[III]

DIMENSIONS OF INEQUALITY

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Increasing Capital Income Share and Its Effect on Personal Income Inequality

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We tend to assume that those with high incomes from capital are also those who are the richest overall; that is, that the association between being capital-rich and overall-income-rich is very close. This is implicit in Piketty's analysis. He argues that as the share of capital in national income rises, interpersonal inequality will also rise. In our first chapter addressing the dimensions of inequality, economist Branko Milanovic asks under what conditions this is likely to be true.

Milanovic imagines three kinds of societies: socialist, where there is an equal per capita distribution of capital assets; classical capitalist, where workers draw their entire income from labor and capitalists derive their entire income from capital; and "new" capitalist, where everyone receives income from both labor and capital. He uses these archetypes to examine what happens to the inequality—as measured by the Gini coefficient of interpersonal income inequality—if Piketty's α—the share of capital in net income—rises. Unsurprisingly, he finds that the institutional setup matters. The way the rising share of capital income gets transmitted into greater interpersonal inequality varies between different social systems as a function of the underlying asset distribution. In new capitalism, a rising share of capital income almost directly translates into a higher Gini, while in classical capitalism, this is true once the share of capitalists becomes sufficiently high. In a socialist world, however, a rising capital share does not imply rising interpersonal Gini.

Methodological Contributions of Piketty's *Capital*

When discussing *Capital in the Twenty-First Century,* we need to distinguish between its analytics and methodology, its recommendations, and its forecasts. One can agree with the analytics without agreeing with the recommendations, or the reverse. The methodology introduced by *Capital*—because it seems to fit quite well the likely evolution of the rich world in the decades to come, and more importantly because it provides a novel way to look at economic phenomena—is probably the most significant contribution of the book. It will affect not only how we think of income distribution and capitalism in the future but also how we think about economic history, from ancient Rome to prerevolutionary France.

The most important methodological contribution of Piketty's book is his attempt to unify the fields of economic growth, functional income distribution, and personal income distribution.[1] In the standard Walrasian system, the three are formally related—but in actual work in economics they were generally treated separately, or some were even simply left out. Functional income distribution was studied much more by Marxist economists. Neoclassical economists tended to assume that capital and labor shares were broadly fixed. This view changed only fairly recently, and we are now witnessing an upsurge of interest in the topic.[2] Piketty's emphasis on the rising share of capital income contributed to this efflorescence.

Personal income distribution tended to be studied almost as divorced from the rest of economics, because in a Walrasian world, agents come to the market with the already-given endowments of capital and labor. Because the original distribution of these endowments is not the subject of economics (narrowly defined), personal income distribution was assumed to be whatever the market generates. But in *Capital,* the movements in the capital / income ratio—driven by "the fundamental inequality" or "central contradiction of capitalism," namely $r > g$ (return on capital greater than the growth rate of overall income)—lead to the rising share of capital income in net product. This, in turn, leads to a greater interpersonal inequality.

This chapter concentrates on the last point, which is usually implicitly taken for granted: A greater share of capital is associated, it is thought almost implicitly, with a rising interpersonal inequality. This view is understandable because during most of economic history, people with high capital income were also people with high overall income. Therefore, a greater share of net product going to capitalists came to be associated with greater interpersonal inequality.

In a recent paper investigating the association between higher capital shares and income inequality over the long run (going back in some cases to the mid-nineteenth century), Erik Bengtsson and Daniel Waldenström find, in a country fixed-effect setting, that the correlation has typically been positive and fairly strong. For the entire sample of fifteen advanced economies, they find that, on average, each percentage-point increase in the capital share was associated with a 0.89-point increase in the (log of) top 1 percent income share. When other controls are introduced, the size of the coefficient is reduced, but it remains positive and statistically significant.[3] Margaret Jacobson and Filippo Occhino similarly find that for the United States, a 1 percent increase in the capital share tended to increase Gini by between 0.15 percent and 0.33 percent.[4]

Maura Francese and Carlos Mulas-Granados use more recent 1970s–2010 Luxembourg Income Study microdata from forty-three countries, and decompose the overall change in disposable income Gini into its accounting components: concentration coefficients of labor and capital, labor and capital shares, and changes in taxation and social transfers.[5] Unlike Bengtsson and Waldenström, they find a negligible impact of higher capital share, and conclude that most of the increase in disposable income Gini was driven by the rising concentration of wages. They complement the decomposition analysis by a regression on a sample of ninety-three countries, for the 1970s—2013 period, of capital (labor) share on Gini. Once controls are introduced, labor (capital) share is insignificant.[6]

So the link between greater capital share and increased interpersonal inequality is not as simple and unambiguous as it seems. Even when there exists a positive relationship between the two, the strength of that relationship varies.

The chapter is organized as follows. In the next section I discuss in general the link between the rising share of capital in net income (Piketty's α) and the Gini coefficient of interpersonal income inequality. Next I look at this relationship in three ideal-typical societies: socialist, classical capitalist, and "new" capitalist. (The terms are defined there.) In the penultimate section

I present the empirical analysis of the relationship using 138 harmonized household surveys from seventeen advanced economies. In the last section I discuss policy implications.

It may be useful, even before we embark on the study of the relationship between α and Gini, to indicate why this is important. The increase in capital share is not, by itself, an inequality "problem"; that is, it does not necessarily lead to an increase in interpersonal inequality. For example, when the underlying distribution of capital is egalitarian, an increase in α may cause a decrease in interpersonal inequality or leave it unchanged. Hence, even for the proponents of strong egalitarianism, the increase in capital share cannot be a problem as such. It becomes a "problem" only because in most real-world situations, the underlying distribution of capital assets is extremely skewed. The realization of this fact leads me, in the prescriptive part, to argue in favor of equalization of ownership of assets among individuals. This provides a realistic agenda for fighting inequality and is especially relevant for the rich societies where a rising wealth / income ratio implies that, unless the return on capital decreases sufficiently, a greater share of national net product will be received by asset-holders. Thus, we have a choice among acquiescing in the rising interpersonal inequality, trying to reduce it through taxation, or working on the deconcentration of asset ownership.

