

An Empirical Analysis of Multidimensional Poverty in Pakistan

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The present study aims to empirically analyze the extent and depth of multidimensional poverty in Pakistan. The dimensions covered by present study are education, health, house services, quality of house, additional facility and women empowerment. The required data is extracted from latest Pakistan Demographic Health Survey. The study followed Alkire-Foster (2009; 2011a) methodology and analyzed poverty by using six measures including headcount index, average deprivation, multidimensional poverty index, poverty gap, adjusted poverty gap, squared poverty gap and adjusted squared poverty gap. Each index is calculated at three different poverty cutoffs, i.e. $\frac{1}{3}$, $\frac{1}{2}$ and $\frac{2}{3}$. Moreover, poverty at each cut-off is measured by assigning equal and unequal weights to each dimension of well-being. The results revealed that about 10% households are chronically poor and another 30% are substantially poor. It is also worth mentioning that for analysis with unequal weights, headcount indices at all threshold levels were low but average deprivations and poverty gaps were higher. This indicates that when dimensions are weighted according to preferences, a lesser proportion of population is poor but the intensity of poverty increases.

Keywords: poverty, multidimensional poverty, well-being

Poverty is the incapability of individuals to satisfy their basic needs. It is a global problem, based on the definition of 1.90\$ a day in 2012 about 13 percent population of the world was unable to meet basic needs of life [World Development Indicators (2016)].¹ Empirical analysis of poverty has always been an area of interest for economists. Initial work on the measurement of poverty merely focused on shortfall of consumption as a measure of poverty. Consumption requirements mainly comprises of food, shelter and clothing. Thus it excludes factors like health, provision of public goods, freedom, education, empowerment, social exclusion and various other factors. However, in recent years an argument has been established that poverty is a multidimensional phenomenon, highlighting that merely focusing on consumption requirements ignores important dimensions of well-being.²

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¹In 1990, the research wing of World Bank introduced the dollar-a-day international poverty line which reflects the standards of absolute poverty in the poorest countries of world and was based on the purchasing power parity exchange rates (PPPs) of 1985. The purchasing power parity exchange rates are periodically revised and with the revision of these rates, international poverty line is also adjusted. For instance, a new set of PPPs was published in 1993, the line changed to \$1.08 per day. PPPs were revised again in 2005, and the poverty line was accordingly up scaled to \$1.25. Latest revision of these rates took place in 2011 which yielded an international poverty line of 1.90 \$ a day. [for details see Ferreira F.H.G *et.al* (2016)]

²The systematic analysis of multidimensional poverty and especially the ways to measure it became an important research area in the late 1970s. In this regard capability approach introduced by Sen A.(1979) is of great

Since the pioneering work of Tsui (2002) Bourguignon and Chakaravaty (2003), multiple approaches have been proposed to measure and analyze multidimensional poverty (see for example, Deutsch & Silber, 2005; Ducloset *al.* 2006). However, the seminal work by Alkire and Foster (2009) is a new milestone setting study in the measurement of multidimensional poverty. It opened new endeavors in the empirical analysis of multidimensional poverty.

In Pakistan, not much has actually been done to empirically analyze multidimensional poverty. Very few studies, if ever, have attempted to measure poverty through a multidimensional approach [see for example, Jamal (2009), Naveed & Islam (2010) and Awan *et al.* (2011)]. The present study attempts to undertake a comprehensive analysis of multidimensional poverty in Pakistan. In this regard, the latest available data set of Pakistan Demographic Health Survey (2012-13) shall be utilized.³ This study shall consider six dimensions: education, health, housing services, quality of house, additional facility and women empowerment. The present study not only aims to measure poverty but also to explore the extent of poverty in Pakistan.

Literature Review

Multidimensional poverty has remained largely unexplored in Pakistan. There are very few studies that have empirically measured multidimensional poverty in Pakistan. In this context, Jamal (2009) was amongst the pioneers to measure multidimensional poverty in Pakistan. Later, Naveed and Islam (2010, 2012), Awan *et al.* (2011, 2012) also analyzed the extent of multidimensional poverty in Pakistan. Latest efforts in this regard include Saluhaddin and Zaman (2012), Saboore *et al.* (2015) Attaullah *et al.* (2016).

All the studies mentioned above measure poverty for various periods ranging from 1998-99 to 2014-15. These studies drew on data taken either from Pakistan Demographic Health Survey (PDHS) or Pakistan Social and Living Standard Measurement Survey (PSLM). All used Alkire and Foster (2009) methodology to measure poverty. However, these studies surveyed different dimensions. The dimensions covered by earlier studies in the empirical analysis of multidimensional poverty in Pakistan are summarized in Table 1.

significance. It eventually led to the formation of Human Development Index (HDI) by UNDP which is based on life expectancy, education and income. Since HDI focus on entire population, not only deprived, so in 1997 it was complemented with Human Poverty Index (HPI) which measures deprivation in a better way. Later on HPI was supplanted by Multidimensional Poverty Index (MPI).

