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Rural-Urban Income Inequality under Financial Development and Trade Openness in Pakistan: The Econometric Evidence

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1. INTRODUCTION

Pakistan is a developing economy, which has adopted Structural Adjustment Programme (SAP) in the form of economic reforms initiated in early 1990s. Economic reforms related to privatisation of state-owned assets, deregulation, confiscation of price controls, trade liberalisation generally and financial reforms (especially to improve quality of financial institutions) particularly. The objective of such reforms was to improve the welfare of society but these reforms never fruited to every livelihood in the country. Perhaps, fruits of economic reforms are eaten up by poor governance, lack of transparency in economic policies, high level of corruption, high burden of internal and external debts and interest rate payments on these debts, weak situation of law and order, and improper implementation of economic policies.

All this resulted in widespread poverty, which has pervasive effects on global and local communities. The unequal distribution of resources adding to material deprivation makes life courses further difficult for millions of people. Thus, all these issues of poverty and income inequality have frequently been raised internationally on a premise that nation cannot progress when a vast segment of society is deprived of it's due share. If we look at those countries, which are able to acquire rapid economic growth for instance, China, this growth has been accompanied by remarkable increases in inequality. China is among those countries, which has the highest level of inequality in the world [World Bank (1997) and Chang (2002)]. This shows that growth no doubt is a necessary condition but not the sufficient condition for the alleviation of poverty. But, Deinenger and Squire (1996) did not find any evidence to support the proposition that growth leads to higher income inequality.

As argued by Eastwood and Lipton (2000), urban residents are more educated and better informed of economic opportunities. Therefore, they are in much advantageous situation as compared to the rural residents with regard to socio-economic benefits both at the public and private level along-with the political representation. Specially, in this

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era of globalisation, which demands integration into global markets, there are opportunities for well positioned and those at the detrimental situation remain deprived. It will not be incorrect to say that globalisation has also created a great deal of insecurity for a number of cohorts. The opening up of trade and capital flows benefits only the existing well to do or those who are already well established and well connected. For the lower as well as the middle income group there is still a sense of insecurity related to economic changes, unemployment, lack of access to social services, etc. So, what is needed is the sound functioning of the labour and financial markets with the sense of accountability at all levels. This is also the pre-requisite for any developing country for integrating into the international financial markets. The issue of price and trade liberalisation benefits rural areas or the urban is still unresolved. One argument is that liberalisation programmes or deregulations benefit formal sector of the urban areas. But here, Kruger, *et al.* (1995) argues that price distortions against tradable are often harmful to agricultural products; thus when prices and trade are liberalised such distortions are eliminated. This cause rural-urban inequality to fall and brings improvement in the rural standards of living.

It could, therefore, be argued that, the entire literature on rural urban poverty and inequality in terms of income, consumption or other social indicators need some assessment of the role of financial sector at the same time, keeping in view the on-going process of globalisation. In fact, it is often argued that financial development has an important role in improving income distribution. According to the dynamic model of Greenwood and Jovanovic (1990), the inverted U-shaped relationship between finance and inequality shows that in the early stage financial development might widen income inequality, but then starts reducing as average income level rise with more households acquiring financial intermediaries and services. On the contrary, Galor and Zeira (1993) and Banerjee and Newman (1993) gives negative and linear relationship between finance and inequality thereby showing that development of financial markets and it's intermediaries reduce income inequality and Shahbaz, *et al.* (2006) for the case of Pakistan.

This entire discussion, shows that imperfection of financial markets create inequality as the benefits from high-return investments are acquired by those who are already stable and have wealth in hand. Those who are poor will become poorer on account of lack of access to credit markets. This is because as the financial system becomes healthier, powerful and competitive, it is possible that, a greater capacity and desire exists to bear the high cost of small credits [Rajan and Zingales (2003)]. Instead, of relying on the informal credit system there will then be more demand for the formal credit from the well-established financial institutions. Infact, Li, *et al.* (1998) and Clark, *et al.* (2003) are also strong advocates of this concept.

Moreover, the growing literature on globalisation and on the issues of inequality with respect to rural-urban dimensions shows that it varies across regions/sectors and many developing countries are bound to undertake reforms to get positive effects of this process. For example, Eastwood and Lipton (2000) and Jha (2000) have measured urban-rural gaps while considering inequality as rural poverty relative to urban poverty. Most important factors contributing towards rural-urban disparity are provision of services both by public and private sector, resource endowment and the level of infrastructure. As the rural areas lack all these facilities and apart from that the services offered there by banks

or financial institution are far from satisfactory. This entire situation makes a strong case for slow growth and under development of the economy, which is mainly depending on the agrarian sector's performance, based in rural settlement thereby effecting majority of country's population. Thus, this inequality or disparity causes growth rates to fall [Alesina and Rodrick (1994) and Ravillion (1998)]. On the other hand, in the setting of competitive market for goods and production factors, credit may improve the well-being of the poor, even if they do not directly receive loans [Beck, *et al.* (2004)].

