

Income Inequality, Inequality Growth Patterns, and Social Mobility:
Examining the Dynamics of Great Gatsby Curve

Dongkyu Kim
Department of Political Science
University of Texas Rio Grande Valley

Abstract

In most recent studies, income inequality is understood as an unequal and thus unfair distribution of income. Income inequality is to reduce social mobility, which is aptly depicted by the “Great Gatsby Curve,” a negative relationship between inequality and social mobility. Recent studies provide much insight about the relationships between inequality and social rigidity, but it remains unclear under what conditions the unequal distribution of income jeopardizes social mobility. This paper focuses on the growth patterns of income inequality in recent decades to identify a specific mechanism of the Great Gatsby Curve. It is hypothesized that the persistent growth of inequality can generate the negative relationship between inequality and mobility. After examining the growth patterns of inequality across nations, this paper employs a regression analysis to test the interaction between income inequality and its growth patterns to explain social mobility. The results provide strong empirical evidence for the hypothesis that the persistent growth of inequality is critical to generating the Great Gatsby Curve.

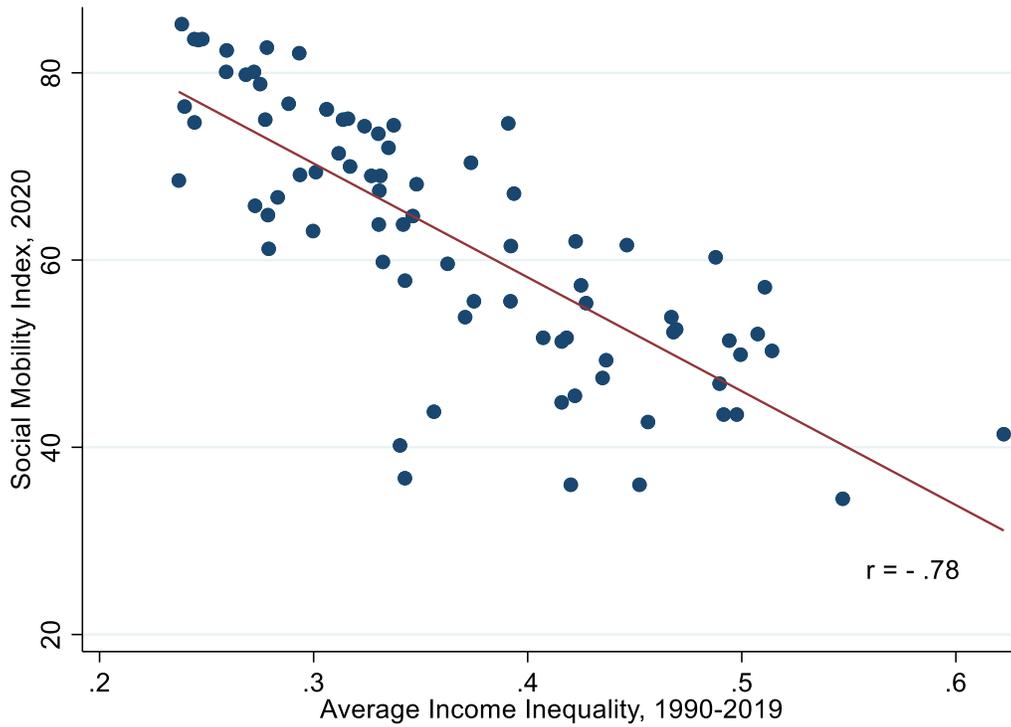
Introduction

Income inequality has received much scholarly attention across diverse disciplines in recent decades. In most cases, income inequality is often understood as an unequal, thus unfair, distribution of income, leaving little room for the long-held liberal tolerance of inequality as a mechanism for social mobility (Benabou and Ok, 2001; Chetty et al., 2014; Corak, 2013). The concept that connects income inequality to the unfairness in opportunities is supported by the “Great Gatsby Curve.” As Corak (2013) once aptly puts it, the curve could be evidence for the argument that inequality at a certain time point would refer to the reduced mobility across generations, as shown below in Figure 1. With the Global Social Mobility Index across 79 economies in 2020, provided by the World Economic Forum¹, the average income inequality between 1990 to 2019 shows a noticeable negative relationship with the mobility index ($r = -.78$). Income inequality could ultimately mean the unfairness of opportunities by making the social ladders less available for future generations.

Unfortunately, however, our understanding of the Great Gatsby Curve is limited. As we all may acknowledge, a strong correlation between inequality and intergenerational mobility, as shown in Figure 1, does not necessarily mean a causal relationship. Furthermore, our knowledge of the curve is still limited as both of these topics have been studied in an isolated fashion in academia. For instance, while political scientists mostly pay attention to the consequences of economic inequality, sociologists and economists tend to focus primarily on the dynamics of intergenerational mobility itself and its behavioral and attitudinal consequences (Alesina and La Ferrara, 2005; Chetty et al., 2014; Piketty and Saez, 2003; Solt, 2008a). The attempt to understand the relationship between inequality and mobility is a recent phenomenon, which is the focal point of this study (Andrews and Leigh, 2009; Carroll and Chen, 2016; Corak, 2013; Durlauf and Seshadri, 2018; Kim et al., 2021).

¹ The Global Social Mobility Index was provided by the World Economic Forum and measures the intergenerational mobility with ten pillars in five categories – Health, Education, Technology Access, Work, and Social Protection and Inclusive Institutions across 82 global economies. However, data were only available for 81 countries from the website. Missing counties is Morocco. Serbia and Saudi Ariba are additional omitted due to the lack of other data.

Figure 1. The Great Gatsby Curve: Income Inequality and Social Mobility Index



What accounts for the impact of inequality on social mobility? In particular, under what conditions does income inequality worsen social rigidity? In this paper, I focus on the growth patterns of income inequality over the last three decades in explaining the international variation of social mobility in 2020. The existing studies lend some insights. Many scholars focus on the impact of the differential childhood development process that a skewed income distribution could create, for instance, through the dynamics of income segregation (Bénabou, 1996a, 1996b; Corak, 2013; Durlauf, 2004; Durlauf and Seshadri, 2018). Given the influence of socioeconomic status on early childhood development, many factors are at play to make income inequality create social immobility through family resources, connections, neighborhoods, school fundings, even family culture or parents' innate ability that can be transmitted to the next generations.

In this article, I focus on the growth patterns of income inequality to understand the causal relationship between income inequality and social mobility rather than focusing on micro-mechanisms of childhood development. The approach is critical to examine the causality of the Great Gatsby Curve in many points. Economic inequality, by definition, measures the structures

of the cross-sectional income distribution in a society at a given time. Although a repeated measure of inequality could create its temporal variations, the operationalization itself is cross-sectional in nature. On the other hand, social mobility is fundamentally a temporal construct. Of course, there could be diverse concepts of social mobility, such as intra-generational income mobility, inter-generational income mobility, occupational mobility, or educational mobility. However, the concept of social mobility itself has a built-in temporal component. Accordingly, paying attention to the formative period of social mobility, thus the development patterns of inequality over generations, should provide us critical insights to understand the causal relationship between economic inequality and social mobility.

The approach is novel in understanding the Great Gatsby Curve. In the existing studies, income inequality often carries equal weights across time and space. Given much scholarly attention paid to the case of the United States partly due to the Curve's apparent contrast to the idea of the American Dream, the existing approach to focus on the skewness of the income distribution can be justified as far as the scope of the study is within the United States, or within advanced economies (see, e.g., Corak, 2013; Durlauf and Seshadri, 2018). That is because, as I will show in the next section, income inequality has been persistently grown in most advanced economies. However, with a global perspective, we can no longer justify the existing approach. As the next section will also reveal, the growth trajectory of economic inequality widely varies beyond developed countries. If we want to observe the relationship between income inequality and social mobility from a global perspective, we cannot simply assume that inequality carries the same weight across countries. I hypothesize that the persistent growth of economic inequality over time would make the mechanisms for the Great Gatsby Curve work. If a society has experienced a recent development of inequality or reduced inequality over time, the negative impact of inequality of social mobility should be significantly lower.

For testing this hypothesis, I mainly deploy two datasets; the 2020 Global Social Mobility Index (GSMI) provided by the World Economic Forum for 82 economies² and the Standardized World Income Inequality Database (SWIID) version 9.2 (Solt, 2020). The GSMI index measures

² <https://www.weforum.org/reports/global-social-mobility-index-2020-why-economies-benefit-from-fixing-inequality>

the overall performance of each country on five key dimensions of social mobility: health, education, technology, work, and protection and institutions. The five dimensions were scored with 10 pillars from 51 indicators, and the index is the average score of ten pillars: health, education access, education quality & equity, lifelong learning, technology access, work opportunities, fair wages, working conditions, social protection, and inclusive institutions. As for income inequality, I use the standardized household disposable income Gini coefficient. Based on a variety of sources, such as the United Nations University's World Income Inequality Database, the OECD Income Distribution Database, World Bank, etc., it imputes inequality to provide an internationally comparable index.

With these two datasets, this paper explores the patterns of inequality development since 1990 to understand the cross-national variation of GSMI. The starting point was arbitrarily set for inequality to have enough time to materialize its negative generational influence in making a society immobile. I believe about 30 years could be long enough to scrutinize the long-term relationship between inequality and mobility. The following section examines the growth patterns of inequality across countries for about three decades. Then, this paper analyzes how the inequality growth patterns affect the level of social mobility as of 2020. After briefly examining some theoretical underpinnings of this paper's approach, this paper will take advantage of the multivariate regression analysis to explore the Great Gatsby Curve. In doing so, this paper will also examine how the growth pattern of inequality affects different dimensions of social mobility.

Growth Patterns of Income Inequality: 1990 - 2019

Given much attention to income inequality, we can easily assume that income distribution has been skewed in many countries. However, no study systematically explores inequality's growth patterns over time cross-nationally to my best knowledge. Partly because the concept of income inequality is cross-sectional in nature, most studies focus on the shape of the income distribution when it comes to understanding the dynamics of income inequality or its consequences. Due to this, lots of questions are left unanswered. Have income inequality grown in most countries, as is often assumed? Are there any countries that have developed a more

egalitarian distribution of incomes over time? What commonalities do countries have if they have experienced similar patterns of increased or decreased income inequality over time? This section addresses these questions by examining 79 countries with enough data points for both disposable income inequality and social mobility.

