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WELFARE ANALYSIS OF ENERGY PRICE VARIATIONS IN PAKISTAN

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Abstract. This study analyzes the impact of energy price variations on households' welfare in rural and urban areas of Pakistan. Welfare implications of energy price changes are drawn from the estimation of compensating variation associated with simulated energy price increases. For this purpose, an Almost Ideal Demand System (AIDS) is estimated with pooled data of Household Integrated Economic Survey (HIES) over the period 1985 to 2013. The econometric analysis shows that welfare losses resulting from energy price inflation in Pakistan have been substantial. Further, the energy prices in Pakistan have been somewhat regressive. Based on these findings and the consideration that poor households are relatively more vulnerable to energy prices increase, the study proposes to extend a compensation package to poor households in the light of rising energy prices. It is shown that the budgetary impact of the required subsidy would be moderate and can be realized by exempting poor households from certain levies and taxes.

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This paper is based on MPhil thesis of Muhammad Atta ul Islam Abrar supervised by Eatzaz Ahmad. The paper is extended by Eatzaz Ahmad and Ghulam Saghir to estimate the welfare effects of energy price changes at different income quintiles and to include in this estimation the indirect (spillover) effect of energy price inflation on non-energy price inflation.

Keywords: Welfare analysis, energy price variations, budgetary impact, compensating variation , almost ideal demand system

I. INTRODUCTION

Energy is an important consumption item both in developed and developing countries. As of the year 2014, per capita energy consumption in Pakistan is 460 kg of oil equivalent compared to South Asian average of 574 kg and global average of 1922 kg.2 In a country like Pakistan where electrification of the rural sector is not yet complete, besides electricity and natural gas, other forms of energy like kerosene, coal and firewood still remain important components of household consumption basket, especially in rural areas.

Governments in the modern era have acknowledged energy as one of the basic needs and this realization has led many countries, specifically the developing ones, to establish such energy pricing policies that would benefit consumers at large and would make energy affordable for low income groups. However, due to the rapid increase in oil prices internationally until the recent years, large balance of payments and budget deficits have forced them to revisit the policies regarding energy subsidies. Until quite recently, electricity and natural gas were available on highly subsidized rates in Pakistan. However, taking into account the fiscal pressures and crowding out of high priority public spending, particularly on infrastructure, health and education, the subsidies on energy have been reduced substantially in the recent years.

Energy prices directly and indirectly affect households' real incomes. The increase in real disposable income due to payment of lower prices by households for consumption of energy products is termed as the direct effect. The indirect effects can be noticed in the payment of lower prices by households for other goods and services that are reflected in lower costs of energy-based production inputs.

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[2] Source: *Databank* of World Development Indicators.

The opponents of energy subsidy argue that these are inequitable as well as inefficient and also encourage overconsumption (International Monetary Fund, 2013). Another problem is that most of the benefits of lower energy prices go to the groups who have higher incomes and consume more fuel (Arze et al., 2010). Recognition of these factors has led to changes in energy pricing policies mostly in the form of reduction or removal of subsidies.

Various governments in Pakistan have allocated generous subsidies on energy. During 2004 to 2010 fuel subsidy on average accounted for 1.12% of GDP (Vagliasindi, 2013). The total amount of subsidies extended to energy sector in the last five years was Rs.1250 billion (IMF, 2013). Despite the government's intentions to effectively target vulnerable groups of society; rich consumers, commercial consumers and some categories of industrial consumers have also been reaping the benefits. In this regard, the IMF has advised the Government of Pakistan several times to bring reforms in the energy pricing policy and cut down subsidies, being inefficient and untargeted (Mills, 2012).The reduction in subsidies and rising domestic prices of energy products affect the welfare of households in two ways (Arze, et al., 2010). One is a direct effect in the form of increased prices of electricity and fuels. The other one is the indirect effect that the households face in the form of increased prices of other goods and services, reflected in increased costs of production.

Due to the prevailing energy situation in Pakistan, many researchers have analyzed energy prices in search of the possible causes and solutions of energy crisis. Most of the researchers have addressed the energy demand and energy supply issues (Burney and Akhtar, 1990; Hathaway, 2007; Jamil and Ahmad, 2010, 2011; Khan and Ahmed, 2009). The issue of energy pricing policy, energy subsidies reforms and its consequences on welfare of consumer has only recently been addressed. An earlier study by Ashraf and Sahih (1992) finds that electricity prices in Pakistan have been considerably different from the second best optimal prices. However, the focus of this study has been on efficiency rather that welfare of the consumers of electricity. Abrar (2015) considers welfare implications of energy prices on the average (representative) consumer and finds that the welfare loss in substantial. The present study is extracted from this thesis with some two extensions. First the welfare effects are estimated for average consumer as well as for

the representative consumers at different quantiles of income. Second, the study considers direct welfare effect of energy price changes as well as the indirect effect that occurs due to spillover inflationary effect of energy price changed on prices of non-energy goods. Another similar recent study by Aziz et al. (2016) that estimates welfare effects of energy price changes suffers from two serious problems. First, it estimates 13 parameters for share equation using only 26 observations, which makes the results highly unreliable. Secondly, the entire exercise considers energy products only and excludes the role of prices of non-energy goods. Since no substitution between energy and non-energy goods is allowed, the welfare effects of energy price increases are expected to be overestimated.

The main objective of the present study is to analyze the impacts of energy price changes (increase or decrease in energy prices) on consumer's welfare in Pakistan. The paper does not analyze energy price shocks, as done in macroeconomics literature, n does it analyze any specific energy pricing policies; it analyzes scenarios for systematic price variations. This is so because energy prices in Pakistan are driven by a number of factors, including world prices, donors' conditionalities, revenue collection, regulations to stabilize general price level and sector-specific targets. It is quite unrealistic to either identify the role of specific policies in the realized energy prices or to label all energy price changes as policies.

The study will be conducted for both Rural and urban consumers. The welfare analysis is derived from household demand functions based on the well-celebrated Almost Ideal Demand System (AIDS), which not only satisfies almost all the theoretical properties of demands but is also flexible enough to capture the observed data reasonably well. Once the demand system is estimated, it is possible to obtain the Indirect Utility Function and, hence, the Expenditure Function. Then in the final step, it is possible to estimate the expected changes in household expenditure in response to changes in prices of any goods or services in the system, while holding constant the level of household's satisfaction (utility). This change is expenditure to satisfy a given level of satisfaction is the compensating variation (CV), which is a correct measure of welfare gain or loss resulting from price changes. The CV measures the welfare change of a consumer due to price changes, while allowing for the

possible adjustment in consumption pattern in response to price changes. For example, if a consumer is able to avoid the effect of increase in electricity price by reducing electricity consumption, while maintaining the perceived level of satisfaction constant, the CV variation will show a smaller amount of welfare loss as compared to the increase in expenditure to buy a given basket of goods including electricity.

Although the above analytical framework is well known in welfare economics, its use has not been found in empirical literature on the welfare effects of energy price changes. In particular, no empirical study has been undertaken to formally estimate the welfare cost energy price changes in Pakistan. Welfare analysis in the present study is conducted separately for the rural and urban households by simulating the effects of one to 100 percent increases in the prices of energy goods on welfare level of an average household at the sample mean. This exercise is carried out first by holding the prices of all the non-energy goods constant and then by incorporating the spillover inflationary effect of energy price increases on the non-energy prices estimated through an auxiliary equation.

Finally, to draw distributional implications of energy price changes, the study estimates the above-mentioned welfare loss for an average representative consumer as well as for the relatively poor and rich consumers placed at the first and the fourth quintiles of total expenditure (taken as a proxy of income).

Main conclusion of the study is that energy price inflation has resulted in a substantial welfare loss both for rural and urban households of Pakistan and the energy pricing policy in Pakistan has been regressive in nature in the sense that the welfare loss in percentage terms has been somewhat higher among the poor households than among the rich households. Based on these results and other considerations the study recommends in favor of a compensation package exclusively for poor households to enable them face the burden of energy price inflation. The calculations show that if, for example, all the 20% poorest households are protected against 25% increase in energy prices then the impact of the subsidy would be about 0.2% GDP and a simple way out to finance the subsidy would be to exempt the poor households from certain categories of levies and taxes.

The study is organized in five sections. Section 2 provides a brief review of literature. Section 3 presents household demand model to be estimated, while section 4 explains the methodology employed for estimating the welfare effects of energy pricing policies. Section 5 describes data and variables to be used. The results are presented and discussed in section 6 and finally section 7 concludes the study.

II. SURVEY OF LITERATURE

The main reason, due to which energy pricing has become an issue in major public policy and has attracted many researchers and policy makers, is its cost. Subsidized energy has contributed to fiscal deficits that are hardly sustainable. Price controls once adopted are difficult to roll back and become persistent. Phasing-out of such controls later becomes much difficult for policy makers in the face of opposition. Literature on the specific subject of energy pricing is available in abundance.

Energy pricing policy is important not only as a burning issue in economics but also in the context of environment, long run sustainability of natural resources and social dimension of the provision of basic needs to the poor. This is perhaps the main reason why the subject of energy pricing attracts attention in non-academic circles as much as in academic ones and a large variety of research tools are being used to address the issue depending on focus of the analysis. One can see all strands of research methods and designs such as pure qualitative research, descriptive statistical analysis, micro and macro econometric techniques, input-output analysis, dynamic CGE analysis, etc.

A brief summary of selected literature on energy pricing is presented in Table 1. The table shows that researchers in all regions of the world have addressed this issue. Most of the researchers and policy makers tend to criticize governments on the extension of universal energy subsidies to consumers, as their studies show that untargeted energy prices are inefficient as they result in over consumption of energy and crowd out high priority government spending. Though most of the studies find that increase in energy prices would cause real income inequitable, contrary evidences are not uncommon. A few studies do favor energy price regulation but recommend its proper targeting in order to fully achieve the proposed objectives of energy price regulation (e.g. Frondel et al.,

2006). In any case, the majority of the studies recommend governments to phase-out energy subsidies for one reason or the other (e.g. Arze et al., 2010; Vagliasindi, 2013; Mills, 2012).

TABLE 1

Summary of Literature on Energy Demand and Pricing Policies

Study	Countries	Data Type	Methodology	Results/Conclusions
Abrar (2015)	Pakistan	Pooled household survey data	AIDS	• Energy price reduces consumes' welfare substantially. • The welfare loss is higher in rural areas as compared to urban areas.
Adagunodo (2013)	Nigeria	Households surveys data	AIDS	• Low marginal social and welfare costs of energy products suggest that removing of energy subsidy and price reforms will free large amount of funds for government expenditures.
Ahmadian *et al.* (2007)	Iran	Annual macro time series data	Structural time series model	• Social welfare decreases due to higher gasoline prices, which can be partially offset by changes in other variables.
Anand *et al*. (2013)	India	Annual, time series macro data	Descriptive	• Fuel subsidies are badly targeted because the richest 10% percent households are receiving 7 times more benefits than the poorest 10%. • Subsidy reform will generate large fiscal savings, while real incomes of households will be lowered due to increases in fuel and other prices. • Better targeted fuel subsidies will protect lower income groups and will still generate large fiscal savings.
Abrar (2015)	Pakistan	Pooled household survey data	AIDS	• Energy price reduces consumes' welfare substantially. • The welfare loss is higher in rural areas as compared to urban areas.
Adagunodo (2013)	Nigeria	Households surveys data	AIDS	• Low marginal social and welfare costs of energy products suggest that removing of energy subsidy and price reforms will free large amount of funds for government expenditures.
Ahmadian *et al.* (2007)	Iran	Annual macro time series data	Structural time series model	• Social welfare decreases due to higher gasoline prices, which can be partially offset by changes in other variables.
Aziz *et al*. (2016)	Pakistan	Time Series data	AIDS	• When energy prices increase inadequately, consumers need to

Study	Countries	Data Type	Methodology	Results/Conclusions
				be compensated. • If consumers substitute towards inexpensive energy sources, compensating variation gets much smaller.
Breisinger *et al.* (2011)	Yemen	Households Survey data	CGE model	• Efficiency gains from petroleum subsidies reform are likely to accelerate economic growth from 0.1 to 0.8 percentage points annually. • If other measures along with reform are not taken, poverty will increase in both urban and rural areas. • The poorest groups can be saved for the direct negative effects of subsidy reform through social transfers and the investment of saved resources.
Brennan (2010)	The USA	Households surveys data	Descriptive	• Price of energy prices are too low in comparison to marginal cos. Therefore, subsidy financing through increase electricity price will ensure efficiency gains. • If efficiency practice leads to reduction in electricity use, reduced revenue through energy sales can enhance substitution of efficiency for generation when efficiency cost is less.
Charap *et al.* (2013)	A panel of country	Cross country macro data	Regression analysis	• There is loss of consumer welfare resulting from subsidy reform. • Loss of consumer welfare is larger in short term than in the long term, • Gradual approach for reforming subsidy is suggested along with generous safety nets for poor households in short term.
Dansie *et al.* (2010)	China, India and Russia	Annual macro time series data	Descriptive	• Subsidy reform should be implemented gradually over a period of time. • Major obstacles to effective subsidy reforms are the lack of public acceptance, sluggish implementation, rent seeking and lack of governments' capability to turn the savings from reforms to other welfare goods.
Dartanto (2012)	Indonesia	National Socio-Economic Survey data	CGE micro-simulation approach	• Energy subsidies have shrunk the fiscal space to the extent that the expenditure share of the subsidies has exceeded the share of development expenditures. • Although subsidies mostly benefit

Study	Countries	Data Type	Methodology	Results/Conclusions
				the middle and upper class, yet poverty is increased by 0.25 percent if one-fourth of subsidy is phased out. • This adverse effect can be reduced and economic growth can be accelerated if subsidies from upper income households are transferred to poor households.
Freund and Wallich (1996)	Poland	Households surveys data	Regression analysis	• The first best energy pricing policy could be to increase the energy prices, while targeting the poor through a social assistance. It is socially better to use social assistant schemes and a large increase in energy price as compared to an overall, but smaller, price increase.
Glomm and Jung (2012)	Egypt	Annual macro time series data	Dynamic general equilibrium model	• How the cuts in energy subsidy affect economic growth depends on how government adjusts its fiscal policy. Growth effects can be realized if the freed resources are used for infrastructure investments whereas no growth effects are realized if government compensates the households by lowering other taxes. • Cuts in energy subsidies without the efficient usage of energy in production can lead to even lower growth rate but the welfare effects are still realized.
González (2009)	Argentina	Annual data on energy subsidies from IEA (2008)	Descriptive	• High subsidies for natural gas discouraged the choice for efficiency, led to spread of unawareness on the advantages of efficiency and brought up injustices as not all the households enjoy the same benefits. • Natural gas subsidy has lowered the economic efficiency because high consumption by households prevents the use of energy in production activities. • It has negative consequences on environment.
Granado *et al.* (2012)	Developing countries	Household survey data	Descriptive	• Fuel subsidy is a costly mechanism for protecting the poor in developing countries. • High income groups capture six times more benefits from energy subsidies than lower income groups.

Study	Countries	Data Type	Methodology	Results/Conclusions
Hamid And Rashid (2012)	Malaysia	Annual macro data, input-output table and Social Accounting Matrix	CGE model	• Delay in the removal of subsidies will reduce competitiveness and other related economic problems. • Gradual rationalization of energy pricing is suggested for gradual reaping of more efficient fuel utilization and efficiency. • Phasing out of the subsidies will affect the economic structure, sectors performance and welfare favorably.
Hosseini and Kaneko (2012)	Iran	Quarterly macro time series data	Input-output price model	• If energy subsidies are removed, rural families will suffer more inflation than the urban families. • To avoid devastating inflationary shocks, especially to poor households and to alleviate the negative effects, gradual increase in energy prices is recommended.
Huang and Huang (2012)	The USA	Annual macro time series data	Regression analysis	• An increase in energy prices would incur a substantial consumer welfare loss, creating an especially heavy burden for low income households.
Moshiri (2015)	Iran	Household surveys for 8 years	Regression analysis	• Energy demand among urban households is more sensitive to price changes, while the demand in rural areas appears more sensitive to income changes. • Since increase in energy prices is not enough to reduce energy consumption, policies have to be geared towards improving energy efficiency.
Nugumanova (2013)	Kazakhstan	Annual macro data	CGE model	• With energy subsidy reform energy demand will decrease; therefore there could be slight increase in the export of fuels. • For achieving goals of reform, such policies and institutions are necessary that provide incentives towards investments.
Silvia (2005)	Italy	Households surveys data	Regression analysis	• The welfare loss from the carbon tax has been quite substantial, but the distribution of welfare losses across different levels of income does not allow sustaining regressive Carbon taxation. • This evidence might encourage the use of Carbon taxes, at least in the transport sector, as cost-effective instruments of environmental policy.
Umar and Umar (2013)	Nigeria	Household	Regression	• Highest income group receives four times more benefit from fuel

Study	Countries	Data Type	Methodology	Results/Conclusions
		Survey data	analysis	subsidy than the lowest income group. Still the welfare loss to poor households due to subsidy reform is greater due to their small income. • Subsidies on fuel are costly in protecting the poor households as there is a substantial leakage of benefits to the households with higher incomes. • Subsidy reform is necessary but has to be implemented gradually along with programs for mitigating the welfare loss to poor and middle income groups.
Vagliasindi (2012)	Developing countries	Annual macro data and household survey data	Descriptive	• Compensating vulnerable groups is an important condition for successful reforms. • Subsidy reforms also depend on the credibility of the government commitment. • Subsidy reforms meet success when the funds freed from reforms are used for more pro-welfare activities. • Public should be informed about the benefits of subsidy reform and also about the compensating measures.
Widodo *et al.* (2012)	Indonesia	Social Accounting Matrix	General equilibrium model	• By reallocation of freed funds to agriculture, trade, food and beverages sectors, adverse impacts of subsidy reform can be reduced. • Government should design a clear long-term scheduled and gradual program for energy subsidy reforms. • All of a sudden a total removal of fuel subsidy will be a shock for the economy. • Government should not consider policies such as "targeted fuel subsidy" for correcting the misallocation.
Zhang (2011)	Turkey	Households surveys data	Regression analysis	• Rich households are more responsive in adjusting consumption to energy price changes as compared to poor households. • The welfare loss to the poorest income quintile (the change in consumer surplus as a percentage of income) is 2.9 times that of the highest income quintile.

III. SPECIFICATION OF HOUSEHOLD DEMAND SYSTEM

Although quite a few functional forms of household demand functions are available in the literature, we choose Almost Ideal Demand System (AIDS) of Deaton and Meulbauer (1980). AIDS is considered as a major breakthrough in demand system. Alston and Chalfant (1993) commented that, in a relatively short time since the introduction of AIDS, economists had adopted it to the extent that it appeared to be the most popular of all demand systems. This is an ideal demand system because this system satisfies almost all the axioms of choice and hence, satisfies the properties of a theoretical demand system in spite of being quite flexibility. Without invoking linear parallel Engel curves, it aggregates perfectly over consumers (Deaton and Meulbauer, 1980). Its estimation is straightforward. In particular, its linear approximated version avoids the need for non-linear estimation.

The system is based on an expenditure function of the form:

$$log\ [M(p,u)] = (1 - u)\ log\ [a(p)] + u\ log\ [b(p)] \tag{1}$$

where *M*, *u*, *p* denote total expenditure, utility and the price vector respectively and

$$log\ [a(p)] = \alpha_0 + \sum_k \alpha_k\ log(p_k) + \frac{1}{2}\sum_k \sum_j \gamma^*_{kj}\ log(p_k)\ log(p_j) \tag{2}$$

$$log\ [b(p)] = log\ [a(p)] + \beta_0 \prod_k (p_k)^{\beta_k} \tag{3}$$

Substituting Eqs. (2) and (3) into Eq. (1), yields:

$$log\ [M(p,u)] = \alpha_0 + \sum_k \alpha_k\ log(p_k) + \frac{1}{2}\sum_k \sum_j \gamma^*_{kj}\ log(p_k)\ log(p_j) + u\,\beta_0 \prod_k (p_k)^{\beta_k} \tag{4}$$

The uncompensated demand function for any good i is obtained in two steps. By taking derivative of the above expenditure function with respect to $log(p_i)$ and applying Shepherd's lemma in the first step, the compensated demand function is obtained in the form of expenditure share equation of good '*i*'. The second step is to substitute in the resulting equation the indirect utility function, which can be obtained by inverting

the above expenditure function. The result would be the demand system of good i expressed in expenditure share form:

$$s_i = \alpha_i + \sum_j \gamma_{ij} \log(p_j) + \beta_i \log\left(\frac{M}{P}\right), \quad (5)$$

$\gamma_{ij} = \frac{1}{2}\left(\gamma^*_{ij} + \gamma^*_{ji}\right)$ and P is the price index, defined as:

$$\log(P) = \alpha_0 + \sum_k \alpha_k \log(p_k) + \frac{1}{2}\sum_k \sum_j \gamma_{kj} \log(p_k)\log(p_j) \quad (6)$$

Based on theoretical properties of demand system certain restrictions are imposed on parameters of Eqs. (5) and (6). These restrictions are:

$$\gamma_{ij} = \gamma_{ji} \quad (7)$$

$$\sum_i \alpha_i = 1, \quad \sum_i \beta_i = 0, \quad \sum_i \gamma_{ij} = 0 \quad (8)$$

Eq. (7) implies that the demand system satisfied Slutsky symmetry conditions, while Eq. (8) ensure that the demand system satisfies the adding up and homogeneity conditions[3].

The demand functions given in Eq. (5) are nonlinear in parameters**.** The natural starting point for predictions using AIDS model is that in the absence of changes in the relative prices and real expenditure (*M/P*), the budget shares are constant and this is the simple interpretation if AIDS. The changes in real expenditure works through the parameter β_i and the changes in relative prices operate through the parameters $\gamma_{ij}'s$. Further note that $\beta_i's$ add up to zero and are positive for luxuries and negative for necessities.

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[3] In the original draft of the paper we had also considered Linear Approximate AIDS (LA/AIDS) as proposed in Deaton and Meulbauer (1980), in which the price index given by Eq. (6) is approximated by Stone's (1953) price index. However, with this linear approximation version it is not possible to estimate intercept a_0 in Eq. (6), which is needed for the welfare analysis of energy price changes presented in section 4.

IV. WELFARE EFFECTS OF ENERGY PRICE CHANGES

The first consideration while analyzing the effects of energy price changes on consumers' welfare is the choice of a welfare measure. Since utility is not measurable, the effects of price changes on the welfare can only be measured in monetary terms. A simple way is to compute the effects of price changes on total expenditure incurred in purchasing a given basket. The only advantage of this measure is that it allows the easiest calculation for welfare effects of price changes but it does not capture the true welfare effects as it assumes that consumers do not at all respond to price changes. The alternative approach of involving the concept of consumer surplus that allows for changes in demands in response to price changes is obviously preferable.

The typical measure of consumer surplus as presented in basic textbooks of microeconomics is based on the assumptions that utility is measurable cardinally and that the marginal utility of money is constant [See Winch (1971)]. Alternative measures of consumer surplus have been proposed that do not require these two assumptions. Winch (1971) explains four alternative measures of consumer surplus, known as compensating variation, equivalent variation, compensating surplus and equivalent surplus. Although any one of these measures can be used to estimate the effects of energy price changes on welfare of consumers, the most suitable one, as will become obvious in the following analysis is the compensating variation, which measures the increase in income that compensates for the price increase or the decrease in income as may be the case.

Let us denote the initial and the proposed prices by P_k^0 and P_k^1 respectively and the initial income by M^0. The first step is to compute the value of utility using the Indirect Utility Function (IUF), which can be obtained by inverting the expenditure function given by Eq. (4) for utility. The result is:

$$U^0 = \frac{\log\left(M^0\right) - a_0 - \sum_k a_k \log\left(p_k^0\right) - \frac{1}{2}\sum_k \sum_j \gamma_{kj}^* \log\left(p_k^0\right)\log\left(p_j^0\right)}{\beta_0 \prod_k \left(p_k^0\right)^{\beta_k}} \qquad (9)$$

The value of utility obtained above is used to compute the value of the log of expenditure at the new prices using the expenditure function (Eq. 4) as follows.

$$log\left(M^1\right)= a_0 + \sum_k a_k\ log\left(p_k^1\right)+ \frac{1}{2}\sum_k\sum_j \gamma^*_{kj}\ log\left(p_k^1\right)log\left(p_j^1\right)+ U^0\ \beta_0\ \Pi_k\left(p_k^1\right)^{\beta_k} \quad (10)$$

Substituting for U^0 from Eq. (9), we obtain:

$$\begin{aligned} log\left(M^1\right)&= a_0 + \sum_k a_k\ log\left(p_k^1\right)+ \frac{1}{2}\sum_k\sum_j \gamma^*_{kj}\ log\left(p_k^1\right)log\left(p_j^1\right) \\ &+\left[log\left(M^0\right)- a_0 - \sum_k a_k\ log\left(p_k^0\right)- \frac{1}{2}\sum_k\sum_j \gamma^*_{kj}\ log\left(p_k^0\right)log\left(p_j^0\right)\right] \Pi_k\left(\frac{p_k^1}{p_k^0}\right)^{\beta_k} \end{aligned} \quad (11)$$

Note that in the estimation of AIDS, we estimate only the share equations but we cannot estimate the expenditure function or the IUF. This means that all parameters of the system except β^0 are estimated. However, as we can see from Eq. (11), this parameter drops out in the computation of the expenditure at new prices but old level of utility. This means that despite not being able to estimate β^0, we are able to make all the necessary computations for our welfare analysis.[4]

Finally, given the initial total expenditure M^0 and the computed new expenditure to retain the initial level of utility, M^1, we obtained the percentage compensating variation while moving from old prices to new prices as follows.

$$CV = \frac{M^1 - M^0}{M^0} 100 \quad (12)$$

The welfare effects of changes in energy prices can be analyzed by employing the actual and hypothetically specified energy prices. One approach for setting the hypothetical energy prices, which is quite often adopted in the literature, is to consider the existing energy subsidies and then see what impact the removal of these subsidies will have on

[4] The welfare analysis proposed above is not possible in case of LA/AIDS, because the parameter a_0 cannot be estimated in this system.

consumers (see the section on literature review). This approach is appropriate when analyzing the effect of removing one specific structure of energy subsidies. But, by using this approach it becomes quite difficult to analyze the cumulative effect of removing all distortions that exist due to the introduction of taxes and subsidies applied in the past. In case of Pakistan, for example, prices of electricity, petroleum products and natural gas are set by their respective regulatory authorities and certain amounts of subsidy and tax are implicit in price setting, especially in the presence of power tariff slabs with progressive rates and differential peak and off-peak hour rates. This practice is accompanied with specific surcharges. Quite often, under the pressure of aid-donor agencies government announces price increases but at the same time compensates consumers by removing surcharges or increasing subsidies. If one tries to read government documents, one finds that the distinction between changes in price, taxes and subsidies is blurred.

Under the above circumstances, not only it is difficult to pinpoint and analyze the impact of certain taxes or subsidies, such an analysis is also undesirable because the objective of the welfare analysis of government policies is to see how various target groups are affected on net basis. Thus, an alternative easier approach that we followed here is to set the energy prices at some benchmark level and then compare the effect of difference between the actual and the benchmark levels.

One may also account for the possible indirect effects of energy price changes through the resulting changes in non-energy prices. When energy prices increase due to changes in pricing policy, subsidies or taxes; normally all categories of the users of energy besides households are affected. Since energy is also used as an input, the increase in energy prices can cause increase in other goods' prices as well.

It follows that estimating the effects of energy price changes on consumers in a precise manner is not a straightforward task. A practical way is to simulate the welfare effects of energy price changes by creating a number of scenarios. Thus, we consider the following cases for the welfare analysis.

Case 1, Direct Energy Price Effect:

> Compensating variation in response to x% increase in prices of all energy items, holding all other prices constant

Case 2, Energy and Non-energy Price Effects:

Compensating variation in response to x% increase in prices of all energy items, allowing for the spillover effect of energy price increase on non-energy prices

The value of the percentage factor x is set to vary between 1% and 100% in order to capture the possible non-linearity in the relationship between prices and compensating variation.

The calculation of compensating variation in case 1 is straightforward and can be carried out by using Eqs. (11) and (12), wherein the prices of energy goods are raised by x% and all other prices are held constant. For case 2, we also need the information on the indirect (spillover) effect of energy price changes on the prices of non-energy consumption goods. This indirect effect of energy price hike on the non-energy prices is estimated using an auxiliary time-series regression model. Since non-energy inflation may also be caused by usual factors like money growth, exchange rate depreciation and lack of output growth, the model includes non-energy price index as the dependent variable and energy price index, quantity of broad money (M2), nominal exchange rate (Pak rupees per US dollar) and real GDP as independent variable. Denoting non-energy price, energy price, quantity of money, exchange rate and GDP by P_{NE}, P_E, *M2*, *ER* and *Y*, respectively in natural logs, the model is specified as:

$$log(P_{NE}) = b_0 + b_1 log(P_E) + b_2 log(M2) + b_3 log(ER) + b_4 log(Y) + U \quad (13)$$

Since the parameter b_1 measures the effect of one percentage increase in energy price on non-energy price, the indirect effect of x% increase in the prices of energy goods on the prices of non-energy goods is given by $b_1 x\%$. It follows that the compensating variation in case 2 can be estimated by raising the prices of energy goods by x% and the prices of non-energy goods by $b_1 x\%$ in Eq. (11).

Further, to draw distributional implications of energy pricing policies, the effects of price changes are also estimated at the mean per capita total expenditure of each of the five household groups separated by the four quintiles of total expenditure, considering both the cases outlined above.

V. DATA AND VARIABLES

While estimating household demand function in Pakistan limited data availability poses a major problem. Although rich cross-section data are available in the form of *Household Integrated Economic Survey (HIES)*, previously known as *Household Income and Expenditure Survey (HIES*) and *Pakistan Social and Living Standards Measurement (PSLM*) that provide a lot of useful information, these data are not helpful for analyzing the effects of price changes on consumers' choices. Even the limited information on prices of a few goods that can be obtained from the expenditures and quantities consumed reported by households reflects differences in quality chosen by and the market information available to consumers rather than any genuine price variation. The alternative to cross-sectional data is the time-series aggregate data that do provide information on prices but only indirect information on quantities consumed. Household consumption is usually derived indirectly by adding imports and subtracting exports from the annual production and using some ad hoc assumption about changes in stocks. These dubious data along with limited sample size also make the alternative of time-series data unattractive.

Therefore, to overcome the problems associated with pure cross-section or pure time-series data, we pool a number of cross-section data sets. This allows making use of the income variation in cross-sectional as well as time dimensions and at the same time benefiting from the price variation in the time dimension. All the information except on prices is obtained from the survey data, while the information on prices is obtained from time-series data assuming that all consumers face the same set of prices. Another advantage of pooling is the availability of reasonably large sample to yields sufficient degrees of freedom. It is expected that with the pooled cross-section and time-series data parameter estimates of the demand system will be more reliable than the estimates obtained from pure cross-section or pure time-series data.

This study uses the data of *HIES* for rural and urban areas of Pakistan for the fourteen survey over the period 1985 to 2013, conducted by Pakistan Bureau of Statistics (PBS). This data set divides households into several income groups and provides information about the expenditures made by households on various commodities like wheat,

sugar, electricity, travel, etc. and the commodity groups like fuel & lighting, food & beverages, house rent & housing and communications, etc. Since the present study focuses on energy demand, we consider energy items in disaggregated form and the rest of the goods and services at aggregated forms. The total household expenditure is classified into four categories of energy consumption and five categories of other (non-energy) consumption, which are electricity, gas, kerosene oil, firewood & coal, food & beverages, apparel, textile & footwear, house rent & housing, transport & communications, and miscellaneous. The goods included in the miscellaneous category are furniture & household equipment, education and recreation.

Data on prices or price indices of the nine goods used by this study are obtained from various issues of *Pakistan Economic Survey* published by Ministry of Finance (MOF) and *Pakistan Energy Yearbook* published by Ministry of Petroleum and Natural Resources, Government of Pakistan. All price indices are converted to the base year 2001-02. The CPI of the category Miscellaneous is derived by using the aggregation identity whereby the overall CPI is the weighted sum of the CPIs of the sub-categories, where weights are the consumption shares in the base year. The weights are computed on the basis of household consumption data are taken from *HIES*.

For the estimation of the auxiliary Eq. (13), quarterly data are used for the period: third quarter 1988 to second quarter 2014. Data on all the variables used in Eq. (13) except GDP are taken from *Pakistan Economic Survey* and *Pakistan Energy Yearbook*, while the data on quarterly GDP are taken from Kemal and Arby (2004) and Hanif, *et al*. (2013).