This pioneering endeavour utilises both expressive and empirical methods to analyse the inter-link between rural-urban gap, financial intermediation and trade-openness plus per capita income and foreign capital openness in small developing economy like Pakistan. The present paper explores the understanding between financial deepening, trade-openness and rural-urban income inequality. To investigate the order of integration running actors in the model, we utilised **DF-GLS** and **Ng-Perron** due to their superiority over ADF and P-P Tests and modified **ARDL** co-integration along with **Johansson Technique** for robustness of long run association between said actors and **ECM** (Error Correction Method) for short run dynamics. Rest of the paper is designed as; Section 2 describes the model specification, methodological framework and data collection is discussed in Section 3, while Section 4 elaborates the interpreting Style and finally, conclusions and policy implications are included in the remaining of this paper.

2. MODEL SPECIFICATION

In the light of above discussion in literature and to inquire the relationship between financial intermediation, trade-openness and rural-urban income inequality, the following equation is being modelled;

$$AG/MA = \alpha_o + \alpha_1 M2 + \alpha_2 GDPC + \alpha_3 CPI + \alpha_4 FDI + \alpha_5 TR + \varepsilon_t \quad \ldots \quad \ldots \quad (1)$$

Where $M2$ as share of GDP is for financial intermediation, dependent variable is ratio between agricultural to manufacturing value-added as share of GDP (AG/MA) for rural-urban income inequality, real per capita income (GDPC), consumer price index is proxy for inflation (*CPI*), while *FDI* and *TR* (export + imports as share of GDP) captures the phenomenon of openness of foreign capital and Trade.

$$\beta_{11} M2 + \beta_{12} M2^2 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

The inequality-narrowing hypothesis predicts $\alpha_{11} > 0$ and $\alpha_{12} = 0$, the inequality-widening hypothesis predicts $\beta_{11} < 0$ and $\beta_{12} = 0$, and inverted U-shaped hypothesis predicts if $\beta_{11} > 0$ and $\beta_{12} < 0$, if $\beta_{11} < 0$ and $\beta_{12} > 0$ U-shaped hypothesis predicts.

$$\gamma_{11} GDPC + \gamma_{12} GDPC^2 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

After including linear term of *GDPC*, we also utilised squared term of said actor to inquire the monotonous impact of economic growth on rural-urban income inequality. So, relation between said variables predicts inverted U-shaped hypothesis

predicts if $\gamma_{11} > 0$ and $\gamma_{12} < 0$ and U-shaped friendship can be predicted as $\gamma_{11} < 0$ and $\gamma_{12} > 0$.

Table 1 describes the pair-wise correlations among working actors in the said model. Correlations show that economic growth is negatively associated with rural-urban income inequality, which indicates that an increase in economic growth widens the rural-urban gap. Like foreign capital and inflation are strongly correlated with rural-urban inequality except trade-openness. Inflation, trade, FDI and financial development promote the economic activity in the economy. Openness of foreign capital is also positively and significantly correlated with inflation.

Table 1

Correlation Matrix and Descriptive Statistics

Variables	AG/MA	GDPC	M2	CPI	FDI	TR
Observations	**36**	**36**	**36**	**36**	**36**	**36**
Std. Dev.	0.1661	0.3129	0.0949	52.6778	0.4636	0.1259
Skewness	–0.0845	0.0296	–0.4185	0.5132	1.0206	–1.8850
Kurtosis	2.3887	1.9885	3.0433	1.7525	3.7345	8.3488
AG/MA	**1.0000**					
GDPC	–0.8305	**1.0000**				
M2	–0.2642	0.4812	**1.0000**			
CPI	–0.7725	0.9292	0.4128	**1.0000**		
FDI	–0.8025	0.7852	0.4463	0.8166	**1.0000**	
TR	–0.4816	0.1748	–0.0517	0.2208	0.4238	**1.0000**

Except the financial intermediation (financial deepening) and trade-liberalisation, we also included other explanatory variables in the model to avoid the problem of mis-specification. Due to an increase in the trade, manufacturing sector becomes more export-oriented due to its enhancement. Expecting positive correlation between manufacturing sector and trade liberalisation, trade and price liberalisation may influence the farmers positively. Expanding manufacturing sector may generate new demand for agricultural products additionally and hence, migration to urban areas could also decline unemployment situation and improve the wages in rural areas. Therefore improvement in growth of agricultural sector relative to manufacturing sector may reduce rural-urban gap.