A. Growth Patterns of Income Inequality in Advanced countries

Figure 2. The Growth Patterns of Income Inequality in North America

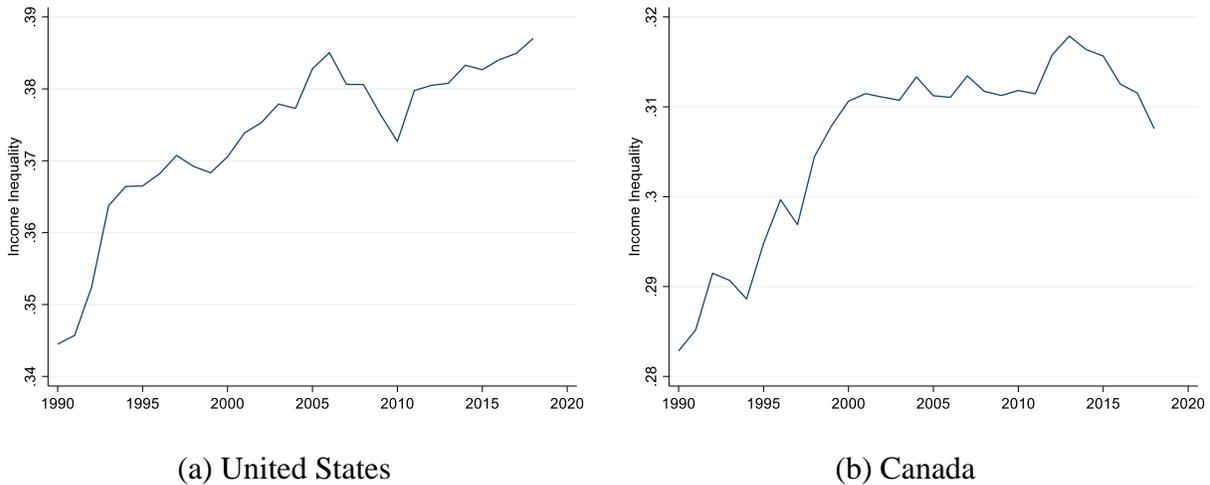
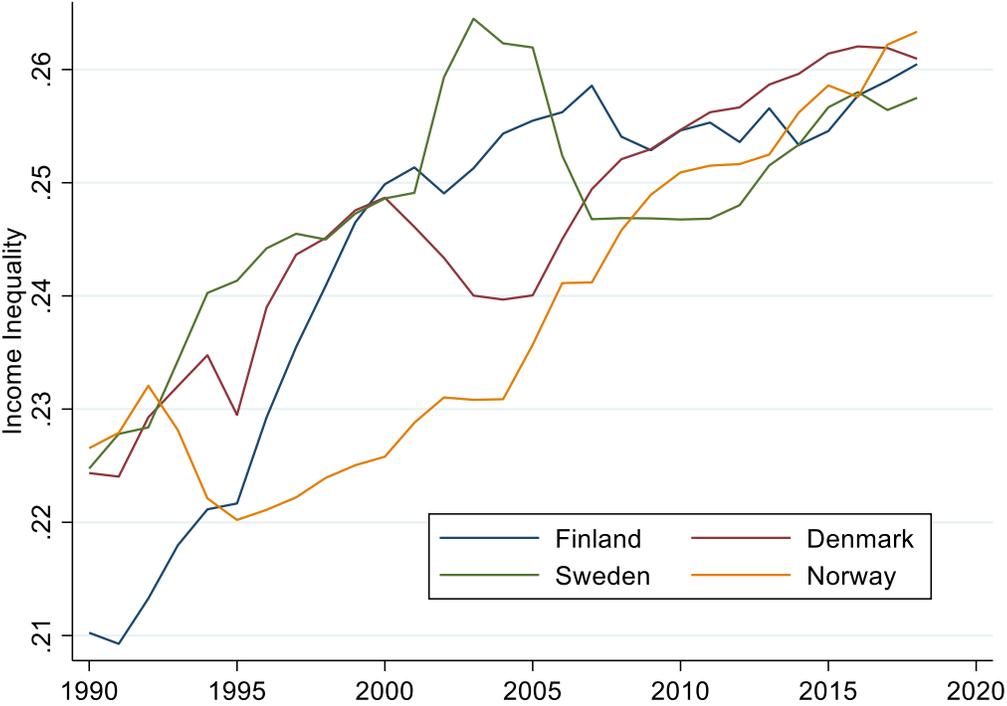


Figure 2 provides the growth patterns for two advanced countries in North America. We can clearly see an increasing trend for over three decades with some minor ups and downs for both countries. Interestingly, however, this pattern of persistently increasing inequality is common across the advanced economies. Among 17 advanced economies, which have been frequent target samples in the literature of welfare states (Esping-Andersen, 1990; Garrett, 1998; Katzenstein, 1985; Swank, 2002), most countries except for both Switzerland and the United Kingdom have shown the similarly increasing pattern of income inequality. Although there are some minor temporal fluctuations, it is safe to say that income inequality has steadily grown in most advanced economies. This can explain the scholarly attention paid to the skewed distributions of wealth in rich countries.

There are two noticeable patterns for the growth of income inequality among advanced countries. First, it is surprising to observe that income inequality has steadily increased even in

Northern European countries. These are so called the Scandinavian welfare states, or coordinated market economies that have established political, economic, and social institutions in the late twentieth century to address inequality in the labor market by coordinating market and public actors (Esping-Andersen, 1990; Hall and Soskice, 2001; Hollingsworth and Boyer, 1997). Even with the coordinated efforts to compress wages across occupations, provide generous welfare benefits, and compensate the economic risks of workers, however, income inequality has continued to rise in the past three decades in these countries. Figure 3 shows an unequivocal pattern of persistently increasing inequality for Denmark, Finland, Norway, and Sweden. This is a striking picture as rising inequality has been considered to be a typical feature of only the liberal market economies, such as the United States, Canada, Australia, or New Zealand, up until the late 1990s (Kenworthy and Pontusson, 2005). Apparently, with two more decades into the analysis, the Northern European countries begin to develop the pattern similar to their liberal market counterparts.

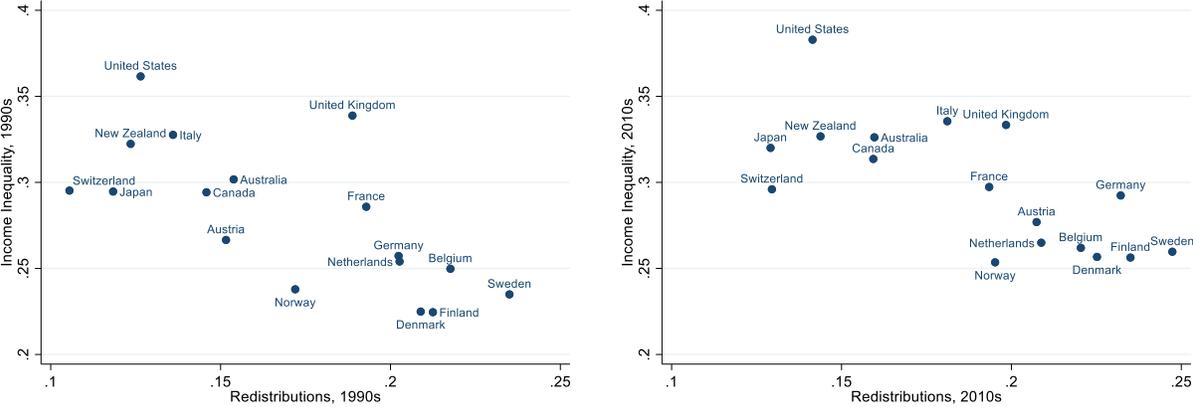
Figure 3 The Growth Patterns of Income Inequality in Northern Europe



Second, what differentiates these Northern European countries from the rest of the advanced economies is their initial starting point in the 1990s. Based on the established welfare

state institutions, the levels of income inequality in 1990 across these countries are low compared to other advanced countries. As was shown in Figure 3, the inequality index is around 0.22, which indicates that these countries were relatively more egalitarian than other countries. However, despite the redistribution, the increase in disposable income inequality seems apparent. Following Kenworthy and Pontusson (2005), we can measure the government’s redistributive efforts through social welfare policies by subtracting the disposable income inequality index from the inequality measure based on market gross income. The scatter plot of the redistribution measure with respect to the disposable income inequality shows the pattern clearly. The left side of Figure 4 shows how redistributive efforts addressed the disposable income inequality in the 1990s, while the right side of the same figure for the 2010s. From left to right, we can clearly see that income inequality has been generally increased across most advanced economies regardless of their efforts for redistribution.

Figure 4 The Growth Patterns of Income Inequality in Advanced Economies: 1990s vs. 2010s



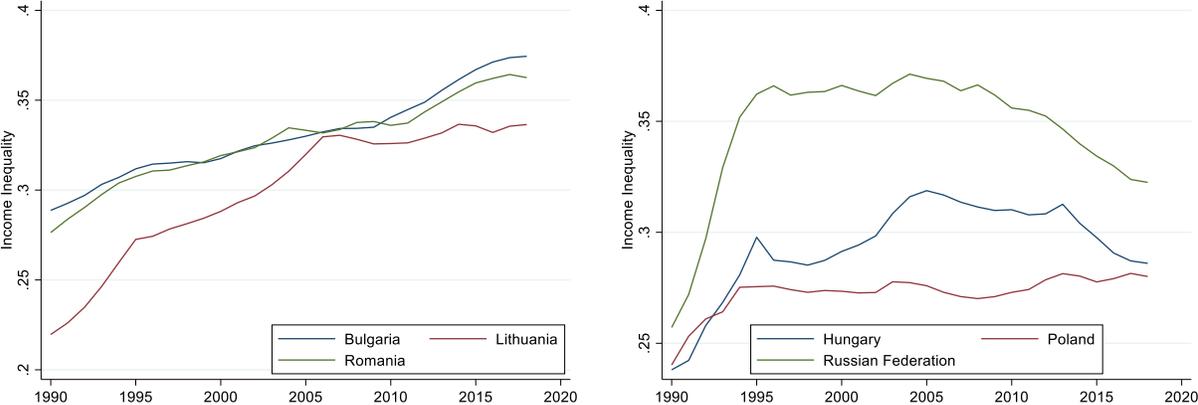
This increasing trend of income inequality across advanced economies is in line with the predictions of traditional trade theories. According to the Heckscher-Ohlin model, or Stolper-Samuelson theorem, the scarcity of the production factor tends to determine the relative wage of the factor owners under globalization (Rogowski, 1989). Through global economic integration developed at an unprecedented pace in the late twentieth century, the advanced economies have become labor scarce, through which the wages of workers are stagnant and decline in a comparative perspective. Under severe import competition, workers in developing countries undercut unskilled laborers in advanced countries. Inequality is to rise in this period. In that

regard, many scholars have argued for the compensation hypothesis that welfare states in developed countries are to bumper off the external risks emanating from economic globalization (Cameron, 1978; Garrett, 1998; Jensen and Skaaning, 2014; Katzenstein, 1985; Rodrik, 1997, 1998). What is interesting here is that the increasing trend has occurred across different arrangements for social welfare policies.

B. Growth Patterns of Income Inequality in Developing countries

As a residual category, developing countries show a variety of inequality growth patterns over the three decades. In general, however, two distinctive patterns emerge. First, some countries follow the trajectory of advanced economies. In that regard, transitional economies in Central and Eastern Europe, the Baltic countries, and former member countries of the Soviet Union display an interesting pattern of inequality growth. As Figure 5 clearly shows, the overall increase in inequality in transition economies is evidential. In particular, the rapid growth of inequality is evident for the first decade after the transition. Of course, some countries have been able to address inequality successfully in the recent decades by lowering inequality before that of the 1990s. Kazakhstan and Moldova are good examples. However, in other transition economies among a total of 18 countries, inequality has been worsened compared to that of the 1990s. This pattern is consistent with what existing studies have found about the inequality in transitional economies (Bourguignon and Pleskovic, 2007).