VI. ESTIMATION AND RESULTS

In econometrics context AIDS is a non-linear Seeming Unrelated Regressions (SUR) model and is to be estimated by iterative GLS method of Zellner (see Greene, 2003). The system is estimated separately for the rural and urban areas of Pakistan. The parameter estimates of AIDS are shown in Tables 2 and 3 for the rural and urban areas of Pakistan respectively

TABLE 2

Parameter Estimates of AIDS for Rural Pakistan

	Electricity	Gas	Kerosene	Firewood	Food	Apparel	Housing	Transport	Misc.
Alphas	-0.3256	-0.346	1.1345*	2.7586*	18.459*	2.4995*	1.205#	-5.1736*	-19.212*
Betas	0.0012#	0.0013+	-0.0043*	-0.0103*	-0.0681*	-0.0093*	-0.0040*	0.0199*	0.0736*
Gemmas									
Electricity	0.0265*	0.0163*	-0.0002	-0.0094+	0.0318#	0.0170*	-0.0420*	-0.0210*	-0.0190
Gas	0.0163*	-0.0074	0.0013	0.0280*	0.0006	-0.0181#	-0.014#	0.0077	-0.0144
Kerosene	-0.0002	0.0013	-0.0108*	-0.0146*	-0.0789*	-0.0113*	0.0098+	0.0340*	0.0707*
Firewood	-0.0094+	0.0280*	-0.0146*	-0.0032	-0.2086*	-0.0025	-0.0131	0.0286#	0.1948*
Food	0.0318#	0.0006	-0.0789*	-0.2086*	-1.0673*	-0.2270*	-0.0144	0.3548*	1.2092*
Apparel	0.0170*	-0.0181#	-0.0113*	-0.0025	-0.227*	0.1773*	-0.0178	-0.0439#	0.1264*
Housing	-0.0420*	-0.0140#	0.0098+	-0.0131	-0.0144	-0.0178	-0.0525*	0.0655*	0.0786+
Transport	-0.0210*	0.0077	0.0340*	0.0286+	0.3548*	-0.0439#	0.0655*	-0.0772*	-0.3485*
Misc.	-0.0190	-0.0144	0.0707*	0.1948*	1.2092*	0.1264*	0.0786+	-0.3485*	-1.2977
R-Square	0.9470	0.5204	0.6582	0.5271	0.6191	0.7577	0.2693	0.6753	0.7157

The parameters significant at 1%, 5% and 10% levels are indicated by the signs *, # and + respectively.

In case of rural areas of Pakistan the intercepts $\alpha_i's$ for kerosene oil, firewood & coal, food & beverages, apparel textile & footwear, and house rent & housing are positive and highly significant with reasonable magnitudes, which indicate that significant portions of expenditures on these commodities are independent of the changes in prices and incomes. The intercept term for natural gas, transport & communications and miscellaneous category of goods are negative and significant, which indicates that the shares of these goods will be negative if price and income effects are ignored. Only in case of electricity and gas the intercept is statistically insignificant. In case of urban areas of Pakistan the intercept terms are positive for electricity, kerosene oil, firewood & coal, food & beverages and apparel textile & footwear and negative for natural gas, house rent & housing, transport & communications and

miscellaneous category but these are all statistically insignificant. Thus, while in rural areas expenditure shares are mostly dependent on income and/or prices, in urban areas the shares remain mostly independent.

TABLE 3

Parameter Estimates of AIDS for Urban Pakistan

	Electricity	Gas	Kerosene	Firewood	Food	Apparel	Housing	Transport	Misc.
Alphas	0.0176	-0.0236	0.0342	0.1751	1.4762	0.1676	-0.1724	-0.2573	-0.4173
Betas	-0.0002	0.0034*	-0.0037*	-0.0136*	-0.0862*	-0.0067*	0.0310*	0.0250*	0.0509*
Gemmas									
Electricity	0.0309*	0.0110*	0.0002	-0.0041	0.0051	-0.0059	-0.0346*	-0.0091+	0.0065#
Gas	0.0110*	-0.0023	0.0047*	-0.0013	0.0043	-0.0117+	-0.0077	-0.0037	0.0068
Kerosene	0.0002	0.0047*	-0.0071*	-0.0018	-0.0037	0.0023	-0.0003	0.0052	0.0004
Firewood	-0.0041	-0.0013	-0.0018	0.0239+	-0.0457	-0.0116	0.0002	0.0309	0.0094
Food	0.0051	0.0043	-0.0037	-0.0457	-0.0606	0.0239	0.1087	-0.0362	0.0043
Apparel	-0.0059	-0.0117+	0.0023	-0.0116	0.0239	0.0260	-0.0479*	0.0119	0.0130
Housing	-0.0346*	-0.0077	-0.0003	0.0002	0.1087	-0.0479*	-0.0556	0.0407	-0.0035
Transport	-0.0091+	-0.0037	0.0052	0.0309	-0.0362	0.0119	0.0407	-0.0079	-0.0317
Misc.	0.0065#	0.0068	0.0004	0.0094	0.0043	0.0130	-0.0035	-0.0317	-0.0052
R-Square	0.9401	0.8103	0.7957	0.6807	0.7448	0.7046	0.4381	0.7512	0.5981

The parameters significant at 1%, 5% and 10% levels are indicated by the signs *, # and + respectively

The sign of β_i determines whether a good is a relative luxury or necessity. If $\beta_i > 0$ ($\beta_i < 0$), the good *i* is classified as luxury (necessity) meaning that in response to increase in real total expenditure by a given proportion, the demand for the good i will increase by a greater (smaller) proportion. The results in case of rural areas of Pakistan show that $\beta_i's$ for kerosene oil, firewood & coal, food & beverages, apparel, textile & footwear and house rent & housing are negative and statistically significant indicating that these goods are necessities. The parameters $\beta_i's$ for electricity, natural gas, transport & communications and

miscellaneous goods are positive and statistically significant, indicating that these goods are luxuries Pakistan. In urban areas of Pakistan, electricity, kerosene oil, firewood & coal, food & beverages and apparel, textile & footwear are classified as necessities as indicated by the negative sign of the corresponding $\beta_i's$ while natural gas, house rent & housing, transport & communications and miscellaneous goods are luxuries. The changes in the shares of various goods due to changes in relative prices are indicated by the signs and magnitudes of $\gamma_{ij}'s$. We can see that the expenditure shares of both the energy and non-energy items in rural sample are by far more sensitive to price changes than those in the urban sample.

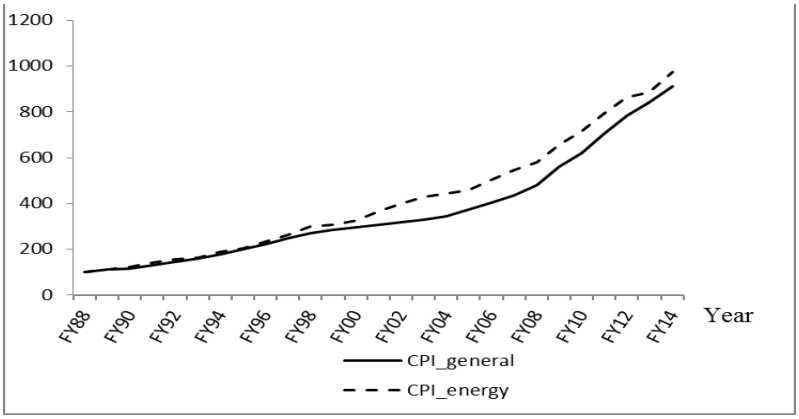
Coming to the estimation of the auxiliary Eq. (13), it is to be noted that spurious regression is the major concern in the time series regression. Therefore, estimate of the equation is extracted from the full ARDL model. Since this equation is not the focus of analysis, only an auxiliary exercise, only the results of short-run and long-run effects of energy price index on the non-energy price index are presented. According to the estimates the long-run effect of one percentage point increase in energy price index on the non-energy price index (the value of the parameter b_1 in Eq. 15) is 0.22, while the corresponding short-run effect is only 0.029, which is one-eighth of the long run effect. Therefore to take into account the inflationary spillover of energy price increases on prices of other goods, for every one percentage point increase in energy prices, the prices of other goods are increased by 0.22 percentage points. Since the short-run spillover is negligible, no short run analysis is carried out.

Figure 1 shows the trend in overall CPI and CPI of fuel and lighting (referred to as CPI_general and CPI_energy respectively) in Pakistan over the study period. The figure shows that both the price indices have increased exponentially but the rate of increase in general CPI has been greater than the one in CPI of fuel and lighting. The annual compound inflation rates in general and fuels and lighting price indices has indices have been 8.99% and 9.15% respectively. Since both the price indices have grown quite rapidly, it is important to consider the indirect welfare effects of energy price variation through its spillover effect on the prices

of non-energy goods. Both the direct and total (direct plus indirect) effects of energy price variations are discussed below.

FIGURE 1

Trends of General and Energy Consumer Prices Indexes



For the welfare analysis, we first consider the estimated percentage compensating variation (Eq. 12) for the representative rural and urban households associated with the increases in energy prices with and without considering the spillover of energy price increases on other goods' prices. Table 4 presents the results for price increases from 10% to 100% with intervals of 10 percentage points. The table shows that there is not much difference in the compensating variation between the rural and urban samples. In both the cases the rate of compensating variation increases almost proportionately with the increase in energy prices. The correlation coefficient between the rate of energy price inflation and the rate of compensating variation is more than 0.99 for each of the four cases presented in the table. This linearity implies that there is no additional substantial long-run welfare gain or loss if the targeted increase in energy prices is staggered over some period.

TABLE 4

Size of Compensating Variation against Energy Price Increases

	Rural sample		Urban sample	
Percentage increase in energy prices	Compensating variation (direct effect)	Compensating variation (direct plus spillover effects)	Compensating variation (direct effect)	Compensating variation (direct plus spillover effects)
10	0.73	2.77	0.76	2.79
20	1.48	5.55	1.51	5.58
30	2.25	8.34	2.26	8.37
40	3.02	11.14	2.99	11.15
50	3.80	13.94	3.70	13.92
60	4.58	16.74	4.41	16.69
70	5.35	19.54	5.10	19.45
80	6.12	22.35	5.78	22.21
90	6.89	25.15	6.45	24.96
100	7.65	27.96	7.11	27.71

The results further show that if the spillover effects of energy price increases on the prices of non-energy goods are also taken into account, the size of compensating variation will increase to almost four times. Whether or not one should take into account the spillover effects in considering compensation of consumers is a tricky question. One may argue in favor of taking into account the spillover effects on the grounds that the increase in price of any good will result in welfare loss irrespective of whether this price increase constitutes part of the pricing policy or is a secondary consequence/spillover of the original policy. On the other hand, a counter argument is that if the spillover effects on the prices of non-energy goods are taken into account in any compensation package, there will be an equally valid argument to reduce the size of compensating variation to the extent that households' incomes changes as wages of household members tend to catch up with price inflation. However, it is not feasible to consider this aspect in the present framework because the welfare analysis here is based on compensating variation itself, that is, the change in total expenditure (as a proxy of income) required to compensate for the price variation. Since one cannot altogether ignore the changes in income brought about by energy price increases, the size of compensating variation estimated here indicates a benchmark against which the realized income changes can be compared.

This interpretation can be useful in designing the overall energy pricing policy including the possible compensation package.

Whether and how the consumers should be compensated for the welfare loss is a normative question and the answer depends on the ultimate objective of the proposed energy pricing policy. If the objective is to raise government revenues then the compensation should be focused on the distributional aspects of the policy with no intention to make the full or even a partial compensation to all consumers. If, on the other hand, the proposed pricing policy aims at removing price distortions with no consideration of revenue generation then the compensation scheme would include both real income as well as distributional considerations.

In a developing country like Pakistan, energy pricing policy is often influenced by external pressure from the aid-donor agencies in a bid to raise government revenue in order to reduce the country's dependence on borrowing and to increase its capacity to timely meet its debt servicing obligations. Under this situation across the board compensation of consumers seems counter-productive and the role of compensation is to be confined to distributional consideration only. In order to explore the distributional implications of energy pricing policies, we now present the estimated size of compensating variation at the mean per capita total expenditure of the lowest and the highest quintiles of total expenditure.[5]

Figures 2 to 5 show the size of compensating variation associated with varying percentage increases in energy prices for the lowest and highest quintiles of total expenditure (representing relatively poor and rich households). The figures indicate that the percentage compensating variation is higher for the lowest quintile of total expenditure as compared to the one for the highest quintile both in the rural and urban samples. The difference is, however, negligible if the spillover effects of energy price increases on non-energy prices are taken into account. To understand why the difference becomes smaller when the spillover effects are taken into account, note that in the first place the difference arises due to different preference structures between the poor and rich households. When prices of energy items increase, the consumers are

[5] Since the size of compensating variation does not show much difference across the expenditure quintiles, we present the results for the extreme quintiles only.

able to avoid the welfare loss to the extent they can substitute from energy to non-energy consumption goods. The size of welfare loss will obviously depend on the differences in preferences between the poor and rich households. On the other hand, when spillover effects of energy price increases on non-energy prices are also taken into account, the consumers' ability to avoid the welfare loss through substitution is curtailed because the changes in relative prices between energy and non-energy goods are now relatively less and, hence, differences in preferences between the poor and rich households also matter less.

FIGURE 2

CV for Energy Price Increase (Rural Sample)

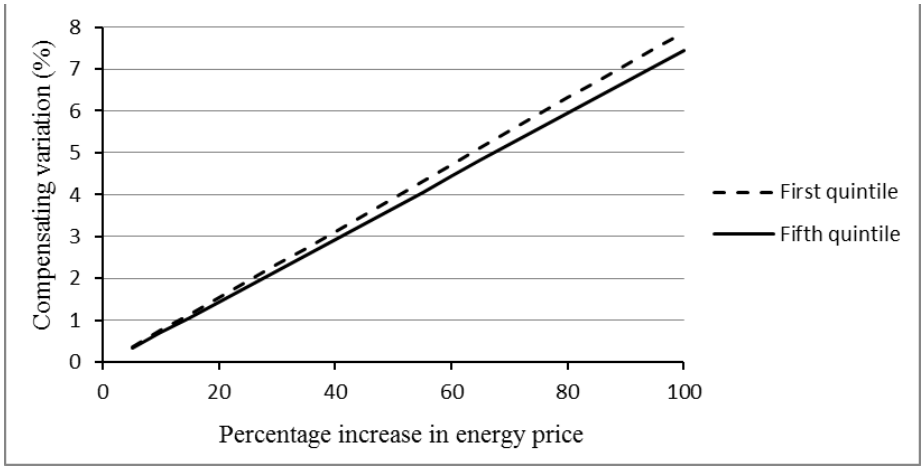
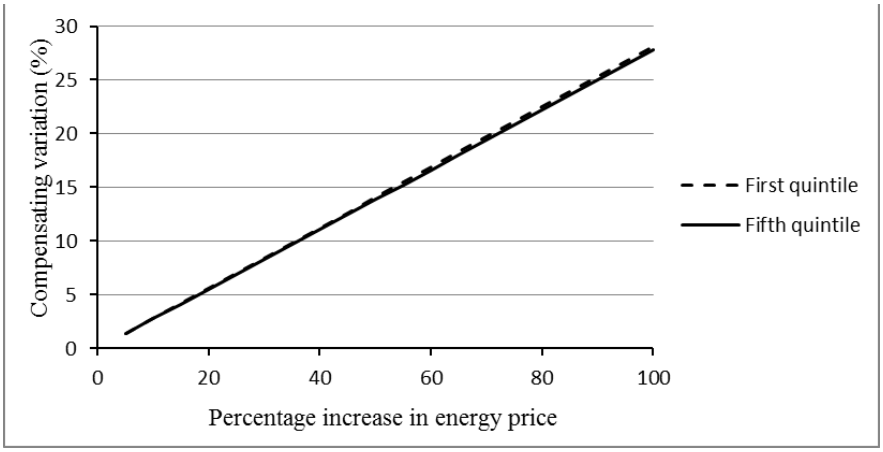


FIGURE 3

CV for Energy and Non-Energy Price Increase (Rural Sample)



We can also see that the difference in compensating variation between the poor and rich households is greater in the urban sample as compared to the one in the rural sample. This reflects that the preference structure between rich and poor households is greater in urban areas as compared to the one in rural areas.

FIGURE 4

CV for Energy Price Increase (Urban Sample)

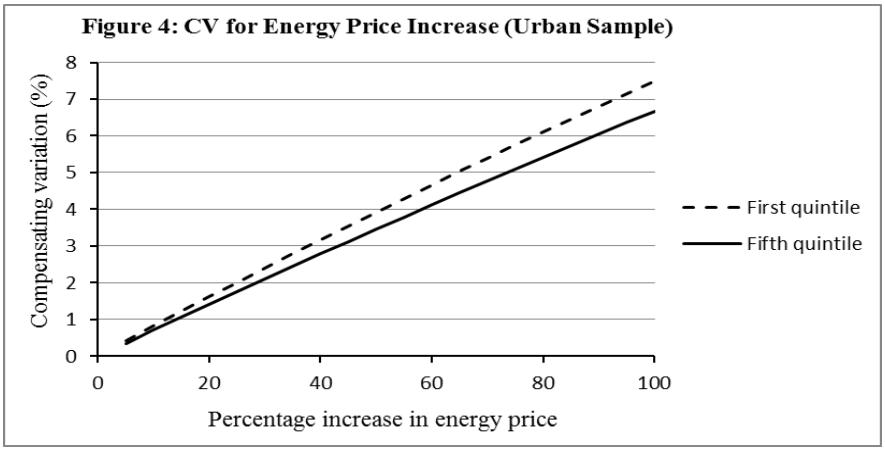
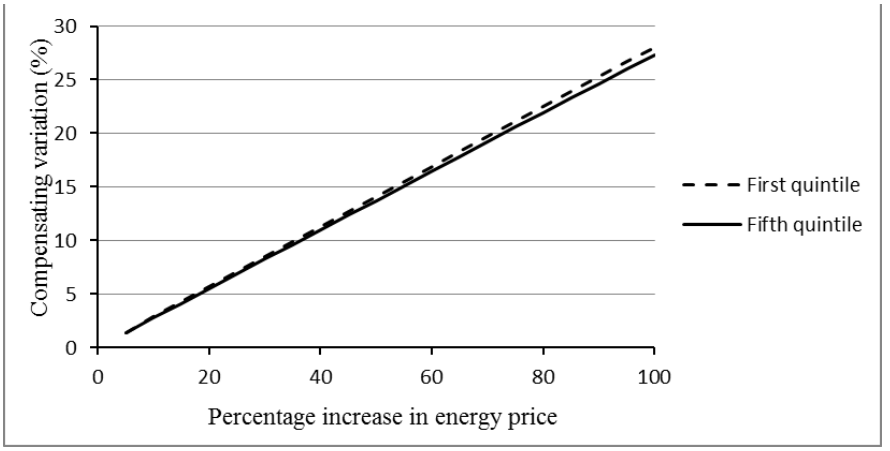


FIGURE 5

CV for Energy and Non-Energy Price Increase (Urban Sample)



In any case, the main finding here is that the size of compensating variation in percentage terms is somewhat higher among the poor households than among the rich households in all the cases considered. This means that energy price increases result is greater welfare loss to the poor households.

VII. CONCLUDING REMARKS

This study has been an attempt to analyze the welfare effects of energy price increases on the rural and urban households of Pakistan using the Almost Ideal demand system (AIDS) estimated on the basis of Household Integrated Economic Survey (HIES) data pooled over the period 1985-86 to 2013-14. The welfare analysis is carried out by estimating percentage compensating variation in total expenditure corresponding to alternative scenarios on energy prices.

The prices of electricity, petroleum products and natural gas in Pakistan are set and regulated by their respective regulatory authorities and certain amounts of subsidy and tax are implicit in price setting in addition to the explicit subsidies, taxes and surcharges. Price changes are often accompanied by changes in taxes, surcharges or subsidies. Since it is neither feasible nor much useful to disentangle the incidences of changes in price regulations, taxes, surcharges and subsidies; welfare

analysis in this paper is conducted on the basis of alternative scenarios regarding energy prices. The welfare costs (percentage compensating variations) of 1 to 100 percent increases in energy prices are estimated at the mean per capital total expenditure in the latest year of data first by ignoring and then by incorporating the possible spillover effect of energy price changes on the prices of non-energy goods and services.

The results show that welfare losses due to energy price increases are almost the same, 7.65% against 100% increase in energy prices in rural sample and 7.11% in the urban sample. Further, the rate of compensating variation is almost proportional to the increase in energy prices. If the spillover effects of energy price increases on the prices of non-energy goods are also considered, the welfare loss would be multiplied by four.

Since in Pakistan energy pricing policy is often driven by the need to improve government budget position, the role of compensation is to be confined to distributional consideration only. To gain more insight into the distributional implications of energy pricing policies, the welfare costs of energy price changes are also estimated at the mean per capita total expenditures of the household belonging to the poorest and the richest quintiles of total expenditure. The percentage compensating variation for the poorest quintile is found to be slightly greater than the one for the richest quintile in rural as well as urban areas.

The main conclusion of the study is that energy price inflation has resulted in a substantial welfare loss both for rural and urban households of Pakistan and the energy pricing policy in Pakistan has been regressive in nature in the sense that the welfare loss in percentage terms has been somewhat higher among the poor households than among the rich households.

The only comparable study for Pakistan is by Abrar (2015) that estimates welfare effects of energy price changes on the representative household. The present study extends the same work and shows that welfare loss becomes greater when the spillover effect of energy price increase on the prices of non-energy goods are also taken into consideration. The present study also shows that the welfare loss is greater for the lowest income quintile than the higher highest income quintile. It is not worthwhile to compare our results with the other study on welfare effects of energy price changes by Aziz et al. (2016) because

it suffers from serious shortcoming of data and model specification as mentioned in introduction.

The policy implication of this conclusion is straightforward. There are three reasons why poor households need to be given preferential treatment while protecting them against the energy price hike. First, irrespective of the relative size of compensating variation, as compared to rich household, the poor households are in a greater need to be protected against energy price hike because their low incomes make them more vulnerable when energy prices increase. Second, the regressive effect of energy price hike means that the poor households suffer relatively greater welfare loss when energy prices increase, which makes the case of protecting poor households even stronger. Third, since the absolute expenditure on energy items among the poor households is quite small, any compensating package directed towards the poor will have affordable effect on government budget. These three reasons justify the need for a comprehensive compensation package exclusively for poor households to enable them face the burden of energy price inflation.

It is also important to consider the budgetary implications of the energy pricing policy recommended above. For example, if all the 20% poorest households are protected against 25% increase in energy prices, its impact comes out to be about 2% of the total expenditure of the poorest quintile of households, whose total expenditure is about 12.8% of the aggregate household expenditure in Pakistan. This means that the cost of subsidy would be 0.256% (that is, 2% of 12.8%) of aggregate consumption expenditure. If the average propensity to consume is set equal to 80%, the impact of subsidy would turn out to be approximately 0.2% of GDP. This amount is obviously not negligible. Currently there are various types of levies and implicit taxes on electricity, natural gas and petroleum products. A simple way out to finance the subsidy would be to exempt the poor households from certain categories of such levies and taxes.

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ANALYZING THE IMPACT OF INTELLECTUAL CAPITAL ON FINANCIAL PERFORMANCE OF FOOD & PERSONAL CARE AND TEXTILE SECTORS: A COMPARATIVE ANALYSIS

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ABDUL QADEER AND NAZISH YOUNAS*

Abstract. This paper has examined the role of intellectual capital in profitability of firms belonging to food & personal care and textile sectors in Pakistan. From each of the chosen sectors, seven firms are selected using systematic random sampling technique and data have been gathered from audited statements of these firms for financial years 2012 to 2016. We have employed modified value added intellectual coefficient (MVAIC) model to measure intellectual capital. We have used Stata software version 14, for conducting multiple regression analysis and paired sample T test. The findings propose direct and significant influence of capital employed efficiency (CEE) on selected firms' financial performance. The influence of intellectual capital efficiency (ICE) is found to be significant in certain cases investigated through different models employed in the study. Result of paired sample T test demonstrate that MVAIC score in the textile sector is greater than food & personal care sector. The findings of this study have highlighted the need for formulation of such

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policies which encourage allocation of financial resources for development of firms' intellectual capital.

Keywords: Intellectual capital, financial performance, food & personal care sector, textile sector

JEL Classification: GOO, G39

I. INTRODUCTION

Human society has been moving through different phases. The recent visible phase is industrialization. The post-industrialization phase is marked by a shift from the industrial to service sector in the developed countries. Now many countries get most of their GDP from the services sector. Another visible change observed during last two decades was the shifting of human society towards being a society based on information and digital technology (Tarigan, Listijabudhi, Hatane, & Widjaja, 2019). This gave rise to better access and use of knowledge. As the digital knowledge accumulated, there was unprecedented access to knowledge and gaining of skills. In such digital and information era, intellectual capital (IC) has become more important and effective. Global market is shifting from capital-intensive industries to knowledge industries. These industries are comprised of more virtual resources. Such intangible assets are not part of the balance sheet of the companies. Hence, their effect is underestimated if even accounted for.

In an economy where knowledge is important, it is norm to consider information technology, innovation, creativity, and research and development as strategic assets. With strongly developed mediums of communication, storage and accumulation of knowledge, combined with easy access to knowledge; IC has become more and more important (Khalique, Ramayah, Shah, & Iqbal, 2019). According to World Bank (1998, p.1), "Knowledge is like light. Weightless and intangible it can easily travel the world enlightening the lives of people everywhere." In this context, majority of the knowledge-based firms have invested a significant amount of their wealth in the form of intangible assets. Physical and manual systems are shifting day by day in automated and computerized systems that can use knowledge in a way that was never possible before (Poh, Kilicman, Ibrahim, & McMillan, 2018). As a result,

fewer people have to do physical work, while majority of the people have to perform mental work (Akpinar & Akdemir, 1999). The problem with mental work is that it does not appear in the financial statements of the company because we cannot exactly estimate the price of mental work. The measurement of such intangible asset is not only difficult but also sometimes impossible. This type of mental work is usually known as IC that is used by firms for creating wealth through production of greater valued assets (Stewart, 1991).

Studies conducted in the past acknowledge the significant and affirmative contribution of IC in financial performance of firms (see for instance, Arslan & Zaman, 2014; Mondal, 2016; Ulum, Rizqiyah, & Jati, 2016). Information and knowledge have been converted into an asset that is taken care of and protected from theft. IC is valuable asset for every business. It may not be shown in the balance sheet but has an influence on the working and culture of a business firm (Ozkan, Cakan, & Kayacan, 2017). Spending money on training the staff for increasing their skills may not make sense given high employment turnover. However, its importance is evident from the fact that, today firms are spending significant money on human capital. Accumulation of knowledge in any way, such as in the form of training employees, is a form of capital that is additive in nature. Therefore, training someone means influencing others when such skill may trickle down and benefit quick accumulation of knowledge collectively.

This study aims to (a) examine the effect of intellectual capital efficiency (ICE) and capital employed efficiency (CEE) on firms' financial performance and (b) compare and contrast the performance of food & personal care and textile sectors in terms of their MVAIC scores. In accordance with research objectives, the present study is expected to provide a unique contribution to extant literature on IC. It is the first study in Pakistan in which researchers have compared the role of both IC and capital employed using MVAIC model. This comparison has been undertaken by focusing on two major sectors that make significant contribution in Pakistan's economy i.e., Food & personal care and textile sectors.

Pakistan is an emerging economy in South Asian region and its economic development is based on strong manufacturing industry. The

manufacturing sector makes 13.6% contribution towards GDP of Pakistan and includes two major sectors crucial for society i.e., textile and food & personal care sectors. According to Economic Survey of Pakistan (2017-18), textile sector is important for Pakistan's economy as it contributes 0.47% in GDP growth and 60% in total exports (Finance Division, 2018). Textile sector also helps in providing employment opportunities to around 40% of industrial labor force. After getting GSP plus status in 2019, demand for innovative textile related products is continuously increasing in local and foreign markets, which requires investment in IC in order to utilize available resources in an efficient way. Food & personal care, is another important sector, which, according to the Economic Survey of Pakistan (2017-18), has 2.33% contribution in GDP growth. Also, according to US Department of Agriculture's Economic Research, Pakistani people spend almost 46.99% of their wealth on food & personal care related items (Seale, Regmi & Bernstein, 2012). This is a feature common in low income and middle-income economies that a major portion is spent on necessities. Likewise, they also spend significant proportion of their incomes on textile related products. Therefore, there is a need to study how firms from both of these sectors preserve human competencies, improve internal processes and develop exemplary relations with stakeholders. This could be done by ascertaining the investment in IC made by both sectors because it is proved that investing a significant proportion in IC enhance firms' profitability (Khalique et al., 2019).

The present study is an effort to assist academia in exploring different aspects of IC and develop more suitable proxies for the measurement of IC using MVAIC model. This study can also help practitioners by providing useful insights and motivation for making policies related to better investment for formulation and development of IC. The next part of article discusses the theoretical and empirical review of the pertinent literature, which is followed by conceptual framework. After this, research design ~~and methods used,~~ and the operational definitions of key constructs are provided. Next section contains findings of the study and discussion with reference to extant literature. Last section is about conclusion, limitations and future directions.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

THEORETICAL BACKGROUND

The term IC has originated from strategic management views namely; Resource Based View (RBV), that focuses on internal resources, and Knowledge Based View (KBV) (Lentjusenkova & Lapina. 2016; Ulum et al., 2016). Before RBV, it was considered that an organization can gain competitive edge if it changes itself according to the dynamic environment in which it operates (Porter, 1981). This view was called Industrial Organizational View. Later on, a new view emerged that focused on internal resources being rare, inimitable and scarce (Wernerfelt, 1982) and this view was referred to as RBV. The theme behind RBV was that an organization could gain competitive edge if it managed its internal resources efficiently and effectively (Xu & Wang, 2018).

It is observed that RBV does not deal with the development of human resources with the objective to create competitive advantage. It is more static in nature as it is intrinsic to environmental changes (Daou, Karuranga, & Su, 2013; Teece & Pisano, 1994). Moreover, RBV does not put major emphasize on knowledge and IC; rather it treats these as generic sources. To overcome the deficiencies of RBV, a new concept emerged which came to be known as KBV, that considers knowledge as a valuable source for competitive edge (Grant, 1986). According to KBV, management of knowledge creates IC which is important for an organization. In this regard, it is stated that a firm can attain competitive advantage; if it manages its knowledge and IC simultaneously (Akpinar & Akdemir, 1999).

Every firm wants to maximize its profits by utilizing its resources efficiently and effectively. Resources can be tangible and intangible and are required to obtain a competitive advantage (Mohammadi, Sherafati, & Ismail, 2014). Given the scarcity of tangible resources, gaining competitive advantage over rivals requires greater emphasis to be placed on intangible resources (Albertini & Berger-Remy, 2019). IC can be calculated through subtracting book value of assets from their market value (Akpinar & Akdemir, 1999). Also, IC is basically comprised of

three major categories namely; human capital, relational capital and structural capital (Chowdhury, Rana, & Azim, 2019).

Human capital basically refers to the knowledge, qualification, intuition, skill, capabilities, innovative style, proactivity, intellectual agility and experiences which are retained by employees (Akpinar & Akdemir, 1999). It is multidimensional phenomenon that may include education, training, health, productive habit development, and benefit of more social interaction. Better social interaction may increase the spread of knowledge without putting in much effort. Normally, an organization can't preserve this capital, as employees take it with them when they retire or resign from the organization (Edvinsson & Malone, 1997). Human capital, being a significant part of IC, helps a company in strategic renewal and innovation; which shows its importance for a business. Organization may try to preserve this capital by offering lucrative salaries, bonuses and vocational benefits (Akpinar & Akdemir, 1999). According to Human Development Index (HDI) 2019, Pakistan is ranked at 152 out of 189 nations and its HDI value is 0.56 which is lower than medium level (UNDP, 2019). These statistics highlight lesser investment in human capital in Pakistan which is central aspect of IC.

Structural capital refers to organizations' competencies that are required to fulfill market requirements. It consists of the procedures and configurations that encourage employees for optimum performance; which in turn enhances business performance (Akpinar & Akdemir, 1999). According to Van and Mark (1999), process capital and innovation capital are two components of structural capital. Process capital consists of systems, tools and techniques of an organization. The innovation capital, on the other hand, refers to capability of an organization to innovate new products and service. The emphasis on innovation in business is not a new idea. Again, as above, better relations and interaction of staff may lead to innovative ideas. The structural capital can be protected through various strategies such as registration of patents, copyrights, trademarks, brands, and trade secrets (Akpinar & Akdemir, 1999).

Relational capital refers to the knowledge gained through inter-connection, not only with consumers, but also with outside stakeholders including; partners, suppliers, competitors and government (Akpinar &

Akdemir, 1999; Arslan & Zaman, 2014; Cohen & Kaimenakis, 2007). Relational capital consists of customer capital and external capital (Akpinar & Akdemir, 1999). Customer-relational capital is based on how a company manages good relations by fulfilling the needs of its customers. External-relational capital can be created by managing good relations with external stakeholders (Cheng et al., 2010). It is created by fulfilling their needs and through participation of company in corporate social responsibility (CSR) activities. Both types of relational capital are crucial for maintaining good relations which influence corporate life (Arslan & Zaman, 2014).

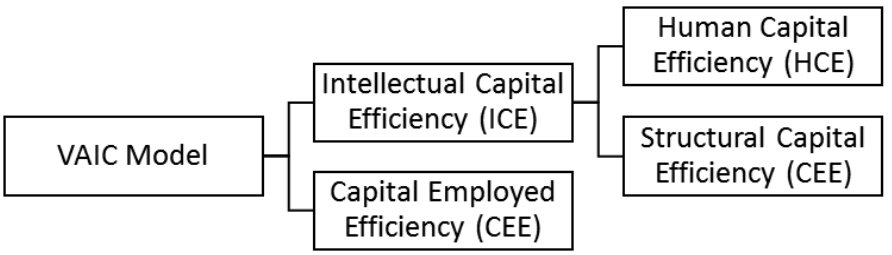
Capital employed is another important variable that has been studied in relation to financial performance of firms (Arslan & Zaman, 2014; Fijalkowaska, 2014; Mondal, 2016; Nimtrakoon, 2015; Sledzik, 2013; Ulum et al., 2016). Capital employed (CE) can be described as the book value assigned to net assets of a firm (Sharma & Naqvi, 2017; Pulic, 1998) and capital employed (CEE) is the capital employed divided by the value added (Mondal, 2016).