Openness of foreign capital is proxied by foreign direct investment inflows in the country; inward foreign direct investment may deteriorate the rural-urban gap. The main reason is that, FDI in Pakistan is going to services and telecommunications sectors etc. Inflationary pressures hurt more poor segments of the society and fixed salaried persons than rich individuals. We are expecting increasing rural-urban inequality of income on account of inflationary impact because as against non-poor, majority of the poor population is living in the villages holding cash in their hands to purchase basic necessities of life and inflation thus, erodes their purchasing power. Impact of economic

growth on rural-urban income inequality is captured through inclusion of GDP per capita and expecting a rural-urban income distribution improving impact of real per capita income in the country.

Time series data from 1971 to 2006 of all the variables have been collected from World Development Indicators (WDI, 2007 **CD-ROM**), Economic Survey of Pakistan (**various issues**) and International Financial Statistics (IFS, 2007 **CD-ROM**).

3. METHODOLOGY AND DATA

Unit Root Estimation

In order to scrutinise the integrating level of variables, standards tests are employed like DF-GLS and Ng-Perron in the prior step. Mostly in literature to find out the order of integration, ADF [Dicky and Fuller (1979)] and P-P [Philip and Perron (1988)] tests are often used respectively. Due to their poor size and power properties, both tests are not reliable for small sample data set [Dejong, *et al.* (1992) and Harris (2003)]. They conclude that these tests seem to over-reject the null hypothesis, when it is true and accept it, when it is false. While, two newly proposed tests seem to solve this arising problem: the Dicky-Fuller generalised least square (**DF-GLS**), de-trending test developed by Elliot, *et al.* (1996) and **Ng-Perron** test following by Ng-Perron (2001). On the assumption that there is need to test the order of integration of variable X_t, Elliot, *et al.* (1996), enhance the power of ADF test by de-trending procedure and DF-GLS test is based on null hypothesis $H_o : \delta_o^* = 0$ in the regression:

$$\Delta \mathbf{X}_t^d = \delta^* \mathbf{X}_{t-1}^d + \delta_1^* \Delta \mathbf{X}_{t-1}^d + ... + \delta_{p-1}^* \Delta \mathbf{X}_{t-p+1}^d + \eta_t \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Where $\mathbf{X}_t^d$ is the de-trended series and null hypotheses of this test is that $\mathbf{X}_t$ has a random walk trend, possibly with drift as follows.

$$\mathbf{X}_t^d = \mathbf{X}_t - \overset{\cap}{\varphi}_o - \overset{\cap}{\varphi}_1 t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Basically, two hypotheses are proposed, (i) $\mathbf{X}_t$ is stationary about a linear time trend and (ii) it is stationary with a non-zero mean, but with no linear time trend. Considering the alternative hypotheses, the DF-GLS test is performed by first estimating the intercept and trend utilising the generalised least square technique. This estimation is investigated by generating the following variables:

$$\bar{\mathbf{X}} = \left[\mathbf{X}_t, (1 - \bar{\beta} L)\mathbf{X}_2, ..., (1 - \bar{\beta} L)\mathbf{X}_T \right] \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

Subject:

$$\bar{Y} = \left[\mathbf{X}_t, (1 - \bar{\beta} L)Y_2, ..., (1 - \bar{\beta} L)Y_T \right] \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

and

$$Y_t = (1,t)\bar{\beta} = 1 + \frac{\bar{\alpha}}{T} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

Where "T" representing number of observation for $\mathbf{X}_t$ and a is fixed.[1] While OLS estimation is followed by this equation:

$$\bar{\mathbf{X}} = \varphi_o \bar{Y} + \varphi_1 Y_t + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

and OLS estimators $\bar{\varphi}_o$ and $\bar{\varphi}_1$ are utilised for the removal of trend from as $\mathbf{X}_t$ above. ADF test is employed on the transformed variable by fitting the OLS regression[2]:

$$\Delta \mathbf{X}_t^d = \lambda_o + \rho \mathbf{X}_{t-1}^d + \sum_{j=1}^{k} \gamma_j \Delta \mathbf{X}_{t-j}^d + \mu_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

In alternative hypothesis, $\bar{\alpha} = -7$ in the required equation of $\bar{\beta}$, above, then they calculate $\mathbf{X}_t^d = \mathbf{X}_t - \varphi_o$, fit the ADF regression on new transformed variable and employ the test of the null hypothesis that is $\rho = 0$.

