Must capital income increase long-term inequality? Evidence from Sweden 1991–2021

Andreas Bergh[1] and Martin Nordin[2]

Abstract

Capital income is known to increase income inequality when measured on an annual basis, but the role of personal capital income in long-term inequality is rarely studied. Theoretically, capital income can increase or decrease long-term inequality depending on the correlation with other income. We examine, using Swedish register data, the evolution of annual and long-term income inequality in Sweden 1991–2021, using disposable income with and without capital income. Capital income had a small equalizing effect on long-term inequality for the period 1991 to 2006 but added substantially to long-term inequality for the period 2007 to 2021. A tax reform in 2006 is a plausible explanation of the shift, and the composition of capital income in the top decile has changed, away from realized gains towards dividends and interest income. To fully understand the distributional effects of capital income, a long-term perspective is needed.

JEL-codes: *D31, D63, E22*
Keywords: *Income distribution, capital income, inequality, register data*

Acknowledgements: Financial support from Jan Wallanders och Tom Hedelius Stiftelse is gratefully acknowledged

[1] Department of Economics, Lund University, Box 7082, 220 07 Lund, Sweden
Research Institute of Industrial Economics (IFN), Box 55665, 102 15 Stockholm, Sweden
ORCiD: 0000-0003-2621-6769
[2] AgriFood Economics Centre and Department of Economics, Lund University, Box 7080, 220 07, Lund, Sweden.

1. Introduction

In recent decades, income inequality has increased in many countries. This trend is typically documented using time series of annual income distributions (e.g. Cingano 2014; Milanovic 2016; Chancel and Piketty 2021; Vuković and Damijan 2025). At the same time, it is well known that inequality measured over periods longer than one year, henceforth referred to as long-term inequality, tends to be lower than annual income inequality (Björklund 1993; Gottschalk and Moffitt 2009). It therefore remains an open question whether the increase in inequality is as pronounced when income is measured over longer horizons. In principle, long-term inequality may increase more, less, or remain unchanged, even when annual income inequality rises substantially.

A related and well-established finding is that annual income inequality is typically higher when capital income is included, and that capital income has contributed to the rise in annual inequality (Fräßdorf et al. 2011; Hoffmann et al. 2020; Krolage et al. 2022). Including capital income in the study of inequality is important for several reasons. Most obviously, capital income increases disposable income and thereby expands consumption opportunities. Ignoring capital income will therefore understate inequality, especially in societies where some individuals receive substantial capital income despite having little or no labor income. Moreover, if capital income has become more important over time, as suggested by Piketty and Zucman (2014), the bias from excluding it is likely to have increased. Yet because the measurement of capital income requires detailed individual-level data, empirical studies of its role in long-term inequality remain rare.

Sweden provides an informative case. Capital income has been a major driver of rising annual income inequality since around 2000 (Karimi et al. 2024; Waldenström 2020). At the same time, features of the Swedish tax system suggest that the distributional role of capital income may have changed over time, particularly following the 2006 reform of the taxation of closely held corporations under the 3:12 rules. This reform increased the incentives for shifting income from labor to capital income, which may have altered the relationship between capital income and other income. This suggests that the impact of capital income on long-term inequality may differ not only from its effect on annual inequality, but also across periods.

Because capital income includes realized capital gains, dividends, and interest income, its effect on annual inequality need not coincide with its effect on long-term inequality. In theory, capital income may lower long-term inequality even when it raises annual inequality. This may happen if capital income generates large but infrequent increases in income for some individuals, yet over longer periods is distributed relatively broadly across the population. Given the importance of realized capital gains from housing and other assets, such a scenario cannot be excluded. On the other hand, if capital income accrues mainly to individuals who already have high labor income or transfer income, it is likely to increase long-term inequality as well. The question is therefore empirical.

Much of the literature on capital and inequality takes a macro-historical perspective. Piketty and Zucman (2014), for example, document a long-run U-shaped pattern in private wealth-to-income ratios in several advanced economies. Other studies examine the relationship between the capital share of national income and top income shares. Bengtsson and Waldenström (2018) document a strong positive link between the capital share and top personal income shares, while Berisha and Meszaros (2020) show that a higher capital share is associated with higher income inequality in the United States. In contrast to this macro-oriented literature, empirical studies of the role of personal capital income in long-term inequality using individual-level data are rare.

