

## The effect of financial market development on income distribution in OPEC (2000-2012)

Mohammad Hassan Pour, Reza Yousefi Hajiabad \*

*Department of management, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran*

---

**Abstract:** This paper examines the relations and financial market development on income distribution in OPEC 2000-2012. The intended type in this article is Data Panel. Then, the reliability evaluation of the variables has been preceded using Lin, Levin and Chu (LLC) and Philips-Proun (PP) Test. The experimental results of this study is confirmed the significant and positive relationship the variable of income inequality financial development in OPEC and also, square of financial development is negative. The adequate evidence is being to confirm the existence of Greenwood and Jovanovich (1990) inverted-U-shaped non-linear relationship between financial development and income inequality in these countries. Also, human capital has negative effect and inflation has positive effect on income distribution in the studied countries.

**Key words:** *Financial development; OPEC; Inequality; Data panel; Income distribution*

---

### 1. Introduction

The fair distribution of income has always been one of the most important the considerable economic issues in different countries. In recent years, particularly after the plan of poverty reduction, the state of income distribution and influence of policies and macro-economic decisions on this problem have been being further considered. Because today's, the biggest factor causing poverty is not income shortage but also is unfair distribution. At present, almost all economists, particularly in developing countries, considered the distribution of income as one of the macro-economic policy goals and the impact of government fiscal policies than it are assigned very important and decisive.

Based on the principles of economics, the wide disparities in income distribution leads to poverty and increase its range. Of course, due to the lack of equal opportunities and talents, speaking of the quite uniform income distribution isn't relevant. But big gap also features an unhealthy economic, the economics that only certain people are able to earn an income and a considerable number of people are living in bad conditions.

Certain people are able to earn an income and a considerable number of people are living in bad conditions. Short gap and appropriate income distribution also has special significance socially. Being top of welfare in part of a community is caused that the other people also target high income.

In Iran as the other countries, distribution of income is one of the major and important involvements and due to distribution of income is considered from point of view the social justice

issues and poverty frequently, this has caused to advise a short-time solutions for resolving this problem; Whereas the phenomenon of income distribution inequality, due to inner forces resistance, shows stability and the implementation of short-term policies and without cognition of effective elements, it follows the adverse effect on income distribution and economic growth (Dehmordeh et al, 1389). Therefore, to deal with the problem of inequality distribution of income, the factors affecting it should be recognized and with the right policies, it can be taken to improve the distribution of income.

Financial development is multidimensional concept that in addition to the development of the banking sector, the other aspects such as the development of non-bank financial sector, financial sector development and monetary policy making, banking regulation and supervision, financial sector openness and institutional environment also takes part (Ghanbari et al, 1388).

### 2. Literature review

#### 2.1. Theoretical foundations

The efficient financial systems can lead to better allocation of resources by obtaining information about collection and equipment investment opportunities of savings, monitoring investments and exerting corporate governance, facilitating the exchange of goods and services, distribution and risk management by reducing transaction costs and business analysis (Ghanbari et al, 1388).

Distribution of income is one of the most experienced issues of economic theory. There are fewer categories in the economy such as distribution

---

\* Corresponding Author.

of income is influenced by many economic policies and it is impressive on the most economic variables. Also, one of the best evaluation indices of economic policy in the public view is evaluation of their distribution effects. In 1950, the main aim of economical programming focus on economic growth by concept increasing the income and national product and it was justified whatever income and total production are increased a greater proportion will be awarded to population. But before the benefits from increased production are gotten to low-income people, at the first, an unequal distribution of income must be realized which it led to the accumulation of income in the hands of a particular group (until it is allocated to investment and then production). Because, it was argued that the rich against the poor save a greater percentage of their revenues and accumulated savings can be enabled investment and economic growth. Also, Kozentes contemporary economist who analyzes the historical growth pattern of contemporary developed countries, said that although at the first in the economic growth is increased in come disparities between income groups in society, but after a while, benefits of economic growth give to poor and low-income groups and as a result, incomes are recovered in society. This thinking led to less attention to income distribution and examining the issues such as economic growth, employment, economic performance and balance of payments is the prevailing main axis of the economic researches. As a result, development of relevant theories to income distribution and analysis their relevant problems have been significantly weaker than expanding the theories in other economic categories. But with over a decade of relatively rapid economic growth in most of developing countries in 1960, it was observed that sources of economic growth, due to inputs and social, economic, political structures prevailing on that countries gave to certain group of the population and income gap between poor and rich has increased. So expect to improve the lives of all segments of society and or reduce distance between income classes were not fulfilled and it becomes opening for pay attention the economists to such matters. Today's, problems of income distribution and social justice have special place in topics of economic and social development. Based on the new attitude and unlike in the past in the Third World, between economic growth and equitable distribution of income in society, there is no contradiction and between economic growth and equitable distribution of income in society, there is no contradiction and when economic policy, social as appropriate polices are evaluated that it can be provided reducing the poverty and increasing the economic welfare of the society within a reasonable time and conducting a series of extensive studies and reasonable are necessary. In this parallel, studying the state of income distribution and factor affecting it has certain importance.

