

Rural-Urban Inequality under Finance and Trade Nexus: An Econometric Evidence

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Abstract:

Pakistan is a developing economy, which has adopted Structural Adjustment Program (SAP) in the form of economic reforms initiated in early 1990s. Economic reforms related to privatization of state-owned assets, deregulations, confiscation of price controls, trade liberalization 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 individual living 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.

The present paper explores the understanding between financial deepening, trade-openness and rural-urban income inequality in case of small developing economy like Pakistan. We utilized **DF-GLS** and **Ng-Perron** to examine the order integration and modified **ARDL** co-integration along with **Johansson Technique** for robustness of long run association between said actors. Our empirical analysis suggests that improvements in financial performance decline the rural-urban income inequality in the case of 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. Present endeavor may open up new directions for policy-making authorities in Pakistan.

JEL Classifications: F43, D30, C4

Key-Words: Finance, Inequality, ARDL Co-integration

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Introduction

Pakistan is a developing economy, which has adopted Structural Adjustment Program (SAP) in the form of economic reforms initiated in early 1990s. Economic reforms related to privatization of state-owned assets, deregulation, confiscation of price controls, trade liberalization 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. But at the same time 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 have the highest level of inequality in the world (World Bank 1997, Chang, 2002). This shows that growth no doubt is a necessary condition but not the sufficient condition for the alleviation of poverty. Even 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 era of globalization, 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 globalization 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 labor 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 liberalization benefits rural areas or the urban is still unresolved. One argument is that liberalization programs 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 liberalized such distortions are eliminated. This cause rural-urban inequality to fall and brings improvement in the rural standards of living. Similarly, Birchenall (2001) shows that structural reforms in Colombia in the 1980s have caused inequality to increase due to the introduction of skill-biased technologies.

We can, therefore, argue 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 globalization. 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; 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 globalization 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 utilizes the both expressive and empirical methods to analyze 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 utilized **DF-GLS** and **Ng-Perron** due to their superiority over ADF & 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 paper is designed as; B section describes the model specification, methodological framework and data collection discuss in C part while D elaborates the interpreting Style and finally, conclusions and policy implications are included in rest of paper.

B. 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 modeled;

$$AG / MA = \alpha_0 + \alpha_1 M2 + \alpha_2 GDPC + \alpha_3 CPI + \alpha_4 FDI + \alpha_5 TR + \varepsilon_t \dots (1)$$

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.

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

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.

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

After including linear term of GDPC, we also utilized 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
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

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 economy activity in the economy. Openness of foreign capital is also positively and significantly correlated with inflation.

Except the Financial intermediation (financial deepening) and trade-liberalization, we also include other explanatory variables in model to avoid the problem of specification. Due to increase in trade, manufacturing sector becomes more export-oriented due to its enhancement. Expecting positive correlation between manufacturing sector and trade liberalization, trade and price liberalization 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 on account of inflationary impact because as against non-poor, majority of the poor population is living in villages holding cash in their hands to purchase basic necessities of life and inflation thus, erodes 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.

C. Methodology and Data

Unit Root Estimation

In order to scrutinize 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 (Dickey & Fuller, 1979) and P-P (Philip & Perron, 1988) test 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 hypotheses when it is true and accept it when it is false. While three newly proposed tests seem to solve this arising problem: the Dickey-Fuller generalized 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 $H_0 : \delta_0^* = 0$ in the regression:

$$\Delta X_t^d = \delta^* X_{t-1}^d + \delta_1^* \Delta X_{t-1}^d + \dots + \delta_{p-1}^* \Delta X_{t-p+1}^d + \eta_t \dots \dots (4)$$

Where X_t^d is the de-trended series and null hypotheses of this test is that X_t has a random walk trend, possibly with drift as follows.

$$X_t^d = X_t - \hat{\varphi}_0 - \hat{\varphi}_1 t \dots \dots \dots (5)$$

Basically, two hypotheses are proposed, (i) 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 utilizing the generalized least square technique. This estimation is investigated by generating the following variables:

Subject:

$$\bar{X} = \left[X_t, (1 - \bar{\beta}L)X_2, \dots, (1 - \bar{\beta}L)X_T \right] \dots \dots \dots (6)$$

$$\bar{Y} = \left[X_t, (1 - \bar{\beta}L)Y_2, \dots, (1 - \bar{\beta}L)Y_T \right] \dots \dots \dots (7)$$

and

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

Where “T” representing number of observation for X_t and $\bar{\alpha}$ is fixed¹. While OLS estimation is followed by this equation:

$$\bar{X} = \varphi_0 \bar{Y} + \varphi_1 Y_t + \varepsilon_t \dots \dots \dots (9)$$

and OLS estimators $\bar{\varphi}_0$ and $\bar{\varphi}_1$ are utilized for the removal of trend from as X_t above.

