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# The Rise of Multiple Inequalities: Focusing on Interactions between the Political and Economic Spheres*

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As a result of the global financial crisis, researchers have come to recognize that income inequality, political inequality, and inequality of opportunity are all rising concurrently, and that these increases are cumulative due to interaction effects between the inequalities. Further, through the realization that economic crises may result from interactions between the political and economic spheres — not just from interactions within the economic sphere itself — researchers have come to understand that the recent economic crisis and the current crisis of democracy are interrelated. This study analyzes how multiple inequalities and crises can develop concurrently by considering the interactions between the political and economic spheres. First, we examine how income inequality, inequality of opportunity, and political inequality are interrelated by building a model comprising two classes — the elite class and the ordinary-citizen class. Thus, this paper investigates the cumulative causal relationships among these types of inequality by examining mechanisms through which such inequalities can rise contemporaneously. Second, using this model, we find that, in contrast to the hypothesis posited by Meltzer and Richard (1981), when political inequality and inequality of opportunity increase at the same time, democracies may struggle to solve the problem of income inequality through the voting process.

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# 1. INTRODUCTION

The experience of the global financial crisis that started in 2007-2008 has led to new views on inequality. First, observers have noted that the previous wave of growth did not "float all boats." Unlike the assumptions under trickle-down effect theory, economic growth does not automatically solve the problem of income inequality, and growing income inequality can threaten the stability of the economy and eventually lead to economic crises (Ostri *et al*., 2014; Tridico, 2012; Stockhammer, 2012). Second, the ideal government that listens to all citizens equally does not exist in reality, and it has become clear that politicians and governments are more responsive to the voices of the rich (Stiglitz, 2012; Acemoglu and Robinson, 2008; Acemoglu *et al*., 2013). The American Political Science Association, which published the report *American Democracy in an Age of Rising Inequality* in 2004, argues that not all citizens exert equal influence over government policies, and indeed, that government policy reflects the opinions of the rich more than it does the opinions of the low-income and middle-income classes. Finally, inequality of opportunity is rising, and this inequality is being passed on from generation to generation. As Rawls (1999) emphasizes in *A Theory of Justice*, equal opportunity forms the basis of social justice, and for this to hold true, individual achievement and income must not be affected by factors such as race, gender, and family background. In other words, individuals of like talent should be able to dream of similar futures. However, recent studies (Stiglitz, 2012; Corak, 2013) have found that income inequality and inequality of opportunity are closely related, and that family background and parental socioeconomic status have a greater impact on children's income today than in the past.

As a result of the global financial crisis, researchers have come to recognize that income inequality, political inequality, and inequality of opportunity are all rising concurrently, and that these increases are cumulative due to interaction effects between the inequalities. Researchers also understand that rising inequality can not only result in economic crises, but also lead to crises of democracy.

In this paper, we examine through modelling how income inequality, inequality of opportunity, and political inequality are interrelated by describing pathways through which income inequality can lead to political inequality and inequality of opportunity, and then, how these resulting inequalities may then act to further boost income inequality.[1] Therefore, the primary objective of this paper is to analyze cumulative causal relationships among various types of inequality to explain processes through which multiple inequalities are rising in the world today. Secondarily, we seek to demonstrate that, in contrast to the Meltzer and Richard hypothesis (1981), democracy may struggle to solve the problem of income inequality through the voting process if these types of inequality develop contemporaneously.

The rest of the paper is organized as follows. Chapter 2 briefly discusses previous studies on the cumulative increase in various types of inequalities. Chapter 3 examines through modelling the interactions between income inequality, inequality of opportunity, and political inequality. Chapter 4 concludes the paper.

## 2. PREVIOUS STUDIES

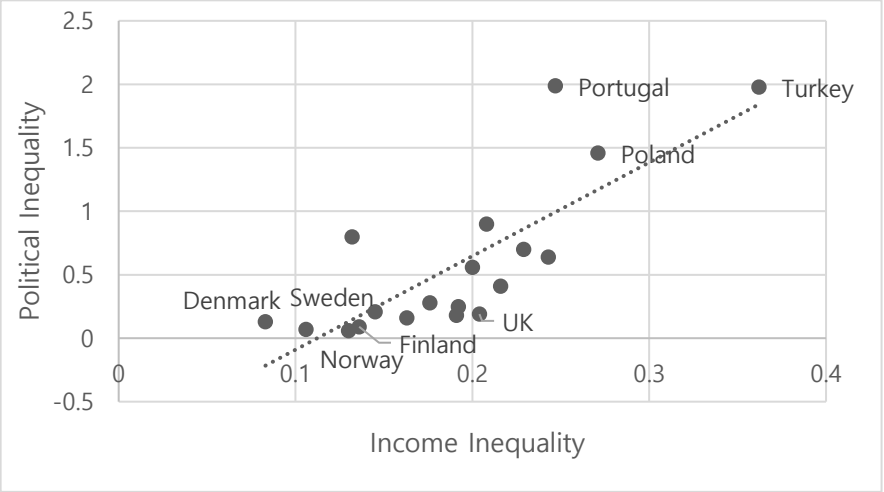
Because decisions are made on a majority-rule basis in a democracy, as income inequality grows, lower- and middle-class voters, who together make up a majority, are likely to support income redistribution policies. Based on this logic, Meltzer and Richard claimed that democracy produces equalizing effects. However, as seen in democratic countries over the past forty years, lower-and-middle class voters have been unable to effectively impose tax increases on the wealthy even during a time of rising income inequality. As

[1] In this paper, the inequality of opportunity and political inequality are defined as follows. World Bank (2006) defines equality of opportunity as the economic, social and political achievements of individuals should be determined by their efforts, not by predetermined race, place of birth, or family background. Political inequality is the case where power is concentrated in the hands of an elite and the political system mainly represents their preferences (Acemoglu and Robinson, 2006).

a result, income redistribution efforts have not been successful (World Inequality Lab, 2017). Instead, the high-earning minority has manipulated policies and market rules to favor themselves and have monopolized market opportunities using their economic power (Stiglitz, 2012). As a result, the so-called equalizing effects of democracy espoused by Meltzer and Richard have not materialized. Empirical studies (Sirowy and Inkeles, 1990; Gradstein and Milanovic, 2004; Scheve and Stasavage, 2009, 2010, 2012; Mulligan, Gil and Sala-i-Martin, 2004) have also failed to clearly identify a relationship between democracy and redistribution policy.

