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Did Belgium withstand the storm of rising inequalities? Income inequality in Belgium, 1985–2020

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Abstract

Belgium exhibits a rather constant level of income inequality during the last decades, contrary to Germany, the United States and some Nordic countries, which have all faced substantial increases in inequality. We use the available income surveys from 1985 to 2020 to describe the evolution of income inequality by means of the Gini index. Earnings inequality has slightly decreased in the last two decades, at least if one takes into account the impact of the substantial increase in employment of, especially, older people and women. Though the education gap in earnings is widening, the rapid increase in (mostly female) education may have a dampening effect on earnings inequality. The income surveys largely underestimate financial capital incomes. Moreover, by definition, these do not cover undistributed profits of the corporate sector. When correcting for this, it turns out that pre-tax factor income inequality increased substantially between 2009 and 2016. The redistributive role of the welfare state through taxes has increased, while redistribution through the social security system exhibited a more irregular course. While there has been an increase in assortative matching in the last two decades, its impact on the evolution of income inequality is unclear.

KEYWORDS
income inequality, capital income, undistributed profits, distributional national accounts, Belgium

JEL CLASSIFICATION
D31, D33, D63

1 | INTRODUCTION

Based on evidence from standard income surveys, Belgium shows a rather flat and relatively low level of inequality in equivalised disposable income, with a Gini hovering around 25 during the last four decades. This is in stark contrast in both levels and pattern with Anglo-Saxon countries such as the United States (an increase from 30 in 1975 to almost 40 in 2022) or the UK (an increase from 25 to 35 from 1968 to 2021).[1] Even when we restrict the comparison to continental Europe, it is fair to conclude from this comparative study that among high-income countries, Belgium belongs, together with for example France, to the group of countries with a rather constant level of income inequality during the last decades, contrary to Germany and the Nordic countries Denmark, Sweden and Finland, which all faced substantial increases in inequality. Moreover, income inequality in Belgium seems to be rather low compared with other rich countries.

Zooming in on the Belgian case, Assal et al. (2023) provide an overview of existing evidence on income inequalities in Belgium. Most studies agree that the Gini of equivalised household disposable income has declined somewhat since 2004. There is, however, less unanimity about the evolution of the top income shares based on fiscal register data of taxable income. One of the major issues is the variable population in the tax databases, due to non-filers and changes in legal regulations and administrative practices (Decoster, Dedobbeleer and Maes, 2017). While the evolution of inequality in pre-tax factor income – that is income from labour, capital and self-employment before taxes – is less stable, and critically depends on who is included in the calculation of the statistics, there is certainly no evidence that there has been a substantial rise in factor income inequality during the last two decades. The share of labour income in gross domestic product (GDP) is lower now than at the end of the 1970s and the early 1980s. Though highly volatile during the last two decades, it is not declining further.

In this paper, we investigate in more detail whether Belgium indeed withstood the storm of rising income inequalities faced by some other high-income countries. To that end, we focus on the evolution and interplay of three major determinants of the equivalised disposable income distribution: the distribution of pre-tax factor income (that is, income from capital, labour and self-employment); the redistributive effects of the tax and benefit system; and demographic evolutions such as education level and household composition. We highlight those aspects of these three major determinants and their interplay which we believe have most contributed to the evolution of equivalised disposable income inequality in Belgium.

In Section 3, we focus on the gross earnings component of factor incomes (income from employees and the self-employed before taxes are subtracted). We investigate the evolution of the gender and education gap in earnings and their contribution to earnings inequality. We pay special attention to the impact on the evolution of earnings inequality of the employment rate, which is reflected in the number of people who have zero earnings. This leads to the hypothesis that increasing employment rates may have contributed to the declining trend of earnings inequality during the first two decades of the 21st century observed in our data. It remains an open question whether this increase in employment rate has affected the inequality figures of other OECD countries too.[2] Independent from the impact of the rising employment rate on inequality, we also find no evidence of rising earnings inequality according to the Gini index when concentrating on the working population only, contrary to what is the case for Germany or Canada, for example.

[1] As a part of the Institute of Fiscal Studies Deaton Review of Inequalities, harmonised reports on a set of income inequality statistics for 17 high-income countries were compiled (see https://ifs.org.uk/inequality/country-studies/). The cited figures stem from these reports and apply to the equivalised disposable income distribution among the population of individuals aged 25–60. We furthermore observe the following changes in those Ginis for other countries: Denmark from 20 to 30 between 1988 and 2022; Finland from 20 to 35 between 1990 and 2021; Germany from 20 to 30 between 1984 and 2020; and Sweden from 20 to 25 between 1990 and 2020.

[2] Usually, inequality statistics for gross income are calculated for the working population only. Such statistics then provide information on both the differences in hours worked and the differences in remuneration of different types of labour activity.

Next, in Section 4, we move to the second component of pre-tax factor income: capital income. It has been argued that rising income inequalities are to a large extent driven by capital income inequality (see, among others, Piketty, 2014; Milanovic, 2016; Saez and Zucman, 2016; Piketty, Saez and Zucman, 2018). We investigate the contribution of capital income to factor income inequality. In the surveys that we use, financial capital income captures only a small fraction of (financial) capital income in the national accounts (NA), contrary to employees' incomes which are fairly well covered. This is partly because of under-reporting and the unrepresentativeness of the sample, but it is also because part of financial capital income (undistributed profits of the corporate sector) is not intended to be captured by surveys on household incomes. There is, however, a tendency in Belgian society to incorporate economic activities and to keep and enjoy the profits and benefits they generate within the corporate entity. Using distributional national accounts (DINA) methods (Blanchet et al., 2021) to allocate the entire net national income (NNI) to the population and to analyse the inequality of the resulting income distribution, we find that between 2009 and 2016 Belgium indeed faced a period of rising income inequality.

