0807)	(0.0120)
Constant	-0.0114	-0.0655**	0.00658	0.0134	0.322***	0.0235	0.00403	0.0505	0.00991
	(0.0170)	(0.0306)	(0.00576)	(0.0457)	(0.0833)	(0.0368)	(0.0241)	(0.0465)	(0.0130)
Households FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,382	9,382	9,382	9,382	9,382	9,382	9,382	9,382	9,382
R-squared	0.004	0.011	0.004	0.026	0.050	0.016	0.009	0.006	0.006
Number of IDCODE	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465

Table D-2: Number of hours per week child from 6 to 17 years worked at any kind of Work

VARIABLES	Boys		Girls		Boys		Girls		Boys		Girls	
	(6-13Years)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17)	(6-13)	(14-17)
Idiyo_Shocks	0.265	0.112	0.153	0.216**	0.412	-0.0241	0.436	0.338	-1.268	0.0182	-1.386	0.0470
	(0.370)	(0.340)	(0.127)	(0.104)	(1.082)	(0.918)	(0.546)	(0.333)	(0.950)	(0.288)	(0.878)	(0.0726)
Covariate_Shocks	0.0501	0.180	-0.130	0.0168	0.631	0.332	0.299	-0.0822	1.214	0.470	0.744	-0.00813
	(0.340)	(0.309)	(0.113)	(0.0724)	(0.952)	(0.872)	(0.329)	(0.215)	(1.163)	(0.380)	(1.072)	(0.163)
Access_Credit	-0.273	-0.0894	-0.184	-0.0156	0.157	-0.0152	0.172	-0.0567	0.128	0.161	-0.0330	-0.0614
	(0.458)	(0.398)	(0.201)	(0.0884)	(0.798)	(0.743)	(0.274)	(0.152)	(0.796)	(0.274)	(0.742)	(0.153)
Credit_Idyo_Shocks					-0.157	0.151	-0.308	-0.134	1.875*	-0.115	1.990**	0.000710
					(1.114)	(0.952)	(0.546)	(0.364)	(1.051)	(0.335)	(0.969)	(0.158)
Credit_Cov_Shocks					-0.636	-0.166	-0.470	0.108	-1.651	-0.558	-1.094	0.169
					(0.984)	(0.907)	(0.325)	(0.218)	(1.177)	(0.402)	(1.080)	(0.176)
BISP									0.847*	0.259*	0.588	0.0906
									(0.478)	(0.155)	(0.438)	(0.113)
Idyo_Shock*BISP									2.244	0.526	1.718	0.373
									(1.635)	(0.712)	(1.444)	(0.475)
Credit*Idyo_Shocks*BISP									-2.586	-0.196	-2.390	-0.148
									(1.756)	(0.753)	(1.556)	(0.547)
Cov_Shocks*BISP									-0.847	-0.258	-0.589	-0.115
									(1.244)	(0.483)	(1.094)	(0.198)
Credit*Cov_Shocks*BISP									1.449	0.134	1.315	-0.0785
									(1.200)	(0.465)	(1.056)	(0.186)
Agriculture income	-0.448	-0.595	0.147	-0.203*	-0.446	-0.593	0.147	-0.204*	-0.426	0.146	-0.572	-0.208*
	(0.440)	(0.392)	(0.151)	(0.120)	(0.440)	(0.392)	(0.151)	(0.121)	(0.441)	(0.152)	(0.393)	(0.121)
Salary	-0.296	-0.470	0.174	-0.0212	-0.297	-0.469	0.172	-0.0222	-0.301	0.174	-0.475	-0.0203
	(0.647)	(0.601)	(0.210)	(0.132)	(0.648)	(0.602)	(0.210)	(0.133)	(0.646)	(0.210)	(0.600)	(0.133)
Remmittances	-0.0378	-0.353	0.315	0.128	-0.0381	-0.349	0.311	0.124	5.35e-05	0.325	-0.325	0.128