³Pakistan Demographic Health Survey (PDHS) and Pakistan Social and Living Standard Measurements Survey (PSLM) are the two available national level surveys covering various dimensions of well-being. The present study had preferred PDHS due to its comprehensiveness information on women's freedom in making choices and information on weight and height of children.

Table 1

Dimensions Covered by Studies on The Empirical Analysis of Multidimensional Poverty in Pakistan

	Education	Health	Living Standard / Housing Services	Assets / Durable Goods	Consumption / Income	Land / House Holding	Empowerment	Livelihood / Employment	Child Status
Jamal (2009)	✓		✓			✓			
Naveed & Islam (2010)	✓	✓	✓	✓				✓	✓
Awanet.al. (2011)	✓		✓	✓	✓				
Awanet.al (2012)	✓		✓	✓	✓	✓			
Naveed & Islam (2012)	✓	✓	✓	✓					
Salahuddin&Zaman (2012)	✓	✓	✓	✓				✓	
Awanet.al (2015)	✓		✓	✓	✓	✓	✓		
Sabooret. al. (2015)	✓	✓	✓		✓				
Atta ullahet.al. (2016)	✓	✓	✓		✓				
Government of Pakistan (2016)	✓	✓	✓	✓		✓			

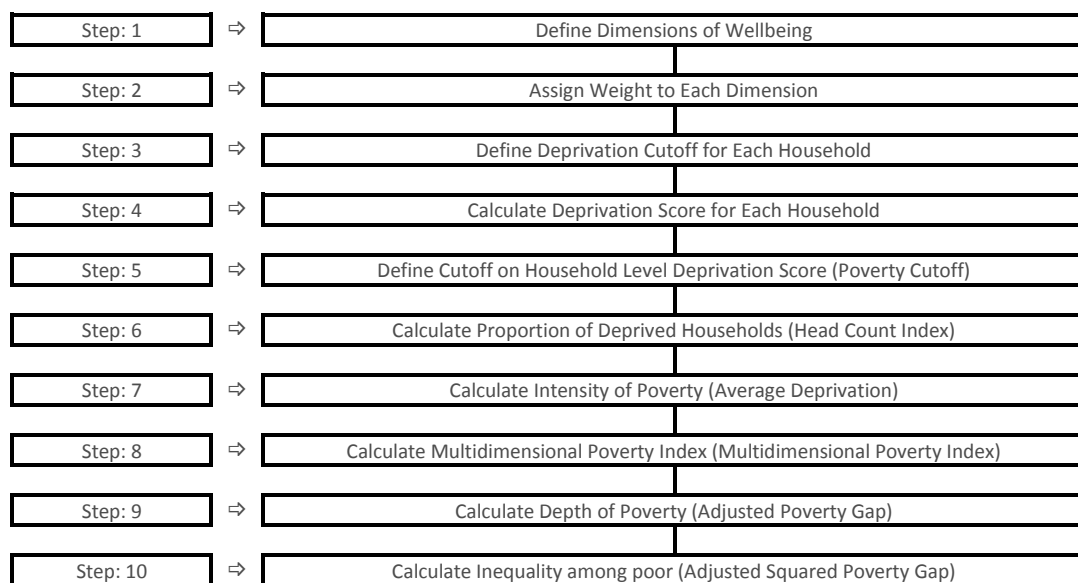
Most of the studies focused on education, health, living standards and assets. The present study shall consider an additional variable of women empowerment. Moreover, it shall use multiple definitions for measuring each indicator. Whereas in the earlier studies equal weights were assigned to all dimensions regardless of their relative importance, the present study shall attempt to assign different weight to each dimension of well-being with respect to its relative importance. Finally, this study differentiates the poor and non-poor households by setting the deprivation cutoff on proportion of each indicator rather than on the absolute values.

Data Source and Regions of Analysis

The data for this analysis come from the third round of Pakistan Demographic and Health Survey (PDHS) 2012-03 conducted by National Institute of Population Studies. The data carries household level information on various dimensions of well-being including education, child health, women health, house quality, associated facilities and women empowerment. PDHS is a national level survey comprising of 12,943 households with appropriate representation of all regions.

