# INVESTIGATING THE INTERACTIONSBETWEENINCOME INEQUALITY AND SOCIAL CAPITAL: USINGPANELDATA PATTERN

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**Abstract:**

To access social capital and income equality has been considered as a main goal in sustainable development of any society. Social capital, as a symbol of interpersonal cooperation and based on mutual trust among individuals, is one of the main bases for economic development.This paper studies the importance of income inequality for the formation of social capital. Using panel data pattern, data from 16 developing countries within 2000-2008 is used with the main aim to investigate theinteractions betweensocial capital and income inequality. The results show that increase in income inequality in society causes a decrease in clarification of the relationships between social capital and income inequality can be influential on macro policies of the governments, especially those policies regarding distribution and redistribution of income in society with the purpose to achieve higher levels of social capital.

**Keywords:**

social capital, trust, income inequality, tax, inflation, productivity.

**JEL classification:** O15, Z13

## 1- Introduction:

Presence of such an approach in various economic discussions delineates the significant role of policymaking and social communications on economic variables. Nowadays, income distribution is not only considered as one of the development goals, but it also can be the basis for social capital formation in a society. Therefore, income distribution policies, with anaim to reduce the inequality and the economy class differences, are of the main economic policies of countries and are considered as one of the major infrastructures in economic development process, so much so that most countries today pay special attention to these policies. Resultantly, to shed lightinto the relationship between social capital and income inequality can be beneficial to macroeconomic policy-makings in income distribution which have targeted higher levels of social capital in the society.

The importance of investigating the interactions betweensocial capital and income inequality can be inspected from two points of views:from one hand, it can be claimed thatmore extended and specialized studies of factorsaffectingsocial capital can lead tomore accurate analyses of the role of each effective factor, thus making the prediction of social capital growth more precise. On the other hand, clarification of the relationships between social capital and income inequality can be influential on macropoliciesof the governments, especially those policies regarding distribution and redistribution of income in society with the purpose to achieve higher levels of social capital. The present paper attempts to provide a vaster horizon for socioeconomic policymakersso as to achieve a fair distribution of income in society and therefore higher levels of social capital, through studying the mutual causalities betweensocial capital and income inequality as well as the close and interactional relationship between these two variables.

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In this paper, the interactions between social capital and income inequality is surveyed based on data from 16 developing countries within 2000-2008 and using panel data pattern. In 1960, Kravisintroduced a hypothesis statingthat income inequality is more evident among underdeveloped countries; he observed a kind of positive and complicated correlation between inequality rate and real level of percapita income. Therefore, a group of developing countries have been used in this study.

**2- Literature Review:**

The term social capital is often traced back to the work of the sociologist Bourdieu (1977), but it gained popularity with the seminal work of Coleman (1990) and Putnam (1993). Recently, Huisman&Oldhinkelcited(2008) define social capital as "good" culture—i.e., a set of beliefs and values that facilitate cooperation among the members. The social capital can be measured by both direct indicators (such as generalized trust) and indirect indicators (such as blood donations).

The original coinage of the term "social capital" and its conceptual explanation is commonly attributed to Robert Putnam. To him, social capital is among the aspects of a social ssfollow their common goals efficiently through facilitating cooperation and coordination among the members. He used social capital synonymous to other concepts like social coherence, social cohesion, and even brotherhood.

Social capital is similar to other forms of capital in that it is productive, and unlike other form is that it enjoysself-increaser;in other words, the more social capital is used, the more it will increase;still similar to other forms of capital, it enhances theproductivity of individuals and groups in society, though not in economic terms. Social capital, defined as trust, coherence, and unity of society members, facilitates the coordination of economic behavior and thus results in better economic performance (Khezri, 2005).

In developmental studies, social capital isintroduced as amissing linkand a very vital factor;based on this,many development experts and underdeveloped countries hope to get rid of their numerous development-related issues through social capital. The importance of social capitalas one of the main factors effective on economic development and growth is so much so thatin addition to having conducted numerous researches, Iranian government is determined to make policies in order to improve social capital, toevaluate thesocial capital, and to present annual reports,following the Article 98 in the 4$^{th}$national development plan,with the aims to maintain and promote social capital, public satisfaction, and extension of civil institutions (Ghassemi&Azarbayjani, 2011).