Focusing on the distribution of assets is, in my opinion, a more promising policy than Piketty's emphasis on taxation of capital. But regardless of whether one tool is better than the other, they are two complementary ways to address rising inequality in the ever more affluent societies (that is, in societies with a rising K / Y ratio).

Going from Functional to Personal Income Distribution

The main link between the functional and the personal income distribution is provided by the relationship $r > g$. But in order to lead to a rising interpersonal inequality, it needs to satisfy the three following requirements.[7]

First, r must be overwhelmingly used for investment and not for consumption. Clearly, if all of r was simply consumed by capitalists, the K / Y ratio in the next cycle would remain unchanged, and dynamically there would be no increase in either $\beta = K / Y$ or in the share of total income derived by capital (α). This is the point on which Debraj Ray in his critique of

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Capital has strongly insisted.[8] Yew-Kwang Ng makes the same point.[9] It is indeed a formally correct argument, but misses the entire point of what capitalism and capitalists are. If capitalists were interested solely in consumption, in spending most of their income on what Adam Smith nicely termed "baubles and trinkets," the process would play out as Ray imagines. But capitalists are precisely capitalists because they do not consume all surplus and are interested in expanding the scope of their operations, and thus in investing all or most of r. The assumption of the saving rate out of r being close to 1 is not only well founded in the precedents from theoretical economics (in modern times, from Kalecki, Solow, and Kaldor, and obviously all the way back to Ricardo and Marx) but is equally well founded in the empirical behavior of the rich, and in what are the central features of capitalism as a system.[10]

But the rising β and even a rising α do not ensure by themselves transmission into greater interpersonal inequality. For this to happen, concentration of capital income has to be very high. Working with only two factor incomes, those of labor and capital, for the overall inequality of personal income to go up, the requirement is that the more unequally distributed source has to grow relative to the less unequally distributed source. With capital income this condition is relatively easily satisfied, because in all known cases the concentration of capital income is greater than the concentration of labor income. In the United States, for example, Gini of income from capital (calculated across household per capita incomes) is in excess of 80, while similarly calculated Gini of labor income is around 40. The situation is identical in other countries. This is simply a reflection of the well-known heavy concentration of capital assets and of the fact that about a third of Americans have zero net capital assets, and hence draw no income from ownership.

The third requirement is that the association between capital-rich and overall income-rich people be high. A simple high concentration of a given income source will not guarantee that that source contributes to inequality. Unemployment benefits have a Gini that is generally in excess of 90 (because most people receive no unemployment benefits during any given year), but because recipients of unemployment benefits are generally income-poor, an increase in the share of unemployment benefits in total income reduces income inequality. Technically, the third requirement is (in the case of the Gini coefficient with which we work here) expressed in the form of a high correlation between rankings according to capital income and rankings according to total income. Put simply, this requirement means that people who receive large capital incomes should also be rich. Empirically, this requirement is easily satisfied in most countries.

We tend to see the transmission from a rising capital income share into an increasing interpersonal inequality as a foregone conclusion, precisely because we tend to take as given:

(1) High saving out of capital income
(2) High concentration of assets
(3) High correlation between one's drawing a large capital income and being rich.

But this is not always so, or at least the strength of that transmission is variable. We move to a more formal derivation of the relationship.

We know that total income Gini can be decomposed into inequalities contributed by each income source, in our case capital (c) and labor (l) as in (1):

$$G = s_l R_l G_l + s_c R_c G_c \tag{1}$$

where s_i = share of a given income (*i*-th) source, R_i = correlation ratio between the source and total income, G_i = Gini coefficient of an income source, and G = overall income Gini. R_i in turn is equal to the ratio of two correlation coefficients (ρ's), namely, between income source and recipients' ranks (from the poorest to the richest) according to total income, and between income source and recipients' ranks according to income source itself. For capital income, the correlation ratio can be written:

$$R_c = \frac{covar(r(y),c)}{covar(r(c),c)} = \frac{\rho(r(y),c)\sigma_{r(y)}\sigma_c}{\rho(r(c),c)\sigma_{r(c)}\sigma_c} = \frac{\rho(r(y),c)}{\rho(r(c),c)} \tag{2}$$

Notice that if people's ranks according to total income and income from capital coincide, $R_c = 1$. In all other cases, $\rho(r(y),c) < \rho(r(c),c)$ and $R_c < 1$. For unemployment benefits mentioned above, $R_i < 0$.

For the rising share of capital income (s_c)[11] to increase overall income Gini, we need therefore to have two "transmission" tools: Gini coefficient of capital income (G_c) and R_c, positive and high.[12]

The rest of the chapter will deal with these two "transmission" tools. Equation (2) gives the definition of R_c, which I also call "elasticity of transmission" between the change in capital share and change in personal income inequality. The definition of G_c is a standard one, with the Gini coefficient calculated across the entire distribution but with individuals ranked by their amount of capital income (rather than by total income as we normally do in calculations of overall income Gini). Note that every Gini point increase in the concentration of capital income will be translated into $R_c s_c$ Gini point increase in total income Gini. Similarly, as the share of capital in total income increases by a percentage point, Gini will go up by $R_c G_c - R_l G_l$.

Transmission of Higher Capital Income Share into Personal Inequality: Three Social Systems

It is useful to consider three ideal-typical social systems and to observe how they "transmit" an increased share of income from capital into personal income distribution.

SOCIALISM We assume that in socialism, returns from capital are distributed equally per capita. This could happen in two ways: All capital can be state-owned and the returns from it can be distributed equally among members of a community, or every member can have the same amount of (privately owned) capital on which she or he receives the same return.[13] A variant of that is a "social dividend" proposed by James Meade in the 1970s and 1980s and more recently the "minimum inheritance" idea proposed by Tony Atkinson.[14] They differ, however, from our ideal-typical socialism in that, under the latter, all capital income is distributed equally per capita whereas in Meade and Atkinson's schemes only a part of national income from capital is thus distributed.