The study most closely related to ours is Roine and Waldenström (2012), who examine realized capital gains and top income shares in Sweden using a representative sample covering about 3 percent of the population. Our study differs in several important respects. We use total-population register data, analyze total capital income rather than realized capital gains alone, and examine both annual and long-term inequality using measures that capture different parts of the income distribution. In addition, we compare two extended periods, 1991–2006 and 2007–2021, which allows us to assess whether the long-term distributional role of capital income has changed over time.

Using register data covering the entire Swedish population aged 20 and older, we obtain three main results. First, capital income does not necessarily increase long-term inequality. In the earlier period, it had a small and, in some cases, equalizing effect, especially in the lower half of the income distribution. Second, long-term inequality increased substantially between 1991–2006 and 2007–2021 when capital income is included, suggesting that the rise in annual inequality cannot be explained simply by transitory income fluctuations. Third, the distributive profile of capital income changed markedly over the period studied, and in the later period after 2007 it contributed substantially to long-term inequality. To illustrate this shift, we show that the correlation between capital income and other income, defined as labor income and transfers, increased and changed sign from negative to positive between 1991 and 2021.

The remainder of the paper is organized as follows. Section 2 presents the inequality measures used and discusses their interpretation. Section 3 describes the data. Section 4 reports the empirical results, comparing annual and long-term inequality with and without capital income and examining how the correlation between capital income and other income evolved over time. Section 5 concludes.

2. Measuring Inequality

The Gini coefficient is one of the most widely used summary measures of income inequality. It quantifies the extent to which the distribution of income among individuals or households deviates from a perfectly equal distribution. Formally, the Gini coefficient is defined as:

$$G = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} |y_i - y_j|}{2n^2 \mu}$$

where y_i and y_j are incomes of individuals i and j, n is the number of individuals, and μ is the mean income of the population.

The value of the Gini coefficient ranges between 0 (perfect equality in the sense that everyone has the same income) and 1 (perfect inequality in the sense that one individual has all the income). In practice, Gini values for disposable income tend to fall between 0.25 and 0.5 in most OECD countries.

While the Gini coefficient is useful for summarizing inequality in a single number, it has several limitations. Most importantly, a change in the Gini coefficient can arise from changes in the top, the middle, or the bottom of the distribution. Thus, it does not show whether inequality is due to poverty (bottom tail) or affluence (top tail). To address these issues, this study supplements the Gini coefficient with two income ratio measures:

- P90/P50 (top-to-middle ratio) compares the income at the 90th percentile to the median income. It captures the degree of affluence or top-end inequality.
- P50/P10 (middle-to-bottom ratio) compares the median income to the 10th percentile income, highlighting the extent of poverty or bottom-end inequality.

These measures are chosen because they complement each other in ways that are relevant for the distributional role of capital income. The Gini coefficient summarizes overall inequality, while P90/P50 and P50/P10 make it possible to distinguish changes in the upper and lower parts of the distribution. This is useful in the present context because capital income may affect the top and bottom halves of the distribution differently.

3. Data

Our data come from the comprehensive register-based longitudinal database LISA (Longitudinal Integration Database for Health Insurance and Labor Market Studies), developed by Statistics Sweden, for the period 1991–2021. Unlike surveys or samples, the LISA database includes the entire Swedish population aged 15 and older who are registered in Sweden as of December 31 each year. Because LISA is register-based and longitudinal, individuals can be followed year by year over time, allowing researchers to track life-course dynamics and, as in our case, measure long-term inequality, rather than just annual snapshots. Maintained by Statistics Sweden (SCB), the LISA database is consistently structured, well documented and trusted in both national and international research contexts.

Register data may nevertheless understate inequality at the top if taxable capital income is shifted abroad or otherwise not fully observed in Swedish registers. This concern is relevant in principle for all register-based studies of income concentration and should be kept in mind when interpreting our estimates.

Our inequality metrics are calculated for the population aged 20 and older. Inequality metrics are calculated using individual disposable income with and without capital income included, both measured in constant prices. Disposable income includes labor and capital income, taxable and non-taxable benefits, and is measured net of taxes. Capital income consists of realized capital gains, interest income, and dividends.