As a result, researchers have turned their attention to interactions between various types of inequality to explain why the equalizing effects of democracy have not materialized as expected and why income inequality has increased over the past forty years, results that run counter to the Meltzer and Richard hypothesis. Ostry *et al*. (2014) argue that in order for the equalizing effects of democracy proposed by Meltzer and Richard to function properly, the increase in income inequality in the economic sphere must not result in a change in the distribution of power within the political sphere. Acemoglu and Robinson (2008) also note that income inequality must not promote inequality in the political sphere if the political realm, which emphasizes equality, is to maintain its control over the economic realm, which promotes inequality. If the rich succeed in using their wealth to acquire de facto political power (through the mobilization of non-state armed actors, lobbying, donating campaign funds, exerting influence in the media, and threatening to transfer capital abroad), the actual distribution of power will differ from a distribution determined simply based on population. In this case, wealthy voters will exercise decision-making power, not middle-income earners, and political parties will be more responsive to the interests of the rich than to the interests of the low- and middle-income groups, thus adopting policies and institutions that represent the interests of the wealthy (American Political Science Association Task Force, 2004; Gilens, 2005; Bartel, 2008; Hacker and Pierson, 2010). Furthermore, the policies and institutions adopted in this way will also impact the relative bargaining powers of the various classes, and

**Figure 1 Relationship between Income Inequality and Political Inequality**




Notes: Lower income inequality and political inequality values indicate higher equality levels. Income inequality is measured using the Theil-T index. The following countries are included: Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Latvia, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Turkey, UK.

Source: The income inequality index is based on Ferreira and Peragine (2015) and the political inequality data is from Dubrow (2010).

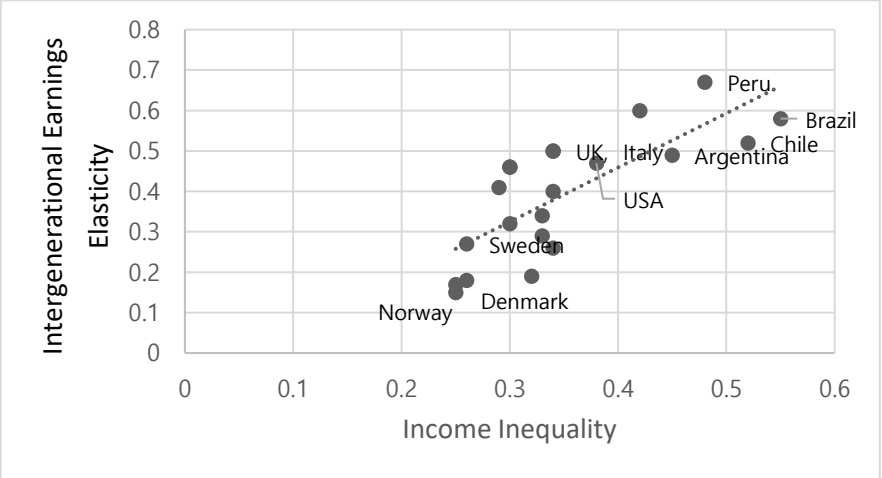
this will affect income distribution and income inequality even more (Acemoglu and Robinson, 2006). If income inequality promotes an imbalance of political power among economic classes, the resulting unequal political system will mainly represent the preferences and interests of the minority elite, resulting in conditions where the equalization effects of democracy do not function properly. This type of democracy is referred to as a *captured democracy*.

In figure 1, countries are plotted along two axes. The horizontal axis represents income inequality based on the Theil-T index proposed by Ferreira and Peragine (2015). The vertical axis is a measure of political inequality proposed by Dubrow (2010). The Dubrow study examines political inequality in Europe and does not include values for the United States and elsewhere. Therefore, the data set is limited to the 19 European countries for

which political inequality values are available. In countries such as Denmark, Finland, Norway and Sweden, political inequality and income inequality are both low. On the other hand, in Turkey, Poland and Portugal, both political inequality and income inequality are high. Norway has the lowest political inequality (0.06), while Turkey (1.98) exhibits 33 times more political inequality than Norway. In a simple regression, the coefficient of estimation is positive and $R^2$ is 0.618, indicating a high correlation between political inequality and income inequality.

OECD (2011) and Corak (2013) look at the interaction between income inequality and inequality of opportunity, while Acemoglu and Robinson focus on the interrelationship between income inequality and political inequality. Rawls warns that once income inequality exceeds a certain threshold level, the influence of family background begins to rise, and that this then threatens equality of opportunity — the basis of social justice. Recent studies (Bailey and Dynarski, 2011; OECD, 2011; Corak, 2013) have supported Rawls' warning by finding that increasing income inequality leads to even higher influence of family background and parental income on the expected earnings of children relative to those children's own efforts. These studies also demonstrate that the increase in inequality of opportunity further promotes income inequality and negatively impacts economic growth. The OECD (2011) finds that in countries with high income inequality (Italy, Britain and the United States), social mobility is low, while in northern Europe, where income inequality is low, social mobility is high and children's income is less affected by family background. Corak (2013) presents similar findings based on OECD studies. Using the "Great Gatsby Curve" (figure 2), Corak finds that the more unequal the income distribution is in a parent generation, the higher the influence of parental income on child income. In the UK, USA, and Italy, where income inequality is high, parental income has a strong influence on child income. In these countries, the elasticity of child income to parent income is approximately 0.5, while in northern Europe it is 0.2. This means that, in the UK, USA, and Italy, roughly 50 percent of any parental advantage or disadvantage is passed on from parent to child, while less than

**Figure 2 The Great Gatsby Curve: More Inequality Is Associated with Less Intergenerational Mobility**

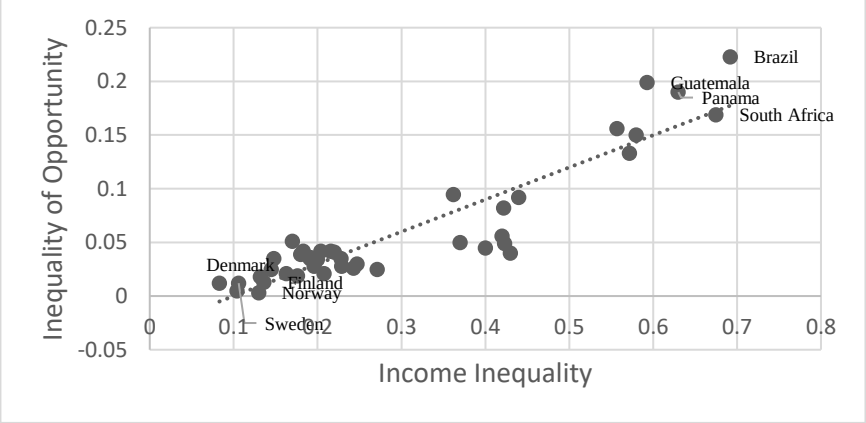



Notes: Income inequality is measured using the Gini coefficient based on earnings after taxes and transfers. Intergenerational earnings elasticity is the elasticity between parent earnings and a son's adult earnings. The following countries are included: Peru, China, Brazil, Chile, UK, Italy, Argentina, US, Switzerland, Pakistan, France, Spain, Japan, Germany, New Zealand, Sweden, Australia, Canada, Finland, Norway, Denmark.
Source: Corak (2013) and OECD (2011).

one-fifth is passed on in the Nordic countries. In a similar vein, Bailey and Dynarski (2011) conducted an empirical analysis of American society after controlling for cognitive ability. They find that for those born in the 1980s, a generation of relatively high income inequality, the income level of one's parents was a stronger determinant of whether one went to college than it was for those born in the relatively income-equal 1960s.