Now, $r > g$ will not be "transmitted" into greater interpersonal inequality because $G_c = 0$. In such a society, we can write income of an individual i (y_i) as $y_i = l_i + \bar{c}$ where labor income (or more realistically, log of labor income) l is distributed normally with the mean $\bar{l}$ and standard deviation σ_l $l : N\left(\bar{l}, \sigma_l\right)$ and income from capital is a constant $\bar{c}$. R_c will be equal to zero because the correlation between the ranks according to total income and amounts of capital income will be 0 and the numerator of (2), $\rho(r(y), c)$, will be equal to zero.

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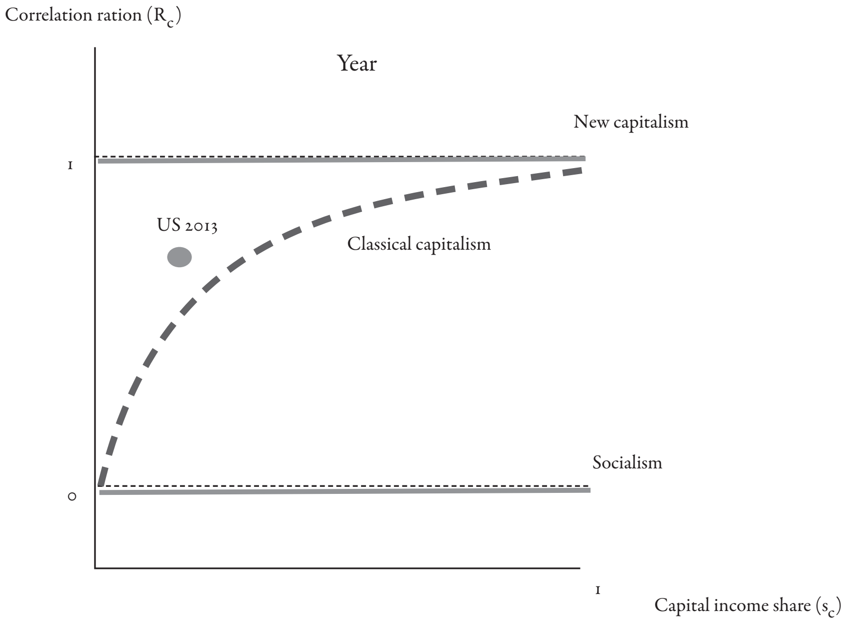

FIGURE 10-1: Transmission of rising capital share into interpersonal inequality.
Note: Three ideal-typical social systems and how they "transmit" an increased share of income from capital into personal income distribution.

The same result obtains if we distribute capital randomly across individuals, regardless of their labor income. In that case, G_c will be positive, and individual income becomes $y_i = l_i + c_i$ where now both labor income (or log of labor income) and capital income are normally distributed with $l : N\left(\bar{l}, \sigma_l\right)$ and $c : N\left(\bar{c}, \sigma_c\right)$ but are basically uncorrelated. The "transmission" will again fail because there would be no clear association between being a capitalist and having a higher overall income. R_c may be positive or negative (it will just depend on how the lottery of capital incomes gets correlated with the distribution of labor incomes) but it would be very small in the absolute amount.[15]

In any case, the transmission from greater share of capital to interpersonal income distribution will be weak: nil or quasi nil across any value of s_c. This is shown in Figure 10-1 by the line denoted "socialism," which we draw to be almost undistinguishable from $R_c = 0$ for all values of s_c. Basically—and this is key—we have full independence of personal income distribution

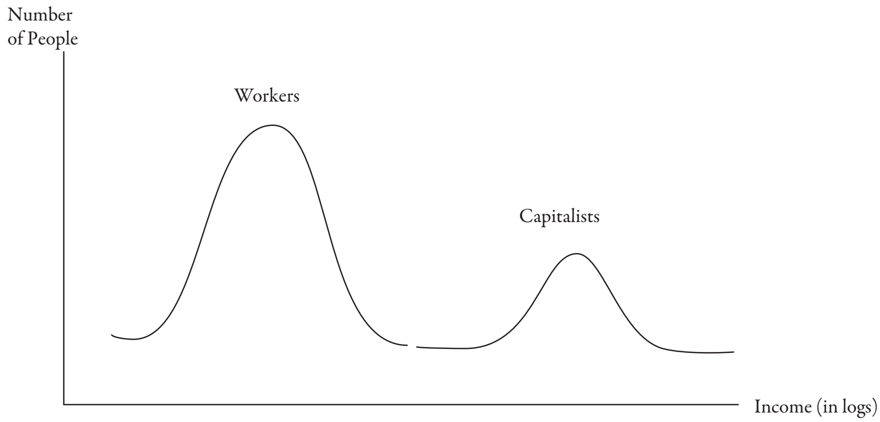

FIGURE 10-2: Social structure of classical capitalism (simplified).
Note: Capitalism's social structure can be depicted as two social groups differing in their size and income levels.

from the rising share of capital in net output. The former is "insulated" from the latter.

CLASSICAL CAPITALISM In classical capitalism, ownership of capital and labor is totally separated, in the sense that workers draw their entire income from labor and have no income from the ownership of assets, while the situation for the capitalists is the reverse. Moreover, we shall assume that all workers are poorer than all capitalists. This is an important simplifying assumption because it gives us, as shown in Figure 10-2, two social groups that are nonoverlapping by income level. When the groups are nonoverlapping, Gini is exactly decomposable across the recipients (see equation 3), and this simplifies the relationship between Gini calculated across income sources and Gini calculated across the recipients.

In general, Gini calculated across recipients belonging to groups i (1,2, . . . r) is equal to

$$G = \frac{1}{\mu} \sum_{i=1}^{r} \sum_{j>i}^{r} \left(\overline{y}_j - \overline{y}_i \right) p_i p_j + \sum_{i=1}^{r} p_i s_i G_i + L$$

where μ = overall mean income, $\overline{y}_i$ = mean income of i-th group, p_i = population share of i-th group, s_i = share of i-th group in total income, and L = the overlap term that is generally calculated as a residual and is positive when there are recipients from the mean-poorer group who are richer than (overlap with) some recipients of a mean-richer group. Because in our case all workers are poorer than all capitalists, L disappears and the expression for the Gini simplifies:

$$
\begin{aligned}
G &= \frac{1}{\mu}\left(\bar{y}_k - \bar{y}_w\right) p_k p_w + p_k s_k G_k + p_w s_w G_w \\
&= s_k p_w - s_w p_k + p_k s_k G_k + p_w s_w G_w = s_k\left(p_w + p_k G_k\right) + s_w\left(-p_k + p_w G_w\right)
\end{aligned} \tag{3}
$$

where we use subscripts *w* for workers, and *k* for capitalists.