Following a major tax reform, Sweden introduced a dual tax system in 1991. In dual tax systems, labor income is taxed progressively while capital income is taxed proportionally. This year is therefore the natural starting point of our analysis. We follow individuals as long as possible, which means that the most recent year in our data is 2021, covering 31 years in total. Because we are interested in changes in long-term inequality, we divide the time period into an early and a more recent period, 1991–2006 and 2007–2021.

4. Results

4.1 Disposable income, age 20 and older

The main results using the Gini coefficient are summarized in Table 1a. For the years 2006 and 2021, we calculate the Gini coefficient for disposable income with and without capital income. As expected, inequality has increased between these two years, and more so when capital income is included: 14.8 and 9.7 percent including and excluding capital income, respectively. In the two rightmost columns we have calculated the Gini coefficient for incomes summed over the periods 1991–2006 and 2007–2021, again with and without capital income. For long-term income the Gini coefficient has increased by 21.2 and 10.1 percent including and excluding capital income, respectively. A striking observation from these statistics is that the rise in inequality between 2006 and 2021 is higher for long-term income than it is for annual income. Thus, transitory income fluctuations and lifecycle smoothing are unlikely to account for the recent increase in annual inequality in Sweden.

Another conclusion from Table 1a is that for the earlier period, capital income hardly increased long-term inequality at all: Including capital income in the calculation of long-term inequality raises the Gini coefficient only marginally (from 0.258 to 0.260).[1] For the more recent period, capital income increased long-term inequality by 10.9 percent (.315 – .284)/.284).

While the Gini coefficient is a widely used measure of income inequality, it is less informative on where in the income distribution changes occur. In Table 1b and 1c, we use the P90/P50 and P50/P10 ratios as supplementary inequality metrics. The P90/P50 ratio compares incomes at the 90th percentile to those at the median, highlighting inequality in the

[1] *Note that we are reporting measurement based on a population register, not inferring from a sample.*

upper half of the distribution, while the P50/P10 ratio compares the median to the 10th percentile, shedding light on inequality in the lower half.

Table 1. *Annual and long-term inequality for disposable income with and without capital income*

a. Gini coefficients

	Gini for annual income		**Gini for long-term income**	
	Incl capital income	Excl capital income	Incl capital income	Excl capital income
2006	0.334	0.298	0.260	0.258
2021	0.384	0.327	0.315	0.284
Increase (percent)	**14.8**	**9.7**	**21.2**	**10.1**

b. P90/P50

	P90/P50 for annual income		**P90/P50 for long-term income**	
	Incl capital income	Excl capital income	Incl capital income	Excl capital income
2006	1.779	1.752	1.637	1.672
2021	1.850	1.804	1.810	1.764
Increase (percent)	**4.0**	**3.0**	**10.6**	**5.5**

c. P50/P10

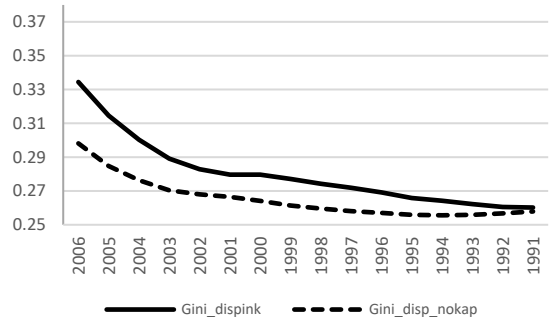
	P50/P10 for annual income		**P50/P10 for long-term income**	
	Incl capital income	Excl capital income	Incl capital income	Excl capital income
2006	2.110	2.173	1.805	1.931
2021	2.393	2.416	1.951	1.961
Increase (percent)	**13.4**	**11.2**	**8.1**	**1.6**

The percentile ratios in Table 1b and 1c reveal that, for the earlier period, capital income lowered long-term inequality in both the upper and the lower half of the income distribution (e.g. by (1.931–1.805)/1.931 ≈ 7% for P50/P10). For the more recent period, capital income still marginally lowered (0.5 percent) the P50/P10 ratio of long-term income (but the same is true for annual income). To summarize, the analysis has shown that capital income can in fact decrease long-term inequality, especially in the lower half of the income distribution. But it no longer does so in Sweden.

