

FINANCIAL DEVELOPMENT AND INCOME INEQUALITY: A CASE OF PAKISTAN

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***ABSTRACT**-The objective of this research paper is to investigate relation between financial development and income inequality in Pakistan. For this purpose, we used time series data from 1980 to 2016 and used ADF test to check stationarity. We also applied the Autoregressive Distributive Lagged (ARDL) model, Bound Test and Error Correction Model (ECM) to ascertain short-run a long-run relationship between variables. Our finding rejects the gj hypothesis and concludes that there is a negative relationship between financial development and income inequality in short-run and positive relation in long run. Financial development worsens the distribution of income in the long run. Our hypothesis conclude Pakistan economy is not in favor of G j hypothesis and that income inequality increases with an increase in financial development. We defend our result that Pakistan economy could not produce the same result like GJ hypothesis due to corruption and low circulation of wealth and negative term of trade.*

Keywords: financial development, income inequality, circulation of wealth.

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1. INTRODUCTION:

1.1 BACKGROUND OF STUDY:

Pakistan is a developing country and is going on the way of prosperity during the last three decades but with the development of GDP growth, the distribution of income start worsens during 1980 to 1990. Now days Pakistan economy have wide income disparities. In 1990 a stable government was set up which followed macroeconomic policies to help the distribution of income and increase the growth rate. In 2005 and 2006, Pakistan economy attained the regions second-highest economic growth with inflation rate at 9% and income inequality 0.42 which led people to expect that with this type of growth income distribution would be improved and living standard of low income people would rise. During this period the bottom 20 % population was worsened and increased the value of Gini coefficient due to decrease in government revenue. After these outcomes, it is said that the financial sector development can be the crucial solution to these economic crisis and sound financial policies can improve the economic condition. Generally beneficial economic policies run through two channels. First, by providing cheaper credit and ensure that the small scale entrepreneurs will be benefitted from it. Exploring the new business talent and opening the productive sources would create jobs that would increase welfare of people. Secondly, providing the low-interest loans to compensate financially disadvantage families to support their lost business, to support their family, to support their children health and to invest in their children education. Many developed countries first improved their education which opened the new window of financial resources and improved income distribution. Education plays a vital role in producing human capital which creates a set of opportunities for the individuals.

As Pakistan is a developing country and like other many developing countries have taken many financial reforms to reduce fiscal deficit and to reduce the increasing gap in income distribution. In 1990 Pakistan followed restrictive economic policies. It was resulted in low-level of saving, investment, higher income inequality, and low economic growth. So Pakistan could not produce the same results like developed countries due to unstable political system, corruption and dishonesty. The trend of income inequality increasing overall the world but condition in Pakistan is more crucial. It is noted that financial sector growth is too slow if we apply gj hypothesis it is not in favor of Pakistan economy because of low per capita income. But with gradually reforms in domestic financial sector situation can be improved.

Galor and Zeira (1993) investigated the linear relationship between financial development and income inequality and stated that increase in financial development will raise income inequality in the same ratio. Some authors have paid the attention on the relationship between financial liberalization and income inequality but financial aspects were mostly neglected. This is the reason that we have decided to explore relationship between financial development and income inequality.

1.2 Main Research Problem:

The main problem of this research study is to investigate relationship between “Financial development and income inequality in Pakistan”

1.3 Objectives of study:

- To investigate the causes of income inequality in Pakistan.
- To study relationship between financial development and income inequality in Pakistan
- To study the factors that are responsible for increasing the gap between rich and poor segments of society in Pakistan

- To study the impact of financial development on economic growth in Pakistan.
- To analyze the impact of income inequality on poverty.

2 LITERATURE REVIEW:

Sebastian, Watzka (2011) investigated financial advancement and income inequality. They find a positive connection between financial development and income inequality in country.

Zicheng Liang (2006) studied the financial development and income inequality in rural areas of China. Their experimental result showed a negative and linear connection between financial development and income inequality.

