

# Varieties of Capitalism and Income Inequality

## Abstract:

Why do countries diverge significantly in the levels of income inequality across the Global North? Most scholars believe that the answer lies in the ways that economic resources are organized through institutions. Drawing on a country-level, longitudinal dataset from 1985 to 2016 matched with three other data sources, the author explains how and to what extent institutions matter for income inequality across the ‘varieties of capitalism.’ To sort countries based on their institutional similarities, the author conducts cluster analysis and examines the extent to which institutions predict variation in the levels of income inequality, both cross-nationally and within each cluster of countries. In cross-national, panel data regressions, strong evidence is presented that labor market interventions such as vocational rehabilitation programs as well as characteristics of corporate governance are important determinants of income inequality.

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Since the 1980s, most countries in the Global North have experienced a significant rise in the levels of income inequality. Numerous comparative studies on income inequality have consistently shown that within-country inequality often measured by the Gini index has risen (Brandolini and Smeeding 2011; Salverda et al. 2014; Nolan et al. 2014, Clark 2020). As plotted in Figure 1 below, within-country inequality—the gap between rich and poor—has widened in most countries in the Global North over the past four decades. While the magnitude of change varies substantially across countries, the broad trend is unmistakable: rising income inequality has been the defining challenge of societies in late capitalism.<sup>1</sup> Research on income inequality from across three disciplines namely economics, political science and sociology has put forward four main explanations: (1) skill-biased technical change: a shift in the production of technology that favors skilled over unskilled labor by increasing its relative productivity and, therefore, its relative demand (Autor, Katz and Krueger 1998; Acemoglu 2002; Autor, Levy, and Murnane 2003; Katz and Murphy 1992; Bluestone and Harrison 1988); (2) decline of organized labor, stagnation of welfare state generosity, and the ever-weakening standards of employment protection as a result of the new dominant neoliberal regime (Lemieux 2008; Western and Rosenfeld 2011; Brandolini and Smeeding 2011, Kenworthy and Pontusson 2005; Rueda and Pontusson 2000; Pontusson, Rueda, and Way 2002); (3) tax policies, changes in compensation practices, and the rise of the “top-earners” epitomized by the premiums associated with high salaries of top management, particularly in the United States (Piketty 2014; Piketty and Saez 2006; Beckfield 2006, Cernat 2004, Leigh and Posso 2009); and (4) changes in family formation and practices such as assortative mating and a significant increase in the number of single mother families (Goldstein and Kenney 2001; Schwartz 2010).

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<sup>1</sup> Perhaps it would be instructive to note that on average, Gini index was 0.26 in 1986 but increased to 0.30 in 2016 across 21 countries in the Global North. This rate reflects an *average* rate and varies from one country to another.

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**Figure 1.**

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In the sociological tradition, social stratification research often relies on human capital dimensions (i.e., educational attainment, parental resources, network of social capital) in order to predict social and economic inequalities among individuals (Western, Bloome, and Percheski 2008; McCall and Percheski 2008). While the human capital approach in the social stratification research is informative, there is a wide consensus among scholars from across social science disciplines that much of social and economic inequalities observed both within and between countries are directly resulted from the ways in which economic resources are organized through institutions (Kenworthy and Pontusson 2005; Rueda and Pontusson 2000; Pontusson, Rueda, and Way 2002; Lemieux 2008). This behooves us to pay close attention to the role that *institutions*—and not *just* individual attributes—play in generating distributive outcomes (Beramend and Rueda 2014). Hence, an important body of scholarship has developed in political science and economic sociology known as the “varieties of capitalism” (henceforth, VoC) that underscores the important role of institutional configurations across different countries in producing socioeconomic outcomes (Hall and Soskice 2001; Witt and Jackson 2016).

The VoC approach was first articulated by Peter Hall and David Soskice in their seminal introductory book *Varieties of Capitalism* (2001) where they set out, in the Weberian sense, two ideal-types of capitalist economies namely, liberal market economies (i.e., U.S., U.K., Canada, Australia, New Zealand, Ireland) and coordinated market economies (i.e., Germany, Austria,

Switzerland, Belgium, Sweden, Japan). Institutions lie at the heart of the VoC approach to the study of economy and society, and the differences in their designs implicate economic and social outcomes including macroeconomic growth, living standards, employment relations, patterns of technical change as well as social and economic inequalities among others (Hall and Soskice 2001; Witt and Jackson. 2016; Streeck and Yamamura 2001; Yamamura and Streeck 2003, Schmidt 2002, Amable 2003; Baccaro and Pontusson 2016; Hope and Soskice 2016). The VoC approach understands capitalism not as a *unified* or *static* economic system, but one that varies significantly across time and space, and that the sources of these variations are identifiable: they lie in “system coordination” and “institutional complementarities” (Hall and Soskice 2001a, 2001b: 17; Amable 2016; Deeg 2005). Here, institutional complementarities refer to a set of sub-systems that not only yield better—or worse—macroeconomic outcomes (Amable 2016), but also govern capital and labor relations. When such institutional complementarities are presented in the “right” form, they increase aggregate welfare and reduce income and social inequalities. Institutional complementarities thus create a significant degree of *coordination capacity*, one that is independent of market’s coordination capacity. In this sense, the famous German vocational training system and the extensive Norwegian social security network are conspicuous examples of such institutional complementarities.<sup>2</sup> Essentially, the VoC literature seeks to underscore the importance of *non-market* coordinating forces, emphasizing both the interventions of the state to ‘de-commodify’ social services (Esping-Andersen 1990) and to coordinate economic actions such that standards of living are raised and social disparities are reduced. Using this framework, variation in the levels of

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<sup>2</sup> While there is a wide consensus among scholars that capitalism—at least in the developed world—exists in varieties that exhibit distinct and discrete characteristics, there are those who disagree with this foundational claim of contemporary political economy. For a recent critique, see “Does capitalism (still) come in varieties?” by Colin May (2020) in *Review of International Political Economy*.

income inequality observed within different countries can be re-examined in a way that compliments and extends the existing literature on institutions and income inequality.

How do institutional complementarities—differences in institutional designs and blueprints of national economies across the Global North—explain the divergent levels of income inequality that we observe? The institutional approach to the study of income inequality posits that much of economic and social inequalities are directly resulted from the ways in which economic resources are organized through institutions (Acemoglu and Robinson 2015; Krueger 2012; Piketty and Saez 2003; Piketty, Saez, and Zucman 2018; Piketty 2014). In this context, institutions signify both codified rules or formal arrangements as well as various domains of policymaking (Hall and Soskice 2001). Given that the levels of income inequality have risen dramatically in the Global North over the past four decades (See Figures 1 below), it would be instructive to further investigate the extent to which differences in the institutional designs of national economies explain variation in the levels of income inequality cross-nationally. Drawing on the varieties of capitalism (VoC) perspective, I examine how and to what extent *institutional complementarities*—differences in the institutional designs of national economies—within different regimes<sup>3</sup> of market economies produce such divergent levels of income inequality. It is crucial to note that the determinants of income inequality can be different across regimes of capitalism. That is, what predicts variation in the levels of income inequality in liberal market economies can be different than that of social democratic market economies. Hence, the analysis of within-regimes determinants of income inequality is crucial.

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<sup>3</sup> I use “regime” and “variety” interchangeably.

This paper makes three contributions to the comparative institutions research more broadly (Brady et al. 2009; Korpi 1983) and the VoC literature more specifically (Rueda and Pontusson 2000; Pontusson, Rueda, and Way 2002; Roberts and Kwon 2017; Kwon, Roberts, and Zingula 2017). First, this study demonstrates that public expenditure on vocational rehabilitation programs, an important form of labor market intervention, inhibits income inequality cross-nationally. In a recent and important report by the UK Parliament, 8.4 million working-age (16-64) individuals reported disability in 2020 (Powell 2021). This constitutes 20% of the entire workforce in the UK (ibid). Additionally, in 2020, the Labor Force Survey in Norway reported that 17 % of the entire working-age population reported disability (Statistics Norway 2020). Similar percentages of workforce with disability can be found elsewhere. Hence, the percentage of workforce with disability across the Global North is not negligible. Vocational rehabilitation programs provide stable employment opportunities with benefits to individuals with disabilities, facilitating their labor market participation despite physical limitations (OECD 2019). Therefore, this is an important mechanism by which income inequality is inhibited. To the best of my knowledge, this study is the first that examines the effect of vocational rehabilitation programs as an important dimension of institutional complementarities on the levels of income inequality cross-nationally. The strong, negative association between average levels of public expenditure on vocational rehabilitation programs and income inequality can be clearly seen in the bivariate scatterplot in Figure 3 below ( $r = -.62$ ).