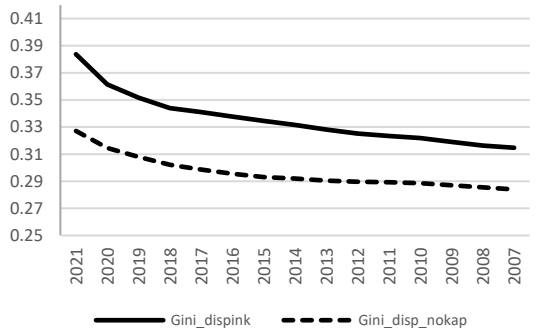
Figure 1 illustrates how the three inequality metrics change when incomes are summed up over more years. The values for 2021 in Figure 1a are the Gini coefficients for the income distribution in 2021 (with and without capital income), the values for 2020 are Gini coefficients calculated when incomes are summed over the years 2020 and 2021, and so on until 2006 where values are based on all incomes during the 2006 to 2021 period. Thus, for the year 2021 the Gini coefficients in Figure 1a are the same as the Gini coefficients for annual income in 2021 in Table 1a, and for the year 2006 the Gini coefficients in Figure 1a are the same as the Gini coefficients for long-term income in 2021. Figure 1b illustrates the same exercise but starting with the year 2006 and summing back to 1991 at the longest. The remaining graphs repeat the exercise for different inequality metrics.

Figure 1. *The effect of calculating inequality metrics for longer time periods.*