The economic theories are shown that financial development of the different channels affect the distribution of income. About the relation of financial development and inequality, there are two perspectives that are presented in two different schools. First school that is presented by Greenwood and Jovanovic (1990), it is proved the relationship between financial development and inverted- U shape inequality and the second one that is presented by Benery and Newman (1993) and Galler and Zira (1993) is explanatory the linear relation between financial development and inequality.

Developing the tools and financial expensive medium it can be imagined in the problem of information weakness in financing the income distribution inequality. In elementary levels of development, when the financial mediums are less developed, the economic growth is accomplished slowly, in the median levels of development, the income distribution inequality with faster economic growth and deepening and developing the financial sector are increased and when the extensive and well-developed financial structures is dominant, income inequalities will be declined and it would be become stable.

## 2.2. Research histories

Shahbaz and Islam (2011), in article "Financial Development and Income Inequality in Pakistan", had studied the relationship between financial development and income inequality from 1971 to 2005 using Auto Regressive Distributed lag (ARDL) pattern in Pakistan. Their results are shown that financial development reduce income inequality while financial instability aggravates financial development. Contrary to the conventional wisdom, the results are shown that economic growth worsens income distribution. Also, the inverted- U-shaped relationship didn't prove between financial development and inequality.

Silica Garcia (2010), in a study had analyzed macro-economic variables and incomes distribution based on normal data in England from 1961 to 1999. Estimations based on the models are associated income distribution parameters to periodic variables, are shown that neither inflation nor unemployment impact on incomes inequality. Compared with the conventional methods of direct modeling income, this approach is shown that there was no clear relationship between macro-economic variables and income distribution in the UK by the end of the twentieth century.

Kappel (2010) was studied the effect of financial development on income inequality and poverty using panel data and Ordinary Least Square (OLS) assessment method for 78 developed and developing countries in the periods of 1960-2006. He had resulted that ethnic and racial variety and ground distribution were two significant, effective factors on income distribution and poverty. Also, in high income countries, government expenditures led to

deterioration in income inequality and in low income countries, there aren't any significant factors.

Ang (2009), in article "Financial Liberalization and Income Inequality", studied the relationship between financial section and inequality in India with respect to time series data in this country using Vector Auto-Regression (VAR) in period of 1951-2003. The result were shown that even taking into account the different indicators of financial development, this factor had a significant role in reducing inequality of income distribution.

Sucre (2008) in article "Financial Development, Economic Growth and Inequality: assessing evidence for Latin America and the Caribbean" had review of recent empirical studies on the relationship between financial development and income inequality. His results using dynamic data and cross the country, suggested that financial development was essential for economic growth. Most of documents and studies are shown that financial development is the factor of inequality reduction. Because financial development is helped to poverty reduction with fast growth and income inequality reduction. Pajoian (1373) in his research project by title "support polices of the vulnerable classes had studied income distribution 1362-1368. The indicators of used income distribution in this study had been the Gini Coefficient of deciles share indicator and share proportion. The result is that the Gini Coefficient of urban consumption was little changed during this period and it had been reached 0/428 in 1362 to 0/427 in 1368. The Gini coefficient for rural area had been reach 0/389 in 1362 to 0/372 in 1368. Studying 40% share of low income households also were provided similar results. In total, the indicators of urban and rural areas had the same process except this indicator was indicative the better state in term of income distribution in village.