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**Figure 2.**  
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Second, I test the relationship between the volume of companies listed on stock exchange on the levels of income inequality, highlighting an important institutional dimension of corporate governance. Previous research has demonstrated that financialized,<sup>4</sup> corporate governance is associated with higher levels of income inequality cross-nationally (Kwon, Roberts, and Zingula 2017; Godechot 2016; Flaherty 2015; Huber, Petrova, and Stephens 2020). These studies have predominately relied on stock market capitalization or the volume of stocks traded as a percentage of GDP which are measures of the degree of financialization of the corporate governance. However, the relationship between the *mode* of capital allocation to firms and the levels of income inequality within countries has not been explored. This is another critical void that this research fills. Capital is allocated to firms predominantly through two major channels under different regimes of capitalism: stock exchange in a liberal market economy such as the United States vs. relational banking (i.e., long-term lending) in a coordinated market economy such as Germany (Hall and Soskice 2001; Aoki 1994; Witt and Jackson 2016). While previous research has demonstrated that financialized corporate governance is associated with higher levels of income inequality cross-nationally (Kwon, Roberts, and Zingula 2017; Godechot 2016; Flaherty 2015; Huber, Petrova, and Stephens 2020), the relationship between the *mode* of capital allocation to firms and the levels of income inequality within countries has not yet been explored. I find that capital allocation through stock exchange leads to higher levels of income inequality within countries, and that the mode of capital allocation to firms bears on distributive outcomes. Indeed, as shown in the scatterplot below, there is a clear, positive correlation between the number (log) of firms and income inequality ( $r = 0.4$ ).

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<sup>4</sup> Financialization is often described as a pattern of accumulation and economic activities relating to “the provision (or transfer) of liquid capital in expectation of future interest, dividends, and capital gains” (Krippner 2005:175-176).

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**Figure 3.**

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Third, I draw on a popular *unsupervised* machine learning algorithm known as *K*-mean cluster analysis to explore how countries can be sorted and grouped based on their institutional similarities. Cluster analysis is construed as an inductive and morphological approach (Hastie, Tibshirani, and Friedman 2009), because it allows the data to ‘speak for themselves’ (Ermakoff 2019). While this study is not the first attempt at conducting cluster analysis of national economies (Schneider and Paunescu 2012), it certainly presents a more up-to-date taxonomy of the varieties of capitalism. It is not an arcane notion that institutions despite their resilience are not static; they are dynamic (Streeck 2011; Thelen 2014). The dynamic character of institutions thus behooves us to take the crucial effect of *time* into account. In order to present a more up-to-date typology of the varieties of capitalism, I take the average values of the institutional variables for each country over the last 5 years (2011-2016) of the panel data. The cluster analysis presented here also incorporates an understudied dimension of institutional complementarities namely, vocational rehabilitation programs.

In what follows, I will first identify the institutional spheres by which we can distinguish varieties of capitalism. Second, I will conduct cluster analysis in order to sort and group countries based on their institutional similarities. The VoC scholars have put forward numerous typologies in order to categorize national economies (Hall and Soskice 2001; Amable 2003; Whitley 1999).

By conducting cluster analysis, I avoid taking for granted the existing typologies that we have been bequeathed from previous research but present a more up-to-date version. Third, I will use the clusters generated to examine the determinants of income inequality *within* each regime of capitalism. Drawing on a uniquely constructed cross-national, panel data entitled “Comparative Welfare States in the 21st Century” (Brady, Stephens and Huber 2020) matched with two other data sources namely, the Global Economy Dataset (2018) and World Intellectual Property Organization Statistics Data (WIPO 2020), I explore the determinants of income inequality in various regimes of advanced capitalist economies. In so doing, I explore the extent to which institutional complementarities within varieties of capitalism matter for explaining divergent distributive outcomes such as income inequality.

### **VARIETIES OF CAPITALISM (VoC)**

The VoC literature identifies five spheres within which firms coordinate their activities with other actors (Hall and Soskice 2001; Hall and Gingerich 2009; Streeck and Yamamura 2001; Yamamura and Streeck 2003, Schmidt 2002, Amable 2004; Morgan et al. 2005). The first sphere is industrial relations. Coordination of collective action, strikes, bargaining over wages and working conditions are usually undertaken through workers’ associations and labor unions, which fall in the sphere of industrial relations. The labor force in liberal market economies (LMEs) tends to be less organized and unions tend to be both weaker and fewer in numbers than that of coordinated market economies (CMEs) (Hall and Soskice 2001; Kenworthy 2005). CMEs set wages through industry level bargaining between trade unions and employer associations, and by equalizing wages at equivalent skill levels across an industry, this version of capitalism makes it difficult for firms to

poach workers. The upshot is that workers tend to be more loyal to their employers in CMEs than LMEs (Hall and Soskice 2001; Thelen 2007).

The second sphere is a set of labor market interventions through educational systems, vocational training and rehabilitation programs. While LMEs tend to invest in general—‘portable’—skills transferrable across firms rather than company and asset-specific skills, the CMEs have a labor force with a high degree of industry and *asset-specific* skills, usually trained through various apprenticeship programs. In this vein, Germany is a canonical example of such labor market interventions in the form of vocational training and rehabilitation programs (Thelen 2007; Amable 2003). Career trajectories in CMEs, therefore, tend to be stable while fluid labor markets in LMEs incentivize poaching and employees’ movement between firms (Hall and Soskice 2001). Additionally, the CMEs exhibit significantly larger expenditure on vocational rehabilitation programs compared to LMEs (see Figure A1 in Appendix A).

The third sphere is corporate governance, which concerns the question of how capital is allocated to firms in either of the two varieties of capitalism. While LMEs encourage firms to be attentive to the prices of shares in the equity market and secure funds through stock market, firms in CMEs usually secure funds through “patient capital” and relational banking (Vitols et al. 1997, 2005). Capital is allocated to firms (large and small) through stock and equity markets in LMEs, whereas firms in CMEs depend on bank-coordinated capital allocation (Witt and Jackson 2016). It is important to note that the difference in access to the sources of finance between LMEs and CMEs is not arbitrary nor contingent. If the financial markets in CMEs are deregulated in the way they are in LMEs, facilitating long-term employment will face serious challenges. As a result, it becomes

harder for firms to recruit skilled labor or sustain worker loyalty (Aoki 1994; Jackson and Miyajima 2007). It is thus with reason that countries across the VoC exhibit different degrees of “financialization” of national economies which then implicates both capital allocation to firms and the levels of income inequality.

The fourth sphere is the internal management of the firms and the degree of employment protection across various sectors of the economy. It is often the case that in CMEs, company-level workers councils—composed of elected employee representatives—are usually endowed with considerable authority over layoffs, which stands in glaring contrast with LMEs’ ‘employment at will’ tradition. In LMEs, the upper echelon of the firms has almost unilateral control over the decision-making processes, including substantial autonomy to hire or fire for a good reason, bad reason and no reason at all without incurring legal liability. In CMEs, however, top managers of the firm must secure agreement for major decisions from supervisory boards, which include employee representatives as well as major shareholders (Aoki 1994, Jackson and Miyajima 2007). The German ‘co-determination’ councils in firms involve workers to participate in the internal management of the firms, which increases the participatory dimension of workers in the managerial domain (Turner et al. 2001). Hence, the lack of employer coordination in LMEs is indicative of a less regulated and more flexible labor markets. The direct result of this is that LMEs feature considerably less employment protection compared to CMEs.