Income distribution explainsthe quality of each individual's share from the national income. In other words, it refers to the inequality rate existinginthemembers' incomeswithin a country (Jafarisamimi, 2001). Moreover, inequality of national income and wealth distribution causes many problems in a society including socioeconomic ones. It also hasseveral indirect effects on a society; some believe that economic inequality (including income inequality) is a major factor in emergence of social injustice and conflicts, which lead to a reduction of trust among people and thus lowering their social participation (Alesina&Devleeschauwer, 2002).Inequality seems to be a strong determinant of trust. People in unequal societies trust each other to a much smaller extent than people do in more equal communities. Several economic and social mechanisms could explain this relationship. Political factors could also be important; political arguments and decisions are often influenced by notions of distributive justice. People's aversion to inequality has also been demonstrated in more systematic studies, for example cited by Fehr and Schmidt (1999).

Consequently, a fair distribution of income which leads to a reduction in inequality in society provides a basis for social capital formation and increases the social welfare. In addition, the existence of institutes in society with fair activities generalizes and deepens the trust in society. Example of justice in economy is equal opportunities to have life facilities. On the other hand, the more inequality

in individuals' wealth and property exists, the more difficult mutual connection, participation, and trust is created (Putnam, 2006).

Studies on the variables determining generalized trusthave proved that social conflicts in form of income inequality are harmful to public trust, a major index of social capital. Moreover, they have found out that the most effective factor determining the public trust is income inequality, which can be affected by redistribution policies; therefore, there is a negative, powerful, and significant relationship between income inequality and public trust (Uslaner 2002, Wilkinson & Pickett (2009),Kemp-Bendick 2011, and Oliver 2013).

Obtained experimental evidences have proved that the relativebenefit of equal income is harmful for social capital formation;also, it is possible that a positive income gap leads to the feeling of fear, criminal behavior, vengeance, and trust decrease among the peers of those individuals whose relative income has been decreased (Fisher &Torgler, 2011).Since social capital reflects the behavioral norms based on trust, cooperation, and participation among society members, such deviations from social norms ascorruption can be a reflection of lack of social capital(Fukuyama, 1997).The politician can extract corruption rate, which reduces the provision of public goods and sacrifices the welfare of citizens. When inequality among citizen is large, political support is less sensitive to a decrease in corruption rate. Therefore, large inequality increases corruption and impedes investment and economic growth (Mizuno &Katsuyuki&Okazawa, cited 2010).

Income inequality increases the level of corruption through material and normative mechanisms. The wealthy have both greater motivation and opportunity to engage in corruption, while the poor are more vulnerable to extortion and less able to monitor and hold the rich and powerful accountable as inequality increases (You &Kagram, cited 2004).Current research on the relation between income inequality and generalized social trust shows a widely shared theoretical prediction about the effect of income inequality on social trust: when income inequality rises, trust will decrease (Leigh 2006; Rothstein and Uslaner 2005; Putnam 2007; Uslaner and Brown 2005; Jordahl 2007; Gustavsson and Jordahl 2006; Delhey and Newton 2005 cited). Although there is consensus on the direction of the effect, the underlying mechanism is contested.

Economic inequality seems to be a strong determinant of trust. This relationship shows up consistently in different studies, although in a few of them it is not statistically significant. The detailed investigation of Gustavsson and Jordahl(2007), which addresses several empirical problems, confirms the negative association and indicates that income differences in the bottom half of the income distribution may have a particularly strong influence on trust.

Alesina and La Ferrara cited (2002) interpret their findings in line with this mechanism (dissimilarity reduces trust) and the experimental evidence is also affirmative. One can also mention a survey conducted by Johansson-Stenman cited (2006) which shows that the higher a person’s income, the more he is willing to trust someone with high income relative to someone with low income. It is, however, less straightforward to explain Gustavsson and Jordahl’s finding cited (2007) that inequalities in the bottom half of the income distribution are especially important.

Furthermore, Uslaner and Brown cited (2005) contend that “where inequality is high, people will be less likely to believe that the future looks bright, and they will have even fewer reasons to believe that they are the masters of their own fate”. In this example, inequality is expected to affect trust through perceptions of inequality.

In the present literature review, we concentrate our attention on economic inequality. Several mechanisms could explain the association between income inequality and social capital (Hombres & Weber,cited ,2012).

First, individuals might be adverse to heterogeneity. In other words, they prefer having contacts with individuals that are similar to themselves, i.e. that belong to the same socio-income group. In

heterogeneous societies, contacts between dissimilar individuals will be at a lower rate than in more homogeneous societies. Repeated interactions being conducive of social capital and trust, heterogeneous societies are thus characterized by fewer contacts and, in consequence, by lower levels of cooperation and trust (cited as in seminal work by Colman 1990, and Alesina&devleeschauwer, 2002).