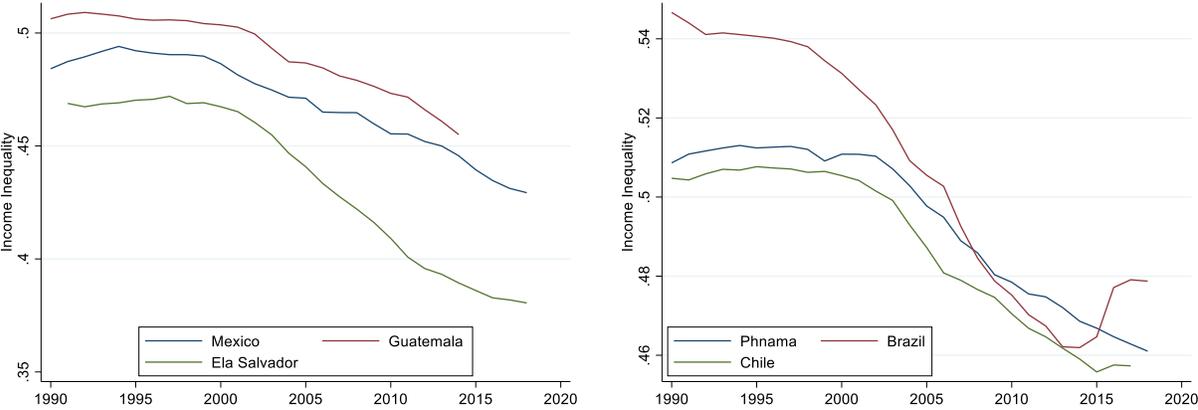
Figure 5 The Growth Patterns of Income Inequality in Transition Economies



Some developing countries have also followed the increasing trajectory of inequality growth in the last three decades. For these countries, it is difficult to identify geographical clusters as these countries are spread out across the globe. What is interesting with these countries is that they entered the 1990s with a slightly more skewed distribution of income compared to the transitional economies. For example, some countries started the 1990s with about 0.4 Gini index, including countries such as Cameroon, Ghana, Ivory Coast, Egypt, Costa Rica, and India, while developing a further increasing pattern of inequality in the next three decades. In the case of the Republic of Korea, its initial inequality started around 0.3 but consistently grew for the past decades.

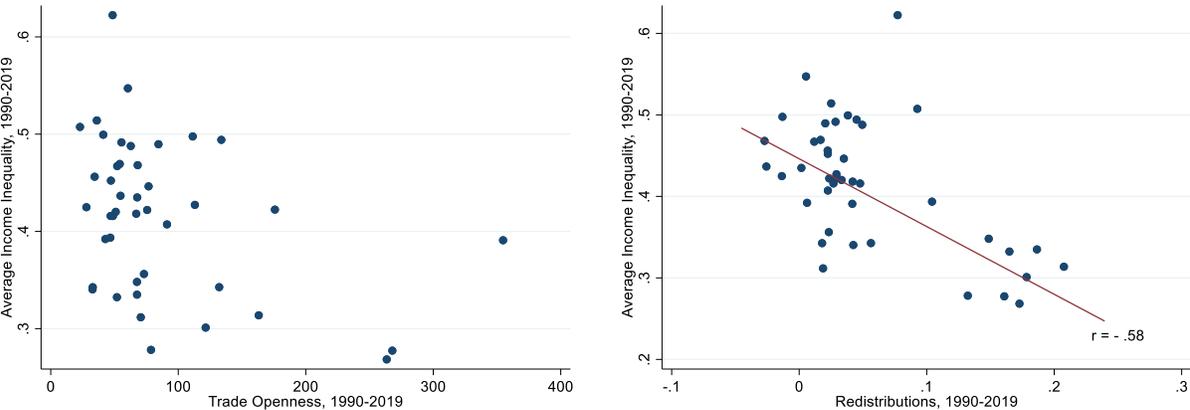
Second, some developing countries have shown an opposite pattern. Among 79 countries under consideration, 19 developing countries have followed a noticeably egalitarian trajectory in their recent history of income distribution structures. This pattern is prominent among Latin American countries. As Figure 6 clearly shows, these countries started the 1990s with a relatively high level of inequality. However, over the three decades, inequality growth has been negative for these countries. If we consider the last two decades, inequality has a clear declining pattern in all Latin American countries except Costa Rica. However, we also observe some declining patterns outside the Western Hemisphere. The list of countries includes Singapore, Ireland, Iceland, Malta, Greece, etc.

Figure 6 The Declining Patterns of Income Inequality in Latin America



Given much attention paid to the ever increasing income inequality under globalization, such declining patterns of inequality unfolding in some developing countries over time seem surprising and interesting. However, in the perspective of the traditional trade theories, declining inequality in the age of globalization rather makes sense with an assumption that these developing countries actively participated in the global integration of markets. If we examine the argument cross-sectionally, we can understand why inequality was lower in some countries and higher in other countries in the developing world. Figure 7 visualizes that argument. With the most popular measure of trade openness as the GDP percentage of import and export values, we can see that more open economies in non-transitional and less developed countries (LDCs) will substantially reduce the level of inequality. At the same time, in the cross-sectional standpoint, governmental efforts for wealth redistribution also significantly address the unequal distribution of income. On the right-side scatterplot of Figure 7, we can see that income inequality goes down as the level of the welfare efforts (market Gini – disposable income Gini) increases.

Figure 7 Globalization, Redistribution, & Income Inequality: Non-traditional LDCs



This section examined the growth pattern of income inequality from a global perspective while briefly reflecting upon the external sources of income inequality growth (globalization) and domestic measures to address the skewed distribution of income (redistribution efforts). Some clear patterns have emerged. First, income inequality has risen in most advanced economies in the last three decades. Second, however, the increasing trend of income inequality is not confined only to the developed economies. Many developing countries have also experienced a rising trend in income inequality. Among them, transitional economies in the

Central and Eastern Europe and post-Soviet countries are geographically clustered. Lastly, other developing countries, especially Latin American countries, have experienced a declining income inequality over the last three decades. I will put these patterns into a systematic empirical analysis in the following sections.

Intensified Inequality & Social Mobility

To my best knowledge, no studies have paid attention to the growth patterns of inequality to study its dynamics and consequences. In most inequality studies for advanced countries, it is largely assumed that inequality has been worsened everywhere (see, e.g., Bartle et al., 2017; Newman et al., 2015; Solt, 2008b). Based on what has been discussed in the previous section, it is a good assumption to make only for advanced countries. However, it is not valid from the global perspective. First, the increasing trend of inequality is also observed in some developing countries. Second, income inequality has shown the opposite growth pattern in other developing countries in recent decades. Thus, without considering the varying patterns of inequality growth over time, the existing studies cannot answer how these differences affect social mobility across countries.

Of course, the level of inequality, instead of its growth pattern, is critical to understanding the mechanisms of the Great Gatsby Curve. With the role of communities to incubate human capital and create varying levels of productivity (Bénabou, 1996a; Durlauf, 1996; Fernandez and Rogerson, 1996) and the neighborhood and network effects to determine education and labor market outcomes (Topa and Zenou, 2015), heightened inequality would reduce social mobility through the process of economic segregation (Durlauf and Seshadri, 2018; Reardon and Bischoff, 2011). An important aspect of these Great Gatsby Curve's processes is that the intergenerational transmission of intangible assets through economic segregation takes a long-term process, at least a generational process. Although many scholars acknowledge the importance of chronic inequality, few studies have provided a systematic analysis about how the Great Gatsby Curve works across different growth patterns of inequality. This paper provides one.

In that regard, this paper argues that income inequality decreases social mobility through the persistently intensified inequality. The skewed distribution of income itself could not be enough to expedite the mechanisms we know about the Great Gatsby Curve. On the one hand, as emphasized above, the formative process to create social rigidity across generations takes a long time. Economic segregation does not happen overnight. In this perspective, we can see that the prior research has tried to understand a fundamentally longitudinal process with a cross-sectional analysis. The empirical truism that cross-sectional comparisons cannot prove causality cannot be more correct than this case (Durlauf et al., 2009). On the other hand, the argument is in line with the traditional liberal tolerance of inequality. The differential income structure has been the basic incentive structure to reward those individuals who climb up the social ladder and punish the downwardly mobile. In that regard, what really matters for the mechanism of the Great Gatsby Curve is how individuals perceive the skewed distribution of income (Gimpelson and Treisman, 2018; Habersack et al., 2021; Heiserman et al., 2020).

With persistently worsening inequality, however, a skewed distribution of incomes could generate the Great Gatsby Curve. At a given point in time, some individuals who believe they can climb up the social ladder are more likely to perceive inequality favorably than those who are more pessimistic about the possibility of their upward mobility in the future. Although income inequality at any point in time could affect economic segregation and intergenerational immobility negatively, I argue that persistently worsening inequality should be there to make the process faster and stronger. Thus, this leads us to the hypothesis that income inequality would decrease social mobility in a country with an increasing pattern of inequality growth in recent decades.

Data & Method

For testing the hypothesis, this paper examines the cross-national variation of the 2020 Global Social Mobility Index (GSMI), provided by the World Economic Forum. Instead of focusing on a specific aspect of social mobility, such as income or education mobility, the GSMI provides a comprehensive measure of social mobility based on 10 major component factors: health, education access, education quality/equity, lifelong learning, technology access, work

opportunities, fair wage distribution, working conditions, social protection, and inclusive institutions. Each component factor is measured on 0-100 scores, and the GSMI index aggregates these scores by taking the arithmetic mean.³ By considering the diverse aspects of lives that children would face in their early life, the GSMI applies a holistic approach to come up with a composite measure of social mobility instead of focusing on an aspect of social mobility, such as education or income. Furthermore, as it utilizes different components of social mobility, we can explore what drives the Great Gatsby Curve.

For examining the cross-sectional variation of social mobility, this study focuses on the income inequality of each country during the last three decades. Concerning the measurement of income inequality, I adopt one of the most popular measures of inequality, the Gini coefficient, provided by Frederick Solt's (2020) SWIID database. The Gini index measures the distribution of income by calculating the ratio between the Lorenz curve and the observed cumulative income distribution. A perfectly equal distribution of income can create the value of 0, while a perfectly unequal distribution can make the value of 1. The SWIID dataset calculates the same index by standardizing numerous global income sources and provides globally comparable data of inequality. As I will explain later, the regression analysis will consider the market Gini index that does not consider the role of tax and income transfer primarily because of the multicollinearity issue. With this data, the inequality variable measures the overall market inequality of a country since 1990.

The growth pattern of income inequality was measured in two different ways. First, I created a dummy variable for a country that has experienced continued growth of inequality over three decades. A total of 44 countries were identified as having an increasing growth pattern of income inequality over the last three decades.⁴ Second, instead of having a qualitative measure, I created the growth intensity measure by regressing the disposable income inequality on time. By

³ For the complete list of indicators for each component variable, please see <http://reports.weforum.org/social-mobility-report-2020/appendices/>

⁴ The countries included in the analysis are Albania, Australia, Austria, Bangladesh, Belgium, Bulgaria, Cameroon, Canada, China, Costa Rica, Croatia, Czech Republic, Côte D'Ivoire, Denmark, Egypt, Finland, Georgia, Germany, Ghana, Hungary, India, Indonesia, Israel, Italy, Japan, Korea, Rep., Laos, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, United States, Vietnam.

considering how the linear time trend explains the growth of inequality over three decades, this measure captures the growth patterns of inequality either increasing or decreasing over time as a continuous variable. Table 1 displays the growth intensity measure for all countries included in the analysis. The zero-order correlation between the two measures of inequality growth pattern is 0.78.