The transition from factor income to disposable income is to a large extent driven by the tax–benefit system. In Section 5, we describe the redistributive impact of both the social security system and taxes. Although there is a tendency to increased redistribution through the tax system, the inequality of disposable income turns out to evolve largely in parallel with that of gross factor income inequality. We conjecture that the increase in redistribution through taxes is not in the first place a consequence of policy changes, but is mainly a consequence of changes in the composition of the population.

Finally, it has been claimed that the increasing tendency of assortative mating in terms of education levels has contributed to the increase in overall individual income inequality; for example, see Greenwood et al. (2014) for the US. In Section 6, we confirm that the number of couples with equal education levels has risen in the last two decades in Belgium. Couples with two low-educated partners are becoming rarer, and those with two high-educated partners are occurring more frequently. This is in the first place a consequence of the rise in education, especially among women. There are even slightly more high-educated women than men in recent years. However, we argue that the impact on income inequality of this evolution is ambiguous. We start with a brief discussion of the data in Section 2.

2 | DATA

We use three repeated cross-sections containing micro data on living circumstances: the Socio-Economic Panel (SEP) organised in 1985, 1988 (telephone survey), 1992 and 1997; the European Community Household Panel (ECHP) covering the years 1994–2001; and the European Union Statistics on Income and Living Conditions (EU-SILC), a follow-up of the ECHP, started in 2004, and still organised yearly up to the present day. The most recent EU-SILC data that we use in this paper are from 2021. These data also served as a basis for the compilation of the Belgian country study of the IFS Deaton Review of Inequalities (Capéau et al., 2023a). However, for reasons which will become clearer below, we do concentrate on a partly different segment of the population than in that study: the population aged 20–64 for earnings inequality (Section 3), and the whole adult population (aged 20+) for pre-tax factor income and disposable income (Sections 4–6).[3] All our statistics are calculated for the population of individuals, not households.

Differences in methodologies between surveys and, possibly, imperfections in the construction of the sample weights for the ECHP lead to quite large differences in results for the same statistic drawn from different surveys for overlapping years. We are therefore reluctant to draw time trends by connecting results from different surveys, and hence in the figures here we do not connect observations stemming from different surveys.

[3] The IFS Deaton Review Country Studies focus mainly on the population aged 25–60.

For the ECHP and EU-SILC, income information applies to the (full) year preceding the survey year. For the SEP, it applies to the month preceding the date of the interview. The years in the figures in this paper refer to the income year, not the survey year. For the SEP and ECHP, gross incomes (i.e. incomes inclusive of taxes and, when applicable, employee social security contributions) are reconstructed from answers on net incomes in the questionnaire using inverted routines of an arithmetic tax–benefit calculator. Up to income year 2017 (EU-SILC 2018), EU-SILC data on gross incomes stem from respondents' answers on survey questions. From 2019 onwards (income year 2018), EU-SILC obtains data on gross incomes from employment, pensions and social security benefits through tax registers. We highlight this break by not connecting the 2017 and 2018 points in the figures based on this information. Nominal amounts are converted in real terms of 2019 using the standard consumer price index.

The results in Sections 4 and 5 stem from rescaling the survey information so that income aggregates at the population level equal the amounts of the corresponding NA concepts. This methodology is explained in Capéau et al. (2023b).

3 | EARNINGS INEQUALITY OF THE POPULATION AGED 20–64

In this section, we relate earnings inequality among individuals, as measured by the Gini coefficient, with a number of sociodemographic evolutions of people aged 20–64. Earnings are defined as the sum of gross income from employment and self-employment.[4] Individuals with negative earnings are excluded from the calculations, but those with zero earnings are included. The fraction of zero earnings is a reflection of the fraction of the subpopulation aged 20–64 who are not active either as employees or as self-employed. Therefore, the difference of the evolution of inequality in earnings before and after excluding the zero earnings, which we treat at the end of this section, sheds some light on the explanatory power of changing employment rates on observed changes in inequality of earnings.

3.1 | General trend

Figure 1 shows the evolution of the Gini index of earnings for the population of individuals aged 20–64 between 1985 and 2020. The observation of 1992 for the SEP is an outlier and might be untrustworthy. Apart from that, the Gini does not change drastically between the 1985, 1988 and 1997 observations stemming from the SEP (from 59 in 1985 to 60.3 in 1988, and 59.6 in 1992). In the overlapping period of 1993–97, the Gini index drawn from the ECHP data is systematically higher than the one drawn from the SEP, except for 1997, where we have information from both surveys, and the Gini indices are almost equal (59.6 according to the SEP and 59.9 according to the ECHP). According to the ECHP data, there is also no clear trend in the Gini for the 1990s. It jumps around between 60 and 65 Gini points.[5]

For the EU-SILC years, we discover a downward trend from 54 Gini points in 2003 to 51 in 2008, followed by a bump in the period 2008–12 (covering the Great Recession) starting from 51 Gini points in 2008, rising to 53 in 2010, and falling down again to somewhat less than 51 points in 2012. From 2012 to 2016, there is a slight increase from less than 51 to almost 52 Gini points, after which the downward trend resumes. In 2018–19, the downward trend continues, but it seems to stop during the first year of the COVID-19 pandemic, potentially driven by the containment measures during that

[4] Gross income of employees is cash income, including end-of-year premia, holiday payments and employees' social security contributions. It does not include employers' social security contributions and in-kind benefits (e.g. financial advantages linked to having a company car). For the self-employed, gross income is defined as total revenues minus costs to operate their business and related economic activities.

[5] The values for 1998 and 1999 are affected by outliers at the top. Also the values for EU-SILC incomes of 2004 and 2010 seem to be plagued by outliers.