ADF test is employed on the transformed variable by fitting the OLS regression²:

$$\Delta X_t^d = \lambda_0 + \rho X_{t-1}^d + \sum_{j=1}^k \gamma_j \Delta X_{t-j}^d + \mu_t \dots \dots \dots (10)$$

¹ The power of envelop curve is one-half at $\bar{\alpha} = -13.7$ when the model has constant and trend term, and at $\bar{\alpha} = -7$ when it has only constant term (see Elliot et al., 1996 for comprehensive study)

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

In alternative hypothesis, $\bar{\alpha} = -7$ in the required equation of $\bar{\beta}$, above, then they calculate $X_t^d = X_t - \varphi_0$, 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 utilizing GLS de-trended data D_t^d . The calculates values of these tests based on 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 defining as following below:

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

While de-trended GLS tailored statistics are as given below:

$$MZ_a^d = (T^{-1} (D_T^d)^2 - f_0) / (2k)$$

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

$$MSB^d = (k / f_0)^{1/2}$$

$$MP_T^d = \left\{ \begin{array}{l} \bar{c}k - \bar{c}T^{-1} (D_T^d)^2 / f_0, \text{ and, } \bar{c}k + (1 - \bar{c})T^{-1} (D_T^d)^2 / f_0 \dots(12) \end{array} \right.$$

If $x_t = \{1\}$ in fist case and $x_t = \{1, t\}$ in second³.

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 to carry out co-integration analysis among poor's happiness and its determinants. 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

³ $\bar{\alpha} = -7$, If $x_t = \{1\}$ and $\bar{c} = -13.7$ $\bar{\alpha} = -7$, If $x_t = \{1, t\}$

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 (Banerjee 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 as follows:

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

Where λ_0 is the drift component and μ is the 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 residual⁴. Following Pesaran et al (1999), two separate statistics are employed to “bound test” for the existence of along-run relationship: an F -test for the joint significant of the coefficients of the lagged levels in Eq. (13) (so that null hypothesis $H_0 : \lambda_2 = \lambda_3 = \lambda_4 = 0$ means no evidence of existence of long run relationship while alternative hypothesis is $H_1 : \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$ indicates existence of long run relationship among variables in concerned model. Two asymptotic critical value bounds provide a test for co-integration when the independent variables are $I(d)$ (Where $0 \leq d \leq 1$): a lower assuming the regressors are $I(0)$, and an upper value assuming purely $I(1)$ regressors.

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 (Min B. Shrestha, 2003).

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

$$y_t = \partial_0 + \partial_2 x_t + \partial_3 z_t + \nu_t \dots (14)$$

Where $\partial_0 = -\lambda_1/\lambda_2$; $\partial_2 = -\lambda_3/\lambda_2$; $\partial_3 = -\lambda_4/\lambda_2$, 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:

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

To ascertain the goodness of 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 heteroscedasticity 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.

D. 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.

Table-2
Unit Root Estimation

Variables	DF-GLS Test at Level		DF-GLS Test at 1 st Difference	
	Calculated values	Lags	Calculated values	Lags
AG/MA	-2.571	0	-5.213*	0
M2	-5.236	1	-5.563*	1
GDP	-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
GDP	-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 1 st 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
GDP	-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
<p align="center">Short-run Diagnostic Test-Statistics <i>Serial Correlation LM, F = 0.0920 (0.764)</i> <i>ARCH Test = 0.1608 (0.691)</i> <i>\Normality J-B Value = 1.006(0.604)</i> <i>Heteroscedasticity Test, F = 1.029 (0.466)</i> <i>Ramsey RESET Test, F = 0.0108 (0.917)</i></p>				

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 P (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.