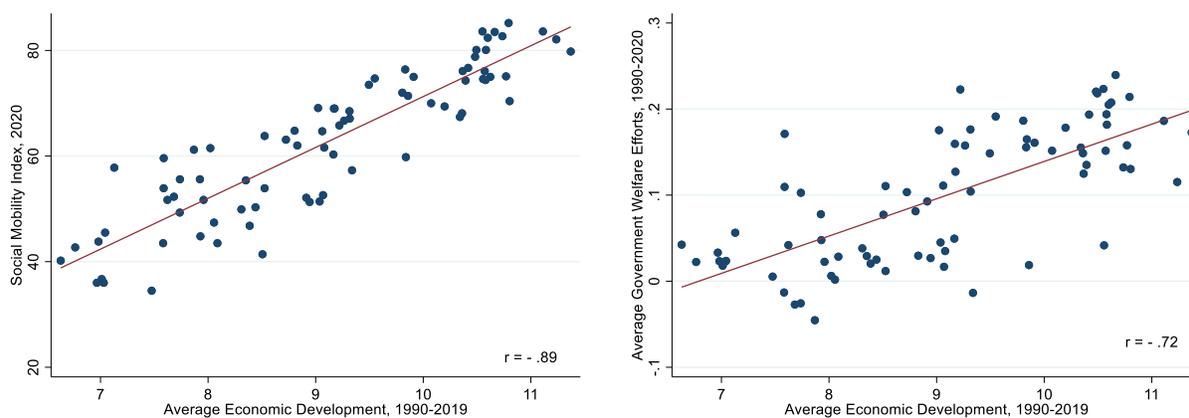
Table 1. Intensity Measure of Inequality Growth

Country	β	Country	β	Country	β	Country	β
India	0.412	Republic of Korea	0.133	Vietnam	0.049	Moldova	-0.105
Romania	0.400	Australia	0.128	France	0.049	Tunisia	-0.109
China	0.357	Bangladesh	0.127	Croatia	0.048	Ireland	-0.117
Latvia	0.284	Sweden	0.127	Italy	0.041	Colombia	-0.120
Bulgaria	0.278	Czech Republic	0.125	New Zealand	0.026	Paraguay	-0.126
Lithuania	0.271	Spain	0.120	Pakistan	0.013	Turkey	-0.136
Georgia	0.221	United States	0.113	Switzerland	0.002	Malaysia	-0.150
Sri Lanka	0.199	Albania	0.107	Cyprus	0.000	Kazakhstan	-0.160
Slovak Republic	0.199	South Africa	0.106	Singapore	-0.001	Iceland	-0.161
Indonesia	0.198	Canada	0.099	Armenia	-0.006	Thailand	-0.197
Luxembourg	0.198	Egypt	0.098	United Kingdom	-0.020	Panama	-0.211
Costa Rica	0.189	Slovenia	0.087	Honduras	-0.022	Guatemala	-0.219
Germany	0.174	Laos	0.085	Portugal	-0.024	Chile	-0.226
Finland	0.169	Norway	0.082	Estonia	-0.031	Mexico	-0.231
Israel	0.168	Russian Federation	0.078	Malta	-0.033	Argentina	-0.253
Denmark	0.153	Belgium	0.077	Ukraine	-0.041	Peru	-0.335
Poland	0.153	Hungary	0.068	Senegal	-0.054	Brazil	-0.343
Ghana	0.152	Austria	0.064	Greece	-0.073	Ecuador	-0.402
Japan	0.141	Cameroon	0.055	Philippines	-0.075	El Salvador	-0.404
Côte D'Ivoire	0.139	Netherlands	0.053	Uruguay	-0.091		

A standard set of economic variables are included, such as the overall market size (the natural logarithm of Gross Domestic Product, GDP), the level of economic development (the natural logarithm of GDP per capita), and economic performance (GDP growth rates). Based on what we examined earlier, economic globalization should considerably affect the trajectory of inequality growth. Although economic globalization creates an increasing inequality trend over time for advanced countries, many developing countries do not follow that pattern. Thus, we can

specify it along with the two growth pattern variables discussed above. I rely on the most popular measure of economic globalization: the sum of import and export values as a GDP ratio. This trade openness variable measures the country's overall level of trade openness to the world market. Lastly, I include two dummy variables for transition economies and Latin American countries. As these two sets of countries have shown a particular growth pattern of inequality in recent decades, it is important to account for the regional heterogeneity.

Figure 8 Income Inequality, Economic Development, & Social Mobility



The estimation strategy is straightforward. Because the dependent variable (GSMI) is a continuous variable, I rely on the ordinary least square (OLS) method with a robust standard error. Because the final dataset has only 79 countries, the model was minimally specified in order to increase the degree of freedom. Given that the primary focus is on the growth pattern of inequality, it is important to control the level of inequality. Disposable income inequality is most commonly used for this purpose. However, its high correlation with the level of economic development ($r = 0.58$) is an obstacle because it will generate incorrect standard errors. In understanding the dynamics of social mobility, however, specifying economic and political development is critical (see, e.g., Yaish and Andersen, 2012). In particular, in the tradition of modernization theory, industrialization increases social mobility through diverse social transformations (Deutsch, 1961; Treiman, 1970), eventually leading to political development (Cutright, 1963; Lipset, 1959). On the left side of Figure 8, we can see that the level of economic development is highly correlated with the social mobility index, supporting the argument ($r = .89$). Thus, to keep the level of economic development in the equation, I adopt the market

income inequality that only considers nominal incomes before taxes. In a separate analysis, I check the sensitivity of the results with disposable income inequality without the level of economic development variable. The results are consistent.

Another reason to use market inequality instead of using disposable income inequality is the latter measure's correlation with governments' social welfare efforts. As discussed earlier, the distribution of disposable incomes is a function of social welfare programs through which incomes are redistributed from the rich to the poor. Accordingly, if we use the income inequality measure based on disposable income, it will be highly correlated to the level of government redistributive efforts. Accordingly, the correlation between disposable income inequality and the welfare effort measure (market inequality minus tax-adjusted inequality) is extremely high ($r = -.73$). At the same time, the level of economic development is highly correlated with the government's redistributive efforts, as is shown on the right side of Figure 8. Thus, the main model adopts market inequality and the level of economic development on the right side of the equation. Adopting a similar model with disposable income inequality without the logged GDP per capita variable does not change the results.

I also control for political development. Based on the Polity IV dataset (Marshall and Jaggers, 2010), I include the polity regime score that subtracts autocracy score from democracy score. The regime scores, which vary from -10 to $+10$, are collapsed into an average polity score from 1990 to 2018. The ending point is arbitrary due to the data availability. However, given the general stability of the polity regime, I do not think the missing observations radically change the results we have here. In a similar vein, including the political development variable takes away two developing countries (Malta and Iceland), which are not included in the Polity IV dataset. In order to base our analytical inference on as many countries as possible, the regime score data is only used for checking the robustness of the results. Controlling for democracy does not change the results we have. The results are presented in Table A.1 in the Appendix.

$$\begin{aligned}
& \text{Social Mobility}_i \\
& = \beta_0 + \beta_1(\text{Inequality})_i + \beta_2\text{Ln}(\text{GDP per capita})_i + \beta_3\text{Ln}(\text{Trade})_i + \beta_4\text{Ln}(\text{GDP})_i \\
& + \beta_5(\text{Growth})_i + \beta_6(\text{Transition economy})_i + \beta_7(\text{Latin America})_i + \beta_8(\text{Growth Pattern})_i \\
& + \beta_9(\text{Inequality} \times \text{Growth pattern})_i + u_i
\end{aligned}$$

As a result, the main model focuses on the effects of average income inequality in the last three decades on the social mobility index in 2020 for country i . The general expectation of the Great Gatsby Curve is that the coefficient of inequality (β_1) is negative and statistically significant in the baseline model. I expect that the trending growth pattern has a negative conditional effect on how inequality affects social mobility. The coefficient of the interaction term (β_9) would be negative and statistically significant. As explained above, I have two variables of inequality's growth pattern: a dummy variable for trending growth patterns and an inequality growth pattern measure based on a linear time trend. With two separate measures of the inequality growth model, I have two different sets of models. All regressions are estimated with robust standard errors.

Results

Table 2 presents the results. The first column is the baseline model that does not consider the growth pattern of inequality over three decades. It provides strong evidence for the Great Gatsby Curve from a global perspective: Income inequality undermines social mobility. The coefficient of income inequality is negative and statistically significant at a 0.01 level. However, as shown in the second column, inequality's growth pattern per se does not have a meaningful influence on social mobility. The following column, which includes the interaction term between inequality and its growth pattern, provides strong evidence for our hypothesis. Since the growth pattern variable is binary, the baseline inequality variable shows how the Great Gatsby Curve works in a country without persistent growth of inequality over time. Unless it has persistently grown over time, inequality does not decrease social mobility. The interaction term, however, has a negative and statistically significant at a 0.05 level. This means that inequality significantly dampens social mobility in a country where income inequality has intensified in the past decades. The remaining two columns replicate the interactive model with another measure of

income inequality growth. In general, the same results are found. In Model 5, income inequality has a negative and statistically significant coefficient for social mobility while the inequality's growth pattern variable fails to reach the statistical significance at the conventional level. In Model 6, the interaction term has a negative but insignificant coefficient, and the baseline term for inequality still has a negative and statistically significant coefficient. As I will explain later, the interpretation of the multiplicative interaction term should be approached with caution. A careful interpretation leads us to provide strong evidence to our hypothesis.

Table 2. Regression Analysis of Income Inequality Growth Pattern and Social Mobility

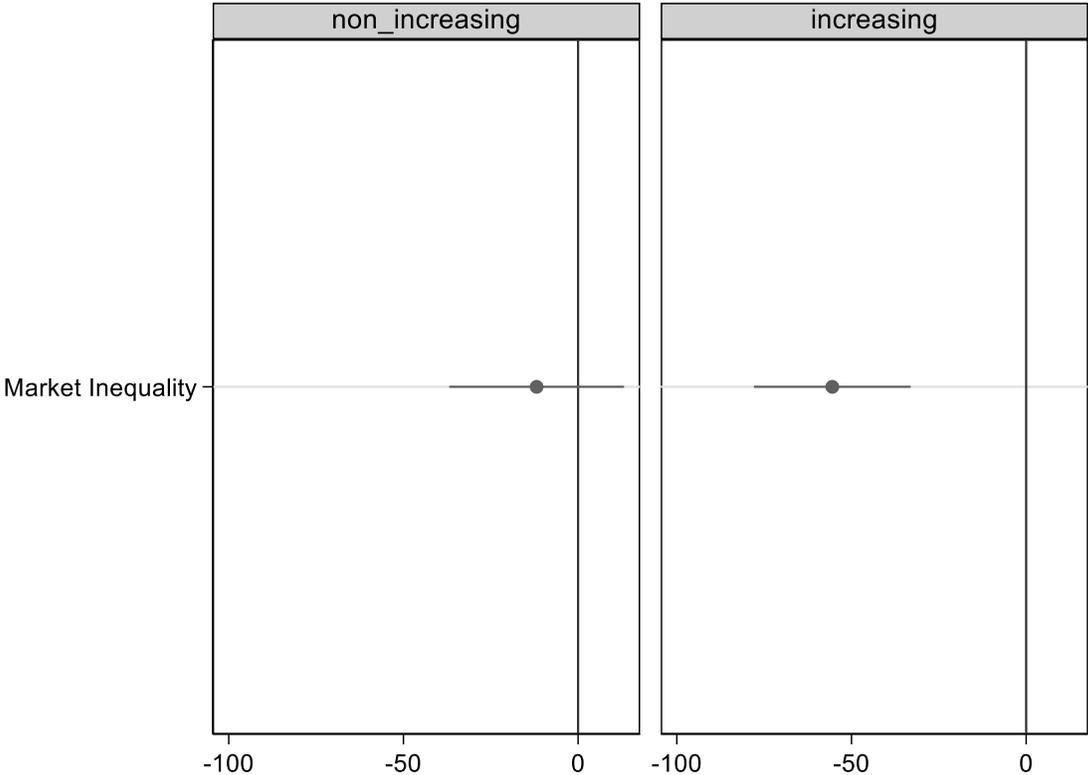
	Pattern = Increasing dummy			Pattern = Intensity	
	Model 1	Model 2	Model 3	Model 4	Model 5
Market inequality	-32.85*** (9.643)	-33.24*** (10.09)	-11.86 (12.54)	-33.20*** (10.04)	-32.88*** (8.914)
Growth Pattern ¹		1.033 (1.368)	21.07** (8.061)	4.708 (3.790)	37.96 (23.22)
Log GDP per capita	10.22*** (0.609)	10.16*** (0.622)	9.827*** (0.639)	10.18*** (0.613)	10.15*** (0.615)
Trade openness	0.00313 (0.0139)	0.00561 (0.0153)	0.0101 (0.0154)	0.00512 (0.0146)	0.00558 (0.0146)
Log GDP	-0.0974 (0.381)	-0.127 (0.384)	-0.0993 (0.400)	-0.151 (0.384)	-0.244 (0.403)
Growth	0.544 (0.361)	0.489 (0.374)	0.102 (0.440)	0.447 (0.360)	0.306 (0.371)
Transition	6.480*** (1.257)	6.219*** (1.402)	5.703*** (1.380)	6.026*** (1.401)	5.668*** (1.371)
Latin America	-3.297** (1.482)	-2.706 (1.671)	-3.729** (1.706)	-2.077 (1.826)	-2.819 (1.876)
Inequality × Growth Pattern			-43.63** (17.41)		-72.06 (49.23)
Constant	-15.66 (9.529)	-14.81 (9.588)	-21.24** (9.930)	-13.89 (9.429)	-10.90 (9.891)
Observations	79	79	79	79	79
R-squared	0.900	0.901	0.908	0.902	0.904