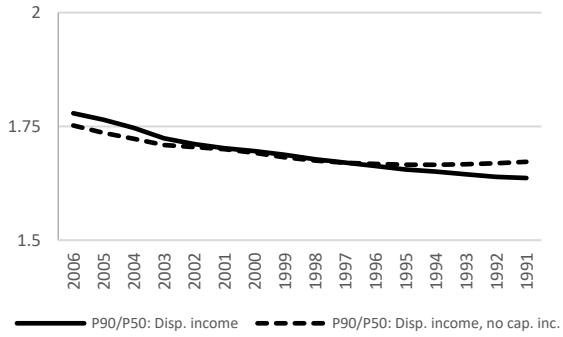
a. Gini, 1991–2006



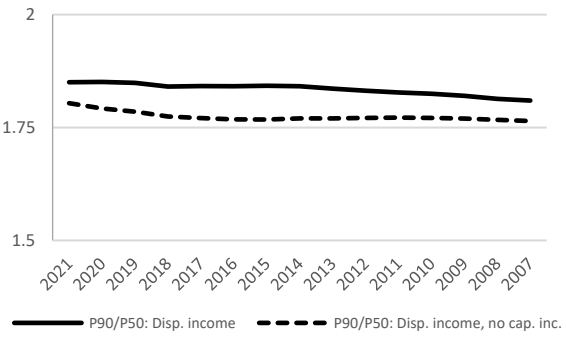
b. Gini, 2007–2021



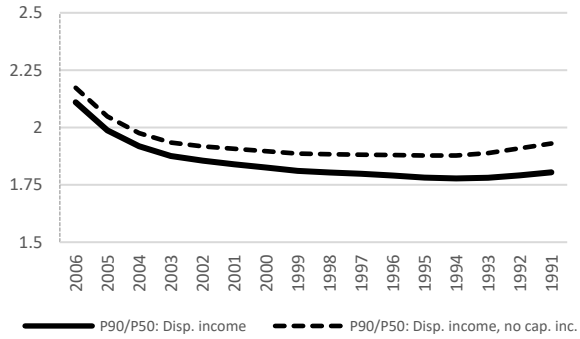
c. P90/P50 ratio, 1991–2006



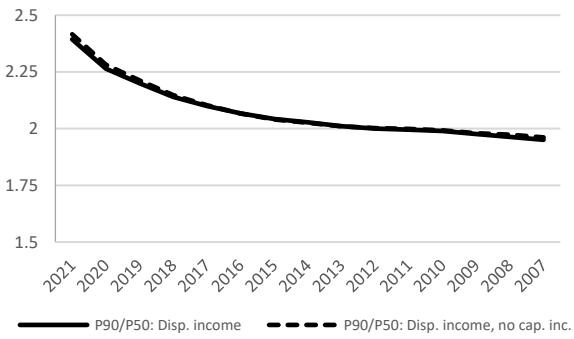
d. P90/P50 ratio, 2007–2021



e. P50/P10 ratio, 1991–2006



f. P50/P10 ratio, 2007–2021



The graphs in Figure 1 indicate that when incomes are summed over longer periods, income inequality typically falls (as expected based on previous studies). The effect is larger (in the sense that inequality decreases more) when capital income is included, suggesting that capital income fluctuates more from year to year. When incomes are summed from 1991 to 2006, Gini inequality is almost exactly the same with and without capital income. Using the P90/P50 metric, capital income decreases long term inequality when incomes are summed from 2006 back to 1991 (Figure1c). Finally, for the lower half of the income distribution as captured by the P50/P10 metric, capital income is equalizing even for annual inequality and more so for long-term inequality (see Figure 1e and 1f).

4.2 Results for natives aged 45–50

It is well documented that demographic changes in Sweden may influence measured inequality. Over the study period, both the share of foreign-born individuals and the proportion of older individuals have increased (Statistics Sweden 2026). Although the main purpose of this paper is to compare different measures of inequality, we therefore present results for natives aged 45–50 as a robustness check. Focusing on a narrowly defined and relatively homogeneous group reduces the influence of demographic change and allows us to assess whether the main patterns are driven by changes in the population or reflect broader distributional dynamics.

Table 2. *Annual and long-term inequality for disposable income with and without capital income (natives, age 45–50)*

a. Gini coefficients

	Gini for annual income		**Gini for long-term income**	
	Incl capital income	Excl capital income	Incl capital income	Excl capital income
2006	0.289	0.250	0.246	0.246
2021	0.336	0.266	0.286	0.250
Increase (percent)	**16.2**	**6.6**	**16.1**	**1.9**

b. P90/P50

	P90/P50 for annual income		**P90/P50 long-term income**	
	Incl capital income	Excl capital income	Incl capital income	Excl capital income
2006	1.669	1.621	1.587	1.649
2021	1.674	1.574	1.715	1.640
Increase (percent)	**0.3**	**-2.9**	**8.0**	**-0.6**

c. P50/P10

	P50/P10 for annual income		**P50/P10 long-term income**	
	Incl capital income	Excl capital income	Incl capital income	Excl capital income
2006	1.714	1.737	1.692	1.771
2021	1.924	1.933	1.829	1.852
Increase (percent)	**12.2**	**11.3**	**8.1**	**4.6**

The results for natives aged 45–50 are broadly consistent with the main findings. As in the full population, annual inequality increases more when capital income is included than when it is excluded. For the Gini coefficient, annual inequality rises by 16.2 percent with capital income, compared to 6.6 percent without, confirming that capital income remains an important driver of annual inequality also within this more homogeneous group.

For long-term inequality, the pattern again differs across periods. In the earlier period, capital income has essentially no effect on long-term inequality: the Gini coefficient is identical with and without capital income (0.246). In the later period, however, capital income contributes substantially. The long-term Gini increases by 16.1 percent with capital income, compared to only 1.9 percent without. This suggests that the growing role of capital income in long-term inequality is not driven by demographic change.

The percentile ratios point in the same direction. For the upper half of the distribution (P90/P50), capital income reduces long-term inequality in the earlier period but increases it in the later period. For the lower half (P50/P10), capital income has a modest equalizing effect in the earlier period, which becomes even weaker in the later period.

4.3 Top-income shares

To complement the inequality measures above, we examine the share of total income accruing to the top 1 percent (P99). As expected, including capital income substantially increases top-income shares in both periods.

Table 3. *Annual and long-term P99 shares with and without capital income*

	P99 share for annual income		**P99 share long-term income**	
	Incl capital income	Excl capital income	Incl capital income	Excl capital income
2006	8.9%	4.9%	5.5%	3.8%
2021	11.7%	5.8%	7.4%	4.5%
Increase (percent)	**32.4**	**18.5**	**34.9**	**17.1**

For annual income, the P99 share rises from 8.9 to 11.7 percent when capital income is included, compared to an increase from 4.9 to 5.8 percent when it is excluded. A similar pattern emerges for long-term income: the P99 share increases from 5.5 to 7.4 percent with capital income, compared to an increase from 3.8 to 4.5 percent without.