INTELLECTUAL CAPITAL MEASUREMENT MODELS

Value Added Intellectual Coefficient (VAIC) Model

To measure IC, Pulic (2000; 2008) developed VAIC model, which consisted of two components i.e., ICE and CEE.

FIGURE 1



Source: Pulic (1998)

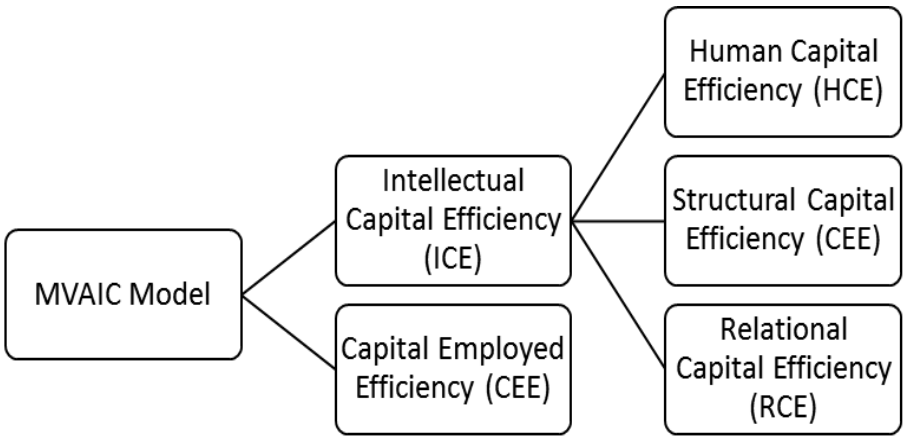
The effectiveness of key resources of an entity in terms of value added is measured by VAIC model (Setyawati, Widyastuti, Suryati, & Hartani, 2019). VAIC model uses simple procedure for the calculation of necessary coefficients and has been frequently used in the literature (e.g.,

Arslan & Zaman, 2014; Fijalkowaska, 2014; Pulic, 2008; Santoso, 2011; Ulum et al., 2016; William, 2001). However, VAIC model has also been criticized by some researchers such as; Mondal, (2016), Nimtrakoon, (2015) and Sledzik (2013). The biggest criticism on this model is that it does not consider the role played by relational capital in creating value for the firms. In addition, VAIC model calculates structural capital as the variance between value creation and human capital which is not a suitable proxy according to Mondal (2016).

Modified Value Added Intellectual Coefficient (VAIC) Model

In order to address the deficiencies of VAIC model, some researchers proposed a new model as an extension of the Pulic model (Mondal, 2016; Ulum et al., 2016; Nimtrakoon, 2015). The new modified model is known as MVAIC which is used for measuring the influence of ICE and CEE on firms' financial performance. This model includes relational capital as an indispensable tool of firms' value creation (Sharma & Naqvi, 2017). Structural capital is also considered as a separate part of IC which doesn't depend on human capital.

FIGURE 2



Source: Developed by researchers based on literature review

EMPIRICAL REVIEW

Various studies have been carried out to check association of IC with firms' performance from a financial perspective, using both primary and secondary data sources. An overview of major empirical studies in the field is provided hereafter.

Mohammadi et al. (2014) investigated various aspects related to IC and their relationship with firms' financial performance. They developed 14 latent variables and collected data through the questionnaire filled by 79 respondents. To check association between latent variables, they applied visual partial least square (PLS). Their findings suggested that relational capital has the greatest influence on financial performance; followed by human capital and structural capital. Another similar study carried out by Emadzadeh et al. (2013) used balance scorecard technique to measure IC and its relevance for corporate performance. Their findings substantiated the idea that IC had positive significant effect on firm performance. Moreover, IC was also found to affect the internal processes, customers, learning, and growth.

Suraj and Bontis (2012) examined IC management in Nigerian telecommunication firms. A sample of 29 firms was chosen and questionnaires were distributed among 320 top-level managers. Their findings revealed that Nigerian telecommunication firms should place greater emphasis on customer capital as compared to other types of IC. Another research was carried by Kojori, Aghajani, and Rasooli (2013). They studied the role of IC in Tehran based cosmetics companies' performance. They used fuzzy approach to develop the self-administrated questionnaire. Correlation and regression analyses were applied and their findings revealed that all dimensions of IC have positive significant influence on financial performance.

In addition to primary data, some researchers have used secondary data sources for IC measurement, such as; Arslan and Zaman (2014), Fijalkowaska (2014), Latif, Malik and Aslam (2012), Mondal (2016), Pal and Soriya (2016) and Santoso (2011). Such empirical evidences are found both in financial and non-financial sector firms. For example, Santoso (2011) examined the nexus between IC and financial performance of Indonesian banks. Both primary and secondary sources were used for data collection. To quantify IC, VAIC model of Pulic

(2000; 2008) was used. The dependent variable (financial performance) was measured by ROA. The data was analyzed using correlation estimates and regression technique. The findings indicated moderate and positive nexus between IC and bank performance. In addition, a questionnaire survey was also conducted with help from bank executives to collect primary data and findings of this survey were compared with those of VAIC model. It was concluded that in comparison to the questionnaire survey method, the use of VAIC model resulted in a stronger effect of IC on the financial performance.

In a similar study, Latif et al. (2012) looked into the influence that IC has on corporate performance while considering a developing country. They obtained data from Islamic and conventional banks operating in Pakistan. For operationalizing the construct of IC, VAIC model was used and corporate performance was measured through indicators of profitability, productivity, and market capitalization. The data collected were analyzed using correlation and multiple regression analysis techniques. Their findings suggested that human capital played significant role in the performance of companies.

In addition to financial institutions, various studies have been conducted on non-financial institutions using secondary data. Deep and Norwal (2014), for instance, conducted a research to see if IC is related to financial performance of textile sector firms. They measured intellectual and physical capital using VAIC model; while productivity, profitability, and market valuation were employed to measure financial performance. They collected panel data from 100 textile companies of India for the period of 2002 to 2012. Correlation estimates and regression technique were applied to gauge the nexus between performance of different textile companies and their IC. According to their results, IC has no influence on market valuation and productivity. However, their findings revealed a significant and affirmative effect of IC of firms and their profitability. Their findings suggested that IC is an important indicator to enhance the profitability of firms in the textile sector.

A study was conducted by Pal and Soriya (2012) that investigated the influence of IC on firm performance in the Indian textile and pharmaceutical sectors. IC was operationalized by VAIC model, while financial performance was measured by productivity, profitability, and

market capitalization. They selected a sample of 105 firms from pharmaceutical sector and 102 firms from textile sector. They applied multiple regression analysis on panel data. and found that profitability was significantly and positively influenced by IC; consistent with previous studies (Arslan & Zaman, 2014; Deep & Norwal, 2014). However, the role of IC in firms' productivity and market capitalization was found to be insignificant.

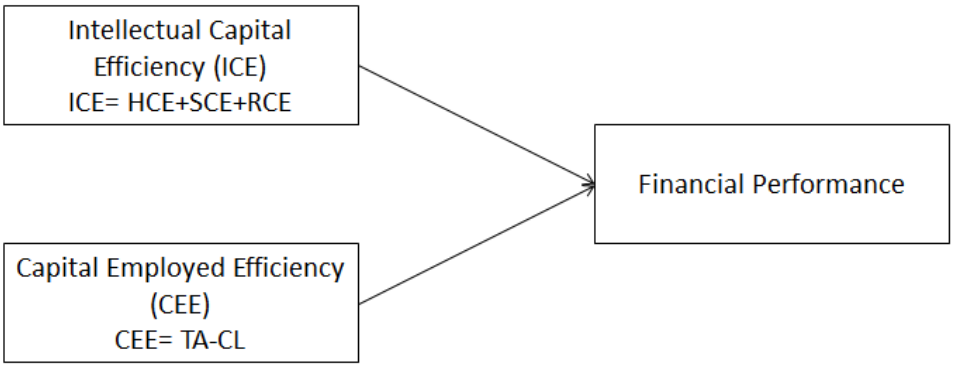
Calisir, Gumussoy, and Bayraktaroglu (2010) investigated the impact of various dimensions of IC, using VAIC model, on firm performance of information technology (IT) and telecommunication sectors. For this purpose, only those companies were selected which were registered on Istanbul Stock Exchange. To check the causal relationship between IC and financial performance, they applied regression analysis technique. Their findings suggested that out of different elements of VAIC model, only CEE had a significant on firms' performance.

Likewise, Dženopoljac, Janosevic and Bontis (2016) selected information and communication technology (ICT) industry to study the influence of physical capital and IC on firms' performance. The IC and physical capital were measured through VAIC model. On the other hand, financial performance was operationalized through such proxies as ROA, ROE, return on investment (ROI), and asset turnover ratio. They collected data from 13989 firms during the period of 2009-2013. Their findings also confirmed the positive influence of CEE on the selected firms' performance.

The findings of aforementioned studies show that although IC is found to have a significant effect on firms' performance in many cases; however, there are certain instances where such impact could not be confirmed for some sectors. Moreover, researchers have observed dearth of empirical evidence to compare the score of MVAIC using Paired Sample T test. This highlights the need to conduct comparative analysis of firms belonging to different sectors. Therefore, present study is conducted to check the effect of IC by focusing on performance of a group of firms belonging to two sectors, namely: food & personal care and textile sectors in Pakistan.

CONCEPTUAL FRAMEWORK

FIGURE 3



RESEARCH HYPOTHESES

In light of above discussion, this study has proposed following hypotheses:

H_1: There is significant influence of ICE on firms' profitability.

H_2: There is significant influence of CEE on firms' profitability.

H_3: MVAIC scores of food & personal care and textile sectors are significantly different.

III. RESEARCH METHODS AND DATA COLLECTION

To achieve desired research objectives, researchers have collected quantitative data, using secondary sources from annual report of firms listed in Pakistan stock exchange (PSX) belonging to two sectors namely: food & personal care and textile sectors. Out of total population (see Appendix A), seven companies have been selected from each sector using systematic random sampling technique (see Appendix B).

MVAIC MODEL

This study has measured the IC using MVAIC model which is an extended and modified form of VAIC model, developed by Pulic (2000; 2008). A number of researchers have used this model in their studies such as, Mondal (2016), Nimtrakoon (2015) and Sharma and Naqvi (2017). As

elaborated in literature review section, this model has been developed to overcome the deficiencies in the VAIC model (Mondal, 2016; Nimtrakoon, 2015). The MVAIC model is designed to measure how value is created efficiently by firms (Santoso, 2011). MVAIC model can be summarized in the form given below:

$$MVAIC_i = ICE_i\ (HCE_i + SCE_i + RCE_i) + CEE_i$$

TABLE 1

Operational Definition of Variables

Construct	**Proxies**	**Operational Definition**	**References**
Value Addition	Value added (VA)	Total sales (output)-total operating expenses (input)	Nimtrakoon (2015)
Intellectual Capital	Human capital efficiency (HCE)	VA/total salaries and wages, and training and development expenses	Mondal (2016)
	Structural capital efficiency (SCE)	VA/administrative expenses	Vishnu (2015)
	Relational capital efficiency (RCE)	VA/ total marketing, selling and promotional expenses	Mondal (2016)
Physical Capital	Capital employed efficiency (CEE)	VA/(total assets-current liabilities)	Mondal (2016)
Financial Performance	Return on assets (ROA)	Net profit after taxes/total assets	Gitman and Zutter, (2015)
	Return on equity (ROE)	Net profit after taxes/total equity	Khan and Jain, (2010)

PANEL DATA EQUATIONS

The following equations have been developed to test the variables of the study:

$$ROA_{it} = \beta_{\circ} + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 RCE_{it} + \beta_4 CEE_{it} + \mu_{1it}$$

$$ROE_{it} = \beta_{\circ} + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 RCE_{it} + \beta_4 CEE_{it} + \mu_{2it}$$

DATA ANALYSIS

This study has analyzed the data using multiple regression analysis. Hausman test is applied for model specification (see inter alia Arslan &

Zaman, 2014; Mondal, 2016; Sharma & Naqvi, 2017) and paired sample T test for mean comparisons in line with extant literature e.g., Arora and Marwaha (2014), Feng, Huang, and Ma (2017), Khan and Masrek (2017) and Wickramasinghe and Wickramanayake (2013).

IV. RESULTS AND DISCUSSION

TABLE 2

Multiple Regression Analysis

Variables	**Food & Personal Care Sector**		**Textile Sector**	
	Model			
	1	2	3	4
Dependent Variables	Return on Assets	Return on Equity	Return on Assets	Return on Equity
Independent Variables	Coefficient (Robust Estimates)	Coefficient (Robust Estimates)	Coefficient (Robust Estimates)	Coefficient (Robust Estimates)
Constant	-0.0784	-0.3.2875	0.3855	-2.0990
HCE	-0.0298	-5.7778***	0.3478***	-0.7112
SCE	0.4470***	0.9316	-0.0358	1.2889
RCE	-0.0001	0.0009***	-0.0002	-0.0001
CEE	19.9704***	101.1527***	6.6865*	94.0979**
Adj. R-squared	0.8637	0.8397	0.4108	0.6339
Wald Chi2	414.74***	262.69***	43.83***	9.519134***

***Significant at 0.01 level, **Significant at 0.05 level, *Significant at 0.10 level.

Table 2 shows that researchers have developed separate models for each of the two related sectors[1]. Researchers have presented robust estimates for heteroskedastic free standard errors. From empirical evidence of Model 1 related to food & personal care sector, it can be observed that there is significant and favorable influence of SCE on selected firms' ROA, as P value is less than 0.01. However, the same is not true about the other two components i.e., HCE and RCE, thus H_1 is

[1] Results of regression analysis, both for Random and fixed effect models, have been presented in Appendix C.

partially confirmed. CEE also has significant positive influence on ROA of firms at 1% level, which confirmed H_2. Adjusted R square is good and shows that independent variables are able to explain 86.37% variation in ROA. Value of Wald chi2 is 414.74 which is significant at 1% level.

The results of Model 2 demonstrate significant impact of HCE and RCE on ROE of the firms, which partially confirms H_1. However, a negative relationship is found between HCE and ROE of the firms which is consistent with the study of Hitt, Bierman, Shimizu and Kochhar (2001). Negative coefficient of HCE recommends food & personal care firms not to spend excessively on salaries, bonuses, training, and other benefits to their employees as this study suggests a negative impact of such funding on ROE, which is in line with existing literature (Gunawan & Ramadhani, 2018). The effect of CEE on ROE is found to be significant positive at 1% level, which confirms H_2. Value of adjusted R square indicates that independent variables can explain 83.97% variation in ROE. Wald chi2 shows the goodness of fit the model at 1% significance level.

Model 3 and Model 4 are related to the textile sector. The empirical results for Model 3 show positive significant impact of only one component of ICE namely, HCE on ROA of the firms, which partially confirms H_1. The role of CEE is found significant as well as positive at 10% level, which fully validates H_2. Value of adjusted R square demonstrates that independent variables can explain 41.08% variation in dependent variable. Wald chi2 shows goodness of fit model at 1% level of significance. These empirical findings suggest that textile firms have utilized their human capital and capital employed in an efficient and effective way. Findings of Model 4 show significant impact of CEE on ROE of the firms which confirms H_2. The empirical results do not show any significant impact of HCE, SCE and RCE on ROE, which means that H_2 cannot be confirmed for this model. Value of adjusted R square reveals that independent variables are able to explain 63.39% variation in ROE. Wald chi2 also shows that the model is of good fit at 1% significance level.

TABLE 3

Results of Hausman Test

Sectors	**Food & Personal Care Sector**		**Textile Sector**	
Models	Model 1	Model 2	Model 3	Model 4
Dependent variable	ROA	ROE	ROA	ROE
Chi Square (P values)	0.2624	0.0000	0.5146	0.0113
Model Applied	Random Effect Model	Fixed Effect Model	Random Effect Model	Fixed Effect Model

Researchers have applied Hausman test to select the appropriate model for regression analysis. The results of Hausman test are interpreted in a way that if P value is found to be greater than 0.05, random effect model should be used. On the other hands, where, P value is lesser than 0.05, then fixed effect model needs to be used. Based on the results of Hausman test, appropriate models have been applied in regression analysis the findings of which are given in Table 2.

PAIRED SAMPLE T TEST

This study has used the paired sample T test to check the difference between average scores of MVAIC performance of the firms in the food & personal care and textile sectors.

TABLE 4

Paired Sample T Test Results

Method	**Value**
T-Statistic	2.828781***
Average MVAIC Scores	
Food& Personal Care sector	440.9704
Textile sector	2399.308

***significant at 1% level

The results of Table 4 show that there is significant difference in the performance of MVAIC of the two selected sectors. The findings of the study confirms H_3 that there is significant difference in the scores of MVAIC model. Furthermore, mean value of food & personal care

sector's firms is lesser than that of the textile sector firms. A possible reason is that textile is the biggest export sector of Pakistan and provides employment opportunity to 40% of industrial labor force (Economic Survey of Pakistan, 2017-18). In order to increase the share in exports, majority of the textile firms are focusing on innovation, value creation and unique products to satisfy the demand of local and foreign customers. As a result, IC performance in this sector has improved significantly.

V. CONCLUSION

In an economy relying on knowledge, human capital, structural capital and relational capital are regarded as strategic assets for an organization. In this regard, knowledge based firms tend to invest a significant proportion of their wealth in the form of these strategic assets. These assets are collectively known as intellectual capital (IC). Literature identifies different measures to quantify intellectual capital. For instance; questionnaire, balance scorecard and fuzzy approaches have been used by different researchers, such as; Kojori et al. (2013) and Sharabat, Jawad and Bontis (2010). In this study, researchers have investigated the role of intellectual capital and capital employed in financial performance of the food & personal care and textile sectors of Pakistan using modified value added intellectual coefficient (MVAIC) model. The MVAIC model is frequently used in the literature for measuring intellectual capital performance (e.g., Mondal, 2016; Ulum et al. 2016).

In present study, researchers have developed four models (two for each sector) for comparative analysis. Findings of the study demonstrate that financial performance is mostly influenced by capital employed efficiency (CEE), which is followed by human capital efficiency (HCE). Results of the study are found to be consistent with the previous literature (Calisir et al., 2010; Deep & Norwal, 2014; Dženopoljac et al., 2016; Nimtrakoon, 2015). The findings indicate that both sectors have invested a significant proportion of their wealth in the form of capital employed. Some findings of the study reveal mixed trend. For example, in food & personal care sector, human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed efficiency (CEE) have shown significant and positive association with return on assets (ROA) and return on equity (ROE) of the firms. Whereas in textile sector, HCE and CEE have demonstrated a significant and positive impact on financial

performance of the firms. However, no significant association has been found among structural capital efficiency (SCE), relational capital efficiency (RCE) and financial performance of textile firms.

LIMITATIONS AND FUTURE RECOMMENDATIONS

There are certain limitations associated with this study. The first limitation is the relatively small sample size used in the study as it was based on only two sectors from the manufacturing category. Therefore, findings of the study may only be generalizable to manufacturing sector of developing countries like Pakistan. In addition, intellectual capital measurement was limited to MVAIC model, instead of other measures like balance scorecard, and questionnaire survey. These limitations can be addressed in future research in this area. In addition to larger sample size and application of different research methods, future researchers may conduct similar study for comparing the intellectual capital performance of different countries at international level. Moreover, intellectual capital performance can also be measured by comparing government and private organizations.

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Appendix A

Total Population

Sectors	Total companies listed
Food & personal care sector	56
Textile sector	21

Appendix B

Sample

Serial No.	Food & Personal Care Sector	Textile Sector
1	Engro Foods Ltd.	Blessed Textile Limited
2	Good luck Industries Limited	Gul Ahmed Textile Mills Limited
3	Mithchells Fruit Farms Limited	Ishaq Textile Mills Limited
4	Nestle Pakistan Limited	Mehmood Textile Mills Limited
5	Rafhan Maize Products Co. Limited	Nishat Mills Limited
6	Treet Corporation Limited	Sapphire Textile Mills Limited
7	ZIL Limited	ZahidJee Textile Mills Limited

Appendix C

Regression analysis results

The tables given below provide detail of the results of regression analysis using both fixed effect model and random effect model.

Variables	Food & Personal Care Sector			
	Model 1		Model 2	
Dependent variable	ROA		ROE	
Independent variables	Coefficient (Robust Estimates)	Coefficient (Robust Estimates)	Coefficient (Robust Estimates)	Coefficient (Robust Estimates)
Constant	-2.1571	-0.0784	-3.2875	-0.7389
HCE	-0.3651	-0.0298	-5.7778***	-5.7721***
SCE	0.6925*	0.4470***	0.9316	0.5537
RCE	-0.0001	-0.0001	0.0009***	-0.0037
CEE	21.6543*	19.9704***	101.1527***	113.0898**
Adj. R-squared	0.8426	0.8637	0.8397	0.9108
Wald Chi2	734.33**	414.74***	262.69***	262.69***
Model Applied	Fixed Effect Model	Random Effect Model	Fixed Effect Model	Random Effect Model

***Significant at 0.01 level, **Significant at 0.05 level, *Significant at 0.10 level

Variables	Textile Sector			
	Model 3		Model 4	
Dependent variable	ROA	ROA	ROE	ROE
Independent variables	Coefficient (robust estimates)	Coefficient (robust estimates)	Coefficient (robust estimates)	Coefficient (robust estimates)
Constant	3.2887	0.3855	-2.0990	-9.4775*
HCE	0.2222	0.3478***	-0.7112	0.4249
SCE	-0.2462	-0.0358	1.2889	0.4343
RCE	-0.0004	-0.0002	-0.0001	-0.0010
CEE	10.7260	6.6865*	94.0979**	115.6877*
Adj. R-squared	0.1263	0.4108	0.6339	0.7134
Wald Chi2	7.79**	43.83***	9.51***	19.28***
Model Applied	Fixed Effect Model	Random Effect Model	Fixed Effect Model	Random Effect Model

***Significant at 0.01 level, **Significant at 0.05 level, *Significant at 0.10 level

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THE ENTREPRENEUR'S QUEST: A QUALITATIVE INQUIRY INTO THE INSPIRATIONS AND STRATEGIES FOR STARTUPS IN PAKISTAN

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Abstract. For rapidly urbanizing Pakistan, entrepreneurial activity is a critical source of employment and economic development. This study adopts a qualitative approach to investigate what drives an entrepreneur's decision to establish a business and which elements of a city may possibly nurture the growth of new firms. The study explores the entrepreneurs' perspectives on the factors that lead to the successful growth and expansion of small and young firms. The study also presents reform proposals in public and urban policies that would enable a conducive environment for entrepreneurship. The results are based on focus group discussions with IT sector entrepreneurs in the two largest cities of Pakistan: Lahore and Karachi.

Keywords: Entrepreneurship, knowledge spillovers, urbanization, cities, public policy, startups

JEL Classification: J48, K20, L26, L53, M13, O32

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I. INTRODUCTION

This paper is aimed at exploring factors that drive the creation and the subsequent expansion of small and young firms. Knowledge spillover and urbanization in conjunction with entrepreneurship, particularly firm entry and consequent expansion of small and young firms, is key to job creation, innovation and productivity improvement. An understanding of how to enhance creation and expansion of small and young firms can be helpful for entrepreneurs, policy makers and the academic community. Entrepreneurship remains an under-researched area in the field of urban economics (Glaeser, Rosenthal & Strange, 2010). This may partially be attributed to the dynamic nature of the entrepreneurship phenomenon. The knowledge spillover theory of entrepreneurship (KSTE) argues that the ability of knowledge intensive environments to foster new ideas can create entrepreneurial opportunities and their commercialization, leading to urban success (Audretsch, Belitski and Korosteleva, 2019). Urban environments are particularly conducive to entrepreneurial activities, innovation and growth because of agglomeration economies (Jacobs 1969). Different competencies and financial resources are more accessible in cities, allowing for denser information flows and market proximity (Acs et al. 2009). Hence, literature finds a two-way relationship between cities and knowledge-driven entrepreneurship. While urbanization has vast potential for social and economic development, the urbanization process also poses serious challenges (Glaeser 2012). Some of these challenges include traffic congestion, higher crime rates, pressure on urban services, and the spread of disease. The twenty first century will witness the movement of 5 billion people into cities—more than half of which will be in Asia. So, it becomes important to investigate how cities can support or hinder entrepreneurship.

The growth rate of employment creation by small and young firms is higher as compared to large corporations (Decker et al. 2015). Identification of factors that influence creation and expansion of small and young firms can be useful for employment generation and improving the quality of life in urban centers (Glaeser. et al. 2010, Backman & Lööf, 2015). Building on Knowledge Spillover Theory of Entrepreneurship (Acs et al. 2009, Audretsch & Keilbach, 2007, Audretsch & Lehmann 2005), this paper attempts to contribute to the

discourse on entrepreneurship through qualitative insights by analyzing perspectives of entrepreneurs about the role of various sources of knowledge spillover and constraints being faced by them. This paper specifically attempts to analyze the entrepreneurial process of young firms (3 to 5 years) in the information technology (IT)sector of the two largest cities of Pakistan, namely Karachi and Lahore. It also sheds light on the strategies that may help startups in scale up and how cities can promote entrepreneurship.

The remaining study is organized as follows: Section II presents a literature review; Section III outlines the research design employed for the study; Section IV discusses the key characteristics of focus groups and select cities; Section V describes the findings and analysis of focus groups; and Section VI concludes.

II. LITERATURE REVIEW

Traditionally, research and theory in entrepreneurship were built using quantitative analysis, which may sometimes not capture the real-world interplay of knowledge spillover and other related issues relevant to entrepreneurship. Considering the role of tacit knowledge, quantitative data has limitations and forges aggregation biases in capturing knowledge spillover. Suddaby, Bruton, & Si (2015) explain that while the quantitative approach has helped in accumulating knowledge, it also undermines many subjective and reflexive aspects in the theoretical process leading to missing elements within the endogenous entrepreneurship theory. Peters and Waterman (1982), for example, have inspired research that fills this gap by compiling an account of successful American corporations. Their study was based on extensive interactions with different levels of management and front desk employees of various corporations. The study found how customer care, autonomy of front-desk officials, and eagerness for experimentation led to success of those companies. The unique individualistic narratives of success of those corporations could not have been captured in quantitative data or financial indices. Simpeh (2011) has compiled an outline of different dimensions of entrepreneurship theories including sociological and psychological aspects among others, which highlights the need for qualitative and interdisciplinary research in entrepreneurship.

Compared to developed countries, governments and firms in developing countries do not invest much in knowledge creation. Property rights are also not very strong in the latter. In this context, the incentives and factors affecting entrepreneurship may be different in the developing world. Leff (1979) explains that a key function of entrepreneurship in developing countries is to mobilize factors such as capital and skilled labor which might otherwise not be supplied or allocated to the activities where their highest productivity is unleashed. In this context, the necessity of well-functioning markets to facilitate the entrepreneurial process has been recognized in many countries, and governments have worked substantially on improving markets and removing barriers to entrepreneurship and other market failures. It is imperative, however, that urban policy be designed to ensure that positive externalities (knowledge, network and demonstration) flourish and assist in the growth of entrepreneurship.

Young incumbent firms grow more rapidly and undertake risks that often lead to more innovation (Wadho, Goedhuys & Chaudhry, 2019). Thus, it becomes important to understand the perspectives of entrepreneurs running small and young firms. There has been relatively little focus in research on qualitative techniques to understand entrepreneurship; insights through such techniques can bring forward important perspectives and many aspects which remain hidden through a country or city level analysis of quantitative data. Williams, Shahid & Martinez (2016) surveyed 300 informal enterprises in Lahore and shared how the motivations for informality display heterogeneity and instead of compliance cost, informality is driven by the nature of entrepreneurs and enterprises. Considering a sizeable informal economy in Pakistan, this was an important finding as this result counters the traditional view that the informal economy is a direct result of high regulatory compliance costs.

The initial years of a startup or business firm are important to raise investment and gain customers. A study conducted by the World Bank has found "the early stage capital gap", in which entrepreneurs highlighted the challenges posed by limited financing due to a lack of venture funding. The same study has also reported: "the stakeholders interviewed for this study unanimously highlighted the unfriendliness of the current policy and regulatory environment" (World Bank, 2019).

However, the study mainly analyses such regulatory barriers in the case of investors and venture funds. There was also no discussion on urban policy and governance issues that directly affect startups and IT firms in any city. The current study attempts to further unravel the influences of urban policies and governance on starting and expanding a firm.

There is substantive literature on drivers of entrepreneurship in Pakistan that highlights the importance of research and development expenditures, and government stability (Rasool, Gulzar & Naseer, 2012). Sector, city and cluster level studies provide important insights about entrepreneurship, innovation and expansion of firms (e.g. for textile sector innovation: Wadho and Chaudhary, 2016). Many city level dynamics are active in Pakistan such as presence of skilled and creative workforce, education level and urbanization trends (Iftikhar, Ahmad & Audretsch, 2020). Agglomeration and urbanization also play an important role; firms prefer to start their operations where there is concentration of similar or diverse firms. This may be helpful for firms to gain from knowledge spillovers and business-to-business (B2B) contracts (Haroon & Chaudhary, 2014). Personal perspectives of entrepreneurs can lead to a deeper understanding of the dynamics associated with entrepreneurship. Nishat & Nadeem (2016) have found that personal contact with successful entrepreneurs reduces the risk of failure among potential entrepreneurs. However, the study had limitations as it only pointed out that direct contact reduces the fear of failure but could not explain whether such personal contacts could lead to knowledge spillover from incumbent entrepreneur to potential entrepreneurs.

A strand of literature also explores entrepreneurial intentions and entrepreneurial education (Ahmed, Chnadran & Klobas, 2017). Pakistan has witnessed a rise of public and private national incubation centers recently. It is important to understand perspectives of entrepreneurs about how they have gained knowledge and mentoring from such programs by university based and other entrepreneurial education programs. Such incubation centers may also help in developing social capital of entrepreneurs. Social capital has been found to be an important contributor of entrepreneurial success (Khan, 2020).

Haque (2007) examined entrepreneurship in Pakistan and used focus groups with businessmen to collect their perspectives about the

challenges they face. The study found that many of the businesses in Pakistan lack innovation and are being operated as inherited property. The businessmen also shared constraints such as unfavorable legal framework, corruption, lack of financing and unfriendly city management. The focus groups were conducted in four cities of Punjab and participants were selected from various industries without any constraint with regards to the age of the firm in question. The current study differs in two ways; one, it is concerned with young firms and two, it considers specifically the IT sector.

There is not much literature in Pakistan that attempts to understand the motivations of entrepreneurs, especially in the IT sector. There is an understanding that entrepreneurial intentions play an important role in the entrepreneurial journey. However, the motivations that trigger someone to pursue entrepreneurship remains a scarcely explored dimension in the literature. Similarly, there is room to further investigate the formal and informal sources of knowledge for Pakistani entrepreneurs. Secondly, urban policy and governance have not gained traction as important contributors to varying performance of entrepreneurs across different cities of Pakistan. Third, there is a high rate of failure amongst IT startups in Pakistan and in general; this warrants an exploration into why some small firms and startups perform better than others. Existing literature revolves around regulatory constraints, but we rarely come across discussion on management practices, which can be helpful at an early stage of a firm. What are the motivations, personal perspectives and experiences of entrepreneurs? What are the city level dynamics that might explain their success or failure? Insight to such questions can contribute to the scholarship on entrepreneurship and may inform public policy.

III. RESEARCH DESIGN

The key research question is: What drives firm creation and expansion in major cities of Pakistan? Focus group interviews for this study were conducted with IT sector entrepreneurs, based in the two largest cities of Pakistan namely Karachi and Lahore. The IT sector was selected due its emerging presence in Pakistan. There has been much debate in academic as well as policy circles about the rise of this sector as well its domestic growth and export potential. However, there have been many cases of

failure; moreover, many IT startups opt to leave Pakistan and set up shop in other countries in search of favorable and promising business environments. Lahore and Karachi are the main hubs of IT activity. These cities are selected due to the ease in identifying IT sector firms and due to a stronger presence of IT sector entrepreneurs. Respondents were chosen through Pakistan Software Houses Association (P@SHA). Such organizations play the role of gatekeeper in research regarding identification of respondents for interviews and FGDs. Focus groups are effective in understanding collective perspectives of participants through discussions on motivations, priorities, experiences, and reflexivity. FGDs were chosen as the method of information in this study as they help to gain an understanding of perspectives through interaction amongst similar participants which may not be obtained through individual interviews. FGDs have the advantage that they allow participants to explore and clarify ideas with each other, which provides checks and balances on various perceptions and opinions. They allow for an in-depth exploration of cultural norms, attitudes and opinions, and help bring out shared values. The participants influence each other through their ideas and experiences and the moderation also helps to stimulate conversation required on key questions (Freitas, Oliveira, Jenkins & Popjoy, 1998).

The key advantage of FGDs is the interaction amongst participants of focus groups and the role of the moderator. Literature also discusses pros and cons of the level of engagement of the moderator e.g. active or passive. Morgan (1996) explains three essential components of focus groups: (1) its purpose i.e. data collection (2) interaction amongst the group as a source of data, and (3) the researcher's active role in facilitating the group discussion. He also highlights other additional dimensions and forms of focus groups, but the three components measured above hold a key position in this regard. The process of focus groups was conducted in four phases: (a) planning for participant selection and elaboration of key questions, (b) organizing and conducting focus group sessions, (c) transcription of sessions, and (d) analysis. Semi-structured focus groups were conducted in order to explore perspectives of entrepreneurs beyond a priori expectations. A priori codes have been identified in the Appendix. A few broad questions and probes for focus groups are described below.

How (and where) do entrepreneurs acquire ideas and knowledge about starting and growing a business?