Siong and tan (2009) conducted research on "financial improvement and income disparity in Malaysia." Their outcomes showed linearity between financial development and income disparity, financial market is statistically insignificant in diminishing income inequality.

Quanda, Chen (2015) examined link between financial development and income disparity in China. Its exact outcomes were that in the first phase of financial advancement expanded inequality and just in the second or third phase of development inequality was really declined.

Mansoor varies (2015) explored the impact of financial advancement on income imbalance in Iran's economy by utilizing nonlinear co-integration method. The result demonstrates that the financial advancement builds income disparity in the public arena. Be that as it may, subsequent to achieving the greatest worth, the extension of financial improvement causes decrease in inequality.

Odionye (2014) examined financial improvement and income disparity study instance of Nigeria. Their outcomes show a long run connection between financial development and income imbalance. It

additionally demonstrates that the wide proportion of cash supply to GDP and the proportion of bank credit to the private sector as percentage of GDP positively affects income inequality.

Shahbaz and Islam (2011) broke down the connection between and financial development and income inequality. They made effort to discover whether Greenwood and Jovanovic's theory could be applied to Pakistan. Their results recommend that budgetary improvement decreases income disparity while expanding money supply decrease financial instability.

Alimi and yinusa, (2016) investigated the issue of financial development and income disparity in Nigeria. The results of study show a negative relationship between financial advancement and income disparity.

Murad, Iyigun and Owen (2004). considered the issue of income inequality, financial development, and macroeconomics. Their outcomes recommend that financial development may explain the connection between inequality and consumption variation.

Juvencio, and Pizzeria (2015) examined the financial development and income inequality in Mexican districts. The consequences of the econometric analysis affirm the dynamic desires, noticing that the consideration of higher financing would at first lead to more prominent disparity inside the Mexican regions, and later caused a decrease in income inequality.

George , Lixin xu, heng- zou (2003) examined link between financial development and income distribution. Their outcomes show that disparity is reducing as financial intermediaries develop.

3.RESEARCH METHODOLOGY:

3.1 Types of data and source:

Generally, three types of data are used: 1st is primary data (to be collected from individuals through questionnaire), 2nd type of data is

secondary (to be collected data from published materials like books, research journals and official reports) and 3rd type is panel data (a mixture of primary and secondary). We used secondary data in this paper.

3.2 Selected variables and description.

The selected variables of this study and their definition are given in table 1:

Table 1: Selected variables and their description

Variables	Data description	Source
Gini	Gini- Income Inequality,	Hand Book Of Statics, 2016 Economic Survey Of Pakistan
GDP	Gross Domestic Product,	World development indicators
DcrF	Domestic credit,	World development indicators
Fdi	Foreign investment,	State bank of Pakistan, Economic Survey Of Pakistan
GCF	Gross Capital Formation,	World Development Indicators
LGEX	Government final consumption	World Development Indicators
GNEx	Gross National Expenditure,	World Development Indicators
LMtr	Merchandise Trade,	World Development Indicators
LSrv	Services: value added,	World Development Indicators
LTro	Trade openness,	World Development Indicators

Where gini is dependent variable and others are independent variables. All variables will be taken as a % age of GDP.

3.3 Econometrics model:

The econometric model is shown in the following:-

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9 + e$$

Where,

Y=Income inequality,

X₁=Gross domestic product,

X₂=Domestic credit to the private sector.

X₃=Foreign direct investment

X₄=Gross capital formation,

X₅=Government final consumption expenditure

X₆=Gross national expenditure,

X₇=Merchandise trade

X₈=Services value added. ,

X₉=Trade openness,

3.4. Analytical techniques:

The following statistical techniques will be used in the analysis of data:-

- i. Descriptive statistics.
- ii. ADF Test.
- iii. Correlation Analysis.
- iv. ARDL Model
- v. Bound Test.
- v. Error Correction Model.