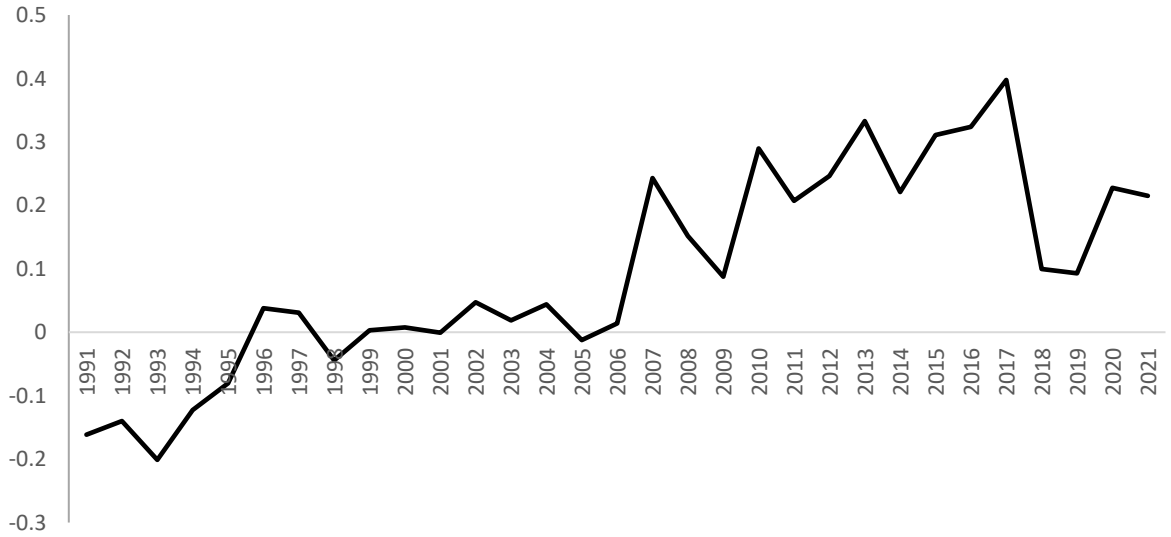
These results confirm that capital income plays a central role in the rise of top incomes, both in annual and long-term perspectives. They are consistent with previous findings for Sweden and complement our earlier results by showing that the increasing importance of capital income is particularly pronounced at the top of the distribution.

4.4 Explaining the findings

From a normative egalitarian perspective, some of the preceding results may be seen as encouraging. In the earlier period, capital income had little effect on long-term inequality and in some cases even reduced it. When comparing the two periods, however, this equalizing effect weakened or disappeared entirely. From the same normative perspective, that is less encouraging.

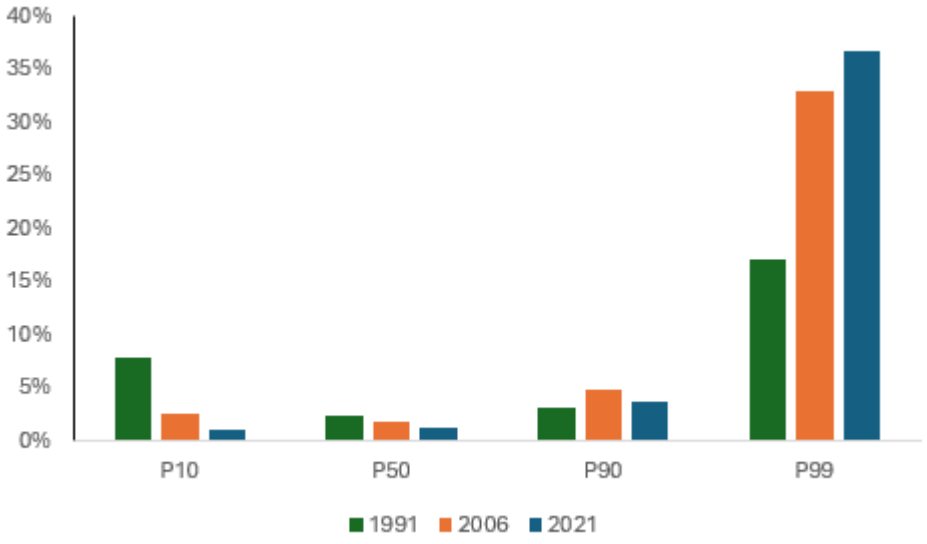
What explains the difference between the two periods? A first clue is provided by Figure 2, which plots the correlation between capital income and other income, defined as labor income and transfers net of taxes, over the period 1991–2021. The correlation was negative in the early 1990s, fluctuated around zero from the mid-1990s onward, and has been positive since around 2006. This suggests that capital income has become increasingly concentrated among individuals who already have relatively high income from other sources.