	(0.623)	(0.548)	(0.235)	(0.228)	(0.624)	(0.549)	(0.236)	(0.231)	(0.626)	(0.239)	(0.549)	(0.232)
Business	-0.600	-0.667	0.0671	0.0463	-0.604	-0.667	0.0629	0.0461	-0.605	0.0676	-0.672	0.0486
	(0.535)	(0.490)	(0.163)	(0.155)	(0.535)	(0.490)	(0.164)	(0.156)	(0.534)	(0.164)	(0.488)	(0.157)
Private_Transfers	4.545	1.749	2.796	-0.00442	4.537	1.752	2.785	-0.00744	4.517	2.778	1.739	-0.00936
	(4.116)	(3.323)	(2.492)	(0.0487)	(4.109)	(3.325)	(2.470)	(0.0537)	(4.105)	(2.470)	(3.322)	(0.0520)
Pension_Social_Assistance	-0.731	0.0369	-0.768	-0.0160	-0.675	0.0475	-0.723	-0.0221	-0.644	-0.709	0.0646	-0.0182
	(0.931)	(0.327)	(0.890)	(0.0595)	(0.916)	(0.334)	(0.870)	(0.0602)	(0.915)	(0.865)	(0.345)	(0.0669)

Other_Sources	2.021*	1.787*	0.234	0.00239	2.042*	1.794*	0.248	-0.00244	1.982*	0.233	1.749*	-0.00677
	(1.051)	(1.004)	(0.208)	(0.115)	(1.051)	(1.004)	(0.207)	(0.117)	(1.049)	(0.206)	(1.004)	(0.117)
FHH_Head	-1.555**	-1.572**	0.0168	0.165	-1.549**	-1.568**	0.0196	0.162	-1.590**	-0.00369	-1.586**	0.149
	(0.698)	(0.657)	(0.346)	(0.279)	(0.699)	(0.660)	(0.347)	(0.280)	(0.702)	(0.347)	(0.663)	(0.277)
HH_Age	-0.0183	-0.00246	-0.0158*	-0.00120	-0.0184	-0.00245	-0.0159*	-0.00121	-0.0171	-0.0156*	-0.00154	-0.00119
	(0.0189)	(0.0160)	(0.00823)	(0.00397)	(0.0189)	(0.0160)	(0.00822)	(0.00396)	(0.0188)	(0.00818)	(0.0160)	(0.00395)
HH_Education	0.00939	0.0169	-0.00750	-0.0193	0.00873	0.0168	-0.00806	-0.0193	0.0143	-0.00788	0.0221	-0.0199
	(0.0607)	(0.0556)	(0.0227)	(0.0268)	(0.0606)	(0.0555)	(0.0226)	(0.0268)	(0.0606)	(0.0227)	(0.0554)	(0.0270)
Mother's Education	0.0327	0.0251	0.00752	-0.137	0.0312	0.0253	0.00594	-0.138	0.0275	0.00806	0.0194	-0.136
	(0.196)	(0.185)	(0.0525)	(0.0921)	(0.196)	(0.185)	(0.0526)	(0.0920)	(0.196)	(0.0531)	(0.185)	(0.0918)
DependencyRatio	0.445***	0.303***	0.143***	0.0323	0.445***	0.303***	0.143***	0.0321	0.445***	0.141***	0.303***	0.0315
	(0.0990)	(0.0810)	(0.0472)	(0.0259)	(0.0992)	(0.0811)	(0.0475)	(0.0260)	(0.0988)	(0.0472)	(0.0808)	(0.0256)
Agri_Land1	0.456	0.487	-0.0314	0.0627	0.454	0.486	-0.0318	0.0634	0.411	-0.0421	0.453	0.0630
	(0.483)	(0.471)	(0.0977)	(0.0792)	(0.483)	(0.472)	(0.0976)	(0.0792)	(0.482)	(0.0979)	(0.470)	(0.0793)
Floor	-0.707**	-0.439	-0.268**	-0.0471	-0.705**	-0.439	-0.267**	-0.0474	-0.673**	-0.260**	-0.414	-0.0477
	(0.297)	(0.268)	(0.108)	(0.0633)	(0.297)	(0.268)	(0.108)	(0.0632)	(0.296)	(0.108)	(0.267)	(0.0621)
Urban	1.037	1.168*	-0.131	-0.0652	1.036	1.168*	-0.132	-0.0657	1.041	-0.130	1.171*	-0.0631
	(0.653)	(0.623)	(0.132)	(0.113)	(0.653)	(0.623)	(0.133)	(0.113)	(0.654)	(0.133)	(0.625)	(0.114)