4. DATA ANALYSIS:

4.1 Descriptive statics:

In table .2, we can see gross national expenditure have maximum mean and median and Gini coefficient have maximum standard deviation which is 4.930523 as compared to other variables. On the basis of probability Gini and FDI are significant variables in the model.

Table 2 Descriptive statistics

	GDP	GINI	DCR F	FDI	GEX	GEN X	CAP F	MR T	TR O	SL
Mean	2.86 1	33.09 5	3.87 7	-0.376	2.40 1	2.780	4.66 2	3.43 0	1.92 9	3.91 9
Median	2.67 8	32.00	3.90 1	-0.460	2.38 5	2.813	4.66 7	3.41 6	1.90 9	3.91 0

Maximum	8.385	48.400	4.056	1299735	2.820	2.956	4.721	3.632	2.330	4.026
Minimum	-2.218	28.700	3.616	-227636	2.051	2.527	4.594	3.242	1.545	3.819
Std.Dev	2.331	4.930	0.109	0.7795	0.1855	0.106	0.036	0.092	0.186	0.057
Skewness	0.136	2.427	-0.806	0.0855	0.146	-0.760	-0.111	0.081	0.040	0.185
Kurtosis	0.211	7.999	3.122	3.255	2.715	2.686	1.970	2.454	2.187	2.378
Jarque-Bera	0.895	72.841	3.928	0.141	0.250	3.615	1.6635	0.487	0.999	0.789
Probability	0.8959	0.00	0.140	0.931	0.882	0.164	0.435	0.738	0.606	0.675

LGINI=Gini, GDP= GDP, LDCRF = domestic credit, LFDI= foreign direct investment, LCAPF =capital formation, LGEX= government final consumption expenditures, GNEX= gross national expenditures, LMT=merchandise Trade, LSRV = services value-added, TRO= trade openness

4.2 ADF Unit root test:

Theory following ARMA model based on stationary time series, a sequence said to be stationary if the mean and covariance of the series do not depend on time. If sequence depends on time is called nonstationary series before applying the bound test approach we have to examine the stationary of series checked by ADF test developed by Augmented Dickey and Fuller. The results of ADF test in table 3 test show all variables are inactive at I (1) so they are integrated at first difference except (gini) income inequality and gross domestic products stationary on level. Here, all series are not stationary at the same point so such mixed results allow us to apply ARDL bound test approach.

Hypothesis:

H0: If $\beta=0$ then Y_t non stationary

H1: if $\beta \neq 0$ then Y_t stationary.

Table 3: Result of ADF Test

Variables	I(0)		I(1)		Conclusion
	t- statics	Probability value	t- statics	Probability value	
Gini	-4.64777	0.0007	-----	-----	I(0)
Gdp	-5.747030	0.0000	-----	-----	I(0)
Fdi	-2.763651	0.0739	-3.959004	0.0043	I(1)
GNex	-1.883501	0.6422	-6.564708	0.0000	I(1)
Dcrf	-1.813669	0.6772	-4.936042	0.0017	I(1)
Capf	-2.316699	0.4148	-5.232705	0.0008	I(1)
Mt	-2.678551	0.0901	-7.54635	0.000	I(1)
TRO	-3.525859	0.06453	-6.222060	0.0001	I(1)
Srv	-3.168398	0.1082	-4.384339	0.00097	I(1)
GEx	-1.774151	0.6963	-5.07446	0.0012	I(1)

LGINI=gini, GDP= gdp, LDCRF = domestic credit, LFDI= foreign direct investment. LCAPF= capital formation, LGEX= government final consumption expenditures, GNEX=gross national expenditures, LMT=merchandise trade, LSRV = services value-added, TRO = trade openness.

In ADF test/unit root / stationary test there are three possibilities and method

- (1) if all variables are stationary on level (0) then we would use ordinary least square (OLS) method.
- (2) if all variables are stationary on I (1) then we would use Johansson co-integration approach to estimate results.
- (3) if variables are satisfied on both level and I(1) then conduct the ARDL approach to reach the best results.