In recent times, Ng-Perron (2001) developed four test statistics utilising GLS de-trended data D_t^d. The calculated values of these tests based on the forms of Philip-Perron (1988) Z_α and Z_t statistics, the Bhargava (1986) R_1 statistics, and the Elliot, Rotherberg and Stock (1996) created optimal best statistics. The terms are defined as follows:

$$k = \sum_{t=2}^{T} (D_{t-1}^d)^2 / T^2 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (11)$$

While de-trended GLS tailored statistics are given below:

$$MZ_a^d = (T^{-1}(D_T^d)^2 - f_o)/(2k)$$

$$MZ_t^d = MZ_a \times MSB$$

$$MSB^d = (k / f_o)^{1/2}$$

$$MP_T^d = \begin{cases} (\bar{c}^{-2}k - \bar{c}T^{-1}(D_T^d)^2 / f_o, and, (\bar{c}^{-2}k + (1-\bar{c})T^{-1}(D_T^d)^2 / f_o & \ldots \quad \ldots \quad (12) \end{cases}$$

If $x_t = \{1\}$ in fist case and $x_t = \{1, t\}$ in second.[3]

Modified ARDL Bounds Testing

We employed the modified autoregressive distributed lag (MARDL) bounds testing approach suggested by Pesaran, *et al.* (2001) as the most appropriate specification

[1]The power of envelop curve is one-half at $a = -13.7$ when the model has constant and trend term, and at $a = -7$ when it has only constant tern [see Elliot, *et al.* (1996) for comprehensive study].

[2]For the critical values see [Elliot, *et al.* (1996)] of null-hypothesis which is $\rho = 0$.

[3]$a = -7$, If $x_t = \{1\}$ and $\bar{c} = -13.7$, $a = -7$, If If $x_t = \{1, t\}$.

to explore the impact of financial development and trade-openness with battery of other variables on rural-urban inequality (earnings-gap) in long run in the case of Pakistan. The bounds testing approach has numerous advantages. The main merit lies in the fact that unlike other widely used co-integration techniques, it can be applied irrespective of whether the variable are integrated of order *I(0)* or integrated of order *I(1)*. Fortunately, modified ARDL method is free of any problem faced by traditional techniques in the literature. Another merit is that it has better small sample properties. Moreover, a dynamic error correction model (ECM), can be derived from modified ARDL through a simple linear transformation [Banerrjee, *et al.* (1993)]. The ECM integrates the short-run dynamics with the long-run equilibrium, without losing long-run information.

The modified ARDL approach to Co-integration involves estimating the conditional error correction version of the ARDL model, described as follows:

$$\Delta y = \lambda_1 + \lambda_2 y_{t-1} + \lambda_3 z_{t-1} + \lambda_4 x_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta y_{t-1} + \sum_{j=0}^{p} \alpha_i \Delta x_{t-j} + \sum_{j=0}^{p} w_s \Delta z_{t-s} + \mu_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (13)$$

Where, λ_o is the drift component and μ is assumed to be white noise error processes. The modified ARDL approach estimate $(p+1)^k$ number of regression in order to obtain optimal lag length for each variable, where '*p*' is the maximum number of lags to be used and "*k*" is the number of variable in the Equation 13. The optimal lag structure of the first difference regression is selected by the Schwarz-Bayesian criteria (SBC) to ensure an absence of serial correlation in the estimated residual.[4] Following PSS (1999), two separate statistics are employed to "bound test" for the existence of a long-run relationship: an *F-test* for the joint significance of the coefficients of the lagged levels in Equation (13), so that null hypothesis $H_o : \lambda_2 = \lambda_3 = \lambda_4 = 0$ means no evidence of existence of long run relationship, while alternative hypothesis is $H_1 : \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$ which indicates existence of long run relationship among variables in the concerned model. Two asymptotic critical value bounds provide a test for co-integration when the independent variables are *I(d)* (Where $0 = d = 1$): a lower value assuming the regressors are *I(0)*, and an upper value assuming purely *I(1)* regressors.

If the F-statistics exceeds the upper critical value, we can conclude that a long run relationship exists, regardless of whether the underlying order of integration of the variables is *I(0)* or *I(1)*. If, the *F*-statistics falls below the lower critical values, we cannot reject the null hypothesis of no co-integration. If, the *F*-statistics exceeds the upper bounds, one may reject the hypotheses of no long run relationship. However, if the *F*-statistics falls between these two bounds, inference would be inconclusive. Moreover, when the order of integration of the variable is known and if all the variables are *I(1)*, the decision is made based on the upper bound. Similarly, if all the variables are *I(0)*, then the decision is made based on the lower bound. Then, the long-run relationship is

[4]SBC is known as selecting the smallest lag length to specify a parsimonious model. The mean prediction error of AIC based model is 0.0005 while that of SBC based model is 0.0063 [Shrestha (2003)].

estimated using the selected ARDL model. If variables are co-integrated, the conditional long run model can then be produced from the reduced from solution of Equation (13), when the first differenced variables jointly equal to zero, i.e. $\Delta x = \Delta y = \Delta z = 0$. Thus,

$$y_t = \partial_o + \partial_2 x_t + \partial_3 z_t + \nu_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (14)$$