Constant	1.300	0.535	0.765*	0.129	0.909	0.463	0.446	0.169	0.260	0.265	-0.00510	0.116
	(1.081)	(0.968)	(0.400)	(0.200)	(1.263)	(1.166)	(0.411)	(0.243)	(1.282)	(0.398)	(1.190)	(0.234)
Observations	9,349	9,349	9,349	9,349	9,349	9,349	9,349	9,349	9,348	9,348	9,348	9,348
R-squared	0.006	0.005	0.006	0.003	0.006	0.005	0.006	0.003	0.008	0.007	0.007	0.003
Number of IDCODE	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465

TableD-3: Number of hours per week child from 6 to 17 years worked at Home

VARIABLES	Boys		Girls		Boys		Girls		Boys		Girls	
	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)	(6-13Yrs)	(14-17Yrs)
Idiosyncratic Shocks	0.265	0.0275	0.299	-0.0313	-0.250	-0.279	1.756*	0.883	1.547	0.271	-0.0792	-0.590
	(0.370)	(0.268)	(0.288)	(0.198)	(1.043)	(0.750)	(0.978)	(0.751)	(2.069)	(1.102)	(2.138)	(1.511)
Covariate Shocks	0.0501	0.646***	0.896***	-0.269	-1.601	-0.0833	-0.567	-0.589	-2.197*	-0.655	-0.141	-0.892
	(0.340)	(0.234)	(0.267)	(0.179)	(1.168)	(0.895)	(0.919)	(0.605)	(1.196)	(1.181)	(1.290)	(0.911)
Access to Credit	-0.273	-0.618	-0.0736	0.132	-1.221	-1.186	-0.756	0.114	-1.232	-1.187	-0.780	0.109
	(0.458)	(0.440)	(0.476)	(0.295)	(1.167)	(0.892)	(0.847)	(0.448)	(1.168)	(0.892)	(0.846)	(0.445)
Credit*Idyo_Shocks					-0.0979	0.331	-1.606	-1.005	-2.301	0.348	0.543	0.414
					(1.089)	(0.794)	(1.027)	(0.770)	(2.153)	(1.180)	(2.182)	(1.539)
Credit* Covariate Shocks					1.436	0.798	1.599*	0.349	2.163*	1.946	1.302	0.426
					(1.175)	(0.949)	(0.953)	(0.623)	(1.253)	(1.203)	(1.307)	(0.905)
BISP									0.384	0.454	0.810	-0.114
									(0.473)	(0.597)	(0.546)	(0.357)
Idyo_Shock*BISP									-2.387	-0.753	2.331	1.869
									(2.252)	(1.353)	(2.300)	(1.824)
Credit*Idyo_Shocks*BISP									2.979	-0.0664	-2.771	-1.786
									(2.375)	(1.437)	(2.365)	(1.861)
Covariate Shocks*BISP									0.806	0.756	-0.646	0.406
									(0.965)	(1.141)	(1.340)	(0.969)
Credit*Cov_Shocks*BISP									-0.997	-1.559	0.460	-0.0869
									(0.968)	(1.101)	(1.302)	(0.962)
Agriculture Income	-0.448	0.758	-0.218	-0.248	0.517	0.757	-0.236	-0.256	0.525	0.742	-0.237	-0.256
	(0.440)	(0.525)	(0.522)	(0.291)	(0.566)	(0.525)	(0.522)	(0.292)	(0.566)	(0.525)	(0.521)	(0.292)
Salary	-0.296	0.796*	-0.232	0.188	-0.417	0.799*	-0.243	0.181	-0.408	0.801*	-0.245	0.179
	(0.647)	(0.413)	(0.444)	(0.298)	(0.528)	(0.413)	(0.444)	(0.298)	(0.527)	(0.414)	(0.444)	(0.298)
Remmittances	-0.0378	0.432	-0.562	0.646*	-0.780	0.435	-0.605	0.622	-0.759	0.409	-0.591	0.625