Figure 3, showing the relationship between income inequality and inequality of opportunity, is constructed using data from 41 countries provided by Ferreira and Peragine (2015). The horizontal axis represents income inequality as measured by the Theil-T index. The vertical axis is a measure of inequality of opportunity. Both inequality of opportunity and income inequality are low in the Nordic countries of Denmark, Finland, Norway, and Sweden. On the other hand, Brazil, Guatemala, Panama, and South Africa exhibit both high inequality of opportunity and high income inequality.

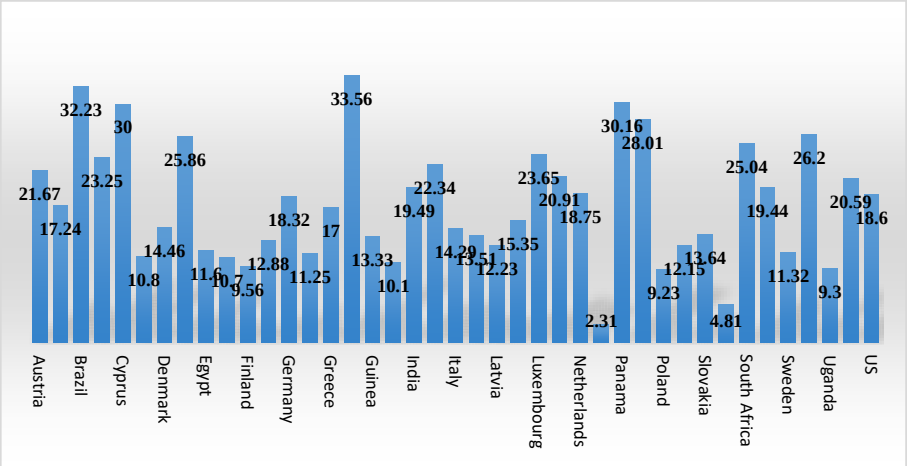
**Figure 3 Relationship between Income Inequality and Inequality of Opportunity**




Notes: Lower income inequality and political inequality values indicate higher equality. Income inequality is measured using the Theil-T index. The following countries are included: Austria, Belgium, Brazil, Columbia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Germany, Ghana, Greece, Guatemala, Guinea, Hungary, India, Ireland, Italy, Ivory Coast, Latvia, Lithuania, Luxembourg, Madagascar, Netherlands, Norway, Panama, Peru, Poland, Portugal, Slovakia, Slovenia, South Africa, Spain, Sweden, Turkey, Uganda, UK, USA.

Source: The data is from Ferreira and Peragine (2015).

**Figure 4 Contribution of Inequality of Opportunity to Income Inequality (%)**




Source: The data is from Ferreira and Peragine (2015).

Denmark has the lowest opportunity inequality at 0.012, whereas inequality of opportunity in Italy is 0.028, in the UK is 0.042, and in the USA is 0.0409. Thus, countries with high intergenerational earnings elasticities under the Great Gatsby Curve also show high inequality of opportunity. A simple regression analysis of income inequality and inequality of opportunity produces a positive estimated coefficient, with an $R^2$ value of 0.838. This implies that the two inequalities are highly and positively correlated.

Figure 4 shows how inequality of opportunity contributes to income inequality. In Guatemala, the contribution of opportunity inequality to income inequality is the highest at 33.56%, followed by Brazil at 32.23%. The United Kingdom and the United States also show high rates: 20.59% and 18.6%, respectively. Norway, on the other hand, is the lowest, at 2.31%.

## 3. MODEL

### 3.1. Demographics, Preferences and Human Capital Accumulation

We modify the Solon (2004) and Seo and Kim (2014) to analyze the cumulative relationships between income inequality, opportunity inequality, and political inequality.[2] To simplify, we make the following assumptions.

1) The population of a society is fixed and normalized at 1.
2) $i$ represents class, and there are two classes (or groups) in a society:[3] the elite class $(h)$ and the ordinary-citizen class $(l)$. Categorized by income level, the elite class is the high-income class (or "the rich") and the ordinary-citizen class includes both lower-income and middle-income citizens.
3) The ordinary-citizen class is significantly more numerous than the elite class. If the population weight of the elite class is $\phi$, then that of the

[2] While Seo and Kim (2014) emphasized the role of welfare systems and trade unions in reducing inequality, this study focused on the interactions between the political and economic spheres.

[3] In this paper, we use *class* and *group* interchangeably.

ordinary-citizen class is $1-\phi$. This means that $\phi < \frac{1}{2}$ and $\phi$ is fixed. Irrespective of political regime, the elite class and ordinary-citizen class are defined as the only two groups making up the population.

4) Members of each class have the same preferences and income.
5) Each family consists of one parent of generation $t$ and one child of generation $t+1$.

We assume the Cobb-Douglas utility function for the representative parent of class *i,*

$$U_{i,t} = (1-\alpha)\log C_{i,t} + \alpha \log Y_{i,t+1}, \quad (1)$$

where $i \in \{h, l\}$.

We assume that the parent is satisfied with his or her own consumption $(C_{i,t})$ and with the child's lifetime income $(Y_{i,t+1})$. $\alpha$ is a parameter indicating the degree of altruism of the parent, having a value between 0 and 1. The closer this value is to 1, the more altruistic the parent is considered to be. We also assume that $\alpha$ and $1-\alpha$ are the same for each class.

Equation (2) represents a representative parent's budget constraint,

$$(1-\tau)Y_{i,t} = C_{i,t} + I_{i,t} + L_{i,t}, \quad (2)$$

where τ represents the tax rate, which is the same for each class.

