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Impact of Agricultural Land Inequality on Human Development in Punjab (Pakistan)

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Inequality of income, wealth and assets has important implications for different socioeconomic outcomes. This study has investigated the impact of agricultural land inequality on human development across the districts of Punjab (Pakistan). Human Development Index (HDI) and Non-income Human Development Index (NIHDI) have been used as proxy for human development. Agriculture land inequality, HDI and NIHDI have been calculated by utilising data of different waves of Multiple Indicators Cluster Survey (MICS) and Pakistan Social and Living Standard Measurement Survey (PSLM) conducted during the period of 2003-2014. By using fixed effects model, we have found that agricultural land inequality has negative and significant relationship with human development across the districts of Punjab. The study suggests redistribution of agricultural land as a strategy to bring improvements in human development.

JEL Classification: Q15, O1
Keywords: Agricultural Land Inequality, Human Development, Punjab, Pakistan

1. INTRODUCTION

Human development of a society is not solely determined by its gross or per capita income. It can be affected by number of factors such as choices and preferences of individuals reflected through their consumption pattern and their willingness to invest in education and health and public policy exercised by government. Nonetheless, an increase in human development can be expected to be strongly correlated with an increase in income and wealth of individuals and societies. People living in rich countries, generally, have higher level of education and better health as compared to people of poor countries. Similarly, within a country, affluent individuals are expected to be more educated and healthier than poor. A concave relationship is assumed where income and wealth have positive effects on education and health outcomes and such effects are greater and more pronounced among the poor than the rich [Deaton (2003)]. Therefore, redistribution of income and wealth from rich to poor, within countries, or among the countries, will enhance human development [Preston (1975); Dasgupta and

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Ray (1987); Gradstein and Justman (1997); Easterly (2001, 2007)]. On the other hand, a skewed distribution of wealth or assets can retard human wellbeing of a society [Smith (1776)]. Egalitarian societies having an inclusive environment for all segments of their population have better solidarity, more social cohesion, more social capital and hence better provision of public goods, higher economic growth, less likelihood of conflict among different ethno-linguistic groups and better human development as measured by education and health of people [Easterly (2001); Easterly, *et al.* (2006); Wilkinson and Pickett (2009); Pervaiz and Chaudhary (2015); van Staveren and Pervaiz (2017)].

The relationship of distribution of income with different indicators of development has been studied by different researchers [Webb (1977); Preston (1975); Lecaillon, *et al.* (1984); Dasgupta and Ray (1987); Adelmon and Robinson (1988); Ravallion (1997); Deaton (2003); Easterly (2001, 2007)]. But the relationship of inequality of assets or wealth with human development has not been much explored in literature. The studies which have tried to explore this relationship have often relied upon the data of income inequality as a proxy for wealth inequality [Bénabou (1996)]. However, wealth is even more unequally distributed than income globally [Avery, *et al.* (1988)] and inequality of wealth and assets can plausibly be more relevant in exploring such relationship than the inequality of consumption or income [Ravallion (2012)]. Among other assets, the distribution of agricultural land can be of utmost significance for economic development [Stigler (1965); Tawney (1932) and Breman (1983)] particularly in many developing countries like Pakistan where ownership and distribution of land is also very closely related with distribution of political power [Gazdar (2007)].

The countries where agricultural land inequality has been reduced through land reform programmes have higher economic development as compared with those countries which have not initiated such reforms. Japan, South Korea and Taiwan are among the famous examples of the countries which can be placed in the category of the countries which implemented such reforms whereas some of Latin American and south Asian countries like Pakistan can be placed in the category which have not undergone land reforms and therefore have lower economic development [Adelman (1979); Alesina and Rodrik (1994)]. However, the empirical testing of the proposition that land inequality is harmful for human development of a society is rare in literature. We have used panel data over the period of 2003 to 2014 for all districts of Punjab to test this proposition. The rest of the paper is structured as following. Next section has presented a review of relevant literature. Section 3 provides theoretical framework of our study. Section 4 is about methodology whereas data sources have been presented in Section 5. Empirical results of the study along with discussion on these results and policy suggestions derived from our empirical findings have been presented in last section of the paper.

