

Investigating the Relationship between Gini Coefficient of Income Strata and Financial Depth in Iran

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Abstract

Increasing financial depth is one of the main concerns of policy makers as a prerequisite for economic growth. And since poverty is one of the most important economic and social complications as well as a barrier for reaching financial development, this study tries to investigate the effects of the Gini coefficient, as a poverty measure for income strata, on financial depth during the time period between 1990 and 2011 using combinatorial data analysis. The results of the study show that there is a positive relationship between Gini coefficient in each income stratum and financial depth, which implies that increasing the financial depth does not decrease poverty in each income stratum. Moreover, there is a negative relationship between government expenses and financial depth in Iran. On the other hand, it can be said that increasing the degree of economic openness and inflation have a positive impact on financial depth.

Keywords: Gini coefficient, financial depth, combinatorial data.

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Introduction

Paying attention to the problem of poverty and poverty alleviation has been and is a global issue and since poverty is one of the most important economic and social complications in each and every country as well as one of the barriers for reaching economic development, assessing and calculating poverty and its measures is very critical

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and significant. However, poverty is not a simple phenomenon to be defined from a single point of view. Due to the multidimensional nature of poverty, providing a comprehensive and exact definition for it is very difficult.

From the viewpoint of Asian Development Bank, poverty is being deprived of assets and opportunities which each individual deserves (Khodadad Kashi et al., 2002). Bout and Ruantery have considered poverty from two distinct viewpoints of absolute and relative poverty and distinguish between these two. Absolute poverty is defined as inability to earn the minimum life standard and relative poverty is defined as inability to reach a certain level of life standards which are considered necessary in the current social stage. Generally, poverty is considered related to material needs and requirements; in other words, it is created due to insufficient tools for fulfilling minimum needs regarding food, housing, health and education. Poverty occurs in all countries with a higher rate in developing countries where average income is low and with a lower rate in developed countries where income levels are higher.

Moreover, financial depth or development is one of the prerequisites for economic growth and development in different countries so that countries with shallow financial sector suffer from the fact that their financial resources have not been efficiently allocated among different needs (AlvandiZadeh, 2013). In the dictionary of financial and banking terms, financial depth is defined as the depth of perceived financial assets. In other words, financial depth is defined as a situation in which the speed of financial asset increase is more than the speed of non-financial asset increase. In this case, the ratio of financial assets to nonfinancial assets will tend to increase (Azimi and Ibrahimi, 2011).

Considering the discussions above and the fact that poverty and its measures have a significant impact on the financial depth of a country, the main question of the current study is whether there is a relationship between poverty and financial depth in Iran or not. In order to answer this question, the current paper is outlined in a way that after the introduction and in section two, the literature related to the issue at hand is discussed. In the third section, the model is specified and it is estimated in the fourth section. Finally, the conclusions are presented.

Literature Review

There are several studies on poverty and financial depth and we will discuss some of these studies in the following.

Studies in Iran

JaberiKhosroshahi et al. (2011) in a study investigate the impact of financial development on income inequality in Iran during the time period between 1973 and 2008. The results of the study show that there is a positive and decreasing relationship between financial development and Gini coefficient. Moreover, human resources have a negative impact on Gini coefficient while inflation has a positive impact on Gini coefficient.

Elmi and Ariani (2012) in their study entitled “the effects of financial development on income distribution in Iran during the time period between 2000 and 2006” conclude that

the efficiency measure has a significant impact on reducing inequality in Iranian provinces and unlike inflation rate, government expenses is among the stimulating factors for reducing inequality. Based on the obtained results it can be said that financial development in Iran will lead to reduced inequality.

Khosravinezhad (2012) in a study entitled “estimating poverty and poverty measures in urban and rural areas” concludes that estimations of poverty line during the selected time period (2001-2007) have had an increasing trend. Moreover, poverty measures have had a decreasing trend up to the first half of the selected period while they have started to increase in the second half of the selected period.

Studies in Other Countries

Cull et al. (2002) investigated the impact of deposited insurance premiums on financial depth and concluded that insurance rates were mainly considered in order to decrease the likelihood of banks becoming broke, which in turn helped increase the stability of payments and the financial system. Moreover, they found out that the supervising body was weak and the banking sector was unstable. Furthermore, adopting deposited insurance premiums decreased financial depth in the short term.

Hinder and Sikender (2007) in a study entitled “poverty, income distribution and social development in Lahore” comparatively analyzed poverty and income inequality in seven cities of Lahore and found out that Nishtar City had the highest poverty rate of 44 percent and 4.5 percent of the population in this city were very poor.

Hassan et al. (2008) in their study entitled “bank efficiency, financial depth and economic growth” found out that the positive relationship between financial development and economic growth had weakened in recent years (1996-2005). Moreover, the effect of quality on economic development was stronger while quantitative expansion was useful in developing countries.

