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journal homepage: www.elsevier.com/locate/jceCapitalist systems and income inequality[☆]Marco Ranaldi^{a,*}, Branko Milanović^{a,b}^a Stone Center on Socio-Economic Inequality, The Graduate Center, City University of New York (CUNY), New York, USA^b International Inequalities Institute, London School of Economics, UK.

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ABSTRACT

The paper investigates the relationship between compositional inequality (how the shares of capital and labor income vary along income distribution) and inter-personal income inequality. Using a new methodology and data from 47 countries covering the period 1995–2018, we show that higher compositional inequality is associated with higher inter-personal inequality. This is clearly shown by Latin American countries and India. Nordic countries are exceptional because they combine high compositional inequality with low inter-personal inequality. Their exceptionalism is attenuated when pension income received from largely government-mandated accumulated savings is added to capital income. The analysis shows the theoretical possibility of societies where low compositional inequality may be combined with high income inequality. Currently, China and the United States come closest to that position.

1. Introduction

The way capital and labor incomes are distributed across the population conveys information on systemic features of modern societies. Two particular distributions are especially relevant.

In the first distribution, one group of people earns only incomes from ownership (capital), and another group earns incomes only from work (labor). These two groups of people may not be overlapping in terms of total income. All members, or most members, of the former group (capital-owners) may be richer than any member of the latter group (workers). We label this society “classical capitalism”. It is a picture of a society implicit in the works of classical political economy, from Adam Smith to Ricardo and Marx. At the extreme, classical capitalism is a society where the rich earn only capital incomes, and the rest earn only labor incomes. In such a society, the type of income one receives determines also one’s position in income distribution.

The second distribution describes, instead, a society in which individuals receive incomes both from capital and labor. In the extreme version of such a society, shares of income from capital and labor are equal for all members, and thus type of income and position in income distribution are orthogonal. In the sense of factoral income composition such a society is “classless”. A society of equal factoral composition need not be a society of equal incomes. It is theoretically possible that such a society has high income

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inequality. Thus, compositional and inter-personal inequality can, theoretically, be unrelated.

Development of this classification (with classical capitalism at one end of the spectrum, and society of compositional equality at the other) is the first objective of the paper. The following questions are therefore addressed: Can we identify today's societies that are close to classical capitalism, and do they display high income inequality? Are there societies of relatively equal compositional structure, and do they tend to have low or high inter-personal inequality? Our approach to the varieties of capitalist systems is different from those put forward by [Hall and Soskice \(2001\)](#) and [Amable \(2003\)](#), since it fully relies on empirically-observed distributional characteristics of the economies and covers much more than Western countries.

The second objective of our paper is to address in a new way the old problem of the relationship between the functional and personal income distributions. The origins of the work on income inequality go back to functional inequality, that is, to the share of total net income received by the three (land, labor and capital) and later two (capital and labor) factors of production. Studies of inter-personal inequality have however almost entirely developed without much reference to, or interaction with, functional inequality. [Atkinson \(1997\)](#), [Atkinson, \(2009\)](#) tried to provide a framework to integrate these two distributions. Our paper shows one way in which that integration can be accomplished.

With the rising capital share during the past thirty years, both in advanced and emerging economies ([Atkinson and Piketty 2010](#); [Karabarbounis and Neiman, 2014](#); [Dao et al., 2019](#); [Bengtsson and Waldenström, 2018](#); [Roine and Waldenström 2015](#)), the relationship between the two distributions has gained in practical relevance, as argued, among others, by [Piketty \(2014\)](#). If earnings from capital are mostly “located” at the top of the income distribution, then the rising capital share will almost automatically be translated into higher interpersonal inequality. This is the case with systems such as classical capitalism, in which the dynamics of the functional income distribution proxies relatively well that of inter-personal income inequality.¹

Differently, a system where capital and labor shares are broadly equal for most individuals makes inter-personal income distribution “insulated” from factorial income changes. The share of capital income that some authors expect to further increase with automation, for instance, can go up without affecting at all inequality of personal incomes. Since everyone derives about the same percentage of their income from capital, an increase in the capital share raises everybody's income by the same proportion, and leaves standard (relative) measures of inequality the same.

To address these two objectives, the paper empirically investigates the relationship between inequality in the composition of income and level of inter-personal income inequality. While income inequality is commonly measured by standard statistics as the Gini coefficient, mapping compositional income inequality requires a different methodology. To do so, we use a new statistic, the *income-factor concentration* (IFC) index, defined and developed in [Ranaldi \(2021\)](#).

The IFC index is based on the following idea. If we decompose total income into two factors, such as capital and labor income, then income composition inequality is the extent to which the shares of the two income sources within each individual's income vary along the total income distribution. If all individuals have the same shares of capital and labor in their total income (regardless of the amount of total income), compositional inequality will be minimal. It will be at the maximum when individuals at the top and at the bottom of the total income distribution earn two different types of income. Therefore, under a high level of compositional inequality a society can be seen as close to classical capitalism, whereas under a low level of compositional inequality it can be seen as close to a classless society.

In today's societies that are characterized by capital income being still overwhelmingly received by the rich, we show that the two recently observed changes, namely rising capital income share and increasing concentration of capital income, will both tend to increase the IFC index (the latter unambiguously, the former most likely) while also, as we know from earlier analytical work, driving Gini up. This expected similar movement in IFC index and in Gini, responding to the underlying changes in income distribution, informs our cross-sectional analysis too. While the conclusions regarding the effects of rising capital share and rising capital concentration on IFC and Gini are valid for a given country over time, we would still expect to find a broad positively-sloped alignment of countries according to their IFCs and Ginis. When we do not, as in some cases we shall not, this by itself will highlight specific country features.

We study this empirically using a broad geographical coverage. We include 21 developed economies from Western Europe, North America and Oceania, 10 countries from Latin America, 11 from Eastern Europe, and 5 from Asia, including China and India. The total included population, calculated at the most recent year when a country is included in the database, is almost 4.4 billion.

The paper is structured as follows. Section 2 presents the theoretical framework, in which we define IFC, introduce a novel expression for the Gini coefficient and establish the relationship between compositional inequality (IFC) and inter-personal inequality (Gini). Section 3 gives the main results. Section 4 discusses a political economy interpretation of the main findings. Section 5 concludes.

¹ In a recent article, [Lindert \(2014\)](#), argues that the functional income distribution is an antiquated measure of income inequality. The framework adopted in our paper however suggests that under classical capitalism, or under a high level of compositional inequality, there is a one-to-one mapping between variations in the functional personal income inequality. An increase (decrease) in the capital income share directly increases (decreases) the income of those at the top of the distribution, and in turn the level of inequality among individuals.

2. Methodology and data

2.1. The income-factor concentration index

The IFC index measures the level of compositional inequality, and it is constructed by means of specific concentration curves for income source. The concentration curve is a curve that cumulates the relative share of a given variable (such as capital income) across the population with individuals ranked according to another variable (such as total income). Three specific concentration curves are needed to construct the IFC index: the *zero*-, the *actual*-, and the *maximum-concentration* curve.