Analytical Framework and Methodology

Multidimensional poverty refers to the situation where household / individual is deprived of multiple units of wellbeing. This present study shall estimate Multidimensional Poverty Index (MPI) by using , with a few modifications,the methodology proposed by Alkireand Foster (2009). MPI does not explain the depth of poverty and inequality among the poor. To overcome this deficiency, poverty gap and squared poverty gap indices are proposed in various studies [see for example, Alkire and Foster (2011a). The Figure 1 gives a summary of the steps involved in the measurement of multidimensional poverty:

Figure 1. Steps Involved in the Measurement of Multidimensional Poverty

Dimensions of Wellbeing

The first step in the measurement of multidimensional poverty is to define the indicators of wellbeing. The deprivation in these indicators demonstrates poverty. Pakistan Demographic Health Survey (PDHS) provides comprehensive information on various dimensions that measure the well-being of the household. The present study shall consider six dimensions of well-being: education, health, house quality, house services, additional facilities and women's empowerment.⁴ The deprivation of these indicators reflects poverty. The rationale of considering these dimensions is given below:

i. Education:

Education is the most important factor in the development of human capital. It is thought to be a way out of poverty. Education plays a vital role in determining the productivity of an individual. Therefore the present study has considered deprivation in education as one of the indicators of poverty. Its deprivation shall be measured in terms of the years of education and child enrollment status.

ii. Health:

Health is another fundamental unit of wellbeing. Healthy persons are likely to be more productive. The present study shall consider deprivation in health as another indicator of poverty. Deprivation in health shall be measured in terms of child mortality, women health and child health.

iii. House Services:

The quality of life largely depends upon the house services. In this regard availability of electricity, gas and access to water are very important. These are the basic needs for quality life. A large number of studies, including those by Alkire and Santos (2014), Vijahaet.al. (2014), Naveed and

⁴ Income is also an important dimension of well-being. The data on income is not available in PDHS. Moreover the crux of multidimensional poverty is in the access to basic facilities of life not the means of accessing the basic facilities.

Islam (2012), considered deficiency in electricity, gas and access to water as measures of poverty. The present study shall also consider these three as the indicators of house services.

iv. Quality of House:

Another important dimension of wellbeing is house quality. Sanitation, building material, location are some of the indicators of house quality which were taken by Dehury and Mohanty (2015), Salahuddin and Zaman (2012), Naveed and Islam (2012). Based on the available information in the present study, the quality of walls and roof material and sanitation facility are used as the proxy of house quality.

v. Additional Facilities:

Besides the house services and the quality of house, some other additional facilities are also taken as a separate dimension. In this regard we shall focus on three elements: means of communication, means of transportation and availability of room cooler. [see, for example, Alkireet.al.(2015), Awanet.al. (2012)]. The additional facilities are taken as the proxy of assets.

vi. Women Empowerment:

Women empowerment is another dimension of well-being. The constitution of Pakistan ensures that women are allowed to participate in all spheres of life. Therefore, women empowerment is taken as one of the indicators of well-being. Awanet.al.(2015), Vijahaet.al. (2014),Wagle (2008) also considered women empowerment in multidimensional analysis of poverty.

4.2. Weights of each dimension

After an identification of dimensions the next step is to assign weights to each dimension. In this regard most of the previous studies assign equal weight to all dimensions. Assigning equal weight means that all dimensions are of the same importance. This seems to be unrealistic as all indicators cannot be of the same importance. Therefore, the practice of assigning unequal weights is used by a few studies. A brief discussion on these two approaches is presented below:

a) Equal weights to each dimension

Equal weight means that all dimensions of wellbeing are of equal importance. Since the present study shall use six dimensions, each dimension shall be assigned a weight of $\frac{1}{6}$.

b) Unequal weights to each dimension

Equal weights are assigned on the assumption that all dimensions are equally important. This is not true in most cases since health and women empowerment may not be of the same importance as that of household. It depends upon preferences and various socio-economic factors. For instance, where one household may give maximum importance to education, others may consider house quality most important of all.

Assigning weight to each dimension is a subjective phenomenon and depends upon household preferences. Therefore, the present study conducted a survey for assigning weights to each dimension. In the survey,two hundred and fifteen household heads were asked to rank the dimensions according to their perception. The targeted households of survey belong to the lower income group. Summary of the average weights is given in Table 2.