Overall inequality, whether calculated across income sources or across recipients, must be the same, so (3) must be equal to (1), and thus

$$
\begin{aligned}
& s_c\left(p_w + p_k G_c\right) + s_l\left(-p_k + p_w G_l\right) = s_l R_l G_l + s_c R_c G_c \\
& s_c\left(p_w + p_k G_c - R_c G_c\right) + s_l\left(-p_k + p_w G_l - R_l G_l\right) = 0
\end{aligned} \tag{4}
$$

where we make use of the fact that the share of labor income (s_l) is exactly the same as the share of income received by workers (s_w), and the share of capital income is equal to the share of income received by capitalists, $s_c = s_k$. Similarly, $G_k = G_c$ and $G_l = G_w$. Annex 1 shows further manipulations of the relationship. At the end we obtain a positive and concave relationship between s_c and R_c (as shown in Figure 10-1 by the curve denoted "classical capitalism"). The transmission from an increased capital share into a higher interpersonal inequality increases in s_c but does so at the diminishing rate. It asymptotically tends toward 1 when s_c approaches unity.

Some intuition will help explain the result. Suppose that classical capitalism is such that there is only an infinitesimally small number of capitalists (at the extreme, just one person) and that all other individuals are workers, so that both s_k and s_c are low.[16] By assuming a sole capitalist, we also assume that she or he is the richest person in the community (but not so extravagantly rich to drive s_c very high). The correlation coefficient in the numerator of R_c, cov(r(y), c), will be low because ranks according to total income, running from 1 to 100, will not be correlated with the amount of income from capital. We shall have two vectors, that of ranks [1 2 3 . . . . . . n] and that of capital income [0 0 0 0 . . . K] where K = total capital income (received by one person only). Now, the denominator of R_c will be obtained from a correlation between a vector where the ranks for all recipients but the top will be the same (because they all have the same, nil, amount of income from capital)—that is, between a vector such as $\left[\frac{1}{(n)/2}, \frac{1}{(n)/2} \ldots n\right]$, and [0 0 0 . . . K]. Such a correlation will be much higher (actually, equal to 1) and the ratio between the two correlation coefficients will thus be low. We can illustrate it with a numerical example. Let n = 100 and K any random number but which we selected to be 100. The correlation in the numerator is 0.17, that of the denominator 1. Hence $R_c = \text{cov}(r(y), c) = 0.17$.

Consider now the other extreme, where classical capitalist society is composed mostly of capitalists and an infinitesimally small number of workers, so that s_c approaches unity. It is clear that a person's rank according to capital income will entirely (or almost entirely) coincide with his or her rank according to total income, and $\text{cov}(r(y), c) \approx \text{cov}(r(c), c)$ and thus $R_c \approx 1$. In other words, there would be practically no difference between total and capital income because at the limit they are the same. This makes the two correlation coefficients almost the same and their ratio $R_c \approx 1$.

NEW CAPITALISM We assume that new capitalism differs from the classical capitalism in that all individuals receive income from both capital and labor. Thus, instead of the two sharply delineated groups, workers with income $(1_i,0)$ and capitalists with income $(0,c_i)$, we have for all individuals positive labor and capital incomes $(1_i,c_i)$. We assume further that the amounts of both labor and capital income received increase monotonically as we move toward (total-income-) richer individuals. A poor person's income would be, for example, (2,1), a middle-income person's would be (7,3), and a rich person's income (24,53).

Monotonic increases of labor, capital, and total income (such that if $y_j > y_i$ then we must have $l_j > l_i$ and $k_j > k_i$) ensure that the ranks according to capital, labor, and total income are the same. Thus, $R_c = R_l = 1$. This is why in Figure 10-1 we draw the "transmission" function for new capitalism at $R_c = 1$ throughout.

Two elaborations of this situation, however, are possible. We can have a situation illustrated in Figure 10-3 by the *labor income* and *capital income2*

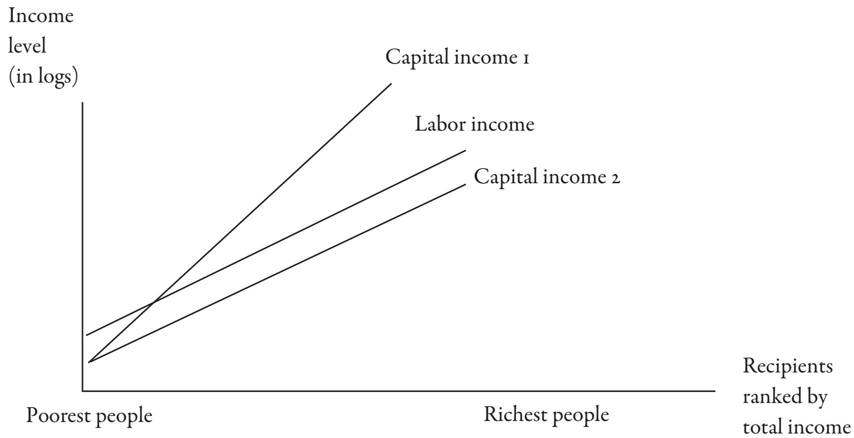

FIGURE 10-3: Labor and capital income across recipients in new capitalism (simplified).