¹ The growth pattern variable is a dummy variable for increasing growth for Model 1 through Model 3 and a time trend measure for Model 4 through Model 6; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Let us explore the interaction between inequality and its growth pattern more closely. To see the effect of inequality on social mobility in a country that has experienced persistently rising income inequality in the last three decades, we can take the partial derivative of the equation in Model 3 with the inequality variable. Then, the effect of the growth pattern equals – 11 .86 –

43.63 × Pattern. As the growth pattern is a dummy variable, we can add up two coefficients to have the point estimate. However, the standard errors are not easily acquired. Instead of manually calculating it, I create another dummy variable for a country without the persistent growth pattern and re-run the analysis so that we could refer to the table to have both coefficient and standard error from the baseline term (Braumoeller, 2004; Solt et al., 2014). Figure 9 displays the results to compare the impact of inequality on social mobility between two country groups. The coefficient graph confirms the hypothesis. The 95 percent confidence interval for market inequality includes zero for countries without the persistent growth of inequality. In countries that have experienced persistently growing inequality in the past decades, the 95 percent confidence interval does not include zero, and the point estimate is negative. In other words, the Great Gatsby Curve is upheld in countries with the persistent growth of inequality.

Figure 9 Coefficient of Market Inequality on Social Mobility by Inequality Growth Pattern



As mentioned above, the interpretation of the interaction term in Model 5 should be handled with caution. In the literature, it is well known that the multiplicative interaction term requires careful exploration of the conditional relationship among the involved variables (Brambor et al., 2006; Braumoeller, 2004). When a moderating variable is binary, the baseline term of the other variable shows its effect when the moderating variable takes the value of 0. However, if the moderating variable is a continuous variable, this is no longer the case. Although the baseline variable still indicates its effect when the moderating variable takes the value of 0, we cannot readily refer to the table to see how the effect of the key independent variable varies across different values of the moderating variable. In this case, we can take the partial derivative of the equation with respect to the independent variable of interest (inequality) to visualize how the marginal effects change as the moderating variable changes its values from the minimum to maximum values.

Figure 10 Interaction between Market Inequality and Growth Pattern: The Marginal Effect

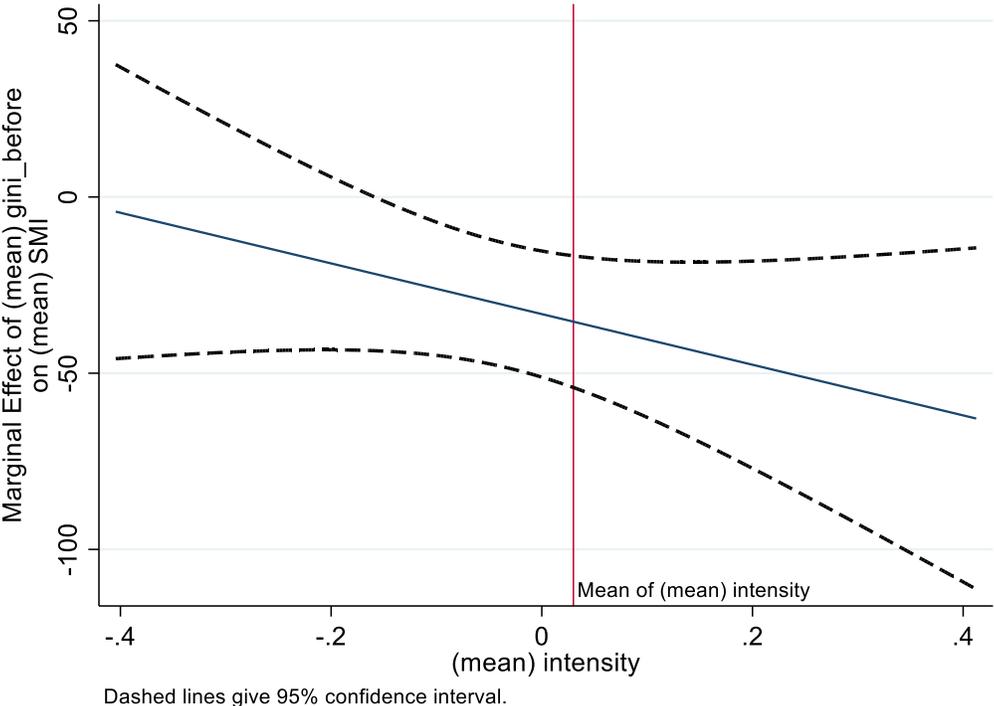


Figure 10 provides the results for Model 5, which specifies the multiplicative interactions between income inequality and its growth pattern measured by regressing it on a linear time trend. As the regression coefficients are the marginal effects in the context of the OLS, the graph shows how the coefficient of market inequality changes across the different values of its growth pattern (intensity) while holding other variables at their mean values. As the graph clearly shows, the baseline coefficient for inequality is -32.88 and statistically significant when the intensity growth measure equals 0. When the intensity growth measure takes the minimum value, the Great Gatsby Curve is not supported. The 95 percent confidence intervals include zero until the intensity growth measure reaches around - 1.3. The results imply that the negative connection between inequality and social mobility is concentrated in countries that have experienced continued polarization in income distribution over the past decades.

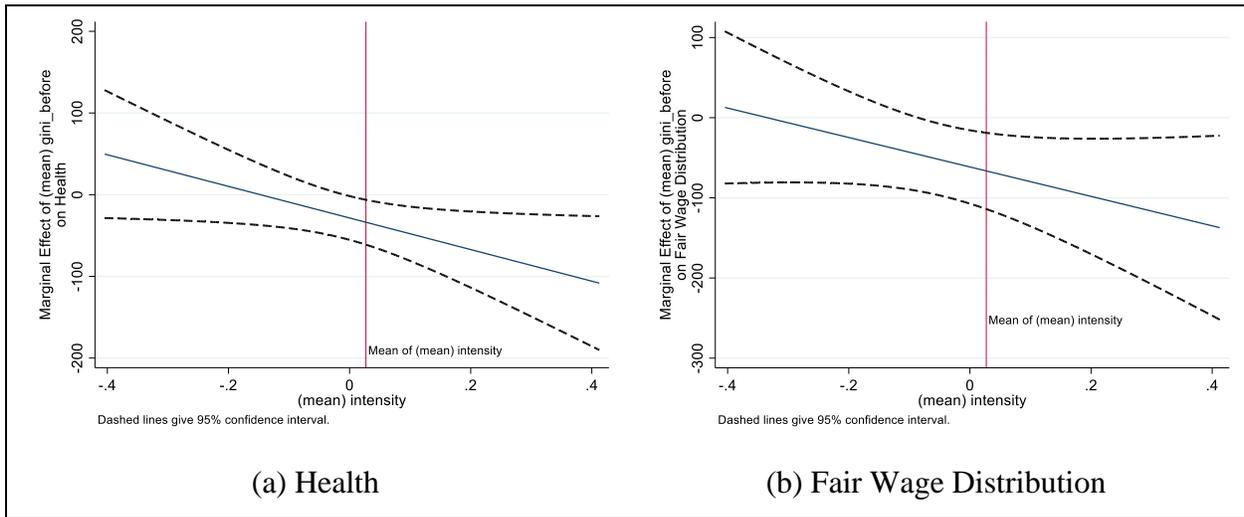
The results for the control variables provide some insightful findings as well. The economic development variable provides strong evidence to the long-held hypothesis between economic development and social mobility (Goldthorpe, 1985). The coefficient of the GDP per capita is positive and statistically significant at a 0.01 level across models in Table 1. While controlling for other variables, economic development is positively associated with the increase in social mobility. Against the commonly believed impact of economic globalization, trade openness fails to reach statistical significance at the conventional level. The same statistical insignificance is found for both the market size (GDP) and economic performance (growth rate) variables. In line with our earlier discussion, being transitional and Latin American economies turn out to have their own contextual influence on social mobility. Even after controlling for inequality and growth pattern, social mobility increases in transitional economies and decreases in Latin American countries. Once the intensity growth measures are in place, however, the Latin American effect disappears.

What drives the Great Gatsby Curve?

Based on the findings from the global analysis of the Great Gatsby Curve above, it is important to examine factors that contribute to the negative relationship between income inequality and social mobility. What drives the Great Gatsby Curve? This section tackles this

question by focusing on 10 component variables, pillar variables, of the social mobility index. I re-estimate Model 5 of Table 1 ten times by having each component variable as the dependent variable: Health, Education Access, Education Quality and Equity, Lifelong Learning, Technology Access, Work Opportunities, Fair Wage Distribution, Working Conditions, Social Protection, Inclusive Institutions. Including the baseline models, a total of 20 models are estimated, and income inequality's marginal effects are created, as is shown in Figure 10.

Figure 11 What Drives the Great Gatsby Curve Down?: Health and Fair Wage Distribution



Among 10 pillar component variables of the social mobility index, only two variables have significant conditional influences for income inequality to reduce social mobility: Health and Fair Wage Distribution. Figure 11 displays the results. As the intensity growth measure increases, the coefficient of income inequality for social mobility begins to decrease and becomes negative and statistically significant. Thus, according to this coefficient plot, we can say that health and fair wage distribution are the critical components that contribute to the Great Gatsby Curve shown in Figure 10. In other words, it suggests that in a country where income inequality has consistently worsened for the past decades, income inequality significantly deteriorates the country's ability to provide a good health condition for the population. At the same time, it negatively affects to make wage distribution even more unfair. The analysis indicates the negative spiral effect that income inequality can create when it grows persistently.

Some of the null findings on other components of the social mobility index are insightful. Income inequality and its persistent growth do not, fortunately, reduce education access or educational quality and equity in the global perspective. The interaction terms between education and income inequality do have negative coefficients across models. However, we may need to investigate more to see how inequality and its persistency would affect the conditions of education later. By simply comparing the minimum and maximum values of the intensity growth measure, we are not able to observe inequality's education-deteriorating effect. Another interesting null finding is that persistently rising inequality does not affect working conditions, such as workers' rights, meritocracy, collective bargaining, etc. I believe this is partly because the negative influence of persistently growing inequality on these factors might need a much longer time period for us to be able to observe its impact. I believe that other null findings concerning social protections and inclusive institutions can be understood similarly. Institutional changes for increasing the social safety net, the efficiency of government agencies, or social protection coverages take place in the long run.