We assume that the government only spends tax revenue on education subsidies for households, meaning that education subsidies have an income redistribution function. A representative parent of class *i* allocates his or her disposable income $((1-\tau)Y_{i,t})$ to the parent's own consumption $(C_{i,t})$, investment in the child's education $(I_{i,t})$, and expenditures for the acquisition of de facto political power $(L_{i,t})$. Investing in the acquisition of de facto political power means spending on activities (lobbying and political donations) that contribute to the expansion of de facto political power of the respective class. These investments also include maintenance costs of the

organizations (associations and labor unions) that represent the respective class interests.

We assume that a representative parent of class *i* invests a certain percentage $(\beta_i)$ of his or her disposable income in the acquisition of de facto political power.

$$L_{i,t} = \beta_i (1-\tau) Y_{i,t} \ . \tag{3}$$

The expected earnings $(Y_{i,t+1})$ of a representative parent's child at time $t+1$ is determined by the level of human capital at time $t+1$.

$$\log Y_{i,t+1} = \mu_i + p\pi_{i,t+1}. \tag{4}$$

In equation (4), $\pi$ and $p$ represent the levels of human capital and earnings return to human capital, respectively. $\mu_i$ signifies other sources of income, such as asset income, and is assumed to be fixed.

Equation (5) represents the accumulation of human capital. The human capital of class *i*'s children is accumulated both through education and on-the-job training. The accumulation of human capital through education is determined by parental investment in the education of the children $(I_{i,t})$. and government education subsidies to class *i*'s children $(GV_{i,t})$. Additionally, we assume that the human capital accumulated through on-the-job training $(\overline{e}_i)$ is fixed from generation to generation. $\theta$ and $\eta$ represents the marginal product of human capital investment $(I_{i,t}$ and $GV_{i,t})$, marginal product of knowledge and experience formed through on-the-job training, respectively,

$$\pi_{i,t+1} = \theta \log\left(I_{i,t} + GV_{i,t}\right) + \eta \overline{e}_i, \tag{5}$$

where $\theta$, $\eta$ and $\overline{e}_i > 0$.

Elite class parents, having higher incomes, are able to invest in their children's education at a higher level than are members of the ordinary-citizen class. Therefore, $I_{h,t} > I_{l,t}$ is assumed. However, the allocation by the government of education subsidies to each class is determined by the respective political powers of the classes. If the political power of the elite

class is superior to that of the ordinary-citizen class, the interests of the elite class will be more strongly reflected in the allocation of education subsidies. As a result, subsidies will be more concentrated on elite class children. On the other hand, if the political power of the ordinary-citizen class is stronger than that of the elite class, ordinary citizens will decide on the allocation of education subsidies and will allocate more of these funds to their own children.[4)]

If the political power of the elite class $(PO_{h,t})$ is greater than the political power of the ordinary-citizen class $(PO_{l,t})$ — that is, if $PO_{h,t} - PO_{l,t} > 0$ — then the education subsidies per elite-class child $(GV_{h,t})$ will be greater than the tax paid by elite-class parents $(\tau Y_{h,t})$. Equation (6) represents the government education subsidies per elite-class child,

$$GV_{h,t} = \left(\delta_h \tau Y_{h,t}\right), \tag{6}$$

where $\delta_h > 0$.

In equation (6), if the power of the elite class is higher than that of the ordinary-citizen class, elite families will receive education subsidies in excess of tax paid by the elite class, so that $\delta_h > 1$. Thus, through subsidies for education, income is redistributed from the ordinary-citizen class to the elite class. Equation (7) represents government education subsidies per ordinary citizen-class child,

$$GV_{l,t} = \left(\delta_l \tau Y_{l,t}\right), \tag{7}$$

where $\delta_l > 0$.

On the other hand, if the political power of the ordinary-citizen class dominates the political power of the elite class $(PO_{h,t} - PO_{l,t} < 0)$, the ordinary-citizen class in equation (7) will receive education subsidies in excess

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4) For example, suppose that elite-class children attend private schools with high tuition fees, while ordinary citizen-class children attend public schools with little or no tuition fees. If the political power of the elite class dominates that of the ordinary-citizen class, the government's education subsidies will be concentrated on private schools. On the other hand, if the political power of the ordinary-citizen class is superior to that of the elite class, the education subsidies will be concentrated on public schools.

of ordinary citizen-class taxes paid $(\delta_l > 1)$. In this case, the elite class will not receive as much in subsidies as elite-class taxes paid, so that $\delta_h < 1$.

Equation (8) represents the government budget constraint. The government spends collected taxes only on education subsidies.

$$\phi\tau Y_{h,t} + (1-\phi)\tau Y_{l,t} = \phi\delta_h \tau Y_{h,t} + (1-\phi)\delta_l \tau Y_{l,t}. \quad (8)$$

The left side of equation (8) represents the government budget, whereas education subsidies are denoted on the right side.

### 3.2. Political Power

The political power[5] of each class is determined by two factors. The first factor is the number of group members. Under democracy, the number of group members is a more critical factor in determining political power than it is under authoritarianism because of the principle of majority rule. The second determining factor is total investment by class *i* in de facto political power acquisition $(D_{i,t})$.

Based on this assumption, equation (9) represents the function of political power of the ordinary-citizen class, having $1-\phi$ members,

$$PO_{l,t} = \log(n_l(1-\phi))^{\gamma} D_{l,t}^{1-\gamma}, \quad (9)$$

where $0 < n_l \leq 1$ and $0 \leq \gamma \leq 1$.

In equation (9), $\gamma$ represents the degree of democratization of the society. The closer $\gamma$ is to 1, the more political power is determined based on the principle of majority rule. On the other hand, the closer $\gamma$ is to 0, the more the political power of classes is determined by their de facto political power. Thus, under an authoritarian government, this value is close to zero. However, in a more democratic state, γ would approach 1, making investment in de facto political power less efficient.

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[5] Acemoglu and Robinson (2006) define political power as a group's ability to pursue and develop its preferred policies despite the resistance of other groups.

There is a difference between the number of members in the ordinary-citizen class $(1-\phi)$ and the number of ordinary citizen-class members who actually exercise their right to vote $(n_l(1-\phi))$. Many previous studies describe factors leading to this difference: 1) opportunistic behavior by members (Acemoglu and Robinson, 2008), 2) low voter turnout due to high illiteracy rates and difficulty by members to earn a living (American Political Science Association Task Force, 2004),[6] 3) the existence of cleavages based on religious, racial, ethnic, and ideological conflict (Schattschneider, 1960), 4) the existence of a policy regime (Przeworski, 2014), and 5) high distrust of government-led income redistribution policies due to government corruption (Rothstein, 2005). This means that the number of ordinary citizen-class members who actually vote for the interests of the ordinary-citizen class may not reach $1-\phi$; rather, in the presence of the above factors, this number will be less than $1-\phi$.[7] In equation (9), $n_l$ represents the percentage of citizens actually voting for the interests of the ordinary-citizen class. If all ordinary citizens vote for the interests of the ordinary-citizen class, the equation is $n_l = 1$.