The *zero-concentration* curve is simply the Lorenz curve multiplied by the capital share. This curve reflects the condition of zero inequality in income composition. This condition is met when the individual capital share π_i is, for all individuals, equal to the average capital share in the population π . Differently from the equality (or 45-degree) line used to construct the Gini coefficient, which is the same regardless of distribution, the zero-concentration curve is distribution specific and depends on the share of capital income in total income. Hence, two different distributions with different zero-concentration curves display, in turns, different benchmarks of zero inequality in income composition.

The *actual-concentration* curve is the concentration curve for capital income with individuals being ranked by their total income. This curve is also multiplied (“normalized”) by the capital income share.

The *maximum-concentration* curve, which reflects the hypothetical condition of maximal inequality in income composition, is flat up to a certain income percentile p , and then mirrors the Lorenz curve.² This curve describes a distribution in which the bottom $p\%$ of the total income distribution does not earn any capital income at all, whereas the top $(1-p)\%$ earns capital income only. In other words, the maximum concentration curve is obtained by “distributing” total capital income among $(1-p)\%$ of richest income recipients until total capital income is “exhausted”. All lower income percentiles consequently “receive” zero capital income.

For illustrative purposes, we plot in Fig. 1 the three concentration curves described above, together with the Lorenz curve for income for Egypt and Norway in 2012 and 2014, respectively. The Lorenz curve for income (blue line) for Egypt (subfigure b) is, as expected, more convex than the Lorenz curve for Norway (subfigure a). This implies that Norway is less unequal than Egypt in total income terms. The ending point of the three concentration curves corresponds to the capital share of income (subfigures c and d). This is approximately equal to 0.10 in both countries. For both countries the red line, which represents the actual-concentration curve, lies below the green line, which is the zero-concentration curve. This means that the capital income is very low among the poor (i.e. their cumulated share of capital income is less than their cumulated share of total income) and consequently that capital income is concentrated at the top of the total income distribution.

Let us now move to the construction of the IFC index. If, similarly to the definition of Gini or concentration coefficient, we denote by A the area between the zero- and the actual-concentration curve, and by B the (larger) area between the zero- and the maximum-concentration curve, we define the IFC index, denoted by I , as follows:

$$I = \frac{A}{B}$$

IFC ranges between -1 and 1 . It equals 1 when the entire capital income is concentrated at the top and the labor income at the bottom of the total income distribution. It equals zero when all individuals have the same composition of capital and labor income (so income composition inequality is nil). Finally, it equals -1 when the capital income is concentrated at the bottom, and the labor income at the top of the total income distribution. Negative values of the IFC index are unlikely to be found in real world, probably both now and in history, since people having a high share of their income being derived from property were seldom poor. In our empirical example, the IFC index is equal to 0.84 for Egypt in 2012, and to 0.78 for Norway in 2004.

2.2. The relationship between IFC and Gini

How are compositional inequality (IFC) and inter-personal inequality (Gini) related? In this section, we present a framework to jointly study the two. To this end, we firstly introduce a novel formal expression for the Gini coefficient

$$G = G_{\pi}^{\alpha} G_w^{\beta} \quad (1)$$

where G , G_{π} and G_w are the Gini coefficients of total, capital and labor income, respectively (for the derivation see Appendix A). The coefficients α and β are the relative contributions of capital and labor to overall income inequality, and are defined as follows: $\alpha = \frac{\pi \tilde{G}_{\pi}}{G}$ and $\beta = \frac{w \tilde{G}_w}{G}$, where π and w are the capital and labor share, whilst \tilde{G}_{π} and \tilde{G}_w are the concentration coefficients (i.e. pseudo-Ginis) of capital and labor income, respectively. Obviously, $\alpha = 1 - \beta$. Eq. (1) follows from the Euler’s homogeneous function theorem, the same used to relate the Cobb-Douglas production function, $K^{\alpha} L^{\beta}$, with the production identity, $y = rK + wL$, under perfect competition, and from the decomposition of the Gini coefficient introduced by Lerman and Yitzhaki (1985).

The IFC index can be expressed as:

² For the details about the choice of p , see Ranaldi (2021).