Note: Two possibilities exist. Either the proportions of labor and capital income stay constant throughout the distribution or the share of capital income increases with total income.

lines, for example: The proportions of labor and capital income stay constant throughout the distribution—that is, both amounts of capital and labor increase by the same percentage as we move from poorer to richer recipients. A person's income can be written as $y_i = \varsigma_i\left(\overline{l} + \overline{c}\right)$ where ς_i increases in *i,* indicating that everybody receives a specific portion of both overall labor and capital income. In other words, as we move up along the income distribution, we move from income that can be written as (2,1) to (10,5) to (200,100) and so on, where every individual receives twice as much labor income as capital income, but the absolute amounts of both differ. Obviously, richer people receive more of both. In that case (let's call it "new capitalism 2"), Ginis of labor and capital will be the same and the Gini coefficient of total income can be written as

$$G = s_l\overline{G} + s_c\overline{G} = \overline{G} \tag{5}$$

When r > g and the share of capital income goes up, overall inequality is unaffected. Thus, in the "new capitalism 2" where everybody (poor and rich alike) has the same composition of total income (for example, everybody's total income is composed of 70 percent labor income and 30 percent capital income), a rising share of capital income does not get transmitted into an increased interpersonal inequality. Note that this happens because the rising capital share leaves Gini of capital income unchanged (and Gini of capital income is the same as Gini of labor income). In socialism, this happens because $G_c = 0$.

A more realistic version of the new capitalism (named "new capitalism 1") is the one where the proportion of capital income increases as a person becomes (total-income-) richer. This can be written (in a continuous case) as $\frac{d\left(\frac{c}{l}\right)}{dy} > 0$ with $\frac{dc}{dy} > 0$ and $\frac{dl}{dy} > 0$ ensuring that absolute incomes from both capital and labor are higher for richer individuals.[17] The relationship cov(r(y),c) = cov (r(c),c) then still holds, because the rankings according to total income and the rankings according to capital income coincide and thus $R_c = 1$, but now an increase in the capital share pushes the overall Gini up. This happens because capital income (depicted by the *capital income1* line in Figure 10-3) has a greater Gini than labor income and as the share of a more unequally distributed source increases, so does the overall Gini. The actual increase in Gini will be $G_c - G_l$.

New capitalism represents a strong departure from the model of classical capitalism.[18] Every individual receives both labor and capital income, and in principle (if their shares were the same across the distribution), we could obtain the same outcome as in socialism, namely full orthogonality of personal income distribution from the rising share of capital income. This seems unlikely, however, as rich countries today are in effect closer to "new capitalism 1," where the share of capital income is greater for the rich households.

Under "new capitalism 1," the transmission from increased capital share into greater interpersonal inequality may be as strong as in classical capitalism. Suppose that $s_c = 0.3$ and that it increases to 0.35. Under classical capitalism with R_c (say) around 0.6, these 5 additional percentage points of net income received by capitalists will increase the overall Gini by about 3 points. Under the "new capitalism 1," the increase will be —-1
—0
—+1

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($G_c - G_l$) times 5. The $G_c - G_l$ gap is empirically about 0.3 – 0.5 (0.8 – 0.9 minus 0.4 – 0.5), so the Gini increase may be 1.5 – 2.5 points. The new capitalism may be just marginally more successful than classical capitalism in checking the spillover from the rising capital share into a greater interpersonal inequality.

Transmission of Higher Capital Income Share into Personal Inequality: Empirical Results

How does the transmission of higher capital income into personal inequality, summed up in the elasticity parameter, look empirically in the advanced capitalist economies? I use a sample of 138 standardized household surveys produced by the Luxembourg Income Study, or LIS, covering seventeen capitalist economies over the 1969–2013 period, and calculate all the relevant statistics (Gini coefficients, concentration coefficients, correlation ratios for capital and labor income). The number of surveys by country ranges from twelve for Canada and eleven for the United States to five for Switzerland and Greece. For almost all countries, the most recent surveys are from 2010 or 2013. The list of surveys is given in Annex 2.

One has to keep in mind, however, that despite the best efforts at harmonization conducted by the Luxembourg Income Study, the amount of capital incomes is probably underestimated in many cases. This is due to the fact that the original surveys out of which LIS data are built underestimate capital income, both because the rich (who receive a high share of income from capital) refuse to participate in surveys, or rich respondents, when participating, underestimate their capital income. LIS data for the United States, for example, give an average share of capital income (exclusive of capital gains) in total market income of 7 percent, which is about two-thirds of the value obtained from fiscal sources.[19] Despite that, comparisons of U.S. data obtained from the Luxembourg Income Study and from fiscal sources show very close correspondence between the values of the Gini coefficient for capital income and correlation ratios (R_c), the two factors that determine the transmission. The latter is therefore likely to be very similar whether calculated from household surveys or from fiscal sources (see Table 10-1).

TABLE 10-1.
Comparison of LIS survey and fiscal data for the United States

	2000		2004	
	Surveys	**Fiscal**	**Surveys**	**Fiscal**
Inequality of market income without capital gains (in Gini points)	53	55	54	55
Capital income share in market income (in %)	7	11	6	10
Gini of capital income (in Gini points)	90	92	92	94
Capital correlation ratio, R_c	0.63	0.76	0.64	0.78

Note: Calculations from household surveys are based on household per capita income; calculations from fiscal data are based on fiscal units (which are very close to households). The fiscal series ends in 2005. For comparison, I choose the two most recent years for which I had both survey and fiscal data. Source: LIS household surveys based on US Current Population Surveys: my own calculations. Fiscal data: personal communication by Christoph Lakner.

Figure 10-4 shows the data on the elasticity of transmission (R_c) over time for four advanced economies. In addition to the United States, I selected Germany as an example of a continental-corporatist welfare state, Sweden as a prototype of a Scandinavian welfare state, and Spain as an advanced Mediterranean welfare state. The results show the United States with a rather high elasticity throughout. U.S. elasticity steadily increases, passing from 0.54 in the late 1970s to 0.64 in 2013. Most interesting, however, is Sweden, where the elasticity was as low as 0.2 in the mid-1970s but increased to 0.5 by 2000. This parallels the well-known increase in income inequality and especially wealth inequality in Sweden.[20] German elasticity also increased significantly, from 0.4 in the mid-1970s to the peak of 0.65 thirty years later. Finally, Spanish elasticity went up as well, from less than 0.3 in the 1980s to just short of 0.5 in 2010. In these four cases, there was a clear upward trend over the past thirty years. In addition, the gaps between countries' elasticities in the early 2010s are smaller than they were in the 1970s. We shall find very similar results for the whole sample of seventeen countries.