Discussion in the focus group started with this broad question and was followed by supplementary questions: Did you come up with the idea about the business and firm creation while working in another organization? Did anyone help you identify a business idea and then expand it? Have you ever registered or reviewed a patent document relating to your business concern? Was there any research by any other organization (public or private) that you found helpful? What kind of support did you get from family members, friends, colleagues and employees for starting a business and then learning new ideas to expand the business?

The aforementioned and following questions were posed to the participants since the purpose was to shed light on research regarding the role and sources of knowledge required to start a business.

What are the key factors and practices that helped in the survival and growth of the businesses/startups?

Many businesses fail in their initial years. If you have succeeded, what about your approach made you successful? What are some of the managerial or business practices which have helped you? Where did you learn those practices and ideas? Should the government focus more on research for your business area or should it strive to fulfill infrastructure requirements such as energy and roads among others?

What is the role of urban policies and design on firm performance?

Why have you set up your business in this city? What are the advantages and disadvantages of doing business in this city? How effective is this city in inspiring business ideas and how has it facilitated you in finding resources to work on your business ideas? Have you ever considered shifting your business to another city? Why or why not?

The replies of the entrepreneurs to this particular question were useful in explaining whether urbanization and city dynamics play a moderating role for knowledge spillovers.

What urban policy changes can be conducive for business?

Should this city focus more on urban transport or housing? How do these issues affect your businesses? What do you think about internet facilities in this city? Are there enough places and forums where businessmen meet with each other and professionals to discuss business issues? How can the city government enhance learning opportunities which will be helpful to you and to your employees?

This question was posed to the participants in order to understand their perspectives regarding key policy changes required to promote entrepreneurship.

IV. KEY CHARACTERISTICS OF FOCUS GROUPS AND THE TWO CITIES

Three focus group interviews were conducted in each city in year 2018. 6-12 entrepreneurs participated in each group and a total of 55 entrepreneurs were interviewed in this process. Each focus group interview lasted for 60 minutes. Owners of domestic small and medium enterprises in the IT sector were invited to participate. As a token of appreciation, a small gift was given to participants and they were apprised in advance, through invitation letters, about this study, expectations of the researcher, and potential benefit for entrepreneurs in the form of collective learning. Members of the focus groups were selected based on the criterion that they have a small business that has survived for at least three to five years. The approval for research with human subjects was obtained from the University of Delaware[1].

Table 1 shows similarities and contrasts between the socio-economic profiles of the two cities.

TABLE 1

Economic and Social Profile of Karachi and Lahore

Key Indicators of Socio-Economic Profile of Cities	Karachi	Lahore
Province	Sindh	Punjab
Sea Port	Yes	No

[1] The first author was enrolled as a PhD student at the University of Delaware

Total Population in 2017 (Millions) Source: Pakistan Census Data 2017	14.91	11.13
Increase in Population in 2017 since 1998 census Source: Census Data 2017	59.65%	116.3%
Area (Sq.Km) Source: Census Data 2017	3,527	1,772
Total Number of New Limited Liability Companies (from 2002 to 2015) Source: Securities and Exchange Commission of Pakistan (SECP)	10,696	13,902
Employment in Finance, Business, and Technical/Engineering Professions as a percentage of total employment Source: Global Cities Extract for the World Bank	4.72%	4.12%
Industry Employment as percentage of GDP (2015) Source: Global Cities Extract For World Bank	34.72%	34.57%
Labor Force with Secondary Education as a Percentage of Total Labor Force (2015) Source: Labor Force Survey of Pakistan	23%	20%
Labor Force with Tertiary Education as Percentage of Total Labor Force Source: Labor Force Survey of Pakistan (2015)	10%	10%
Net Migration Rate (Per Thousand population) Source: AERC calculations based on LFS (2010-11)	141	176
GDP Per Capita 2015 (US$)	1,910	1,864
Labor force participation Source: PRIME (2018)	38.0%	37.9%
Metropolitan Competitive Index (Islamabad ranks first with 0.744 score, higher score is better) Source: PRIME (2018)	0.450	0.503

It may not be possible to generalize the findings of focus groups in this study due to limited representation. However, a few important dimensions of outcomes of focus groups may contribute to the analysis in five ways. First, focus groups provide contextual and personal narratives about entrepreneurial activity. Second, they capture the collective perspective about sources of knowledge including urban design and policies. Third, most entrepreneurship studies focus on constraints to entrepreneurship, however little is known about how small businesses grow and survive. This aspect has been discussed in focus groups and effort has been made to identify the defining factors for growth of small business following Peters and Waterman(1982) who highlighted successful business practices in US firms. Fifth, the literature identifies tacit sources of entrepreneurial knowledge in agglomeration economies

which have been explored through focus groups. Chen, Zou, & Wang (2009) have also highlighted how soft skills and networks nurture growth in small ventures. So the findings of this paper may be helpful for academics, policymakers and entrepreneurs.

V. FINDINGS AND ANALYSIS OF FOCUS GROUPS

This section discusses the data obtained through six focus groups, 3 each in Lahore and Karachi. These two cities are the most populated and industrialized cities of Pakistan. They are under different provincial jurisdictions and are the pioneering grounds for IT based entrepreneurship in the country. The same set of questions was posed to all focus groups in both cities. This section is divided into four subsections based on the four primary questions and topics discussed in the focus groups. Names of entrepreneurs are not mentioned in the analysis and each entrepreneur was given a code. Entrepreneurs occupied numbered seats for the focus group discussions. The first letter denotes city (L for Lahore and K for Karachi), the first digit represents the sequence of the focus groups (there were 3 groups in each city), and the last digit represents the seat number that an entrepreneur occupied during the focus group discussion. Thus, if an entrepreneur participated in the second focus group in Lahore and was sitting on the fourth seat, he/she was assigned the identifier L.2.4. If an entrepreneur in Karachi participated in the third focus group and was sitting on the seventh seat, he/she was assigned the identifier K.3.7.

IDEAS, KNOWLEDGE AND INSPIRATION TO START A BUSINESS

This section explores perspectives and insights into how (and where) entrepreneurs acquire ideas and knowledge about starting a business and the operational and decision-making process of starting a business. Literature reports that educational achievements and patents may be considered as sources of knowledge for starting a business. Discussion in the focus groups, however, revealed that patents may not hold much significance as a source of knowledge. Similarly, there was no mention of the role that research and development by the public or private sector might play in encouraging startups. However, they reported other sources

of knowledge and ideas that contributed to their process of starting a business.

In contrast to the a priori codes, most entrepreneurs narrated how their business idea was inspired by a problem or issue in their surroundings. They confronted a problem either by themselves, with people around them or during an interaction in the market. A scholar may call it a gap in the market that entrepreneurs identify. However, entrepreneurs considered it as a problem to be solved through their business ideas. An entrepreneur (K.3.9) who started an e-commerce platform for trading fabrics described, "*The basic problem in the online business of fabrics was customer frustration"*. His response to this problem took the shape of firm creation as he decided to resolve this issue in the market. Another entrepreneur (K.3.2) who established an online platform for matching businesses and freelancing workers said, *"The idea generated when I outsourced my own work to somebody"*. He encountered a problem in dealing with his supplier and it motivated him to address this issue by matching clients and outsourcing industry according to their mutual requirements. Similarly, an entrepreneur (K.3.3.) said, "*Ideas are derived from needs. When an entrepreneur finds that there is a need for a product or service in their surroundings, he/she starts working on it*".

Many entrepreneurs reported a similar personal experience of observing a problem and then trying to solve it. An entrepreneur (K.3.4.) who is involved in banking and financial solutions said:

"I think ideas are based on experiences that you gain through travel and meeting people. Ideas arise when one comes up with alternate means of performing a task. Ideas usually come from experiences. They may arise when you work with someone, they may arise when you go out with the kids at the shopping mall or the park. You find ideas from what is happening around you."

The above statement highlights the importance of confronting a problem or challenge and a subsequent response to addressing the problem in question. However, it also shows the spillovers of working in other organizations or setups as people get ideas from their jobs and then try to exploit them by forming their own businesses. This aspect also appeared as a consistent theme in all focus groups. An entrepreneur

(L.2.5.) said, *"My previous job enabled me to acquire the right skill set which geared me up to start a business and groomed me to confront the challenges that I faced when running the business"*. An entrepreneur (L.3.2.) shared that when he decided to start the business, he talked to his ex-employer and proposed a B2B relationship. Thus, it shows that existing work and job experience feeds the potential entrepreneur. But it is clear from the analysis of the focus group data that there is indeed diversity in motivation, reasons, and ideas to start a business. An entrepreneur (L.2.2), for example, said that he entered into business immediately after graduation and the motivation was that he wanted to venture into something different.

As mentioned earlier, problem solving was a consistent theme. An entrepreneur (L.2.3) shared that he came up with the idea to improve Kidney Dialysis Machines after his Aunt and Uncle died. He shared:

"I watched my Aunt and Uncle suffer many diseases due to unsafe kidney dialysis machines in Pakistan. That is when I realized patients in Pakistan requiring dialysis were exposed to health risks due to poor quality of kidney dialysis machines. I observed that there were no alternatives. I was working in a similar industry in the US and knew that the technology used in dialysis machines in the US was decades ahead of the obsolete and cheap technology Pakistan was relying on. After my Aunt and Uncle died, I moved back to Pakistan and decided to develop technology to introduce state of the art dialysis machines in Pakistan at an affordable price for a developing country."

Thus, in this particular case, confronting the problem was not enough and there was still a need for knowledge stock and ideas which came from his work experience in the US. Many entrepreneurs also said that they look around the world especially the US market and observe the latest occurrences and activities there. Then they try to replicate or build on the same idea. However, this may only be true for sectors like IT and it may have limited generalizability to other sectors. An entrepreneur (L.1.7) said that her nephew's blindness led her to develop new gadgets for the blind. After observing the problem, she confronted it by discussing it with people with special needs to gauge their requirements and design solutions for them. This shows that the entrepreneur in this case was sensitive to what was happening around her and it led her to set

a business to provide entertainment and learning opportunities to blind children.

Given that IT is one of the most knowledge-intensive sectors, it was expected that the entrepreneurs would be drawing knowledge from research-oriented initiatives and universities, however, this only applied to a few cases. An entrepreneur (L.2.5.) said: *"LUMS (Lahore University of Management Sciences) taught us business development and many of the lessons and insights I gained during those classes have proven to be of core value in running my business"*. One of the entrepreneurs (L.3.2.) shared that they found research papers of a professor from Washington DC who was working on the same idea that they wanted to commercialize. They approached the professor with a request to explain the paper in detail as they had difficulty in understanding it. In this case they found the relevant work but had to resort to interaction for a deeper understanding. Similarly, an entrepreneur (L.2.5.) who was working on virtual reality said that at some stage he was stuck and could not find a solution to the problem he was confronting. He then approached his former teacher who informed him about a paper by a Stanford professor. That paper indeed helped the entrepreneur to develop his idea further. This highlights the process of knowledge spillover. It is important to understand that in this case a personal connection played an important role in helping the entrepreneur reach the required information and knowledge. Thus, human to human interactions are essential for knowledge spillover. It is widely understood that uncodified knowledge is transferred through personal connections. In this case, even codified knowledge was transferred through both personal and digital connections.

A few entrepreneurs also acknowledge the role played by friends. An entrepreneur (L.3.5.) said, *"I think the fact that we started this initiative with friends is an important aspect behind the success of our business. Moreover, support from family is common for startups especially at the early stage."* Pakistani society is structured around families and personal connections, which carry weight for starting a business. A study by Qidwai et al. (2017) pointed out that "…in a joint family, the family has been more dependent on the decision-making powers of the elderly members of the family as compared to the ones who are living separate from their parents and almost all the areas of their lives have been contributed to by them". Many entrepreneurs reported that they discussed

ideas with friends and family members to refine them and to get new knowledge.

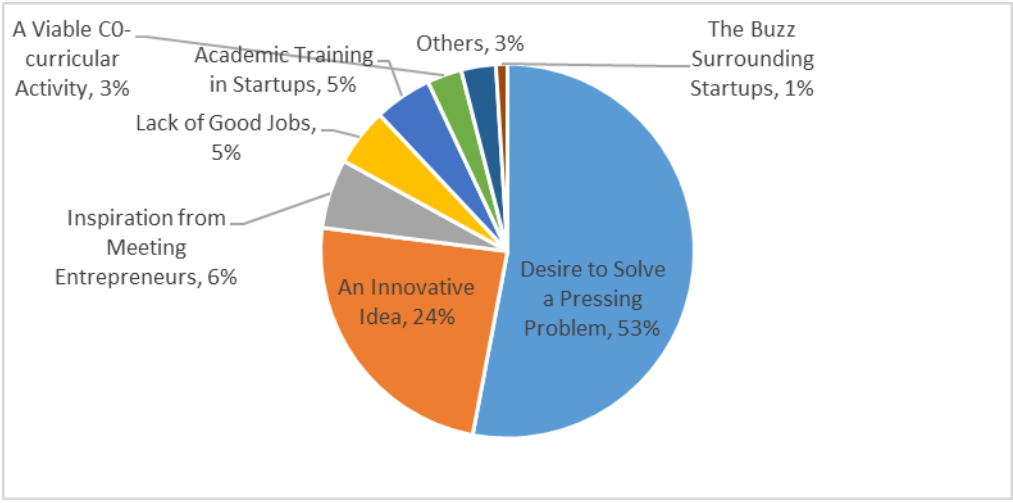
Regarding the process of starting a business, only a few complained about hurdles in the business registration process. Starting a business is considered an important indicator in World Bank's Ease of Doing Business Report and governments have been focusing on reforms in this area. But its impact on entrepreneurship is debatable. One entrepreneur (K.2.1.) opined, *"The barrier to entry is very weak in Pakistan"*. Some entrepreneurs however did talk about other regulatory problems (discussed later) but it was clear that once they have an idea, they observe their surroundings and try to test it before starting a business. Some of them discussed with peers and colleagues while others focused on market research. This finding was in line with the Austrian school of economics which postulates that entrepreneurs learn from interactions with the market. An entrepreneur (K.2.2.) who started a portal for e-books said: *"We conducted market research to gauge the demand for an e-book portal. It was very useful since we came across a couple of good opportunities. Eventually we pitched the idea to some investors and were successful."*

One entrepreneur (L.3.2.) got the idea to turn his hobby into a business. He was a motorcyclist in California and decided to start a motorcycle business in Pakistan. These diverse perspectives were interesting as they showed that it is not possible to generalize the sources of knowledge or the process of starting a business. The diversity in experiences of entrepreneurs makes a strong case for qualitative research in entrepreneurship. Another entrepreneur (K.1.4.) started a business because he felt that he could not utilize his creativity fully at his previous job.

A survey conducted by the Social Innovation Lab (SIL) in 2018 reports the following results based on responses by 200 startups from sixteen cities of Pakistan:

FIGURE 1

Founders' Motivation to Establish Startups



Source: SIL (2018)

Figure 1 corroborates the results of the focus groups conducted in this study. It shows the popularity of the various reasons or motivating factors that inspired entrepreneurs to start their businesses. A majority of entrepreneurs reported "desire to solve a problem" as their motivation to establish a startup. However, the second most common motivation is the entrepreneur striking "an innovative idea". If we combine categories of "an innovative idea" and "academic training in startups", it reaches 29% in the above pie chart.

Thus personal interactions, previous jobs, and personal motivations play a role in driving entrepreneurship. However, the dominant theme in these focus groups was that in Pakistan many entrepreneurs recognized a problem and tried to provide the solution. Many people may come across the same dilemma but may not think of starting a business to solve it. An entrepreneur when confronting the same problem would create a business solution. This points to an important dimension of entrepreneurship which is the unique personality of the entrepreneur. This also highlights the importance of understanding behavioral aspects of decision-making by entrepreneurs and what makes them different. This is beyond the scope of this study, but some experimentation and research can enhance the body of knowledge further.

KEY FACTORS AND PRACTICES FOR FIRM SURVIVAL AND GROWTH

The endogenous growth theory highlights the role of knowledge spillovers among incumbent firms that lead to the expansion of firms and ultimately enhance economic growth in a society. This section explores answers to the questions: What helps businesses in expanding and flourishing? What are the key factors and practices which support firms in growing during initial years of their establishment?

Other than a priori code, an emerging theme in the discussion was centered on client/customer care or need. Many entrepreneurs reported that the key to their survival and growth can largely be attributed to client care. An entrepreneur (K1.1.) said; *"In my opinion the most important factor is the value you give to the customer".* Another entrepreneur (K.3.8.) said: "*Keep a good relationship with them (clients)*". Hence the entrepreneurs discussed various aspects of dealing with and managing clients in order to survive and succeed in the business. An entrepreneur (K.1.1.) highlighted that working with large businesses really helps young firms. He said, *"If you are working with an established brand and providing quality services within a given time, it multiplies your business".* It seems like a good strategic choice and it points to the diversity of factors that shape the growth of a firm.

After client-related practices, the second most discussed factor for the survival and growth of a business was patience and persistence. Entrepreneurs shared stories of the hard times they faced during the initial years of business. They expressed how patience and commitment proved vital for their survival. An entrepreneur (K.2.4.) opined: "*The passion needed to run a business is what helped us survive"*. Failure also played an important role as learning key lessons helped entrepreneurs make better decisions in subsequent ventures.

The third most discussed factor was financial management. Many entrepreneurs mentioned that prudence in spending was a major factor in survival and growth. Some entrepreneurs said that they did not have any finances when they started commercializing their ideas. The fact that they had to raise everything from scratch taught them valuable lessons in financial planning and this proved to be a crucial ingredient for their success. An entrepreneur (K.2.1.) said: *"We focused on strategically*

minimizing costs and this proved to be a highly beneficial approach. Better financial management helped in the long term". However, it is difficult to ascertain whether too much focus on prudence is a good practice. Sometimes it may lead to avoiding essential expenses on human resources, research as well as marketing. Thus, a one-size-fits-all financial management practice is not good for businesses and the best financial management practice is often figured out while in operation.

A few participants considered that a good team is vital for business survival and growth. An entrepreneur (K1.2.) said: *"In hard times, the most important support comes from your team and not from finances"*. An entrepreneur (L.2.5.) said: *"The team factor is vital for business development"*. It may be interpreted that the teams are not only good for implementing ideas but may contribute to new ideas as well. This is an area that needs further exploration.

Some entrepreneurs mentioned that support of family members is a crucial element behind their success during hard times. On the other hand, some expressed their exasperation over excessive and unwelcome intervention from their family, as many Pakistanis continue to live with their parents during their adulthood, a lifestyle which is also prevalent in the rest of Asia to some extent. Such influences of family systems on economic progress and political mobility have been researched. Alesina & Giuliano (2014) found that "strong family ties may interfere with activities leading to faster growth, but they may provide relief from stress, support to family members and increased wellbeing." However, one of the entrepreneurs (K.3.5.) said; *"It is indeed a dual edge. On one hand, joint families put pressure on you to avoid failures and on the other hand they support you in case you fall*." However, personal network was considered a key factor in business survival and growth. Members of the younger generation may take over the family business and introduce latest management and operational techniques; however, such innovation in the family business is not always appreciated by the family elders. An entrepreneur (K.3.1.) said:

"*I brought the family business towards technological innovation and have transformed it into a more innovative business solution; we reshaped the process to reach the end customer instead of sharing profits with retailers and middlemen. At first, I faced resistance from my family,*

but insisted on running the business according to modern and contemporary business strategies. It worked out well in the end".

However, another entrepreneur (K.3.5) had different views and he said: "*Family supports you, yes. But friends and family do not help much. Frankly speaking, they disturb you a lot as well".* Thus, opinions regarding the role of family and friends vary across entrepreneurs, but most entrepreneurs considered family support a positive factor in the survival and growth of their businesses. An entrepreneur (L.3.2.) specifically mentioned the dominant role played by a friend who helped him grow his business.

In terms of sources of ideas, an entrepreneur (K.3.9.) reported that he watched movies to understand coding and business ideas. He said: *"I watched the movie Social Network (a movie about coding on Facebook), and decided to do something along these lines. Then I started coding and a year and a half later, I established my startup".* An entrepreneur (L.2.5.) said: *"We watched movies/seasons and Steve Jobs' interviews to improve business development".* Thus, it is important to know that research and development in the form of research papers and patents are not the only sources of knowledge that entrepreneurs draw on. They extensively explore various other sources of information and ideas to start and grow their businesses. Only a few entrepreneurs mentioned it as a source of ideas and knowledge, but it does point to the role of such avenues for ideas. Robert Shiller, the Nobel Prize Winner in Economics, emphasized the role of narratives to change the course of development in a society (Shiller, 2017). However, there may be many people who have watched such movies but did not aspire to become entrepreneurs. Thus, the uniqueness of being an entrepreneur is reiterated through this finding. An entrepreneur (L.2.2.) said: *"We do business with clients in the US and most of our ideas come from that market".* This again points to the diversity in sources of knowledge spillovers for entrepreneurs in developing economies.

An entrepreneur (L.1.1.) emphasized that there is a need to synchronize your ideas with client needs. He said: *"If our services, ideas and end customers are on the same page, business will grow. There are three recipes for disaster when running a business: 1) running out of cash, 2) undesirable products and services, and 3) time consuming*

business processes." An entrepreneur (L.2.5.) was of the view that *"A businessman should have good planning and startup investment".* In terms of knowledge spillovers, an entrepreneur (L.2.3.) mentioned: *"Mentorship and hired consultants are helpful in gaining new ideas and knowledge when planning to expand a business"*. Similarly, an entrepreneur (L.2.1.) said: *"I meet CEOs of various companies for techniques, ideas, and learning how to attract customers".* An entrepreneur (L.2.4.) while discussing business growth said: *"In my field, core technical knowledge gained from my engineering education and relevant work experience helped me"*. Thus, knowledge spillovers do play a role in the growth of a firm but almost nobody mentioned the role of any government research or any such project that may have served to create new knowledge relating to their business.

IMPACT OF URBAN QUALITY AND CITY DYNAMICS

The focus groups were held in the two largest and most industrialized cities of Pakistan. They host majority of the IT companies and startups operating in the country. However, both cities fall under separate provincial jurisdiction and differ significantly in terms of city dynamics. So, while there were many similarities, some contrasts also emerged in the data obtained through focus groups. The role and dynamics of each city were discussed with regards to promoting entrepreneurship.

Most entrepreneurs shared that they started the business in a particular city because they were already living there. This is in line with the argument presented by Glaeser (2011), who holds the opinion that entrepreneurs first choose where to live and then decide where to establish their business. An entrepreneur (K.2.3.) said: *"I was born and raised in Karachi. That was a major factor that kept me on track…In the business of e-distribution, all our connections are based in Karachi".* An entrepreneur (K.2.4.) shared *"I was brought up in Karachi and started the business at a very early age. Karachi seems to be the hub of all kinds of products."*

Many entrepreneurs reported that they preferred a particular city because they had strong family and professional connections there which were helpful at the early stage of their business. However, an entrepreneur (K.3.5.) said that if he had to move his business, he would

move to Lahore or Islamabad because, *"these cities have a stronger community of entrepreneurs".* It highlights the role of connections and bonding among like-minded professionals that help them start and grow a business. An entrepreneur (K.2.3.) said; *"The support system of the family was of much benefit in everything from recruitment to office space to opening up a bank account. This is the advantage of being in your home ground"*. Another entrepreneur (L.2.4) shared his story of the resistance he faced from his family when venturing into entrepreneurship.

Entrepreneurs discussed that they preferred cities like Karachi and Lahore because they had higher literacy levels and a large market. An entrepreneur (L.1.6.) started a marketing business in Lahore because he thought a higher literacy level was essential for such a business to be popular. He said, "O*ur startups depend on the education levels of people. The more aware and enlightened they are, the more we sell".* Similarly, an entrepreneur (L.1.2.) said: *"People choose Lahore to start their business because of higher education and awareness levels in Lahore as compared to other cities. The marketing cost is low in Lahore because of educated people in this city".* Education levels affect both the supply and demand side of entrepreneurship. Moreover, many entrepreneurs pointed to relatively better access to internet and broadband services in these cities. This finding shows that urban quality (including access to infrastructure such as broadband services) contributes to higher entrepreneurship.

Although Karachi has the largest share in the GDP of Pakistan and is also the most industrialized city, entrepreneurs shared that Lahore seemed more conducive to startups and early stage IT companies. Entrepreneurs attributed this to the proactive role of the provincial government of Punjab in Lahore as compared to provincial Government of Sindh operating in Karachi. The federally administered legal and regulatory arrangements are the same in both cities, but the sub-national policies have a strong impact on the entrepreneurial environment. An entrepreneur (L.1.5) said: *"The establishment of an IT park called Arfa Kareem Tower and a government-run incubator inside this park has helped Lahore promote startups"*. However, an entrepreneur (K.2.5.) from Karachi said: "*I appreciate Karachi for its mature business environment especially in the IT sector. The market in Karachi is diverse and extensive, making it suitable for business"*. It seemed that there was

some bias in considering the other city better than theirs. However, there is still a lack of research on in-depth comparison between these cities to make a conclusive argument. An entrepreneur (K.3.6) for example said: *"Government support is much better in Lahore as compared to Karachi. Sindh Government is not doing a lot for entrepreneurs".*

The focus groups revealed that more participants in Lahore had moved to the city from other smaller cities. The entrepreneurs talked about talented professionals who were based in other cities but ended up working in Lahore. This was not the case in Karachi. Most entrepreneurs were born in Karachi and were hiring staff only from Karachi. This is in line with Pakistan's recent Census 2017 according to which Lahore has grown by 116% in population from 1998-2017 while Karachi has grown by 60% during the same period. An entrepreneur (L.1.1.) said*: "I belong to Sialkot, a small city and could not find appropriate staff and opportunities there and thus decided to shift to Lahore"*. Similarly, an entrepreneur (L.1.3.) said: *"I am from Mandi Baha Uddin and pursued my education from Lahore".* There were not many entrepreneurs in Karachi who had migrated from other cities as compared to Lahore where many entrepreneurs had moved from smaller cities and rural areas. There is a lack of concrete evidence, but it appears that more talent is now moving more towards Lahore than Karachi. Further research is needed to substantiate this claim. It is an important area for enhancing further understanding about the entrepreneurship process. As pointed out by Hamguchi and Kondo (2016), turn-over of knowledge is more significant for entrepreneurship and innovation as compared to knowledge stock. Turn-over in their study was referred to as the movement of knowledge/talented workers to and from a city. An entrepreneur (K.3.3.) shared: "*Punjab Government's incubation center in Lahore has made an impact on the entrepreneurship culture and has promoted startups. However, I personally feel that Karachi is a multicultural society and suffers less from social ills such as class segmentation as compared to the rest of Pakistan, and also offers a huge market. That is the strength of Karachi."* However, in terms of governance, the public transport system may have made a difference. Lahore started a public bus transit system which was appreciated by many entrepreneurs who participated in the focus groups. No such system exists in Karachi. Entrepreneurs pointed to the lack of a public transit system in Karachi which makes it difficult for

workers to commute smoothly. In this case entrepreneurs preferred to hire workers who lived closer to their office which restricts their choice to recruit workers from a diverse pool. An entrepreneur (K.1.5.) said: *"General infrastructure as well as property is too expensive. If an employer wants to hire someone who lives far away from the business site, it becomes an issue. Karachi is a huge city, so if one wants to find the best talent it is a challenge because the natural preference is to hire only those who live nearby due to transport constraints. By doing so the talent aspect is constantly undermined. So efficient and safe public transport systems will allow men and women to work freely anywhere in Karachi".* This is an important point to appreciate the role of public transport in promoting entrepreneurship and facilitating knowledge spillovers.

In terms of constraints and regulatory barriers, entrepreneurs pointed towards the negative role played by the informal economy. Entrepreneurs working in the formal sector comply with all taxation and regulatory requirements while informal businesses substantially reduce costs by avoiding taxes and other regulatory compliances. This type of situation in any sector makes it difficult for formal entrepreneurs to compete with informal businesses. An entrepreneur (K.3.4.) said: *"As far as weaknesses are concerned, there is an issue of the lack of proper documentation of all businesses operating in the city which leads to the growth of the informal economy".* It was also pointed out in the focus groups that Karachi had faced a law and order situation in the past which has contributed to relatively suboptimal performance of entrepreneurs. An entrepreneur (K.3.5.) said: *"The worst aspect of Karachi is its law and order situation"*, while another (K.3.10.) shared: *"The situation of security is much better in Lahore and Islamabad as compared to Karachi. It explains why there are more startups in those cities…I think it impacts your thinking power…You would go to the safest place".*

An interesting contrast became evident during the discussions. Karachi hosts big corporate conglomerates which are considered to create an unfavorable environment for startups and entrepreneurs. This situation is partially analogous to the comparison between Pittsburg and New York carried out by Chinitz (1961). He points to large agglomerates in Pittsburg which were not conducive to small entrepreneurs as compared to the culture of diverse and relatively small enterprises based in New

York. Karachi also has the presence of a huge number of small and medium enterprises, but the presence of large corporate agglomerates has probably made a difference as they generally prefer to do business with more established firms instead of young companies and startups. However, entrepreneurs expressed that one positive aspect of Karachi is the presence of banks and financial institutions; one entrepreneur (K.3.8.) said: *"We work with financial insurance companies. All banks are operating from here…Similarly headquarters of major insurance companies are based in Karachi. It is an added advantage as we do not have to travel to other cities."* Similarly, an entrepreneur (K.1.1.) said: "*The advantage of doing business in Karachi is that B2B relationships can start easily"*. On the other hand, an entrepreneur (K.1.3.) believed: *"Karachi is a highly saturated and very competitive market"*. Hence profit margins are also thin in the city. Contrary to this perspective, another entrepreneur (K2.3.) said: "*Operating cost is cheaper in Karachi*". Thus, population density, as pointed out by Glaeser (2012) poses both negative and positive externalities for economic activity. Effective urban policies and governance can help a city to maximize positive externalities and minimize negative externalities.

PERSPECTIVES ON POTENTIAL URBAN AND PUBLIC POLICY REFORMS

This section discusses the ideas and proposal public policies in promoting or hindering entrepreneurship. It was not astonishing that most entrepreneurs highlighted the role of tax policies and their enforcement as the biggest constraint to the entrepreneurial process. Many entrepreneurs mentioned that the presence of multiple tax regimes and agencies hinder business growth. Pakistan has recently allowed provincial governments to collect General Sales Tax (GST) on services. Earlier the federal government used to collect GST on services on behalf of the provinces. But recently provinces established their own revenue collection authorities. Provincial revenue authorities are now proactive in terms of collecting taxes. Most entrepreneurs said the duplication between federal and provincial taxes really hurt them. An entrepreneur (L.1.6.) said: *"Tax policies should be reviewed overall in Pakistan"*. Startups also mentioned that the recent move of the federal government to exempt startups from income tax for three years was a healthy development.

Regarding regulatory barriers an entrepreneur (K.2.3.) shared an interesting observation:

"I think when your business is small, regulatory barriers do not hurt it. In fact, it works to your advantage. You have sole proprietorship; the bank manager will facilitate you in opening the account and obtaining checkbooks. EOBI (Employees Old Age Benefits Institute) persons will not give you any trouble, but as the business grows, these regulations will create difficulties. Generally, middle-size businesses face more problems. Both the large corporations and small businesses do not worry much about regulations. The system works in their favor or they can turn it to their advantage. But medium size businesses usually get trapped. Public sector officials are bribed by large corporations while small businesses are usually not on their radars. The moment a business starts growing, regulatory officials come to impose all sorts of barriers. Thus, there is an inherent bias against medium size businesses in Pakistan".

This is an important finding regarding how young and growing firms face more challenges as compared to large corporations. While small firms remain informal and avoid all sorts of levies, corporations are powerful enough to manipulate the system. Similarly, a few entrepreneurs said that the government should support new businesses to compete with established corporations. Participant (L.2.2.) said that a public-sector organization in Punjab working in the IT sector directly competes with many small entrepreneurs during the process of public procurement which has hurt small and young private businesses in the city. He further said: *"The Government needs to stay away from running businesses itself. It should help industry and universities through financing research initiatives".* An entrepreneur (K.2.3.) appreciated the federal government for establishing National Incubation Centers (NICs) in large cities and suggested: "*The government should establish a growth fund with some good Venture Capital Firms*". There has been a rising trend in Pakistan to invest in property speculation which has squeezed investment for entrepreneurs and other productive sectors of the economy. In this regard, an entrepreneur (K.3.3.) said: *"The biggest problem in Karachi is that one can purchase a piece of land worth Pakistan Rupees (PKR) 10 million and it would sell for PKR 10.2 million after six months. Under such circumstances why would people with savings invest in innovative ideas of young entrepreneurs?"*

An entrepreneur (K.2.4.) mentioned the weak enforcement of property rights and an inefficient judicial system as the biggest constraints in the growth of IT companies and startups. He said: "*I think the judicial system is highly flawed in Pakistan. If you face any dispute, it goes nowhere for a very long period. We faced a lot of problems regarding such issues. Even if you get a decision of a commercial dispute in your favor, it takes years and years to recover the amount. We went through painful experiences of this nature."*

Another entrepreneur (L.2.4.) said: "*Infrastructure is very important for a healthy business environment"*. An entrepreneur (K.1.3.) highlighted the parking problem in Karachi and opined that it is a major loophole in the urban architecture given that a public transit system is non-existent, and everyone has to use their personal vehicles for commuting. Ride sharing services have partially contributed to overcoming this problem.