Discussion

This article examined a well-known negative relationship between inequality and social mobility. The more a society becomes unequal, the less its members being able to move across social strata. Recent scholarship on this topic has provided many insights to understanding the dynamics of the so-called Great Gatsby Curve. These existing studies, however, have failed to recognize an important aspect that could affect the causal dynamics between inequality and mobility: the varying patterns of inequality growth over time across countries. As economic liberalism has long implied, a society has the ability to tolerate a certain level of wage differentials, and thus, the unequal distribution of income can be accepted to a certain degree. Moreover, it implies that inequality does not necessarily mean an unfair distribution of incomes. This article argues that the persistent growth of income inequality can be a crucial factor contributing to the Great Gatsby Curve. As the analysis shows clearly, in a country where income inequality has risen unfailingly over the last three decades, income inequality does have a negative and statistically significant influence on the social mobility index. Without its persistent growth, the Great Gatsby Curve is not upheld.

Based on the analysis this study provides, it is not surprising that much scholarly attention has been given to inequality in advanced economies. In most advanced countries, income inequality has persistently grown in recent decades. Noticeable increasing patterns are observed in the United States, Australia, Germany, Sweden, Norway, Denmark, Finland, and Japan. Here, what is surprising is that a group of Northern European countries, which are known for generous welfare state institutions, have also experienced ever increasing inequality. Of course, the level of income inequality is relatively low compared to other advanced economies. However, our findings suggest that these institutional measures were not able to compress the growth of inequality in these countries. Overall, the findings provide an important policy implication for income redistribution: Welfare state measures to redistribute income should also consider how to control the pace of inequality growth.

Lastly, the fact that the level of inequality interacts with its persistently growing pattern in deteriorating a fair distribution of incomes is not that surprising. Income inequality gets embedded and reproduces its negative consequences, if it continues to grow. What is interesting is that inequality can deteriorate the health dimension of social mobility when it grows persistently for a long period of time. The unequal distribution of incomes may make us focus on the mechanisms to redistribute the wealth. However, the analysis of this paper indicates that public efforts must be paid to the health system that can be negatively affected by inequality and its persistent growth. This implication is in line with some recent studies that social classes have some health-related consequences (Gugushvili et al., 2020; Simandan, 2018). When income disparities between the rich and the poor get wider and wider consistently over time, society can create a system that lower classes may not have adequate access to quality health care. Providing access to quality health care might be critical to breaking the vicious cycle created by income inequality and its persistent growth.

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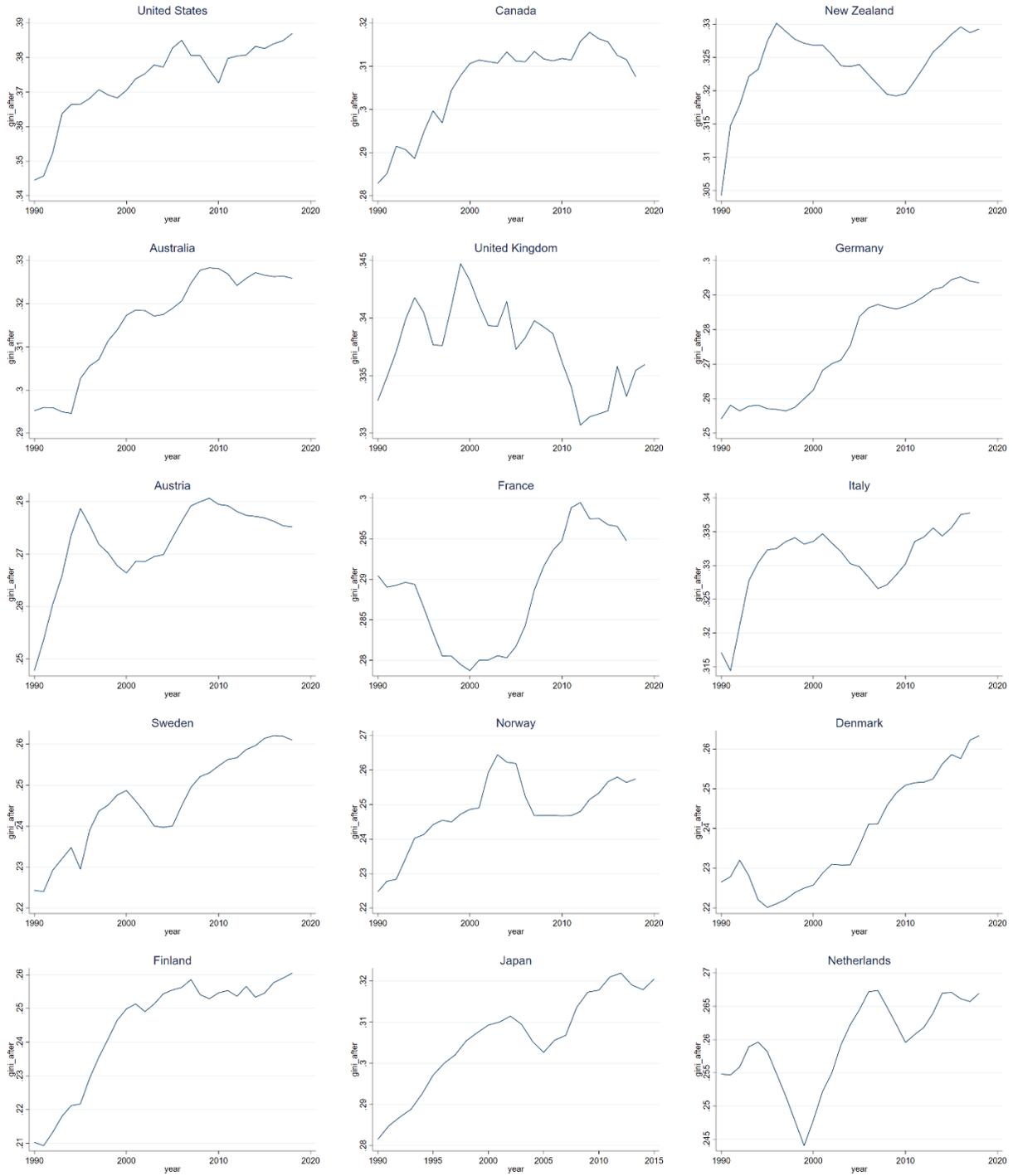
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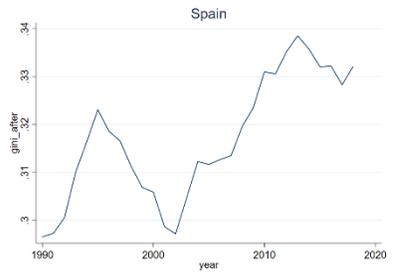
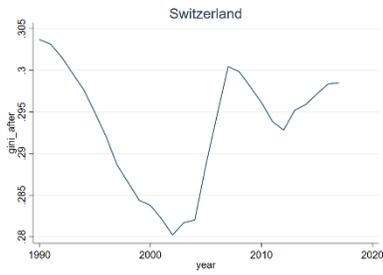
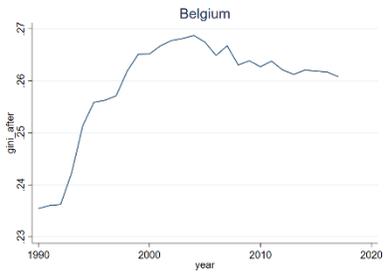
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Appendix

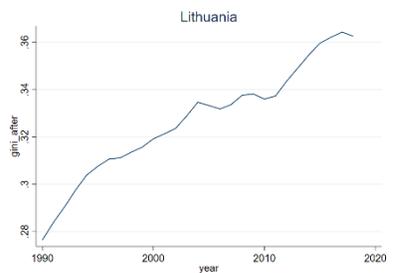
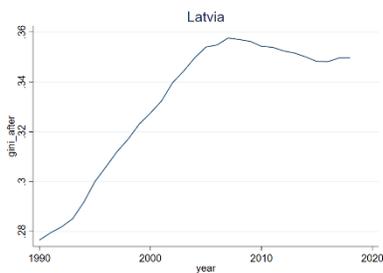
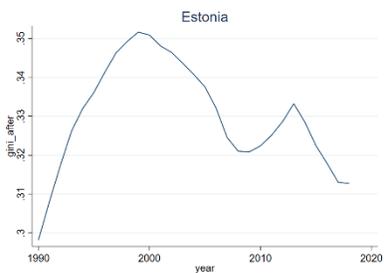
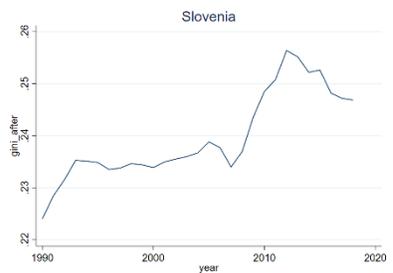
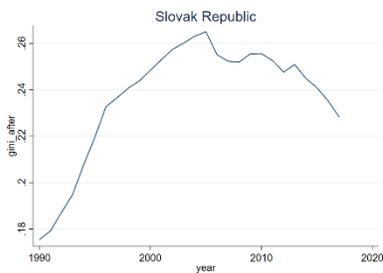
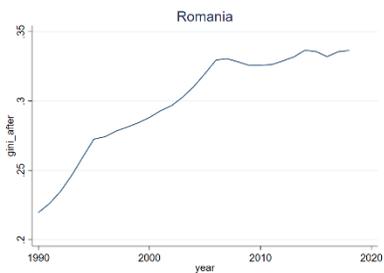
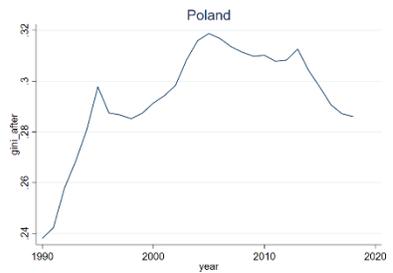
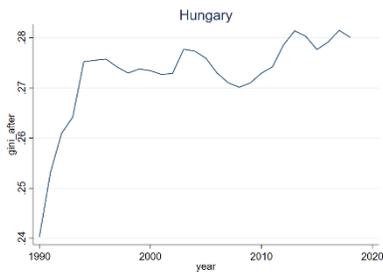
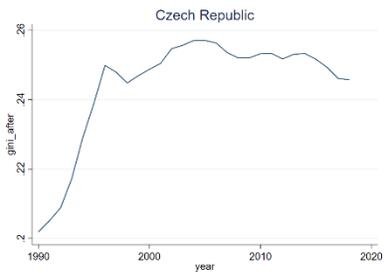
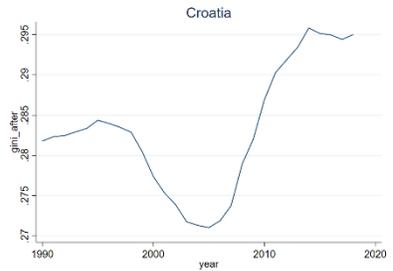
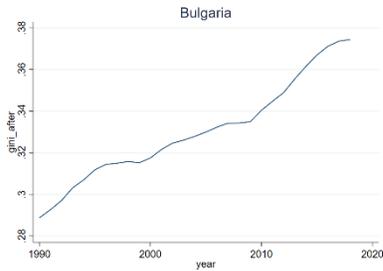
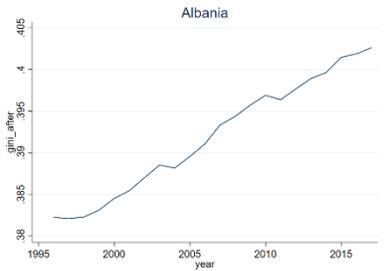
Figure A.1. The Growth Pattern of Income Inequality across Countries