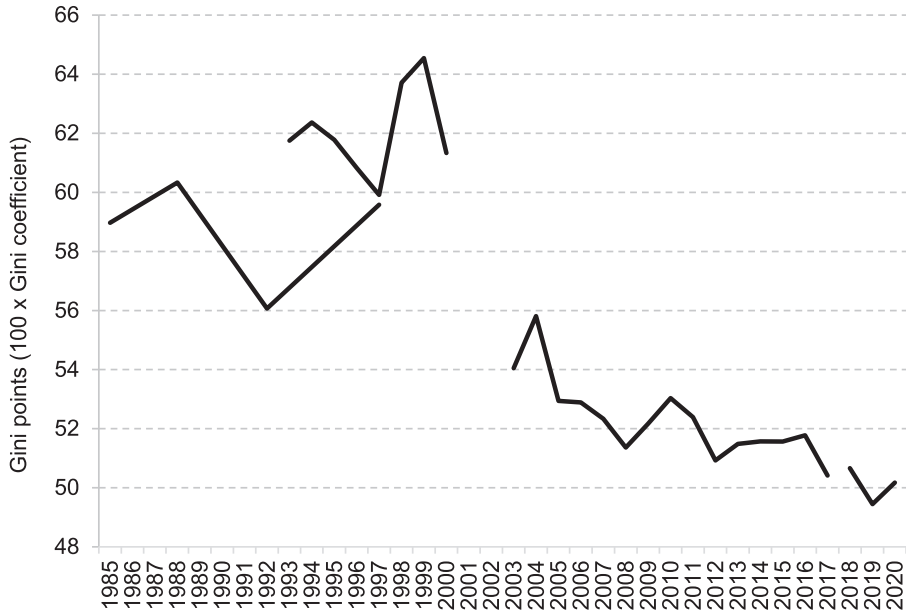

FIGURE 1 Evolution of the Gini index of earnings (population aged 20–64, zero earnings included). *Note*: Earnings are defined as the gross income of employees and the self-employed. For employees, gross income is their cash income (including their social security contributions). For the self-employed, gross income is defined as total revenues minus costs to operate their business. Negative earnings are excluded. Zero earnings are included. *Source*: Authors' own calculations based on the SEP (1985–97), ECHP (1994–2001) and EU-SILC (2004–21). Incomes apply to a year earlier than the survey year for the ECHP and EU-SILC. The horizontal axis refers to those income years.

period, which caused massive temporary unemployment and a lockdown of many businesses. During these months, the affected individuals received zero earnings.

3.2 | Role of gender and education

In Figures 2 and 3, we decompose the overall Gini of earnings by gender and education level. The decomposition of the Gini by subgroups consists of three values adding up to the overall Gini displayed in Figure 1 (Lambert and Aronson, 1993).[6] The first component (green solid lines in Figures 2 and 3) consists of the between-group inequality and reflects the population-weighted Gini coefficient of the mean earning levels of the groups. Thus, it equals the Gini if there were no within-group inequality, and therefore members of a group would all earn the mean income of their group. The second component (red dashed lines in Figures 2 and 3) is a weighted sum of the within-group Gini coefficients of each of the subgroups, with the weights being equal to the product of the income share and the population share of the groups. The third component (blue dotted lines in Figures 2 and 3) is the overlap term. It reflects the part of inequality due to some members of a poorer group being richer than poorer individuals in a richer group, with a higher mean. This term is zero if there are no overlaps between the income distributions of the different groups.

From Figure 2, it can be seen that the between-gender earnings inequality is decreasing over time. The share of women within the population of individuals aged 20–64 has remained rather constant over the same period: its lowest value during the observation period is 49.7 per cent in 1994, and the highest is 50.9 per cent in 1992. Therefore, the decreasing trend of the between-group inequality

[6] More detail on the decomposition of the Gini coefficient by subgroup components is provided in online Appendix A.

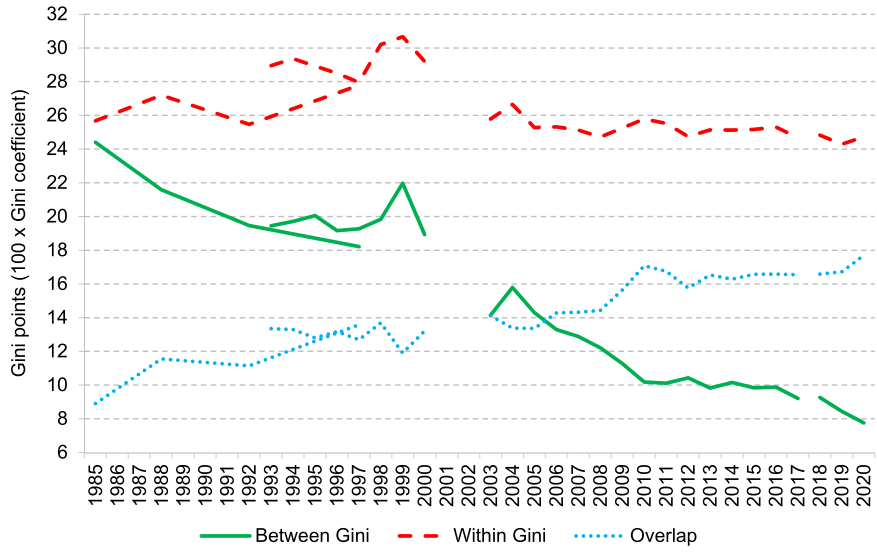

FIGURE 2 Gini index of earnings, decomposition by gender (population aged 20–64, zero earnings included). *Note*: Earnings are defined in the note to Figure 1. The between component (green solid line) is the population-weighted Gini of the means of the subgroups. The within component (red dashed line) is the weighted average of the Gini of each of the subgroups, with weights equal to the product of the income share and the population share of the groups. The overlap term (blue dotted line) reflects the part of inequality ascribed to the overlap between each of the groups' income distributions. The three terms add up to the overall Gini coefficients reported in Figure 1. *Source*: Authors' own calculations based on the SEP (1985–97), ECHP (1994–2001) and EU-SILC (2004–21). Incomes apply to a year earlier than the survey year for the ECHP and EU-SILC. [Colour figure can be viewed at wileyonlinelibrary.com]

(green solid line in Figure 2) reveals that average earnings of men and women have been converging during the last four decades. Reversely, the overlap term is increasing: from less than 9 Gini points in 1985, which is about 15 per cent of the overall Gini at that time, to almost 18 Gini points in 2020, which is about 40 per cent of the Gini in that year. Relatively more people are situated in the overlap of the gender earnings distributions: from slightly less than 70 per cent in 1985 to over 83 per cent in 2017, and even more than 88 per cent in the last three years (2018–20). However, the inequality among the people belonging to the overlap of the earnings distributions of both genders has not risen. So, we can conclude that the gender earnings distributions have been converging with each other.