Tikmir (2009) in a study entitled “rural poverty” concludes that the majority of poorest people of the world live in rural areas. 3.4 percent of people with income levels lower than a dollar a day are classified as rural residents. Sources of rural poverty are numerous including environmental complications, colonization, semi-governmental organizations and so on.

Hee and Xang (2011) in their study entitled “measuring poverty in lifetime” provide an obvious framework for measuring poverty in lifetime during several time periods and found out that for an individual the lifetime poverty was affected by poverty in each period as well as the permanent consumption of the person’s lifetime.

Chouticanich et al. (2014) in a study entitled “income distribution, inequality and poverty in Asia during 1992-2010” modeled income distribution in 11 developing countries in Asia, focusing on urban and rural areas in China, India and Indonesia. They find out that China is rapidly growing and at the same time inequality is also developing in this country. Moreover, India is suffering from recession and after withstanding the 1997 financial crisis of Asia, Indonesia has been rapidly growing.

Model Specification

Based on the provided theoretical foundations and the previous studies it can be said that financial development can affect poverty through both affecting economic growth and affecting inequality. Moreover, financial development can directly impact poverty.

Similar to Levin and King (1993a), in the current study it is assumed that economic growth is directly related to financial development and other explanatory variables including inflation rate and the degree of economic openness. This relation can be formulated as follows:

$$g = \alpha_0 + \alpha_1 FD + \alpha_i W_i \quad i = 2, \dots, m \quad (1)$$

in which g is the growth rate of per capita income, FD is the measure for financial development and W_i indicates other explanatory variables which qualitatively and quantitatively affect the growth of per capita income. By adding a random error term to the above equation, a general econometric model will be reached, which can be used for measuring the volume of different determining factors of growth.

In order to analyze the relationship between financial development and income inequality, model (2) can be used in which income inequality is explained using per capita GDP level. In this model, squared per capita GDP is used for controlling other variables and specifications or special conditions in different countries (Barro, 2000).

$$G = \alpha + \beta_1 y + \beta_2 y^2 + V_i \quad i = 3, \dots, m \quad (2)$$

In the above equation, G is the Gini coefficient, y is the per capita income level and V_i is the controlling variable used in this model for indicating other variables affecting income distribution. Model (2) is a general model which is used for testing the reversed U hypothesis.

The third relation estimated in this section is the relationship between economic growth and poverty. In order to investigate this relationship, Dollar and Kraay (2002) method is used and the following semi-logarithmic model is used for estimating this relationship.

$$\text{Ln}y^p = \mu_1 \text{Ln}y + \sum_{i=2}^m \mu_i X_i \quad i=2, \dots, m \quad (3)$$

In this model, y^p is the per capita income in the poorest section of the population and y is the average per capita income of the entire population. Moreover, X is the controlling variable used in this model for assessing the other factors affecting poverty. In the previous sections it was shown that the relationship between economic growth and poverty depends upon the distribution changes during the growth process as well as the basic level of inequality and in this equation, inequality is used as one of the controlling variables.

In order to be able to estimate the relationship between the income growth of poor people and the average income growth, we differentiate Eq. (3) in the first order and by

adding an intercept as well as a random error term; we obtain an econometric model for factors determining poverty. The first-order differentiation of Eq. (3) is as follows:

$$g^p = \mu_1 g + \sum_{i=2}^m \mu_i \Delta X_i \quad (4)$$

Estimating the parameters of Eq. (4) gives the elasticity of poverty reduction considering the economic growth and other factors determining poverty such as inequality.

In order to obtain the direct relationship between income growth of poor people and financial development, Equations (1), (2) and (4) are combined together. Moreover, the growth equation for assessing the impact of financial development on growth, formulated as Eq. (1) will be placed in Eq. (4) as the growth term in the first-order differentiation of factors determining poverty. The result can be presented as Equation (5):

$$g^p = \phi_1 FD + \sum_i \phi_{2i} W_i + \sum_i \phi_{3i} \Delta X_i \quad (5)$$

In the above equation, $\phi_1 = \alpha_1 \mu_1$, $\phi_{2i} = \alpha_i \mu_1$, $\phi_{3i} = \mu_i$ and $i = 2, \dots, m$. Equation (5) indicates the general impact of financial development on poverty through economic growth and income inequality. However, estimating the above model will give the general coefficients of ϕ while we are trying to estimate α and μ . On the other hand, in case of the presence of a high correlation among variables, due to the co-linearity problem, estimating this model will not present reliable results. Accordingly, in order to assess the effects of financial development on poverty, each one of the specified equations will be independently estimated.