	(0.623)	(0.510)	(0.662)	(0.388)	(0.652)	(0.510)	(0.661)	(0.385)	(0.648)	(0.512)	(0.662)	(0.384)
Business	-0.600	0.785**	0.229	-0.153	-0.357	0.791**	0.228	-0.158	-0.342	0.793**	0.228	-0.168
	(0.535)	(0.389)	(0.465)	(0.277)	(0.474)	(0.389)	(0.464)	(0.276)	(0.476)	(0.389)	(0.463)	(0.276)
Private_Transfers	4.545	4.284	7.537***	-0.754	-0.713	4.297	7.502***	-0.779	-0.719	4.327	7.501***	-0.786
	(4.116)	(3.043)	(2.714)	(1.703)	(1.768)	(3.040)	(2.705)	(1.711)	(1.767)	(3.025)	(2.723)	(1.725)
Pension_Social_Assistance	-0.731	1.990*	1.583	-0.221	-0.714	1.916*	1.485	-0.229	-0.690	1.867*	1.482	-0.196

	(0.931)	(1.034)	(1.744)	(1.136)	(1.407)	(1.033)	(1.740)	(1.137)	(1.410)	(1.038)	(1.748)	(1.136)
Other_Sources	2.021*	0.992	-0.650	0.0146	0.00785	0.966	-0.719	-0.00531	-0.00558	0.959	-0.765	-0.0192
	(1.051)	(0.917)	(1.145)	(0.855)	(1.260)	(0.918)	(1.146)	(0.853)	(1.258)	(0.915)	(1.146)	(0.854)
FHH_Head	-1.555**	0.566	0.728	0.244	-1.029	0.559	0.695	0.231	-1.040	0.576	0.659	0.215
	(0.698)	(0.704)	(0.673)	(0.500)	(0.683)	(0.703)	(0.672)	(0.500)	(0.691)	(0.703)	(0.674)	(0.501)
HH_Age	-0.0183	-0.0224	0.0421**	-0.0209*	0.000895	-0.0223	0.0422**	-0.0210*	-2.79e-06	-0.0223	0.0416**	-0.0209*
	(0.0189)	(0.0179)	(0.0211)	(0.0122)	(0.0185)	(0.0179)	(0.0211)	(0.0122)	(0.0185)	(0.0178)	(0.0211)	(0.0122)
HH_Edu	0.00939	-0.0239	0.000610	0.0206	-0.110	-0.0230	0.000350	0.0206	-0.108	-0.0213	0.00348	0.0202
	(0.0607)	(0.0877)	(0.0848)	(0.0459)	(0.0707)	(0.0877)	(0.0848)	(0.0460)	(0.0711)	(0.0876)	(0.0851)	(0.0463)
Mother's Education	0.0327	0.581*	0.453	0.0914	0.462	0.583*	0.452	0.0892	0.467	0.572*	0.444	0.0881
	(0.196)	(0.325)	(0.416)	(0.183)	(0.350)	(0.324)	(0.415)	(0.183)	(0.351)	(0.324)	(0.414)	(0.184)
Dependency_Ratio	0.445***	0.480***	0.809***	0.394***	0.415***	0.480***	0.806***	0.392***	0.412***	0.482***	0.806***	0.391***
	(0.0990)	(0.0873)	(0.0997)	(0.0642)	(0.118)	(0.0873)	(0.0995)	(0.0642)	(0.118)	(0.0873)	(0.0998)	(0.0640)
Agri_Land1	0.456	-0.747	-0.665	-0.253	0.0893	-0.746	-0.656	-0.249	0.0758	-0.718	-0.670	-0.256
	(0.483)	(0.510)	(0.532)	(0.317)	(0.496)	(0.510)	(0.530)	(0.317)	(0.494)	(0.509)	(0.531)	(0.317)
Floor	-0.707**	1.922***	1.657***	0.433***	0.835***	1.920***	1.652***	0.432***	0.849***	1.907***	1.664***	0.432***
	(0.297)	(0.211)	(0.241)	(0.157)	(0.259)	(0.211)	(0.241)	(0.157)	(0.260)	(0.211)	(0.241)	(0.157)
Urban	1.037	0.380	0.122	0.439	-1.215	0.382	0.116	0.435	-1.230	0.394	0.134	0.409
	(0.653)	(0.540)	(0.681)	(0.348)	(0.755)	(0.540)	(0.682)	(0.349)	(0.757)	(0.543)	(0.685)	(0.349)