Table 2

Summary of Weights Assigned to Each Dimension of Wellbeing

Dimensions	Equal weights	Unequal Weights
Education	$0.1667 = \frac{1}{6}$	$0.242 = \frac{1.452}{6}$
Health	$0.1667 = \frac{1}{6}$	$0.238 = \frac{1.428}{6}$
Housing & services	$0.1667 = \frac{1}{6}$	$0.142 = \frac{0.852}{6}$
Quality of House	$0.1667 = \frac{1}{6}$	$0.136 = \frac{0.816}{6}$
Additional Facility	$0.1667 = \frac{1}{6}$	$0.128 = \frac{0.768}{6}$
Women empowerment	$0.1667 = \frac{1}{6}$	$0.114 = \frac{0.684}{6}$

Deprivation cut off for each dimension

The third step is to assign the deprivation cutoff for each indicator. The purpose is to identify the deprived households. The deprivation cutoffs considered by the present study are summarized in Table 3.

Table 3

Summary of the Dimensions of Wellbeing and their Deprivation Cutoffs

Dimensions	Sub-dimensions	Deprivation Cut-off, Deprived if
Education	Year of schooling	Number household member above 14 years completed primary education.
	Child enrollment status	At least one child of school going age (5-13years) in household is not attending school.
	Deprivation in Education	Household is deprived in education, if is deprived in at least one of these sub dimensions of education
Health	Child mortality	At least one child under 60 months, died in household.
	Child health	No child under 60 months has desirable health in household ¹
	Nutrition	Household has malnourished women if her BMI does not lie in standard normal BMI (18.50-24.99) kg/m ²
	Deprivation in Health	Household is deprived in health, if it is deprived in at least one of the sub dimensions of health
Housing and Services	Gas	Household has neither natural gas nor LPG
	Electricity	Household has no electricity
	Water	Household has no access to improved water source. ²
	Deprivation in Housing & Services	Household is deprived in Housing and Services if it has less than two of the above facilities
Quality of House	Roof material	Household has no/un-improved roof material (Rustic mat, wood planks, grass/leaf, irons sheet, bamboo etc.)
	Wall material	Household has no/un-improved wall material (mud/stones, unbaked bricks, dirt, sticks etc.)
	House condition	At least one of above house conditions (wall and roof) are not improved in household.
	Toilet facility	Household has no/ un-improved toilet facility. ³
	Deprivation in House Quality	Household is deprived in Quality of house if Either house condition or toilet facility is not improved
Additional Facility	Mobile	Household has no mobile.
	Telephone	Household has no telephone land line
	Television	Household has no television
	Computer	Household has no computer
	Internet	Household has no internet facility.
	i. Deprivation in Communication facility	Household is deprived in this category if it has less than two of these means
	Bike	Household has no bike
	Car	Household has no car
	ii. Deprivation in Transportation facility	Household is deprived in this category if it has no transportation facility
	Air conditioner	Household has no air conditioner

	Room cooler	Household has no room cooler
	<i>iii. Deprivation in AC/Cooler</i>	<i>Household is deprived in this category if it has neither air conditioner nor room cooler</i>
	Deprivation in Additional Facilities	Household has less than two additional facilities
Women Empowerment	Decision of health care	Married women (15-49 years) in household are not consulted in basic decision about her health care.
	Decision of purchases	Married women (15-49 years) in household are not consulted in basic decision about purchases of daily needs.
	Decision of visit	Married women (15-49 years) are not consulted in basic decision about visit to family or relative.
	Decision of husband choosing	Married women (15-49 years) were not consulted in basic decision about choosing of husband
	Women education	Married women (15-49 years) had not completed primary education.
	Deprivation in Women empowerment	Household is deprived in Women Empowerment if married women (15 to 49 years) is not consulted in three or more of the above decisions.

¹*Fordesirable child health, see weight and height chart for girls and boys(source;http://www.md-health.com/Weight-Chart-For-Kids.html)*

²*Improved water source include piped source within the dwelling, yard, a public tap/stand pipe bore hole, a protected well, spring water and filtration plant (WHO and UNICEF Joint Monitoring Program for Water Supply and Sanitation, 2010)*

³*Improved toilet facility includes flush connected to sewer system/septic tank/pit latrine, ventilated improved pit latrine, pit latrine with slab (WHO and UNICEF,2010)*

Deprivation Score

The fourth step in the measurement of multidimensional poverty is the calculation of deprivation score. Its value lies between 0 and 1, zero indicating no deprivation and one indicating full deprivation. Mathematically it can be written in equation as:

$$C_i = \sum_{i=1}^n (WI)_i \tag{1}$$

Where, C_i = deprivation score of i th household

I_i = i th dimension of wellbeing

W_i = weight assigned to i th dimension, $\sum W_i = 1$

Poverty Cutoff

The poverty cutoff is a benchmark above which household is considered poor. It is the proportion of indicators a household must be deprived in to be considered poor. If there are 'D' dimensions, then poverty cutoff (k) can be fixed as $\frac{1}{D} \leq k \leq \frac{D}{D}$. Mathematically it can be written as:

$$k = \frac{\text{Number of dimensions in which household is poor}}{\text{Total number of dimensions}} \tag{2}$$