Samadi (1371) in a study had examined "the effect of inflation on income distribution in Iran" using the function of consumption demand of income distribution situation during the years 1347-1367. His results shown that the inflation had the negative effect on income distribution with the exception of the years 1365-1367 that the inflation in these years had been caused the better distribution situation.

Aboo Noori (1376) in an article "the effect of macroeconomic indicators on the income distribution in Iran" during the years 1350-1370 using Gini coefficient and one econometric approach concluded that the respect of employment and labor productivity had decreasing effects on inequality level, but inflation factors, the relative share of personal income in gross domestic product, the average total of received taxes from each household and government expenditure for each household had increasing effects on income distribution and made it more unequal.

### 3. Methodology

Due to the use of time series data in estimating the model, before assessment the reliability of the

model variables and their collective degree must be examined. Macroeconomic variables contain a stochastic trend (unit root) that the presence of such a process invalidates the estimation and statistical inferences to the traditional method of econometrics. The first step for econometric analysis is determination of integrative degree. In this section for reliability analysis of variables first, all of variables are entered as logarithmic and the results of the unit root is given using Lin-Levin-Chu (LLC) and Philips-Proun (PP) Test

#### 3.1. Unit Root Test in Panel Data

Then, before assessing the model, to insure that the results are not fake, how the static variables has been investigated using Im, Pesaran and Shin (IPS) test Levin and Lin and Chu (LLC). Levin and Lin unit root test is shown below.

$$\Delta X_{i,t} = \rho_i X_{i,t-1} + \sigma_t + \alpha_i + \epsilon_{i,t} \quad , \quad i = 1, 2, \dots, N, t = 1, 2, \dots, T$$

That, N is the number of segments, T time period,  $\rho_i$  autocorrelation parameter for each section,  $\sigma$  time effect,  $\alpha_i$  constant coefficient for each section and  $\epsilon_{i,t}$  error term with normal distribution. Null hypothesis as  $H_0: \rho_i = \rho < 0$  and the contrary hypothesis is as  $H_1: \rho_i = 0$ . The statistic of Im, Pesaran and Shin Test is calculated as:

$$\Gamma_i = \frac{\sqrt{N} [\bar{I}_{NT} - \mu]}{\sqrt{V}} \rightarrow N(0,1)$$

In this test, the null and contrary hypothesis is as follow:

$$H_0: \{ \rho_i = 0 \quad i = 1, 2, \dots, N$$

$$H_1: \begin{cases} \rho_i < 0 & i = 1, 2, \dots, N \\ \rho_i = 0 & i = N+1, \dots, N \end{cases}, 0 < N+1 < N$$

Based on this hypothesizes, some sections can have unit root. In case of non-stationary of model variables, there is a possibility of false regression. In this situation, if there is co integration between the studied variables, regression model is estimated without fear of being false, based on the estimated parameters (Khodad Kashi et al, 1392: p. 10).

In this study, the empirical model Batu et al (2011) has been used in the relationship between variables of financial development on income distribution in developing countries, which is as follow:

$$GINI = f(FD, FD^2, GDPOP, HC, INF)$$

GINI: is the Gini Coefficient that is used as a measure of income inequality

FD: is the compound Financial Development which follow the Batu et al include  $M_2/GDP$  and  $M2 / GDP$  (the currency outside the banking system plus the current accounts and other interest-bearing liabilities of bank).

FD<sup>2</sup>: Financial Development Square

GDPOP: Per Capita Gross domestic product at constant prices as an indicator of economic development

HD: Human Development  
 INF: Inflation

Kuznets hypothesis has been tested the square of two financial development variables and gross domestic product simultaneously. Because based on Kuznets inverted U-shaped hypothesis, the Gini coefficient has a close relationship with level and square of income. Therefore, relying on theoretical justification, in this study financial development variables and gross domestic product with their squares are entered together in the studied model.