2. LITERATURE REVIEW

The economic, sociopolitical and development implications of income and wealth inequality has become an important subject of many academic debates. It is recognised to be a detrimental factor for economic growth as it lowers down the potential of economies to grow because unequal societies have more likelihood of political instability, ethnic strife and sociopolitical conflicts [Alesina and Rodrik (1994); Alesina and Perotti (1996);

Perotti (1996); Rodrik (1999); Dahlby and Ferede (2013); Piketty (2014)]. Inequality can be a cause of corrosion of social cohesion [Kawachi and Kennedy (1997); Kawachi, *et al.* (1997)], deterioration in the quality of institutions [Easterly, *et al.* (2006)] and low human capital accumulation [Galor and Zeira (1993); Acemoglu and Robinson (2000); Bourgignon and Verdier (2000); Easterly (2001); Galor and Moav (2006); Galor, *et al.* (2006)]. The societies having an environment of level playing field for different groups can be more cohesive [Van Stavern and Pervaiz (2017)] and in turn can have better economic growth [Pervaiz and Chaudhary (2015)].

Alesina and Rodrik (1994) and Persson and Tabellini (1994) suggest that, there will be high demand for redistribution in unequal societies. But higher redistributive taxation will have damaging effects on economic growth by lowering down the incentives for investment in physical and human capital. Alesina and Perotti (1994) have presented the empirical evidence of the positive effect of improved wealth distribution on political stability, domestic demand and economic growth rates. Birdsall, *et al.* (1995) finds a negative relationship between income inequality and economic growth for a sample of East Asian economies. Alesina and Perotti (1996) describe that inequality can create unrest and conflict in the society which will hinder economic growth. It is also found to be related with higher crime rates [Fajnzylber, *et al.* (2000)] which can retard economic growth by creating unrest in the society. Perotti (1996) also provides strong empirical support between income distribution and sociopolitical instability. Excessive inequality can create divisions in the society and unrest among the laborers due to which demand for redistribution of income, assets and resources will be made and in turn, it will hinder investment and economic growth [Benhabib and Rustichini (1996)]. Thus high inequality would result poor economic growth due to which incomes of masses would remain low and they will be bound to spend less on education and health. The result would be low human development in the society. Barro (2000), however, argues that inequality impedes economic growth only in poor countries whereas it encourages economic growth in rich countries and hence inequality-growth relationship is largely contextual specific which depends upon a number of other factors.

Inequality of income also appears to be correlated with poor provision of public education and health [Eastery (2001)]. On the other hand, fair distribution of assets leads to the availability of improved nutrition, more employment and greater output growth. Inequality leads to poor institutional quality [Easterly, *et al.* (2006)] which has negative effects on economic growth and development. Schultz (1988), Becker and Chiswick (1966), Psacharopoulos (1977) and Gregorio and Lee (2002) found a negative association of income inequality with human capital. This notion has also been put forward by some other studies in literature [Galor and Zeira (1993); Perotti (1996); Galor and Moav (2006); Galor, *et al.* (2006)].

Inequality is also associated with high school dropout rates, less public spending on education and low literacy rates [Kaplan, *et al.* (1996)]. Moreover, inequality can result elite dominance in the society. The ruling oligarchy would resist mass spread of education because they feel threatened that more educated people are more likely to demand their political rights and redistribution of income [Bourguignon and Verdier (2000); Rajan and Zingales (2006)]. Thus investment in the education of masses would remain low [Acemoglu and Robinson (2000)].