Total investment by ordinary-citizens in de facto political power $(D_{l,t})$ is derived from equation (3) as follows:

$$D_{l,t} = n_l(1-\phi)L_{l,t} = n_l(1-\phi)\beta_l(1-\tau)Y_{l,t}. \quad (10)$$

As described above, equation (9) distinguishes between the number of class members actually exercising their right to vote and the total number of members. In contrast, equation (10) distinguishes between the number of

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[6] In the United States, the low-income voter turnout rate is less than 50% due to the struggles such voters endure to earn a living and due to high illiteracy rates. On the other hand, voter participation among the rich is around 90%. In addition, 56% of the wealthy made political donations, while only 6% of low-income families did so. In fact, the top 0.01% accounted for 40% of total political donations. Three-quarters of the rich were involved in political activities. This is in contrast to only 13% of the poor (American Political Science Association Task Force, 2004; Bonica *et al*., 2013).

[7] Class-betrayal voting means lower-income voters or higher-income voters voting for higher-income class or lower-income class interests, respectively. Our model, however, does not include class-betrayal voting. We assume that lower-income voters who do not support lower-income class issues simply do not vote.

ordinary citizen-class members investing in de facto power $(n_l(1-\phi))$ and the total number of ordinary citizen-class members $(1-\phi)$. Thus, equation (10) assumes that those who vote for the interests of the ordinary-citizen class also invest to obtain ordinary citizen-class de facto political power.

Accordingly, equation (9) can be expressed as follows:

$$PO_{l,t} = \log\left(n_l(1-\phi)\right)^{\gamma} (n_l(1-\phi)\beta_l(1-\tau)Y_{l,t})^{1-\gamma}. \quad (11)$$

In the same way, the level of political power of the elite class can be expressed as follows,

$$PO_{h,t} = \log(n_h\phi)^{\gamma} (n_h\phi\beta_h(1-\tau)Y_{h,t})^{1-\gamma}, \quad (12)$$

where $0 < n_h \leq 1$.

Equations (11) and (12) show that if a large number of ordinary citizens do not exercise their right to vote $(n_l < n_h)$ for the five reasons described above, a relatively small number of elites actively participating in an election may be able to form a voting majority.

Equation (13) combines equations (11) and (12) to calculate the difference in power between the two classes.

$$PO_{h,t} - PO_{l,t} = \log(\frac{n_h\phi}{n_l(1-\phi)})(\frac{\beta_h}{\beta_l})^{1-\gamma} + \log(\frac{Y_{h,t}}{Y_{l,t}})^{1-\gamma}. \quad (13)$$

We then derive following:

$$\log(\frac{n_h\phi}{n_l(1-\phi)})(\frac{\beta_h}{\beta_l})^{1-\gamma} = c_0 \text{ and } \log\frac{Y_{h,t}}{Y_{l,t}} = G_t. \quad (14)$$

In equation (14), $G_t$ represents the income gap between the elite class and the ordinary-citizen class in period $t$, the income gap being the level of income inequality in the parent generation.[8)]

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[8)] Since the population of each class is assumed to be fixed and the income of each class member

Equation (13) can be expressed as follows:

$$PO_{h,t} - PO_{l,t} = c_0 + (1-\gamma)G_t . \quad (15)$$

As indicated in equations (14) and (15), the greater the values of $n_h$, $1-\gamma$, $\beta_h$, $\phi$ and $G_t$, the wider will be the political power gap $(P_{h,t} - P_{l,t})$. On the other hand, the greater values of $\gamma, n_l, (1-\phi)$ and $\beta_l$, the smaller the political power gap will be between the elite and ordinary-citizen classes and the more relative political power the ordinary-citizen class will hold.

As shown in equations (6), (7), and (13), income inequality affects investment in de facto political power and this eventually leads to more inequality of political power. Additionally, the growing political power gap between the two classes affects decision-making on the allocation of education subsidies, which further exacerbates the uneven distribution of human capital (equation (5)). As seem in equations (4) and (5), an uneven distribution of accumulated human capital can even affect income inequality in the next generation.

### 3.3. Cumulative Relationship between Income Inequality, Inequality of Opportunity, and Political Inequality

Given equations (2) through (5), maximizing the utility function of a representative parent (equation (1)) under budget constraints (equation (2)) yields an optimal level of human capital investment in the representative child $(I^*)$ as shown in equations (16) through (18).

In equation (16), which describes the utility function of a representative parent of the elite class, κ and λ indicate the return on investment on human capital accumulated through education and the return on investment on human

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is assumed to be the same, the degree of income inequality between classes $(\frac{\phi Y_{h,t}}{(1-\phi)Y_{l,t}})$ is proportional to the income gap between representative parents $(\frac{Y_{h,t}}{Y_{l,t}})$.

capital accumulated through on-the-job training, respectively,

$$U_{h,t} = (1-\alpha)\log((1-\tau)(1-\beta_h)Y_{h,t} - I_{h,t}) + \alpha\mu_h + \alpha\kappa\log(I_{h,t} + GV_{h,t}) + \alpha\lambda\bar{e}_h. \quad (16)$$

where $\kappa = p\theta$ and $\lambda = \eta p$.

Estebez-Abe *et al*. (2001) find that the return on investment ($\kappa$) on human capital accumulated through education (i.e., wage premium from tertiary education) is higher in production systems operating on general technology than in production systems based on firm- or industry-specific technologies. This is because human capital accumulated through education can be applied to general-technology production systems in a wider range of industries and areas. On the other hand, in firm- or industry-specific production systems, the educational wage premium is relatively low, even as the return on investment in human capital accumulated through on-the-job training ($\lambda$) is higher. For example, wage premiums from tertiary education are higher in the United States, which is strong in general technology, than in other countries. This contrasts with countries such as Germany and Denmark, where firm- or industry-specific technologies are considered more valuable and the education premium is relatively low. Therefore, the value of $\kappa$, which represents the educational wage premium, differs from country to country depending on the mix of production systems.