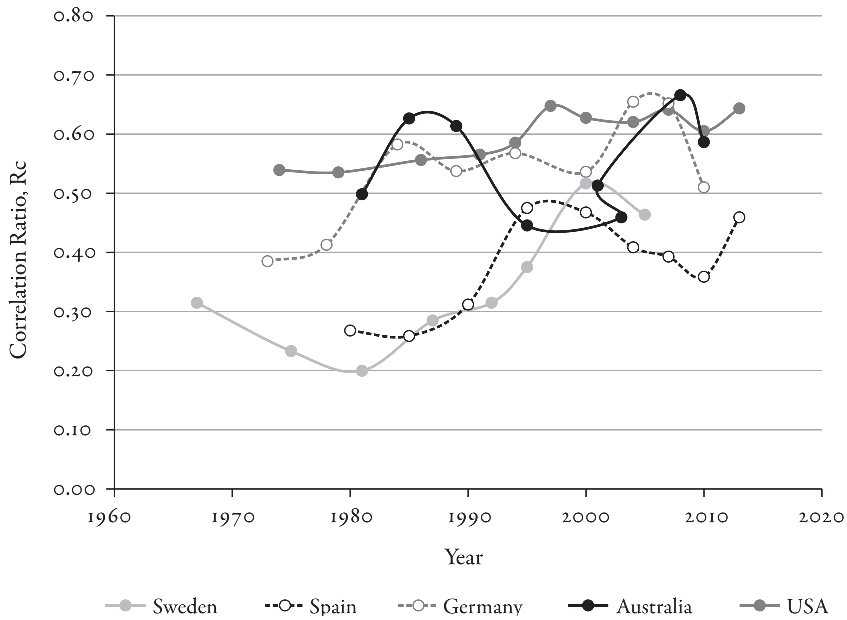

FIGURE 10-4: Elasticity of interpersonal income Gini to changes in capital income share, four advanced economies, 1967–2013.

Note: In all four countries, elasticity has clearly trended upward in the past three decades, and the gaps between countries' elasticities have become smaller.

Source: Calculated from household-level data available from Luxembourg Income Study (see Annex 2). All underlying variables normalized by household size, that is expressed in per-capita terms.

Figure 10-5 shows the average elasticity by country, ranked in increasing order. Italy, the United States, and Finland have the highest elasticities, around 0.6; at the other extreme are Belgium, Sweden, and Switzerland, with average elasticities of just under 0.35. Note that the period over which these elasticities are calculated is not identical across countries (the first data point for the United States goes back to 1979, and for Greece to only 1995), nor is the number of observations per country the same.

Figure 10-6 shows the scatterplot of elasticities obtained from 138 surveys against the capital shares calculated from the same surveys. As implied by our derivation in the previous section, higher capital share is associated with greater elasticity, but the scatterplot shows that the relationship is concave and that after the capital share reaches about 0.12, the elasticity increases

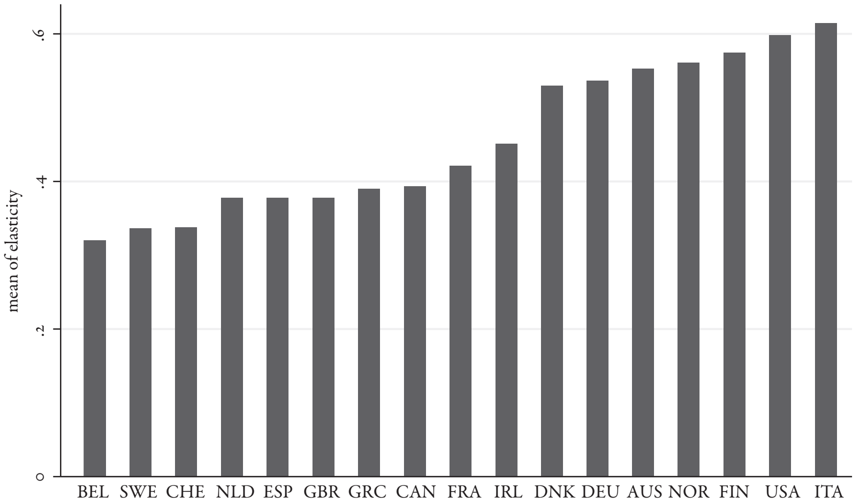

FIGURE 10-5: Average elasticity over the past approximately forty years, by country.

Note: Italy, the United States, and Finland have the highest elasticities at around 0.6; at the other extreme are Belgium, Sweden, and Switzerland with average elasticities just under 0.35.

Source: See Annex 2.

by very little or is stable. This means that any increase in the capital share (say, by 1 percentage point) will be associated with a greater increase in interpersonal Gini at higher levels of capital share. But once that level is reasonably high, further increases in the capital share will produce about the same effect on interpersonal inequality.

Most elasticities are between 0.3 and 0.6, with both the median and the mean elasticity of 0.46 (implying a fairly symmetrical distribution of elasticities). The distribution of elasticities is shown in Figure 10-7.

How is elasticity related to the capital share? In other words, can we estimate the relationship shown in Figure 10-6 parametrically? Table 10-2 shows the regression results for several specifications. In the simplest linear specification where elasticity is regressed on capital share and time only, we find a steep slope on capital share of about 3, and a statistically significant positive coefficient on time. This former means that, on average, each percentage-point increase in the capital share is associated with an increase of elasticity of almost 3 points—for example, if the capital share increases from 0.05 to 0.06 (from 5 percent to 6 percent), the elasticity increases from 0.4 to 0.43. The positive

FIGURE 10-6: Elasticity with which capital share is "transmitted" into higher interpersonal inequality, and capital share, 17 advanced economies, 1967–2013.

Notes: All underlying variables normalized by household size, that is expressed in per-capita terms. Non-parametric *lowess* function in Stata with default bandwidth shown. Capital share is expressed as a ratio (0.05 = 5%) A single country abbreviation appears for all years for which surveys for such a country are available. For the list of country abbreviations, see note to Figure 10-5.