**4. Analysis of experimental research result**

**4.1. Unit root test**

Due to the use of time series information in estimating the model, it is necessary before estimation, the stability of model variables and their integrative degree are studied. Macroeconomic variables contain a random approach (unit root) that presence of such approach is caused to invalidate estimation and the statistical inference in traditional econometric methods. Therefore, the first step for analyzing the econometrics is determination of integrative degree. In this section for analyzing the stability of variables at the first, all of variables are entered as logarithmic and the results of unit root are shown in Table 1 using LLC and PP Test

Table1: integration test and study of variables stability

Res.	PP-Fisher		L,L&C		Test Variable
	Prob	Statistic	Prob	Statistic	
static	0,003	68,100	0,000	-6,68	LOGGINI
static	0,00	137,87	0,000	-11,04	LOGFD
static	0,00	137,85	0,000	-11,38	LOGFD <sup>2</sup>
static	0,036	42,48	0,00	-4,28	LOGGDPPOP
static	0,00	78,51	0,000	-3,75	LOGINF
static	0,000	70,95	0,000	-9,01	LOGHDI

Ref: researcher calculation. Values are reported the minimum amounts of Type 1 error

According to the table and the evidence from Lin, Levin and Cho and Philips-Proun Test, it is observed that the null hypothesis despite the unit root is rejected for all variables in level. That is, all integrative variables are of null degree or in the other words all of them are in stability level. In this situation with regard to the integrative degree of variables using OLS model will be appropriate to estimate the relationship.

**4.2. Estimation Results**

The following for estimating the model, at the first we estimate the desired model as the fixed effects with the collected least squares method then F Lymer is used. If H<sub>0</sub> is rejected the estimated model is panel and then again, we estimate model with random effects and using Hasman statistic we determine that the model should be estimated by the fixed effects or by random effects.

Table2: the result of F Lymer for showing the combined data against random effects model

Test Result	Significance level	Test Statistic	Test Type
Confirming the fixed effects model against the combined data model	0.00000	10.65	F Lymer Test

Resource: research calculation

The result of Lymer test (table 3) indicate that the p-value is less than 0/05, as a result H<sub>0</sub> is rejected, therefore the method of combined data should be used for estimating the model.

In Table 4 the Hasman test indicate that the model of stable effects is confirmed. Because being larger the value of the test statistics than table statistics, it is reason to reject the null hypothesis based on random model.

Table 3: the results of Hasman test for showing fix model against random model

Test Result	Significance Level	Test Statistic	Test Type
Confirming the fixe d effects model against random effects model	0.0076	2.009	Hasman Test

Resource: research calculation

**4.3. Model estimation**

The obtained result the model of stable effects (Table 5) indicate that the statistic value F is equal to 33.08, therefore with the confidence coefficient 95%, it can be said that with the null hypothesis, coefficient of all variables are rejected, as a result the model is significant. The corrected determination coefficient of model is 0.78 namely, 78% the dependent variable explain the independent variables (the model have high explanatory power).

According to the obtained result estimating model, values.

The independent variables explain 78 percent of the dependent variable (the explanatory power of the model is high). Value of the coefficient of the explanatory variables is as follow.

**4.4. The coefficient of the explanatory variable current ratio**

The value of the explanatory variable coefficient of current ratio (LOGFD) is indicator of combined financial development that it contains  $M_2/GDP$  and  $Cre/GDP$  (currency outside the banking system plus the current accounts and credit granted to private sector and bank sector to GDP) is equal to 0.014 and it is significant in error level 05%. The square of financial development (LOGFD<sup>2</sup>) is equal to -0/10 and it is significant in error level 05%. And for 1% change in the explanatory variable, dependent variable is changed 0/10%.

**Table 5:** the models of random effects

P-Value	Statistic T	Coefficient	Variable
0/01	-2/58	-0/95	C
0/00	1/44	0/014	LOGFD
0/04	-3/44	-0/100	LOGFD <sup>2</sup>
0/034	-0/76	-0/029	LOGGDP
0/00	-5/31	-0/51	LOGHDI
0/004	0/47	0/0013	LOGINF
0/00	13/75	0/68	LOGGINI(-1)
R <sup>2</sup> bar=0/78 D-W=1/83 Prob(F- statistic)=33/08 (0/00)			

Resource: research calculation

Per capita net production (LOGGDP) is equal to -0/029 and it is significant in error level 5%. And for 1% change in the explanatory variable, Gini Coefficient is decreased -0/029. Inflation rate (LOGINF) is equal to 0.0013 and it is significant in error level 10%. And for a change unit in variable, the inflation rate is increased Gini coefficient 0.0013. Human development index (LOGHDI) is equal to -0/35 and it is significant in error level 5%. Therefore, the fourth hypothesis in confidence level 95% is admitted. And for a change unit in variable, the rate of this variable is increased 0/35 Gini coefficient.