An entrepreneur (L.2.5.) suggested: *"The Punjab Government should make the province a freelancing hub for the IT sector's development".* However, such policies should be carefully designed as many initiatives of the sort turn out to be unsuccessful in fostering the true essence of entrepreneurship. In some cases, many startups are launched but only survive during the incubation phase. One of the entrepreneurs (K.3.2.) highlighted the need to revisit the curriculum in order to produce more entrepreneurs and said: "*The role of curriculum is crucial in promoting entrepreneurial spirit amongst the young. When we went to school and university, we did not know that entrepreneurship was a career option. Including inspiring stories from the corporate world into the national curriculum may promote entrepreneurship in the young generation".* However, an entrepreneur (K.3.4.) mentioned an interesting initiative by one of the leading business schools in Karachi: *"They invite CEOs for mentorship and have even designed courses that are meant to be taught exclusively by CEOs".* An entrepreneur (K.3.9.) said: "*Our education system is not working. We pay PKR 80,000 fees for children, but they end up studying like horses and donkeys. Our society only cares about getting degrees and overlooks the value of genuine education. My own parents did not want me to become an entrepreneur."* The popular view in Pakistan is that children should pursue a good education just so that they can secure a good job.

An entrepreneur (K.1.3.) especially highlighted the constraints he faced in importing a particular hardware for his startup. The same entrepreneur also said; *"The charges for getting our payments from other countries through banking channels, against our services/products, are very high in Pakistan."* Many entrepreneurs expressed constraints they face in receiving and sending payments abroad due to a number of foreign exchange controls imposed by the State Bank of Pakistan. It has led to higher costs and delays in business transactions. Entrepreneurs further informed that due to the lack of reliable and efficient payment methods and gateways like PayPal, many IT companies have shifted their offices to UAE and Singapore.

Table 2 presents a summary of key findings of the FGDs. The summary is presented in terms of the same four categories discussed in this section.

TABLE 2

A Summary of Findings

Ideas, Knowledge and Inspiration to Start a Business • *Bridging Gaps.* Many entrepreneurs observed social surroundings around them and tried to come up with business ideas create opportunities or fill gaps. In some cases, entrepreneurship may be a response to observing everyday problems and trying to solve them or seek alternative means to perform a task. • *Observation of Social Needs.* Encountering social problems may precede the search for ideas and knowledge to start a business. Many entrepreneurs shared that their motivation to start a firm was driven by a social need and they explored knowledge in the relevant field subsequently. • *Universities as a source of knowledge*. Few entrepreneurs attributed their knowledge to universities and teachers. • *Motivation in unlikely places.* In terms of sources of ideas, an entrepreneur shared that he was inspired by the movie *The Social Network* to further his understanding of coding and develop business ideas. Another entrepreneur shared that interviews by Steve Jobs were instrumental in his inspiration to start a business.
Key Factors and Practices for Firm Survival and Growth • *Client Care.* Many entrepreneurs reported that the key to their survival and growth can largely be attributed to client care. • *Patience and persistence.* After client-related practices, the second

most discussed factor for the survival and growth of a business was patience and persistence of an entrepreneur. Entrepreneurs shared stories of the hard times they faced during the initial years of business and how patience and commitment proved vital for their survival. • *Linkages with big firms.* Few participants shared that linkages with established firms can help young businesses grow. • *Financial management*. It was unanimously agreed that financial prudence is of paramount importance. • *Teamwork.* A few participants considered that a good team helps business survival and growth. • *Family and friends.* Some entrepreneurs mentioned that support of family members is a crucial element behind their success during hard times. On the other hand, some expressed their exasperation over excessive and unwelcome intervention from their family. • *Interactions with the market.* Understanding the dynamics of the potential market can be instrumental
• Impact of Urban Quality and City Dynamics *Higher literacy rates.* Entrepreneurs discussed that they preferred cities like Karachi and Lahore for their higher literacy levels. Education levels affect both the supply and demand side of entrepreneurship. • *Large market and access to facilities.* Densely populated cities provided a large market in terms of customers, labor as well as inputs. Many entrepreneurs pointed to relatively better access to internet and broadband services in these cities. • *Proactive role of the provincial government.* Entrepreneurs shared that Lahore seemed more conducive to early stage IT companies. Entrepreneurs attributed this to the proactive role of the provincial government of Punjab in Lahore as compared to provincial Government of Sindh in Karachi. The federally administered legal and regulatory arrangements are the same in both cities, but sub-national policies have an impact. • *City Level Initiatives.* City level initiatives also play a significant role. An entrepreneur said that he appreciates Karachi for its mature business environment. There was also some discussion how the lack of public transit system in a large city like Karachi hurts business activity. • *Negative role of informal economy.* The negative role played by the informal economy was highlighted. Entrepreneurs working in the formal sector comply with taxation and regulatory requirements while informal businesses substantially reduce costs by avoiding taxes and other regulatory compliances. Entrepreneurs expressed that this type of situation in any sector makes it difficult for formal

entrepreneurs to compete with informal businesses.

- *Law and Order.* It was also pointed out in the focus groups that Karachi had faced a law and order situation in the past which has contributed to relatively lower performance of entrepreneurs.
- *Advantages and disadvantages of large conglomerates.* Large corporate conglomerates in Karachi generally prefer to do business with more established firms instead of young companies and startups. However, entrepreneurs expressed that one positive aspect of Karachi is the presence of banks and financial institutions.
- *Infrastructure.* An entrepreneur highlighted the parking problem in Karachi and opined that it is a major loophole in the urban architecture given that a public transit system is non-existent, and everyone must use their personal vehicles for commuting.

Perspectives on Potential Urban and Public Policy Reforms

- *Tax Policies.* Most entrepreneurs suggested reforms in tax policies and their enforcement to improve the entrepreneurial outcomes in the country. Many entrepreneurs mentioned that the presence of multiple tax regimes and agencies hinder business growth. While small firms remain informal and avoid all sorts of levies, corporations are powerful enough to manipulate the system. Medium sized firms end up suffering.
- *NICs and need for venture funds.* An entrepreneur appreciated the federal government for establishing National Incubation Centers (NICs) in large cities and suggested that more venture capital firms would further promote the startup culture.
- *Judicial System.* The weak enforcement of property rights and an inefficient judicial system were identified as major hurdles in the growth of IT companies and startups. This needs to be addressed to support entrepreneurs.
- *Import Constraints.* Entrepreneurs pointed out the need to reform import procedures and the movement of foreign exchange into and out of the country by IT sector firms.

VI. CONCLUSION

The research on entrepreneurship and knowledge spillovers has dominantly been quantitative in nature. The Knowledge Spillover Theory of Entrepreneurship stipulates that potential entrepreneurs decide to start a business when they come across unexploited knowledge. However, the above analysis reveals that the starting point for most of the businesses was an encounter with a problem or an issue that exists in the surrounding of a potential entrepreneur. Entrepreneurs highlighted the

importance of knowledge spillover but this step came after the decision to start a business.

The discussion also highlights the channels of knowledge spillover such as family connections, association with teachers and mentors, work experience in other companies and abroad, and hiring of consultants. Entrepreneurs reported their learning from business relations with either established domestic brands or international clients. Some entrepreneurs also passionately searched for ideas and knowledge from research on Silicon Valley. The discussion has also added to the body of knowledge through sharing the first-hand experiences of entrepreneurs in expanding their businesses. Client/customer care was described as the most important management practice that helps a business expand. Similarly, meticulous financial management and patience were considered the most important qualities of entrepreneurs that help them foster business growth. Entrepreneurs learn such practices from various personal interactions and experiences which indicates the role of knowledge spillovers in the process of firm expansion.

As hypothesized in this article, entrepreneurs shared that the overall quality of urban policy and a city's ability to attract talent are important considerations for an entrepreneur. Karachi, being the largest and most industrialized city, displayed a relatively weak performance in starting and growing IT companies recently as compared to Lahore, the second largest and industrialized city. This has emanated in part due to Lahore's relatively better law and order situation, public transport, provincial support for IT based startups and ability to attract talent from many parts of the country. Thus, the analysis highlights important insights into establishing and expanding IT businesses including the moderating role played by urban policies and governance in Lahore and Karachi.

Entrepreneurs especially suggested improvement of education system, commercial dispute resolution system, enforcement of property rights, quality of infrastructure such as broad band access and public transport as well as support by the government for small and young firms in the form of incubation centers, growth funds, favorable public procurement rules, and tax facilitation.

This qualitative analysis was limited to IT sector entrepreneurs in the largest cities of Pakistan. A similar research on other sectors cities in Pakistan can help to generalize the findings of this paper.

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APPENDIX

A Priori Codes for Focus Groups

Starting a Business

1. Ideas for Starting a Business
2. Support for Starting a Business
3. Help for Starting a Business
4. Process of Starting a Business
5. Constraints to Business Startup
6. Difficulties in Business Startup

Role of Knowledge Investment

1. Familiarity to Patents
2. Ideas from Patents
3. Learning from earlier employment
4. Support due to personal education
5. Interaction with Highly Educated Peers and Family Members

Business Growth

1. What Helped to Grow Business?
2. What mattered most?

Urban Quality

1. Why only this City for Business?
2. City policies
3. What the city did not do to support business
4. How many workers came from rural areas?
5. What a city should do?

Supporting Entrepreneurs

1. What matter most for entrepreneurs
2. How to ensure more entrepreneurs
3. What should the Federal and Provincial Government Do
4. What a City Government Should Do

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MACROECONOMIC VARIABLES AND INCOME INEQUALITY NEXUS: TIME SERIES ANALYSIS OF PAKISTAN

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Abstract. Current study attempts to explore the short run and long run relationship among the macroeconomic variables and income inequality by employing the annual data of five decades of Pakistan. Three econometric models have been developed; first model explores the impact of fiscal variables on income inequality while second model tried to investigate the role of monetary variables on income inequality. The third model tried to depict relationship of growth components on income inequality in Pakistan. Study utilized ADF test to check the unit root problem of time series data which shows that variables are stationary on different level of integration. Study used ARDL cointegration approach to check the short run and long run dynamics among the variables. The study used Gini-Coefficient as a proxy variable of income inequality while budget deficit, investment growth, indirect taxes, subsidies, exchange rate, inflation rate, and remittances are fiscal and monetary variables used in this study. Whereas, GDP, rate of unemployment, agriculture growth rate, and manufacturing growth rate are the growth variables used in this study. In long run budget deficit, indirect taxes, and subsidy are negatively related with income inequality while investment growth rate is affecting directly inequality in the first model findings.

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Results of second model depicts that monetary variables also have short run as well as long run relation with income inequality. In long run coefficients of exchange rate, growth rate of foreign remittances, and rate of inflation are affecting inequality positively. Results of third model: growth model investigated the long run relationship where manufacturing growth, log of domestic product, and rate of unemployment are affecting the inequality positively. Furthermore, in the short run agriculture growth rate, manufacturing growth rate log of gross domestic product are significant with income inequality in Pakistan.

Keywords: Income inequality, fiscal policy, monetary policy, ARDL cointegration

JEL Classification: D30, E52, E62, C22

I. BACKGROUND OF THE STUDY

Economic inequality is not a unidirectional phenomenon. There are multidimensional factors which can harm or favor level of income distribution in an economy (Cloninger 2016). Some personal factors differentiate individuals from the others with respect to earning like personal capability of labor, gender status and cultural constraints. Some global factors also plays pivotal role to determine income distribution level. These factors are beyond the capacity of individuals. Literacy level of a country, production technologies, development model followed by the government and opening economies are important exogenous factors having significant impact on level of income distribution (Conrad 2017).

The whole countries of the world can be categorized as developed and developing ones. Inside a country, different regions can be divided in the same categories as stated above. Within one region, population can be divided into haves and have not's (Rosentiel 2007). Some of the regions or individuals are lacking resources with compared to their needs whereas, some are lacking as compared to resources of other people or regions. The first dimension is well known in the literature of development economics as absolute poverty. The other is called relative poverty. Different groups in a society are working for their own interest. Some exogenous factors are responsible for income polarization. So, confliction among groups of a society and among different regions of a

country starts due to their own economic interests. There was confliction between east and West Pakistan. May be the cause was regional disparity (Hussain 1993). So, it is core responsibility of state, government or political parties to equally distribute the fruits of economic growth among all segments of society. All this debate is core theme of "Political Economy of inequality" (Busemeyer and Iversen 2014).

In 1947, Pakistan was constituted in an area where, there were fertile lands, rivers and minerals. All the God gifted recourses were abundant for our needs initially (Leyon 2008). The major mode of economic activity was agriculture sector. At that time, Pakistan was not inherited any industrial assets and there was feudal dominance due agrarian structure. Irrigation system of this country was matchless.

During last seven decades, Pakistan attains marvelous developments in agriculture and industrial sector. During 1960s, green revolution and rapid industrialization put Pakistan as example for developing countries. Unfortunately the fruits of economic growth can't be delivered properly to lower pole of society. We are still facing inequality of income, lack of health facilities and problems of political freedom, women empowerment etc.

Due to inherited factor, there are still mega landholdings in rural Pakistan. These people are high "caste" land holders. These people are still influential in decision making or even in government formation. They will have to do work for their own interest. They don't want to scarify for equitable distribution of income, equity of opportunity of reduction of poverty. More than 70 % seats in local or national elections are captured by the feudal in Pakistan (PILDAT 2008). They were able to block tax on agriculture for a long time. This landholding class has their significant share in military decision making bodies. Land reforms were considered a key for reduction of rural poverty in Pakistan but those were also least satisfied.

Pakistan experienced different development strategies for a short while. There seems no continuity of policies (Naqvi 2004). During 1950s, import substitution industries were considered as key to success. However, in next decades, policy makers emphasized upon export promotion schemes for rapid economic development. During the same decade i.e. 1960s, rapid agriculture growth was key to success. In late

1960s, government/state was again confused due to some political factors. Population control, nationalization and islamization of economy were core agenda items during 1970s and 1980s.

Now a days, development economists have started discussion of international poverty. This question was also on the top agenda of MDGs and SDGs. Level of income distribution has polarized the world into high and low income groups. This gap is further increasing between rich and the poor. All the nations of the world possess some degree of inequality. There might be a natural degree of inequality but further worsening inequality is a question for policy makers. This problem is more swerves in developing countries than developed world. During 1960s, the richest 20% of the world was enjoying 70% of income share but in 1990s it has been climbed up to 80 % (World Bank 2016)

Individual countries of the world are possessing different level of income distribution. The most common examples of countries facing heavy income inequality are South Africa, Columbia and Mexico. The countries facing moderate inequality are Libya, Malaysia and Tanzania. For many countries there seems no collinearity between per capita income and level of income inequality (Vogli, Mistry, Gnesotto and Cornia 2005).

The underdeveloped countries have realization to follow developed countries for rapid development. Developed countries have shifted their production possibility curves upward by improving their production techniques which is considered core principle of economic development. Previously Japan was also facing the pace of underdevelopment, but following Germany and France they got developed. The experience of developed countries provides motivation for developing countries to follow others for required development. Asian tigers have also settled example for others because these countries have performed East Asian miracle. In developed countries each segment of population is enjoying benefits of growth. It means their growth experience is accompanied with fairer distribution of income.

On the other hand, many developing countries are accelerating GDP which is accompanied by concentration of wealth (World Bank, 2018). So, economic growth does not seem fruitful for vulnerable people. The case of Pakistan is also not too much distinct from above stated situation.

In Pakistan here is clarity about failure of trickle down mechanism. Approximately 30% population falls below poverty line of single dollar daily income or consumption.

The political leaders are mostly addressing the issue of poverty and inequality in their discussion. Mostly, poverty reduction and provision of basic needs got core importance in political agenda but practically there is no significant improvement. Still people don't have satisfactory educational and health facilities. The governments are looking too much crazy for strong GDP growth rates. For equitable distribution of income, governments will have to intervene significantly through their macroeconomic policies (Mahmood, Rehman and Rauf 2010).

In Pakistan, fiscal and monetary policies are devised in a way that income shifted towards rich people. The income share of bottom 40 % population was gradually declining. Our policies regarding taxation, subsidies, social welfare and public facilities are not in line with pro poor growth. Social, economic and political unrest is not unexpected among poor masses.

In our region some countries like India, China and Sri Lanka have kept in view that income can be accelerated without its concentration in few hands. In countries where resources are centrally possessed by the governments, showed significant improvements in case of distribution of benefits. If maximum resources are privately owned, the rich group will work for their own interest and they will grow at the cost of labor class. The upper group or business class will try their best to minimize wage rates and maximize prices. Pakistan has faced the same situation where business and agricultural elite is much effective in decision making. Decision making role of elite class has made it impossible to grow with distribution. Tradeoff between growth and equal distribution is remained economic reality in our country (Kemal 2005).

Absolute and relative poverty can be reduced by implementing an impressive agenda, which requires the attention of policy makers. But mostly there happens a lag between decision making and its implication. This lag minimizes the effectiveness of policy. Political instability is one major cause for poor implementation of policies because our governments are not sure about their tenure competition. Random variation in developing countries also affects adversely the pace of

development in countries like Pakistan. Unorganized money and good markets are also causes of poor policy outputs.

The current study aims to explore the impact of macroeconomic variables on income inequality in Pakistan by using annual data from 1960-2010, covering the period of five decades. We developed three econometric models; first model explores the impact of fiscal variables on income inequality while second model tried to investigate the role of monetary variables on income inequality. The third model tried to depict relationship of growth components on income inequality in Pakistan.

The rest paper is balanced as; part two discusses the past studies related to the study objectives, part three explains the data sources and empirical methodology. Part four discusses the results of the studies while last part concludes the study and suggests the policy options.

II. REVIEW FROM PAST STUDIES

Khundkar (1973) studied income inequality in Pakistan for the period 1963-64 to 1968-69. He used Gini coefficient as key indicator of income inequality for above stated period after categorizing in to rural and urban areas. He reported rising income inequality in urban areas and declining inequality trend in rural areas. Responsible factor for rising income inequality in urban areas was subsistence wage rate in the manufacturing sector. On the other hand rural worker was enjoying better wages due to increasing yield of agriculture sector. This was impact of "Green Revolution". It means fruits of agriculture output were trickling down during the period of this study. Although this study was a short time series analysis but was a significant contribution. The study by Azfar (1973) started to investigate distribution of income in Pakistan with a doubt that income of elite group is underestimated in Pakistan. So splicing method was opted as a remedy for above stated problem. He made a comparative analysis of Pakistan with other countries. In overall analysis Gini coefficient was reported 0.37 for Pakistan and 0.51 for other countries. Analysis was also decomposed into categories of east/west Pakistan and rural/urban areas for the period 1966-67. It was survey and income tax data. This data also faces limitations like Khadija Haq (1964). Inequality measure showed comparatively good income distribution in West Pakistan as compared to East Pakistan. Similarly rural areas were seemed well as compared to rural areas like Khundkar

(1973). Moreover, Naseem (1973) selected 1963-64 to 1970-71 period to study income inequality in Pakistan. The author preferred real consumption expenditure rather than household income to study inequality. By calculating Gini coefficient, the author reported inverted U- pattern of inequality. Initially inequality measure was climbing from 0.33 to 0.37 but later on it was declining like a secular trend during the period 1966-67 to 1970-71.

Suleman (1973) computed a number of inequality coefficients for 1963-64 and 1968-69. Besides Gini-coefficients he reported inter-quartile range test, coefficient of variation etc. Contrary to the conclusions of a decline in income inequalities reached earlier by comparing Bergan and Azfar studies, Suleman shows an increase in the income inequalities over 5 year period during 1963-64 to 1968-69. Arndt (1975) did empirical work for Indonesian economy. He analyzed the impact of growth on the higher income group and lower income group during 1961-71. For this purpose he worked out per capita income, economic growth, distribution of wealth and income, food production and prices, employment / unemployment and trends in income distribution. The author found that many people of this country were enjoying better living standards which were outcome of government policies during last decade. On the other side many people were facing worse real income and malnourishment. The study by Allauddin (1975) has extended Nassem's study up to 1971-72 and reported Gini-coefficient for income. It may be noted that both expenditure as well as income Gini-coefficients show an increase in the inequalities in the year 1971-72 after a decline in the inequalities up to 1970-71. Haq (1976) commit his policy crime "there exists a functional justification for inequality if it raises production for all and not consumption for a few. The road to eventual equalities may lie through initial inequalities." In 1971, the chief economist, called for distribution policies after the failure of "Trickle Down" mechanism. The main conclusion of this study was that for Pakistan there did not seem to be trade-off between growth and distribution. The economy seems to have performed well in terms of distribution when growth rate was faster and vice versa. But this finding is contradictory to Haq (1976) where he committed the failure of "Trickle Down" mechanism and called for redistribution.

Blider and Esaki (1978) studied the macroeconomic activities and income distribution in USA. They addressed the question of income inequality due to increasing protest against increasing prices. Because increasing prices were considered to create further gap between rich and poor. Actually the authors wanted to determine the role of increasing prices and unemployment on income inequality. The study covers a period of 27 years ranging from 1947 to 1974. Empirical estimation showed that if unemployment rises by one percent, approximately 0.3 % income will move from poorest 40 % towards richest 20 % population of the country. Whereas inflation harms poor class slightly as compared to elite or rich class. It also seems that the effects of inflation are much less important for income distribution than for employment.

Jeetun (1978) examined the inequality trends in Pakistan for the period 1963-64 to 1971-72. Three measures i.e. the Gini-coefficient, Kuznet's measures and coefficient of variation were used for analysis. All these measures indicated an increased income disparity between 1963-64 and 1966-67, then a slight decline during 1968-69 and 1969-70. Again rising income disparity was observed in 1970-71 and 1971-72 in urban areas. On the other hand, four coefficients were used for rural areas. i.e. relative mean deviation, coefficient of variation, Kuznet's measures and Gini-coefficients. Rural income inequality declined between 1963-64 and 1966-67 but rose in 1969-70.Changes in income distribution in Pakistan followed the pattern of rural sector due to its weight in the total population. According to his findings, there was no consistent trend in income disparities over all the years and Pakistan's experience did not support that income distribution is worsened with economic growth.

Kemal (1978) found that Gini-coefficient for the urban areas of Pakistan decreased during 1968-69. Income inequality between rural and urban areas also declined. According to him, this happened due to Green Revolution. Keesing (1980) studied income distribution from outward-looking development policies. He addressed the question that whether inequalities can be reduced by the policies which are suggested to developing countries or not. The analysis suggested that under outward-looking policies, severe inequalities will not generally cure themselves. Except in a few small but relatively advanced countries, income distribution in favor of the poor will not occur automatically, even in the

long run, as a side effect of the development policies that are now being recommended. Inequalities may in some ways increase, and meanwhile inequality is exploited to promote output growth. To cure for inequality in distribution of income, author suggested that what possibly needed is to incorporate systematic measure of redistribution into the outward-looking strategy. It may prove wise to maintain factor prices that reflect the social opportunity cost of different resources in production but correct the resulting income inequalities systematically on the basis of taxes and transfers. It may also prove effective in some places to change relative prices and the mix of output, including public sector demand in order to generate a more intensive demand for unskilled labor.

Ghaffar (1982) investigated the authenticity of the notion that "the Green Revolution has led to exaggeration of income inequality in rural Pakistan". He concluded that there is positive role of green revolution in rural Pakistan to reduce income polarization. Income differential between large and small farms was reduced. It is also concluded that land distribution in Pakistan between 1960 and 1972 reduced the skewness of land ownership which further reduced income inequality. The author suggested that Green Revolution may be supported as a key to economic development. Chaudhry (1982) tried to read rural income distribution from 1963-64 to 1971-72 by calculating Gini-coefficient based upon household personal income and also by using per capita income. The both bases provide measure of income inequality, indicating declining trend during Ayub Khan's regime. The author recommended that land distribution in "Green Revolution" period become fairer, due to this fact income distribution in that period become less skewed among farmers. Again in early 1970s Gini-coefficient shows worsening position of income inequality in rural Pakistan. Gillis, Perkin, Roomer and Snodgrass (1983) examined that during 1960s, Pakistan experienced a fairly rapid industrialization. However, most of the economic activities were concentrated in the western part of the country. The East Pakistan made limited gains; the people felt that the western part was developing at their expense, the result was civil war, the splitting of country in to two parts, within the formation of Bangladesh. In other words, one of the reasons for separation of Bangladesh was the unequal regional distribution of the fruits of economic growth.

Mahmood (1984) calculated inequality measure for both rural and urban areas based on HIES grouped data for the duration 1963-64 to 1979. This study was a pioneer work to discuss inequality trend among 15 years. The value of Gini-coefficient tends to 0.295 from 0.350 during 1963-64 and 1971-72. As similar to previous studies, the author advocated declining income inequality till early 1970s. But in later years of the same decade, income distribution becomes skewed again. Political instability may probably be the root cause of increasing income inequality between 1971-72 and 1979. He further concludes that Kuznet's hypothesis was very much valid for the case of urban areas of Pakistan and not for rural areas. His study also showed that income inequality in Pakistan was lower than other developing countries. Pakistan was ranked third out of twelve selected developing countries.

Ehtisham (1990) examined poverty, inequality and growth in Pakistan. He classified inequality into upper, middle and lower range of distribution. First inequality is due to severe affluence, second type of inequality is among less excessive and third type of inequality is due to severe scarcity. The conclusion of the study was that Pakistan displayed a little change in inequality over the period 1963-85. However the inequality at all Pakistan level takes important changes that might have occurred at the sectoral or regional level. He concluded that income disparities were relatively more intensive in most rural as well as urban areas of NWFP and Baluchistan. Rising income in urban Sindh and Punjab have been accompanied by a reduction in the concentration of the alpha, beta and to some extent of gamma types of inequality.

Besides the determinants of rural poverty in Pakistan, Shahnawaz (1992) analyzed rural and urban income inequality for the period 1971-72 to 1984-85. Based on household income data, the author found increasing income inequality in rural Pakistan as similar to those of Mahmood (1984) and Ahmed and Ludlow (1989) for the period 1979 to 1984-85. However, the author found a declining trend of income inequality in urban areas and a rising trend in rural areas between 1984-85 and 1986-87. These studies were based on published (HIES) data conducted by the FBS, in Pakistan during this period. The behavior of urban poverty is depicted as inverted U-Shaped. Urban inequality measure is slightly upward moving between 1970-71 and 1979 but it shows slight declining trend after 1979. So findings of Malik (1992) are mostly comparable to

Ahmed and Ludlow (1989) although both these studies are based upon different units i.e. household income and household expenditure. Literacy ratio, Dependency ratio, Landholding and households headed by female are core determinants of absolute and relative poverty in Pakistan as expressed by Malik Shahnawaz (1992).

Amjad and Kemal (1997) examine the poverty estimates for the period 1963-64 to1992-93. This study suggested a strategy for poverty alleviation after analyzing the impacts of macroeconomic policies and structural adjustment programs on the absolute poverty in our country. They tried to explore the influence on poverty by the factors like employment opportunities, tax structure, industrial output, terms of trade, price level and overall growth etc. The author seems to be cautious about interpretation of the results due to data limitations. We can compile foremost judgments of the author as follow:

- Foreign remittances are recommended oxygen to remove poverty. Increasing employment opportunities and a heavy growth rate of GDP also plays significant role for poverty alleviation.
- By declining subsidies on agriculture input commodities, there is increasing unemployment and increasing taxes which again pushes vulnerable people into grave of poverty.
- Decline in growth rates, minimized subsidies on agricultural inputs and consumption, increasing unemployment, increasing taxes and reduction in government expenditure on social services has increased poverty in Pakistan.
- To reduce poverty in Pakistan it is necessary to encourage informal sector.

Kemal, Rehana and Rizwana (2001) examined the impact of trade liberalization (reduction in tariff) on income distribution in Pakistan during structural adjustment period by using SAM-based CGE model. Simulation exercises suggested that reduction tariff has following effects

- It reduces price of imported goods.
- Domestic prices will relatively be low
- It will increase demand for goods.

- GDP/ capital ratio increases
- Share of labor in GDP reduces.
- Gap between rich and poor will be increased
- Inequality measure shows worsened income distribution at a marginal rate.

Sarfraz (2001) discussed that the poverty levels and income distribution in Pakistan which were affected by structural adjustment programs. In the history of Pakistan, rising poverty has been witnessed with healthy growth rate, rising poverty with stagnation and also rapid growth with positive impact on poverty. Durring first two decades of Pakistan's history, distributional aspect was ignored and there was total concentration on achieving high growth rate. It was supposed that in later phase there will be trickle down and poor segment of economy will also enjoy the fruits of economic growth. During 1970s there was political instability, rapid industrialization and export of labor force towards Gulf countries. So, incoming remittances become a source of income transfer towards poor people. Again, Anwar (2005) conducted a time series analysis of inequality trends in Pakistan, supported by a logical framework. The author regarded "Growth Strategy" of Martial law regime as major cause of worsening income inequality in Pakistan during 1960s.In early 1980s, income inequality was declined due to increasing real wages and workers remittances belonging to poor class. Again distributional changes in 1990s were caused to increase income inequality. Between 1987-88 and 2001-02 income inequality has risen in both rural and urban Pakistan.

Sadiq and Akhtar (2006) studied the occupational status and earning inequality in Pakistan by using PIHS 2001-02 and PSLM 2004-05. The authors estimated earning inequality for the period 1992-93 to 2004-05. He compared his estimates with Ahmed (2002). Short term trends were also measured for the duration 2001-02 to 2004-05. Rising income inequality was reported by the author for long time period as well as for short time period.

III. DATA AND METHODOLOGY

After a brief literature review and discussion on "correlates" of income distribution, the next step is model specification. As the core purpose of our study is to explore the impacts of macroeconomic policies on income distribution in Pakistan, a combination of fiscal, monetary and investment policy variables is under consideration. A combined accurate analysis of such set of macroeconomic variables is difficult because most of the economic variables move in a same fashion, respect to a specific duration of a trade cycle. Such movement of economic variables may cause spurious or meaningless regression coefficients. So it is necessary to divide these macroeconomic variables into further sub categories or strata. For simplicity and convenience in analysis, the variables are categorized according to macroeconomic policies.

DATA SOURCES AND VARIABLE CONSTRUCTION

The study used annual data of Pakistan from 1960-2010 extracted from World Development Indicators, various publications of Pakistan Economic Surveys, State Bank of Pakistan, and International Financial Statistics. The study used Gini-Coefficient (Gini) as a proxy variable of income inequality while used budget deficit (BDF), investment growth (INVG), indirect taxes (ITAX), subsidies (SUBS), exchange rate (EXR), inflation rate (RINF), and remittances (GFREMIT) are fiscal and monetary variables used in this study. Whereas, GDP (LGDP), rate of unemployment (RUNM), agriculture growth rate (AGR), and manufacturing growth rate (MGR) are the growth variables used in this study. All the variables are taken in local current unit except the growth rates and indices.

EMPIRICAL METHODOLOGY

Unit Root Test

After the descriptive analysis of data, first step of inferential analysis is to check all the time series for their order of integration (I (d)). A series is said to be stationary if it has "zero" order of integration i.e I(0) otherwise if the series is not I(0) then is called non stationary series. A stationary series have constant mean, constant variance and constant covariance.

$E(Y_t) = \mu$ ..... Constant Mean

$Var\ (Y_t) = (Y_t - \mu)^2 = \sigma^2$ ..... Constant variance

$COV\ (Y_t, Y_{t+s}) = \delta s$ ..... Constant Covariance

A series that is that is stationary at level is called order of integrated zero I(0), if series is not I(0) it mean there is need to check it for higher order of integration like I(1). I (1) mean that a series that is non stationary at level can be made stationary by differencing it.

It is important to check the order of integration or all time series because the choice of econometric technique to be applied on model is solely an issue of order of integration of all variables. For example if all the time series are I(0) then OLS is suitable model estimation, and if all variables are I(1) then cointegation technique is applied for estimation.

One common way to determine the order of integration of time series is "Unit Root Test". Dickey and Fuller (1979, 1981) introduced technique to determine the order of integration of time series. The Dickey-Fuller (DF) test based on the simple AR (1) model which is as

$$\Delta Y_t = \delta Y_{t-1} + \epsilon_t \quad (1)$$

Where, null hypothesis is Ho: δ =0 and alternative hypothesis is H1: δ <1. Rejection of null hypothesis implies the presence of unit root (δ = 1) that mean series is not stationary. Two more equations were introduced by Dickey and Fuller (1979) to check the order of integration, one with including constant and one with including trend as well.

Equation for unit root with constant:

$$\Delta Y_t = \propto_1 + \delta Y_{t-1} + \epsilon_t \quad (2)$$

Equation for unit root with constant and trend:

$$\Delta Y_t = \propto_1 + \propto_2 t + \delta Y_{t-1} + \epsilon_t \quad (3)$$

Mackinnon (1991) tabulated the critical values for these three models. If the DF calculated value is smaller than the tabulated value then null hypothesis is rejected and series is stationary. DF test suffered from some serious limitations as it is not applicable to those time series

having serial correlation above AR (1). Augmented Dickey Fuller (ADF) and Phillips Perron (PP) test are utilized in this research to check unit root. These tests do not suffer from statistical problems like DF test, and are widely used in time series estimation.

Augmented Dickey-Fuller (ADF) Test

Augmented Dickey-Fuller (ADF) Test is modified form of Dickey-Fuller test. It includes extra P lags of differenced dependent variable and overcome the problem of autocorrelation in dependent variable. The lag length is determined on the basis of minimum Akaike Information Criterion (AIC) or Schwartz Bayesian Criterion (SBC). The general forms of equations in ADF test are as follows:

ADF equation without constant and trend:

$$\Delta Y_t = \gamma Y_{t-1} + \sum_{i=1}^{m} \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (4)$$

ADF equation with constant:

$$\Delta Y_t = \propto_0 + \gamma Y_{t-1} + \sum_{i=1}^{m} \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (5)$$

ADF equation with constant and trend:

$$\Delta Y_t = \propto_0 + \gamma Y_{t-1} + \propto_2 t + \sum_{i=1}^{m} \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (6)$$

Here $\propto_0$ Represents constant term and "t" shows the trend.