Where $\partial_o = -\lambda_1/\lambda_2$; $\partial_2 = -\lambda_3/\lambda_2$; $\partial_3 = -\lambda_4/\lambda_2$, and ν_t are the random errors. These long run coefficients are estimated by the modified ARDL model in Equation 11 by OLS. When, there is long relationship between variables, there exists an error correction representation. Therefore, the error correction model is estimated generally as in the following given reduced form:

$$\Delta y_t = \sum_{i=1}^{p} \lambda_i \Delta y_{t-1} + \sum_{j=1}^{m} \beta_i \Delta x_{t-j} + \sum_{k=1}^{n} \beta_k \Delta z_{t-k} + \eta ECM_{t-1} + \omega_t \quad \ldots \quad \ldots \quad (15)$$

To establish the good fit of the ARDL model, the diagnostic test and the stability test are conducted. The diagnostic test examines the serial correlation, functional form, normality and heteroscedisticity associated with the model. The stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMsq). Examining the prediction error of the model is another way of ascertaining the reliability of the modified ARDL model. If the error or the difference between the real observation and the forecast is infinitesimal, then the model can be regarded as best fitting.

4. RESULTS INTERPRETING STYLE

Process of investigating the order of integration reveals that except M2 and FDI, other variables are having unit root problem at level, while stationary at 1st difference level. We relied on the stationarity evidence of DF-GLS and Ng-Perron test statistics, which are more power full and suggestive than ADF & P-P tests, as explained in theoretical background and their statistics are given in Table 2. The lag-order has been selected on the basis of AIC, SBC and FPE that is 2 as mentioned in Table 3. After investigating order of integration of said variables, we employed both techniques (J-J Test and MARDL) to check the robustness of long run relation between rural-urban inequality and explanatory influencing actors in the said model.

Turning to the modified ARDL results shown in Table 4, the total number of regressions estimated following the ARDL method in the equation-13 is $(5+1)^2 = 36$. The results of the bounds testing approach for Co-integration show that there are five co-integrating vectors among rural-urban inequality and its determinants and F-statistics the lowest value is 5.430, which is also significant if we compare it with Narayan's (2005) critical boundaries at 10 percent level of significance. After the comparison of F-calculated values with upper and lower boundaries created by both Pesaran, *et al.* (2001) or Narayan's (2005), one may conclude that the null hypothesis of no Co-integration cannot be accepted and that there is indeed an existence of long run relationship among the variables in this model.

After the calculation of *F*-statistics of MARDL Test, one seems to agree with J-J Test's conclusion and rejects the null hypothesis of no co-integration between concerned macroeconomic variables. This proves that results about long run friendship between rural-urban inequality and financial intermediation plus other friends in the model are robust.

Table 2

Unit Root Estimation

	DF-GLS Test at Level		DF-GLS Test at 1st Difference	
Variables	Calculated Values	Lags	Calculated Values	Lags
AG/MA	–2.571	0	–5.213*	0
M2	–5.236	1	–5.563*	1
GDPC	–2.681	0	–5.060	0
CPI	–1.986	1	–2.980***	2
FDI	–5.102*	3	–5.607*	1
TR	–2.879	0	–4.712	0
	Ng-Perron at Level			
Variables	MZa	MZt	MSB	MPT
AG/MA	–9.536	–2.179	0.228	9.571
M2	–19.137**	–3.091	0.161	4.775
GDPC	–6.054	–1.738	0.287	15.049
CPI	–1.092	–0.732	0.670	82.225
FDI	–23.430**	–3.422	0.146	3.889
TR	–6.997	–1.855	0.265	13.040
	Ng-Perron at 1st Difference			
Variables	MZa	MZt	MSB	MPT
AG/MA	–38.258*	–4.276	0.111	2.897
M2	–29.921*	–3.851	0.128	3.138
GDPC	–15.043***	–2.532	0.168	7.237
CPI	–18.809**	–2.603	0.138	7.426
FDI	–47.337*	–4.732	0.099	2.578
TR	–56.566*	–5.307	0.093	1.658

Table 3

Lag Length Criteria

Lag-order	AIC	SBC	FPE	HQ
1	–5.516	–3.649	1.34e–10	–5.101
2	*–7.795*	*–4.293*	*2.12e–11*	*–6.601*

Short-run Diagnostic Test-Statistics

Serial Correlation LM, F = 0.0920 (0.764)
ARCH Test = 0.1608 (0.691)
\Normality J-B Value = 1.006(0.604)
Heteroscedisticity Test, F = 1.029 (0.466)
Ramsey RESET Test, F = 0.0108 (0.917)

Table 4

ARDL Bound Testing

Dependent Variable			F-Statistic	
			Lag Order 2	
	AG/MA		13.605	
	CPI		5.430	
	FDI		21.364	
	GDPC		6.847	
	TR		18.605	
	M2		2.394*	
Critical Value	Pesaran, *et al.* (2001) [a]		Narayan (2005) [b]	
	Lower Bound Value	Upper Bound Value	Lower Bound Value	Upper Bound Value
1 %	6.34	7.52	7.527	8.803
5 %	4.87	5.85	5.387	6.437
10 %	4.16	5.06	4.477	5.420

*ARDL estimation shows that there are five Co-integrating Vectors that is strong indication of long run relationship among said actors.