Constant	1.300	2.548**	2.798**	0.561	1.953	3.060**	3.462**	0.601	1.659	2.741**	2.877*	0.691
	(1.081)	(1.100)	(1.310)	(0.736)	(1.930)	(1.285)	(1.474)	(0.788)	(1.934)	(1.332)	(1.527)	(0.854)
Observations	9,349	9,349	9,349	9,349	9,349	9,349	9,349	9,349	9,348	9,348	9,348	9,348
R-squared	0.006	0.033	0.038	0.012	0.009	0.033	0.039	0.012	0.010	0.034	0.039	0.013
Number of IDCODE	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465	3,465

Table D-4: Number of hours per week child from 6 to 17 years worked at Farm

VARIABLES	Boys (6-13Yrs)	(14-17Yrs)	Girls (6-13Yrs)	(14-17Yrs)	Boys (6-13Yrs)	(14-17Yrs)	Girls (6-13Yrs)	(14-17Yrs)	Boys (6-13Yrs)	(14-17Yrs)	Girls (6-13Yrs)	(14-17Yrs)
Idiyo_Shocks	0.327	-0.274	-0.0533	0.139	1.477	-0.592	0.338	0.0377	-1.081	0.628	0.987	-0.0463
	(0.400)	(0.265)	(0.217)	(0.110)	(1.249)	(0.727)	(0.614)	(0.285)	(1.905)	(1.007)	(1.234)	(0.183)
Covariate_Shocks	1.542***	-0.284	0.0179	-0.0204	-0.650	-1.226	-0.326	-0.219	-0.650	-1.647*	-0.514	-0.479
	(0.375)	(0.239)	(0.200)	(0.0639)	(1.411)	(0.864)	(0.589)	(0.369)	(1.058)	(0.868)	(0.627)	(0.381)
Access_Credit	-0.692	0.0112	-0.349	-0.174	-1.942	-0.705	-0.500	-0.333	-0.219	-0.711	-0.507	-0.331
	(0.699)	(0.417)	(0.288)	(0.171)	(1.385)	(0.835)	(0.608)	(0.403)	(0.589)	(0.838)	(0.608)	(0.402)
Credit*Idyo_Shocks					-1.275	0.343	-0.431	0.110	0.779	-0.511	-1.786	0.0188
					(1.325)	(0.738)	(0.663)	(0.305)	(1.940)	(1.077)	(1.310)	(0.245)
Credit*Cov_Shocks					2.398	1.031	0.376	0.218	0.404	1.697*	0.454	0.336
					(1.476)	(0.861)	(0.608)	(0.408)	(1.055)	(0.894)	(0.677)	(0.400)
BISP									-0.214	0.493	-0.0796	-0.195*
									(0.437)	(0.374)	(0.223)	(0.112)
Idyo_Shock*BISP									3.081	-1.625	-0.860	0.0956
									(2.151)	(1.229)	(1.332)	(0.324)
Credit*Idyo_Shocks*BISP									-2.758	1.101	1.881	0.157
									(2.201)	(1.371)	(1.404)	(0.407)
Cov_Shocks*BISP									-0.0409	0.562	0.264	0.367
									(1.085)	(0.752)	(0.499)	(0.250)
Credit*Cov_Shocks*BISP									0.570	-0.905	-0.118	-0.167
									(1.077)	(0.745)	(0.519)	(0.274)
Agriculture	0.540	0.179	0.327	0.0152	0.521	0.177	0.322	0.0150	-0.209	0.178	0.327	0.0174
	(0.817)	(0.437)	(0.291)	(0.174)	(0.816)	(0.437)	(0.291)	(0.174)	(0.374)	(0.438)	(0.292)	(0.174)
Salary	0.565	-0.0926	-0.316	-0.103	0.556	-0.0888	-0.319	-0.102	0.555	-0.0875	-0.312	-0.100
	(0.658)	(0.419)	(0.227)	(0.104)	(0.659)	(0.418)	(0.226)	(0.104)	(0.389)	(0.418)	(0.226)	(0.103)
Remmittances	-0.130	-0.716	-0.290	-0.326**	-0.170	-0.716	-0.303	-0.325**	0.371	-0.715	-0.284	-0.322**