In the table 3, we can see that our all variables are not stationary at one point of time. They are stationary at a mixture of level and first difference so here we can use an Autoregressive Distributive Lag (ARDL) model to estimate the results.

4.3 Correlation Matrix:

Correlation metrics show the correlation among two or more variables. Table 4 shows the positive and negative correlation between variables. A correlation matrix is used as a way to precise data, as an input into a more developed analysis, and as a problem-solving for advanced analysis.

Table 4: Results of Correlation matrix

GINI	GDP	CAPF	DCRF	FDI	GEX	GNEX	MT	SRV	TRO
	1								
GDP	0.241		1						
CAPF		0.211	-0.021	1					
DCRF	0.064	-0.056	0.438	1					
FDI	-0.483	-0.243	0.048	-0.154	1				
GEX	-0.028	-0.074	0.365	0.785	-0.256	1			
GNEX	0.491	0.162	0.235	0.455	-0.386	0.358	1		
MT	0.086	-0.262	0.281	0.068	0.051	-0.025	0.033	1	
SRV	-0.613	-0.304	-0.056	-0.279	0.675	-0.311	-0.290		1
TRO	-0.223	-0.451	0.445	0.317	0.688	0.221	-0.038		
	0.871	0.221	1						

LGINI=gini ,GDP= gdp, LDCRF = domestic credit , LFDI= foreign direct investment, LCAPF =capital formation , LGEX= government total consumption expenditures, GNEX= gross national expenditures, LMT=merchandise trade, LSRV = services value added, TRO= trade openness. In Table.4, we can see how dependent and independent variables correlate with each other. We can see that GDP, CAPF, DCRF, GNEX, MT have positive relationships with income inequality (gini) which means if these variables increase or decrease income inequality also increase and decrease but insignificantly. It shows that their effect is minor. GEX, FDI, SRV, TRO Foreign direct investment is (-0.4808) have a negative relation with income inequality. It means a Gini coefficient increases (0.4 808) if Foreign direct investment decreases one percent.

4.4 Optimal lag selection criterion:

There are different methods for the selection of best possible lag namely Akaike (AICC) Schwarz Bayesian and (HQC) Hanan Quinen criterion. In this study, Akaike information criterion is investigated in both stable and unstable vector model when heteroskedasticity exist in a model or not this holds both small and large sample.

Table 5: Optimal lag selection

Lag	Log	lr	fpe	AIC*	sc	hq
0	123.23	NA	6.06e-16	-6.6610	-6.2122	-6.50795
1	334.05	58.218	1.14e-18	-13.179	-8.2412	-11.4954
2	563.13	175.18*	3.57e-21*	20.772*	-11.345*	-
	17.557*					

* indicate the selected lag , LR seqntial modif LR test AIC akaik info crit , SBC shawarz inf crit.FPE final prdct error , HQ Hannan info crit

There are six different criteria for optimal lag selection best criterion are two which are Akaike information criterion and Schwarz information criterion. We select those criteria where no. satiric* are more. We would choose AICC criterion.

4.5 Bound Test- long run Relationship:

Hypotheses are :

H_0 = There is no co-integration. (if f-statics are more than UB)

H_1 = There is co-integration exists in the model, (if f-statics are less than LB)

Table 5: Bound test results

Test static	values	signifi	I(0) n=100	I(1)
F-statistics	13.95*	10%	1.8	2.8
K	9	5%	2.04	2.08
		2.5%	2.24	3.35
		1%	2.5	3.68

Before applying ARDL model we have to apply bound test to check long run co-integration test. If long-run co-integration exist, its mean there is a long run relationship between variables. If from the bound testing, calculated value of f statics is larger than first bound I (1) so, co-integration exists. We do not accept null hypothesis and accept alternative hypothesis and if f-statics calculated value is smaller than lower Bound I (0) then co-integration does not exist its mean there are no co-integration or long-run relationship between variables and we cannot apply vector error correction model we can only apply ARDL model. But if the f statics value falls into the bound I (0) and I (1) then there is the inconclusive result we cannot assure of the presence of long-run relation. In this situation, we can apply ARDL autoregressive distributive

lagged (ARDL) model and ECM term result indicate the existence of short-run relationship between variables.