The reverse picture is obtained for the decomposition of earnings inequality by education level (Figure 3). The between-group inequality (green solid line) is increasing, while the overlap term is decreasing. Some caution is needed when interpreting the rise of the between term. Indeed, the composition of the population aged 20–64 by education level has changed considerably over the course of the four decades under consideration (1985–2021). While the gap between the mean earnings of those in the high versus middle and low education groups has increased somewhat over time (see Figure B.1 in online Appendix B), the major change is in the composition of the population by education level (see Figure B.2 in online Appendix B).

Until the mid-1990s, the largest group consisted of the low educated, even though, according to the SEP data, their share was steadily declining from 51 per cent in 1985 to 38 per cent in 1997. From 1998 onwards, the low-educated group becomes the smallest group, and as of 2005 the high-educated group is the largest. The share of high educated continues to increase after 2010, while that of the middle educated levels off at about 36 per cent to 38 per cent. This combination of change in population shares and the evolution of mean earnings of education groups has an ambiguous effect on the evolution of the between-group inequality. The overlap term is decreasing. So, not only the mean

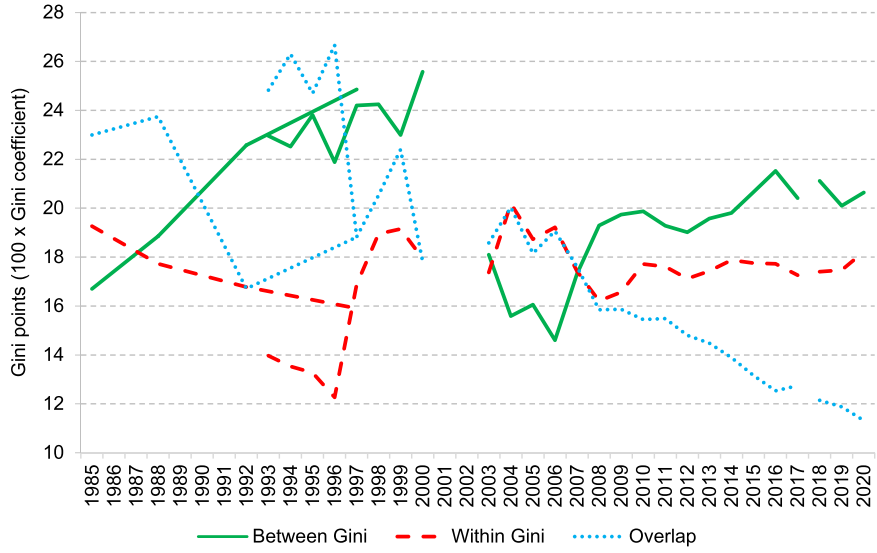

FIGURE 3 Gini index of earnings, decomposition by education (population aged 20–64, zero earnings included). *Note*: Earnings are defined in the note to Figure 1. The between component (green solid line) is the population-weighted Gini of the means of the subgroups. The within component (red dashed line) is the weighted average of the Gini of each of the subgroups, with weights equal to the product of the income share and the population share of the groups. The overlap term (blue dotted line) reflects the part of inequality ascribed to the overlap between each of the groups' income distributions. The three terms add up to the overall Gini coefficients reported in Figure 1. We use the following categories for education: low is less than secondary education (ISCED 0–2); middle (ISCED 3–4) applies to people who finished secondary school (aged 12–18), including those who have obtained a post-secondary non-tertiary education degree; high corresponds to ISCED levels 5–8 (tertiary education completed, including short-cycle tertiary education). We also have a non-negligible group for which the education level is unknown. *Source*: Authors' own calculations based on the SEP (1985–97), ECHP (1994–2001) and EU-SILC (2004–21). Incomes apply to a year earlier than the survey year for ECHP and EU-SILC. [Colour figure can be viewed at wileyonlinelibrary.com]

earnings of different education groups are widening, but the entire earnings distributions of the three education groups are growing apart over time.[7]

3.3 | Employment rate and inequality among earners

In this subsection, we look at the influence of both the employment rate and the income inequality among positive income earners, on the overall inequality reported in Figure 1. In our calculations of the Gini indices reported for the population aged 20–64 in Figure 1, we have included people with zero earnings. In online Appendix A, we show that the switch from zero to positive earnings, as a result of finding a job or starting a business, lowers inequality if that additional income falls in the lower half of the earnings distribution. Therefore, a factor that may have contributed to the declining earnings inequality observed in Figure 1 is the evolution of the employment rate. Figure 4 reports the evolution of the employment rate for the population aged 20–64, in three age groups (20–24, 25–59 and 60–64) for men (dashed lines) and women (dotted lines), and overall (solid lines; black for all three age classes together). Figure B.4 in online Appendix B shows a similar picture for a shorter time period, based on data from the Labour Force Survey.

[7] The overlap and the between term do not necessarily have to evolve in different directions. The means of the groups' income distributions can grow apart, but still their overlaps can become larger and/or more densely populated, and the inequality among people in the overlap belonging to different groups might increase.