	(0.866)	(0.454)	(0.387)	(0.165)	(0.866)	(0.456)	(0.389)	(0.165)	(0.469)	(0.455)	(0.386)	(0.164)
Business	1.014	-0.129	-0.180	0.0337	1.019	-0.122	-0.180	0.0354	-0.108	-0.119	-0.169	0.0363
	(0.653)	(0.370)	(0.254)	(0.136)	(0.653)	(0.370)	(0.253)	(0.136)	(0.330)	(0.371)	(0.253)	(0.136)

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Private_Transfers	11.82***	-0.455	-0.286	0.592	11.80***	-0.440	-0.296	0.596	-1.287	-0.424	-0.318	0.590
	(3.396)	(1.065)	(1.376)	(0.632)	(3.392)	(1.039)	(1.368)	(0.632)	(1.738)	(1.040)	(1.360)	(0.633)
Pension_Social_Assistance	3.573	-0.0850	-0.566	0.929	3.402	-0.178	-0.588	0.909	0.499	-0.204	-0.543	0.930
	(2.369)	(1.292)	(0.361)	(1.052)	(2.365)	(1.289)	(0.370)	(1.056)	(1.294)	(1.289)	(0.375)	(1.057)
Other_Sources	0.341	-0.0178	0.0462	-0.549	0.247	-0.0514	0.0295	-0.555	0.445	-0.0645	0.0272	-0.552
	(1.677)	(0.943)	(0.735)	(0.549)	(1.680)	(0.946)	(0.737)	(0.550)	(1.039)	(0.947)	(0.736)	(0.549)
HH_Age	1.294	-0.00269	0.000504	-0.0132***	1.254	-0.00251	0.000525	-0.0132***	0.257	-0.00196	0.000180	-0.0132***
	(0.999)	(0.0135)	(0.00958)	(0.00426)	(0.996)	(0.0135)	(0.00957)	(0.00425)	(0.612)	(0.0135)	(0.00955)	(0.00427)
HH_Education	-0.0646**	-0.0553	-0.0278	0.00514	-0.0645**	-0.0541	-0.0274	0.00540	-0.0196	-0.0507	-0.0284	0.00426
	(0.0304)	(0.0553)	(0.0291)	(0.0145)	(0.0304)	(0.0553)	(0.0290)	(0.0145)	(0.0145)	(0.0555)	(0.0290)	(0.0147)
Dependency_Ratio	-0.0245	0.232***	0.184***	0.0747**	-0.0226	0.232***	0.183***	0.0748**	-0.00775	0.233***	0.180***	0.0737**
	(0.141)	(0.0836)	(0.0644)	(0.0295)	(0.141)	(0.0836)	(0.0642)	(0.0294)	(0.0568)	(0.0838)	(0.0638)	(0.0295)
Urban	1.034*	-0.711	-0.518	0.0739	1.035*	-0.711	-0.520	0.0742	-0.0557	-0.714	-0.530	0.0692
	(0.557)	(0.611)	(0.356)	(0.144)	(0.557)	(0.612)	(0.356)	(0.144)	(0.212)	(0.614)	(0.356)	(0.145)
Floor	1.289***	0.540***	0.330**	-0.0321	1.286***	0.539***	0.329**	-0.0325	0.559***	0.543***	0.341**	-0.0328
	(0.151)	(0.199)	(0.139)	(0.0687)	(0.150)	(0.199)	(0.139)	(0.0685)	(0.0745)	(0.199)	(0.141)	(0.0691)
Constant	-1.412*	0.973	0.197	0.648**	-1.401*	1.619	0.344	0.791*	-0.231	1.246	0.400	0.931**
	(0.816)	(1.032)	(0.785)	(0.277)	(0.814)	(1.310)	(0.991)	(0.432)	(0.387)	(1.311)	(1.001)	(0.446)
	3.579***				3.572***				0.893***			
Observations	(0.340)	9,389	9,389	9,389	(0.340)	9,389	9,389	9,389	(0.194)	9,388	9,388	9,388
R-squared	0.502	0.004	0.006	0.005	0.497	0.005	0.006	0.005	0.0488	0.005	0.007	0.005
Number of IDCODE	(0.942)	3,465	3,465	3,465	(0.943)	3,465	3,465	3,465	(0.559)	3,465	3,465	3,465