Tsai, *et al.* (2004) found that social infrastructure had strong positive relationship whereas income inequality had negative association with economic development across the developing countries of the world. Galor and Zeira (1993) postulate that poor are liquidity-constrained from accumulating human capital; higher inequality implies a greater share of population will be liquidity constrained and thus the society accumulates less human capital. Easterly (2001) argues that more egalitarian societies with less ethnic diversity (which he terms as middle class consensus) have better education, better health, better infrastructure, better economic policies, less political instability, less civil war, more safe ethnic minorities, more social modernisation and more democracy. Income inequality can also cause education inequality [Chani, *et al.* (2014)] by restraining common people's access to education and eventually human capital formation might remain low. Similarly, inequality of asset and wealth reduces human capital formation [Pickett and Wilkinson (2015); Cesarini, Lindqvist, Östling, and Wallace (2016); Karagiannaki (2017); Ward and Viner (2017)]. On the other hand, equality may help to improve human capital accumulation in a society [Galor and Maov (2004)]. Like other assets, the distribution of agricultural land is also argued to be significantly related with development of economies [Stigler (1965); Tawney (1932) and Breman (1983)] through its links with poverty, social and technological backwardness and political exclusion of common people [Quan (2006)].

3. THEORETICAL FRAMEWORK

Inequality of income, wealth and assets can be important factor to affect human development outcomes through different channels. Inequality of agricultural land can be of even greater significance than inequality of any other assets because distribution of land is not merely distribution of assets or wealth but also about distribution of political power particularly in a developing country like Pakistan. Inequality can work as hindrance for economic and development outcomes of countries by increasing the likelihood of political instability, sociopolitical unrest and ethno-linguistic fractionalisation [Alesina and Rodrik (1994); Perotti (1996); Alesina and Perotti (1996); Easterly (2001); Easterly, *et al.* (2006); Dahlby and Ferede (2013); Piketty (2014)]. Low economic growth, which can be a possible outcome of inequality, can keep the average income of people and particularly of poor people low. With lower income coupled with high inequality, majority of people would bound to spend less on their human development [Galor and Zeira (1993); Galor and Maov (2004); Galor and Maov (2006); Galor, *et al.* (2006)]. Moreover, human development can remain low in unequal societies because such societies tend to spend less on publically provided education and health [Acemoglu and Robinson (2000); Easterly (2001)]. Inequality can also be socially destructive as it corrodes social capital that supports health, and subsequently contributes to stress-related health and social problems [Chiavegatto Filho, Kawachi, Wang, Viana, and Andrade (2013); Pickett and Wilkinson (2015); Wilkinson and Pickett (2010)].

Inequality of asset has negative effects on the level of education and economic growth in developing economies [Deininger and Squire (1998)]. Asset inequality reduces human development and enhances human development inequalities among different regions [Schneider (2004)]. Even in industrial developed economies where credit market restraints are less severe, distribution of assets may be an important factor to affect

individuals' capabilities to start up enterprises and can further worsen the income distribution [Oswald (1997); Barham, *et al.* (1996)]. Ravallion (2001) has reported negative and significant effects of local distribution of assets on consumption growth in China.

Unequal distribution of assets is harmful for country's growth and development [Birdsall and Londono (1998); Deininger and Squire (1998); Persson and Tabellini (1994)]. Inequality of asset and income also connected with poor health and social outcomes [Kondo, *et al.* (2009); Wilkinson and Pickett (2009)]. Research studies indicate that income and asset inequality are related to poor self-rated health [Rözer and Volker (2016)], alcohol misuse [Elgar Roberts, Parry-Langdon, and Boyce (2005)], school bullying [Elgar, Craig, Boyce, Morgan, and Vella-Zarb (2009)], physical assaults [Pabayo, Molnar, and Kawachi (2014)], teenage pregnancy [Pickett, Mookherjee, and Wilkinson (2005)], and child maltreatment [Eckenrode, Smith, McCarthy, and Dineen (2014); Pickett and Wilkinson (2007, 2015)]. Variation in the degree of land ownerships depicts the variation in human capital [Sokolof and Engerman (2000)]. Micro level studies also provides evidence that distribution of assets is the key predictor of household welfare [Oswald (1997); Bardhan and Klasen (2000)].