Autoregressive Distributed Lag (ARDL) Approach

The choice of the ARDL bounds testing procedure as a tool for investigating the existence of a long-run relationship is based on some considerations: First and the foremost, both dependent and the independent variables can be introduced in the model with lags. This is a highly plausible feature:

Conceptually, the dependence of the dependent variable on the independent variables may or may not be instantaneous depending on the

theoretical considerations. A change in the economic variables may not necessarily lead to an immediate change in another variable. Hence, ARDL bounds testing approach is appropriate as it allows flexibility in terms of the structure of lags of the regressors in the ARDL model as opposed to the cointegration VAR models where different lags for different variables is not permitted (Pesaran et al, 2001).

It goes without saying that the correct choice of the order of the ARDL model is very important in the long-run analysis. In this respect, the ARDL approach has the advantage that it takes a sufficient number of lags to capture the data generating process in a general-to-specific modelling framework. The ECM incorporates the short run variations by way of long run stability with no loss of long run information. The ARDL process yields reliable and vigorous fallouts both for short run and long run periods. Estimation of ARDL involves two major stages. It tests long run relationship at initial stage and in the second stage long run and short run coefficients are estimated.

The General Form of Unrestricted ECM model in ARDL (p,q,r,x,y,z) formulation:

$$dGINI_i = a_0 + \sum_{i=1}^{p} B_i GINI_{t-i} + \sum_{i=0}^{q} C_i dBDF_{t-i} + \sum_{i=0}^{r} D_i dINVG_{t-i} + \sum_{i=0}^{x} E_i dITAX_{t-i} + \sum_{i=0}^{y} F_i dSUBS_{t-i}$$
$$+\theta 1 GINI_{t-i} + \theta 2 BDF_{t-i} + \theta 3 INVG_{t-i} + \theta 4 ITAX_{t-i} + \theta 5 SUBS_{t-i} + u_t \quad (7)$$

$$dGINI_i = a_0 + \sum_{i=1}^{p} B_i GINI_{t-i} + \sum_{i=0}^{q} C_i dEXR_{t-i} + \sum_{i=0}^{r} D_i dGFREMIT_{t-i} + \sum_{i=0}^{x} E_i dINF_{t-i}$$
$$+\theta 1 GINI_{t-i} + \theta 2 EXR_{t-i} + \theta 3 GFREMIT_{t-i} + \theta 4 INF_{t-i} + u_t \quad (8)$$

$$dGINI_i = a_0 + \sum_{i=1}^{p} B_i GINI_{t-i} + \sum_{i=0}^{q} C_i dMGR_{t-i} + \sum_{i=0}^{r} D_i dLGDP_{t-i} + \sum_{i=0}^{x} E_i dRUNM_{t-i} + \sum_{i=0}^{x} F_i dAGR_{t-i}$$
$$+\theta 1 GINI_{t-i} + \theta 2 MGR_{t-i} + \theta 3 LGDP_{t-i} + \theta 4 RUNM_{t-i} + \theta 5 AGR_{t-i} + u_t \quad (9)$$

Whereas,

- "d" is the first difference operator
- The coefficients of first fraction such as Bi,Ci, Di,Ei,Fi and Gi, correspond to the short run dynamics
- The coefficients θ1,θ2, θ3, θ4, θ5 and θ6 stand for the long run relationships between the variables

- And u_t for white noise error term

Long run relationship is investigated using bound test under the procedure of Pesaran et al. (2001) whose mechanism is based on F-test.

Null hypothesis:

$$H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$$

i.e., that there does not exist cointegration

Alternative hypothesis:

$$H_1: \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq 0$$

i.e., that there exists cointegration

There are some benefits to check cointegration using bound test.

- The test treats each and every one variable as endogenous.
- This test does not consider integration order and can be used for variables I (0) and I (1).
- Both short run and long run coefficient are estimated immediately.

There are three potential conclusions for bounds test:

1. If F-statistics > upper bound (cointegration exist)
2. If F-statistics< lower bound (no cointegration exist)
3. If F-statistics lies amid upper and lower bounds →(inconclusive)

The Long Run ARDL (p, q, r, x, y, z) Model

If cointegration is found in the general form of unrestricted ECM model in ARDL (p,q,r,x,y,z) formulation, then subsequent long-run model is projected:

The Short Run ARDL (p, q, r, x, y, z) Model

If the study found long run relationship between the variables the next step is to estimate short run coefficients. The following ECM model is applied to estimate short run relationship between the variables.

$$dGINI_t = a_1 + b_1(ecm)_{t-1} + \sum_{i=1}^{p} B_i(dBDF)_{t-i} + \sum_{i=0}^{q} C_i(dINVG)_{t-i} + \sum_{i=0}^{r} D_i(dITAX)_{t-i} + \sum_{i=0}^{x} E_i(dSUBS)_{t-i} + u_i \quad (10)$$

$$dGINI_t = a_1 + b_1(ecm)_{t-1} + \sum_{i=1}^{p} B_i(dEXR)_{t-i} + \sum_{i=0}^{q} C_i(dGFREMIT)_{t-i} + \sum_{i=0}^{r} D_i(dINF)_{t-i} + u_i \quad (11)$$

$$GINI_t = a_1 + b_1(ecm)_{t-1} + \sum_{i=1}^{p} B_i(dMGR)_{t-i} + \sum_{i=0}^{q} C_i(dLGDP)_{t-i} + \sum_{i=0}^{r} D_i(dRUNM)_{t-i} + \sum_{i=0}^{r} D_i(dAGR)_{t-i} + u_i \quad (12)$$

TESTS FOR PARAMETERS STABILITY

In order to analyze the parameter stability for reliable results Pesaran and Pesaran (1975) proposed CUSUM and CUSUMSQ test which is advantage of ARDL technique.

IV. RESULTS AND DISCUSSION

UNIT ROOT TESTS

By using the methodology as discussed in the previous chapter, this section is going to present empirical findings. The models as specified earlier expresses the econometric picture of macro policy impacts on income distribution in Pakistan for the period 1965-2010. Result shows that all the variables are stationary at first difference except INVG. GINI, BDF, ITAX AND SUBS are not significant at level because its values are below then significant level. GINI, BDF, ITAX are significant at 1 percent level at first difference and SUBS is significant at 5 percent in first difference. INVG is significant at 5 percent level at level.

TABLE 1

Unit Root Results

Variables	Level	1st Difference
GINI	-2.844083	-5.423709*
BDF	-1.710569	-4.252897*
INVG	-3.828938**	-5.512829*
ITAX	2.702611	-4.320225*
SUBS	2.874581	-3.947098**
EXR	-1.250173	-4.244393*

Variables	Level	1st Difference
GFREMIT	-1.935765	-3.931316**
RINF	-3.456371***	-6.066142*
MGR	-2.715918	-7.085122*
LGDP	-1.918171	-4.072295**
RUNM	-3.262379***	-6.262625*
AGR	-5.230893*	-7.769740*

* Significant at 1% level of significance
**significant at 5% level of significance

FISCAL POLICY AND INCOME INEQUALITY

Results indicate that there is existence of long run relationship among the variable GINI, BDF, INVG, ITAX and SUBS because the value of F-statistic is greater than the upper bound that is 4.37 and lower bound is 3.21. There exists one co- integrating equation among the above said variables.

TABLE 2

Bonds Cointegration Results

Variables	F- statistics	Conclusion (HO)
F(GINI/BDF,INVG,ITAX,SUBS)	F(5, 14) = 4.71[.014] I(1)=4.37 & I(0)=3.21	Co- integration
Variables	F- statistics	Conclusion (HO)
F(GINI/BDF,INVG,ITAX,SUBS)	F(5, 14) = 4.71[.014] I(1)=4.37 & I(0)=3.21	Co- integration

The coefficients are estimated with the Schwarz Bayesian Criterion by minimizing the absolute value of Schwarz Bayesian Criterion and Akaik Information Criterion. Probability is given in parenthesis. In long run coefficients budget deficit (BDF), indirect taxes (ITAX) and subsidy (SUBS) all variables are affecting inequality negatively. This means as BDF increases by one unit there will be .6139E-6 unit decrease in inequality and vice a versa. Results of these variables are significant at 1% level of significance. While the variable investment growth rate (INVG) is affecting directly inequality and it is significant at 1% level of significance.

TABLE 3

Estimated Long Run Coefficients using the ARDL Approach

ARDL(4,3,2,4,4) selected based on Schwarz Bayesian Criterion *Dependent variable is GINI*			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
BDF	-.6139E-6	.2199E-6	-2.7922*[.012]
INVG	.4751E-3	.2176E-3	2.1834*[.042]
ITAX	-.1133E-6	.2114E-6	-.53570*[.598]
SUBS	-.1077E-4	.1829E-5	5.8869*[.000]
INPT	.35588	.0039476	90.1519*[.000]

* Significant at 1% level of significance
**significant at 5% level of significance

After testing long run relationship ECM approach is utilized for short run dynamics. Mainly the coefficients are significant in the short run. Budget deficit and investment influenced directly inequality while tax and subsidy influenced indirectly inequality and the results are significant. The value of ECM is -.82414 which indicates that the sign is negative so the model is convergent if there is any disturbance in the model it will converge towards equilibrium and speed of adjustment is 82% and approximately it will take more than one year but less than two years.

TABLE 4

Error Correction Representations for the Selected ARDL Model

dITAX1	-.2464E-5	.3285E-6	-7.5002* [.000]
dITAX2	-.1338E-5	.2836E-6	-4.7180* [.000]
dITAX3	-.7200E-6	.3137E-6	-2.2948* [.031]
dSUBS	-.9328E-6	.7485E-6	-1.2461[.225]
dSUBS1	-.9707E-5	.1391E-5	-6.9789* [.000]
dSUBS2	-.9724E-5	.1453E-5	-6.6923* [.000]
dSUBS3	-.6193E-5	.1171E-5	-5.2877* [.000]
dINPT	.29330	.045862	6.3951* [.000]
ecm(-1)	-.82414	.12617	-6.5320* [.000]

R-Squared	.912	R-Bar-Squared	.815
S.E. of Regression	.00768	F-stat. F(17, 23)	11.628[.00]
Mean of Dependent Variable	.0011195	S.D. of Dependent Variable	.017887
Residual Sum of Squares	.0011221	Equation Log-likelihood	157.1986
Akaike Info. Criterion	135.1986	Schwarz Bayesian Criterion	116.3493
DW-statistic	2.0671		

MONETARY POLICY AND INCOME INEQUALITY

Results indicate that there is existence of long run relationship among the variable GINI, EXR, GFREMIT and RINF because the value of F-statistic is greater than the upper bound that is 4.37 and lower bound is 3.21. There exists one co- integrating equation among the above said variables.

TABLE 5

Bonds Cointegration Results

Variables	F- statistics	Conclusion (HO)
F(GINI/ EXR,GFREMIT,RINF)	F(4, 24)= 4.5442[.037] I(1)=4.37 & I(0)=3.21	Co-integration

These coefficients are estimated with the Schwarz Bayesian Criterion by minimizing the absolute value of Schwarz Bayesian Criterion and Akaik information. Probability is given in parenthesis. In long run coefficients exchange rate (EXR), growth rate of foreign remittances (GFREMIT) and rate of inflation (RINF) all variables are affecting inequality positively. This means as EXR increases by one unit there will be .0011162unit increase in inequality and vice a versa. Results of these variables are significant at 1% level of significance.

TABLE 6

Estimated Long Run Coefficients using the ARDL Approach

ARDL(1,0,0,0) selected based on Schwarz Bayesian Criterion *Dependent variable is GINI*			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
EXR	.0011162	.1881E-3	5.9333*[.000]
GFREMIT	.035511	.012028	2.9523*[.005]
RINF	.1998E-4	.5735E-3	.034844[.972]
INPT	.34435	.0084532	40.7361*

*Significant at 1% level of significance
**significant at 5% level of significance

After testing long run relationship ECM approach is utilized for short run dynamics. Mainly the coefficients are significant in the short run. Exchange rate, growth rate of foreign remittances and rate of inflation influenced directly inequality Results are significant at 1% level of significance. The value of ECM is -.71587 which indicates that the sign is negative so the model is convergent if there is any disturbance in the model, it will converge towards equilibrium and speed of adjustment is 71% and approximately, it will take more than one year but less than two years to bring the disequilibrium into equilibrium.

TABLE 7

Error Correction Representation for the Selected ARDL Model

ARDL(1,0,0,0) selected based on Schwarz Bayesian Criterion Dependent variable is Dgini			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
Dexr	.7991E-3	.2018E-3	.9596 [.000]
dGFREMIT	.025421	.0096864	2.6244*[.013]
Drinf	.1430E-4	.4105E-3	.034849[.972]
Dinpt	.24651	.052340	4.7098*[.000]
ecm(-1)	-.71587	.14976	-4.7801*[.000]

R-Squared	.38598	R-Bar-Squared	.31960
S.E. of Regression	.014574	F-stat. F(4, 37)	5.8146[.001]
Mean of Dependent Variable	.0010929	S.D. of Dependent Variable	.017668
Residual Sum of Squares	.0078586	Equation Log-likelihood	120.6648
Akaike Info. Criterion	115.6648	Schwarz Bayesian Criterion	111.3206
DW-statistic	2.0531		

GROWTH COMPONENTS AND INCOME INEQUALITY

Results indicate that there is existence of long run relationship among the variable GINI, AGR, MGR, LGDP and RUNM because the value of F-statistic is greater than the upper bound that is 4.17 and lower bound is 3.21. There exists one co-integrating equation among the above said variables.

TABLE 8

Bonds Cointegration Results

Variables	F- statistics	Conclusion (HO)
F(GINI/AGR,MGR,LGDP,RUNM)	F(5,20)= 4.2911[.019] I(1)=4.17 & I(0)=3.21	Co-integration

These coefficients are estimated with the Schwarz Bayesian Criterion by minimizing the absolute value of Schwarz Bayesian Criterion and Akaik information. Probability is given in parenthesis. In long run coefficients manufacturing growth (MGR), log of domestic product (LGDP) and rate of unemployment (RUNM) all variables are affecting the inequality positively. This means as MGR increases by one unit there will be .0031576 unit increase in inequality and vice a versa. There is inverse relationship between AGR and inequality. Results of these variables are significant at 1% level of significance. LGDP is positively related with inequality but it is insignificant.

TABLE 9

Estimated Long Run Coefficients using the ARDL Approach

ARDL(3,2,1,3,2) selected based on Akaike Information Criterion *Dependent variable is GINI*			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
AGR	-.0024106	.0011663	-2.0668*[.052]
MGR	.0031576	.7607E-3	4.1507*[.000]
LGDP	.0019693	.0048572	.40545[.689]
RUNM	.0075709	.0039683	1.9079***[.071]
INPT	.29302	.048605	6.0285*[.000]

After testing long run relationship ECM approach is utilized for short run dynamics. Mainly the coefficients are significant in the short run. Agriculture growth rate, manufacturing growth rate log of gross domestic product are significant at 1% level of significance. The value of ECM is-.3166 which indicates that the sign is negative so the model is convergent if there is any disturbance in the model, it will converge towards equilibrium and speed of adjustment is 32% and approximately it will take three year to bring the disequilibrium into equilibrium.

TABLE 10

Error Correction Representation for the Selected ARDL Model

ARDL(3,2,1,3,2) selected based on Akaike Information Criterion *Dependent variable is DINI*			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dGINI1	.55758	.26861	2.0758*[.049]
dGINI2	.42155	.20579	2.04848[.052]
dAGR	-.7565E-3	.7166E-3	-1.0556[.302]
dAGR1	.0014260	.6313E-3	2.2587*[.033]
dMGR	.0014821	.9529E-3	1.5554[.133]
dLGDP	.037236	.063107	.59004[.561]
dLGDP1	-.065061	.063818	-1.0195[.318]
dLGDP2	.18960	.072624	2.6107*[.015]
dRUNM	.012768	.0043121	2.9610*[.007]

ARDL(3,2,1,3,2) selected based on Akaike Information Criterion *Dependent variable is DINI*			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
dRUNM1	-.0092716	.0050770	-1.8262***[.080]
dINPT	.38578	.10577	3.6473*[.001]
ecm(-1)	-.3166	.27495	-4.7884*[.000]

R-Squared	.71626	R-Bar-Squared	.50345
S.E. of Regression	.013201	F-stat. F(11, 24)	4.5897[.001]
Mean of Dependent Variable	.0018583	S.D. of Dependent Variable	.018734
Residual Sum of Squares	.0034853	Equation Log-likelihood	115.2872
Akaike Info. Criterion	99.2872	Schwarz Bayesian Criterion	86.6191
DW-statistic	2.1598		

V. CONCLUSION AND POLICY OPTIONS

The current study tried to explore the impact of fiscal, monetary, and growth variable on income inequality in Pakistan by using annual data of Pakistan from 1960-2010 extracted from World Development Indicators, various publications of Pakistan Economic Surveys, State Bank of Pakistan, and International Financial Statistics. The study used Gini-Coefficient as a proxy variable of income inequality while used budget deficit, investment growth, indirect taxes, subsidies, exchange rate, inflation rate, and remittances are fiscal and monetary variables used in this study. Whereas, GDP, rate of unemployment, agriculture growth rate, and manufacturing growth rate are the growth variables used in this study. All the variables are taken in local current unit except the growth rates and indices. We utilized ADF test to check the unit root problem of time series data which shows that variables are stationary on different level of integration. We used ARDL cointegration approach to check the short run and long run dynamics among the variables. We developed three econometric models; first model explores the impact of fiscal variables on income inequality while second model tried to investigate the role of monetary variables on income inequality. The third model tried to depict relationship of growth components on income inequality in Pakistan.

The study found that there is an existence of long run relationship among the variable GINI, BDF, INVG, ITAX and SUBS. In long run

coefficients budget deficit (BDF), indirect taxes (ITAX) and subsidy (SUBS) all variables are affecting inequality negatively. The value of ECM is -.82414 which indicates that the sign is negative so the model is convergent if there is any disturbance in the model it will converge towards equilibrium and speed of adjustment is 82% and approximately it will take more than one year but less than two years.

Results of second model show that that there is an existence of long run relationship among the variable GINI, EXR, GFREMIT and RINF. In long run coefficients exchange rate (EXR), growth rate of foreign remittances (GFREMIT) and rate of inflation (RINF) all variables are affecting inequality positively. The value of ECM is -.71587 which indicates that the sign is negative so the model is convergent if there is any disturbance in the model, it will converge towards equilibrium and speed of adjustment is 71% and approximately it will take more than one year but less than two years to bring the disequilibrium into equilibrium.

The results of third model investigate that there is an existence of long run relationship among the variable GINI, AGR, MGR, LGDP and RUNM. In long run coefficients manufacturing growth (MGR), log of domestic product (LGDP) and rate of unemployment (RUNM) all variables are affecting the inequality positively. There is inverse relationship between AGR and inequality Results of these variables are significant at 1% level of significance. LGDP is positively related with inequality but it is insignificant. The value of ECM is-.3166 which indicates that the sign is negative so the model is convergent if there is any disturbance in the model, it will converge towards equilibrium and speed of adjustment is 32% and approximately it will take three year to bring the disequilibrium into equilibrium.

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APPENDIX

FIGURE 1

Plot of CUSM Model 1

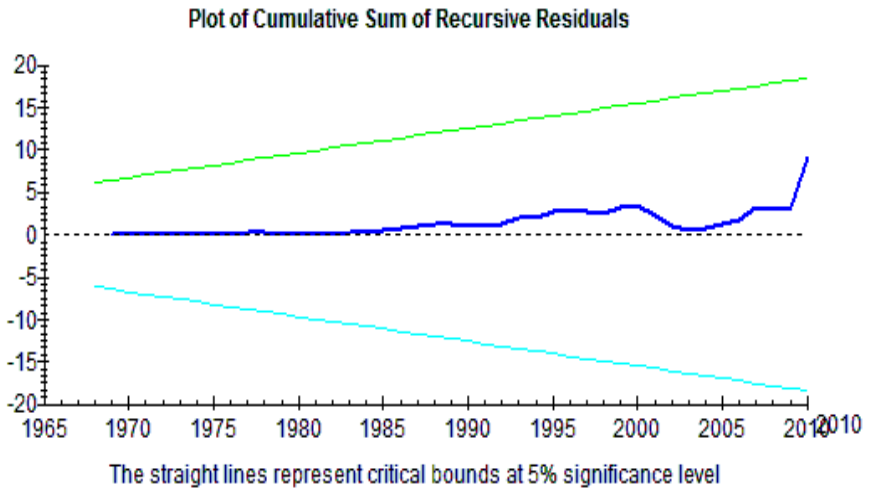


FIGURE 2

Plot of CUSMSQ Model 1

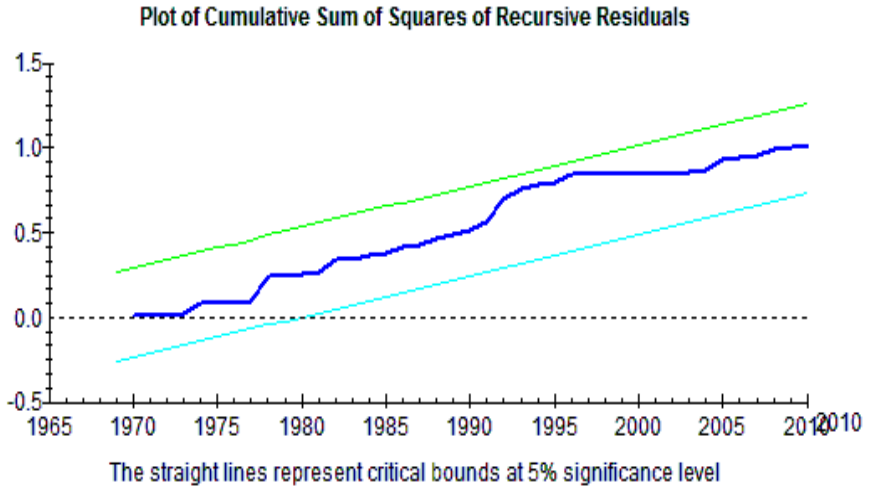


FIGURE 3

Plot of CUSM Model 2

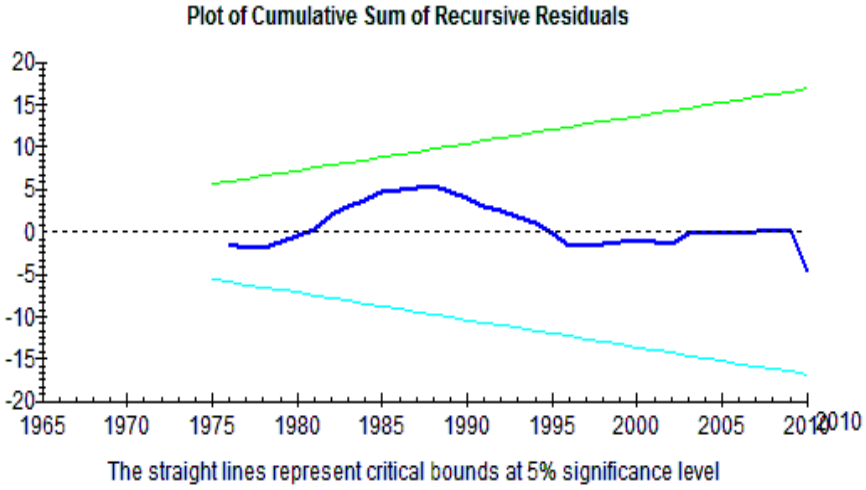


FIGURE 4

Plot of CUSMSQ Model 2

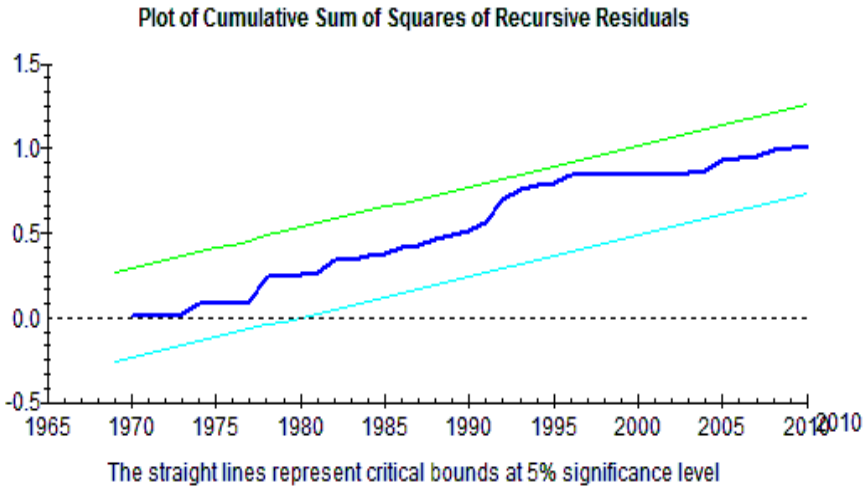


FIGURE 5

Plot of CUSM Model 3

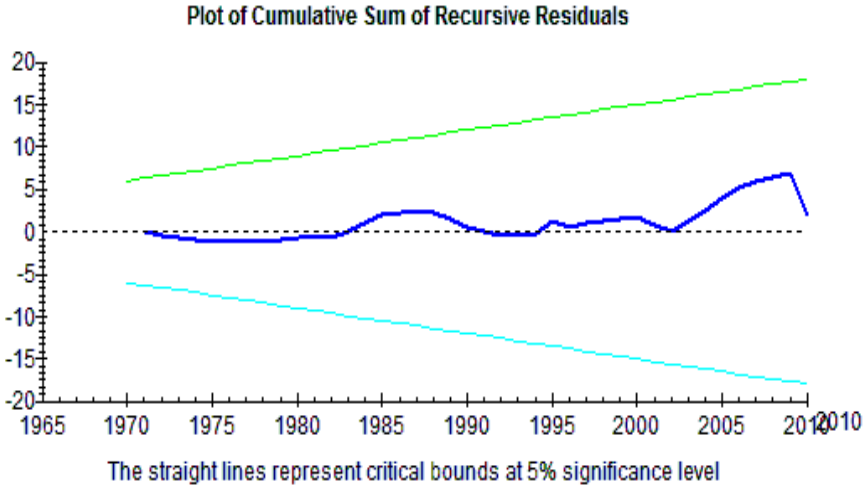
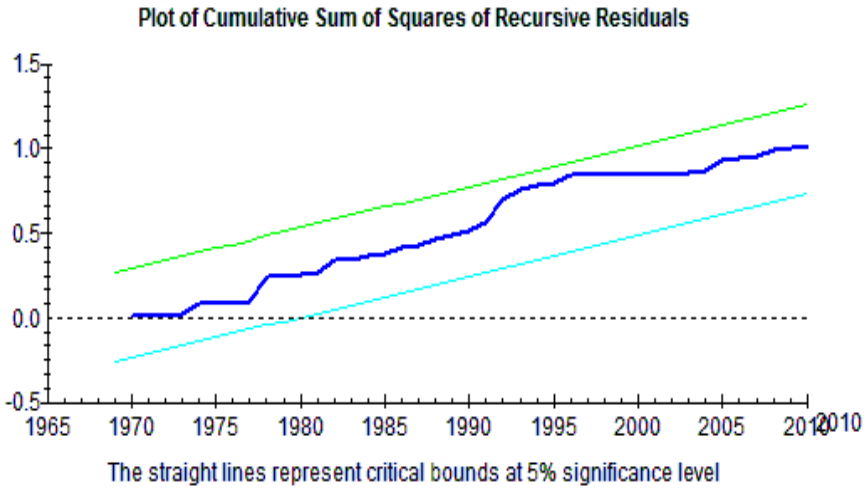


FIGURE 6

Plot of CUSMSQ Model 3



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DEMOGRAPHIC AND ECONOMIC ASPECTS OF POVERTY: A CASE STUDY OF MULTAN DISTRICT, PAKISTAN

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Abstract. This study attempts to explore the demographic and economic determinants of poverty in Multan district by using the data of 300 households collected through random sampling technique. Ordinary least square method has been used. The study uses four poverty indices FGT, Sen Index, Sen-Shorrocks-Thon index, and Watts index to measure poverty. The findings reveal that the incidence, depth, and severity of poverty are higher in rural areas than that in urban areas of Multan district. Moreover, it is inferred that household size, physical disability, mental illness, migration, household head occupation, own house, remittances, and education have a significant impact on poverty.

Keywords: Poverty, Households, Punjab, Pakistan

JEL Classification: I32, J11

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I. INTRODUCTION

The problem of poverty is as old as economic development. Poverty influences the economic condition of society adversely. Poverty limits the abilities and worsens the health of people as they do not contribute in the workforce effectively. Low levels of income lead to bad health, malnutrition and low education levels which lessen economic efficiency and performance (Dasgupta and Ray, 1987). In other words, the countries have to face many economic and political issues when its larger proportion of the population is poor, and the government is compelled to spend more to eradicate poverty. The poor have less physical and monetary assets, fewer investment opportunities, limited access to credit facilities, therefore they are unable to finance their children's education. They have more children as a source of old age financial security and resultantly these factors cause per capita growth to fall (Todaro & Smith, 2014).

Demographic variables are important to analyze the household poverty and these may also influence the economic growth of a country. The countries having high fertility rates and low child mortality rate lead to high youth dependency rate which in turn lowers the per-capita resources for investment in human capital, infrastructure, and economic growth. In these circumstances, it is difficult for the households to tackle the issues arising from poverty. Economic growth and household poverty are also influenced by adult mortality rates. Due to severe and fatal diseases, terrorism and armed conflicts, working age population of the countries declines which consequently upsurge the incidence of poverty not only at household level but also as whole at national lavel by boosting age dependency burdens and reducing the potential for economic growth (Buvinic et al. 2009).

According to the annual report of United Nations Development Program on poverty (2017), 650 million people were suffering from extreme poverty and about 16% of them lived in developing countries, while another 800 million people were at risk of falling back into poverty because of ethnicity, gender, and lack of opportunities where they live. Pakistan is also facing the problem of poverty as the estimates show that a fraction of population is living under a minimum standard line. Over the last decade, the incidence of poverty was observed a decline at

national level because incidence of poverty had decreased from 50.4% in 2005-06 to 24.3% percent in 2015-16. The incidence of poverty was about 12.5% and 30.7% in urban and rural areas respectively in 2015-16. The decline in poverty was more evident in urban areas than those of rural areas. The reasons for this decline were poverty alleviation program like "Benazir Income Support Program" (BISP), reasonable political stability, peace, reduction in terrorism, persistent rise in growth rate of 1.7% in 2008-09 to 5.5% in 2015-16 and inflows of remittances[1].

Poverty trends to vary with location to location. In developing countries, most of the population live in rural areas and connected with the agriculture sector to sustain themselves. The agriculture sector in rural areas plays a significant role in the economic development of rural areas. The conventional agrarian sector in the rural economy has been characterized in most developing economies, by dominant small land possession class, sharecroppers, and tenants that are suffering from poverty (Chaudhry et al. 2009). Pakistan's 63.6% population is living rural areas and incidence of poverty in these areas is estimated at 30.7% in 2015-16[2].

Multan district is located in the Southern Punjab of Pakistan. Multan district accounts for 2.28% of the country population. Most of the population of Multan district is residing in rural areas (56.62%) where people are facing the severe problem of poverty due to a lack of educational and health infrastructure, lack of employment opportunities etc. Multan district has received little consideration, especially in rural areas, at empirical work on poverty. So, the present study focuses on both rural and urban areas to find the determinants of poverty aiming at demographic and economic dimensions. The present study attempts to achieve three broad objectives. These are i) calculating the various poverty indices i.e. FGT, Sen Index, Sen-Shorrocks-Thon-Index, and Watts Index ii) analyzing the poverty profile of Multan district with respect to economic and demographic characteristics and iii) investigating the demographic and economic factors affecting household poverty status in Multan district.

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[1] See, Pakistan Economic Survey, 2016-2017

[2] See, Pakistan Population Census, 2017

The rest of the paper is structured as: Section two presents the profile of study area. Section three portrays the review of literature. Section four explains specification of model, data, and methodology, while section five illustrates the results and section six presents conclusions and policy implications

II. PROFILE OF STUDY AREA

Multan is bounded by the Khanewal district on the North and North East, Vehari district on East and Lodharan district on South. District Multan consists of four tehsils known as Multan city, Multan Saddar, Jalalpur Pirwala, and Shujabad. The Chenab river is on the western side of Multan district. The area of Multan district is 3721 square kilometers. The population density is 250 persons per square kilometer. The climate of Multan district is very hot. The agriculture land of the district is very productive and that's why Multan district is famous for high agricultural yield specifically cotton and Mango not only in Pakistan but also all over the world.

Multan is well known due to saints and Mausoleums because sufis and saints had stayed here for preaching Islam. Multan is the city of markets, mosques, and wonderfully designed tombs. The population of the district is largely the Muslim. The Christians are in a minority, while the Hindus and the Sikhs are negligible. The diverse spiritual groups have their own way of life customs and events, places of adorations.

According to the Pakistan census 2017, the inhabitants of Multan district is 4.745109 million, average annual population growth rate is 2.23 percent, and average household size is 6. About 6.62 percent of the total inhabitants are living in rural areas and 43.38 percent population are residing in urban areas of Multan district. In terms of population, Multan city is the largest tehsil comprising 47.6 percent population and Jalalpur Pirwala is the smallest tehsil comprising 11.68 percent of the population of Multan district.

III. LITERATURE REVIEW

This section is segmented into two sections. First section explains the concept and measurement of poverty while second section elaborates the review of assorted empirical studies.