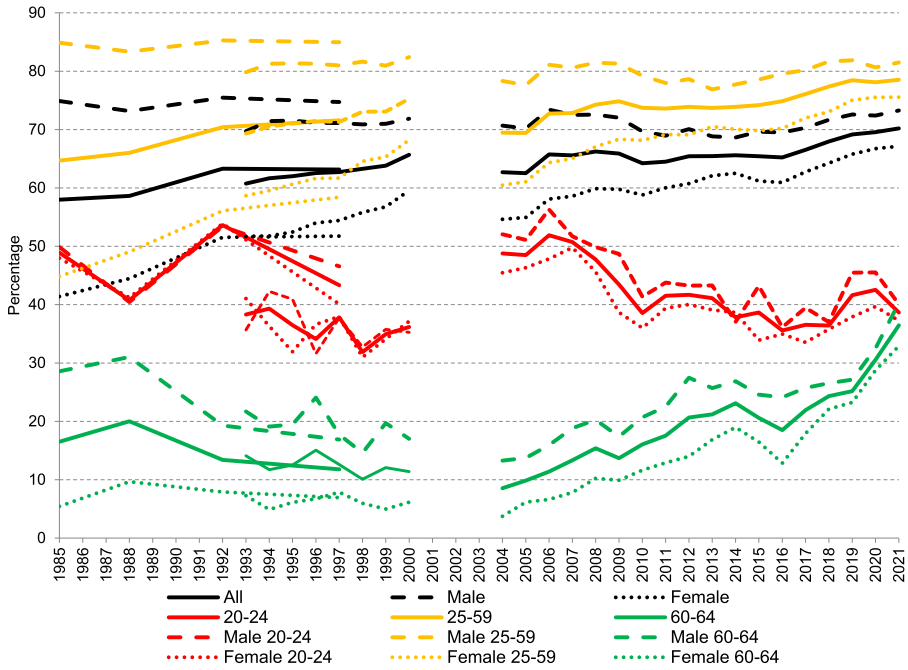

FIGURE 4 Employment rate by gender and age class (population aged 20–64). *Note*: Individuals are considered to be employed if they declare that they are self-employed or employees at the time of the survey. *Source*: Authors' own calculations based on the SEP (1985–97), ECHP (1994–2001) and EU-SILC (2004–21). [Colour figure can be viewed at wileyonlinelibrary.com]

The most salient feature of this evolution is the increase in employment of people aged 60–64 during the first two decades of this century, for both men (from 13 per cent in 2004 to 40 per cent in 2021) and women (from less than 4 per cent in 2004 to almost 33 per cent in 2021). The gradual increase of the legal pension age of women from 60 years in 1996 to 65 years (the same as for men) in 2009 is a factor that has contributed to this evolution. In addition, the system of a conventional early leavers' scheme, which allowed certain categories of older people who were fired to enjoy a higher unemployment benefit, without the obligation to actively look for a new job, was gradually restricted. For example, the condition to actively look for a new job was reintroduced in that system. The increase in employment among men aged 25–59 is moderate and started only in 2013, when it reached an absolute minimum of less than 77 per cent. The employment rate of women aged 25–59 rose from 2004 to 2021 by about 15 percentage points.

The increase in the employment rate among people aged 25–64 is mirrored by a substantial decrease in employment among people aged 20–24, for both men and women, reflecting a lengthening of education spells.[8] However, the share of this group in the population is decreasing (see Figure B.5 of online Appendix B). This is also the case for people aged 25–59 from 2006 onwards. The combination of all these evolutions results in an overall increase in the employment rate by more than 10 percentage points over the last 35 years (from 58 per cent in 1985 to over 70 per cent in 2021). It is worth noting that the COVID-19 crisis is barely noticeable in these employment figures. It should be mentioned that a large number of the affected workers in Belgium might have benefited from a temporary unemployment system. People who fall under this scheme retain their contract with their current employer and have the right to be re-engaged after the unemployment spell. Therefore, they might

[8] These longer education spells are a combination of the required length to obtain a specific degree as well as more people obtaining a higher degree. Potentially, the postponement of starting to look for a job for the first time might also play a role.

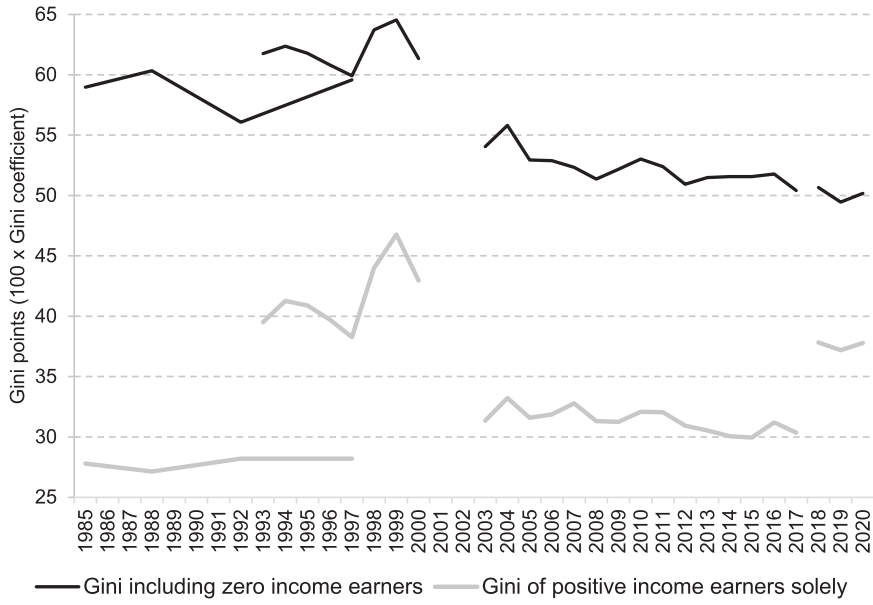

FIGURE 5 Gini index of earnings: positive income earners versus all people aged 20–64. *Note*: Earnings are defined in the note to Figure 1. Negative earnings are excluded. The black line repeats Figure 1 and refers to the Gini including zero earnings, while the grey line only includes people who report positive earnings. Incomes apply to a year earlier than the survey year for the ECHP and EU-SILC. The horizontal axis refers to those income years. *Source*: Authors' own calculations based on the SEP (1985–97), ECHP (1994–2001) and EU-SILC (2004–21).

have responded as being employed or at work during that period, while they were not always actually working. Overall, we can conclude that the increase in the employment figures might have contributed to explaining the downward trend in earnings inequality among people aged 20–64 during the first two decades of this century.