Figure 2. *The correlation between capital income and other income (net of taxes) 1991–2021.*



A second clue is provided by Figure 3, which shows the share of capital income in disposable income at different points of the income distribution over time. Capital income has become less important in the lower part of the distribution and more important at the top. This pattern is consistent with the view that capital income has become increasingly disequalizing over time.

Figure 3. *The share of capital income in disposable income at different points on the income distribution.*



One plausible explanation is the growing scope for income shifting within Sweden's dual income tax system, in which labor income is taxed progressively while capital income is taxed at a lower proportional rate. These incentives increased further with the 2006 reform of the 3:12 rules, which reduced the tax rate on dividends from closely held corporations (*fåmansbolag*) from 30 to 20 percent and introduced a "simplified rule" (*förenklingsregeln*) that allowed owners of closely held corporations to take out a fixed flat-rate amount in dividends at the reduced 20 percent rate. The amount was

increased in 2007, 2009 and 2012 and further changes are planned.[2] Previous studies using Swedish register data find strong evidence that this reform led to substantial income shifting from labor income to capital income (Alstadsæter et al. 2014; Alstadsæter and Jacob 2016; Björklund et al. 2019).

A further indication is provided by the changing composition of capital income. As shown in Table 4, capital gains have become less important within total capital income at the top of the distribution, while dividends and interest income have become more important. This suggests that components of capital income that may previously have had a weaker or even equalizing effect on long-term inequality have declined in importance, while more concentrated forms of capital income have become more prominent.

Taken together, these patterns suggest that the changing distributive profile of capital income is central to understanding why its effect on long-term inequality became more strongly disequalizing after 2006.

Table 4. *The composition of capital income for the top decile (average for 2013–2015 and 2021–2023).*[3]

Category	2013–2015	2021–2023	Change
Real capital gains	46.8%	33.9%	−12.9pp
Financial capital gains	16.8%	12.4%	−4.4pp
Dividends – closely held	21.8%	24.0%	+2.2pp
Other stock dividends	7.6%	10.9%	+3.3pp
Interest income	9.0%	19.6%	+10.6pp

Note: pp stands for percentage points.

5. Concluding discussion

This paper has examined how capital income affects annual and long-term income inequality in Sweden over the period 1991–2021. Using register data covering the full population aged 20 and older, we compare disposable income with and without capital income for two periods, 1991–2006 and 2007–2021. The analysis yields three main conclusions.

First, capital income does not necessarily increase long-term inequality. In the earlier period, its effect on long-term inequality was small and, for some measures, even equalizing. This was particularly true in the lower half of the income distribution. Second, the role of capital income changed markedly over time. In the later period, capital income contributed substantially to long-term inequality and helps to explain why long-term inequality increased more than annual inequality. This suggests that the rise in annual inequality in Sweden cannot be understood simply as the result of transitory fluctuations in income. Third, the changing impact of capital income appears closely related to a broader change in its distributive profile. Over time, capital income became more positively correlated with other income and increasingly concentrated at the top of the distribution.

These findings have two broader implications. One is methodological. Studies of inequality based only on annual income may give a misleading picture of the distributional role of capital income. Capital income can affect annual and long-term inequality differently, and the difference is empirically important. A long-term perspective is therefore necessary for understanding how capital income shapes the income distribution.