4.6 (ARDL) Model:

The results of ARDL model are shown in table 6:

Table 6 : Long run coefficient: lag (1,2,2,2,0,0,2,2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCRF	53.35504	10.03338	5.317753	0.0060
LMT	-66.74651	7.811751	-8.544372	0.0010
LSRV	23.27019	14.45475	1.609865	0.1827
LTRO	145.1040	13.38689	10.83926	0.0004
LCAPF	24.34720	5.871006	4.147024	0.0143
LFDI	0.151949	0.690549	0.220041	0.8366
LGEX	-10.02243	2.953020	-3.393959	0.0274
LGNEEX	-15.11235	12.74374	-1.185865	0.3013
GDP	2.441281	0.336692	7.250786	0.0019
C	-613.8528	81.11958	-7.567258	0.0016

$$EC = LGINI - (53.3550 * LDCRF - 66.7465 * LMT + 23.2702 * LSRV + 145.1040 * LTRO + 24.3472 * LCAPF + 0.1519 * LFDI - 10.0224 * LGEX - 15.1123 * LGNEEX + 2.4413 * GDP - 613.8528)$$

LGINI=gini ,GDP= gdp, LDCRF = domestic credit, LFDI= foreign direct invest , LCAPF =capital formation , LGEX= government final consumption expenditures, GNEX= gross national expenditures, LMT=merchandise trade, LSRV = services value-added, TRO= trade openness

Log form data is used in table 6 shows the long run results show the GJ hypotheses that income inequality would worsens with increasing financial development but in long run income inequality would decrease as financial development increase. Our results also show that GDP, LCAPF, LDCRF, LSRV, FDI, TRO impacts positively on income inequality. GDP coefficient is 2.441281 and t-value 7.25 which is significantly affected income inequality. Our findings suggest that one unit increases in (GDP) will increase income

inequality by 2.44%. Capital formation (LCAPF) coefficient 24.34 and t value is 4.147 and it represent that one unit increases in capital formation (LCAPF) will increase income inequality by 24.34 percent. Domestic credit (DCR) coefficient is positive 53.35 and t statistics is 5.31 which is significant value have a greater impact on income inequality. It means one unit increases in domestic credit increases the income inequality will increase by 53.35% etc. In contrast, LMT, LGEX, LGNEX have a negative relation with income inequality. However, they used to narrow income inequality in the long run.

4.7 Error correction Model(ECM):

Table 7 shows error correction model that indicate there is a negative relationship between financial development and income inequality in the short run. Because most of the coefficient of monetary expansion variables are negative as compared to long-run model as shown in table.7.

Table .7 results of ECM- short-run model.

Regressor	Coefficient	t-statistics	prob.
LDcr	-23.51378	-16.5266	0.0001
LSrV	-30.74530	-10.1075	0.0005
*LTrO	2.56345	2.75648	0.0876
LMt	-73.6664	-17.9523	0.0000
LNEx	-70.1391	-12.1947	0.0003
LGEx	3.6248	3.2019	0.0328
GDP	- 1.0430	-18.0582	0.0000
LFCAP	22.09	10.8549	0.0004
LFDI	1.699	8.202 8	0.0003
Cointe Eq(-1)	-1.43	-23.17585	0.0000
R-square	0.98311	Mean depend var	-0.429412
Adj R-squared	0.963775	SD.dependent var	3.063943
Durbin Watson stat	2.735516	Akaikinfocriterion	1.245246

LGINI=gini ,GDP= gdp, LDCRF = domestic credit, LFDI= foreign invest, LCAPF =capital formation , LGEX= government final consumption

expenditures, GNEX= gross national expenditures, LMT=merchandise trade, LSRV = services value added, TRO= trade openness