The fifth sphere is innovation and technological change. Hall and Soskice proposed that LMEs and CMEs show distinct patterns of institutional comparative advantage for radical or incremental innovations. Radical innovation “entails substantial shifts in product lines, the

development of entirely new goods, or major changes to the production process,” whereas incremental innovation is “marked by continuous but small-scale improvements to existing product lines and production processes” (2001: 381). Hall and Soskice conclude that the combination of factors such as patient capital, long term employment, and firm-specific skills in the CMEs enable more efficient production in industries with incremental patterns of innovation, because the relative immobility of labor and capital restrained firms to focus their efforts on improving existing lines of production. Conversely, fluid capital markets with short-term employment and general skills in LMEs facilitate efficient production in industries with radical patterns of innovation, as these conditions support firms using external markets to mobilize risky equity finance and workers with different skill sets, and thereby take advantage of new technological breakthroughs.

These are the five spheres by which the institutional diversity across national contexts presents itself in a more pronounced way. Indeed, there is a general consensus among scholars that significant variation exists across these core institutional domains, including industrial relations, employment relationship, financial systems, interfirm networks, corporate governance, and of course, the characteristics of the state itself (Hall and Soskice 2001; Witt and Redding 2013; Hall and Gingerich 2009; Whitley 1999). A number of studies have attempted to explore how such differences allow categorization of distinct types of institutional configurations that go beyond Hall and Soskice’s original binary categorization of LMEs and CMEs (2001). For example, Amable (2003) identifies five versions of capitalism namely, market-based, Asian, Continental European, social-democratic, and Mediterranean. Looking beyond the Global North and the “developed” countries, the typologies of the VoC have also been extended to the Global South (Witt et al. 2015). Additionally, Schneider and Panuescu (2012) use cluster analysis incorporating data in different

points in time to investigate how countries can be grouped together based on their institutional configurations.

Drawing on the latest data available, I conduct cluster analysis to generate a more up-to-date typology of the varieties of capitalism based on the institutional characteristics.<sup>5</sup> I incorporate a number of variables connected to the five spheres of institutional configurations across the VoC. The five spheres that I enumerated are universally accepted to be different from each variety of capitalism to another (Hall and Soskice 2001; Amable 2003; Witt and Redding 2013; Hall and Gingerich 2009; Whitley 1999; Schneider and Panuescu 2012). A cluster, in this sense, refers to a collection of data points aggregated together because of certain similarities (Everitt et al. 2011). The cluster analysis here is based on the following variables. Union density (i.e., defined as net union membership as a percentage of employed wage and salary earners), wage setting coordination (i.e., degree of coordination in setting wages by firms, industries, and the state) are both included in order to capture the two important dimensions of industrial relations namely, collective bargaining and wage setting coordination. An index of employment protection is included to capture the degree of employment security. Public expenditure in vocational rehabilitation programs is incorporated in order to capture the volume of expenditure in workers' training and rehabilitation. Additionally, the percentage of 25-64 years old adult population with tertiary degrees is included because in the VoC literature, a high share of university graduates is a characteristic of LMEs, whereas a high share of graduates from occupational training and apprenticeship programs is a characteristic of CMEs (Schneider and Panuescu 2012). Stock market capitalization as a percent

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<sup>5</sup> As noted, there have been attempts to use principal components analysis (PCA) technique to group countries together, but their clustering of countries have either strictly centered around welfare state literature (Kenworthy and Hicks 2002) or have been old (Hall and Gingerich 2009; Schneider and Panuescu 2012) using data limited to the period 1990-2005. As already noted, institutions are dynamic (Acemoglu and Robinson 2015), which necessitates a more up-to-date cluster analysis. The cluster analysis in this paper makes use of the latest longitudinal data on institutional variables in order to take into account the effect of time by averaging the values of the components for the time span of the study.

of GDP measures the degree and intensity of financialization of the corporate governance, and patent rate captures the effect of technical change. Hence, the variables incorporated in this cluster analysis capture various dimensions of the five spheres by which the VoC can be distinguished. It is worth emphasizing that the selection of these variables is not arbitrary, they are based on the differences in the institutional spheres of national economies that I delineated above. Indeed, in all attempts at generating taxonomies of the VoC, a *combination* of the variables that I underscored above have been considered (Hall and Soskice 2001; Whitley 1999; Amable 2003; Witt and Redding 2013; Hall and Gingerich 2009; Schneider and Panuescu 2012).<sup>6</sup>

As noted, cluster analysis in this paper is conducted using the *k*-means method, which is an *unsupervised* technique to group data objects given their similarities (Everitt et al. 2011). That is to say, a data point is considered to be in a particular cluster if it is closer to that cluster's centroid than any other centroid. In effect, *k*-means clustering aims to partition *n* observations into *k* clusters in which each observation belongs to the cluster with the nearest mean, which serves as a prototype of the cluster. The clusters generated can also be statistically tested in order to obtain the optimal number of clusters. The cubic clustering criterion (CCC) test is conducted to investigate the *optimal* number of clusters using Ward's minimum variance, and the performance of the CCC is evaluated by Monte Carlo methods. I explored a wide range of clusters (between 2 and 8) in order to discern which number of clusters is optimal. After conducting cluster analysis, the CCC score indicated that 3 is the optimal number of clusters. Hence, given the institutional variables I incorporated, 3 is the optimal number of clusters whereby within cluster/group differences are minimized and the

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<sup>6</sup> One can, of course, add more variables to conduct cluster analysis. The variables I selected *directly* speak to the institutional spheres I detailed earlier. Indeed, in auxiliary analysis, I added more variables, but the results of *k*-mean cluster analysis remained stable.

between cluster/group differences are maximized. Indeed, this is the whole objective behind conducting *k*-mean algorithm. Appendix (A) at the end of this paper includes a discussion of the *k*-mean cluster analysis algorithm as well as its technical dimensions. As emphasized, cluster analysis using the *k*-mean technique is inductive because it falls under the *unsupervised* learning algorithms (Everitt et al. 2011; Hastie, Tibshirani, and Friedman 2009).

As Table 1 below demonstrates, countries are clustered around 7 main ‘components’ (i.e., institutional variables) that are universally taken to address institutional designs and complementarities in the VoC literature (Hall and Soskice 2001; Hall and Gingrich 2009; Iversen and Soskice 2009; Whitley 1999; Schneider and Panuescu 2012). Given the varying scales of the variables incorporated in the cluster analysis, I z-normalized to avoid any “artificial effects of the different size” or metric of the variables (Schneider and Panuescu 2012: 738). Countries that have lower levels of union density, wage setting coordination, employment protection but the highest levels of stock market capitalization and patent rate are the liberal market economies (see Table 1 below). Conversely, countries that exhibit the highest levels of union density, wage setting coordination, employment protection and expenditure on vocational rehabilitation are the social democratic market economies. Those countries that fall in between this continuum are the coordinated market economies. In Figure 5 below, liberal market economies are located around the centroid of the first cluster while social democratic market economies are located around the centroid of the third cluster. One can easily note the enormous difference in the average of union density, wage bargaining coordination as well as stock market capitalization between clusters in Table 1 below.

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**Table 1.**

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**Figure 4.**

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As alluded earlier, cluster analysis in this research takes the temporal effect into account given that institutions are not static. Indeed, as the ‘liberalization thesis’ suggests, some of the institutional characteristics of national economies (i.e., employment protection and union density) have considerably declined since the 1990s (Streeck 2011; Lucio and Howell 2017; Hall and Thelen 2009; Schneider and Panuescu 2012). By incorporating the average values of the time-varying institutional variables for the last 5 years (2011-2016) of the panel data, I have considered a sufficient ‘time-lapse’ to capture the temporal effect on the changing characteristics of institutions with the most recent data available in the cluster analysis. The most conspicuous advantage of this approach as opposed to just using data from one point in time lies in some of the noticeable changes we observe in the typology presented here compared to others (Hall and Soskice 2001; Hall and Gingrich 2009; Iversen and Soskice 2009; Hicks and Kenworthy 2003; Schneider and Panuescu 2012). For example, Japan had always been construed as a CME, but as exhibited in the cluster analysis in this paper, it has now completely moved in the opposite direction: Japan is now in the proximity of Canada in the LMEs’ cluster (See Figure 5).<sup>7</sup> Moreover, the Netherlands

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<sup>7</sup> To be sure, I also averaged the principal components by only the past 10 years (2006-2016) in order to account for the most recent institutional changes and re-conducted cluster analysis. The results of the cluster analysis are consistent when the time span is limited to only last decade.

has been consistently considered to be a coordinated market economy (Hall and Soskice 2001) but is now part of the social democratic market economies variety.