High inequality in land holdings has been found to be associated with low subsequent growth and development [Alesina and Rodrik (1994); Birdsall and Londono (19980; Deininger and Squire (1998)]. Moreover, a skewed distribution of agricultural land strengthens elite dominance in the society who would oppose mass spread of education and public policies would be formulated to benefit elites [Galor and Zeira (1993); Galor and Moav (2006)]. Present study has investigated the impact of agricultural land inequality on human development across the districts of Punjab (Pakistan). HDI and NIHDI have been used as proxies of human development. Following econometric models have been used for our empirical investigation:

$$HDI_{it} = \alpha_1 + \beta_1 LINQ_{it} + \beta_2 SI_{it} + \beta_3 FR_{it} + \beta_4 UNP_{it} + e_{it} \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

$$NIHDI_{it} = \beta_1 + \alpha_1 LINQ_{it} + \alpha_2 SI_{it} + \alpha_3 FR_{it} + \alpha_4 UNP_{it} + u_{it} \quad \ldots \quad \ldots \quad (2)$$

Where

HDI = Human Development Index
$NIHDI$ = Non Income Human Development Index
$LINQ$ = Agricultural Land Inequality
SI = Social Infrastructure
FR = Fertility Rate
UNP = Unemployment Rate
e = Error Term
i = Cross Sectional Unit
t = Time Period

Social infrastructure, fertility rate and unemployment rate have been considered as control variables in our models because these factors can also important for human development. Social infrastructure can be helpful to improve human development [Mera (1973); Hardy (1980); Antle (1983); Eberts (1986); Adeyemi, *et al.* (2011); Akram (2007) and Siddique (2008)]. Fertility rate can affect population growth and hence can be

a crucial predictor for shaping economic and human development outcomes in the society [Solow (1956); Barro (1991); Mankiw, *et al.* (1992); Cutler, *et al.* (1990); Mcdonald and Guest (2002); Guest (2006); Heijdra and Ligthart (2006); Hondroyiannis and Papapetrou (2005); Lee (1997)]. Similarly, unemployment can affect health and education outcomes negatively by affecting socioeconomic status of individuals [Cohen (1999); Haan, *et al.* (1989); Johnston-Brooks, *et al.* (1998); Klerman (1991) and Rosenbaum (1992)]. However, some research studies argue that prevalence of high unemployment may encourage individuals for self-employment which can be helpful in increasing entrepreneurial activity in the economy and can improve living standards of people [Thurik, Carree, Van Stel, and Audretsch (2008)].

4. METHODOLOGY

We have used panel data framework for investigating the impact of agricultural land inequality on human development across thirty four districts of Punjab (Pakistan). Panel fixed effects model has been applied because it is considered as an appropriate approach in case of existence of heterogeneity and structural characteristics diversity across cross-sectional units. In fixed effects model, intercept term is treated as cross-sectional specific and slope is assumed to be constant across all cross sections [Gujrati (2009)]. The Haussmann test [Hausman (1978)] has also been applied to decide about the suitability of the usage of fixed effects model. It also suggest that application of fixed effects model is appropriate for our empirical analysis. HDI and NIHDI have been used as dependent variables alternatively as proxies of human development in two different models. Agricultural Land Inequality, Social Infrastructure, Fertility Rate and Unemployment Rate have been used as independent variables. A brief description of the variables used in this study is as given below.

4.1. Human Development Index (HDI)

The use of income or income per capita as a measure of economic development of a society has been widely criticised by economists [Dasgupta and Weale (1992); Anand (1994); Streeten (1995); Sen (1988) and Haq (1995)] due to which different alternative approaches and measures have been suggested for this purpose. The Basic Needs Approach introduced by International Labour Organisation [ILO (1977)] was one of the pioneer attempts in this regard. This approach suggested the use of different indicators related with basic needs such as food, water, clothing and shelter for measuring economic development. Physical Quality of Life Index (PQLI) introduced by Morris (1979) was another measure of development. The construction of PQLI was an attempt to measure the degree of development of a society with the help of combined index constructed by using the indicators of infant mortality, life expectancy and literacy. PQLI utilised three indicators related with two important dimensions of human life i.e. education and health. Nonetheless, it completely ignored the third dimension i.e. income which can an important indicator related with standard of living of individuals. Human Development Index (HDI) introduced by United Nations Development Program [UNDP (1990)] in its first human development report is a better measure of human development due to holistic approach used in its construction. HDI is constructed by covering three important dimensions of human lives i.e. knowledge, health and decent living.