For instance, with six dimensions 'k' can be fixed as $\frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}$ or $\frac{6}{6}$. The present study shall consider k equal to $\frac{2}{6}, \frac{3}{6}$ and $\frac{4}{6}$. [see for example, Alkire et al. (2011b)]

Head Count Index

It gives the proportion of the multidimensionally poor households. Head Count Index is calculated as follows:

$$H = \frac{q}{N} \tag{3}$$

Where, H = Head Count Index

q = Number of households that are multidimensionally poor at the given poverty cutoff

N = Total number of households

Average Deprivation

It reflects the intensity of poverty and measures proportion that an average poor household is deprived of the weighted indicators. Average deprivation is calculated as sum of deprivation divided by the total number of the poor households. Numerically average deprivation can be written as:

$$A = \frac{\sum_{i=1}^n C_i[k]}{q} \quad (4)$$

Where, A = Average Deprivation

$C_i(k)$ = Weighted Deprivation, ($C_i(k) = C_i$ if $c_i \geq k$)

q = Number of Households that are multidimensionally poor, ($q = 1$, if $c_i \geq k$)

Multidimensional Poverty Index

Multidimensional poverty index (M_0) is also known as the adjusted Head Count Index. It combines the information on the incidence of poverty H' and intensity of poverty A' . Santos and Alkire (2011) defined M_0 as "It reflects the proportion of weighted deprivations that poor experiences out of the total potential deprivations that a society could experience". Mathematically it can be written as:

$$M_0 = H \times A \quad (5)$$

Where, M_0 = Adjusted head count index or Multidimensional Poverty Index

A = Average Deprivation

H = Head Count Ratio

Multidimensional Poverty Index (M_0) reflects incidence and the intensity of poverty but fails to capture the depth of poverty. So next measure of multidimensional poverty analysis is adjusted poverty gap which captures the depth of poverty.

Adjusted Poverty Gap (M_1)

This measure reflects the incidence, intensity and depth of poverty. The adjusted poverty gap can be calculated by taking product of head count index, average deprivation and poverty gap:

$$M_1 = H \times A \times G \quad (6)$$

Where, M_1 = Adjusted Poverty Gap

H = Head Count Index

A = Average Deprivation

G = Poverty Gap. It is given as:

$$G = \frac{1}{q} \sum_{i=1}^q \left(\frac{C_i(k) - k_i}{k_i} \right) \quad (7)$$

Where, $C_i(k)$ = Weighted Deprivation, ($C_i(k) = C_i$ if $c_i \geq k$)

q = Number of households that are multidimensionally poor, ($q = 1$, if $c_i \geq k$)

k_i = Poverty cutoff i.e. $\frac{1}{3}, \frac{1}{2}, \frac{2}{3}$

The Adjusted poverty gap (M_1) considers the incidence of poverty, intensity poverty and depth of poverty. But it insensitive to transfers within poor. In short it does not consider inequality among the poor. A minor adjustment makes it sensitive to inequality among poor.

Adjusted Square Poverty Gap (M_2)

The Adjusted Square Poverty Gap reflects the incidence of poverty, intensity of poverty, depth of poverty and also considers inequality among the poor. Mathematically M_2 is written as:

$$M_2 = H \times A \times S \quad (8)$$

Where, M_2 = Adjusted Square Poverty Gap

H = Head Count Index

A = Average Deprivation

S = Squared Poverty Gap.

The square poverty gap is calculated as:

$$S = \frac{1}{q} \sum_{i=1}^q \left(\frac{C_i(k) - k_i}{k_i} \right)^2 \quad (9)$$

The present study shall estimate poverty by using all these measures including M_0 , M_1 and M_2 . In next section shall present results of the present study.

Results and Discussions

In this section we shall present a comprehensive discussion of multidimensional poverty in Pakistan. First of all, we shall present the statistics on proportion of deprived and non- deprived households at different cutoffs by assigning equal and unequal weights. Table 4 gives distribution of households with respect to deprivation in dimensions.