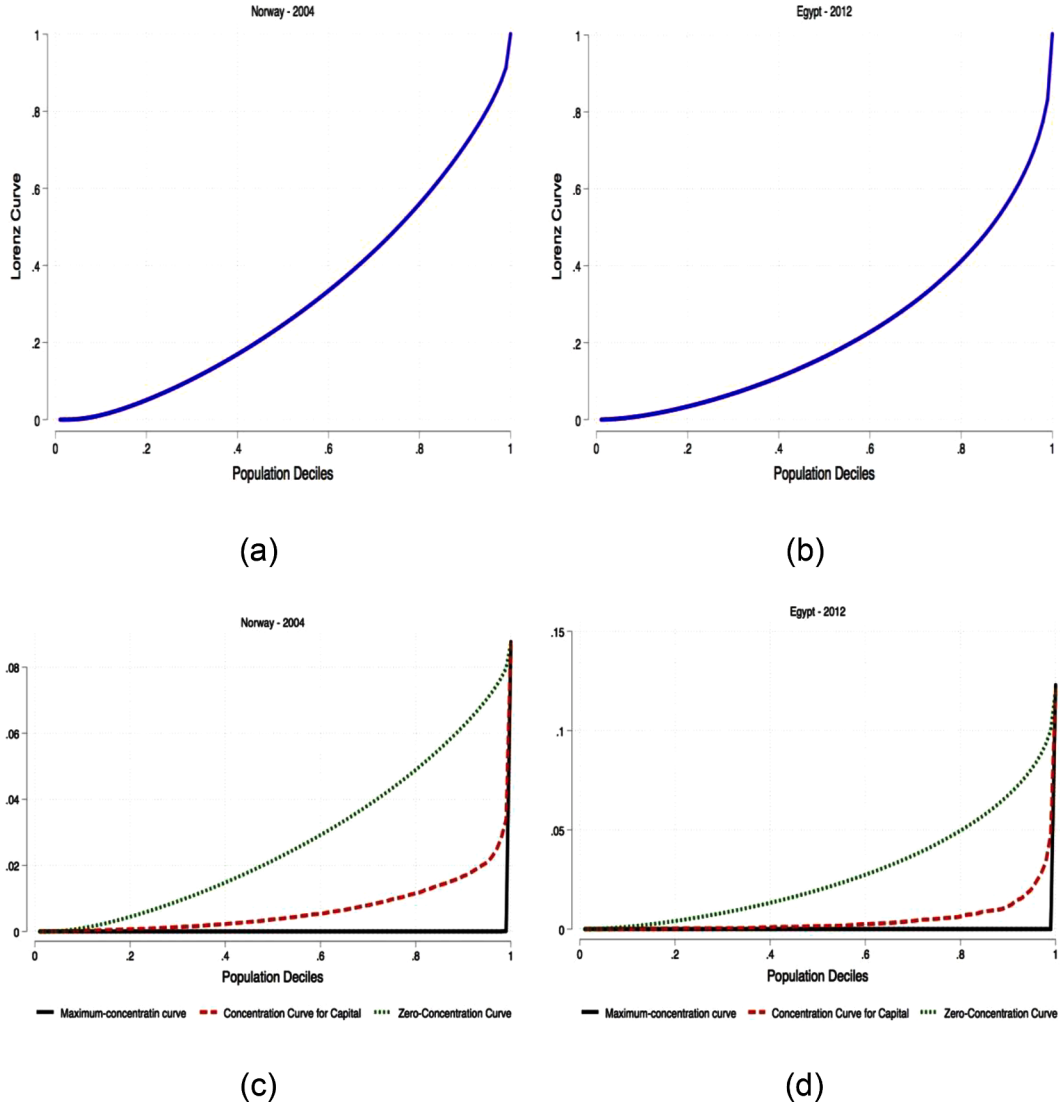


Fig. 1. Lorenz curve and capital concentration curves for Egypt and Norway.

$$I = \frac{\pi w(\widetilde{G}_\pi - \widetilde{G}_w)}{2B} \quad (2)$$

This expression comes from the one derived by [Ranaldi \(2021\)](#), namely that $I = \frac{\pi w(C_w - C_\pi)}{B}$, where C_w and C_π are the areas of the concentration curves for labor and capital income, respectively. Given that the concentration coefficients for capital and labor income equal 1 minus twice the value of the area of the corresponding concentration curve, the IFC index can be re-arranged to obtain [Eq. \(2\)](#).

By further noticing that $\pi w(\widetilde{G}_\pi - \widetilde{G}_w) = G(\frac{\widetilde{G}_\pi \pi w}{G} - \frac{\widetilde{G}_w \pi w}{G})$, and using the above definitions of α and β , we can derive the following expression for the IFC index:

$$I = \frac{G(\alpha w - \beta \pi)}{2B} \quad (3)$$

The IFC-to-Gini ratio can therefore be written as follows:

$$\frac{I}{G} = \frac{(\alpha w - \beta \pi)}{2B} \quad (4)$$

and if we further manipulate Eq. (4) we obtain:³

$$\frac{I}{G} = \frac{\alpha - \pi}{2B} \quad (5)$$

The dynamics of the IFC-to-Gini ratio can be, therefore, seen as the result of two main forces. Leaving the denominator aside for the moment (which is anyway shown to contribute very little to the overall dynamic of the relationship, see Ranaldi, 2019), it depends on the contribution of capital income to overall income inequality, α , and the capital share of income, π . If capital income's contribution to total inequality is the same as its share in total income, this means that the area under capital income's concentration curve is equal to the area under the Lorenz curve. This in turn means that, given that the ranking underlying each curve is the same, capital income must be distributed exactly in the same way as total income. Hence, the IFC index must be zero. Similarly, the IFC index will be positive when capital income's contribution to total inequality is greater than its income share.

2.3. The effect of the rising capital share and rising concentration of capital incomes on IFC and Gini

We consider next the effect on I and G of two factors that have empirically played a role in shaping the recent evolution of inequality in many countries. They are (i) the increasing capital share and (ii) the rising concentration of capital income. We know that both of them increase Gini, the first one so long as $\widetilde{G}_\pi - \widetilde{G}_w > 0$, that is, so long as the concentration coefficient of capital income is greater than the concentration coefficient of labor income, which is almost always the case. The second one instead increases the Gini if the capital share $\pi > 0$, which is also always the case. The question at stake is how will these two factors affect the IFC index.

We begin by considering the effect of rising π first. Differentiating Eq. (2) with respect to π , we obtain

$$\frac{dI}{d\pi} = \frac{(1 - 2\pi)(\widetilde{G}_\pi - \widetilde{G}_w)}{2B} - \frac{\pi(1 - \pi)(\widetilde{G}_\pi - \widetilde{G}_w)}{2B^2} B'(\pi) \quad (6)$$

where we write the change in the area B (i.e. the denominator of the IFC index) due to an increase in capital share as $B^{prime}(\pi)$. We cannot derive this relationship in general, not can we unambiguously sign $B^{prime}(\pi)$. The reason is as follows. B is equal to the area lying between the zero-concentration curve and the maximum-concentration curve. The area under the maximum concentration curve must increase simply to accommodate higher π (that is, we must have more people to whom to allocate the increased capital income), but also the area under the zero-concentration curve must expand as the additional income is distributed across the population. Recall that the zero-concentration curve is nothing else than the Lorenz curve multiplied by the capital share. This last increase in the area will (as noted above) depend on the specific configuration of income distribution, that is, on $f(y)$. Whether B thus goes up or down will depend on which area increases more.⁴

The change in B however is likely to be minimal since it is the outcome of two mutually offsetting changes. If we approximate it to be close to zero, the second term in (6) drops out, and the change in the IFC index becomes positive if $\pi < 1/2$, and if $\widetilde{G}_\pi - \widetilde{G}_w > 0$. The latter is easily satisfied, and, it should be noted, is equal to the change in Gini caused by a change in the capital share.⁵ We can thus conclude that an increase in capital share will drive both IFC and Gini up, so long as the concentration coefficient of capital income is greater than the concentration coefficient of labor income and capital share is less than $\frac{1}{2}$.

We look next at the effect of the rising concentration coefficient of capital. Differentiation of (2) yields

$$\frac{dI}{d\widetilde{G}_\pi} = \frac{\pi(1 - \pi)}{2B} > 0$$

which is unambiguously positive. We also know that $\frac{dG}{d\widetilde{G}_\pi} = \pi > 0$. Thus, rising concentration of capital income will increase both IFC and Gini. Given that in most countries π is relatively small, it is likely that $\frac{(1-\pi)}{2B} > 1$ and that the change in IFC may be greater than the change in Gini.

We conclude that both of the recent empirically-observed changes in income distribution, namely, rising capital share and rising concentration of capital incomes, are likely to drive IFC up. In the case of greater concentration of capital incomes, this is unambiguously so, and in the case of rising capital share very likely.

³ Notice that equation (5) can be also expressed as follows: $\frac{I}{G} = \frac{w-\beta}{2B}$. This is explained by the symmetrical role of the functional income distribution in shaping the Gini coefficient, as previously derived, and, as a consequence, the ratio $\frac{I}{G}$.

⁴ A more detailed discussion of the change in the area B is in Appendix B.

⁵ Note that from $I = \pi w(\widetilde{G}_\pi - \widetilde{G}_w)$ and $\frac{dG}{d\pi} = \widetilde{G}_\pi - \widetilde{G}_w$ we can easily conclude that for an increase in the capital share to lead to an increase in Gini requires $I > 0$. Obviously, if $I < 0$ which would imply that capital income is concentrated among the poor, an increase in the capital share would reduce Gini. Thus, whether increased capital share is pro-inequality or not, depends on the sign of IFC.