The first-order condition for maximizing utility is as follows:

$$\frac{\partial U_{h,t}}{\partial I_{h,t}} = \frac{-(1-\alpha)}{(1-\tau)(1-\beta_h)Y_{h,t} - I_{h,t}} + \frac{\alpha\kappa}{(I_{h,t} + GV_{h,t})} = 0. \quad (17)$$

Solving for the optimal choice of $I_{h,t}$ yields the following:

$$I^*_{h,t} = \frac{\alpha\kappa}{1-\alpha(1-\kappa)}(1-\tau)(1-\beta_h)Y_{h,t} + \frac{(1-\alpha)}{1-\alpha(1-\kappa)}GV_{h,t}. \quad (18)$$

From equations (4), (5), (6), and (18), the income transmission equation for the elite class is as follows:

$$\log Y_{h,t+1} = \kappa \log Y_{h,t} + \kappa \log \frac{\alpha\kappa(1-\tau)(1-\beta_h) + \delta_h \tau(2(1-\alpha)+\alpha\kappa)}{1-\alpha(1-\kappa)} + \lambda \bar{e}_h + \mu_h. \tag{19}$$

And similarly, the income transmission equation of the ordinary-citizen class is as follows:

$$\log Y_{l,t+1} = \kappa \log Y_{l,t} + \kappa \log \frac{\alpha\kappa(1-\tau)(1-\beta_l) + \delta_l \tau(2(1-\alpha)+a\kappa)}{1-\alpha(1-\kappa)} + \lambda \bar{e}_l + \mu_l. \tag{20}$$

Subtracting equation (20) from equation (19) yields equation (21) as follows:

$$\begin{aligned} \log Y_{h,t+1} - \log Y_{l,t+1} = {} & \kappa(\log Y_{h,t} - \log Y_{l,t}) \\ & + \kappa \log \frac{\alpha\kappa(1-\tau)(1-\beta_h) + \delta_h \tau(2(1-\alpha)+a\kappa)}{\alpha\kappa(1-\tau)(1-\beta_l) + \delta_l \tau(2(1-\alpha)+\alpha\kappa)} \\ & + \lambda(\bar{e}_h - \bar{e}_l) + (\mu_h - \mu_l). \end{aligned} \tag{21}$$

Next, we assume the following:

$\log Y_{h,t+1} - \log Y_{l,t+1} = G_{t+1}$,

$\log Y_{h,t} - \log Y_{l,t} = G_t$, and

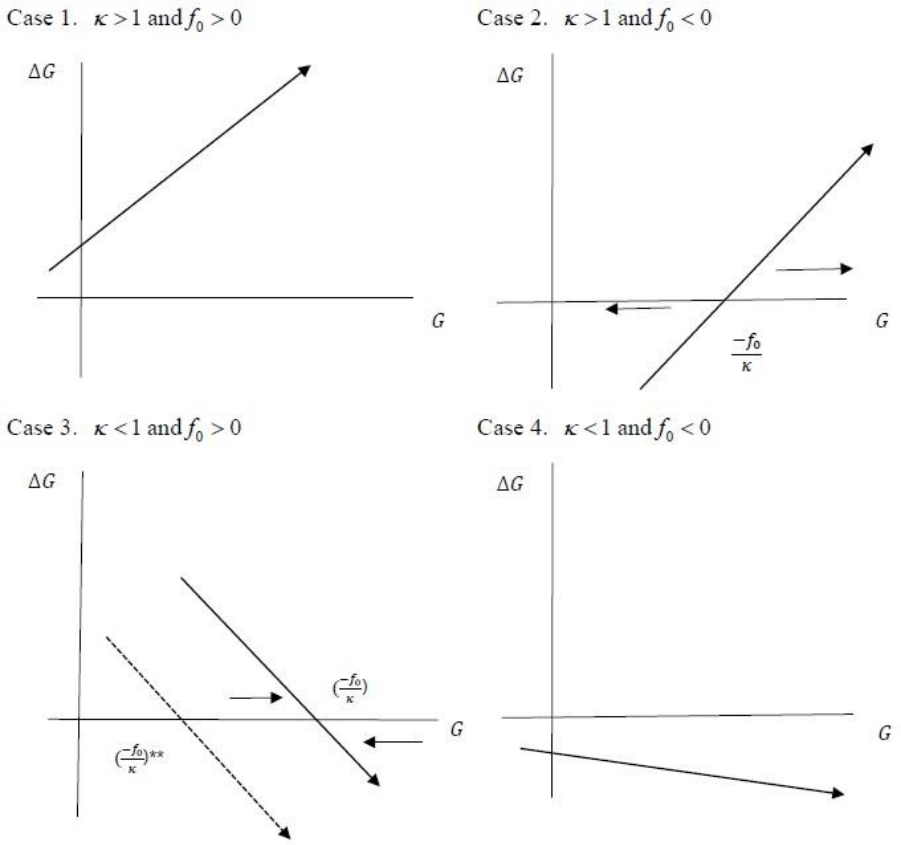
$$\kappa \log \frac{\alpha\kappa(1-\tau)(1-\beta_h) + \delta_h \tau(2(1-\alpha)+\alpha\kappa)}{\alpha\kappa(1-\tau)(1-\beta_l) + \delta_l \tau(2(1-\alpha)+\alpha\kappa)} + \lambda(\bar{e}_h - \bar{e}_l) + (\mu_h - \mu_l) = f_0.$$

Thus, equation (21) is expressed as follows:

$$\Delta G = G_{t+1} - G_t = (\kappa - 1)G_t + f_0. \tag{22}$$

Equation (22) means that the extent to which the child generation can reduce the income gap (or income inequality) relative to the parent generation ($\Delta G <\ > 0$) is determined by the income gap in the parent generation ($G_t$),

**Figure 5 Potential Scenarios**




the return on investment on human capital $(k)$, and the value of $f_0$.

Figure 5 illustrates four scenarios where the income gap between the elite and ordinary-citizen classes in the child generation varies based on the values of $\kappa$, $f_0$ and $G_t$.

In case 1, the larger the income gap in the parent generation, the greater the income gap in the child generation. This is because, if the return on investment on human capital accumulated through education $(\kappa > 1)$ is high enough, the income gap in the parent generation leads to an expenditure gap in the education of children. Because of the high return on investment in education, high-income elites are likely to invest

more in education for their children, and this high investment in education further widens the income gap in the child generation. In addition, since $f_0$ is positive in case 1, the relative weight of investment by elite parents in their children's education $(1-\beta_h)$ is likely to be high, and the asset income earned by elite-class children $(\mu_h)$ is likely to be higher than that of ordinary citizen-class children. Of course, if the political power of elite parents is also superior, the government's education subsidies are concentrated on the children of the elite class, which furthers increase the income gap between the elite class and ordinary-citizen class in the child generation. In case 1, the income gap in the child generation increases relative to the gap in the parent generation regardless of the income gap in the parent generation.