We find the value of domestic credit to financial sector -23.513 which is negative and significant, its mean one unit changes in domestic credit would decrease income inequality by 23.513% . Value added services coefficient is -30.74530 which is negative, it means one unit changes in value added services will decrease income inequality by 30.74530 % . Trade openness and merchandize coefficient is -73.6664 which show significant negative impact on income inequality. If unite changes in merchandize trade it will lead to increase the income inequality by 73.6664%. If the error term lies between 0 and 1 then it's mean model showed the convergent to equilibrium point and it means the independent variables leads GINI to equilibrium and if the error correction coefficient lies less than two than its mean that GINI is going to diverge from equilibrium in long run. Sometimes, ECM value lies between -1 and -2 then it produces oscillation of GINI around the equilibrium point. In our model gini is going to be stable in short run.

4.8 Diagnostic test:

We have checked the soundness of results tested by diagnostic, and stability tests. here we have conducted specification test to check serial correlation and to check white heteroscedasticity. Results are shown in table.8 (a) & (b) shows that short run model has passed all diagnostic test and no auto serial correlation is found and as such there is no heteroscedasticity. The test proves that no serial correlation exists in the model and as well as there is no heteroscedasticity among variables.

4.8.1: Serial correlation:

Table.4.8 (a): Results of Serial Correlation

LM test for Serial correlation			
Null hypo : no serial correlation			
F-static	2.808036	prob. f(2,2)	0.2626
R-square	25.07151	prob. Chi square2	0.0000

4.8.2: Heteroscedasticity:

Table 4.8 (b): Results of Heteroscedasticity

Heteroskedasticity test:			
Null hypothesis. series are Homoscedasticity			
F-statics	1.693597	prob. f(29,4)	0.3278
R-squared	31.04151	prob. Chi square(29)	0.3450
Scale exp SS	0.341831	prob. Chi square(29)	1.0000

4.9 Stability test:

Stability test used to check stability of short and long parameter so for this cumulative sum of square and cumulative sum can be applied. It is shown in figure (a) and Figure (b)

Figure 1: Cosum sum

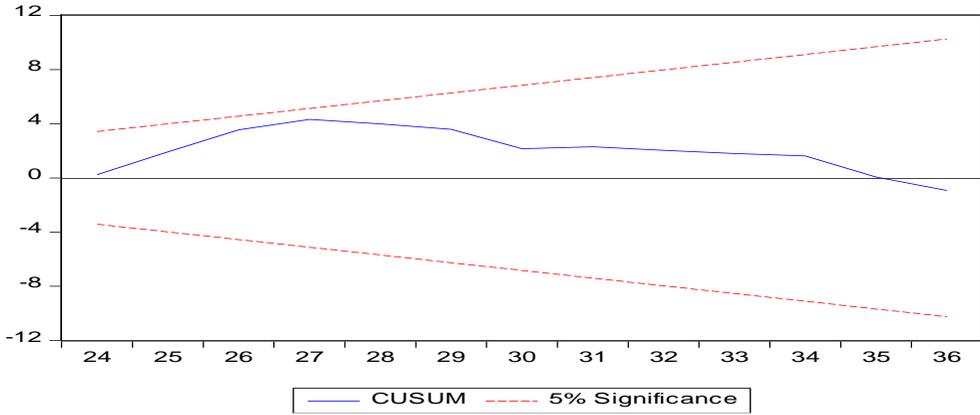
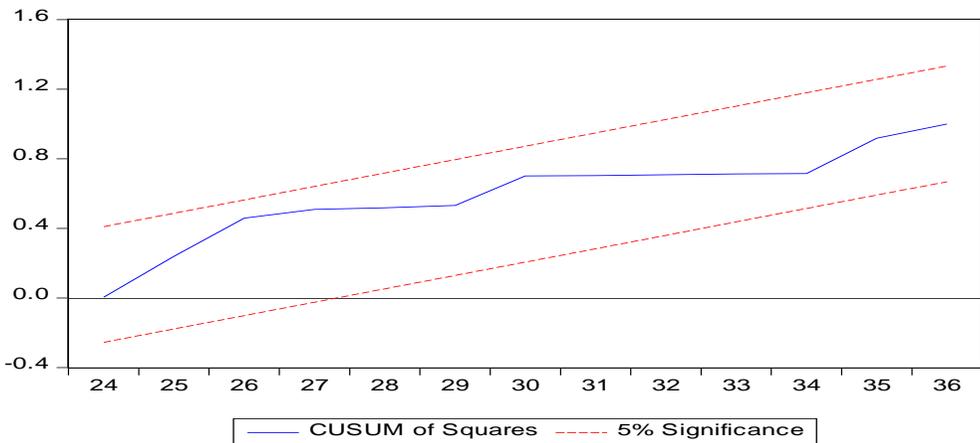