2.4. Data

To measure the level of income inequality via the Gini coefficient, and that of income composition inequality via the IFC index for 47 countries from Europe, North America, Oceania, Asia, and Latin America covering the period 1995–2018, we use data from the Luxembourg Income Study (LIS) Database, in total 302 country-representative household surveys (see Data Annex). The Luxembourg Income Study Database collects and harmonizes microdata from more than 50 countries across the world, and provides information on household- and person-level labor income, capital income, self-employment income, pensions, other public social benefits, and private transfers, as well as taxes and contributions, demography, employment, and expenditures.

The welfare concept adopted in our work is market income (income from capital and labor) plus pensions. Our benchmark definitions of capital and labor income are the following. *Capital income* is defined as the sum of interest incomes, dividends and rental incomes. *Labor income* is defined as the sum of wage income, self-employment income, and pensions. The latter includes public non-contributory, public contributory and private pensions. The rationale for including pensions is that they are viewed as deferred labor income (this is our *Concept 1*). However, in a further check, pensions are divided into public and private: the first are considered as deferred labor income, the second, most often received as a return on previously accumulated capital, are moved to capital income (this is our *Concept 2*).

Self-employment income is considered as pure labor income in both concepts 1 and 2, and hence it is not split into a capital and labor components. This is done to avoid imposing an arbitrary split that may in turn considerably and unrealistically affect the overall picture. This is particularly the case in Latin American countries where self-employment income is mostly received by the poor people and middle-income groups. If we take the examples of Brazil in 2016 and Mexico in 2018, the bottom 90% of the income distribution receives, in both countries, more than two-thirds of self-employment income. Arbitrarily breaking that income into a labor and capital components would wrongly impart a relatively high share of capital income to the poor and the middle class. This is shown in the Appendix C, which reports the result of our analysis when self-employment income is split into its capital (1/3 of the total) and labor (2/3 of the total) income components (concept 3). The appendix also illustrates how our results change when pensions are entirely removed from the definition of income (concept 4).

The unit of analysis is the individual, and all income sources are equally split among household members.

To calculate the Gini coefficient in a given country and a given year, we use the averages of per capita total income for each percentile of the distribution. To calculate the capital and labor concentration coefficients, and then the IFC index, we likewise use the averages of per capita labor and capital income for each percentile of the total income distribution.

3. Is compositional inequality associated with high-income inequality?

3.1. Compositional and inter-personal inequality

The first question we ask is whether higher compositional inequality tends to be associated with more unequal outcomes as measured by the standard inter-personal inequality indices like the Gini coefficient. We have established the relationship analytically above but the question is whether it can be retrieved empirically.

We begin with rich countries of Western Europe, North America and Oceania and Concept 1 definitions of labor and capital incomes. Fig. 2 presents the average values of Gini and IFC for 21 countries with a total of 166 observations spanning the period from 1995 to 2018.

Fig. 2 shows that $\frac{2}{3}$ of rich countries are clustered in the range of IFC between 0.25 and 0.4 and Gini between 0.35 and 0.45. But it also reveals several additional features. First, it highlights the outlier positions of the United States and Israel: they both have an unusually high inequality and higher IFC than the “core” countries in the cluster.

Second, the graph reveals very high compositional inequality among Nordic countries (Finland, Norway, Denmark and Iceland), which is not accompanied by high income inequality.⁶

We next include all the countries (Fig. 3). The dispersion is now, as expected, much greater but three clusters stand out. The first is the cluster of Latin American countries that traditionally have had high inter-personal inequality and which also exhibit (as we now find out) high compositional inequality. They are located in the NE quadrant of the graph with both IFC and Gini values between 0.5 and 0.55. They can be considered, on account of their high IFC, class-based societies associated with classical capitalism where, in our stylized presentation, we expect that people receive either capital or labor income (thus making IFC high) and that capital-owners be income-rich (thus making Gini high). Not all Latin American countries are however the same. Uruguay displays lower income inequality than one might have expected from its IFC; differently, Dominican Republic, Peru, and Colombia display high inter-personal inequality and moderate IFC.

The central cluster of the advanced countries remains as before. In total 15 countries are within the range of IFC and Gini that we identified before (respectively, 0.25–0.4 and 0.3–0.45). Combining this with the analysis over time for the countries for which we have sufficient number of observations (Figure A1 in the Appendix C), we note that several western countries such as Canada, UK and Germany seem to be moving towards greater compositional inequality, while Mexico, which displays a very high level of

⁶ Sweden unfortunately has only three observations with the most recent being 2005. After that year, Sweden no longer provides micro data to Luxembourg Income Study.

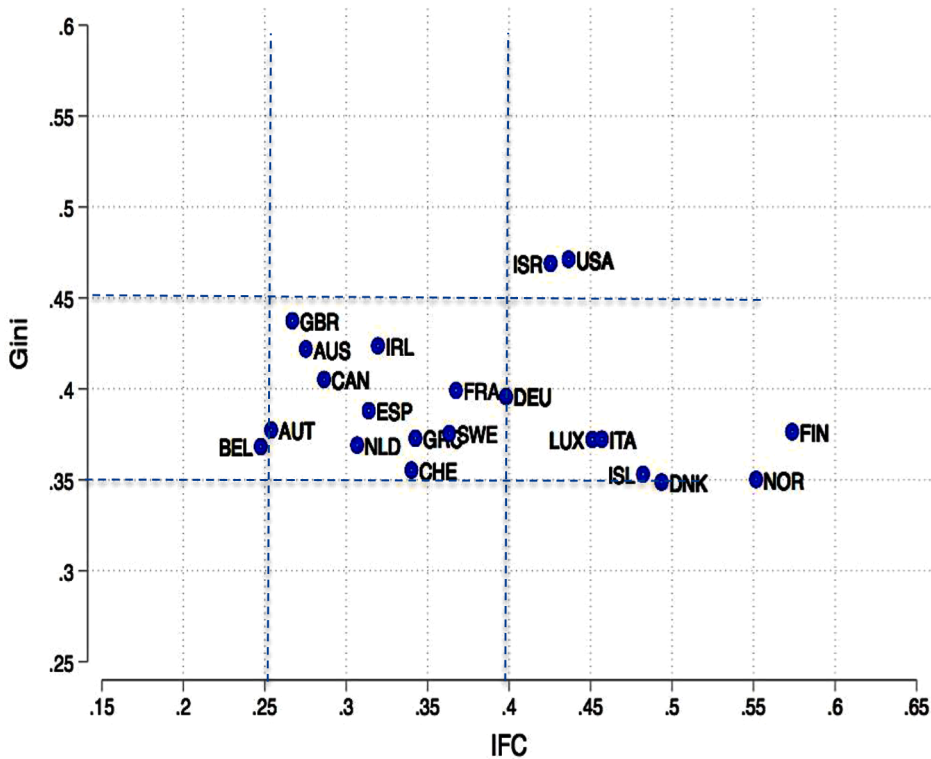


Fig. 2. Relationship between compositional and inter-personal inequality. (Western Europe, North America and Oceania; concept 1 division between capital and labor incomes). Note: The graph shows on the horizontal axis compositional inequality (IFC) and on the vertical axis the standard measure of inter-personal income inequality (Gini coefficient). Each dot is the unweighted average for a country.

compositional inequality, is experiencing a reduction in the value of its IFC. A declining trend of the IFC index is also documented for Italy (Iacono and Ranaldi, 2020), where capital income is increasingly accruing to the middle class. The temporal analysis allows us to appreciate the dynamic nature of our classification, and therefore the fact that the various clusters may change and evolve across time.