While I rely on the most updated cluster analysis in this paper by averaging the values of the variables I incorporate over the last 5 years of the panel data, I have also demonstrated how countries cluster together based on different time periods in Appendix (A). By taking the average values of the variables over 5-year time intervals (i.e., 1985-1990; 1991-1995; 1996-2000; 2001-2005; 2006-2010), I have also conducted cluster analysis temporally (See Tables A7-A12 and Figures A2-A7 in Appendix A).<sup>8</sup> As shown in Figure A2-A6, with the exception of a few cases such as Japan, Ireland, and Austria that have drifted towards different regimes of capitalism over time, most countries have remained in their respective regime over the past three decades. As a result, drawing on the averaged values of variables over the last 5 years of the panel data for the purpose of cluster analysis allows us to present the most up-to-date typology of the VoC.

## **DATA & VARIABLES**

I explicated the theoretical foundation on which the institutional differences within varieties of capitalism rest. This section details the data, method, and variables that are used in the empirical analysis. To empirically test how those differences in institutional designs of advanced capitalist economies affect the levels of income inequality, I use fixed-effect regression models. The time span of the panel data for this study is from 1985 to 2016. Drawing on multiple panel datasets namely, Comparative Welfare Dataset (Brady, Huber, and Stephen 2020),<sup>9</sup> the Global Economy

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<sup>8</sup> I also used the average values of the 5 years periods averages to conduct cluster analysis as demonstrated in Table A11 and Figure A7 of Appendix (A). However, using the average values of the 5 years time intervals compresses the time effect by inflating—or deflating—the recent more recent values of the variables included in the cluster analysis. A noticeable flaw of using average values from the earlier periods is the fact that Germany is clustered along with Finland and other social democracies, but this is not the case in other cluster analyses based on other time periods.

<sup>9</sup> Some of the key variables are missing after 2016 in the Comparative Welfare Dataset (2020), even though other variables are updated until 2020. Hence, I limit the time span from 1980-2016 not to compromise the high quality of the panel dataset.

(2019), and the World Intellectual Property Organization (WIPO, 2020), I examine the extent to which institutional complementarities matter for determining the levels of income inequality across various regimes of capitalism. Detailed statistical description of the variables for each country is presented in Table A1, Appendix (A) at the end of the paper.

I incorporate a host of variables that directly pertain to the institutional complementarities across varieties of capitalism. Table 2 below presents the definition and the sources of the variables included in this study. The variables that have already been examined in other cross-national studies on income inequality include: (1) union density; (2) wage setting coordination; (3) unemployment rate; (4) employment protection in legislation; (5) stock market capitalization as a measure of financialization; (6) total public expenditure on social benefits and welfare as a percentage of GDP<sup>10</sup> (Rueda and Pontusson 2000; Alderson and Nielsen 2002; Roberts and Kwon 2017; Godechot 2016; Mahutga, Roberts, and Kwon 2017, Huber, Petrova, and Stephens 2020); (7) Tax revenues as a percentage of GDP, which is a measure of the degree of the government's extractive capacity and its fiscal resources since it includes all forms of taxes levied (i.e., income, profits, payroll, ownership and transfer of property, goods and services, etc.) (OECD 2019). The variables that have not yet been examined in previous research on income inequality from the VoC perspective that I test in this study include: (8) public expenditure on vocational training programs as a percentage of GDP; (9) public expenditure on vocational rehabilitation programs as a percentage of GDP; (10) listed companies on stock exchange as a dimension of corporate governance as to how capital is allocated to firms; and (11) patent rate as a measure of technical change. I include two controls in the research design of the paper: globalization and population. Given the salience of the

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<sup>10</sup> It should be noted that I also included the welfare state generosity index constructed by Scruggs et al (2010) as an alternative measure to public expenditure on total social benefits, but since Scruggs' dataset is not extended after 2010, it would severely limit my sample size. Hence, I include the public expenditure on total social benefits as a comprehensive measure that captures every aspect of welfare expenditure: healthcare, old-age and sickness benefits, etc.

globalization thesis in the study of income inequality (Hager 2018; Alderson and Nielsen 2002; Kollmeyer 2015; Roberts and Kwon 2017), I control for trade openness defined as the sum of exports and imports as a percentage of GDP at current prices, which is often used as a measure of globalization (Rueda and Pontusson 2000; Kollmeyer 2015). In auxiliary analysis, I also controlled for volume of imports from the Global South as a measure of deindustrialization and the proportion of single mother families to account for demographically oriented explanation of income inequality.<sup>11</sup> Both of these measures, however, suffer from significant number of missing data, which would severely reduce my sample size and the time span of the study. But even when I include these controls for much smaller sample, the results are consistent.

The outcome variable incorporated in this study is Gini coefficient (post-tax-and-transfer) for household income. The choice to use this outcome variable was not arbitrary. First, there was no missing data for this variable and OECD's series of Gini coefficients are of the highest quality data on income inequality that we have available cross-nationally. Second, income generated from employment accounts for the lion's share of earnings in countries of the Global North and the distribution of income from employment by other measures (i.e., 90/10 ratio) correlate quite closely with cross-national measures of income distribution such as the Gini coefficient. Third, the post-tax-and-transfer Gini coefficient is a better measurement of income inequality compared to pre-tax-and-transfer Gini coefficient because the former takes into account the households' *disposable* rather than gross income (Rueda and Pontusson 2000; Pontusson et al., 2002; Piketty 2014; Mahutga, Roberts, and Kwon 2017). Fourth, and as a robustness check, I also test the analysis with Solt's standardized inequality database, but the results are similar (2020).

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<sup>11</sup> I also controlled for female labor force participation and the results are consistent.

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**Table 2.**

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## **METHODS**

Since the dataset analyzed here is structured as a multilevel panel dataset where repeated measures of income inequality and other variables are nested within time and countries, I use a fixed-effects model to account for the heterogeneity of unobserved variables. It should be noted that I initially modeled the data as a random-effects specification, but after running the Hausman test, the random-effects specification was resoundingly rejected at  $\alpha < 0.001$ .

Fixed effects regression models are widely used in longitudinal and panel data in the social sciences (Angrist and Pischke 2008), and their virtue lies in their ability to adjust for unobserved, unit-specific and time-invariant confounders when estimating effects from observational data (Halaby 2004; Imai and Kim 2019). But while fixed effects models adjust for unobserved and time-invariant confounders, time-varying omitted variables may still confound the estimates. Finding a way to adjust for time-varying confounders in a fixed effect model has recently been an important area of discussion in the use of panel data in social science research (Halaby 2004; Imai and Kim 2019). Recent methodological literature on panel data analysis underscores the strategy to adjust for time-varying confounders by including lagged independent variables (Halaby 2004; Imai and Kim 2019).<sup>12</sup> Therefore, in order to account for the time-varying confounders (in addition to the time-invariant ones), I lag all of the time-varying covariates in the model demonstrated below:

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<sup>12</sup> It is crucial to note that the threat of time-varying confounders is not eliminated even after including lagged independent variables. To ensure that my results are robust, I have also included a whole range of controls and the results are consistent.

$$Y_{it} = \beta_1 + \beta_2 X_{1it-1} + \beta_3 X_{2it-1} + \beta_4 X_{3it-1} \dots + \xi_{0i} + \varepsilon_{ij} \quad (1)$$

Equation (1) is a fixed-effects regression model with country-specific intercept  $\beta_1 + \xi_{0i}$ , where  $\xi_{0i}$  is a fixed parameter.  $X_{it-1}$  represents time-varying explanatory variables with a time lag of one year. Since fixed effects regressions model within group (i.e., country, in my case) variation, I also include the results of random effects model in Table A4 of Appendix (A) in order to demonstrate how they may be different if we were interested in between-country variation. The results are by and large consistent in both random and fixed effects models.