We have constructed HDI for thirty four districts of Punjab by utilising data over the period of 2003 to 2014. The index is the geometric mean of three normalised sub-indices measuring the improvements in education, health and living standards [UNDP (2011)]. These three sub-indices are termed as income index, education index and health index. Income index measures achievements in decent standard of living, education index measures achievements in access to knowledge and health index measures achievements in the objective of long and healthy life. Equation 3 describes the construction of HDI with the help of its three sub-indices.

$$HDI_{it} = (IncomeIndex_{it}.EducationIndex_{it}.HealthIndex_{it})^{1/3} \quad \ldots \quad \ldots \quad (3)$$

A brief description of the construction of three sub-indices i.e. income index, education index and health index is as given below.

4.1.1. *Income Index*

For the construction of income index (INI), we have calculated per capita income (in international US $) for all districts of Punjab by using household data from different waves of MICS conducted during 2003-2014. Per capita income of each district has been calculated by utilising incomes of households of that particular district. By following the methodology of UNDP, an income per capita of $100 and $75,000 have been set as a minimum and maximum goal posts respectively to calculate INI by using the following formula given in Equation 4

$$INI_{it} \ (\ln(PerCapitalIncome_{it}) - \ln(100) / \ln(75000) - \ln(100) \quad \ldots \quad \ldots \quad (4)$$

4.1.2. *Education Index*

Education index (EI) has been constructed with the help of two of its sub-indices termed as mean years of schooling index (MYSI) and adult literacy index (ALI). EI is the summation of MYSI and ALI whereby two third of the weight has been assigned to mean MYSI and one third weight has been assigned to ALI. For the construction of MYSI, mean years of schooling (MYS) of population aged 15 years and above has been used. ALI has been constructed by using literacy rate (LR) of age 15 years and above. 100 percent literacy rate is considered as maximum and 0 percent as minimum goal post for the construction of ALI. For MYSI 0 is used as minimum and 15 years of schooling is considered as maximum (UNDP, 2015). Equation (5), Equation (6) and Equation (7) explain the mechanism involved in the construction of education index.

$$MYSI_{it} = (MYS_{it} - 0) / (15–0) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

$$ALI_{it} = (LR_{it} - 0) \ . \ (100 - 0) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

$$EI_{it} = 2 \ /3(MYSI_{it}) + 1/3(ALI_{it}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

4.1.3. *Health Index*

Anand and Sen (1994) suggest that child mortality (i.e. additive inverse of child survival rate) and life expectancy are suitable proxies for health. Because of unavailability of district specific data for life expectancy, we have used under five survival rate (SR) and immunisation rate (IR) in construction of health index (HI). Two

sub-indices termed as Child Survival Index (CSI) and Immunisation Index (IMI) have been constructed which have been further used for the construction of HI. In the construction of both CSI and IMI, 100 percent is considered as maximum goal post and 0 percent as minimum goal post. In the construction of HI, 70 percent weightage has been assigned to CSI and 30 percent weightage to IMI because child survival rate is more representative measure of health condition of a society as compared to immunisation rates. It is an outcome of different health related activities and facilities. Equation (8), Equation (9) and Equation (10) explain the procedure of calculating HI.

$$CSI_{it} = (CSR_{it} - 0) / (100 - 0) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

$$IMI_{it} = (IR_{it} - 0) / (100 - 0) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

$$HI_{it} = 0.7(CSI_{it}) + 0.3(IMI_{it}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

4.2. Non Income Human Development Index

Non Income Human Development Index (NIHDI) takes into account only two aspects which include a long and healthy life and access to knowledge. Thus NIHDI focuses only on non-income dimensions of human development. The construction of NIHDI is as given below:

$$NIHDI_{it} = 0.5[(HI_{it}) + (EI_{it})] \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (11)$$

4.3. Agricultural Land Inequality

Data of individuals' agricultural land holdings in acres is reported in different waves (2003-2014) of MICS. We have calculated agricultural land inequality from data reported in MICS for each of the thirty four districts of Punjab by applying Gini Index on individual land holdings.