North-Western quadrant is empty as there are no countries that combine low compositional and high inter-personal inequality. That implies that low class-based societies (that is, the ones where capital and labor shares are approximately equal regardless of individual income level) are unlikely to be unequal.

3.2. Nordic exceptionalism

In the SE quadrant of the graph are Nordic countries joined by several Central European countries: Poland, Hungary, Czech Republic, and Romania. The position of this rather large cluster (ten countries) and especially of the Nordic countries among them, can best be appreciated if compared with the Latin American cluster. Nordics and LAC cover almost the same range in terms of compositional inequality (interestingly, Nordics are even more compositionally unequal than Latin American countries), but their income inequality outcomes are vastly different (Table 1). While Latin American countries have Ginis around 54, Nordic countries' average Gini is 36 (i.e. 18 Gini points lower). No Nordic country has a Gini above 38, and no Latin American country has a Gini below 47. So in terms of inter-personal inequality, the two groups are non-overlapping. But not so in terms of compositional inequality where the mean values for the two groups are exactly the same (0.51).

The Nordic group poses a very interesting question, even a puzzle: How have these countries combined an apparently strong class structure with moderate or even low income inequality? They are outliers to the rather strong relationship that we detect along the diagonal (Fig. 3) that runs from the classical capitalism to classless society and where IFC and Gini are positively correlated. In fact, the correlation coefficient between compositional and inter-personal inequality when the Nordic/Central European group is excluded is 0.28 and each point increase in IFC is associated with, on average, 0.15 point increase in Gini. But when we include the Nordic/Central European group, both statistics substantially weaken: the correlation between IFC and Gini becomes 0.25, and each IFC point raises Gini by only 0.13 percentage points.

To solve this puzzle let us consider several elements. Note that Nordic countries display a substantially higher $\frac{I}{G}$ ratio than other advanced countries. From the relationship between I and G in (5), we know that high $\frac{I}{G}$ can be caused by high contribution of capital to total inequality (α) which, in turn, is driven by high concentration coefficient of capital income and high share of capital in total

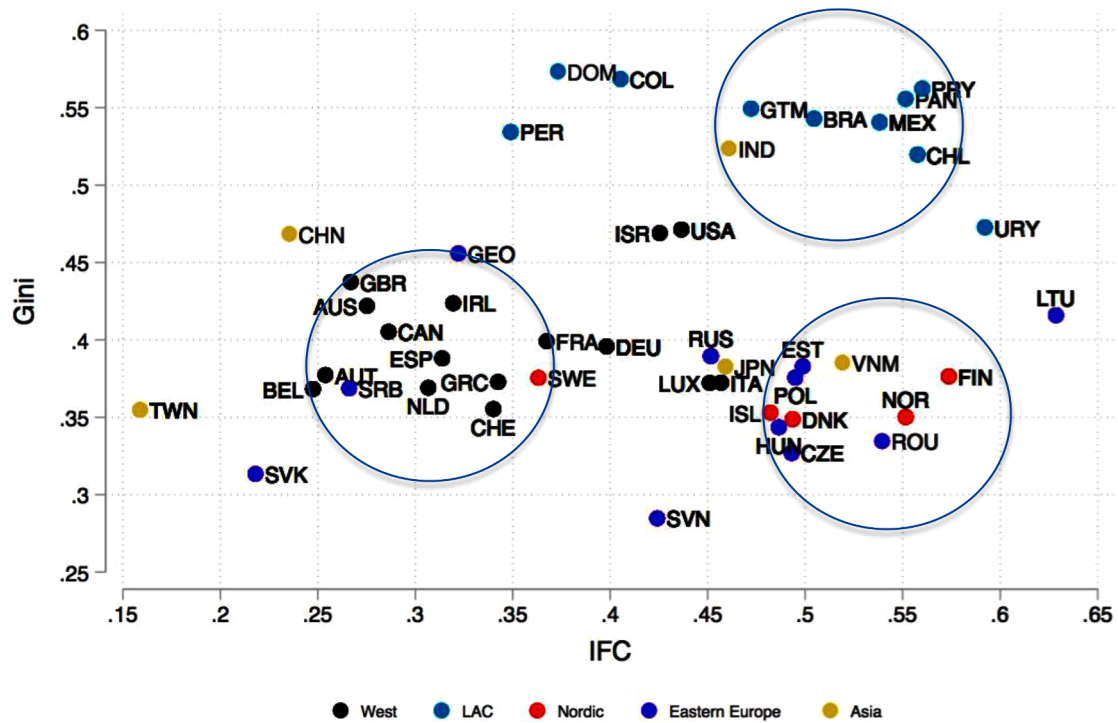


Fig. 3. Relationship between compositional and inter-personal inequality. (all countries; Concept 1 division between labor and capital income). Note: The graph shows on the horizontal axis compositional inequality (IFC) and on the vertical axis the standard measure of inter-personal income inequality (Gini coefficient). Each dot is the unweighted average for a country. Nordic countries (Finland, Sweden, Norway and Denmark) are marked in red.

Table 1
IFC and Gini in Nordic and Latin American countries. (Concept 1).

	Mean IFC	Mean Gini	Number of observations
Denmark	0.49	0.35	7
Finland	0.57	0.38	7
Norway	0.55	0.35	6
Sweden	0.36	0.38	3
Iceland	0.48	0.35	3
<i>Nordics</i>	<i>0.51</i>	<i>0.36</i>	<i>26</i>
Brazil	0.50	0.54	5
Chile	0.56	0.52	10
Colombia	0.41	0.57	5
Dominican R.	0.37	0.57	1
Guatemala	0.47	0.55	3
Mexico	0.54	0.54	11
Panama	0.55	0.56	3
Peru	0.35	0.53	5
Paraguay	0.56	0.56	6
Uruguay	0.59	0.47	5
<i>Latin America</i>	<i>0.51</i>	<i>0.54</i>	<i>54</i>

Note: All pension income is treated as labor income. Regional averages are unweighted averages of all regional observations.

income. In fact, the right-hand side of Eq. (5) can also be written as follows: $\pi \left(\frac{\tilde{G}_x}{\tilde{G}} - 1 \right)$. Table 2 shows that Nordics' capital share is very similar to that of other advanced economies but that their concentration coefficients of capital income are much greater (see column 4 in Table 2). The gap in concentration coefficients is 7 points and is statistically significant. High capital concentration can be also observed if we consider the share of total income from capital received by the top decile of income-earners. This share is much higher in Nordic countries than in other advanced economies (see column 5 in Table 2).