[a]Critical values are obtained from Pesaran, *et al.* (2001), Table CV (V): Unrestricted Intercept and Unrestricted Trend.

[b]Critical values are obtained from Narayan (2005), Table CV (V): Unrestricted Intercept and Unrestricted Trend, p.1990.

After a brief look at Tables 4 and 5, Table 6 describes the long run elasticities because all the variables are in logarithm form, except consumer price index. Estimation shows that financial intermediation or financial deepening helps significantly in improving the rural-urban income gap in the country. Economic growth widens the rural-urban inequality gap. The main reason is that fruits of economic growth are going to top 10 non-poor segments at the cost of remaining segments in the society, where more than 66 percent is living in rural areas. So, economic growth is concentrated to few cities not the whole country. Rising overall income inequality is also a major factor for widening rural-urban gap. Inflation is narrowing rural-urban earnings gap through macroeconomic phenomenon but significant at 11 percent level of significance in the small developing economy like Pakistan.

Table 5

Johansen's Multiple Cointegration Test Results

Hypotheses	Trace-Test	0.05 Critical Value	Inst.Value	Hypotheses	Maximum Eign Value	0.05 Critical Value	Inst.Value
R = 0	226.182	117.708	0.0000	*R = 0*	83.323	44.497	0.0000
R ≤ 1	142.858	88.803	0.0000	*R = 1*	47.235	38.331	0.0037
R ≤ 2	95.622	63.876	0.0000	*R = 2*	39.012	32.118	0.0061
R ≤ 3	56.609	42.915	0.0013	*R = 3*	31.153	25.823	0.0090
R ≤ 4	25.455	25.872	0.0562	*R = 4*	16.043	19.387	0.1434
R ≤ 5	9.4125	12.517	0.1564	*R = 5*	9.4125	12.517	0.1564

Table 6

Long Run OLS (Ordinary Least Squares) Results

Dependent Variable: AG/MA			
Variable	Model-1	Model-2	Model-3
Constant	5.3059	–1.2020	–25.620
	(0.0001)	(0.9332)	(0.0817)
M2	0.3071	3.9690	0.2426
	(0.0519)	(0.6226)	(0.1074)
$M2^2$		–0.4994	
		(0.6496)	
GDPC	–0.5021	–0.5175	6.3211
	(0.0001)	(0.0001)	(0.0525)
$GDPC^2$			–0.3693
			(0.0373)
CPI	0.0011	0.0011	0.0023
	(0.1158)	(0.1100)	(0.0108)
FDI	–0.1128	–0.1072	–0.1070
	(0.0393)	(0.0588)	(0.0388)
TR	–0.3299	–0.3472	–0.4399
	(0.0066)	(0.0074)	(0.0008)
$R^2 = 0.844856$		$R^2 = 0.845975$	$R^2 = 0.866756$
Durban-Wat = 1.435		Durban-Wat = 1.477	Durban-Wat = 1.808
F-stat = 32.67		F-stat = 26.54	F-stat = 31.441

Note: Prob-values are given in parentheses.

GDP per capita worsens the rural-urban income inequality more than the impact of Trade-openness in the economy. Manufacturing sector in Pakistan is concentrated in major hubs of the country and they demand skilled labour for the improvement of their production for exports and to enhance the trade share in the world market. Migration to urban areas could not play its role in declining the rural-urban gap because major share of labour force in rural areas is unskilled, while manufacturing demands skilled human resource. Moreover, migrated labour cannot be fully absorbed in these industries and employment opportunities are captured by

urban skilled population. Rural income inequality is increasing due to unequal distribution of land and water access and obviously, major fruits from trade-openness reaped up by the big landlords or feudals. Openness of foreign capital is also widening rural-urban income inequality, in a small developing economy like Pakistan; most of the FDI is being invested in the services sectors like financial and telecommunications that utilises high skilled urban labour force. In second round of estimation, monotonous impact of financial deepening on rural-urban inequality presents phenomenon of inverted **U**-shaped curve insignificantly. While in the third model, linear and squared terms of GDP per capita show the existence of Kuznets inverted **U**-shaped curve, which confirms the interpretations of linear term.