I examine multiple models of the determinants of income inequality across 21 countries in the Global North. Four models are presented in Table 3: Model (1) incorporates a whole array of variables that are directly connected to the institutional complementarities of national economies but does not restrict the sample to any variety of capitalism. It is crucial to note that what matters for the levels of income inequality in liberal market economies may well be different than that of social democratic market economies. In order to investigate how and to what extent the effects of institutions *vary* across the varieties of capitalism, I restrict the sample to those countries that fall under each regime of capitalism namely, liberal market economies (LMEs), coordinated market economies (CMEs), social democratic market economies (SDMEs). I then run the fixed effects model with lagged independent variables separately for each variety of capitalism in order to demonstrate the *within-regime* determinants of the levels of income inequality. Models (2, 3, and

4) in Table 3 demonstrates the determinants of the levels of income inequality within each regime of capitalism.<sup>13</sup>

## RESULTS

The results of fixed-effects models with lagged independent variables are demonstrated below in Table 3. The coefficients signify the effect of temporal change in independent variables on change in the dependent variable (Halaby 2004; Imai and Kim 2019). To ease interpretation, I standardize the coefficients, so that the effect size of each independent variable can also be compared easily to others. Table 3 demonstrates the results for the determinants of the levels of income inequality across the varieties of capitalism. Model (1) in Table 3 demonstrates the results cross-nationally, with no sample restriction. The associational power of the working class measured by union density as well as public expenditure on vocational rehabilitation programs inhibit income inequality, whereas capital allocation to firms through stock markets (i.e., listed companies on stock exchange) and financialized corporate governance (i.e., stock market capitalization) incubate it. More precisely, a standard deviation increase in union density leads .03 standard deviation decrease in the level of income inequality within countries. Whereas a standard deviation increase in the expenditure on vocational rehabilitation programs leads to 0.67 standard deviation decrease in the level of income inequality, a standard deviation increase in the natural log of the listed companies on stock exchanges leads to .13 increase in the level of income inequality within countries. I also

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<sup>13</sup> It should be noted that since I conducted the Westerlund, Pedroni, Kao cointegration tests. However, none of these tests indicate that my panel data is cointegrated. As a result, dynamic panel models are not appropriate given that there is no cointegration in the panel data I draw on.

find greater degree of employment protection to have an inhibiting effect on the levels of income inequality, though its statistical significance is marginal.<sup>14</sup>

The results of my analysis exhibit two novel findings. First, the persistent *negative* effect of changes in public expenditure on vocational rehabilitation programs—a vastly underexplored area in cross-national research on inequalities—on the levels of income inequality. Public expenditure on vocational rehabilitation programs is aimed at facilitating labor market participation for individuals with disability, enabling them to generate stable income and benefits for themselves (OECD 2019). This result is particularly new. Indeed, across model specifications, I find the negative association between public expenditure on vocational rehabilitation programs as a crucial labor market intervention and the levels of income inequality to be statistically significant ( $\alpha < 0.05$ ), and with a relatively large effect size. As noted, workers with disability sometimes constitute up to 20 percent of the workforce across countries in the Global North (Powell 2020), and the extent to which employees with disability participate in ordinary paid work that generates stable income and benefits for themselves is a major contributing factor to *reducing* the levels of income inequality. Importantly, an OECD report indicates that only 35% of individuals with disability are able to find employment in Spain, whereas 55% of individuals with disability are likely to find employment opportunities in Finland, which is a much higher percentage (2009).<sup>15</sup> We can also observe the average Gini coefficient for household income for the time period that is covered in this study (1985-2016) in Spain is significantly higher than Finland (see Figure A1, Appendix A). Equal treatment of individuals with disability in the hiring processes enables them to generate stable fiscal

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<sup>14</sup> It should be noted that in estimating the standard errors, I have accounted for heteroskedasticity by clustering them around countries' unique identifiers in the panel data.

<sup>15</sup> See OECD (2019) Report titled 'Sickness, and Disability, Work' <http://www.oecd.org/employment/emp/42699911.pdf>, accessed April 10, 2020.

resources and benefits, which then allow them to achieve better labor market outcomes. Investment in vocational rehabilitation programs thus inhibits income inequality within countries.

Second, I find that a crucial dimension of corporate governance namely, the mode of capital allocation to firms (i.e., listed companies on stock exchanges) also affects the levels of income inequality. This suggests that as capital is allocated more through stock exchange, the levels of income inequality increased within countries. The effect of financialization on income inequality often measured by “stock market capitalization” in cross-national studies is well known (Sjöberg 2009; Huber, Petrova, and Stephens 2020; Godechot 2016; Kwon, Roberts, and Zingula 2017; Flaherty 2015), but less known is the relationship between the mode of capital allocation to firms and income inequality. Listed companies on stock exchange allows us to test the relationship between the *mode* of capital allocation to firms and the levels of income inequality. While previous studies have found financialization of corporate governance is positively associated with the increased income inequality, my results demonstrate that the mode of capital allocation to firms is also positively associated with an increase in the levels of income inequality. That is to say, as capital has been allocated more through stock markets as opposed to relational banking, the levels of income inequality have increased within countries and over time (Aoki 1994; Aoki and Dore 2001).

Are the determinants of income inequality the same across varieties of capitalism? For example, does union density matter for income inequality in CMEs as much as it matters in LMEs? How may the results change if I restrict the sample to each regime of capitalism that are identified by the cluster analysis? It is plausible to suggest that what determines the levels of income inequality in Germany as the exemplar of the coordinated market economies may well be different

than those of Sweden as a conspicuous example of the social democratic market economies. To explore the predictors of *regime-specific* estimates of income inequality across the varieties of capitalism, I restrict the sample to those countries that constitute each regime. It must be noted that the models with the restricted samples are similar to fully interacted ones whereby each independent variable is interacted with dummy variables indicating a variety of capitalism.

When restricting the sample to only LMEs as presented in Model (2), union density inhibits inequality while more capital allocation to firms through stock exchange incubates it. Hence, my results demonstrate that declining unionization as well as increasing number of listed companies on stock exchange have led to increased levels of income inequality in LMEs. Model (3) demonstrates the results for CMEs. Crucially, for CMEs, employment protection inhibits income inequality. That is to say, as the degree of employment protection waned or stagnated over time, the levels of income inequality increased in CMEs. In SDMEs, as shown in Model (4), the financialization of corporate governance through greater stock market capitalization is positively associated with the levels of income inequality. Conversely, public expenditure on vocational rehabilitation programs is negatively associated with the levels of income inequality across SDMEs, though its statistical significance is only marginal. I find no support for patent rate as a measure of technical change to facilitate or impede income inequality cross-nationally in the pooled fixed-effects Model (1), but technical change measured by patent rate has marginal inhibiting effect on the levels of income inequality across SDMEs (Model 4). To further investigate the impact of technical change on income inequality, I used two alternative measures. First, total expenditure by both public and private sectors on research and development (R&D) in each country over time, and second, proportion of the working population in each country who completed college degree. Neither of these variables are statistically significant.

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**Table 3.**

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These are my key results, and the ones related to vocational rehabilitation programs and mode of capital allocation to firms are particularly new. However, one may wonder if the results are robust to alternative estimation choices, so I conducted a number of robustness checks. I find these results to be statistically significant at conventional level ( $\alpha < 0.05$ ) when I add a linear measure of time, when I omit one country at a time to test whether the results were driven by the outlying country, and when I employ random (rather than fixed) effects model whose results are exhibited in Table A4, Appendix (A). In fact, I find particularly consistent results when I run random effects model in order to explore between-country—as opposed to within-country—effects of the independent variables on the outcome variable.

In auxiliary analysis, I also explored a number of interaction effects. For example, I explored whether the interaction between employment protection expenditure on social benefits and tax revenues, employment protection and vocational training expenditure, employment protection and vocational rehabilitation expenditure, and listed companies on stock exchange and stock market capitalization explain variation in the levels of income inequality cross-nationally. However, none of these interactions are statistically significant. The interaction effect between public expenditure on vocational rehabilitation and public expenditure vocational training is the only instance that is statistically significant, though only at non-conventional level ( $p < 0.1$ ). It must be noted that I also pursued the ‘interaction approach’ by interacting the fixed-effects model with a categorical variable

indicating each regime of capitalism. The results are particularly consistent, and they are exhibited in Table A6 of Appendix (A).