Table 4

Distribution of Households with respect to Deprivation Level

Classification of Households into Poor and Non-Poor Groups				Percentage
Unit of deprivation: Deprived in at least 2 out of 6 dimensions With Equal Weights	Non Poor (34.3%)	Privileged (13.2%)	Households are not deprived in any dimension	13.2%
		Relatively Better (21.1%)	Households are deprived in one out of six dimensions	21.1%
	Poor (65.7%)	Marginally Poor (21.7%)	Households are deprived in two out of six dimensions	21.7%
		Substantially Poor (33.6%)	Households are deprived in three out of six dimensions	19.1%
			Households are deprived in four out of six dimensions	14.5%
			Households are deprived in five out of six dimensions	7.8%
Chronically poor (10.4%)	Households are deprived in all dimensions	2.6%		
Unit of deprivation: Deprived in at least 2 (= 0.334) of the weighted dimensions With Unequal Weights	Non Poor (44.1%)	Privileged (13.2%)	Households are not deprived in any dimension	13.2%
		Relative Better (30.9%)	Households are deprived in one-sixth (0.167) of the weighted dimensions	30.9%
	Poor (55.9%)	Marginally Poor (19.8%)	Households are deprived in one-third (0.334) of the weighted dimensions	19.8%
		Substantially Poor (28.3%)	Households are deprived in half (0.500) of the weighted dimensions	20.4%
			Households are deprived in two-third (0.667) of the weighted dimensions	7.9%
			Households are deprived in five-sixth (0.834) of the weighted dimensions	5.2%
Chronically poor (7.8%)	Households are deprived in all dimensions	2.6%		

The table is split up into two parts: one part shows equal weights assigned to all dimensions and the other deals with unequal weights assigned to each dimension. Each part is further divided into non-poor and poor households. Non-poor households are categorized as privileged and relatively better; the poor ones are categorized as marginally poor, substantially poor and chronically poor. The results show that when equal weights are assigned to all dimensions, 34.3% households are non-poor, while 13.2% are privileged and 21.1% are relatively better. Next, 65.7% are categorized as poor

among which 10.4% of the households are chronically poor, 33.6% households are substantially poor and remaining 21.7% are marginally poor.

The statistics are quite different with unequal weights. These statistics show 55.9% of the households as poor, indicating that, when dimensions are given weight according to their importance, about 10% of the households move from poor to non-poor. Since our emphasis is on poor households, we shall focus only on poor households for further analysis. As mentioned in Section 4.5, we shall consider three cut-off points, i.e., $\frac{1}{3}, \frac{1}{2}, \frac{2}{3}$ ⁵

Table 5 presents results of multidimensional poverty including M_0, M_1 and M_2 . It has two segments. In the upper segment, the results with equal weights are given The second segment explains the results when dimensions are assigned unequal weights. First, we shall discuss the results with equal weights. Considering deprivation cutoff of $\frac{2}{6}$, we observed that 65.7% households are poor. It is worth mentioning that all are not equally poor. This includes marginally poor, substantially poor and chronically poor households.

Table 5
Multidimensional Poverty in Pakistan

	<i>Distribution of Households considering Poverty cutoffs as $\frac{2}{6}, \frac{3}{6}, \frac{4}{6}$</i>	Head Count Index (H)	Average Deprivation (A)	Multidimensional Poverty Index (M_0)	Poverty Gap (G)	Adjusted Poverty Gap (M_2)	Square Poverty Gap (S)	Adjusted Square Poverty Gap (M_2)
With Equal Weights	Household is deprived in at least two out of six dimensions ($k = \frac{2}{6}$)	65.7%	54.1%	35.5%	62.4%	22.2%	72.0%	25.6%
	Household is deprived in at least three out of six dimensions ($k = \frac{3}{6}$)	44.0%	64.3%	28.3%	28.7%	8.1%	17.4%	4.92%
	Household is deprived in at least four out of six dimensions ($k = \frac{4}{6}$)	24.9%	75.4%	18.8%	13.1%	2.5%	4.7%	0.88%
With Unequal Weights	Household is deprived in at least one-third of the weighted dimensions ($k = 0.334$)	55.9%	58.4%	32.6%	75.4%	24.6%	86.8%	28.3%
	Household is deprived in at least half of the weighted dimensions ($k = 0.50$)	36.0%	68.5%	24.7%	37.0%	9.1%	22.3%	5.5%
	Household is deprived in at least two-third of the weighted dimensions ($k = 0.667$)	15.7%	82.8%	13.0%	24.3%	3.1%	7.9%	1.0%

Therefore, we calculated an average deprivation, which turned out to be 54.1% and finally the multidimensional poverty index (M_0) with deprivation cutoff of $\frac{2}{6}$ is 35.5%. Similarly, when we set deprivation cut-off of $\frac{3}{6}$, we found that 44% of the households are poor with M_0 28.3%. Finally, the results with deprivation cutoff of $\frac{4}{6}$ showed that only 24.9% households are poor with M_0 of 18.8%. It reflects that with a cutoff of $\frac{4}{6}$ about 19% of total potential deprivations are