In this study that will be measured the relationship between financial development and income distribution inequality, Gini coefficient is used as the dependent variable. Also at the first, financial deepening index, that is the liquidity ratio to GDP, will be used as a proxy for financial development for explaining the change of income distribution inequality. The index of financial deepening is the most used and the easiest index for financial development and first, it was used in Goldsmith (1969) Mc kinnon1 (1973) studies. This index represents the ratio of the formal financial intermediaries' size to economic activities. It is usually supposed that the size of financial intermediaries is positively related with financial services provided. This means, whatever the size of financial intermediaries is larger, presentation of financial services will be broadened. The size of financial intermediaries is calculated with help of liquid liability ratio to GDP. Liquid liabilities include currency outside the banking system plus the current accounts and other interest-bearing liabilities of banks and non-bank financial intermediaries. Accordingly, it can be considered equivalent M3. In economics that are not calculated

$M_3$  or reliable figures isn't presented,  $M_2$  is used as substitute. Therefore, financial deepening index is yielded from division the liquidity ( $M_2$ ) to GDP. It should be attended that this index is faced with shortcoming like other financial development indices. The biggest disadvantage of this index beside its close relationship with inflation as one of the main variable influencing income distribution inequality is that the lower efficiency, or in other words, the quality of financial system is considered and only the financial sector size is attended. On the other side, change in variable of financial deepening index can be occurred for other reason except financial development. Despite this shortcoming, it is sounded that in comparison with other one dimensional indices, financial deepening index have still greater reliability.

Theoretically, it is expected that there are following relationship between explanatory variables and gini coefficient:

Financial development and its square: the relationship between financial development and gini coefficient can be positive or negative. Some believes that development of financial markets has a positive effect on income distribution because the expanded and free markets are developed accessing to reliability so the poor have the opportunity to invest in their physical and human capital.

They find an opportunity to increase their own and children's skill, as well as to establish small businesses for their own. So, developing financial opportunities that are provided for the poor, financial markets have positive effect on an equal income distribution (Juch and Etko, 2011). On the other hand, if the poor don't have equal access to credit (due to the lack of collateral and connection), developing financial markets may aggravate income distribution. Because relatively affluent people are ready to get new financial opportunities that it is required to liberalization of financial markets (Batu et al., 2010). Also, the purpose of square use of financial development in model is testing the linear or non-linear between financial development and Gini coefficient. If Greenwood and Jovanovic an inverted-U-shaped hypothesis in the case of financial development is true, it is expected the square effect of financial development on Gini coefficient is negative.

## 5. Conclusion

Due to economic structure of studied countries, compound financial development during the period under study have positive, significant and regressive on Gini coefficient this means, this is an inverted-U-shaped relationship that is justified Greenwood and Jovanovic an inverted-U-shaped theory during the period under study for case study countries. Index of financial development have negative relationship with Gini coefficient To increase the credits to private sector, it is decreased income inequality because the OPEC countries don't have access to credit because of the poor credit limitation, but with

financial development and increasing credit to the private sector and the removal of barrier, the poor can have access to credit. Therefore, theory of financial development of income equality is diminished. Thus a percent increase in index of compound financial development in the desired period has a positive and significant effect on income inequality. In the other words, increasing financial development is caused to increase income inequality.

Due to role and importance of financial institutes and its relationship with poverty and inequality in societies, several studies have been done and different theories have been presented in this field between financial development and U. Greenwood and Jovanovic focus on the relationship of inequality, while other researchers such as Galver vezira and Benergi and Newman confirm the negative linear relationship between these two variables. Based on the results, developing financial institutes play an important role in reducing income inequality in developing countries. The results of this study indicate acceptance of non-linear relationship between U and the negative impact of financial development.