Turning to 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 Co-integration relationship among the variables in this model.

After the calculation of ***F-statistics*** of ARDL 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-5
Johansen's Multiple Co-integration Test Results

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

After a brief look at Table-4 & 5, Table-6 describes the long run elasticities because all variables in logarithm form except consumer price index. Estimation shows that financial intermediation or financial deepening is having rural-urban gap improving impact significantly 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 on the cost of remaining segments in the society and more than 66 percent is living in village's areas. So, economic growth is concentrated to few cities not the whole country .i.e. major hubs of country. Rising overall income inequality is also major reason of rural-urban gap. Inflation is narrowing rural-urban gap through macroeconomic phenomenon but significant at 11 percent level of significance in small developing economy like Pakistan.

Table 6
Long Run OLS (Ordinary Least Squares) Results

<i>Dependent Variable: AG/MA</i>			
Variable	Model-1	Model-2	Model-3
Constant	5.3059 (0.0001)	-1.2020 (0.9332)	-25.620 (0.0817)
M2	0.3071 (0.0519)	3.9690 (0.6226)	0.2426 (0.1074)
M2²		-0.4994 (0.6496)	
GDPC	-0.5021 (0.0001)	-0.5175 (0.0001)	6.3211 (0.0525)
GDPC²			-0.3693 (0.0373)
CPI	0.0011 (0.1158)	0.0011 (0.1100)	0.0023 (0.0108)
FDI	-0.1128 (0.0393)	-0.1072 (0.0588)	-0.1070 (0.0388)
TR	-0.3299 (0.0066)	-0.3472 (0.0074)	-0.4399 (0.0008)
	$R^2 = 0.844856$ Durban-Wat = 1.435 F-stat = 32.67	$R^2 = 0.845975$ Durban-Wat = 1.477 F-stat = 26.54	$R^2 = 0.866756$ Durban-Wat = 1.808 F-stat = 31.441

Note: prob-values are given in parentheses

Trade-openness worsens the rural-urban income inequality after GDP per capita in the economy. Manufacturing industry in Pakistan is concentrated in major hubs of the country and they demand skilled labour for improvement of production to export and to enhance the trade share in the world market. Migration to urban areas could not play its role to decline the rural-urban gap because major share of labor force in village areas is unskilled while manufacturing demands skilled human resource and migrated labor could not 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 landlords and feudals. Openness of foreign capital is also widening rural-urban inequality, in small developing economy like Pakistan; FDI is going in services sectors like banking and telecommunications that is captures by high skilled urban labor force.

In second round of estimation monotonous impact financial deepening on rural-urban inequality presents of phenomenon of inverted U-shaped curve insignificantly. While in 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;

$$\Delta AG / MA = \lambda_0 + \sum_{j=0}^n \lambda_1 \Delta M2 + \sum_{j=0}^n \lambda_2 \Delta GDPD + \sum_{j=0}^n \lambda_3 \Delta FDI + \sum_{j=0}^n \lambda_4 \Delta CPI + \sum_{j=0}^n \lambda_5 \Delta TR + \eta CE_{t-1} + \varepsilon_t$$

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 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; greeter would be force tending to correct the deviation (Banerjee, et al, 1993).

Short run dynamic behavior reveals that financial intermediation improves the rural income distribution insignificantly but GDP per capita is widening the rural-urban gap but statistically insignificant in 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 Behavior

<i>Dependent Variable: $\Delta AG-MA$</i>			
Variable	Coefficient	Std. Error	Inst.values
Constant	-0.0351	0.0167	0.0450
$\Delta M2$	0.0978	0.1315	0.4638
$\Delta GDPC$	-0.1864	0.1328	0.1720
ΔFDI	-0.1235	0.0416	0.0064
$\Delta FDI(-1)$	0.0228	0.0406	0.5791
ΔCPI	0.0063	0.0032	0.0568
ΔTR	-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 (<i>prob</i>) = 3.468 (0.0093)			

The signs of the short run dynamic impacts are maintained to the long span of time. The equilibrium correction coefficients (CR_{t-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 equilibrium level after a shock. Approximately 62.9 % of disequilibrium 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 heteroscedasticity and error term is normally distributed along-with no auto-regressive conditional heteroscedasticity. 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.