Finally, we employed the ECM version of modified ARDL to investigate the short run dynamic relationships. After investigating the long run impacts of concerned variable in the basic model, we turned to short run dynamic model as following;

$$\Delta AG/MA = \lambda_o + \sum_{j=0}^{n} \lambda_1 \Delta M2 + \sum_{J=0}^{n} \lambda_2 \Delta GDPD + \sum_{j=0}^{n} \lambda_3 \Delta FDI + \sum_{j=0}^{n} \lambda_4 \Delta CPI + \sum_{j=0}^{n} \lambda_5 \Delta TR + \eta CE_{t-1} + \varepsilon_t$$

Table 7 reports the results of ECM (Error Correction Model) formulation of above equation. According to Engle-Granger (1987), Co-integrated variables must have in ECM representation. The ECM strategy provides an answer to the problem of spurious correlation in the short run dynamic relationship between rural-urban gap, financial intermediation and trade-openness in a small developing economy like Pakistan. The long run dynamics appear in the set of regressors. Technically, ECM (Error Correction Term) measures the speed of adjustment back to Co-integrated relationships. The ECM posited to be a force affecting the integrated variables to return their long-run relation when they deviate from it and thus the longer the deviation; greater would be force tending to correct the deviation [Banerjee, *et al*. (1993)].

Short run dynamic behaviour reveals that financial intermediation improves the rural income distribution insignificantly whereas, GDP per capita is widening the rural-urban gap but statistically insignificant in the short span of time. Openness of foreign capital and trade worsens the inequality gap between rural and urban areas in short run. Finally, inflation improves the income distribution in rural economy as shown in Table-7.

Table 7

Short-run Dynamic Behaviour

Dependent Variable: ΔAG-MA			
Variable	Coefficient	Std. Error	Inst.values
Constant	–0.0351	0.0167	0.0450
ΔM2	0.0978	0.1315	0.4638
ΔGDPC	–0.1864	0.1328	0.1720

ΔFDI	–0.1235	0.0416	0.0064
ΔFDI(–1)	0.0228	0.0406	0.5791
ΔCPI	0.0063	0.0032	0.0568
Δ TR	–0.2331	0.1384	0.1042
CR(–1)	–0.6291	0.1875	0.0025
	R-squared = 0.48291		
	Adjusted R-squared = 0.34369		
	Durbin-Watson stat = 1.923		
	F-statistics (*prob*) = 3.468 (0.0093)		

The signs of the short run dynamic impacts are maintained to the long span of time. The equilibrium correction coefficients (CRt-1) estimated value of –0.629, which is significant at 1 percent level of significance, has the correct sign and imply a fairly high speed of adjustment to the equilibrium level after a shock. Approximately 62.9 percent of dis-equilibrium from the previous year's shock converges back to the long run equilibrium in the current year. The short-run diagnostic tests results are very satisfactory with an absence of 2nd order serial correlation, prevalence of no heteroscedisticity and error term is normally distributed along-with no auto-regressive conditional heteroscedisticity. Ramsey's Reset test for functional form confirms that there is no specification problem in the short run model.

Following Bahmani-Oskooee and Nasir (2004) the null hypothesis (i.e. that the regression equation is correctly specified) cannot be rejected if the plot of these statistics remains within the critical bounds of the 5 percent significance level. As it is clear from Fig. 1 and 2 as given in Appendix, the plots of both the **CUSUM** and the **CUSUMsq** are within the boundaries and hence these statistics confirm the stability of coefficients of regressors that affect the rural-urban inequality in small developing economy like Pakistan. The model appears to be stable and correctly specified with an indication that neither the **CUSUM** nor the **CUSUMsq** test statistics exceeds the bounds of the 5 percent level of significance.

5. CONCLUSIONS

Pakistan is a developing economy, which has adopted Structural Adjustment Programme (SAP) in the form of economic reforms initiated in early 1990s. Economic reforms related to privatisation of state-owned assets, deregulation, confiscation of price controls, trade liberalisation generally and financial reforms (especially to improve quality of financial institutions) particularly. The objective of such reforms was to improve the welfare of society but these reforms never fruited to every one in the country. Perhaps, fruits of economic reforms are eaten up by poor governance, lack of transparency in economic policies, high level of corruption in the country, high burden of internal and external debts, weak situation of law and order, and improper implementation of economic policies.

The present paper explores the understanding between financial deepening, trade-openness and rural-urban inequality in case of small developing economy like Pakistan. We employed **DF-GLS** and **Ng-Perron** to examine the order of integration and modified

ARDL co-integration along with **Johansson Technique** for robustness of long run association between the said actors. Our empirical analysis suggests that improvement in financial performance declines the rural-urban income inequality in the case for Pakistan. In contrast, economic growth widens the rural-urban income gap in long span of time. Openness in foreign capital and trade worsen rural-urban inequality situation in Pakistan. Finally, low inflation is associated with high rural-urban income gap in the country.

Stability in macroeconomic policies and sustained economic growth declines rural-urban income inequality along-with investment in social sectors like education, health, and population welfare. There is a need to deregulate structural and trade reforms according to the underpinnings of macroeconomic policies and eliminate microeconomic hurdles that affect the economy and slows the speed of economic growth.