[2] *See Government Bill 2025/26:1.*

[3] *Source: Own calculations based on Government Bill 2024/25:100 Appendix 2, graph 2.3.*

The second implication is substantive. The Swedish case suggests that institutional change, including reforms that increase the incentives to shift income from labor to capital, may matter not only for annual inequality but also for the long-term distribution of income.

The analysis has some limitations. Our data do not allow us to decompose capital income consistently over the full period, and the register data may understate top incomes if some taxable capital income is shifted abroad or otherwise escapes observation. Nor do we attempt to identify the causal effect of specific policy reforms. The purpose of the paper is instead descriptive: to document how the inclusion of capital income changes annual and long-term inequality measures, and how this relationship evolved over time.

A natural next step for future research is to examine more closely which components of capital income drive these patterns, and to study whether similar developments can be observed in other countries with dual income tax systems. Another important task is to investigate more directly the role of tax incentives, housing-related capital gains, and income shifting in shaping the long-term distributional effects of capital income.

References

Alstadsæter, A., Jacob, M., 2016. Dividend Taxes and Income Shifting. Scand. J. Econ. 118, 693–717.

Alstadsæter, A., Jacob, M., Vejsiu, A., 2014. 2014:2 3:12-Corporations in Sweden: The Effects of the 2006 Tax Reform on Investments, Job Creation and Business Start-ups. Expertgruppen för studier i offentlig ekonomi (ESO).

Bengtsson, Erik, and Daniel Waldenström. 2018. "Capital Shares and Income Inequality: Evidence from the Long Run". *The Journal of Economic History* 78(3): 712–43.

Berisha, Edmond, and John Meszaros. 2020. "Long-Term Rates, Capital Shares, and Income Inequality". Open Economies Review 31(3): 619–35.

Björklund, A., 1993. A Comparison Between Actual Distributions of Annual and Lifetime Income: Sweden Around 1951–89. Rev. Income Wealth 39, 377–386.

Björklund, A, M Jäntti, P O Robling, J Roine, D Waldenström. 2019. Kapitalinkomster och inkomstfördelning (bilaga 3 till Långtidsutredningen, SOU 2019:62), Swedish government, Stockholm: Norstedts Juridik.

Blanco, Miguel Artola, Luis Bauluz, and Clara Martínez-Toledano. 2021. "Wealth in Spain 1900–2017 A Country of Two Lands". The Economic Journal 131(633): 129–55.

Chancel, L., Piketty, T., 2021. Global income inequality, 1820–2020: the persistence and mutation of extreme inequality. J. Eur. Econ. Assoc. 19, 3025–3062.

Fräßdorf, Anna, Markus M. Grabka, and Johannes Schwarze. 2011. "The Impact of Household Capital Income on Income Inequality – a Factor Decomposition Analysis for the UK, Germany and the USA". The Journal of Economic Inequality 9(1): 35–56.

Gottschalk, P., Moffitt, R., 2009. The Rising Instability of U.S. Earnings. J. Econ. Perspect. 23, 3–24.

Hoffmann, F., Lee, D.S., Lemieux, T., 2020. Growing Income Inequality in the United States and Other Advanced Economies. J. Econ. Perspect. 34, 52–78.

Krolage, C., Peichl, A., Waldenström, D., 2022. Long-run trends in top income shares: The role of income and population growth. J. Econ. Inequal. 20, 97–118.

Milanovic, B. (2016). Global Inequality: A New Approach for the Age of Globalization. Harvard University Press.

Piketty, T., 2014. Capital in the twenty-first century. The Belknap Press of Harvard University Press, Cambridge Massachusetts.

Piketty, Thomas, and Gabriel Zucman. 2014. "Capital is Back: Wealth-Income Ratios in Rich Countries 1700–2010". The Quarterly Journal of Economics 129(3): 1255–1310.

Roine, J., Waldenström, D., 2012. On the role of capital gains in Swedish income inequality. Rev. Income Wealth 58, 569–587.

Statistics Sweden (2026), Sweden's population in summary 1960–2025, SCB.

Waldenström, D. (2020). "Perspektiv på den ekonomiska ojämlikheten i Sverige", Ekonomisk Debatt 48(4), 13–25.