This aversion to heterogeneity can be driven by the fact that individuals from different socioeconomic groups are less likely to share common values and norms which makes it more difficult for them to predict the attitudes of others. This creates an environment not favorable to the development of social capital (Knack & Keefer cited 1997).

Second, when resources are not evenly distributed, poor individuals might perceive that they are living in an unfair society where the rich tend to exploit the poor. This will lead individuals at the bottom end of the income distribution to develop distrust against richer individuals (Rothstein and Uslaner cited 2005). Uslaner and Brown cited (2005) argue that when income inequality is high, individuals from different socioeconomic groups will have the sensation that they are not sharing the same fate, and this will hamper trust. Third, inequality should relate to the level of optimism. Higher level of inequality is likely to reduce the level of optimism for the future and thereby trust (cited Uslaner and Brown, 2005, Rothstein and Uslaner, 2005).Finally, economic inequality such as income inequality increases the incentives for dishonest comportments directed against the rich, by the poor people. This implies that poor people will be less trustworthy, which will, thereby, reduce the level of social capital of richer individuals.

Coffé and Geyscited (2006) argue that inequality makes individuals from differentsocio-income groups less likely to have values and norms in common.Also In a related argument Fischer and Torglercited (2006) propose that envy and positional Concerns have a negative effect on perceptions of others' fairness. People who feel disadvantaged by their relative income position may come to distrust the reference group of "the Joneses" and extend this distrust to other people. This prediction puts additional focus on the relative income of the truster but downplays the position of the trustee.

Zak and Knack cited (2001) derive the proposition that an increase in wage inequality that keeps the mean wage constant will reduce trust. When their wages fall, people with low wages respond by reducing their trust in others. A lower wage means that taking the time to ensure that others are trustworthy becomes more attractive than working and trusting. At the other end of the wage distribution, higher wages lead to more trust in others.

**3- Empirical Findings:**

The present study is conducted with the main aim to evaluate the following hypotheses:

1) There is a significant and negative relationship between income inequality and social capital.

2) There is a two-way causal relationship between social capital and income distribution.

Regarding the limitation of our available data in this study, it was found necessary to use panel data pattern for empirical testing of the hypotheses. In this part, first the model variables were introduced, and thenthestationarity of variables were studied byunit root test. In addition, the required tests for identifying the appropriate method of estimatewere introduced and, post to model estimation, each country's amounts of sectional and unobserved effects were calculated. Finally, the causal relationship between social capital and income distribution was investigated.

**3-1Research variables**

Our variables are being introduced by an econometrics pattern in this section. Regarding the theoretical basis and the previous studies, the considered equation (annually within a time period of 2000-2008) is as follows:

$SC_{it}= \alpha_{it}+ \beta_1 GINI_{it}+ \beta_2 INF_{it}+ \beta_3 TAX_{it}+ \beta_4 GAP_{it}+ U_{it}$

where SC and GINI are the main variables of model, defined as below.

SC: Real measurement of SC is not possible for the following reasons:

1) Qualitative dimension of SC,

2) How to deal with positive effects outside the group, and

3) Pessimism about nonmembers.

Therefore, instead of evaluating the social capital as a positive value, we can measure lack of social capital(or social deviations) by common available methods. It is assumed that since social capital reflects the existence of behavioral norms based on cooperation,the social corruptions can, potentially, be a reflection of lack of social capital (Fukuyama, 1997). To do this, the reverse Corruption Perception Index (CPI)was applied. This index concentrates on corruption in public section (include the government) and defines corruption as “abuseof the benefits of society members by public section and governmental systems”.

GINI: The Gini Index is for measuring the space assigned to the income distributed among individuals or families inside an economy system in proportion to anequal distribution. The Lorenz curve shows the cumulative percentage of total income versus cumulative numbers of receivers, starting from the poorest. This index measures the Lorenz curve space andtheline of perfect equality. Therefore, zero percent Ginicoefficient represents perfect equality of income distribution whilethe hundred percentshows perfect inequality of income distribution among individuals and families.