Case 2 represents a different dynamic around $\frac{-f_0}{\kappa}$. If the income gap in the parent generation is sufficiently large ($G_t > \frac{-f_0}{\kappa}$), the gap in the child generation is wider than in the parent generation, making income inequality worse. On the other hand, if the income gap in the parent generation is below a certain level $(G_t < \frac{-f_0}{\kappa})$, the income gap in the child generation decreases relative to the income gap in the parent generation. In case 2, the return on investment in human capital accumulated through education is as high as in case 1 $(\kappa > 1)$. With a high-enough return on educational investment, a sufficiently large income gap in the parent generation ($G_t > \frac{-f_0}{\kappa}$) leads to a disparity in spending by parents on the education of their children, which results in worsening income inequality in the child generation. In this case, the income gap in the child generation increases despite government efforts to redistribute income. On the other hand, if the income gap in the parent generation is small enough $(G_t < \frac{-f_0}{\kappa})$, the disparity in spending by parents on the education of their children drops. And if the human

capital accumulated through on-the-job training of ordinary citizen-class children ($\bar{e}_l$) is sufficiently high or if education subsidies are focused on the children of the ordinary-citizen class, the income gap between the elite and ordinary-citizen classes falls in the child generation.

In case 3, the return on investment in human capital accumulated through education is relatively low ($\kappa < 1$). However, if the education subsidies are directed mainly to elite-class children, or if the asset income of the elite-class children is high, then the income gap in the child generation converges on the equilibrium income gap of the parent generation ($\frac{-f_0}{\kappa}$). Therefore, the income gap between the parent and child generations do not improve from one generation to the next. Of course, if the political power of the ordinary-citizen class is so strong that the subsidies for education are concentrated on the ordinary-citizen class, or if the accumulation of human capital through on-the-job training of the ordinary-citizen class is strong, the equilibrium income gap shifts from $(\frac{-f_0}{\kappa})^*$ to $(\frac{-f_0}{\kappa})^{**}$.

In case 4, the investment return on human capital is low ($\kappa < 1$). If the political power of the ordinary-citizen class is so strong that education subsidies are concentrated on the children of the ordinary-citizen class, or if the accumulation of human capital from on-the-job training of the ordinary-citizen class is high, then the income gap between the elite class and the ordinary-citizen class decreases in the child generation regardless of the income gap in the parent generation.

### 3.4. Equalizing Effects of Democracy

Meltzer and Richard (1981) argued for the equalizing effects of democracy, asserting that if income inequality increases under democracy, the majority of

citizens will support income redistribution policies, which will eventually bring income inequality levels back down. However, despite the increase in income inequality since the 1980s, very few civic groups have used their political influence to promote higher taxes on the wealthy and income has not been effectively redistributed. Rather, a small number of the wealthy have used their economic positions to influence political decision-making out of proportion to their numbers and have effected changes to policies and systems that favor themselves, and have thus monopolized market opportunities (Stiglitz, 2012). In other words, the equalization effects of democracy have not functioned in accordance with the claims by Meltzer and Richard.

Using the above model, we explain why the Meltzer and Richard hypothesis has not materialized in the real world.

1) Meltzer and Richard Case: $\gamma = 1$ and $n_h = n_l = 1$

Meltzer and Richard assume pure democracy where decisions are made through majority rule; thus, the Meltzer and Richard case describes conditions of $\gamma = 1$ in equation (23) and $n_h = n_l = 1$ in equation (13). In this scenario, complete democratization has been achieved $\gamma = 1$ and members of each class vote in the interests of their own class $(n_h = n_l = 1)$. In equation (23), the political powers of the elite and ordinary-citizen classes are proportional only to their respective populations, so political decisions are made and income is redistributed in accordance with the wishes of the ordinary-citizen class, which makes up a majority of the population.

$$PO_{h,t} - PO_{l,t} = \log \frac{\phi}{1-\phi} < 0. \tag{23}$$

In this case, education subsidies (or income redistribution) are passed on to the ordinary-citizen class, and $f_0 < 0$ if $\delta_l$ is large enough. As a result, the income gap is reduced in the child generation. In cases 2 and 4 in figure 5, income inequality in the child generation is reduced.

However, the Meltzer and Richard hypothesis fails to actuate under conditions of low ordinary-citizen class voter turnout $(0 < n_l < 1)$ and under a captured democracy.

2) Captured democracy: $0 < \gamma < 1$ and $n_h = n_l = 1$

$$PO_{h,t} - PO_{l,t} = \log(\frac{\phi}{(1-\phi)})^{\gamma}(\frac{\phi\beta_h Y_{h,t}}{(1-\phi)\beta_l Y_{l,t}})^{1-\gamma} > 0 . \quad (24)$$

If the elite class invests heavily in de facto political power in equation (24), the political power of the elite class surpasss that of the ordinary-citizen class. If this happens, education subsidies are directed to elite class children, and $f_0 > 0$ if $\delta_h$ is large enough. In this case, the income gap in the child generation is widened relative to the parent generation (case 1 of figure 5), or the income gap in the parent generation is maintained without reducing the income gap in the child generation (case 3 of figure 5). Thus, if the elite class, which is a numerical minority, fully invests in de facto political power, and the political power of the elite class comes to dominate the political system, then income is redistributed from the ordinary-citizen class to the elite class. As a result, inequality in the child generation expands or remains the same relative to inequality in the parent generation.

3) Ordinary citizens fail to exploit their numerical advantages due to the above five reasons: $\gamma = 1$ and $n_h\phi > n_l(1-\phi)$

$$P_{h,t} - P_{l,t} = \log\frac{n_h\phi}{n_l(1-\phi)} > 0 . \quad (25)$$

Among ordinary citizens, high illiteracy, opportunistic behavior and government corruption result in low voter turnout or distrust of government-led income redistribution policies. In this scenario, the number of actual voters in the elite class may surpass that of actual voters from the ordinary-citizen class, so that the political power of the elite class dominates. In this case, education subsidies are directed toward the children of the elite class. As in the case of a captured democracy, inequality in the child generation expands or remains the same relative to inequality in the parent generation.

In a captured democracy or when ordinary citizens fail to exploit their numerical advantage income is not redistributed adequately, an outcome that

contravenes expectations under the Meltzer and Richards model.

## 4. CONCLUSION

This study examines the much-studied increase in income inequality since the global financial crisis, as well as the increase in other forms of inequality (political inequality and inequality of opportunity). By recognizing that the dynamics of inequality are not limited to the economic sphere, but instead result from interactions between the political and economic spheres, our study describes mechanisms through which inequality can result in both economic crises and crises of democracy.

In this paper, we examine how income inequality, inequality of opportunity, and political inequality are interrelated by building a model comprising two classes — the elite class and the ordinary-citizen class. A unique contribution of this study is the introduction of a function for the determination of political power wherein the political power of each class is determined not only by population, but also by de facto political power, which is influenced by income. This political power further influences the adoption of policies, which in turn affect inequality of opportunity and income inequality.