POVERTY: CONCEPT AND MEASUREMENT

It is essential to understand the definition of poverty with the attention to examine the determinants of poverty. Poverty is a multifaceted phenomenon and there is no single delicate meaning and assessment of it.

World Bank (1990) defines the concept of poverty as "the inability to achieve a minimum standard of living". Later, World Bank (2000) defines poverty as "lack of resources in relation to wants, which leads to poverty. This definition is too wider and extends outside the food and nonfood objects by including assets and social position which are vital for the development of human capital. According to Lipton and Ravallion (1995) *"Poverty exists when one or more persons fall short of a level of economic welfare deemed to constitute a reasonable minimum, either in some absolute sense or by the standards of a specific society"*

Absolute poverty is defined as "lack of means in relation to needs" and relative poverty can be defined as "lack of means in relation to the means of others" (Chaudhry et al. 2009).

Poverty Lines

The poverty line indicates the income or expenditure yardstick, from which individuals or households fall below this line is counted as poor. This concept assumes that poverty is basically incapability to satisfy certain basic needs and these can only be fulfilled by income or expenditure. Poverty line are largely used to classify people either they are poor or not and this threshold has become the most preferred indicator for the quantitative measurement of the welfare of the people.

A poverty line differs from location to location and depends on the living condition of the people in that particular location. Poverty line separates the poor from the nonpoor. There are two broad procedures for estimating a poverty line: the first one is "relative" and another one is "absolute" poverty line.

The absolute poverty line is a minimum threshold that shows the minimum amount of income required by the people to obtain certain basic needs. Though, the absolute poverty is explicitly set at a specific welfare level. Developing countries relied on absolute poverty lines

rather than relative poverty lines as a large part of the population in such economies survive with minimum living standards. Sen (1981) asserts that when analyzing less developed economies absolute poverty threshold must be retained.

The relative poverty line is defined in terms of the proportion of population income smaller than a fixed percentage of mean or median income. These poverty lines can be constructed for each society in any time period based on the patterns of allocation of income. Normally it starts with a cutoff of fifty percent of the median income. (Shanahan and Tuma, 1994).

Poverty Measurements

Once the poverty line is estimated, the subsequent subject is the investigation of an adequate poverty measure. In Table 1, we explain the summary of different poverty indices.

TABLE 1

Summary of Poverty Measures

Measure	Formula	Definition and Features
Headcount Index	$P_o = \frac{Q_p}{Q}$	$0 \leq P_o \leq 1$ Count the number of poor Not obey the transfer axiom P_o is scaled invariant[3] P_o is translation invariant[4]
Poverty Gap Index	$P_1 = \frac{1}{Q}\sum_{i=1}^{Q}(\frac{L-Y_i}{L})$	$0 \leq P_1 \leq 1$ Unresponsive to income transfers within the poor
Squared Poverty Gap Index	$P_2 = \frac{1}{Q}\sum_{i=1}^{Q}\left(\frac{L-Y_i}{L}\right)^2$	$0 \leq P_2 \leq \infty$ Sensitive to income transfers within the poor P_2 is Scale invariant P_2 is not translation invariant

[3]If entire incomes and the poverty line are scaled by the equal proportional factor β, poverty measure would remain invariant.

[4]If entire the incomes and poverty line are increased by the equal sum of money say \$10, P_o would remain the same because P_o is independent of income as it only encounters the number of poor.

Measure	Formula	Definition and Features
Sen Index	$P_S = P_o[P_1 + (1-P_1)G_p]$	$0 \leq P_S \leq P_o$ P_s satisfies a transfer principle P_s is not translation invariant Ps is scale variant
Sen-Shorrocks-Thon Index	$P_{SST} = P_o P_1(1+G^P)$	P_{SST} does not satisfy the focus axiom It satisfies the monotonicity axiom[5] P_{SST} satisfies a transfer axiom
Watts Index	$P_W = \frac{1}{Q}\sum_{i=1}^{n}[\ln(L) - \ln(Y_i)]$	P_W satisfies the focus axiom P_W satisfies the transfer principle It satisfies the monotonicity axiom

REVIEW OF EMPIRICAL STUDIES

In this section, efforts are made to review the literature regarding socio-economic and demographic determinants of poverty. These are as follows:

To figure out the factors of rural poverty in Pakistan, Malik (1996) investigated that the size of landholdings, educational attainment, dependency ratio, and household size influenced per-capita income level in a significant way. Dependency ratio and female-male ratio had a significant negative influence on per capita income. In another study, Mukherjee and Benson (2003) examined the various aspects that affect the poverty in Malawi. The results pointed out that level of education, employment, occupation, household size, agriculture landholdings, health care facilities and access to roads had a significant effect on poverty. To explore the profile and factoring causing poverty for Philippines, Albert and Collado (2004) indicated that the an addition of a child affects the household income negatively and the age of the household head along with housing conditions had also a significant impact on poverty. It was observed that most of the households facing poverty are engaged in agriculture. One study based on Multan city was conducted by Chaudhry et al. (2006) which pointed out that good governance influences urban

[5] It requires that if income of the poor individuals increased, the poverty index should be decreased.

poverty. Household size, gender ratio, age of household head, female family unit head, dependency ratio, casual and informal worker and persons per rooms were positively related with poverty while participation ratio, female participation, literate household head, value of assets, owned house and governance were inversely correlated with poverty. In case of Lithuania, Misiunas and Binkauskienė (2007) uncovered the factors of poverty as household size, household head education, marital status, number of earners in a family, number of kids in family, and occupation of household head. Similarly, Chaudhry et al. (2009) determined the socio-economic and demographic characteristics of poverty in Muzaffargarh district. The findings exhibited that as land owned by household increased, the incidence of poverty decreased. Better education and economic conditions were linked with wage earners in a family and poverty fall as participation rate increased. Dependency ratio, sex ratio, and household head age were negatively connected with poverty. The study by Buvinic et al. (2009) found that gender inequality was linked to the significance of females in the household, family planning programs, genetic impartiality in education and employment and old age support. Moreover, liking for sons over daughters were normally observed as trouble for females. Another study that examined the factors of poverty in Zimbabwe conducted by Sakuhuni et al. (2011) pointed out that age squared, sex, education, occupation, migration status, secondary business engagement, loan accessibility and cultivated area of land were negatively associated with poverty while age and size of household were positively connected to poverty. The study by Akerele et al. (2012) estimated the socio-economic factors of poverty particularly amongst metropolitan households in South-West Nigeria found that educational grades of the head of household, household properties, dependency ratio, and profession of the head of household had a significant effect on poverty. Literacy of the household head had a negative influence on poverty. The micro-level factors of poverty was considered in a study by Khatun (2015) and pointed out that household size, household age and dependency ratio portrayed a negative impact on poverty whereas education, participation rate, assets and occupation of the household were positively associated with poverty.

To investigate the factors affecting the poverty status of households in Taiwan Chen & Wang (2015) confirmed that the incidence of poverty

differs across regions. Education attainment, household head age, family setup, earners in a family and, the number of dependents were associated with poverty status. Households headed by females had high probability to fall into poverty than the households headed by males. Significant associations were noticed between poverty and structural characteristics, including unequal distribution of income, economic escalation, structural change, and labor market. Similarly, Mekore and Yaekob (2018) determined the factors that influence the rural poverty in Ethiopia. Participation rate, use of high-quality seed, land size owned by the household, number of members in family, livestock, and remittance earnings were significant factors that influenced poverty negatively. Buba et al. (2018) examined the socio-demographic factors of poverty in Nigeria. The findings of this study exhibited that household head age, size, female-headed household, household head education, and employment status significantly affect the probability of being poor of households.

After reviewing this literature, we may summarize some points related to the determinants of poverty as follows: The incidence of poverty was more in rural regions in relation to urban areas, either in the case of Pakistan or other countries of the world. The policies suggested in the different analysis are varying from localities and based on the needs and living condition of households in particular areas. Most of the research exertions have based on estimating the households under the given poverty line and determining the aspects that affect the standard of living of households.

Numerous studies have pointed out the variables such as household size, education, participation rates, dependency ratio, educational attainment of household, location, and social infrastructure that affect the poverty status of households. Various macroeconomic indicators such as inflation rate, unemployment rate, GDP, and remittances etc. have also been discovered that affect poverty. In the existing literature, we have observed that poverty is mostly measured by FGT index. To measure poverty, we have employed four poverty indices FGT, Sen Index, Sen Shorrocks and Thon, and Watts indices. Multan district has been taken for the household survey because so far, no impressive and detailed research has been taken to observe poverty correlates in Multan district except one study by Chaudhry et al. 2006 with the limitation that it was

limited to Multan city only. In a nutshell, we may declare that this study is different from the preceding studies as it offers a comprehensive analytical and empirical work of many demographic and economic indicators that affect the poverty status in Multan district.

IV. MODEL SPECIFICATION AND DATA AND METHODOLOGY

MODEL SPECIFICATION

To explore the demographic and economic determinants of poverty, we have used atheoretic model by using household survey data. The econometric form of the model is given below:

$$PI_i = \beta_o + \beta_1(SEX) + \beta_2(MS) + \beta_3(HSIZE) + \beta_4(AGEH) + \beta_5(EDUC) + \beta_6(PD) + \beta_7(OCC) + \beta_8(MI) + \beta_9(FR) + \beta_{10}(PR) + \beta_{11}(DR) + \beta_{12}(FMR) + \beta_{13}(MIG) + \beta_{14}(RIM) + \beta_{15}(OH) + \beta_{16}(CRD) + u_i \quad (1)$$

Where PI_i is the poverty indices that we have used as dependent variables and variables in parenthesis are independent variables. We have used five poverty indices PGI, SPG, SI, SST, and WI alternatively as dependent variable in each analysis.

TABLE 2

List of the Variables for OLS Estimates of Demographic and Economic Factors Affecting Poverty

Variables	Description
Dependent Variables	
PGI	Poverty Gap Index
SPG	Squared Poverty Gap
SI	Sen-Index
SST	Sen-Shorrocks-Thon Index
WI	Watts Index
Independent Variables	
Demographic Variables	
SEX	1 if the household is headed by a male 0 otherwise
MS	1 if the head of the household is unmarried 0 otherwise

Variables	Description
AGEH	Age of the household head
HSIZE	Household size or total members of the family
DR	Dependency Ratio
FMR	Female-male Ratio
FR	Fertility Rate
PD	1 if the household has a physically disabled member 0 otherwise
PD	1 if the household has a physically disabled member 0 otherwise
MI	1 if the household has a mentally ill member 0 otherwise
MIG	1 if any member of a household or household migrates from rural to urban area 0 otherwise
Economic Variables	
PR	Participation Rate
RIM	1 if household receives remittances 0 otherwise
OCC	1 if the head of the household is working in the informal employment sector 0 otherwise
OH	1 if the household head has its own house 0 otherwise
CRD	1 if household took credit 0 otherwise
EDUC	Household head years of schooling

JUSTIFICATION OF VARIABLES

In this section, we have explained the demographic and economic variables that are linked with poverty. First, we explain the demographic variables which are as follows:

DEMOGRAPHIC DETERMINANTS OF HOUSEHOLD POVERTY

Demographic variables considerably affect the poverty status of households. In this section, we present concise definitions and details of in what manner these variables are associated with poverty. The important demographic variables are as follows:

Household Size

Household size means a total number of members in a household. A household with a greater number of healthy, educated and working-age members means more earners and can contribute to high household income whereas larger household size with a smaller number of healthy educated persons decreases the per capita income of the household.

Age of the Household Head

Age of household head plays a key role to determine the attitude towards work in a household. The probability of poverty is lower for the households that are in working age. However, poverty incidence may be higher for an old household head that cannot work. The link between household age and poverty can be positive or negative. Old age household heads have more experience and their earnings are higher. Similarly, young household heads may have more potential and power to work hard and can earn more income.

Dependency Ratio

The dependency ratio is defined as the ratio of the number the member's age less than 15 and age greater than 64 to the total members of the household. It shows the dependency burden in the working members within the household. Dependency burden lowers the per capita income of the household. We hypothesize that the dependency ratio is positively connected with the poverty status of households.

Female-Male Ratio

We have computed the female-male ratio of members whose age is less than 15 and greater than 64. Females in rural areas are typically forced to work outside the house. It implies that a high female-male ratio (as measured by the total number of females divided by the total number of males in a household) is negatively correlated to household poverty.

Physical Disability and Mental Illness

Physical disability or mentally illness of the members in a household lowers the participation rates and per capita income. Such households have to face higher health care costs, decrease efficiency, and poor

general health. This suggests that physically disable and mentally ill members in a household increase the probability of poverty.

Fertility Rate

High fertility affects the budgets of poor families, by reducing available resources to feed, increase educational, and health care costs. Lack of education of parents is generally associated with high fertility. In the current study, we have computed the fertility rate as the ratio of children under age one to the number of women of childbearing age (15<age<49). Higher fertility rates positively associated with poverty status of households.

Rural-Urban Migration

Migration can be defined as geographical mobility of people from one place to another for the reason of getting better economic and social opportunities. Rural to urban migration play an imperative role in poverty alleviation. Rural to urban migration takes place due to inadequate employment opportunities, insufficient healthcare infrastructure, production shocks and surplus labor in the agriculture sector.

ECONOMIC DETERMINANTS OF HOUSEHOLD POVERTY

There are many economic variables that are considerably associated with poverty. A brief detail and definition of some economic variables are given as follows:

Household Head Occupation

The household head occupation is an important determinant of household well-being. In the present study, we have distributed the occupations into two categories formal and informal employment sector. We use a dummy variable for occupation and used 0 if household head is working in the formal sector, otherwise used 1. One could presume that working of household head in the informal sector increase the probability of poverty.

Participation Rate

The participation rate is an employment variable. The higher participation rate lowers the poverty incidence as higher participation rate means more earners in a household. Participation rate is obtained by dividing the total number of members of the household who are eligible but not participating in the labor force to the total number of members of the household who are eligible to participate in the labor force.

Remittances

Foreign remittances significantly influence the well-being of the household. It directly affects the household welfare. As household income increases, consumption of food and nonfood items and investment in education also increases. Remittances indirectly affect the poverty through the GDP growth and increase foreign reserves. In the present analysis, we have used a dummy variable for remittance whether the household receives or not.

Credit

Credit facility can improve the efficiency of the households. When credit is used for investment purposes, it raises the household income. In our study, we have used the dummy variable for credit and attempts to know households who took credit from formal or informal resources are enjoying the better living standard or fall into poverty. The outcome of credit with poverty can be positive or negative depending on the use of credit. Normally in rural areas of Pakistan, poor households have a lack of income and they took credit to meet their basic needs or for the marriage of their children. In this situation, value of credit enhances the poverty incidence. On the other hand, if credit is invested for productive activities, it can reduce the probability of poverty of the household.

Own House

In our study, we have used a dummy variable for housing to determine whether the household has its own house or rented house. Poor households have low per capita income if they have not their own house, they must pay rent for house and resultantly their per capita income significantly shrinks and eventually they become poorer.

Education of Head of Household

Education is an important social determinant of poverty. Household heads with higher education have more employment opportunities as they are more efficient, skillful and they can make appropriate decisions regarding the budget of the family. In the present study, educational attainment is measured by years of schooling of the household head. It is evident from previous studies that household heads with a higher level of education have high per capita income in relation to households with no educational attainment.

DATA AND ESTIMATION PROCEDURE

To conduct the household survey, simple random sampling has been used in this study. There are four tehsils of Multan district namely Multan Saddar, Multan city, Shujabad, and Jalalpurpirwala. Data are gathered from both rural and urban areas of the Multan district. We have sampled 75 households from each tehsil and a total sample of respondents in this study is 300. For study, about 42 percent of the samples were collected from urban areas and the remaining 58 percent of samples obtained from rural areas.

In the descriptive analysis, we have constructed the profile of poverty of Multan district and then income distribution has been examined by Gini Index. In the second stage, we have built the profile of poverty based on various household characteristics using household survey data.

We have taken a poverty line ($1.90 per person per day) estimated by World Bank and used for four poverty measures such as FGT poverty index, Sen poverty measure, Sen-Shorrocks, and Thon index and, Watts poverty measure to calculate a detailed poverty profile of Multan district. For regression estimation of results, we have used ordinary least square (OLS) method.

V. RESULTS AND DISCUSSIONS

Firstly, we describe the poverty profile of district Multan along with poverty profile of households by demographic and economic characteristics. After that, we present the econometric analysis to determine the impact of demographic and economic variables on poverty.

Poverty Profile

This section portrays the profile of poverty of Multan district. A poverty profile illustrates how poverty measures vary across sub-groups of the population such as regions of residence, educational attainment, demographic and other characteristics of households. Table 3 illustrates the estimates of poverty measures of Multan district.

TABLE 3

Area-wise Poverty Measurement

Area	HI	PGI	SPG	SI	SST	WI
Multan District	43.67	21.57	12.88	41.96	14.14	34.1
Multan City	22.67	9.48	5.17	2.32	2.97	14.38
Multan Saddar	48.0	23.49	13.73	18.58	14.78	36.69
Shujabad	56.0	29.73	18.48	41.60	21.97	48.69
Jalalpur Pirwala	48.0	23.58	14.16	18.49	14.97	37.76

Source: Authors' calculations based on household survey data, 2018

The results of the poverty measures reveal that 43.67 percent of households are poor of Multan district. The value of the poverty gap index is calculated as 21.57 percent which implies that 21.57 percent of poor income is necessary to break away from poverty. The value of squared poverty indices is projected at 12.88 percent, suggesting that there is 12.88 percent disparity among the poor. In other words, more weight is given to those poor households who are farther from the minimum threshold. This points out that how much of a gap is among the poor and what amount of resources is required to get rid of poverty. The Sen Index, which captures the severity of poverty as well as the inequality of expenditure or income among the poor shows 41.96 percent are poor households. The SST-Index, which incorporates the severity of poverty as well as the inequality of income among the whole population, demonstrates that 14.14 percent are poor people. The value of SST-Index is high (21.97 percent) in Tehsil Shujabad indicates high inequality and Poverty among households. On the other hand, Watts-Index exhibits that 34.1 percent of the population of Multan district falls below the poverty line.

TABLE 4

Poverty Measurement by Rural-urban Areas

Area	HI	PGI	SPG	SI	SST	WI
Rural Areas	55.43	28.16	17.21	36.20	26.69	46.14
Urban Areas	27.20	11.74	6.37	7.82	5.02	17.68

Source: Authors' calculations based on household survey data, 2018

Table 4 shows that the incidence of poverty is higher in rural areas in comparison with urban areas of Multan district. Gini Index is used to measures income inequality that is mostly associated with the descriptive approach to inequality measurement. Gini coefficient lies between 0, which reveals perfect equality, and 1, shows perfect inequality. This index is rigorously linked to the demonstration of income inequality through the Lorenz Curve. In the current study, the Gini index is used only to observe the income inequality in the Multan district.

TABLE 5

Gini-Index Estimates of Multan District

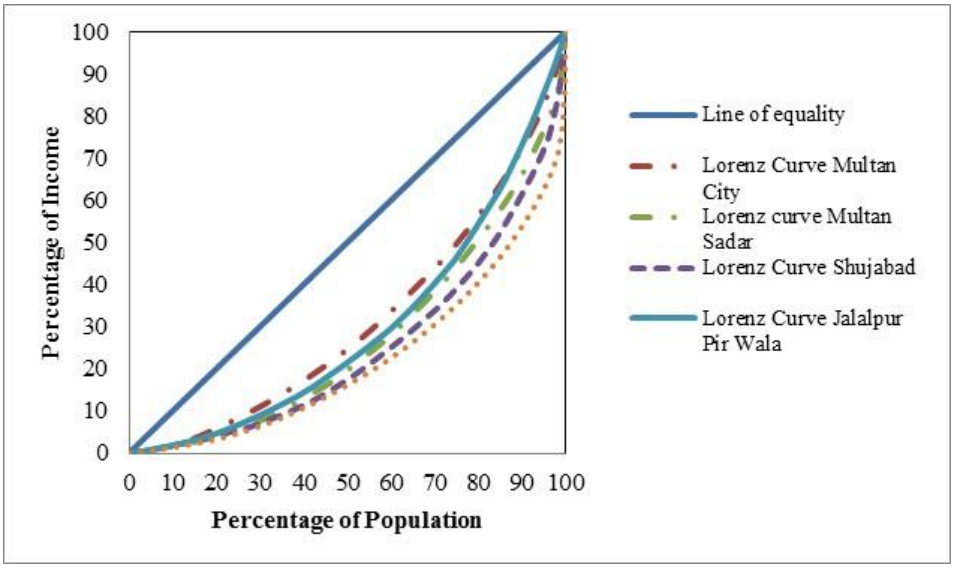
Area	Gini-Index
Multan District	0.50
Multan City	0.34
Multan Saddar	0.31
Shujabad	0.37
Jalalpur Pir Wala	0.33

Source: Authors' calculations

Table 5 reports the estimates Gini Index of Multan district. The value of Gini coefficient of Multan district is 0.50 which implies that 50 percent income is distributed unequally. Among four tehsils of Multan district, high inequality of income is observed at Shujabad where the value of Gini index is 0.37. The graphical representation of Lorenz curves is portrayed in Figure 1.

FIGURE 1

Lorenz Curve Multan District



Source: Authors' calculations based on household survey data, 2018

Poverty Profile of Households by Demographic and Economic Characteristics

TABLE 6

Poverty Measurement by Household Size

Household Size	Percent of Population	HI	PGI	SPG	SI	SST	WI
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1.67	40.0	15.39	6.39	6.70	6.31	16.71
3	2.34	0.00	0.00	0.00	0.00	0.00	0.00
4	16.67	32.0	15.93	9.62	28.77	6.21	25.04
5	21.0	49.20	26.02	15.78	19.08	16.24	40.43
6	18.34	27.27	12.16	7.08	5.33	6.63	18.78
7	14.67	47.72	19.85	11.29	13.98	12.30	31.18
8	8.67	57.69	31.52	19.29	21.58	20.16	51.23
9	5.0	46.67	42.30	25.29	20.89	21.03	40.0
10 & above	11.67	68.57	34.71	21.19	29.66	27.51	56.65

Source: Authors' calculations based on household survey data, 2018

Table 6 suggests that all poverty indices increase slowly as household size increase excluding those containing six and nine members. The outcome reveals that the household size that is mostly affected to poverty are those with 5, 7, 8 10 or above members of a household. In the survey study, no household was found comprising of only one member. Therefore, a household with two members (1.67% of the population) is also to be found be lie below the poverty threshold. The highest incidence of poverty is found in the household size of 10 or more members (11.67 percent of the total household population) indicating by all poverty measures.

Education and poverty are inversely related to each other. The higher level of education ultimately helps in the accomplishment of basic necessities, via high earning jobs; also influence the women's behavior in fertility decisions and family planning.

TABLE 7

Poverty Measurement by Household Head Education

Years of Schooling	Percent of Population	HI	PGI	SPG	SI	SST	WI
Illiterate	23	84.05	46.67	29.46	53.18	51.76	76.88
1-5	17.67	66.03	32.8	19.48	23.54	26.22	51.67
6-8	10.67	59.38	23.77	12.66	19.06	16.35	35.15
9-10	16.00	25.00	11.74	6.82	4.45	3.57	18.34
11-12	11.34	8.82	1.95	0.44	0.39	0.20	2.27
13 & above	21.34	6.25	1.88	0.79	0.60	0.16	2.24

Source: Authors' calculations based on household survey data, 2018

Table 7 explores the results of various poverty estimates at the basis of years of schooling completed by the household head. The result implies that poverty incidence is higher among those households with a household head no educational achievement. It can be seen from Table 7 that higher level of education negatively correlated by poverty status of households. Household heads with no education (comprising 23 percent of the population) are found to be poor indicating by all poverty measures.

The participation rate is the key economic variable and important determinant of poverty. The results portrayed in Table 8 expose that, as the number of members of household participates in income earning

activities, poverty declines as shown by headcount ratio, Sen Index, SST Index, Watts index.

TABLE 8

Poverty Measurement by Participation Rate

Participation Rate	Percent of Population	HI	PGI	SPG	SI	SST	WI
0.00-0.33	16.34	55.10	33.36	22.08	23.79	21.70	56.59
0.34-0.67	64.00	45.83	21.80	12.77	27.08	16.63	34.27
0.68-1.00	19.67	27.11	11.01	5.06	5.27	3.81	51.81

Source: Authors' calculations based on household survey data, 2018

When the participation rate is very low (0.00 to 0.33), poverty is much higher. The level of poverty is 27.11 percent when the participation rate is high (0.68 to 1.00).

A larger number of dependents indicate a smaller number of earners in the household which in turn lowers the per capita income that resultantly household fall into poverty. The results of poverty measurement based on the dependency ratio are presented in Table 9.

TABLE 9

Poverty Measurement by the Dependency Ratio

Dependency Ratio	Percent of Population	HI	PGI	SPG	SI	SST	WI
0.00-0.33	40.00	25.83	10.76	5.84	6.83	4.30	16.28
0.34-0.67	19.00	45.62	22.10	13.52	15.07	12.84	35.73
0.68-1.00	18.37	54.54	23.47	12.42	21.13	16.05	34.45
1.01 & above	22.67	64.70	38.63	25.13	34.54	31.07	64.70

Source: Authors' calculations based on household survey data, 2018

The results illustrate that as the dependency ratio rises from the first to the second group, poverty (Headcount, Sen Index, SST Index, and Watts index), depth and severity increases. From the field survey, it is found that 21.67 percent households have a high dependency ratio (1.01 or more) and these households are living below the poverty line.

The age of the household head also affects the poverty status of the household. Table 10 depicts the results of poverty measurement in terms of household head age. About 9.38 percent of household heads are in the

age group 20-30 and deprived. Interestingly, 23.67 percent of household heads lie in the age group 31 to 40 and show a high level of poverty in relation to other age groups. The level of poverty is low in the age group 51 to 60 because of greater work experience and income. However, poverty occurrence, depth, and severity increases in the age group 61 and above of household heads because of low efficiency and lack of power to work hard.

TABLE 10

Poverty Measurement by Household Head Age

Household Head Age (Years)	Percent of Population	HI	PGI	SPG	SI	SST	WI
21-30	9.34	42.85	19.83	11.53	10.84	9.63	30.75
31-40	23.67	64.78	35.01	21.70	32.71	29.48	56.80
41-50	27.0	44.45	21.02	12.41	16.22	12.54	32.91
51-60	27.34	29.26	12.85	6.98	7.26	5.11	19.30
61 & above	12.34	35.14	18.19	11.43	9.11	7.54	30.86

Source: Authors' calculations based on household survey data, 2018

Poverty estimates of household head occupation are reported in Table 11. Household heads working in informal sector are comprising 56.67 percent of the population are more prone to poverty because in the informal sector, less educated and unskilled workers are employed and as a result their income and productivity tend to lower in relation to formal sector workers.

TABLE 11

Poverty Measurement by the Occupation of Household Head

Employment	Percent of Population	HI	PGI	SPG	SI	SST	WI
Formal Sector	43.33	9.24	0.22	0.73	2.59	3.38	2.71
Informal Sector	56.67	69.42	35.93	21.84	53.36	41.57	58.42

Source: Authors' calculations based on household survey data, 2018

Econometric Analysis

OLS estimates of demographic and economic aspects of poverty are reported in Table 12. The independent variables include household head sex (SEX), marital status (MS), household size (HSIZE), age (AGEH), educational attainment by household head (EDUC), physical disability (PD), mental illness (MI), dependency ratio (DR), participation rate (PR), fertility rate(FR), remittances (RIM), migration (MIG), household head occupation (OCC), own house (OH) , and credit (CRD).

The empirical results in Table 12 shows the explanatory power of the regression equations, as measured by R2, to be 61.6 percent which shows that an average of 61.6 percent of the variation in the dependent variable of (PGI) in Model I is due to explanatory variables and remaining 38.4 percent are due to other variables which are not included in the model. The overall significance of the model is checked by F-statistic which is statistically significant. The variable of household head sex (SEX) does not turn out with a right sign and it is insignificant as well. Household size (HSIZE), household head age (AGEH), household head education (EDU), physical disability (PD), mental illness (MI), dependency ratio (DR), household head occupation (OCC), rural to urban migration (MIG), remittances (RIM), and own house (OH), are statistically significant while gender of household head (SEX), marital status (MS), fertility rate (FR), participation rate (PR), female-male ratio (FMR) and, credit (CRD) are not statistically significant.

The household size is an important demographic variable that has an impact on poverty. A household with many members and possess a high proportion of dependents are likely to be poor in relation to households with few members. This suggests that as the household size increases, the depth of poverty will also increase. The increasing family size advocates a larger number of dependents on fewer earners and this might show fewer earnings and lesser per capita income. The coefficient of household size shows that if other things are remaining the same, the size of household increases by one member which will increase the PGI by 0.010 units. A larger number of children and elderly members in a household would imply a smaller number of earners in the household. High dependency ratio would be correlated positively with the poverty status of the household. The coefficient of the dependency ratio (DR) is

positive and highly significant. Poverty mostly affects people who are under or above productive ages. Normally, young people have low income as their early experience in the labor market starts with low income and fewer hours of work. As individuals age increases, there is a gradual gain in education, work experience, and labor network. The value of the coefficient AGEH has a negative sign and statistically significant. Older heads of households are experienced and can improve the economic well-being of their families.

There is a strong link between education and poverty. A higher level of education ultimately affects the poverty inversely via high earning job opportunities, better decisions for their family, it also influences the women's behavior in fertility decisions and family planning. The educational level of the household is significant in explaining the poverty status of the household. This implies that more educated employed with higher earnings and make healthier decisions on spending; this in turn, reduces poverty. A household with a greater number of physically disables are more prone to poverty because it increases the dependency and affects the per capita income of household (Park & Nam, 2017; Jeon et al. 2017; Braithwait & Mont, 2009). Mental illness also increases one's risk of becoming poor when suffering from mental illness. The result of MI is statistically significant and exhibits households with more members suffering from the disease of mental illness are poorer. Those individuals suffering from mental illness face higher health care costs, decrease productivity and poor general health. Additionally, mental illness has a bidirectional relationship with poverty (See Chung et al. 2018; Anakwenze & Zuberi, 2013).

TABLE 12

OLS Estimates of Demographic and Economic Aspects of Poverty

Explanatory Variables	Model I	Model II	Model III	Model IV	Model V
	PGI	SPG	SI	WI	SST
SEX	0.026 (0.533)	0.023 (0.634)	-0.039 (-1.092)	0.043 (0.488)	0.017 (0.533)
MS	0.006 (0.439)	0.010 (0.953)	-0.002 (-0.224)	0.022 (0.901)	0.004 (0.439)
HSIZE	0.010 (2.205)**	0.003 (0.880)	0.015 (4.472)*	0.011 (1.371)	0.007 (2.205)**
AGEH	-0.003 (-2.981)*	-0.001 (-1.996)**	-0.003 (-4.407)*	-0.004 (-2.227)**	-0.002 (-2.981)*
EDUC	-0.015 (-5.230)*	-0.009 (-4.475)*	-0.011 (-5.074)*	-0.024 (-4.754)*	-0.010 (-5.230)*

Explanatory Variables	Model I	Model II	Model III	Model IV	Model V
	PGI	SPG	SI	WI	SST
PD	0.106 (3.042) *	0.082 (3.157)*	0.055 (2.111)**	0.204 (3.249)*	0.070 (3.042)*
MI	0.115 (3.010)*	0.072 (2.503)**	0.067 (2.330)**	0.183 (2.637)*	0.076 (3.010)*
FR	0.043 (1.407)	0.041 (1.813)***	-0.006 (-0.248)	0.096 (1.746)***	0.028 (1.407)
PR	-0.065 (-1.114)	-0.064 (-1.477)	0.003 (0.070)	-0.146 (-1.396)	-0.043 (-1.114)
DR	0.077 (4.738)*	0.062 (5.111)*	0.032 (2.647)*	0.152 (5.130)*	0.051 (4.738)*
FMR	-0.018 (-1.363)	-0.014 (-1.433)	-0.009 (-0.870)	-0.035 (-1.441)	-0.012 (-1.363)
OCC	0.109 (3.510) *	0.060 (2.588)*	0.104 (4.445)*	0.163 (2.891)*	0.072 (3.510)*
MIG	-0.062 (-2.070)**	-0.043 (-1.926)***	-0.038 (-1.690)***	-.106 (-1.944)***	-0.041 (-2.070)**
RIM	-0.083 (-2.378)**	-0.039 (-1.503)	-0.082 (-3.130)*	-.114 (-1.797)***	-0.055 (-2.378)**
OH	-0.131 (-3.666)*	-0.095 (-3.585)*	-0.081 (-3.027)*	-0.246 (-3.822)*	-0.086 (-3.666)*
CRD	0.053 (1.413)	0.020 (0.700)	0.078 (2.779)*	0.062 (0.912)	0.035 (1.413)
Intercept	0.418 (5.100)*	0.272 (4.433)*	0.359 (5.849)*	.705 (4.746)*	0.276 (5.100)*
R2	61.6	55.0	60.8	57.9	61.6
F-Statistic	28.315	21.576	27.431	24.305	28.315

Source: Authors' calculations

Note: The values in the parenthesis are t-statistic values

'*' p-value < 0.01

'**' p-value < 0.05

'***' p-value < 0.10

One more significant factor that influences the household poverty is household head occupation (OCC). The OCC shows a significant coefficient with a positive sign indicating that people engage with the informal sector are more enduring from poverty as compare to formal sector households. As employment in the informal or casual sector is increasing by one percent, poverty gap index will enhance by 0.109 units. Because in the informal sectors, mostly unskilled laborers are engaged with low productivity and low earnings as in this sector wages are not extremely high, and workers have not any employment security they feel uncertainty about their income. The value of MIG coefficient is significant and suggests that as MIG is increased, PGI will decrease by -0.062 units. The main effect of migration is that it can increase the consumption and income of rural households (Harris and Todaro, 1970). The value of RIM coefficient is statistically significant and points out that

as remittance increases by one unit, the depth of poverty decreases by -0.083 units; other things remain the same.