E. Conclusions

Pakistan is a developing economy, which has adopted Structural Adjustment Program (SAP) in the form of economic reforms initiated in early 1990s. Economic reforms related to privatization of state-owned assets, deregulation, confiscation of price controls, trade liberalization 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 said actors. Our empirical analysis suggests that improvements in financial performance decline 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 inequality alongwith investment in social sectors like education, health, and population welfare etc. 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 & 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 in it, 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 & links that are more professional in their approach operating mainly in urban centers. The entire banking sector need restructuring in favor of rural areas to make the backbone of the country strong thereby reducing rural-urban disparity.

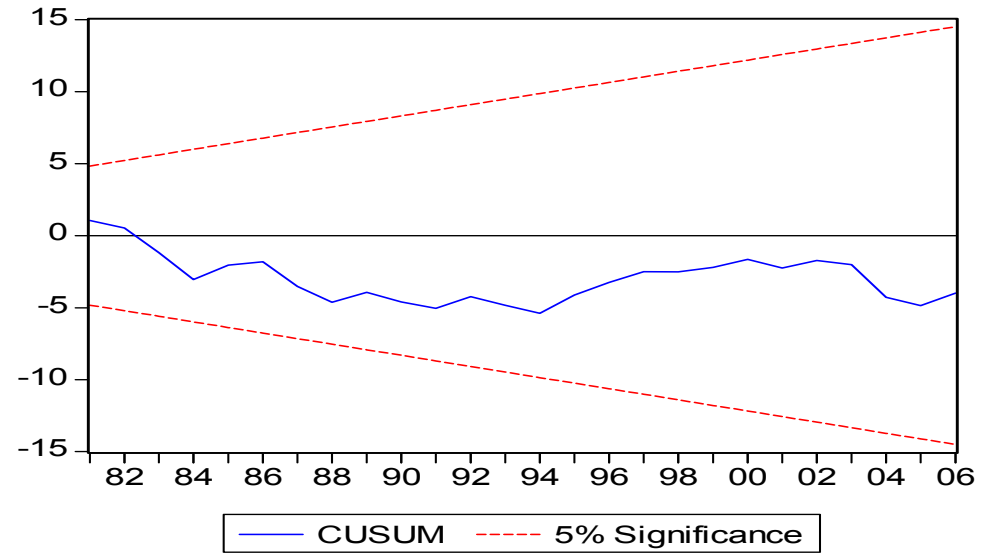
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Appendix
Figure 1

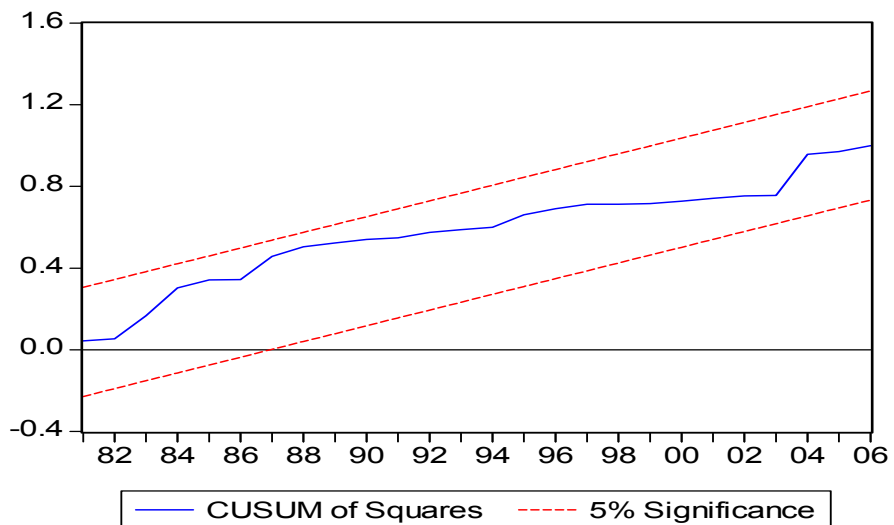
Plot of Cumulative Sum of Recursive Residuals



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

Figure 2

Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level