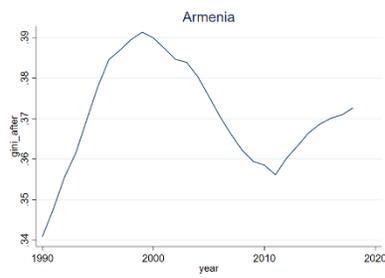
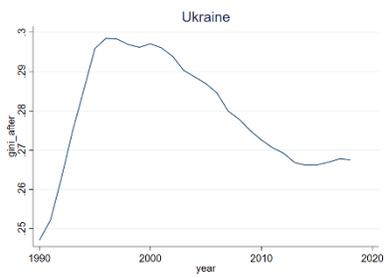
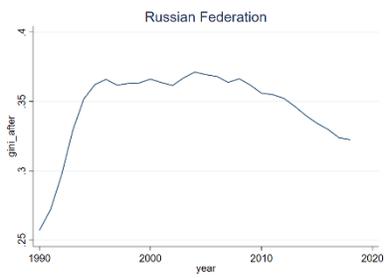
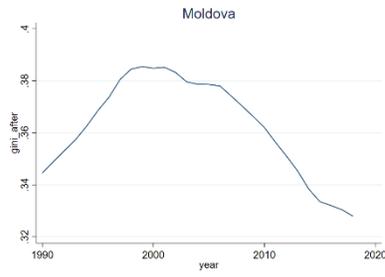
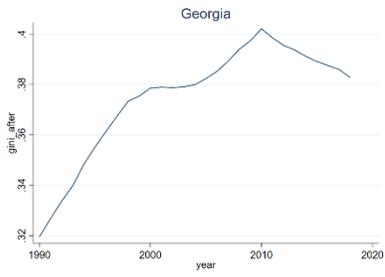
Developed Countries



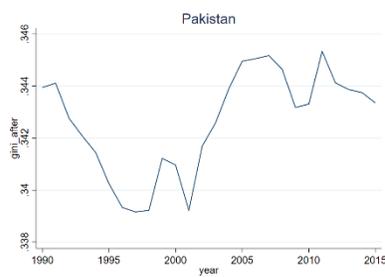
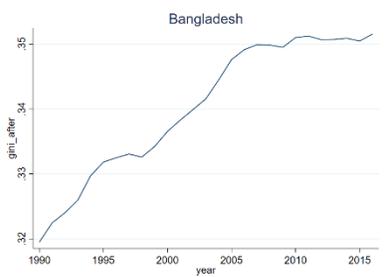
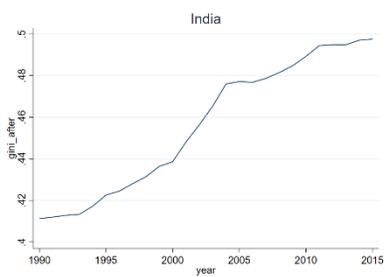
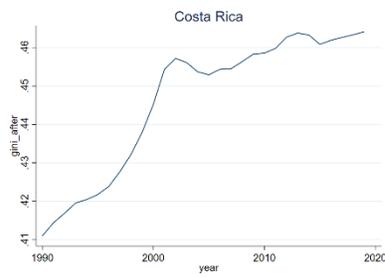
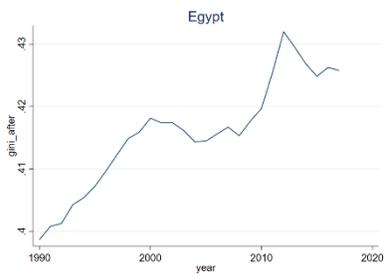
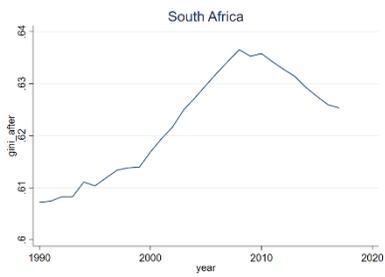
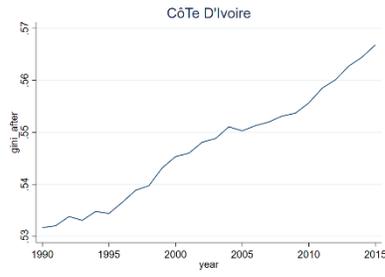
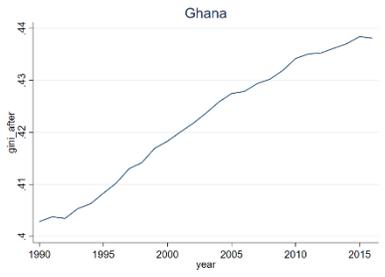
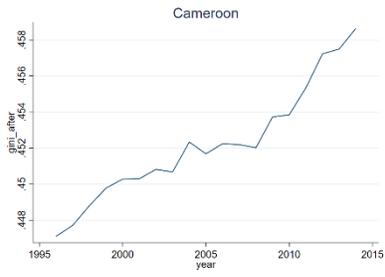


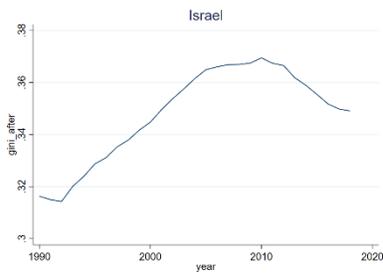
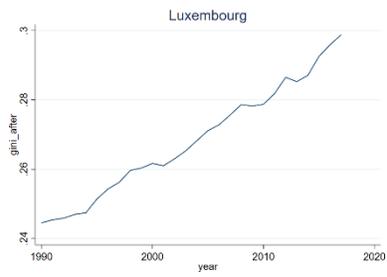
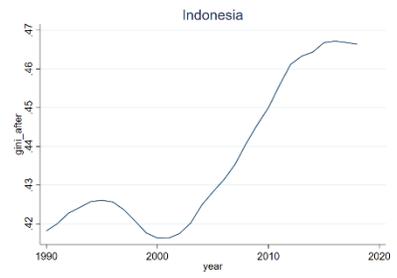
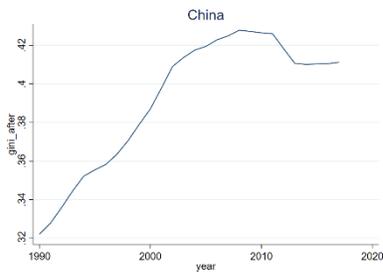
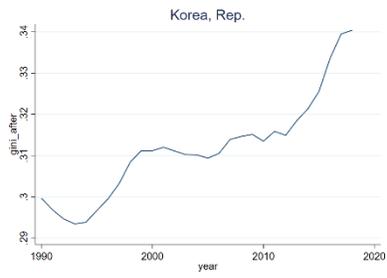
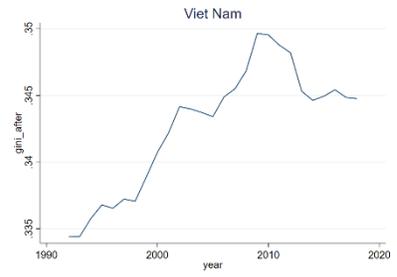
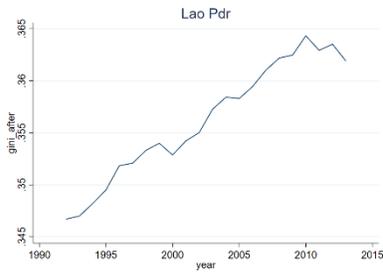
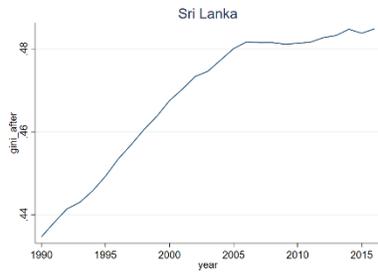
Transition Economies – Central & Eastern Europe, Baltic, & Commonwealth of Independent States



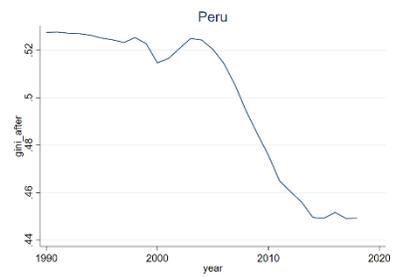
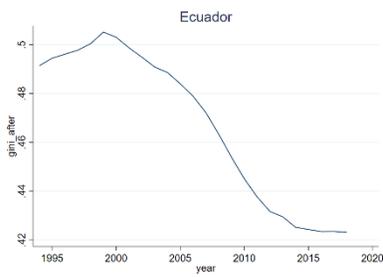
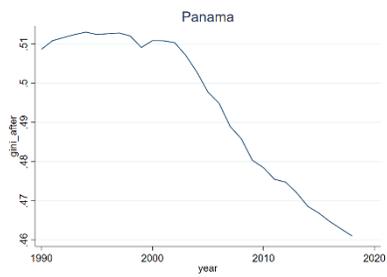
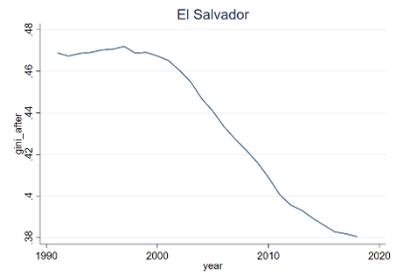
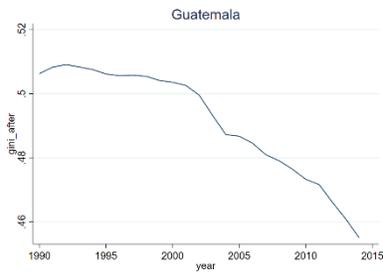
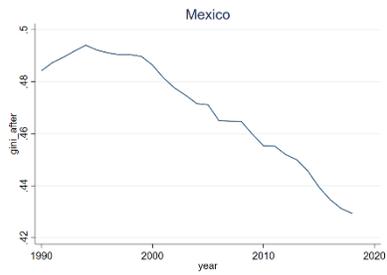


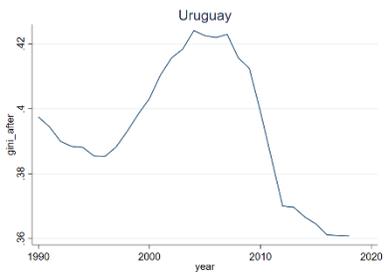
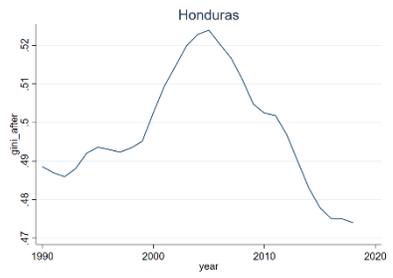
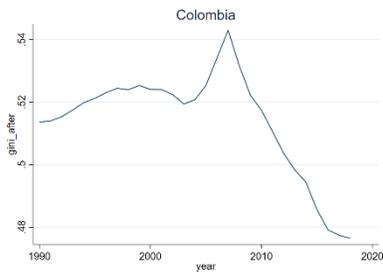
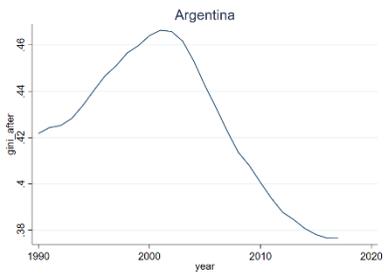
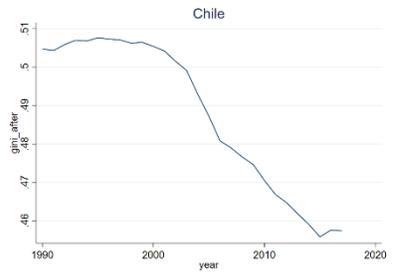
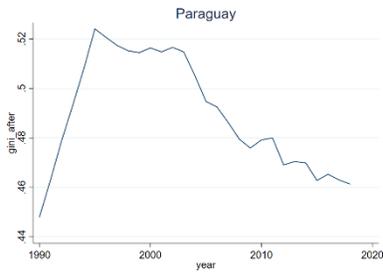
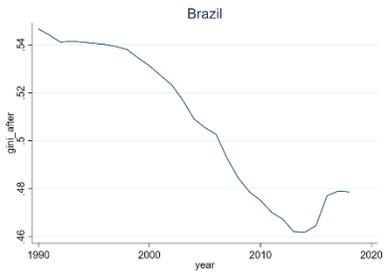
Other Developing Countries 1