We also examine how income inequality promotes inequality of opportunity by considering an intergenerational income transmission equation mediated by human capital accumulation and consider whether inequality of opportunity increases income inequality from generation to generation. Our research emphasizes that income inequality is not limited to a single generation, but is passed on, and that the accumulation of human capital of children is influenced by parental background and wealth. We also consider how political inequality affects inequality of opportunity and income inequality by finding that political power determines the allocation of education subsidies, which further influences the accumulation of human capital.

Therefore, this paper describes the contemporaneous increase in various types of inequality rising on a global level by investigating the cumulative

causal relationships among these types of inequality.

Using this model, we find that, in contrast to the assertion by Meltzer and Richard (1981), when political inequality and inequality of opportunity rise, democracies may struggle to solve the problem of income inequality through the voting process. In contrast to the prediction made by Meltzer and Richard, the equalizing effects of democracy do not function as expected in a captured democracy in which income inequality in the economic sphere creates political inequality in the political sphere, or when there are cleavages in the ordinary-citizen class or the voter turnout rate of the ordinary-citizen class falls for various reasons.

The cumulative increases in the types of inequality described in this study suggest that issues of income inequality are not limited to the economic realm, and that income inequality also affects other areas of society, including politics. This study further confirms the need for political reform — as well as improvements in other areas of society — to mitigate income inequality (Boyer, 2015).

## REFERENCES

Acemoglu, D., S. Restrepo, and J. Robinson, "Democracy, Redistribution and Inequality," NBER Working Paper No. 19746, 2013.

Acemoglu, D. and J. Robinson, "Persistence of Power, Elites, and Institutions," *American Economic Review*, 98(1), 2008, pp. 267-293.

_____, *Economic Origins of Dictatorship and Democracy*, New York: Cambridge University Press, 2006.

American Political Science Association Task Force, "American Democracy in an Age of Rising Inequality," *Perspectives on Politics*, 2(4), 2004, pp. 651-666.

Bailey, M. J. and S. M. Dynarski, "Inequality in Postsecondary Education," in Greg J. Duncan and Richard J. Murnane, eds., *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances*, New York:

Russell Sage Foundation, 2011.

Bartel, L., *Unequal Democracy: The Political Economy of a New Gilded Age*, Princeton, NJ: Princeton University, 2008.

Bonica, A., N. McCarty, K. Poole, and H. Rosenthal, "Why Hasn't Democracy Slowed Rising Inequality?," *Journal of Economic Perspectives*, 27(3), 2013, pp. 103-124.

Boyer, R., *Economie politique des capitalisms*, Paris: La Découverte, 2015.

Corak, M., "Income inequality, equality of opportunity, and intergenerational mobility," *Journal of Economic Perspectives*, 27(3), 2013, pp. 79-102.

Dubrow, J., "Cross-National measures of political inequality of voice," *ASK*, 19(1), 2010, pp. 93-110.

Estevez-Abe, M., T. Iversen, and D. Soskice, "Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State," in A. Hall and D. Soskice, eds., *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford: Oxford University Press, 2001.

Ferreira, F. and V. Peragine, "Equality of Opportunity: Theory and Evidence," Policy Research Working Paper, No. 7217, 2015.

Gilens, M., "Inequality and Democratic Responsiveness," *Public Opinion Quarterly*, 69(5), 2005, pp. 778-796.

Gradstein, M. and B. Milanovic, "Does Liberté = Egalité? A Survey of the Empirical Links between Democracy and Inequality with Some Evidence on the Transition Economies," *Journal of Economic Surveys,* 18(4), 2004, pp. 515-537.

Hacker, J. and P. Pierson, *Winner-take-all Politics: How Washington Made the Rich Richer and Turned its Back on the Middle Class*, New York: Simon & Schuster Paperbacks, 2010.

Kim, J., "Children Facilities, Availability of Substitute Workers and Parental Leave Utilization," *Korea and the World Economy*, 19(2), 2018, pp. 137-168.

Meltzer, A. H. and S. F. Richard, "A Rational Theory of the Size of Government," *Journal of Political Economy*, 89(5), 1981, pp. 914-927.

Mukand, S. and D. Rodrik, "The Political Economy of Ideas: On Ideas versus Interests in Policymaking," NBER Working Paper No. 24467, 2018.

Mulligan, C. B., R. Gil, and X. Sala-i-Martin, "Do Democracies Have Different Public Policies than Nondemocracies?," *Journal of Economic Perspectives*, 18(1), 2004, pp. 51-74.

OECD, *Divided We Stand: Why Inequality Keeps Rising*, Paris: OECD, 2011.

Ostry, J., A. Berg, and C. G. Tsangarides, "Redistribution, Inequality and Growth," IMF Staff Discussion Note, SDN/14/02, 2014.

Rawls, J., *A Theory of Justice*, revised edition, Harvard University Press, 1999.

Scheve, K. and D. Stasavage, "Democracy, War, and Wealth: Lessons from Two Centuries of Inheritance Taxation," *American Political Science Review*, 106(1), 2012, pp. 82-102.

_____, "The Conscription of Wealth: Mass Warfare and the Demand for Progressive Taxation," *International Organization,* 64(4), 2010, pp. 529-561.

_____, "Institutions, Partisanship, and Inequality in the Long Run," *World Politics,* 61(2), 2009, pp. 215-253.

Seo, H. and J. Kim, "Cumulative Increase of Income Inequality, Political Inequality and Inequality of Opportunity: New Roles of Welfare System and Trade Union," *Review of Science and Economic Studies*, 45, 2014, pp. 231-275.

Sirowy, L. and A. Inkeles, "The Effects of Democracy on Economic Growth and Inequality: A Review," *Studies in Comparative International Development,* 25(1), 1990, pp. 126-157.

Solon, G., "A Model of Intergenerational Mobility Variation over Time and Place," in M. Corak, ed., *Generational Income Mobility in North America and Europe*, Cambridge: Cambridge University Press, 2004.

Stiglitz, J. E., *The Price of Inequality: How Today's Divided Society Endangers Our Future*, New York: W.W. Norton & Company, 2012.

Stockhammer, E., "Rising Inequality as a Root cause of the Present Crisis," PERI Working Paper Series 282, 2012.

Tridico, P., "Financial Crisis and Global Imbalances: Its Labour Market

Origins and the Aftermath," *Cambridge Journal of Economics*, 36(1), 2012, pp. 17-42.

World Bank, *World Development Report 2006: Equity and Development*, Washington DC: Oxford University Press, 2006.

World Inequality Lab, *World Inequality Report 2018,* 2017.