## **DISCUSSION & CONCLUSION**

Scholars from across social science disciplines agree that much of income and social inequalities are the direct result of the ways in which economic resources are organized through institutions and their interaction with each other (Hall and Soskice 2001; Acemoglu and Robinson 2015; Thelen 2007; Rueda and Pontusson 2000; Huber and Stephens 2014). The varieties of capitalism perspective endows us with the analytical tool to differentiate which institutions are—and which are not—conducive towards building a more socially and economically equitable society. One of the central goals of this study was to deepen the engagement with the varieties of capitalism perspective and the broader research on income inequality. By identifying a number of variables that capture the effects of differential institutional blueprints of national economies, this study explored what institutional factors matter for the levels of income inequality, both cross-nationally and within each regime of capitalism. There is a wide consensus among scholars that the endogenous evolution of institutions and their interaction influence how gains of economic actions are distributed among individuals (Acemoglu and Robinson 2015; Hall and Soskice 2001). Building on previous research that takes an institutional approach to the study of income inequality (Rueda and Pontusson 2000; Kenworthy and Pontusson 2005; Roberts and Kwon 2017; Kwon, Roberts, and Zingula 2017), this paper made three contributions.

First, it demonstrates that within-country temporal change in the levels of public expenditure on *vocational rehabilitation* programs negatively impacts the levels of income inequality. That is to say, as public expenditure in vocational rehabilitation programs declined (or

in some cases stagnated) over time, the levels of income inequality increased within countries over the time span of the panel data. The relationship between this important labor market intervention namely, vocational rehabilitation programs and income inequality has not been tested in previous research. This is a crucial dimension of institutional complementarities that has been ignored and this study is the first to present this novel finding. To be sure, there has been a body of scholarship known as “active labor market policies” (ALMP) mostly in the economics tradition, but the ALMP literature has been mostly concerned with extent to which such policies and interventions can help reduce unemployment (Crépon and Berg 2016; Laun 2014; Lechner, Miquel, and Wunsch 2011), and not so much income inequality. Additionally, the literature on the ALMP often uses the sum volume of expenditure on labor market policies when examines its relationship with a socioeconomic outcome. It does not ‘parse out’ the effect of *specific* policies such as vocational rehabilitation programs that specially targets individuals with work limitation and disability (Rueda 2015). Afterall, public expenditures on ‘vocational rehabilitation programs and training,’ ‘direct job creation’ and ‘start-up incentives’ all fall under the broad category of active labor market policies, but each may—or may not—have an effect on a particular socioeconomic outcome (OECD 2019). In this paper, I specially demonstrate the effect of one policy within the broad category of active labor market policies namely, public expenditure on vocational rehabilitation programs. I find that the expenditure on vocational rehabilitation programs is negatively associated with the levels of income inequality within countries. However, when I examine its effect on income inequality within regimes, it is only marginally significant in SDMEs.

Second, I find evidence that the *mode* of capital allocation to firms—an important dimension of corporate governance (Aoki 1994; Aoki and Jackson 2008)—bears on the levels of income inequality within countries. The greater the volume of companies listed on stock exchange

suggests that capital is allocated to firms more through stock market, and less through relational banking (i.e., long-term lending).<sup>16</sup> As companies rely more on stock market to secure funds (as opposed to relational banking), the levels of income inequality increase over time. This finding suggests that a particular dimension of corporate governance namely, capital allocation to firms through stock exchange bears on income inequality. As noted, the previous research has found a positive association between a measure of financialization namely, stock market capitalization and income inequality (Anthony and Kwon 2017; Kwon, Roberts, and Zingula 2017; Huber, Petrova, and Stephens 2020). For example, Huber and associates in their most recent study use stock market capitalization as an indicator of financialized corporate governance and find that it is positively associated with income inequality (2020: 444). However, stock market capitalization and listed companies on stock exchange are not the same. If stock market capitalization is a measure of financialized corporate governance, the volume of listed companies on stock exchange measures the *mode* of capital allocation to firms. That is to say, the greater volume of companies listed on stock exchange signifies more capital allocation through the stocks market as opposed to relational banking. I find that the greater allocation of capital to firms through stock exchange incubates income inequality within countries.

Third, I conducted cluster analysis with the most recent data available on institutional characteristics of national economies in most countries of the Global North. To investigate how countries can be grouped together based on their institutional arrangements, I used an unsupervised machine learning algorithm known as *k*-mean clustering. Instead of taking for granted the existing (mostly deductive) typologies of varieties of capitalism, I conducted cluster analysis to inductively

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<sup>16</sup> Due to data limitations, I could not scale this by the total number of companies operating in a given country and given year. I tried scaling this by population and the results are consistent with the natural logarithm of the number of companies listed on stock exchanges.

demonstrate how countries can be distinctly grouped together (Hastie, Tibshirani, and Friedman 2009). The motivation to conduct cluster analysis stems from the fact that institutions are not static, as the ‘liberalization thesis’ suggests (Streeck 2011; Thelen 2007, 2014), and the clustering here takes into account the important effect of time on the changing and dynamic characteristics of institutions. By conducting cluster analysis, this paper not only takes an inductive approach similar to that of Schneider and Panuescu (2012), but also present a more up-to-date picture of how countries can be grouped together based on their institutional similarities. For example, it shows how Japan, a country that has consistently been labeled as a coordinated market economy has moved towards to a socioeconomic system characteristic and reminiscent of liberal market economies. This is largely due to the fact that institutions evolve and change over time (i.e., unions decline, employment protection weakens, expenditure in vocational rehabilitation programs dwindles, etc.), and that the institutional arrangements, which once allowed Japan to be categorized as a coordinated market economy twenty years ago (Hall and Soskice 2001) is no longer the case. By drawing on the latest data available, I account for the *endogenous evolution* and changes in institutions when we attempt to cluster countries, as Acemoglu and Robinson emphasize (2015).

Cross-nationally, I find evidence for crucial institutional blueprints such as labor unions, public expenditure on vocational rehabilitation programs, and the mode of capital allocation to firms as important determinants of income inequality. While more capital allocation to firms through stock markets incubates income inequality, organizational power of the working class expressed in union density and labor market interventions in the form of public expenditure on vocational rehabilitation programs inhibit it. It is worth emphasizing that the *negative* effect of expenditure on vocational rehabilitation programs on the levels of income inequality has not been previously explored in cross-national research on institutions and income inequality, and this is

particularly a novel finding of this study. Vocational rehabilitation programs facilitate more labor market participation for individuals with work limitation and disability, enabling them to generate stable income and benefits for themselves and ultimately improve their labor market outcomes (OECD 2019). My results exhibit strong evidence that more investment in vocational rehabilitation has important implications for reducing the levels of income inequality.

As alluded earlier, to explore regime-specific determinants of income inequality, I restricted the sample to countries that fall under each variety of capitalism informed by the cluster analysis. There are no particular reasons to believe that what explains variation in the levels of income inequality in LMEs is the same in SDMEs. Indeed, restricting the sample to each regime of capitalism and then running the fixed-effects model allow us to explore the heterogeneity of determinants across the varieties of capitalism. Within clusters, and specifically for LMEs, union density is a negative determinant of the levels of income inequality. This suggests that as union density—the associational power of the working class that enables them to win concessions from the employers for better material conditions—declined, the levels of income inequality increased within countries (Rueda and Pontusson 2000; Kenworthy and Pontusson 2005; Anthony and Kwon 2017; Freeman and Katz 1995; Gottschalk and Smeeding 1997; Kollmeyer and Peters 2019; Kwon, Roberts, and Zingula 2017). In CMEs, employment protection inhibits income inequality. More substantively, as employment protection weakened, income inequality increased in CMEs. For SDMEs, the financialization of corporate governance measured by stock market capitalization positively predicts variation in the levels of income inequality, suggesting that as corporate governance became more financialized, the levels of income inequality increased within countries in SDMEs. Additionally, public expenditure on vocational rehabilitation programs negatively predicts the outcome variable in SDMEs, though its statistical significance is marginal ( $\alpha < 0.1$ ).

In short, building on previous cross-national studies, the primary purpose of this paper was to bring the varieties of capitalism perspective to bear on income inequality research by identifying variables that directly correspond to the institutional complementarities of national economies. The necessity to look at the role of institutional designs and their *differences* stems from the fact that much of social and income inequalities are the direct result of the ways in which economic resources are organized through institutions. The varieties of capitalism perspective presents a useful analytical lens by which we can differentiate what institutional designs are most conducive towards building a more socially and economically equitable society. If anything, the recent COVID-19 pandemic crisis has shown that the way institutions are set up and the way they interact with each other shape the strategies that the state adopts to respond to shocks and disasters, both in terms of containing its dissemination and providing relief to those most affected by it. Institutions thus heavily influence how economic resources are distributed, and this study identified the institutional variables across different regimes of capitalism that are most conducive to egalitarian outcomes from the varieties of capitalism perspective.