4.4. Social Infrastructure

It is very hard to find a generally agreed upon definition of social infrastructure but commonly it is related to schools, libraries, universities, clinics, hospitals, courts, museums, theatres, playgrounds, parks, fountains and statues etc. It can be defined as the infrastructure that promotes the health, education and cultural standards of the population [Snieska and Simkunaite (2009)]. We have used number of educational institutes (primary, secondary and tertiary) per person of the age cohort 5 to 25 year and number of health institutes (hospitals, dispensaries, rural health centers, basic health units, sub-health centers) per person to construct social infrastructure index with the help of Principal Component Analysis (PCA).

4.5. Fertility

Fertility rate (total fertility rate) is control variable in our two regression models. District specific total fertility rates have been used in our analysis because fertility can be an important factor affecting human development through its effects on population growth.

4.5. Unemployment

Unemployment rate is our next control variable. District specific unemployment rates have been used as independent variable in both of our econometric models because unemployment can affect human development through its effects on socioeconomic status of individuals.

5. DATA

We have used panel data for thirty-four districts of Punjab which has been extracted from different waves of MICS and PSLM conducted during the period of 2003-2014 and Punjab Development Statistics. The data of variables used in the construction of HDI and NIHDI is from MICS and PSLM. Agricultural land inequality has been calculated through Gini index by using the data of individuals' agricultural land holdings collected from MICS. Punjab Development Statistics is source of data of the variables used in the construction of Social Infrastructure Index. Data of fertility rate and unemployment rate is also from MICS conducted by Punjab Bureau of Statistics with the collaboration of UNDP and United Nations International Children's Emergency Fund (UNICEF).

6. EMPIRICAL RESULTS, DISCUSSION AND POLICY SUGGESTIONS

This study has investigated the impact of agricultural land inequality on human development in Punjab (Pakistan) by using two econometric models. Data used in the study is for thirty four districts of Punjab (Pakistan) over the period of 2003-2014. We have used Hausman test [Hausman (1978)] to identify whether fixed effects model or random effects model is appropriate which suggest the use of fixed effects model in our study. Table 1 below contains descriptive statistics of our variables. Empirical results of both of our econometric models are given in Table 2.

Table 1

Descriptive Statistics

	HDI	NIHDI	LINQ	SI	FR	UNP
Mean	0.497424	0.592067	0.795835	0.416441	3.957243	4.280515
Median	0.490947	0.589321	0.802815	0.421228	3.800000	4.700000
Maximum	0.666903	0.748643	0.971250	0.551993	4.900000	5.900000
Minimum	0.355101	0.450389	0.660686	0.295370	3.250000	2.100000
Std. Dev.	0.066472	0.068341	0.074656	0.066253	0.565591	1.212270
Skewness	0.128876	0.047656	–0.007730	–0.015191	0.374252	–0.408554
Kurtosis	2.518613	2.430951	2.267087	1.902642	1.607647	1.632501

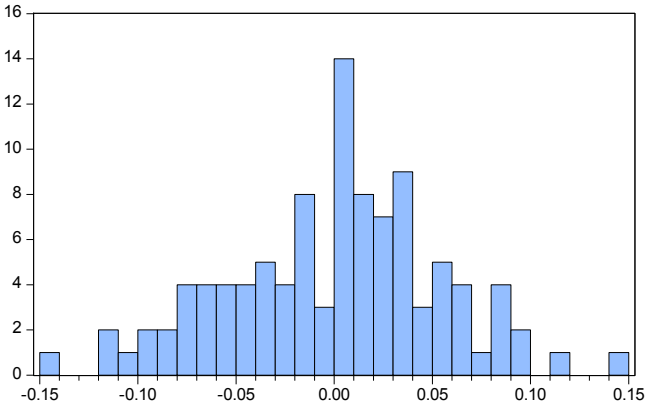

Table 1 provides the mean, median, maximum and minimum values along with standard deviation, Skewness and Kurtosis of the variables used in our analysis. Jarque-Bera statistics indicate that residuals are normally distributed.