Source: Calculated from household-level data available from Luxembourg Income Study (see Annex 2).

sign on the *time* variable implies that the transmission function has recently become stronger. Perhaps more realistic (in light of the pattern in Figure 10-6) is a quadratic formulation, and indeed we find a significant quadratic term in regression 2. Another alternative is a country fixed-effect regression, which allows for heterogeneity between the countries (reflected in the country-specific intercepts). The coefficient on the capital share is quite similar (2.68) to what we have obtained in the simple pooled regression. The coefficient on time remains strongly positive. Finally, specification (4) repeats the squared capital share formulation, now in country-fixed effects, with basically unchanged results. We can draw two conclusions from this exercise: First, a rising capital share is associated with increasing (but concave) transmission into personal inequality, and second, the relationship has recently become stronger.

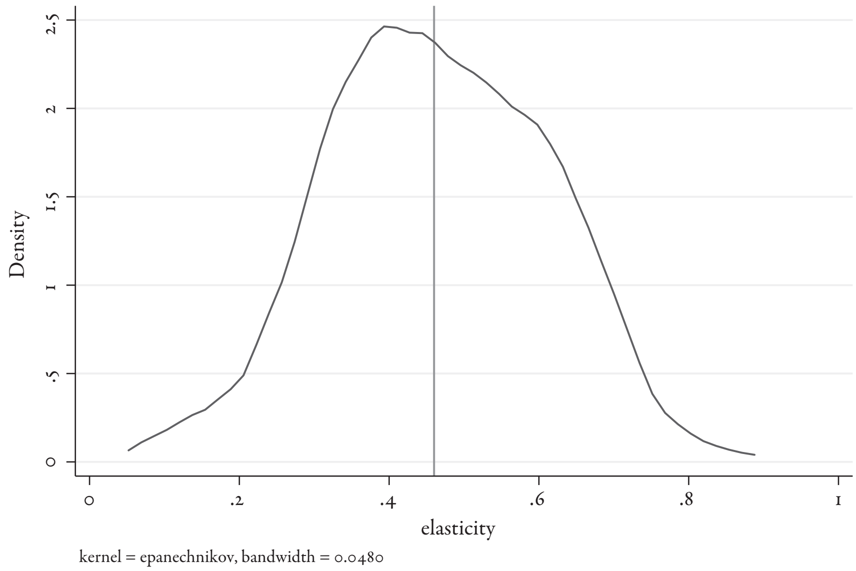

FIGURE 10-7: Distribution of elasticities (R_c) in advanced capitalist economies.

Note: Most elasticities are between 0.3 and 0.6. The straight line is drawn at the median and mean elasticity of 0.46 (implying a fairly symmetrical distribution of elasticities).

Source: Calculated from household-level data available from Luxembourg Income Study (see Annex 2).

We can now compare the elasticities from real life to those that we obtained earlier from our four ideal-typical social systems (Table 10-3). This enables us to see better where, compared to different ideal types, modern capitalist economies lie. Great Britain in 1969, Netherlands in 1987, Switzerland in 1982, and Sweden in 1981 had elasticities smaller or equal to 0.2 and were quite close to the socialist model. One-half of all observed elasticities fall between the values of 0.36 and 0.57 (with the median, as we have seen, of 0.46). This level of elasticity corresponds, within our ideal-typical world, to an intermediate position between socialism and classical or "new capitalism 1." Countries with the highest elasticities, which are Nordic countries in the years after 2000 and Italy in 1998 and 2000, have values above 0.7 and are thus closest to the classical or "new capitalism 1," and furthest from socialism.[21] The United States is close to these countries with its highest elasticity value of 0.65, reached in 1997, and its most recent 2013 elasticity at 0.64, just slightly below the previous peak.

TABLE 10-2.
Regression results: elasticity of transmission and capital share
Dependent variable: elasticity

	Pooled regressions		Country fixed effects (unbalanced panel)	
	1	2	3	4
Capital share	2.95	5.81	2.68	4.99
	(0.00)	(0.00)	(0.00)	(0.00)
Squared capital share		−20.69		−15.81
		(0.01)		(0.03)
Time	0.005	0.004	0.004	0.004
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	−9.19	−8.45	−7.84	−7.17
	(0.00)	(0.00)	(0.00)	(0.00)
Adjusted (or within) R^2	0.41	0.43	0.43	0.45
(F-value)	(48)	(36)	(45)	(32)
Number of observations	138	138	138	138
Number of countries			17	17

Note: *p*-values between parentheses. *Time* is measured by the year when the survey was conducted (see Annex 2).

How much Gini will increase will depend not only on the elasticity but also on other parameters like Gini of labor and capital income and the correlation ratio for labor (R_l). Yet these parameters, and especially Ginis for labor and capital income, do not differ greatly between the countries, and we can make an easy approximation: The average Gini for labor income in our sample is 0.5 and the average Gini for capital income is 0.9. Taking these values and the average correlation ratio for labor gives us an estimated increase of 0.16 Gini point for each point increase in the capital share (see Table 10-3). A 5 percent increase in U.S. capital share (without any change in the underlying distribution of assets), as reported by Karabarbounis and Neiman[22] for the period 1975–2012, may be then expected to be associated with an approximately 0.8 Gini point increase in personal inequality.

TABLE 10-3.
Elasticity of transmission of rising share of capital income into personal income inequality

Economic system	Elasticity	Gini change
"New capitalism 1" (with $G_c > G_l$)	Around 1	G_c-G_l
Classical capitalism	<1	$R_C G_C$-$R_I G_I$
"New capitalism 2" (with $G_c = C_l$)*	1	0
Rich countries today	0.51	$R_c G_c - R_l G_l = (0.51)(0.9) - (0.6)(0.5) = 0.16$*
Socialism	Around 0	Around 0 or negative **

* The mean Rc in the period after 2000 is 0.51; I also take the average values for other variables.
** Since Gini of labor income is supposed to be positive ($G_l > G_c = 0$).

Policy Implications

The implication of this analysis is that the way the rising share of capital income gets transmitted into greater interpersonal inequality varies between different social systems as a function of the underlying asset distribution. We are used to implicitly making the assumption that capital incomes are very concentrated and that the association between being capital-rich and overall-income-rich is very close. Both of these assumptions are reasonable given the empirical evidence. Indeed, as we see in the ideal-typical world of new capitalism, the increase in s_c almost directly translates into a higher Gini (because Gini of capital income is much greater than Gini of labor income). In classical capitalism, this is also true once the share of capitalists becomes sufficiently high. But in a socialist world, rising s_c does not imply rising interpersonal Gini; in effect, given our assumption of equal per capita distribution of capital assets, it implies a reduction in income inequality. Similarly, in "new capitalism 2," where every individual receives an equal share of his or her income from asset ownership, a rising capital share does not affect interpersonal income distribution.