We now turn to the evolution of inequalities among those with positive earnings. Roughly speaking, earnings are a combination of the amount of time spent working and the remuneration per unit of time.[9] We do not investigate this decomposition further in this paper, and concentrate on the difference in the evolution of inequality of earnings when considering the whole population of people aged 20–64 versus those with positive earnings only. Figure 5 repeats the evolution of the Gini coefficient reported in Figure 1 (black line), and adds the Gini coefficient of earnings when taking into account only those with positive earnings (grey line).

It is no surprise that inequality drops when excluding people with zero earnings (the grey line is below the black line). Indeed, this is an analytical property that the Gini shares with many other inequality measures. How large the drop will be depends on the number of zeroes that are dropped. For a given population, a change in the employment rate is reflected in a change in the relative size of the subpopulation with zero earnings. Therefore, changes in the employment rate may partly explain differences in tendencies between the grey and black lines. For example, we observe that the declining tendency of overall earnings inequality between 2003 and 2017 is much less obvious when considering only positive earnings. Indeed, this is the period when the overall rise in employment (Figure 4) may have had an impact on the overall earnings inequality. The fact that rising employment did not coincide

[9] This is only an approximate decomposition, as some parts of employees' remuneration may not (solely) depend on the time invested in work. Furthermore, in Belgium, white-collar workers and civil servants under a regular contract are paid a fixed amount per month, while blue-collar workers are remunerated per hour. Also, the earnings of the self-employed not only depend on the time spent on the job, but also on the capital equipment of the business they run.

with an increase in earnings inequality of the working population suggests that the earnings of the newly active workers fit well into the previous distribution of earnings.

With the exception of the SEP observations (1985–97), the evolution of the overall inequality of earnings (black line) is, by and large, reflected in the evolution of inequality among those with positive earnings (grey line). It is only between 2005 and 2007 that the decrease in inequality of earnings when including zeroes disappears, and even becomes an increase when we exclude the zeroes. The more or less constant level of inequality between 2012 and 2015 becomes a noticeable decline when we exclude the zeroes. There are, however, no obvious explanations for these short-term deviations.

A salient feature of Figure 5 is the upward jump in inequality of positive earnings from 2017 to 2018 (grey line). This is the year of the transition by EU-SILC from collecting information on incomes through the questionnaire, to using tax register data, at least for employees, who form the bulk of earners. A closer look at the data reveals that tax register data contain a number of very low earnings (such as incomes from student jobs and incomes for people who started to become active in the labour market during the previous year, or who have only worked during a small part of the year), which are apparently largely unreported in surveys. Adding these low incomes to the income distribution has, indeed, an upward impact on the Gini coefficient and several other inequality measures. A similar upward jump between 2017 and 2018 is not observed for the black line, which is the one that includes zeroes.

A common critique on the use of surveys for assessing income inequality is their underestimation of top incomes, due to item and unit non-response and/or under-reporting of high incomes; see, amongst others, Carranza, Morgan and Nolan (2023) for a recent contribution to the subject, and the literature cited therein.[10] For Belgium, research on the impact of a top income correction on the evolution of income distribution is in its infancy. Decoster et al. (2017) detail some issues to consider, propose some solutions and give a first preliminary analysis. Some first indications let us expect that such a correction would perhaps change the level of inequality but would not drastically revert the evolution of the earnings inequality as compared with the image that we have outlined above. This is partly confirmed by a more detailed analysis of the transition to collecting the income data of employees through tax register data. We indeed observe a fatter right tail of the earnings distribution in the years 2018–20, where tax register data are used, compared with previous versions of the survey. However, this contributed far less to the upward jump in inequality of the positive earnings distribution (grey line in Figure 5) than the inclusion of the small positive earnings obtained from tax register data. This might indicate either that Belgium escaped the tendency for excessive remunerations of top managers, or that this has had little impact on inequality as measured by the Gini. A final explanation is that these excessive remunerations are not recorded as earnings.

3.4 | Summary of earnings inequality

We conclude from our analysis that overall earnings inequality showed a declining tendency during the last two decades in Belgium when including people with zero earnings in the calculation of the statistics. This tendency hides a lot of underlying opposing forces. While the gender earnings gap has decreased over time, that of education has increased. But at the same time many more people are now at the upper end of the education distribution than in the past. We suggest that the rise in employment rates between 1985 and 2020 might have played a role in the explanation of the decreasing inequality trend, though we cannot give conclusive evidence for this hypothesis. We have found no evidence that the evolution of top incomes would have affected earnings inequality over this period.

[10] Recent research on the EU-SILC in Belgium at the occasion of the transition to collecting part of the income data through tax register data revealed that, in terms of income groups, the EU-SILC sample under-represents the bottom quintile of the fiscal income data (Delclite, 2020).

4 | INEQUALITY OF PRE-TAX FACTOR INCOME AMONG THE ADULT POPULATION

The sum of earnings and capital income is called 'pre-tax factor income'. We now turn to the capital income component of this pre-tax factor income. It is often put forward in the literature that capital incomes have had a major impact on rising income inequalities. We investigate the evidence for Belgium. We distinguish two forms of capital income: returns from financial assets and income from real estate, most often of owner-occupied housing. In this section, we first add the survey evidence on these two forms of capital income to the distributional picture sketched above based on earnings alone. However, in income surveys, the share of financial capital income in this pre-tax factor income is very small. Moreover, income from financial assets poorly covers the corresponding item in the NA. Therefore, we complete the picture by reporting results of rescaling the survey evidence so that aggregates of the components of pre-tax factor income equal NA figures.