Much higher concentration of capital income among Nordic countries can also be observed if we compare capital share (on the

Table 2

Differences between Nordic and other advanced economies (Concept 1).

	(1) IFC	(2) Gini	(3) Capital share (in %)	(4) Concentration coefficient Capital income	(5) Labor income	(5) Capital income in top decile's total income (in %)
(1) Nordics	0.51	0.36	5.0	0.68	0.34	11.7
(2) Other advanced economies	0.35	0.41	4.3	0.61	0.40	7.4
The difference (1)-(2)	+0.16**	−0.05**	+0.7	+0.07**	−0.06**	+4.1**

Note: In all cases, the values are unweighted country/year averages. The number of observations is 26 for Nordic countries and 125 for other advanced economies. Two asterisks indicate statistically significant difference between the means at less than 1 percent level. The capital shares are not statistically significantly different between the two groups.

horizontal axis in Fig. 4) with capital contribution to total Gini (α on the vertical axis). For any given capital share on the horizontal axis, contribution of capital income to Gini is higher among Nordic countries than other advanced economies—implying that capital is more concentrated among the rich than elsewhere.

On the other hand, Nordic countries have a low concentration of labor incomes. Their average concentration coefficient of labor incomes is 0.34 versus 0.4 for other advanced economies. (The difference is statistically significant). Low inequality of labor incomes, combined with a large labor income share, pushes the overall inter-personal inequality down, and explains Nordics' low Gini. It is interesting to observe that the concentration coefficient of capital income among the Nordics is almost exactly the same number of points (seven) greater than the labor concentration coefficient is smaller (six).

In conclusion, Nordic countries display unusually high concentration of capital incomes and unusually low concentration of labor incomes. The former makes for high compositional inequality, the latter for low inter-personal inequality. This gives them the unique position where high IFC coexists with low Gini. In other words, they are class-based societies where the class-based component that normally leads to high Ginis is attenuated or “hidden” thanks to a very egalitarian distribution of labor earnings.

It is relevant to underline that our labor income variable so far includes both current wages and self-employment income, and pensions. (The full inclusion of pensions in labor income will be modified in the next section). A strong welfare state that has historically been associated with Nordic countries has ensured high pension replacement rates.⁷ This complements egalitarian access to education and egalitarian wage policies.

In the view of Karl Ove Moene (Moene and Wallerstein 2003; Moene 2016), the specificity of the Nordic model lies in the combination of wage compression, which implies relatively small wage skill differentials, with high returns to capital that are “socially acceptable” because of the implicit assumption that they are to be reinvested. This specificity of the Nordic model is reflected also in the fact that Nordic countries have high wealth inequality and low income inequality. The top decile's wealth share in Denmark, Sweden and Norway ranges between 65 and 76 percent which is significantly higher than the equivalent shares in Germany, the Netherlands, Spain or the UK which are all under 50 percent (Davies et al., 2012). Fochesato and Bowles (2015) similarly argue that “Nordic exceptionalism” is not due to exceptional equality in wealth, but to high social mobility and low inequality of earnings. Iacono and Palagi (2020) have documented the recent rise in compositional inequality in the Nordic countries, and claim that this was helped by the emergence of Dual Income Tax (DIT) reforms in the early 1990s, characterized by a flat tax on capital incomes (which is considerably lower than the tax rate on labor incomes). Additionally, both Sweden (in 2004) and Norway (in 2014) have abolished taxation of inheritance.

Going back historically, it was argued that the compromise between capital and labor reached in the 1930s was based exactly on these premises: intact rights to capitalist accumulation with centralized bargaining over wages which tended to produce a more equal wage distribution (Rojas 1991; Esping-Andersen 1990).

3.3. Toward classless economies?

Societies of low compositional inequality and low inequality are located in the SW quadrant of the graph. Two countries that are closest to it are Taiwan and Slovakia. In terms of compositional inequality, China is very similar to these two countries. However, its Gini is much higher. It is noticeable that the two countries with low compositional inequality also have low inter-personal inequality—thus reinforcing our previous point regarding the strong correlation between the two.

The position of China is worth highlighting because it reveals China's difference from the formerly communist countries that have transitioned to capitalism as well as from India. Compared with the first group, China is very unequal (its Gini exceeds even that of Russia), but its compositional inequality is much lower. It thus comes relatively close to the (empty) NW quadrant of the graph where would be located societies with low compositional but high inter-personal inequality.

India, on the other hand, shares in both respects (IFC and Gini) strong similarities with Latin American countries. It has already

⁷ In 2017, the average OECD gross pension replacement rate at mean earnings was 53%; in Denmark it was 84%, in Sweden and Finland 56–57%, and in Norway 45% (see OECD, 2017).

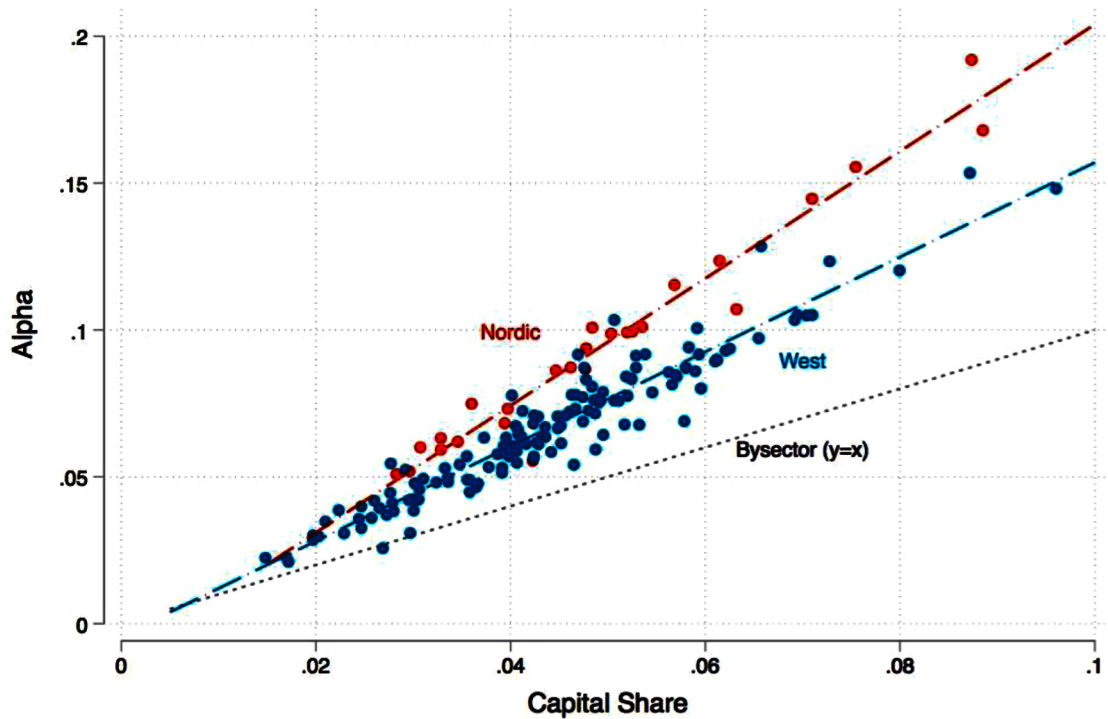


Fig. 4. Capital share and capital contribution to Gini in Nordic and other advanced economies (Concept 1). Note: The horizontal axis shows the share of capital in total income (e.g. 0.08 = 8%) and the vertical axis the contribution of capital to total inequality $\alpha = \frac{\pi G_c}{G}$. If capital income were distributed like overall income, the two shares would be the same (say, 8% of income would come from capital and explain 8% of total inequality). The fact that capital income tends to be more important among the rich explains that the capital's inequality contribution share is always greater than capital income share.