Table 2

Agricultural Land Inequality and Human Development

Independent Variables ⬇	Model 1 (Dependent Variable: HDI)	Model 2 (Dependent Variable: NIHDI)
C	–0.54***	–0.39***
	(–13.6)	(–6.98)
	[0.000]	[0.000]
LINQ	–0.0224***	–0.0205*
	(–2.6614)	(–1.7648)
	[0.0091]	[0.080]
SI	0.0286***	2.1061***
	(27.5251)	(14.6225)
	[0.0000]	[0.0000]
FR	–0.0030*	–0.0050**
	(–1.8060)	(–2.1692)
	[0.0740]	[0.0325]
UNP	0.0005	0.0005
	(1.3327)	(0.9573)
	[0.1857]	[0.3407]
	N=408	N=408
	R Square = 0.9792	R Square = 0.9713
	Adj. R Square = 0.9713	Adj. R Square = 0.9655
	F Stat. =124.7875	F Stat. =103.1457
	Prob.(F-Stat) = 0.000	Prob.(F-Stat) = 0.000
	Hausman Test Chi-Sq.= 35.24 Prob= 0.000	Hausman Test Chi-Sq.= 49.47 Prob= 0.000

Note: Next to coefficients of independent variables, t-statistics have been reported in parenthesis and probability values have been provided in brackets. *, **, *** indicate significance at 10, 5 and 1 percent level of significance respectively.

Empirical results of both models reported in Table 2 show that agricultural land inequality is negatively related with HDI and NIHDI. Social infrastructure has positive and significant relationship with HDI and NIHDI. Fertility rate is negatively and significantly and unemployment rate is insignificantly related to HDI and NIHDI. Social infrastructure has been found to be positively and significantly related with human development because it facilitates people's access to education and health facilities. Fertility rate affects human development negatively through its effects on population growth. High fertility rate leads to higher population growth which reduces per capita public spending on education and health and hence affects human development negatively. The negative relationship of our variable of agricultural land inequality with HDI and NIHDI confirms the arguments that inequality can be detrimental for human development of societies [Deininger and Squire (1998); Schneider (2004); Birdsall and Londono (1998); Deininger and Squire (1998); Persson and Tabellini (1994); Sokolof and Engerman (2000); Alesina and Rodrik (1994); Deininger and Squire (1998)]. Inequality of agricultural land has retarding effects on human development in Pakistan where land distribution is not merely about the distribution of assets but also indicates the distribution of political power. A skewed distribution of agricultural land in Pakistan has strengthened elite dominance. The powerful elite in the country has developed a predatory cycle to support each other [Hussain (1999); Siddiqa (2007); Pervaiz (2010)]. They have been pursuing the policies to benefit themselves which have further strengthened their control over public policies and have caused underdevelopment in the society by restricting the equal opportunities of education and health for masses. They do not want to renounce their political power and the political rents associated with the current status quo. That's why, they molded land reforms in the country to protect their interests and land reforms did not remain very successful in breaking the political power of landed elite.

Pakistan can learn a lesson from the historical experience of some of the countries of the world which have undergone effective land reform programmes. The countries where agricultural land inequality has been reduced through their land reform programs have higher economic development as compared with those countries which have not initiated such reforms. Japan, South Korea and Taiwan are among the famous examples of the countries which can be placed in the category of the countries which implemented such reforms whereas some of Latin American and south Asian countries like Pakistan can be placed in the category which have not undergone land reforms and therefore have lower economic development [Adelman (1979); Alesina and Rodrik (1994)]. Thus an effective land reform program aiming to redistribute land is required in the country to cope with the issues of poverty, social and technological backwardness and political disempowerment of masses [Quan (2006)]. A transparent mechanism of land reforms should be adopted whereby agricultural land can be transferred from big landlords to landless farmers, tenants and agricultural workers. A model of communal or cooperative farming can also be adopted by transforming land acquired from big land lords to the communities living in the same region from where land is acquired. A mixture of the both of the above mentioned strategies is also possible.

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