4.1 | Adding capital income based on survey data

For the same population as in the previous sections (people aged 20–64), the green short-dashed line in Figure 6 displays the Gini index of income from financial assets and the blue long-dashed line income from property, as included in or constructed from the survey information.[11] Financial capital income comprises mainly income from financial assets (interests and dividends), but also – for a minor part – income from private pensions. The blue long-dashed line includes mainly imputed rents for owner-occupied houses, but also covers rents actually received.[12] Contrary to earnings, which are linked to individuals, capital income is mainly registered at the level of the household. Because we are describing inequality at the level of a population of individuals, we have distributed household capital income among all household members (of the subpopulation aged 20–64) on a per capita basis.

With Gini points between 80 and 96, financial capital income turns out to be very unequally distributed. There is a clear turning point in 2009, after which inequality in income from financial assets started rising. Not surprisingly, income from real estate, which mainly consists of imputed rents for owner-occupied housing, is much less unequally distributed. During the EU-SILC and ECHP observation period, property income is less unequally distributed than earnings and pre-tax factor income. Inequality of pre-tax factor income (the grey dotted line in Figure 6), which is the sum of earnings and the two forms of capital income, is somewhat lower than inequality of earnings, considered in isolation. Note that the inequality of the three income sources combined is determined not only by the inequalities in the three income components, but also by the share of the components in total pre-tax factor income and by the differences in rank order of individuals in the different distributions. Therefore, because Figure 6 does not give any information on how sizeable capital income is in the total of pre-tax factor income, or on how the two forms of capital income are spread across the earnings distribution, no a priori conclusions can be drawn from the information in Figure 6 alone about how inequality of pre-tax factor income relates to the degree of inequality of the income components.

Based on survey information only, the pattern of the evolution of inequality of pre-tax factor income is mainly determined by that of earnings inequality, including the downward trends in the first two decades of this century, already highlighted in Figure 1. Part of the explanation is that, in the surveys, capital income from financial assets covers only a small fraction of total pre-tax factor income (earnings plus capital income): less than 5 per cent for the ECHP years and almost always less than 2.5 per cent for the EU-SILC and SEP years.[13]

[11] We only have information on capital income as of 1988.

[12] For the ECHP, we have no imputed rents for 1993 and 1994.

[13] Two exceptions are 4.1 per cent for the SEP of 1992 and 4.4 per cent for EU-SILC income year 2005 (survey 2006).

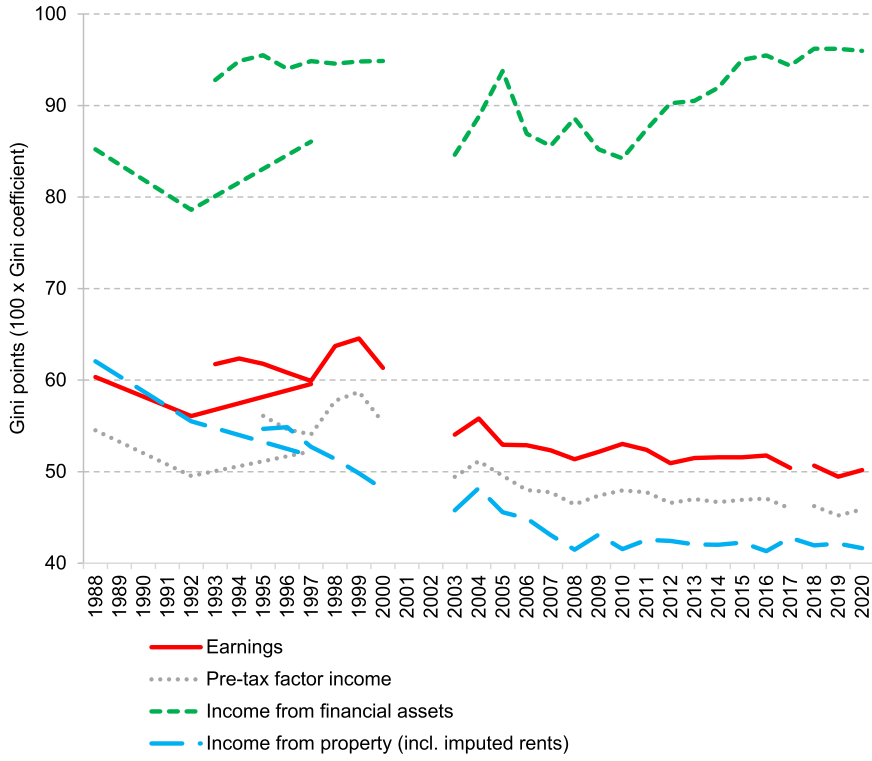

FIGURE 6 Gini index of pre-tax factor income (earnings plus capital income) for the population aged 20–64. *Note*: The earnings inequality (red solid line) refers to the sum of employee incomes and self-employment incomes, and corresponds to the inequality displayed in Figure 1. The green short-dashed line shows the Gini of the sum of per capita income from financial capital (dividends and interests) and of personal income from private pensions. The blue long-dashed line shows the Gini for per capita income from imputed rents and rents actually received. The grey dotted line shows the Gini of pre-tax factor income. Observations with negative income sources are not included in the calculations. Earnings are individually assigned. Except for private pensions, capital income is divided equally across household members. *Source*: Authors' own calculations based on the SEP (1988–97), ECHP (1994–2001) and EU-SILC (2004–21). [Colour figure can be viewed at wileyonlinelibrary.com]

This small fraction contrasts with what one finds in economy-wide data sources such as NA. When aggregating up the survey figures to nationwide aggregates, it indeed turns out that financial capital income (interests and dividends) in the ECHP surveys covers only between 20 per cent and 30 per cent of corresponding NA aggregates. For most of the EU-SILC years, this is even less than 20 per cent.[14] In addition, part of (financial) capital income consists of undistributed profits of corporations for which there is no counterpart in the surveys. However, aggregate imputed rents in the survey overestimate the NA figures.[15]

There is also a substantial change between 1995 and 2021, both in the composition of capital income and in the composition of NNI, and the survey information does not appropriately keep track of this evolution.[16] To shed some light on this evolution, Figure B.6 in online Appendix B reports the

[14] We refer the reader to table D.17 of Capéau et al. (2023b) for more information on the coverage rate of several income components with respect to NA figures.