been observed (Milanovic, 2021) that India, when its distribution is assessed by income rather than by consumption (as was habitually done), has a Gini about equal to those we find in Latin America. What the analysis here reveals is that its compositional inequality is likewise very similar to that of Latin America.⁸ Thus in terms of compositional and inter-personal inequality India appears very “Latin American”.

China's position allows us also to return to a point made in the introduction. Societies of compositional equality can still be income-unequal. We can imagine that developed societies may evolve in a direction where an upper class is created that is rich both in terms of labor and capital incomes. Individuals may either inherit significant wealth and then get high levels of education and thus labor income, or alternatively they may use their high labor incomes to save, and along the years, become rich capitalists while still working. This phenomenon was identified by Milanovic (2019) and dubbed “homoploutia”. It shows that conceptually, we cannot exclude the existence of developed capitalist societies with low compositional and high inter-personal inequality.

3.4. Nomenclature of capitalisms

In Table 3 we propose a nomenclature of capitalisms based on the interplay between compositional and inter-personal inequality. The empirical results allow us to fill in the cells with the actually observed examples. Latin American countries show features associated with classical capitalism while Continental Europe, Canada and Australia can be considered “liberal” capitalism in virtue of their lower compositional and inter-personal inequality. The position of Nordic and Central European countries departs from that strong association between compositional and inter-personal inequality: they are class-based societies with low income inequality. The position of Nordic countries enables us also to define more precisely, and by analogy, the position of their antipode, that is, of “homoploutic” societies who would have low compositional but high income inequality. We do not find actual societies that fit that description although China seems to come the closest. It could be also argued that high homoploutia at the top of US income distribution, where capital-rich households are increasingly also labor-income rich (Berman and Milanovic, 2020), might drive the United States in the same direction.

The types of capitalism that we identified based on their observed inequality characteristics enrich the usual distinction between

⁸ According to the estimates of the World Inequality Lab (WIL), the Indian top 10% income share was equal to 56% in 2015, which is similar to the values for Brazil and Chile during the same year (both 55%).

Table 3
Nomenclature of capitalism.

<i>Inter-personal inequality</i>	<i>Compositional inequality</i>		<i>In-between</i>	<i>High</i>
	<i>Very low</i>	<i>Low</i>		
<i>Low</i>	Taiwan Slovakia	Liberal capitalism (Continental European countries, Canada, Australia)	Russia Japan Italy US Israel	Nordic and Central European countries
<i>In-between</i>		China		Uruguay
<i>High</i>	[Homoploutia]		Dominican R Peru Colombia	Classical capitalism (most Latin American countries, India)

different varieties of capitalism. Moreover, the typology is not entirely static. There is a dynamic element in the distinctions introduced here in the sense that the evolutionary movement of capitalism, it may be argued, takes place mostly along the diagonal that could be drawn in Table 3 from Latin American societies, to continental European countries, Canada, Australia, Taiwan and Slovakia. It is indeed notable that, as one moves towards societies with lower compositional inequality, the level of inter-personal inequality goes down. Such societies are also much more “insulated” from shifts in the overall capital share affecting their inter-personal income distributions, as previously discussed. They thus combine two important features: (a) they tend to have lower inequality, and (b) their inequality level is more robust to structural transformation that may be caused by automation-induced technological change.

However, that development is neither preordained nor without exceptions. We have seen that Nordic and some Central European societies do not fit into that scheme as they combine high compositional inequality with low inter-personal inequality. On the other hand, homoploutic societies to which China and the United States seem the closest may attenuate class structure but maintain high inequality.

The three categories that each inequality dimension can take (low, in-between, high) are also conditional on the definition of capital and labor income adopted. When self-employment income is, for instance, divided two-thirds into labor, and one-third into capital income, or when pensions are removed altogether, the IFC tends to go down (see figures A2 and A3 in Appendix C). In the first case, this is because when a part of self-employment income is imputed to capital more of middle- and lower-middle income people in Latin America have some capital income; in the second case, when pensions are removed altogether, the labor component, of which

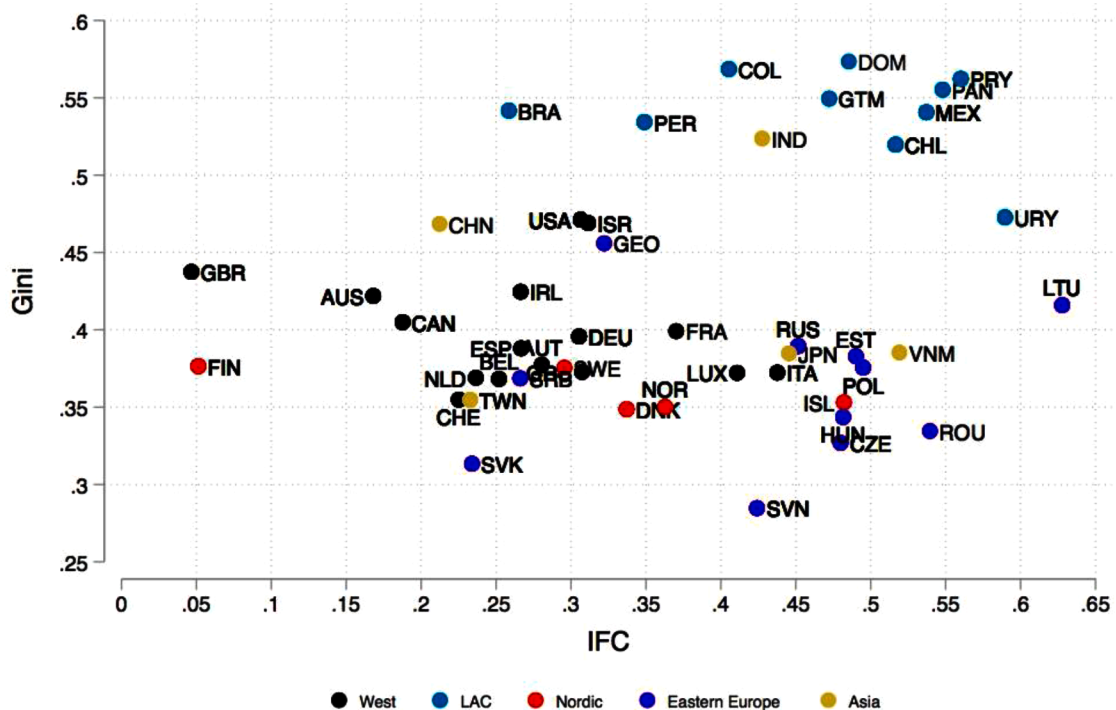


Fig. 5. Relationship between compositional and inter-personal inequality (all countries; Concept 2 division between labor and capital income). Note: The graph shows on the horizontal axis compositional inequality (IFC) and on the vertical axis the standard measure of inter-personal income inequality (Gini coefficient). Nordic countries (Finland, Sweden, Norway, Denmark, and Iceland) highlighted in red. Each dot is the unweighted average for a country.