⁵ The present analysis is based on 6 dimensions. Therefore, Deprivation cutoff of $\frac{1}{3}$ means that household is deprived in at least 2 out of 6 dimensions. Deprivation cutoff of $\frac{1}{2}$ means that household is deprived in at least 3 out of 6 dimensions. Similarly, deprivation cutoff of $\frac{2}{3}$ indicates that household is deprived in at least 4 out of 6 dimensions. Hence, $\frac{1}{3}$ is equivalent to $\frac{2}{6}$, $\frac{1}{2}$ is equivalent to $\frac{3}{6}$ and $\frac{2}{3}$ is equivalent to $\frac{4}{6}$.

being experienced by the society, while these percentages were about 28 and 36 with cutoff of $\frac{3}{6}$ and $\frac{2}{6}$ respectively.

The results with unequal weights assigned to each dimension portray a different scenario. It appears that the proportion of households below poverty line shrinks by almost 10% with all cutoff points. These statistics reveal that with the inclusion of preferences the situation gets realistically better. The statistics of M_0 also depict a better picture.

A problem associated with M_0 is that it fails to measure the depth of poverty. To solve this issue, we calculated squared poverty gap (M_1) which measures the depth of poverty but is insensitive to transfers within poor. To overcome this deficiency, M_1 is adjusted by square poverty gap. Therefore along with M_1 the present study worked out adjusted squared poverty gap (M_2). The statistics show that both adjusted poverty gap (M_1) and adjusted square poverty gap (M_2) are higher if the poverty gap among the poor is higher and vice versa. The results further show that poverty gap (G) for equal weights is lower than poverty gap (G) for unequal weights. These are interesting findings, as a relatively less proportion is poor with unequal weights but the intensity of poverty is much higher. The statistics of M_1 and M_2 also depict the same pattern. Hence we conclude that when dimensions of well-being are weighted according to preferences, a lesser proportion of population is poor but the intensity of poverty increases.

Conclusion

The consumption based approach to measure poverty does not consider the factors like health, education and empowerment. In recent years an argument has been established that poverty is a multidimensional phenomenon; merely focusing on consumption requirements ignores the important dimensions of well-being. Therefore, for the better insight and in-depth analysis of poverty, the traditional consumption-based approach should be complemented with a multidimensional approach. After the seminal work of Bourguignon and Chakravarty (2003), Alkire and Foster (2009), the concept of multidimensional poverty has gained much attention. In this regard very few studies have been conducted in Pakistan. The present study is an attempt to explore the extent of multidimensional poverty in Pakistan.

The prime objective of present study is to conduct a comprehensive empirical analysis of poverty by incorporating six major dimensions of wellbeing. The dimensions covered by present study are education, health, house services, quality of house, additional facility and women empowerment. The required data is obtained from latest available Pakistan Demographic Health Survey. The present study employed the Alkire-Foster methodology and generated the multidimensional poverty indices at three different poverty cutoffs, i.e., $\frac{1}{3}$, $\frac{1}{2}$ and $\frac{2}{3}$. Moreover, poverty at each cut-off is measured by assigning equal and unequal weights to each dimension of well-being. The calculation with equal weights is based on the assumption that households assign the same importance to each dimension. This assumption is not realistic as education, health, house service, quality of house services, additional facility and women empowerment all cannot be of the same importance for all households. Therefore, in the second part of our analysis a multidimensional poverty analysis is measured by assigning weights according to the importance of each dimension.

The results revealed that about 10% of the households are chronically poor and another 34% are substantially poor. Our findings are consistent with the government of Pakistan (2016) which showed that around 39% households are poor. It is also worth mentioning that for analysis with unequal weights, head count indices at all threshold levels were low but average deprivations and

poverty gaps were higher. This indicates that when dimensions are weighted according to preferences, a lesser proportion of population is poor but the intensity of poverty increases.

The present study has a few limitations, such as the data of PDHS do not have information about some important measures of well-beings such as, physical safety, social security, and peace etc. Realizing the importance of multidimensional poverty, it is suggested that the government of Pakistan should initiate a periodical national wide survey covering information on important dimensions of wellbeing. This will enable to compare the trends and formulate effective policies.