INF: The INFis the inflation measured by consumer price index, measuring thepercentage of annual variations in costs for obtaining a basket of goods and consuming services which can be either fixed or variable within specified intervals. During implemented investigations, it is cleared that inflation has a significant negative effect on all kinds of crime potentials (Akça&Yilmaz&Karaca , 2012, Seals &Nunley, 2007). Moreover, for those who experience over-inflation, there is generally a permanent lack of trust (Backman&Scheiber, 2012).

TAX: Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue. Existence of significant positive relationship between trust and tax incomes has been proved (Steijn&Lancee,2011).

GAP: GAP stands for generalized average productivity; several studies have demonstrated the existence of a significant positive relationship between social capital and productivity (Sabtini 2005, Kassa 2007, Luno& Medina, 2009).

**3-2 Thestationarity test:**

Before estimating the pattern survey, it is necessary to implementthestationarity test of the variables (since it is possible that the variables tend strongly to time, so that the explanatory power of

the model results from time variable existence rather than the variables' real relationship). Therefore, studying the actual or artificial relationshipsof the explanatory variables is of utmost importance. In this section, the variables'stationarity will be studied by Levin, Lin, and Chu's single root test. Regarding the results of the implemented tests, our null hypothesis based on the existence of unit root of all variables in 0.10 significance level is rejected; therefore, all variables are I (0).

| **Variable Name** | **Tests** | **Statistic amoun** |
|---|---|---|
| Social Capital (SC) | Levin, Lin & Chu test | 0.0000 |
| GINI Coefficient | Levin, Lin & Chu test | 0.0000 |
| Inflation | Levin, Lin & Chu test | 0.0000 |
| Tax | Levin, Lin & Chu test | 0.0000 |
| Generalized Average Productivity (GAP) | Levin, Lin & Chu test | 0.0000 |

### 3-3Results of the model' estimation

Before studying and interpreting the results of the pattern and' estimationmaking judgments about the relationship between social capital and income inequality,it is necessary to determine whether our data has the poolability or not; hence, the poolability test was implemented firstly, and then after confirming the possibility of data poolability, other testswere used for selection of estimation method. Based on the poolability test of F-Limer, the statistics of calculational F with degrees of freedom of 15 and 98 for section dimension was 5.338. Also, the statistics of calculational F with degrees of freedom of 8 and 105 was 0.427;these relatively minor values may be an indicative of the acceptance of our null hypothesis based on the possibility of data poolability from section and time dimensions. Therefore, it can be claimed that our data had thepoolability.

Now, in order to select the appropriate survey method, it is necessary to implementthe required tests;the results of these tests are presented in Table 1.

| statistics | tests |
|---|---|
| 5.34 | Chow test |
| One-sided sectional effect 35.15 | BreushPagon test |
| One-sided time effect 0.0000 | BreushPagon test |
| 8.69 | Hausman test |

According to Table 1, the Chow statistics in these groups of countries was 5.34, implying the rejection of our null hypotheses. Therefore, the obtained result showed that for surveying, to select between combined data and panel data methods, the panel data method ought to be applied in the present study.

Regarding the results of the BreushPagan test, the nullhypothesis regarding the lack of one-sided sectional effects isaccepted whereas thenull hypothesis regarding the one-sidedtime effects isrejected. Also, the results of Hausman test rejected the null hypotheses indicating the existence of random effects of section type; therefore, the pattern should be surveyed usingfixed effects method.

Regarding the above-mentioned results, the survey method in these groups of countries will be the fixed effects. The results of estmation for the16 surveyed countries in the mentioned period were as follows:

Table (2) the final results of fixed effects method

| variable | coefficent | t-statistic | Level of significanc |
|---|---|---|---|
| *GINI* | -0.185 | -1.88 | 0.062 |
| *INF* | -0.001 | -2.34 | 0.021 |
| *TAX* | -0.001 | -0.7 | 0.484 |
| *GAP* | 0.0052 | 0.68 | 0.498 |
| C | 0.379 | 6.04 | 0.000 |
| Number of sections 16 | Number of observatic 576 | $R^2$= 0.112 | F statistics = 3.09 |

Source: authors' findings

As seen in the above table, in the level of significance, 0.10 of the Gini and inflation variable coefficients were meaningful.

The results of our model' estimation showed that in the studied countries there was a significant negative relationship between income inequality and social capital. The amount of this coefficient equals to 0.185; i.e.a one-percent increase in the income inequality leads to a 0.185 percent decrease in social capital. This result was consistent with the theoretical framework. Based on this, with the increase in income inequality, thelevel of trust as well as the social capital will both decrease.