they are a significant part, is reduced and people in the middle or lower parts of the distribution appear to have less of their income from labor. The latter change is especially important because pensions in rich and relatively old societies represent a sizeable portion of total income. In the next section, we thus discuss our results when pensions are decomposed into public and private.

3.5. Pensioner capitalism?

So far we have treated all pension income as labor income. However, in an increasing number of countries, a part of pensions (occupational and private) is received as a return on forced or voluntary saving made during the working life. At the time of pension receipt, such income clearly represents a return on a financial asset and ought to be treated as capital income. In concept 2 therefore we split pensions into two components: capital component as just explained while all the rest of pension income is, as before, assigned to labor income. Because of country differences both in the way the pension systems operate, and in the way that pensions are classified, it is likely that some private and occupational pensions are underreported, so that our split is biased toward assigning greater share of pensions to labor income. There is also the issue of guaranteed minimum pensions (social pensions) that are paid to people who are without resources in their old age and might not have acquired the right to “normal” pensions. These social pensions are, in some ways paid on account on citizenship, but we treat them as labor income. However that last type of pensions is small and unlikely to affect our results.

Fig. 5 is drawn following the same idea as Fig. 3 but with a different split between capital and labor incomes. The Ginis by definition remain the same, but IFCs change. Not much changes among the Latin American countries and our core cluster. However, Nordic countries “migrate” toward the core. They now appear much less of an outlier with regard to compositional inequalities as they do not depart much from those of France and Germany. It is notable that Denmark, Norway and Sweden are now all within the “central” cluster while Finland moves even further to the left. What this “migration” implies is that a relatively high share of occupational and private pensions in Nordic countries is received by the non-rich. This equalizes the shares of capital and labor income across income distribution.

Nordics present an interesting model of “pensioner capitalism”. If the reduction in compositional inequality comes from private pensions that are received by people across income distribution, one can create, as Nordic countries seem to have done, a class-based society if assessed on its current work and capital incomes, and much less so if assessed taking into account private pensions as well. As the share of older people is on the rise in many advanced countries and the use of private pensions becomes more popular, one can envisage a somewhat novel form of “classless” society where relatively equal shares of capital and labor across distribution are achieved through savings over active life and returns on thus saved capital once in retirement. It is not the model that writers on either class or classless societies had in mind since their attention was focused on earnings during the active life, not on the role and position of the retirees.

What Fig. 5 also highlights is that the SE quadrant is now populated mostly by Central European countries and only two Nordics, Estonia and Iceland. The reason is that private pensions are relatively rare in Central Europe, so the position of those countries does not change much between Concepts 1 and 2. Countries that now seem the closest to a classless society are the United Kingdom and Finland. It is worth considering both. With Concept 1 division between labor and capital income, UK’s IFC was 0.27; once we allow for occupational pensions, IFC goes down to 0.05 and makes UK the country with the lowest compositional inequality. Even more dramatically, Finland’s IFC is reduced from 0.57 which was the level of compositional inequality exceeding Mexico’s, to about 0.05 unmatched by any country except the UK. Private pensions have thus thoroughly transformed the class nature of these two, as well as of several other Nordic, countries.

4. Conclusion

It has always been intuitive to expect that class-based societies where people at the top of income distribution receive most of their income from property would be also societies of high inter-personal inequality. Arguably, one of the reasons why in classical political economy scant attention was paid to inter-personal income inequality lies in that seemingly immovable regularity: knowing functional income distribution was thought sufficient to determine inter-personal inequality. But this does not necessarily hold in modern capitalism where many people at the top of income distribution receive sizeable labor incomes.

The objective of the paper was twofold: to study and document the differences that in this respect exist between various contemporary capitalist societies, and by using a new methodology, to look empirically at the link between functional and inter-personal inequality. That link has become of increasing practical importance as both the capital share in total value added and concentration coefficient of capital have risen in many countries during the past several decades. Clearly, countries where capital income is more widely distributed can “handle” the increasing capital share better: more capital income need not automatically lead to an increase in inter-personal inequality. Societies of (what we termed) homoploutic capitalism where the share of capital income is about the same across income distribution may thus be entirely “insulated” from the effects of a rising capital share.

Using a new indicator, the income-factor concentration (IFC) index, that summarizes in a single number inequality in income composition and can be used to map different capitalist societies, and the data covering 47 countries covering the period 1995–2018, we report three major findings. First, more class-based societies are indeed characterized by higher income inequality. The intuition shared by many classical authors was correct. We find that, on average, a point increase in the IFC index is associated with between 0.13 and 0.15 percentage point increase in the Gini coefficient. Given that the Gini standard deviation in our sample is 0.07, the average “effect” of compositional inequality on Gini is substantial.

Second, we observe countries clustering in three groups. Latin American countries have higher levels of both compositional and

inter-personal inequality than European countries and North America. Nordic societies that are well known for their low income inequality however display relatively high compositional inequality. This class-based nature of the Nordic societies is “hidden” by their low level of inter-personal inequality. However, it is in line with the economic principles of the Scandinavian social compact: it combines wage compression, which implies relatively small skill differentials and generous pension replacement rates, with high concentration of capital. The Nordic exceptionalism however gets attenuated or even disappears when a part of pensions that is received as a return on accumulated savings during the working life, is treated as capital income. Nordic countries become similar to the “core” advanced countries while some, like Finland, moreover show an exceptionally low compositional inequality. The existence of such “pensioner capitalism” is something that neither classical authors nor students of income inequality have envisaged. Still, it might increasingly become a reality in other rich countries faced by the aging of population and unsustainability of the pay-as-you-go pension systems.

Third, we find no examples of countries that combine low compositional inequality and high inter-personal inequality. This reinforces the argument that once societies become “classless” (in the sense of having a low IFC), it is not likely that they would have high inter-personal inequality. Yet that possibility cannot be entirely ruled out. We notice that China comes close to that position and one can speculate that the US might move in that direction too.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jce.2021.07.005](https://doi.org/10.1016/j.jce.2021.07.005).

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