This carries, I think, clear lessons for the rich societies in particular. The definition of rich societies is that they have high K / Y (β) ratios. As currently advanced societies become even richer, the r > g dynamic will lead to rising beta and alpha. One way to ensure that this does not spill out into increased income inequality is through taxation, as advocated by Piketty, but another way—perhaps a more promising one or at least complementary—is to reduce the concentration of ownership of capital and thus of income from capital.

In the framework discussed here, reduced G_c will also reduce the association between (high) capital income and (high) overall incomes. Thus, both G_c and R_c would be reduced and an increase in capital share will have a small or even a minimal effect on personal income distribution. Ultimately, if $G_c = G_l$, it may have no effect at all on overall income Gini.

In turn, this means that much greater attention should be paid to policies that would redistribute ownership of capital and make it less concentrated. In principle, there are two kinds of such policies.

One would be giving greater importance to Employee Stock Ownership Plans and similar plans that would give a capital stake to workers who currently have none. A well-known Swedish trade union plan, for example, whereby companies would issue special shares to go into a fund that would support workers' pensions, was recently "resuscitated."[23] This approach, however, runs into the well-known problem of nondiversification of risk, where individuals' income depends entirely on working in a given company. This is indeed the case for most people today who have only labor incomes, so having both labor and capital income coming from the same company, it could be argued, does not expose them to more risk than they presently experience. While this may be true, it begs the question of why such pro-labor ownership would be introduced if it does not manifestly improve the situation of those who currently hold no capital assets. It therefore seems to me that this approach, while valuable, runs quickly into some limits.

A more promising approach may be to focus on wider share ownership divorced from one's workplace. This could be done through various incentives that would encourage small shareholdings, and penalize heavy concentration of assets. Indeed, Piketty's suggestion of a progressive wealth tax could be combined with implicit and explicit subsidies to those who hold small amounts of wealth.[24]

In rich societies whose capital / output ratio will tend to rise, the share of capital income in net income may be expected to go up as well.[25] If so, efforts should be directed toward ensuring that this inevitable upward movement in the K / Y ratio does not produce unsustainable levels of income inequality. A way to achieve this is to equalize as much as possible individuals' positions at the predistribution stage—or to put it in terms introduced in this paper, to move away from "new capitalism 1," which is in many ways similar to the actually existing capitalism today, and get closer to "new capitalism 2." This involves primarily lesser concentration of capital assets, but also (a topic that I did not discuss here) more equal access to education and deconcentration of the returns to skills.

Annex 1. Derivation of the Transmission Function in the Case of Classical Capitalism (with Two Nonoverlapping Income Classes)

$$s_c\left(p_w + p_k G_c - R_c G_c\right) = -s_l\left(-p_k + p_w G_l - R_l G_l\right)$$

$$s_c\left(p_w + p_k G_c - R_c G_c\right) = -\left(1 - s_c\right)\left(-p_k + p_w G_l - R_l G_l\right)$$

$$s_c\left(p_w + p_k G_c - R_c G_c\right) = -\left(1 - s_c\right)\left(A\right)$$

$$s_c\left(p_w + p_k G_c - R_c G_c - A\right) = -A$$

$$-s_c R_c G_c = -s_c\left(p_w + p_k G_c - A\right) - A$$

$$s_c R_c G_c = s_c\left(p_w + p_k G_c - A\right) + A$$

$$R_c G_c = \left(p_w + p_k G_c - A\right) + \frac{A}{s_c}$$

$$R_c = \left(\frac{p_w - A}{G_c} + p_k\right) + \frac{A}{s_c G_c}$$

$$\frac{dR_c}{ds_c} = -\frac{A}{s_c}\frac{1}{G_c^2} > 0$$

because $A = -p_k + p_w G_l - R_l G_l = -(1 - p_w) + p_w G_l - R_l G_l = p_w(1 + G_l) - 1 - R_l G_l$ will tend to be negative. In one extreme case, when $p_k \rightarrow 1$, this would be clearly the case. In the other extreme case, when $p_k \rightarrow 0$, $A = G_l\,(1 - R_l) \rightarrow 0$

This last case is clearly irrelevant because it implies that there are no capitalists at all. But for all sensible situations where $0 < p_k < 1$, $A < 0$.

The second derivative is

$$\frac{d^2 R_c}{ds_c^{\,2}} = \frac{2A}{s_c} \frac{1}{G_c^{\,3}} < 0$$

All symbols are as explained in the text.

Annex 2. List of Luxembourg Income Study Surveys Used

Country	**Years**
Australia	1981 1985 1989 1995 2001 2003 2006 2010
Belgium	1985 1988 1992 1995 1997 2000
Canada	1971 1975 1981 1987 1991 1994 1997 1998 2000 2004 2007 2010
Switzerland	1982 1992 2000 2002 2005
Germany	1973 1978 1984 1989 1994 2000 2004 2007 2010
Denmark	1987 1992 1995 2000 2004 2007 2010
Spain	1980 1985 1990 1995 2000 2004 2007 2010 2013
Finland	1987 1991 1995 2000 2004 2007 2010
France	1978 1984 1989 1994 2000 2005 2010
Great Britain	1969 1974 1979 1986 1991 1994 1999 2004 2007 2010
Greece	1995 2000 2004 2007 2010
Ireland	1987 1994 1995 1996 2000 2004 2007 2010
Italy	1986 1987 1989 1991 1993 1995 1998 2000 2004 2008 2010
Netherlands	1983 1987 1990 1993 1999 2004 2007 2010
Norway	1979 1986 1991 1995 2000 2004 2007 2010
Sweden	1967 1975 1981 1987 1992 1995 2000 2005
United States	1974 1979 1988 1991 1994 1997 2000 2004 2007 2010 2013

-1—
0—
+1—