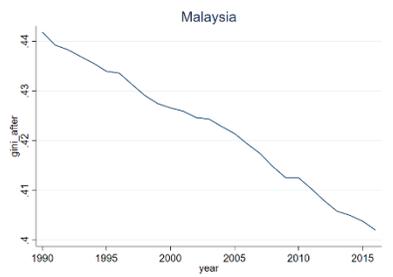
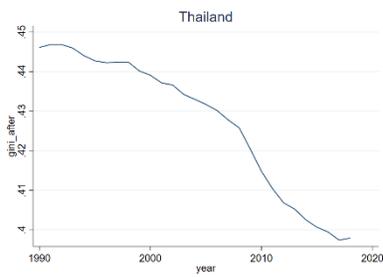
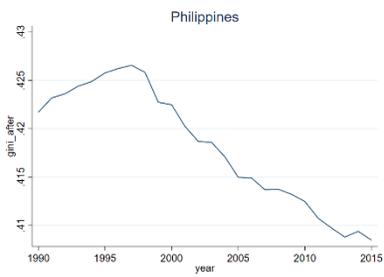
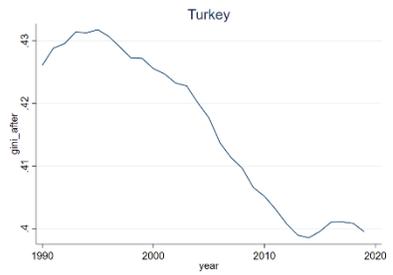
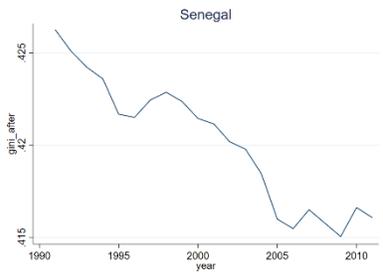
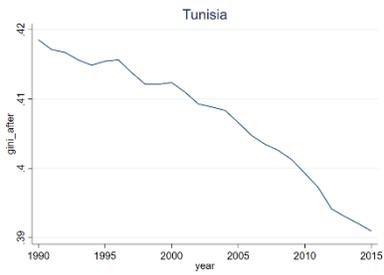


South America





Other Developing Countries 2



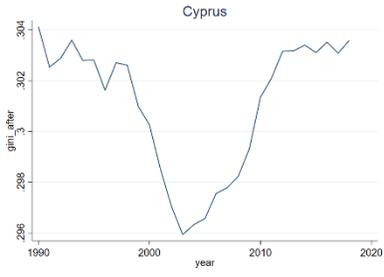
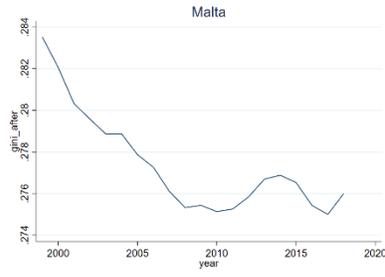
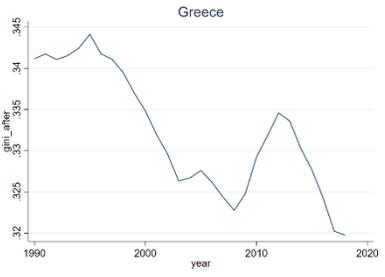
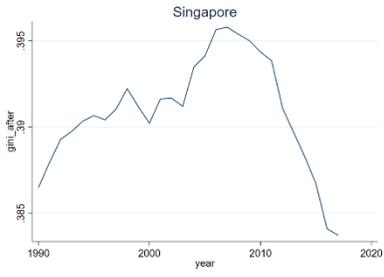
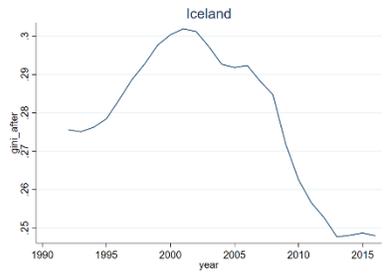
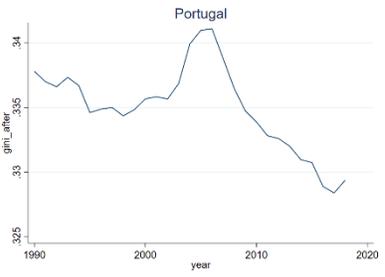
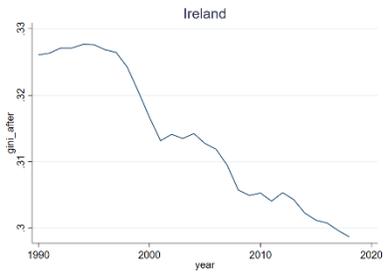


Table A.1. Regression Analysis of Income Inequality Growth Pattern and Social Mobility

	Growth = Increasing Growth dummy			Growth = Intensity	
	Model 1	Model 2	Model 3	Model 4	Model 5
Market Inequality	-34.98*** (10.04)	-35.13*** (10.60)	-11.45 (13.16)	-34.48*** (10.51)	-33.83*** (9.316)
Growth Pattern ¹		1.249 (1.402)	22.43** (8.470)	4.478 (4.142)	37.41 (23.69)
Democracy (Polity IV)	0.220 (0.155)	0.218 (0.158)	0.175 (0.161)	0.184 (0.173)	0.168 (0.171)
Log GDP per capita	9.595*** (0.632)	9.482*** (0.623)	9.133*** (0.640)	9.596*** (0.629)	9.577*** (0.627)
Trade openness	0.00636 (0.0140)	0.00981 (0.0158)	0.0153 (0.0159)	0.00840 (0.0148)	0.00916 (0.0150)
Log GDP	0.0946 (0.401)	0.0932 (0.399)	0.179 (0.399)	0.0686 (0.395)	-0.0131 (0.404)
Growth	0.655* (0.375)	0.579 (0.396)	0.124 (0.453)	0.532 (0.383)	0.376 (0.387)
Transition	6.415*** (1.298)	6.156*** (1.383)	5.754*** (1.423)	6.084*** (1.378)	5.752*** (1.388)
Latin America	-3.578** (1.442)	-2.829 (1.730)	-3.699** (1.703)	-2.319 (1.964)	-2.972 (1.990)
Inequality × Growth Pattern			-45.90** (17.97)		-71.03 (49.29)
Constant	-16.04 (10.55)	-15.71 (10.39)	-24.24** (10.54)	-15.42 (10.15)	-12.85 (10.34)
Observations	77	77	77	77	77
R-squared	0.899	0.901	0.908	0.901	0.903

¹ The growth pattern is a dummy variable for increasing growth for Model 1 through Model 3 and an intensity measure for Model 4 through Model 6; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

초록

최근 전 세계적으로 소득의 불평등 문제에 대한 학문적 관심이 높다. 하지만, 거의 대부분의 연구에 있어, 소득 불평등 개념은 경제적 자원의 불공정한 분배라는 의미로 받아들여지고 있다. 이러한 인식의 중심에는 위대한 개츠비 곡선이 자리하고 있다. 소득의 고르지 못한 분배는 사회적 이동을 저해하므로 불공정한 사회를 만들어 간다는 것이다. 하지만, 위대한 개츠비 곡선에 대한 학문적 관심은 최근에 나타난 것으로, 소득의 불평등과 사회이동에 대한 우리의 이해가 상당히 부족한 것이 사실이다. 이에 본 연구는 위대한 개츠비 곡선을 중심으로 소득의 불평이 사회이동에 미치는 영향을 살펴보고자 한다. 특히, 어떤 조건에서 위대한 개츠비 곡선이 나타나는지를 알아보고자 한다.

소득 불평등과 사회이동의 관계를 연구하는 기존의 이론들은 상당부분 불평등해진 사회경제적 요소들이 어떻게 다음세대의 아동기 발달에 영향을 미치는지에 집중하고 있다. 소득의 불평등은 세대 자체의 경제적인 어려움, 네트워크의 부재, 학군의 어려운 경제적 상황, 그리고 불평등을 재생산 하는 각 세대 자체의 문화로 결국은 사회이동을 저해한다는 것이다. 하지만, 이러한 미시적인 접근은 사회이동이론들이 내제하고 있는 동적인 메커니즘을 파악하기에는 한계가 있다. 많은이론들이 상정하고 있듯이, 소득의 불평등과 사회이동의 관계는 최소한 한 세대의 기간을 넘는 동적인 과정의 산물로 보아야한다. 이러한 관점에서, 본연구는 사회이동의 형성과정에 집중한다. 특히, 각 국가에서 소득불평등이 지난 30 여년간 어떠한 패턴으로 만들어져 왔는지 그리고 그러한 불평등의 성장패턴이 사회이동에 어떻게 영향을 미치는 지를 중심으로 분석한다.

사회이동지수는 세계경제포럼이 제공한 세계사회이동지수를 사용하였다. 2020 년을 중심으로, 총 81 개국가의 사회이동지수는 건강, 교육, 기술, 직장, 그리고 사회안전망의 다섯 차원으로 분류하고 총 51 개의 척도를 사용해 측정되었다. 소득 불평등의 경우, 프레데릭 솔트의 세계소득불평등 데이터베이스(SWIID)를 사용해 1990 년대 이후 30 년간의 성장패턴의 추이를 살펴보았다. 총 79 개의 국가를 대상으로 살펴본 소득 불평등의 성장패턴은 다음과 같다. 첫째, 거의 모든 선진국가에서 지난 30 년간 소득의 불평등이 상승하였다. 상승패턴은 북유럽의 복지국가에서도 나타난다. 둘째, 많은 개발도상국들도 선진국의 소득 불평등 성장곡선을 따랐다. 특히, 전환경제

국가에서 소득불평등의 발전 속도가 빨랐다. 셋째, 거의 모든 라틴 아메리카의 국가에서는 지난 30 년간 소득의 불평등이 완화되어 왔음을 확인할 수 있었다.

이를 바탕으로, 본 연구는 소득의 불평등이 사회이동에 미치는 영향을 회귀분석하였다. 위대한 게츠비 곡선이 주장하는 데로, 지난 30 년간의 소득 불평등의 평균 값이 높을 수록, 해당 국가의 사회이동지수가 낮아짐을 알 수 있었다. 하지만, 소득 불평등 평균값의 사회이동에 대한 효과는 지난 30 년간 지속적인 소득 불평등의 성장을 보여온 국가들에 한정됨을 또한 알 수 있었다. 본 연구가 주장한 대로, 위대한 게츠비 곡선은 단순히 소득의 불평등이 심화된다고 만들어지는 것은 아니다. 소득불평등이 사회이동을 저해하기 위해서는 오랜 시간에 걸쳐 지속적으로 불평등이 심화되어야 하는 것이다. 소득의 불평등이 사회적 문제로 대두하는 요즘, 소득의 재분배 문제는 중요한 이슈이다. 하지만, 본 연구에 따르면, 어떠한 시점에서 어느 정도로 소득을 재분배해야 하는 하는 문제도 중요한 문제임을 시사한다.