Figure 2: Cusm sum



Pesaran and shin (1999) presented cumulative sum and cumulative sum of a square to test the ability of parameters stability. We applied these test in Figure(a) Figure (b). We plot both cosum and cusm square and both are under the boundary of 5% level of significance. So the results indicate the accurateness of short and long factors which shows income disparity in Pakistan.

5. FINDINGS OF STUDY:

Our findings show that there is a negative relationship between financial development and income inequality in short-run and positive relationship in long run. We have found that Pakistan economy is not in favor of G j hypothesis and it is also not consistent with Galor and Zheira (1993) linear hypotheses. Because financial development is less than financial instability. Due to political instability current account does not balance well. However, this proved true in many other developed countries, but for Pakistan financial development declines and it also valid in case of trade openness. Result show that income inequality increases when financial development increase because wealth was accumulated rich class of the society and it did not benefit to poor segment of society in Pakistan. The other main causes of income inequality are corruption, low circulation of wealth and negative term of trade.

6. CONCLUSIONS:

From the above results we conclude that there is a negative relationship between financial development and income inequality in short-run and positive relation in long run. It means financial development worsens the distribution of income in the short run but improve in long run. We can say due to financial development wealth first move to upper rich class and then gradually move down bringing trickle-down effect on low income people. The results are consistent with the results of Le quoc, Chu minh hoi (2015)' Kappel (2009), and reject the GJ inverted U shaped hypothesis. It is generally observed that financial expansion reduces income inequality in developed countries but in Pakistan case financial development has negative impact on income inequality. The same is the case of trade openness. Because of high

deficit financial development reduces the income inequality in the short run. Another cause of income inequality in Pakistan is concentration of wealth in a few hands.

7. POLICY IMPLICATIONS:

Our results have the following policy implications: -

1. Pakistan needs to encourage small enterprises by charging high duties on imports and giving subsidies on domestic products, this will lead to reduce our balance of trade, control the of income inequality, divert financial resources to the small entrepreneurs.
2. Development of assets market can be another solution for Pakistan economy. For example, access to capital market makes re-distribution of assets.
3. The Government should provide cheaper credit and make sure that the small scale entrepreneur will be benefitted from it. Exploring the new business talent and opening the productive source, providing the jobs and pertaining to the welfare of people.
4. The Government should provide low-interest funds to compensate the financially disadvantaged families to support their lost business, their families, children health and education.
5. The government should allow private sector to work freely and take steps to prevent unnecessary political interference.
6. Most of the public sector companies take the major portion of domestic credit. If such an amount of credit is to be provided efficiently to private sector economic growth will improve, in addition to income distribution.

7. It is necessary to develop financial markets towards equal opportunities in financial access to economically deprived groups, such as small businesses and people living in remote areas.. It promotes economic development and promotes income and living standards for a large number of people currently living in rural Pakistan.

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CONTRIBUTION OF AUTHORS AND CONFLICT OF INTEREST

This research work was carried out in collaboration between two authors.

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