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**Table 1.****Principal Components of Cluster Analysis\***

<b>Cluster 1, 2, 3</b>	<b>Mean</b>	<b>Mean</b>	<b>Mean</b>	<b>Mean</b>	<b>Mean</b>	<b>Mean</b>	<b>Mean</b>
	<b>Union Density</b>	<b>Wage Setting Coordination</b>	<b>Employment Protection</b>	<b>Tertiary Education</b>	<b>Vocational Rehabilitation</b>	<b>Stock Market Capitalization</b>	<b>Patent Rate</b>
(1) Liberal Market Economies	-0.78	-0.87	-0.92	1.29	0.68	0.89	1.01
(2) Coordinated Market Economies	-0.80	-0.03	2.68	0.11	-0.20	-0.28	-0.69
(3) Social Democratic Economies	1.21	0.87	-0.03	0.79	0.68	0.11	-0.59

\*The values are Z-normalized given that these variables do not have the same metrics.

**Table 2.**

**Variables Description**

Variables	Description	Statistical Descriptive	
		Mean	SD
GINI Coefficient	Net (Post-Tax-and-Transfer) GINI Coefficient for Household income. Source: Comparative Welfare States Dataset.	29.22	4.20
GDP Growth Rate	Annual GDP Growth Rate. Source: OECD.	2.20	2.50
Union Density	Net union membership as a percentage of employed wage and salary earners. Source: Comparative Welfare States Dataset.	35.05	19.92
Wage Setting Coordination	This variable is coded in the following way: 1 = fragmented wage bargaining, confined largely to individual firms or plants; 2 = fixed or alternating industry-and firm level bargaining, with weak enforceability of industry agreements; 3 = industry-level bargaining with no or irregular pattern setting, limited involvement of central organizations, and limited freedoms for firm-level bargaining; 4 = mixed industry and economy-wide bargaining; 5 = economy-wide bargaining. Source: Comparative Welfare States Dataset. OECD, Employment and Labor Force Statistics (database) via Comparative Welfare States Dataset.	2.96	1.30
Harmonized Unemployment Rate	The number of unemployed persons as a percentage of the civilian labor force. Source: OECD, Employment and Labor Force Statistics (database) via Comparative Welfare States Dataset.	7.44	3.89
Taxes as Revenues Collected as % of GDP	Total tax revenue as a percentage of GDP indicates the share of a country's output that is collected by the government through taxes. Source: OECD, Tax Revenue Statistics Dataset.	35.49	6.79
Expenditure on Social Benefits as % GDP	Public and mandatory private expenditure which supports families, as a percentage of GDP. Source: OECD, Social Expenditure Statistics (database) via Comparative Welfare States Dataset.	14.25	3.47
Expenditure on Vocational Training as % GDP	Public expenditure on job training, as a percentage of GDP. This variable covers two categories of training: vocational and remedial training for the unemployed and targeted retraining for the employed. Source: OECD, Social Expenditure Statistics (database) via Comparative Welfare States Dataset.	0.23	0.18
Expenditure on Vocational Rehabilitation as % GDP	Public expenditure on job rehabilitation, as a percentage of GDP. Vocational rehabilitation programs provide employment opportunities for individuals with reduced working capacity which prepares them to move on to work or regular training with stable income and benefits. Source: OECD, Employment Statistics (database) via Comparative Welfare States Dataset.	0.10	0.14
Listed Companies on Stock Exchange	Listed of companies on stock exchange. It is measure of how capital is allocated to firms. The greater volume of companies on stock markets, the more capital is allocated though stock exchanges and less through relational banking. Source: The Global Economy Dataset.	5.97	1.33

Employment Protection	Employment protection legislation, an index of the overall strictness ranging from 0 (least strictness) to 6 (most strictness). This variable is the unweighted average of the sub-indicators of employment protection legislation for regular contract.	2.07	0.97
Stock Market Capitalization	Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Source: The Global Economy Dataset.	66.40	46.61
Patent Rate	The rates are generated by multiplying the total number of registered patents in each country by 1000 and then dividing it by the population of aged 15-65. Source: World Intellectual Property Organization.	0.48	0.52
Trade Openness	Trade openness, defined as the sum of exports (export) and imports (import) as a percentage of GDP. Source: OECD, National Accounts Statistics (database) via Comparative Welfare States Dataset.	69.63	35.38

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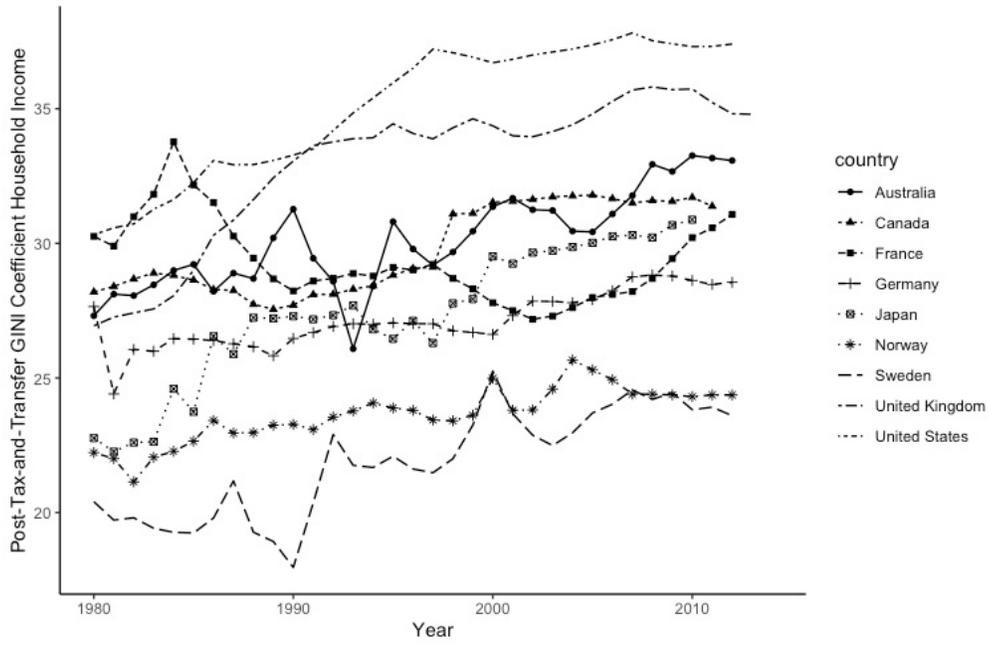
**Table 3. Determinants of Income Inequality, Fixed Effects Regression**

Explanatory Variables	(1) All Countries	(2) Liberal Market Economies	(3) Coordinated Market Economies	(4) Social Democratic Economies
<i>Economic Indicators</i>				
GDP Growth Rates (t-1)	-0.011 (0.008)	0.006 (0.011)	-0.046 (0.033)	-0.010 (0.034)
Unemployment Rates (t-1)	0.016 (0.012)	0.035 (0.021)	0.001 (0.012)	0.034 (0.046)
<i>Labor Organization</i>				
Union Density (t-1)	-0.031*** (0.006)	-0.045** (0.009)	-0.023 (0.054)	-0.032 (0.038)
Wage Setting Coordination (t-1)	-0.001 (0.048)	-0.084 (0.077)	-0.069 (0.183)	0.199† (0.096)
<i>Taxation</i>				
Tax Revenues as % GDP (t-1)	0.009 (0.023)	0.036 (0.031)	0.014 (0.041)	0.028 (0.050)
<i>Welfare Generosity</i>				
Expenditure on Social Benefits as % GDP (t-1)	-0.018 (0.015)	-0.008 (0.029)	-0.066 (0.066)	0.016 (0.026)
<i>Labor Market Interventions</i>				
Expenditure on Vocational Training as % GDP (t-1)	0.031 (0.190)	-0.664 (0.602)	0.414 (0.775)	-0.659 (0.921)
Expenditure on Vocational Rehabilitation as % GDP (t-1)	-0.677*** (0.146)	0.023 (0.675)	-0.804 (0.693)	-1.714† (0.800)
Employment Protection Legislation (t-1)	-0.222 (0.127)	0.127 (0.460)	-0.271* (0.117)	-2.031 (1.103)
<i>Corporate Governance</i>				
Stock Market Capitalization as % GDP (t-1)	0.001† (0.008)	0.001 (0.001)	-0.001 (0.002)	0.004* (0.001)
Listed Companies on Stock Exchange (natural log, t-1)	0.132* (0.062)	0.432* (0.173)	0.049 (0.217)	0.008 (0.147)
Patent Rate (t-1)	0.003 (0.072)	0.052 (0.140)	-0.652 (0.910)	-0.909† (0.384)
<i>Controls</i>				
Trade Openness (t-1)	-0.003 (0.003)	-0.009 (0.005)	0.001 (0.009)	-0.001 (0.008)
Population (t-1)	0.013*** (0.0024)	0.020*** (0.002)	0.018 (0.048)	0.282 (0.393)
Constant	-0.656 (0.969)	-3.697* (1.466)	-2.226 (1.689)	2.429 (6.473)
Observations	651	217	248	186
R-squared	0.340	0.644	0.244	0.506
Number of id	21	7	8	6