Due to positive effect of financial development on reducing inequality in developing countries, requiring small manufacturing units to financial facilities and their positive role in increasing an aggregate supply and inflation control, developing financial institutes and increasing attention and programming for achieving poverty alleviation policies and an appropriate income distribution in developing countries, that is one of the preliminary purpose in every societies, are purposed.

1-Financial policies should be set so that allocated credits to private sector, in addition to raising equity, share more efficiency between different segments of society until in this case with return soon investments, reduce inequalities between different income groups.

2-Increase the knowledge and skill to raise awareness of the wage, and finally income distribution makes more equitable. Therefore, government should provide required basis for increasing the knowledge level and work force skill.

3-Government should apply all of its monetary policies for reducing inflation, for example with control the prices of imported good, control in demand that is due to the rapid increase in consumer spending and investment spending in the public and private sectors, disproportionate liquidity growth of the private sector stop that it causes increasing in aggregate demand and expanding and deepening in inflationary pressure.

### Acknowledgements

This paper was extracted from M.A thesis entitled "The effect of financial market development on income distribution in OPEC (2000-2012)" which is implemented in the Islamic Azad University, Shoushtar Branch, Shoushtar, Iran.

### References

- Abou noori, Esmaeil (1376) "The effect of macroeconomic indices on income distribution in Iran" *Economic Researches Journal*, No.51, pp. 1-31.
- Abou Noori, Esmaeil; Khoshkar, Arash (1385). "The effect of macroeconomic indices on income distribution in Iran": interprovincial study, *Economic Researches Journal*, No.77, p.65-95.
- Ang, J. B. (2009), "Financial Liberalization and Income Inequality", MPRA, Paper No. 14496.
- Assari, Abbass.; Agheli, Lotfal. Shafie, Saeid., Rasooli, Meysam, (1388). Examine the effect of fiscal policies on income distribution in Iran. *Economic Bulletin*, pp. 31-48.
- Dehmoredeh, Nazar; Shokri, Zeynab (1389). The effects of financial development on income distribution in Iran. *Research journal and economic policies*. No 54, pp. 147-164.
- Greenwood, J. and B. Jovanovich, (1990), Financial Development, Growth, and the Distribution of income, *Journal of political Economy*, 98, 1076-1107.
- Jahangard, Esfandiar Ali Asgari, Sara. (1390). Studying the effect of financial development on the effectiveness of monetary policy in developed and developing countries. *Journal of Economic Modeling researches*, No. 4, pp. 147-169.
- Kappel, V. (2010), "The Effects of Financial Development and Income Inequality and Poverty", *Proceedings of the German Development Economics Conference, Hannover 2010*, No. 25.
- Khodadad Kashi, Farhad.; Zra'nezhad, Mansour; Yousefi Hajiabadi, Reza. (1391). Studying the structure effects of market on innovation and research and development in Iran manufacturing industries, *Economic Research Journal*, No. XIV, 1-24.
- Pajouyan, Jamshid (1375) "support policies of the vulnerable segments, Ministry of Economic Affairs, Publications of Economic Affairs Deputy.
- Rasti, Mohammad. (1388). the effects of trade development on financial development in Iran economy. *Journal of Commerce Reviews*, No. 37, pp.56-63.
- Sajjadi, Zahra. (1389). Studying the effect of financial development on inequality of income distribution: A selected case study of developing countries.
- Salem, Ali Asghar. Arab Yar Mohammadi, Javad. (1390). Examine the relationship between

financial development and income distribution in Iran economy. *Journal of Economic researches process*, nineteenth year, No. 58, pp. 127-151.

Samadi, Salime (1371). Examine the effect of preference on income distribution in Iran, MSc thesis, Economics Department, Isfahan University.

Shahbaz, M. and Islam, F. (2011), "Financial Development and Income Distribution in Pakistan: an application of ARDL approach", *Journal of Economic Development*, 36(1), pp 35-58.

Sucre R.M. (2008), "Financial Development, Economic Growth and Inequality: assessing evidence for Latin America and the Caribbean", Working Paper, CEPLAG-San Simon University, pp1-39.