In addition, inflation showed a significant negative relationship with social capital as well; the amount of this coefficient was 0.001; i.e.a one-percent increase in inflation leads to a 0.001 decrease in social capital. This result, too, was consistent with the available theoretical framework. In fact, it can be claimed that high inflationdecreases trust and social participation contexts via intensifying the income inequality and increasing the class differences among members of society.

In a 0.10 level of significance, other explanatory variables of the model lacked the explanatory power and were, thus, meaningless; therefore, they can be omitted from the final estimation of the model.

SC= 0.379 –0.185 GINI -0.001 INF

**3-4 Fixed sectional unobserved effects in final regression**

Fixed sectional unobserved effects are related to cultural factors, social traditions, and traditional infrastructures of each country (and are evidently different in various countries); they are, nevertheless, influential on the formation of social capital and should be taken into consideration in calculations. Therefore, the level of effectiveness of these factors in the formation of social capital was measured as represented in the following table.

| Number | country | Fixed sectional unobserved effects |
|---|---|---|
| 1 | Ukraine | 0.125361 |
| 2 | Kazakhstan | 0.088839 |
| 3 | Moldava | 0.07537 |
| 4 | Argentina | 0.042566 |
| 5 | Dominican | 0.040745 |
| 6 | Belarus | 0.034044 |
| 7 | Armenia | 0.018117 |
| 8 | Colombia | 0.00084 |
| 9 | Georgia | -0.00546 |
| 10 | Brazil | -0.01291 |
| 11 | Romania | -0.01537 |
| 12 | Peru | -0.01688 |
| 13 | Costa Rica | -0.09477 |
| 14 | Poland | -0.11797 |
| 15 | Turkey | -0.13312 |
| 16 | Uruguay | -0.14942 |

Source: authors' findings

### 3-5 Causal relationship between social capital and the Ginny coefficient

After determining the Granger causality optimal lagbetween social capital and Gini coefficient, it was proved that the only valid result was in the third lag. The Granger causality test proved that there was a one-sided relationship between social capital and the Gini or income inequality coefficient; however, due tothe statistical insignificancy of calculated amount of F, there was no causal direction from social capital to the Gini coefficient. This result was consistent with the available theoretical base.

| Prob | Null hypothesis | tests |
|---|---|---|
| 0.1395 | SC does not Granger Cause GINI_INDEX | Granger causality test |
| 0.0921 | GINI_INDEX does not Granger Cause SC | Granger causality test |

### 4-Conclusion:

This study aimed to investigate the relationship between income inequality and social capital. Regarding the limitations of the available data, the panel data pattern was selected as an appropriate pattern for empirical test of theories. To do so, data of 16 underdeveloped countries within the time span of 2000-2008 were utilized. Inflation variables, income tax, and productivity were also entered into the model as control variables. The results showed a significant negative relationship between social capital and income inequality, which is consistent with the reviewed theoretical bases. In other words, as it was expected, the inflation index coefficient was found significant and negative. Other explanatory variables of the model had no validity and were consequently omitted from our final estimation. Also, it was proved that there wasa one-sided causality from income inequality to social capital and that there was no causal relationship from social capital to income inequality,norto the Gini coefficient.

Along with the increasein income inequality coefficient, the class differences will increaseamong the members of the society, and, resultantly, lack of trust and higher levels of public dissatisfaction will prevail and the cooperation and communication among individuals will also decrease. The results also showed a significant negative relationship between social capital and income inequality, i.e.a one-percent increase in income inequality resulted in a 0.185 percent decrease in social capital. Also, consistent with the theoretical background studied, it was rightly expected that by the increasein inflation, social capital would decrease. Results of model'estimation also delineated that there was a significant negative relationship between these two variables, so that by a one-percent increase in inflation, social capital showed a 0.001 percent decrease.

Based on the results of the present study, improvement of income distribution policies and attempts for fairer distribution of income in society(which leads to inequality decrease) is the required condition for enhancing the trust level and social participation and will bring aboutan increase in social capital. Therefore, although the rate of effectiveness of this variable may seem trivial regarding the value of coefficientobtained in this study, we should notice that decreasing the income inequality, by itself, is not only a meanstowards development but is anobjective for development. The studiedissue, therefore, highlights the necessity of modifying and reviewing thepolicies for distribution and redistribution of income so as to provide the prerequisites of increased participation, cooperation, and trust of society members (as the main capitals of each country) through decreasing the income inequality within society.

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