References

- Alkire, S., & Foster, J. (2009). Counting and multidimensional poverty measurement. *OPHI Working Paper No.7*, University of Oxford
- Alkire, S., & Foster, J. (2011a). Counting and multidimensional poverty measurement. *Journal of Public Economics*, 95(7), 476-487.
- Alkire, S., & Foster, J. (2011b). Understandings and misunderstandings of multidimensional poverty measurement. *The Journal of Economic Inequality*, 9(2), 289-314.
- Alkire, S., & Santos, M. E. (2014). Measuring acute poverty in the developing world: Robustness and scope of the multidimensional poverty index. *World Development*, 59, 251-274.
- Alkire, S., Conconi, A., Robles, G., & Seth, S. (2015). Multidimensional Poverty Index, Winter 2014/2015: Brief Methodological Note and Results. *OPHI Briefing*, 27, 1-3.
- Attaullah, K. Saboor, A., Ikram, A., Wasim, S.M., & Khalid, M. (2016). Urbanization of multidimensional poverty: empirical evidences from Pakistan. *Quality & Quantity- International Journal of Methodology*, Springer, vol. 50(1), 439-469
- Awan, M. S., Waqas, M., & Aslam, M. A. (2011). Multidimensional poverty in Pakistan: case of Punjab province. *Journal of Economics & Behavioral Studies*, 3(2), 133-139
- Awan, M.S., Waqas, M., & Amir, A. (2012). Multidimensional Measurement of Poverty in Pakistan, *University Library of Munich, (MPRA) Germany*.
- Awan, M.S., Waqas M., & Amir A. (2015). Multidimensional Measurement of Poverty in Pakistan: Provincial Analysis, *Nóesis. Revista de Ciencias Sociales y Humanidades* 24(48):54-71
- Bourguignon, F., & Chakravarty, S. R. (2003). The measurement of multidimensional poverty. *The Journal of Economic Inequality*, 1, 25-49.
- Duclos, J., D. Sahn & Younger, S. (2006). Robust multidimensional poverty comparisons. *Economic Journal*, 116 (514): 943-968.
- Dehury, B., & Mohanty, S. K. (2015). Regional estimates of multidimensional poverty in India. *Economics*, 9(36), 1. <http://dx.doi.org/10.5018/economics-ejournal.ja.2015-36>
- Deutsch, J., & Silber, J. (2005). Measuring multidimensional poverty: An empirical comparison of various approaches. *Review of Income and Wealth*, 51(1), 145-174.
- Ferreira F, C. Shaohua, D. Andrew, D. Yuri, H. Nada, J. Dean, N. Ambar, P Espen, R. Ana, S. Prem, S. Umer, Y. Nonuo (2016). A Global count of the extreme poor in 2012: Data issues, methodology and initial results. *The Journal of Economic Inequality*, 14(2), 141-172.
- Government of Pakistan (2016) *Multidimensional Poverty in Pakistan*. <http://www.ophi.org.uk/wp-content/uploads/Multidimensional-Poverty-in-Pakistan.pdf>
- Government of Pakistan (2014) National Institute of Population Studies, *Pakistan Demographic and Health Survey (PDHS)*, 2012-13.
- Jamal, H. (2009). Estimation of multidimensional poverty in Pakistan. *Social Policy and Development Centre. Karachi*, Research Report No.79.
- Naveed, A., & Islam, T. (2010). Estimating multidimensional poverty and identifying the poor in Pakistan: An alternative approach. *Research Consortium on Educational Outcomes and Poverty RECOUP Working Paper No.28*

- Naveed, A., & Islam, T. (2012). A New Methodological Framework for Measuring Poverty in Pakistan. Sustainable Development Policy Institute, *Working Paper No.122*.
- Saboor, A., Khan, A. U., Hussain, A., Ali, I., & Mahmood, K. (2015). Multidimensional deprivations in Pakistan: shifts. *The Quarterly Review of Economics and Finance*, 56, 57-67.
- Salahuddin, T., & Zaman, A. (2012). Multidimensional poverty measurement in Pakistan: time series trends and breakdown. *The Pakistan Development Review*, 54(4), 493-504.
- Santos, E.M., & Alkire, F. (2011) Training Material for Producing National Human Development Reports, <http://www.ophi.org.uk/wp-content/uploads/MPI-Primer.pdf> and *alkire 2011*
- Sen, A. (1979) Equality of What?" in McMurrin (ed.), *Tanner Lectures on Human Values*, Cambridge: Cambridge University Press.
- Tsui, K. Y. (2002). Multidimensional poverty indices. *Social choice and welfare*, 19(1), 69-93.
- Vijaya, R. M., Lahoti, R. & S. Hema(2014). Moving from the household to the individual: Multidimensional poverty analysis. *World Development*, 59, 70-81.
- Waglé, U. R. (2008). Multidimensional poverty: An alternative measurement approach for the United States? *Social Science research*, 37(2), 559-580.
- World Development Indicators (2016)<http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>

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