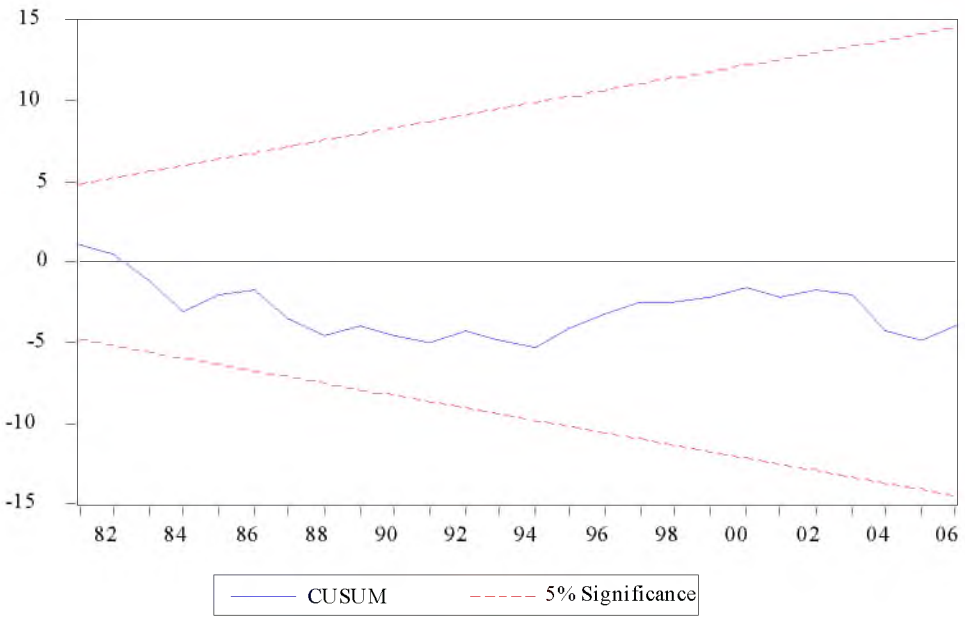
In the case of Pakistan ground reality is different from figures with respect to rural-urban income inequality. Better situation of Law and Order, improved quality of institutions, proper implementation of economic policies and better delivery of social and financial services especially to the poor are essential to lower the gap between rural-urban earnings.

The availability of financial services in rural areas like access to capital is a very important issue for business owners, who often lack formal education in financial matters and who face barriers to accessing financing. They have smaller amounts of personal capital available for start up or they have not much to provide for higher guarantees as collateral to the banks. Thus, they have difficulties in obtaining capital and fair lending terms. Therefore, the high handling cost of the loans (interest) should be bearable along with the banking procedure (forms), which should be easily readable keeping in view the literacy rate especially of rural areas.

For instance, the agricultural sector with large number of peasants involved, the cottage industries and small businesses of rural areas have access to finance from undocumented financial avenues because it requires less paper work and easily available cash on their door-step. Big borrowers and large industrial set-ups of capital intensive nature have access to commercial banks due to political power and links that are more professional in their approach operating mainly in urban centres. The entire banking sector need restructuring in favour of rural areas to make the backbone of the country strong thereby reducing rural-urban disparity.

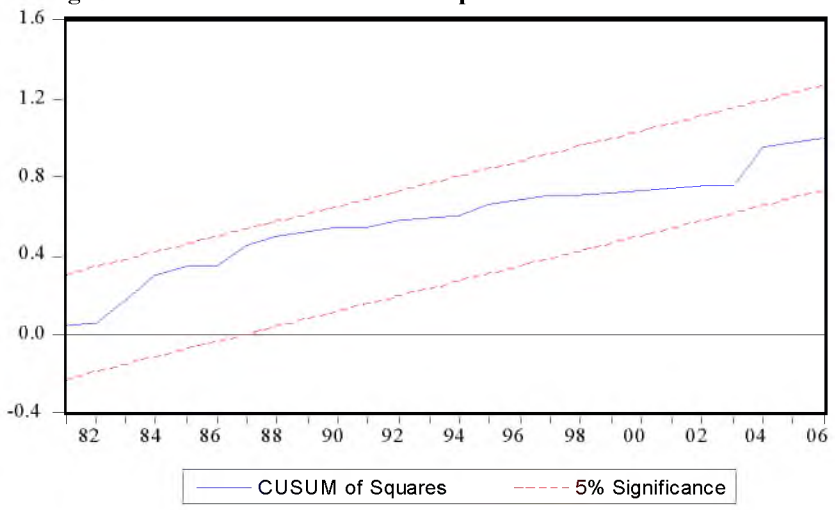
APPENDIX

Fig. 1. Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5 percent significance level.

Fig. 2. Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5 percent significance l.

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