Notes: Coefficients are standardized. Standard errors are in parentheses.

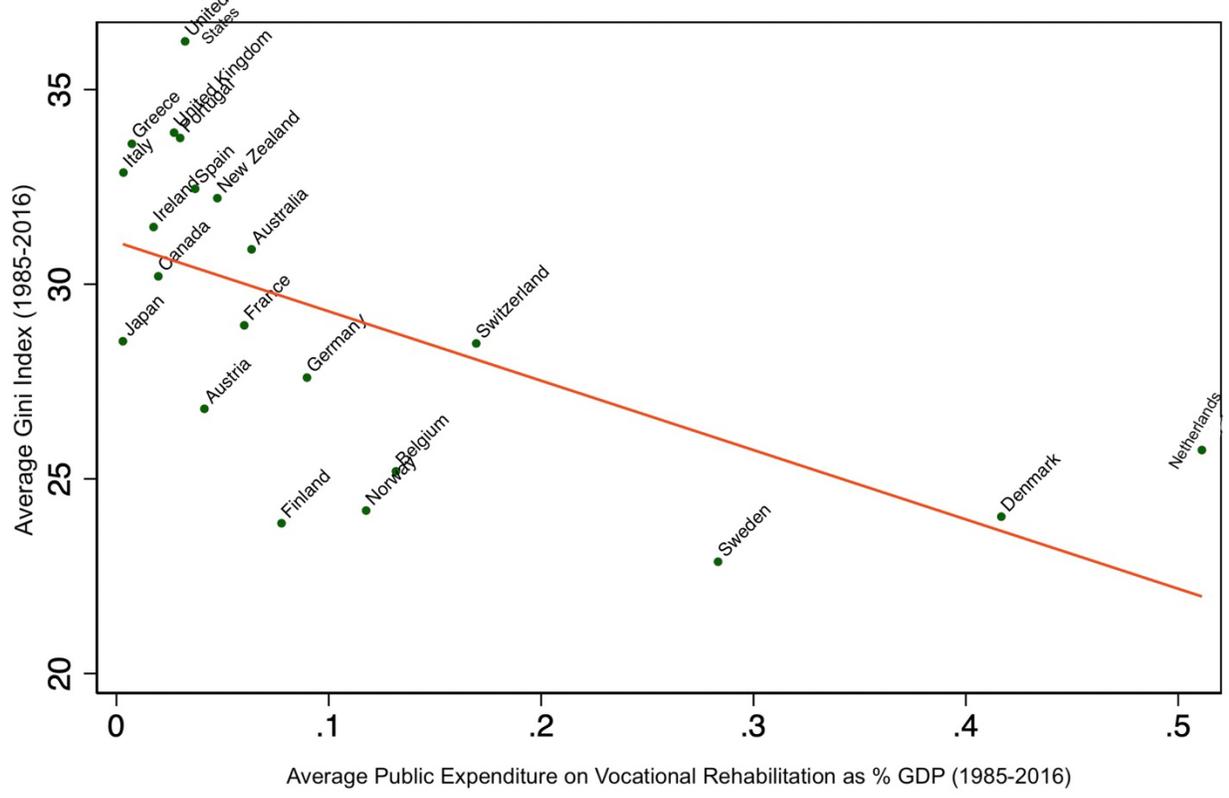
\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, † p<0.1

**Figure 1. Net (Post-Tax-and-Transfer) Gini Coefficient Household income**

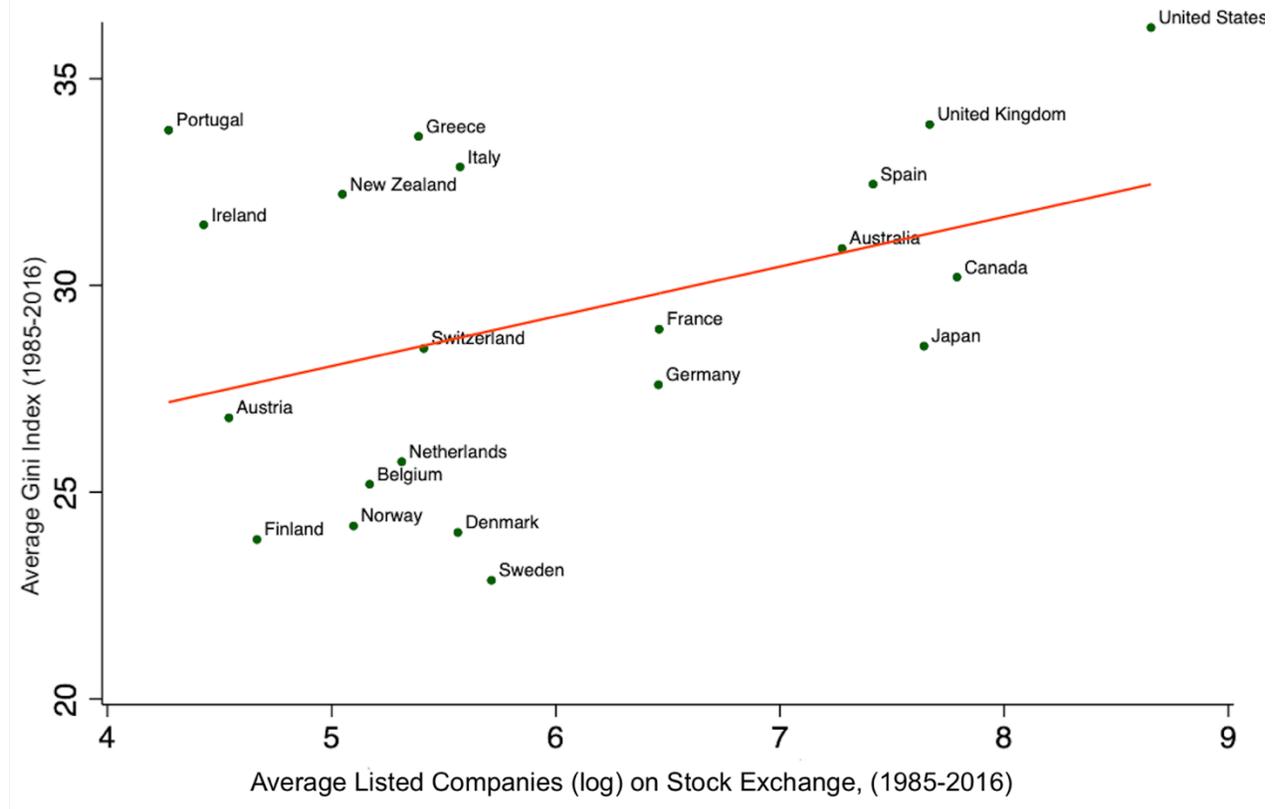


Source: Comparative Welfare States Data Set, 2014

**Figure 2 Bivariate Scatterplot of Gini Index and Vocational Rehabilitation Programs**



**Figure 3. Bivariate Scatterplot of Gini Index and Listed Companies on Stock Exchange**



**Figure 4.**

**K-Mean Cluster Analysis**