Based on Equations (1) and (4), we differentiate Equation (5) on financial development so that we can obtain the general effect of financial development on poverty:

$$dg^p/dFD = \partial g^p / \partial g * \partial g / \partial FD + \partial g^p / \partial FD + dg^p/dG * \partial G / \partial FD \quad (6)$$

Equation (6) presents the general impact of financial development on poverty. The first term in the right side of Equation (6) indicates the effects of financial development on poverty through economic growth. The second term of this equation expresses the direct impact of financial development on poverty and the third term of this equation indicates the effect of financial development on poverty through inequality. Since based on Eq. (4), the rate of income change for poor people to the change of average income in the population equals μ_1 ($\mu_1 = \partial g^p / \partial g$) and based on Eq. (1), changes in average growth of income relative to one unit change in financial development equals α_1 ($\alpha_1 = \partial g / \partial FD$), we can write the general impact of financial development on poverty as follows:

$$\partial g^p / \partial FD = \alpha_1 * \mu_1 + \lambda_1 + \lambda_2$$

In this equation, $\partial g^p / \partial FD = \lambda_1$ indicates the direct impact of financial development on poverty and $\frac{dg^p}{dG} * \partial G / \partial FD = \lambda_2$ is the indirect impact of financial development on poverty through inequality.

In this study, annual time series data of 1990 to 2011 are used for assessing the relationship between the Gini coefficient of income strata and financial depth in Iran. The data used here include: financial depth measure (the ratio of liquidity to gross domestic product), government expenses (the sum of civil expenses and current payments), degree of economic openness (the ratio of total import and export to gross domestic product), inflation (measure for the price of consumer goods and services) and the Gini coefficient of each income stratum, which are denoted by DEPTH, G, OPENNESS, CPI and GINI, respectively. All the data, except for the Gini coefficient for each income stratum, have been acquired from the economic time series database of the Central Bank of the Islamic Republic of Iran.

Model Estimation

Generally, it can be said that the advantage of using panel data compared to time series and cross-sectional data is that panel data with a combination of time series and cross-sectional data provide more information, more variability and variety, less co-linearity among variables and higher degrees of openness and efficiency. Time series are typically suffering from co-linearity while in panel data; the cross-sectional aspect of the data will lead to increased variability and variety and by obtaining this information, more valid estimations can be obtained. Moreover, this method provides better possibility of identifying and measuring effects which cannot solely be identified using cross-sectional statistics or time series. Hence, in the current study, the panel data method is used and Eviews 6.0 software application is utilized for pattern estimation.

Stability Test

One of the main complications faced by different studies is neglecting the stability of the variables or their changing trends during time as a factor affecting regression analyses. On the other hand, one of the important properties which the variables should possess is stability. Hence, before estimating the model, in order to be sure of reliability and having acceptable results, the stability of variables is tested. There are several methods for testing the unit root of variables in panel data. In this study, Levin–Lin–Chu (LLC) unit root test is used for assessing the stability of variables and the results show that the logarithm for all the data is stable in the 0.95 level.

Estimation Method

Before discussing the model estimation issue it is necessary to determine whether we should use panel data method or pooling method for model estimation. Accordingly, we use the F-Limer test. Accepting the H_0 hypothesis indicates the presence of combinatorial data (pooling method) and using OLS estimation for solving the equation. Rejecting the H_0 hypothesis indicates the presence of constant effect model (panel data method) and using LSDV for solving the model.

The result of the F-Limer test in this study does not reject the H_0 hypothesis, which means we should use the pooling model.

Based on the result of this test, the combinatorial data method is preferred over the differential data method. As a matter of fact, in order to obtain an efficient estimation, Ordinary Least Squares (OLS) method is used.

After choosing the model type, we can estimate the model. The results of model estimation are as follows:

$$\text{DEPTH} = -0.7257G + 0.5786\text{OPENNESS} + 2.0788 \text{CPI} + 0.3425\text{GINI}_1 + 0.2251\text{GINI}_2 + 0.2094\text{GINI}_3 + 0.1995\text{GINI}_4 + 0.1968\text{GINI}_5 + 0.1983\text{GINI}_6 + 0.1998\text{GINI}_7 + 0.2085\text{GINI}_8 + 0.2314\text{GINI}_9 + 0.4070\text{GINI}_{10}$$

According to the result of the model estimation, all the variables are significant at significance level of 0.95. Hence, their impact on the measure of financial depth is obvious. The value of 0.98 for R^2 indicates the high explanatory power for the dependent variable by the independent variables. Generally, augmented R^2 is used for assessing the explanatory power of the pattern and this determining coefficient equals 0.979 which confirms the appropriate specification of the pattern.

Conclusion

The main objective of the current paper is to investigate the relationship between the Gini coefficient of income strata and financial depth in Iran during the time period between 1990 and 2011. In order to estimate the model and investigate the effects of variables on financial depth the combinatorial data method (pooling model) is used. The results show that increasing government expenses reduce the depth or financial development. Moreover, increasing the degree of economic openness will lead to an increase in financial depth. Since the financial depth measure is the ratio of liquidity to gross domestic product (GDP), an increase in inflation will lead to an increase in financial depth. On the other hand, there is a positive and significant relationship between the Gini coefficient of each income stratum and financial depth, which means that increasing financial depth have not led to a reduction of poverty in income strata.

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