In Model II, III, IV and V poverty indices are SPG, SI, WI, and SST respectively exercised as dependent variables. It can be seen from Table 12 that some of the explanatory variables are behaving differently at different levels of analysis. The coefficient of CRD is statistically significant in model III when SI is employed as a dependent variable since this variable is insignificant in all other models. Similarly, HSIZE is statistically significant in the model I, III, and V but it is statistically insignificant in model II and IV. The coefficient of RIM is statistically in significant in model II while it is statistically significant in all other models.

VI. CONCLUSION AND POLICY IMPLICATIONS

This study attempts to determine the demographic and economic factors that influence the poverty status of households of Multan district. This analysis is based on the household survey data that were collected from 300 households of Multan district. To measure poverty, we have used four poverty indices i.e. FGT, Sen Index, Sen-Shorrocks-Thon index, and Watts index. The incidence of poverty has been estimated by World Bank poverty line ($1.90). The results revealed that about 43.67 percent of households are poor. The incidence of poverty is higher in rural areas (55.43 percent) than urban areas (27.20 percent). Among the four Tehsils of Multan district, the incidence of poverty and inequality are found to be higher in Shujabad (56.0 percent and 0.37 respectively) while the incidence of poverty is low in Multan city (22.67 percent). While considering income inequality, it is concluded that there is a modest degree of income inequality among households of Multan district as the value of Gini Index is 0.50.

To find the demographic and economic aspects of poverty, OLS has been employed in the current analysis. We have estimated different models by using different poverty indices i.e. poverty gap index, squared poverty gap index, Sen Index, SST Index, Watts Index alternatively as dependent variables. We have found that some of the explanatory variables behaving differently at different levels of analysis. The variables household size, household head age, household head education, dependency ratio, household head occupation, own house, migration,

remittances, physical disability, and mental illness were found to be significant. All these variables have the correct signs. Household size, dependency ratio, household head occupation, physical disability, and mental illness have a positive relationship with poverty while household head education, migration, remittances, and own house are inversely related to poverty. The variables female-male ratio, credit, and fertility rate are found to be significant factors that influence poverty in some analysis.

Based on findings of our study, we suggest some policies to alleviate poverty in Multan district:

- It is evident from the present study that larger household size significantly affects the welfare of the household. Larger household size adversely affects the per capita income. So, people may be advised to reduce the size of household.
- Female education is one of the most important factors that affect fertility. It is always more essential than men's education in explaining not only reduced fertility but also better health and nutrition decisions within households. The government may take steps to increase female education programs so that women can take part in economic activities and which also affect the fertility within a household.
- It is found in the study that households with a higher level of education have a lower incidence of poverty. Better technical education enhances the productivity of the poor, and they become more effective and able to get better earning opportunities. The government may take steps to increase education and improvement in educational infrastructure, especially in rural areas of Multan and generally in Pakistan.
- It is empirically proved that most of the poor households are engaged in the casual and informal sector where they feel employment insecurity and get low wages. Steps may be taken to improve the informal sector for better earnings and job security to workers. Employment opportunities may be enhanced in Multan and Pakistan.

- A household with greater number of physically disabled and mentally ill members increases the dependency and reduces per capita income within a household and resultantly such households fall below the poverty line. The government may take steps to provide medical and financial assistance to these persons.
- The findings of our study suggest that remittances have a strong impact on poverty reduction. To increase the inflow of income from abroad, government may define appropriate channels and provide a conducive environment to the people in transferring remittances to the country.

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EFFECTIVENESS OF THE CONDITIONAL CASH TRANSFERS ON THE UTILIZATION OF THE INSTITUTIONAL HEALTH FACILITIES BY THE EXPECTING WOMEN IN DISTRICT NOWSHERA KHYBER PAKHTUNKHWA PAKISTAN

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Abstract. Demand-side cash transfer programs have been used in many countries to address the problems of underutilization of health and social services, particularly among vulnerable groups. The government of Khyber Pakhtunkhwa initiated one such program to achieve the Sustainable Development Goal 3 (SDG3) to increase handling deliveries by trained birth attendants. This program provides financial assistance of Rs. 2700 to every pregnant woman seeking medical care from public health facilities and community midwives. In this research, we evaluate the effectiveness of this program to find out if demand-side constraints are financial based or driven by socio-economic characteristics. A well-structured questionnaire was designed to collect data from both the beneficiaries and non-beneficiaries of this program. Besides the cash transfer program, other socioeconomic factors effect was estimated on the number of visits to the institutional health care facilities by the expecting woman using the count data models such as Poisson, Exponential Count, and Normal Least Square models. We found that as travel cost increased,

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the number of visits decreased. The study indicated that conditional cash transfer increased the visits statistically significantly. Finally, families with higher income groups took more visits to the institutional health care facilities compared to the lower income groups once the cash transfer was controlled for in the model. The cash transfer amount was not enough to cover for the expenses and there were also complaints about the delays in payments. It is recommended that additional budget for the program may be allocated as it affects the number of visits to the institutional health care facilities. There is also a need for more widespread awareness campaigns run through various media outlets for more extensive adoption of the program.

Keywords: Conditional cash transfer programs, health care service utilization, count data models

JEL Classification: C31, D12, I38

I. INTRODUCTION

Maternal health refers to the health of women during pregnancy, childbirth, and the period after the birth of a child. Maternal mortality has generally been higher among the poor and those living in rural areas. In low income countries, the lifetime risk of dying during pregnancy or childbirth is 1 in 45 compared with 1 in 5400 in high income countries mainly due to variations in access to quality health care facilities available before, during and after the child birth (WHO, 2019). Approximately, half a million women die each year as a result of pregnancy-related complications, out of which ninety-nine percent are from the underdeveloped countries (Hogan, Foreman, & Naghavi, 2010). The insufficient availability of resources to seek proper health care during pregnancy and delivery is a major cause of loss of human life (Ballantyne, 1999). Socio-economic conditions could also be inhibiting women to take care of themselves as well as of their children during and after the pregnancy.

Montgomery and Hewett (2005) observed that a lack of maternal health care is due to the economic status of the family as well as of the norms of the society in which they live. According to a survey by the

world bank, some women are deprived of proper maternal health care because of their in-law's belief on traditional medicines (Simkhada, Porter, & van Teijlingen, 2010 and Mumtaz, Bahk, & Khang 2019). Home deliveries can lead to increased deaths of women as attendants are not very well trained (Paxton, Bailey, & Lobis, 2006). Also, many women avoid seeking trained consultants due to their unfriendly behaviour and also due to their vulnerabilities (Titaley, Hunter, Dibley, & Heywood, 2010). Other factors like age, income and education also affect the health and fertility decisions of women (Alexander, Kogan, & Nabukera, 2002).

In order to avoid more deaths during pregnancy and childbirth, the availability of trained consultants is very important (AbouZahr, 1998). Regular appointments with trained consultants not only ensure proper diet and medication but also regular follow up appointments help to avoid any future complications (Pallikadavath, Foss, & Stones, 2004). Availability of trained consultants and institutional facilities can prevent complications during the pre-pregnancy period, during labour and post-pregnancy (Bullough, 2005. Social factors such as underaged marriages and pregnancies, short duration between pregnancies, level of education, low-income levels in many developing countries could impede such care and leading to mortalities (Clements et al. 2008).

In Pakistan, both federal and provincial levels governments have introduced primary health care programs intending to save the lives of both child and mother by providing them quality services. The primary goal of maternal health is to encourage expecting women for regular examination and to recognize complications that could arise at the time of birth. Sadly, in developing countries such as Pakistan, many mothers lose their lives due to maternal care complications (Addai, 2000).

Pakistan being a signatory to meeting the Sustainable Development Goals (SDGs) has the responsibility to achieving the goal of reducing maternal mortality under "Goal 3: Ensure healthy lives and promote well-being for all at all ages". Further, the World Health Organization introduced the "Strategies toward ending preventable maternal mortality (EPMM)" under which by 2030, global maternal mortality ratio (MMR) need to be lower than 70 maternal deaths per 100,000 live births and no

country should have an MMR greater than 140 maternal deaths per 100,000 live births, a number twice the global target.

As outlined previously, many deaths can be avoided during pregnancy, delivery, and the postpartum period by providing access to safe prenatal care and deliveries in a health facility with skilled birth attendants. Programs can also be introduced that affect the socioeconomic factors that are deterring the use of proper institutional health facilities. The Government of Pakistan has taken measures to reduce these barriers as much as possible. It has put in place several strategies to ensure that specialist doctors are available and trying to provide staff with equipment (Hafeez et al., 2011). These steps are taken under the safe motherhood program to meet the Millennium and the Sustainable Development Goals. Further, to this end, the Government of Khyber Pakhtunkhwa allocated Rs. 200 million in the 2013-2014 budget to protect mothers and their newborns. Under this program, Rs 2700 stipend was provided to expecting women subject to undertaking routine medical check-ups at designated institutional health facilities. It was initially implemented in 12 relatively neglected areas, i.e. Chitral, Shangla, Upper Dir, Lower Dir, Buner, Torghar, Kohistan, Battagram, Nowshera, Hangu, Lakki Marwat and Tank which was extended later to the all districts in KP. The Rs.2700 per pregnancy was provided based on 4 antenatal visits (Rs.300 per visit), the delivery incentive (Rs.1000) and Rs. 500 for a postnatal visit within 42 days of birth.

In this study, we examine the differences in availing the institutional health care facilities between those who benefited from the conditional cash transfer (CCT) program compared to those who did not while controlling for the effect of socio-economic characteristics. It is expected that the result of the study will highlight whether any CCT program could be successful in changing people's behavior. Moreover, the study will help the policy makers in the formulation of future budgetary policies regarding health programs in the province.

II. LITERATURE REVIEW

This section reviews both the theoretical as well as the empirical literature on the use of the conditional cash transfer (CCT) programs in various countries. Conditional cash transfer programs have been used at various times in many countries. Stampini and Tornarolli (2012)

provided a detailed history of the effectiveness of the CCT programs. They described that the very first CCT program named PROGRESSA was started in 1997 in Mexico. It offered funds to poor families conditional upon children regularly attending school and that family bought preventive health care. Similarly, Gertler (2004) examined the impact of PROGRESA on child health outcomes such as morbidity, height, and anemia. Women choice of institutional birthing increased as a result of this program. Similarly, Lim et al, (2010) using district-level data on JSY found that pregnant women received cash payments with a varying degree of 5% to 44%. The probability of receiving payments under JSY amongst the poorest and illiterate women was very low. Antenatal care and in-facility births were significantly affected by JSY. Further, Randive, Diwan and De Costa (2013) found that prior to JSY, institutional births were on average 20% while it increased to 49% during the five years of the CCT. They also found a negative correlation between institutional births and district maternal mortality ratio. Okoli et al. (2014) studied the utilization of conditional cash transfer (CCT) program for promoting the use of maternal and child health (MNCH) services among rural women in Nigeria. The CCT was found to raising the monthly visits of women attending four or more ANC visits.

Barber and Gertler (2009) examined the role of the CCT program on empowering women through a program referred to as "Empowering women to obtain high-quality care" in Mexico. Eligible women accepted CCT in order to obtain health care, nutritional supplements, and to attend health and education sessions. They found that the implementation of the CCT program resulted in achieving women empowerment goals by encouraging beneficiaries to be informed and be active health consumers. It was also found that there was a 12.2% increase in pre-natal care after the program. Leroy Ruel and Verhofstadt (2009) reviewed various CCT programs and their impact on child nutrition. The study examined in detail the two CCT programs regarding child dietary intake in Mexico and Colombia. They concluded that there was a significant improvement in child nutrition due to these programs.

Chaudhury and Parajuli (2007) analyzed the effect of school stipend program on female enrolments in public schools in the Punjab, Pakistan. Methods like the difference in difference (DD), triple differencing (DDD), and regression-discontinuity design (RDD) were employed on

data collected from provincial school censuses 2003 and 2005. Their results showed that there was an absolute increase of six female students per school (9%) due to the conditional cash program.

Stampini and Tornarolli (2012) observed growth of conditional cash transfers in Latin America and the Caribbean (LAC) to promote human capital. The study results showed that there was an increase of 20% in the income of poor beneficiaries and that the poverty headcount index was lower by 13% on average during the CCT program. The CCT programs in Brazil, Colombia, and Mexico were successful in reaching out to about 50-55% of the poor population.

It is evident that the CCT programs have generally been successful in encouraging the use of institutional health facilities for health care, to empower women in making the decisions about health and education, in increasing the school's enrollments and reducing the poverty. However, the effect of CCT could be different in different countries due to varying socioeconomic, cultural, ethnic, religious, and geographic factors. Therefore, this study examines as to how the CCT in Khyber Pakhtunkhwa could be effective in improving the utilization of the institutional health care facilities by the expecting women.

III. RESEARCH METHODS

This section deals with the presentation of the conceptual/theoretical framework, the empirical model, and the data collection.

THEORETICAL FRAMEWORK AND MODEL

Cash transfer generally augments income of the beneficiary households that may allow households to purchase better quality food which they otherwise could not afford. The Conditional Cash Transfer program in the province of Khyber Pakhtunkhwa was introduced in order to increase the utilization of the health care facilities by the expecting women compared to using the non-institutional healthcare methods.

Cash programs conditional upon the number of visits to the hospitals may reduce mother and child illnesses. Also, the program condition of visiting only institutional health facilities for health care, attending educational sessions and to receive payments may be inconvenient for women as they may have to travel long distances. Health CCT programs

may improve both mothers' and newborns' health as women get awareness about different nutrition supplements and have regular checkups before and after delivery. Further, better nutrition may improve cognitive development and educational achievement which may lead to economic productivity at adulthood (Hoddinott, and Bassett (2008). It has been shown that cash transfer brings about positive outcomes for mothers and children (Leroy, Ruel, & Verhofstadt, (2009).

The provision of the CCT is akin to increase in income of the expecting woman and thus can be framed as to affect the demand for medical services. The demand for medical services has been developed in detail in Acton (1973a, 1976b, 1976). Further, Grossman (2017, 1972) similarly developed a model for the demand for health and medical services. Following the household production model developed in Kolstad (2011:188-189), we estimate the effect of the CCT program on the healthcare utilization. It is assumed that utility is maximized by choosing the medical services (represented by the number of visits (v)) and a composite, X, for all other goods and services subject to the monetary and time constraints as given below in equation (1).

$$\underset{X,V}{\text{Maximize}}\ U(X, v) \tag{1}$$

subject

$$y + WL = R_1 X + (P_0 + F)v \tag{2}$$

where $y = Y + \pi + \tau$ represents the lump-sum income taken as exogenous composed of Y as transfer to the households, π as the profit income and the τ as taxes paid. Further, W stands for an endowed wage of households, L is the available working hours, P_0 is the out of pocket charges i.e visits charges or bus charges etc., F is the admission charges to visit a doctor and R_1 is the price of X which is considered as a numeraire good and thus its price is assumed to be equal to 1. Further, the patient may choose to go to a doctor or health care center or use this time for leisure or working productively. Thus, his time is given as follows:

$$T = L + (T_t + T_v)v \tag{3}$$

The equation above shows T as time available to the patient to visit doctor or work, L is working hour, T_t shows travel time of a single trip to

the hospital, T_v shows on site time spent on a single visit , and v shows the number of visits. If we take L to left side of the equation and T on the right side of the equation, we will get equation (4) as follows:

$$L = T - (T_t + T_V)v \quad (4)$$

By substituting the value of T in the budget constraint

$$y + W[T - (T_t + T_v)v] = X + (P_0 + F)v \quad (5)$$

$$y + WT = X + W(T_t + T_v)v + (P_0 + F)v \quad (6)$$

$$y + WT = X + v[P_0 + F + W(T_t + T_V)] \quad (7)$$

Using the Lagrangian optimization techniques, we can find the demand for the number of visits as follows:

$$\mathcal{L} = U(X, v) + \lambda(y + WT - X - v[P_0 + F + W(T_t + T_V)]) \quad (8)$$

We can find the demand for the v which is an optimal number of visits to the hospital depending upon price, income, transfers, and other socioeconomic variables.

Newhouse and Phelps (1976), Wedig (1988) and McCarthy (1985) used the number of visits to the physicians as the dependent variable. We also use the number of institutional health facility visits as a dependent variable to estimate the effectiveness of the CCT program.

Specifically, our empirical model can be represented as follows:

$$v = \beta_0 + \beta_1 P_V + \beta_2 P_t + \beta_3 T_t + \beta_4 T_v + \beta_5 Y + \beta_6 E_i + \beta_7 E_j + \beta_8 R + \beta_9 D + \mu \quad (9)$$

Where v stands for physician visits, P_v are the visitation charges i.e. consultants fee, laboratory tests, X-rays, P_t travel charges in bus or rikshas, T_t is the time spent on the travel, T_v is the time spent in the clinic during a checkup, Y is the income, E_i is the patients' education, E_j is the husband's education, R is the religion, and D is the dummy variable indicated if the CCT program was availed.

SAMPLE SIZE

The universe of the study is the beneficiaries of the conditional cash transfers recipients in the district Nowshera. The number of beneficiaries in the sample district were 8226. The list of beneficiaries with all information including their mobile number, their national identity card (NIC) number, and other characteristics were obtained from the district headquarter hospital Nowshera. This study used Krejcie and Morgan (1970) table and the formula for a given population to determine the sample size which is given below in equation 9:

$$S = \frac{X^2 NP(1-P)}{d^2(N-1)+X^2P(1-P)} \qquad (10)$$

where s is the required sample size, X^2 is the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841), N is the known population size, P is the population proportion (assumed to be .50 since this would provide the maximum sample size), d is the degree of accuracy expressed as a proportion (.08). Using the above relationship, we found the sample size to be 147. Therefore, from the list of beneficiaries (treatment group), about 150 beneficiaries were phoned interviewed. Similarly, about same number of non-beneficiaries were also interviewed for the study as a controlled group. Sekran, (2003, p. 295-296) and Roscoe (1975) suggested that a sample sizes larger than 30 and less than 500 are appropriate for most research, a minimum sample size of 30 is also needed for each subsample in case sample is broken into subsamples, and a sample of preferably 10 times or more of the numbers of variables is required for the regressions analysis.

The data were collected through a well-structured questionnaire. The questionnaire had the information about the general characteristics, cost information on items such as consultant fees, laboratory tests, medicines, travel cost and the problems that the respondents faced in receiving the conditional cash transfer amount.

IV. RESULTS AND DISCUSSIONS

Respondent's access to and utilization of maternal health care services are influenced by different factors such as socio-economic characteristics along with other health expenses and consumption patterns. The

following section presents the results of such relationships by using both the descriptive statistics and econometrics techniques.

DESCRIPTIVE STATISTICS

Table 1 indicates age at marriages of the respondents who belonged to non-beneficiaries (controlled) and beneficiaries (treatment) groups. There is no significant difference found between the ages among the two groups. Table 1 also shows the household relationship with the respondents. In majority of the households in both the groups, husbands were the household heads. The chi-square test shows that there is no difference between the beneficiaries and non-beneficiaries based on the head of the households. Table 1 of the study further shows an association between the level of education of the respondents and the non-beneficiaries and beneficiaries groups. Those who availed conditional cash transfer were generally more educated. Also, the education was statistically different between the expecting women in the two groups.

TABLE 1

Age at the Marriage, Relationship with Head of the Household, and Level of Education of Both Groups

Age at the Marriage						
	15-25	26-35				
Non-Beneficiary					Chi-square	P value
Frequency	150	0			30.94***	0.000
Percentage	100	0				
Beneficiary						
Frequency	151	1				
Percentage	99.3	0.7				
Relationship with Head of the Household						
	Husband	Father in Law	Brother in law			
Non-Beneficiary					Chi-square	P value
Frequency	106	36	08		3.065	0.216
Percentage	70.7	24	5.3			
Beneficiary						
Frequency	114	26	13			
Percentage	74.5	17	8.5			
Level of Education						
	Illiterate	Primary	Secondary	Higher		
Non-Beneficiary					Chi-square	P value
Frequency	111	26	12	1	9.419	0.024
Percentage	74	17.3	8	0.7		
Beneficiary						
Frequency	89	48	14	2		
Percentage	58.2	31.4	9.2	1.3		

Table 2 shows the total household income of the respondents in non-beneficiaries and beneficiaries' groups. In the non-beneficiaries' group, 51.3% respondents had household income between Rs.10, 001-20,000 while only 9% had the income more than Rs. 60, 000. Similarly, majority responds in the beneficiaries group had the income ranged between Rs.10,001-20,000. The association between the income and the treatment and control group was not statistically significant.

TABLE 2

Household Income relationship with Non-Beneficiaries and Beneficiaries Group

	Income Group								
	Rs 0 - 10,000	10,001-20,000	20,001-30,000	30,001-40,000	40,001-50,000	50,001-60,000	>60,000	Chi-square	P value
Non-Beneficiary									
Frequency	2	77	21	13	20	3	14	7.323	0.300
Percentage	1.3	51.3	14	8.7	13.3	2	9.3		
Beneficiary									
Frequency	2	70	32	22	17	1	9		
Percentage	1.3	45.8	20.9	14.4	11.1	0.7	5.9		

***, **, * stands for 1%, 5% and 10% significance level respectively

Table 3 shows the relationship between the number of pregnancy visits (ante-natal, delivery and post-natal) and whether the respondents belonged to the nonbeneficiaries (controlled) group or the beneficiaries (treated) group. In the controlled group, majority (26%) of the woman undertook only four visits to the hospital compared to the 42.5% of woman in the treated group who had all the required six visits. Chi-square test is used to test whether the number of visits is independent of the controlled and treatment group association of the respondents. Chi-square test indicates that there is a strong association between the number of visits and belonging to the controlled and treatment groups. Furthermore, table 3 presents the delivery visits to the institutional facilities by the treatment and control group. In the non-beneficiary's group, 74.7% had institutional delivery while 25.3% chose to deliver at home. However, among the beneficiary's group, 81.7% had institutional delivery while 18.3% chose to deliver at home. The relationship between the delivery visit and treated and control group association was not found statistically significant.

TABLE 3

Cross Tabs of Total Number of Visits, Delivery Visits, and Travel Mode of Beneficiaries and Non-Beneficiaries Group

Total Number of Visits								
Non-Beneficiary	1	2	3	4	5	6	Chi-square	P value
Frequency	28	23	19	39	18	23	30.94***	0.000
Percentage	18.7	15.3	12.7	26	12	15.7		
Beneficiary								
Frequency	24	14	20	20	10	56		
Percentage	15.7	9.2	13.1	13.1	6.5	42.5		
Delivery Visits								
	No		Yes				Chi-square	p value
Non-Beneficiary								
Frequency	38		112				2.199*	0.138
Percentage	25.3		74.7					
Beneficiary								
Frequency	28		125					
Percentage	18.3		81.7					

***, **, * stands for 1%, 5% and 10% significance level respectively

Table 4 shows a comparison of the consumption pattern between those who availed the CCT program compared to those who did not. Wheat and maize being major staples food in the area so there is no difference in the consumption pattern. However, there have been a statistically significant difference between the consumption patterns of rice, fruits, and vegetables between the two groups.

TABLE 4

Household Consumption Pattern of Rice, Wheat, Maize, Vegetables and Fruits between Beneficiary and Non-Beneficiary's' Respondents

Consumption Pattern of Household									
	Daily	2/3 times	Weekly	Bi-weekly	Monthly	Occasionally	Never	chi-square	P-value
RICE									
NON-BENEFICIARY									
Frequency	0	0	134	16	0	0	0	28.949***	0.000
Percentage	(0)	(0)	(89.3)	(10.7)	(0)	(0)	(0)		
BENEFICIARY									
Frequency	1	25	118	9	0	0	0		
Percentage	(0.7)	(16.3)	(77.1)	(5.9)	(0)	(0)	(0)		
WHEAT									
NON- BENEFICIARY									
Frequency	150	0	0	0	0	0	0	0.984	0.321
Percentage	(100)	(0)	(0)	(0)	(0)	(0)	(0)		
BENEFICIARY									
Frequency	152	1	0	0	0	0	0		
Percentage	(99.3)	(0.6)	(0)	(0)	(0)	(0)	(0)		
MAIZE									
NON- BENEFICIARY									
Frequency	1	0	43	70	20	16	0	21.477**	0.02
Percentage	(0.7)	0	(28.7)	(46.7)	(13.3)	(10.7)	0		

Consumption Pattern of Household									
	Daily	2/3 times	Weekly	Bi-weekly	Monthly	Occasionally	Never	chi-square	P-value
BENEFICIARY									
Frequency	0	5	22	81	17	21	7		
Percentage	0	(3.3)	(14.4)	(52.9)	(11.1)	(13.7)	(4.6)		
VEGETABLES									
NON- BENEFICIARY									
Frequency	94	21	16	18	1	0	0	62.847***	.000
Percentage	(62.7)	(14)	(10.7)	(12)	(0.7)	(0)	(0)		
BENEFICIARY									
Frequency	150	3	0	0	0	0	0		
Percentage	(98)	(2)	(0)	(0)	(0)	(0)	(0)		
FRUITS									
NON- BENEFICIARY									
Frequency	1	22	56	19	53	0	0	45.786***	.000
Percentage	(0.7)	(14)	(37.3)	(12.7)	(35.3)	(0)	(0)		
BENEFICIARY									
Frequency	0	5	56	32	33	27	0		
Percentage	(0)	(3.3)	(36.6)	(20.9)	(21.6)	(17.6)	(0)		

***, **, * stands for 1%, 5% and 10% significance level respectively

Table 5 shows the consumption of various types of meat by the beneficiaries and non-beneficiary's households. Beneficiaries household consumed it monthly while 27.3% consumed it on weekly basis. There has been a statistically significant relationship observed in the consumption of the beef, mutton, and chicken while no significant relationship is found in fish consumption.

TABLE 5

Meat, Beef, Mutton, Chicken, and Fish Consumption Pattern of Beneficiaries and Non-Beneficiary's Households

Items	Consumption Pattern of Household								
	Daily	2/3times	Weekly	Bi-weekly	Monthly	Occasionally	Never	chi-square	P-value
BEEF									
NON- BENEFICIARY									
Frequency	0	19	3	65	19	44	0	112***	0.000
Percentage	(0)	(12.7)	(2)	(43.3)	(12.7)	(29.3)	(0)		
BENEFICIARY									
Frequency	0	0	30	18	81	24	0		
Percentage	(0)	(0)	(19.6)	(11.8)	(52.9)	(15.7)	(0)		
MUTTON									
NON- BENEFICIARY									
Frequency	0	0	44	46	21	39	0	26.286***	0.000
Percentage	(0)	(0)	(29.3)	(30.7)	(14)	(26)	(0)		
BENEFICIARY									
Frequency	0	1	17	35	37	60	3		
Percentage	0	(0.7)	(11.1)	(22.9)	(24.2)	(39.2)	(2)		
CHICKEN									
NON- BENEFICIARY									
Frequency	1	21	50	22	54	2	0	18.994**	.002
Percentage	(0.7)	(14)	(33.3)	(14.7)	(36.1)	(1.3)	(0)		
BENEFICIARY									
Frequency	0	16	42	49	38	8	0		
Percentage	(0)	(10.5)	(27.5)	(32)	(24.8)	(5.2)	(0)		
FISH									

Items	Consumption Pattern of Household								
	Daily	2/3times	Weekly	Bi-weekly	Monthly	Occasionally	Never	chi-square	P-value
NON- BENEFICIARY									
Frequency	0	0	41	27	65	17	0	8.787	.32
Percentage	(0)	(0)	(27.3)	(18)	(43.3)	(11.3)	(0)		
BENEFICIARY									
Frequency	0	0	23	38	66	26	0		
Percentage	(0)	(0)	(15)	(24.8)	(43.1)	(17)	(0)		

***, **, * stands for 1%, 5% and 10% significance level respectively

Table 6 shows the consumption pattern of milk, juices, and multivitamins supplements for both non-beneficiaries and beneficiaries' households. Significant differences in the consumption of these items have been observed for the two groups.

TABLE 6

Consumption of Milk, Juices, and Multi-Vitamins between Beneficiaries and Non-Beneficiary Households

	Consumption Pattern of Households								
ITEMS	Daily	2/3times	Weekly	Bi-weekly	Monthly	Occasionally	Never	Chi-square	P-value
MILK									
NON- BENEFICIARY									
Frequency	0	21	28	27	56	18	0	14.23***	0.007
Percentage	(0)	(14)	(18.7)	(18)	(18)	(37.3)	(0)		
BENEFICIARY									
Frequency	0	3	21	44	68	17	0		
Percentage	(0)	(2)	(13.7)	(28.8)	(44.4)	(11.1)	(0)		
JUICES									
NON-BENEFICIARY									
Frequency	0	21	50	26	19	44	0	112.00***	0.000
Percentage	(0)	(12.7)	(2)	(43.3)	(12.7)	(29.3)	(0)		
BENEFICIARY									
Frequency	0	0	30	18	81	24	0		
Percentage	(0)	(0)	(19.6)	(11.8)	(52.9)	(15.7)	(0)		
MULTIVITAMINS									
NON-BENEFICIARY									
Frequency	0	0	44	46	21	39	0	32.75***	0.000
Percentage	(0)	0	(29.3)	(30.7)	(14)	(26)	0		
BENEFICIARY									
Frequency	0	1	17	35	37	60	3		
Percentage	(0)	(0.7)	(11.1)	(22.9)	(24.2)	(39.2)	(2)		

***, **, * stands for 1%, 5% and 10% significance level respectively

ECONOMETRIC RESULTS

Since our dependent variable is the number of visits by the beneficiaries and non-beneficiaries of the CCT program to the institutional healthcare facility, we follow Lattin, Carroll, & Green (2003) and Green (2008). Due to the count number nature of the dependent variable, we shall use the count models. Table 7 presents the results from the estimation of the models using Poisson, Exponential Count, and Normal Least Square models. According to economic theory,

an increase in travel cost decreases the number of visits which is in accordance with the economic theory; however, only in the case of the Exponential Count model it is found to have a statistically significant relationship. The hospital expenses variable sign in all the models has been found to have a positive relationship with the number of visits which may be at odds with the general expectations. The conditional cash transfer variable is significant at 1% level and it positively affects the number of visits by expecting women to the institutional healthcare facility. Age and family type of respondents were not found to be significant determinants of the number of visits. Finally, families with higher income groups were found to be taking more visits to the institutional health care facilities compared to lower income groups.

TABLE 7

Various Estimation Methods of the Effect of CCT and other Socio-Economic Variables on the Visitation Rate of the Expecting Women to Institutional Facilities

	Poisson	Exponential	Normal Least Square
Variable	Co-efficient	Co-efficient	Co-efficient
Travel Cost	-0.003	0.030**	-0.008
Hospital Expenditures	0.599***	0.390***	0.608***
Education	0.043	0.031***	0.012***
Cash transfer	0.123***	0.039***	0.047***
Family type	0.012	-0.023	0.023
Household Income	0.001	0.221**	0.130***
Age	0.014	0.003	0.000
Constant	-3.451***	-2.610***	-3.508***
R^2	0.80	0.74	0.80
F-Statistics/LR Stat.	234.02	64.89	820.00
Prob. of F-Stat.//LR Stat.	0.00	0.00	0.00

***, **, * stands for 1%, 5% and 10% significance level respectively

RESPONDENTS COMMENTS ABOUT THE CCT PROGRAM

Expecting women were also asked some general questions and they responded that most women did not have the resources or the empowerment to care about their own wellbeing. Almost, 48 percent of the respondents expressed that the CCT program encouraged and the conditional grant helped them to visit the hospitals which otherwise they would have probably not done due to income constraints. About 47% of

women participated in the program because of poverty and low income. Previously, many women preferred to deliver at home because they could not afford hospital expenses. Woman also stated that the conditional cash transfer increased their purchasing power, helped improve their health as well as of their newborn babies. Many women suggested that the CCT stipend was not enough to cover for the hospital visitations, medicines, laboratory tests, multivitamins, and should be increased. Further, 12.4 percent of respondents complained that they did not receive cash on time, while some respondents also stated that they received their stipend only after delivery.

V. CONCLUSION AND RECOMMENDATIONS

The main aim of this study was to estimate the impact of conditional cash on expecting women undertaking the four prenatal, delivery and one postnatal visit to the institutional health facilities in the province of Khyber Pakhtunkhwa. A list of beneficiaries was obtained from the district headquarter hospital. After examining the data for completeness, a sample of about 153 respondents were interviewed as a treatment group. Similarly, about the same number non-beneficiaries of similar characteristics in the neighborhood were also interviewed for comparison. Due to the count nature of the dependent variable (number of visits), we used Poisson, Exponential Count, and Normal Least Square models. It was found that as travel costs increased, the number of visits decreased. Other expenses such as hospital expenses when increased, so were the visits but the effect was not statistically significant. The main variable of interest of the study - the conditional cash transfer was found to be affecting the visits positively and statistically significantly. Finally, families with the higher income groups were found to be taking more visits to the institutional health care facilities compared to the lower income groups. Respondents highlighted that the CCT amount was not enough to cover for the expenses and there were also complaints about the delay in payments. Since CCT has a positive effect on the visitation rates, there need to be more allocation for the program. Further, there need to be more widespread advertisements through various media outlets for more widespread adoption of the CCT program.

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