[15] Note that the NA figures we refer to are net of depreciation (which stands for consumption of fixed capital), while the survey figures do not take this depreciation into account, certainly not at the same rate as in the NA. Consumption of fixed capital in the NA substantially rose during the last decades.

[16] NNI is GDP after subtraction of consumption of fixed capital (transition from gross to net, not to be confused with the gross and net terminology that refers to including or excluding taxes) plus the balance of factor incomes from abroad and factor incomes paid to non-residents (transition from a domestic production to a national income perspective).

cumulative growth of the different components of NNI from 1995 to 2021. The cumulative growth of total capital income during the last 25 years was lower than that of NNI. The growth of total capital income results from opposing trends when decomposed in its different elements. Interest income imploded, and its share in national income almost vanished. Also the share of net imputed and real rents (property income) in national income decreased, as their growth rate is below the one of national income. This is mainly due to an increase of the depreciation of fixed capital. On the contrary, the growth of income from dividends was much larger than the average growth of NNI. It even overtook the growth of the compensation of employees, despite downward swings during the implosion of the dot.com bubble (2001–02), the Great Recession (2008–09) and the shock of the COVID-19 pandemic. Even more striking is the growing importance of undistributed profits: these more than doubled from 1995 to 2021, compared to a 48 per cent increase in NNI over the entire period. This might reflect a growing tendency in Belgian society to incorporate economic activities and to keep and enjoy the profits and benefits they generate within the corporate entity.

Given that income from dividends is hardly covered by the income surveys we use, and that undistributed profits are, by definition, not covered by household surveys, the sole use of this kind of survey information is in fact a non-starter to assess the impact of capital income on inequality. In order to cure the defects of survey information, we followed the proposal of the World Inequality Lab[17] to construct DINA, to which we now turn.

4.2 | Pre-tax factor income inequality using DINA

The main principle of DINA is to construct a distribution of the components of NNI over the population. The distributional information for such an undertaking stems from surveys and/or administrative datasets (Piketty et al., 2018; Blanchet et al., 2021). We used the distributional information from the ECHP (1996–2001) and EU-SILC (2004–21) surveys for our implementation. More precisely, for each of the four components of NNI – compensation of employees, mixed income (self-employed), financial capital income and property income – we identified the closest equivalents in the survey. We then grossed-up these survey data (or scaled them down) for each observation in the survey such that the population totals of these rescaled incomes equal the corresponding NA aggregates.[18] Details can be found in Capéau et al. (2023b).

As capital income not only accrues to households with individuals aged 20–64, we extend our population of investigation to all people aged 20 or older (called adults in the following). To keep our analysis at the individual level, we continue to keep earnings assigned to the individual who earned the income, and split capital incomes equally among all adult household members (i.e. people aged 20 or older).

We thus obtain income distributions for the period 1995–2020 for the following four components of NNI:

1. compensation of employees (labour);
2. self-employment income (mixed income in the NA);
3. income from financial capital (including dividends, interests, undistributed profits from the corporate sector, and some other minor categories); and
4. property income.

Our fifth series is the sum of these four income components and equals NNI. We call it pre-tax factor income, in line with the international literature on DINA. The four income components are inclusive of

[17] See https://inequalitylab.world/en/.

[18] Note that this procedure, which is the standard procedure and is described in Blanchet et al. (2021), does not correct for biases following from under-reporting at the extensive margin.

taxes and, where applicable, of social security contributions (of both employers and employees for the compensation of employees). Capital income components are net in the sense that, where applicable, consumption of fixed capital (depreciation) has been subtracted.

To use distributional information from the surveys to spread out the NA aggregates across households and individuals, we identify the corresponding income variables in the surveys as follows:

1. gross salaries of employees (before taxes are subtracted, and including the monetary value for company cars and social security contributions of employees and employers);
2. income from the business activities of self-employed people (revenues minus costs and a deduction for consumption of fixed capital);
3. gross income from financial assets (dividends, interests received and private pensions); and
4. imputed and real rents minus a deduction for the consumption of fixed capital.

The distributional information in the survey is largely left unchanged.[19] But the rescaling rates are different for each component of pre-tax factor income. For example, imputed and real rents are actually scaled down, while the grossing-up of income from financial assets is much more substantial than that of the incomes of the self-employed. As a result, the distribution of the sum of the four factor components of the survey variables differs substantially from the distribution of pre-tax factor income in DINA.[20]

The results of this DINA operation are reported in Figures 7 and 8. Figure 7 shows the Gini coefficients of the pre-tax factor income distribution as calculated on the basis of the survey information only (the grey line) and the ones obtained after the DINA operation (the black line). As already mentioned above, on top of the DINA operation of constructing a distributional picture of total NNI, we also moved to a different population in presenting the results in Figure 7: from all individuals aged 20–64 in Figure 6, to all adults (20+) in Figure 7. This is the reason why the grey line in Figure 7 differs from the grey dotted line in Figure 6. But the change in inequality through time is very similar: a clear decline in inequality of pre-tax factor income from 1995 up to 2008 (at which point the Gini is 53.7), then a small increase until 2011 and again a limited decline until the end of the period.

The comparison of this pattern with the one unveiled by the DINA methodology is revealing though. First, the level of inequality of the rescaled figures is much higher than that of the survey. Second, and probably more important, the DINA series exhibits a clear rise in inequality, starting in 2009 up to 2016 (from 59.6 in 2009 to 63.3 in 2016, or almost 4 Gini points). This is largely due to a strong rise in undistributed profits in 2014 and 2015 (see Figure B.6 in online Appendix B). In the series based on the survey only, the 'turning point' is more evident as a halt or interruption in the declining pattern of inequality up to 2008. After that, the pattern is more one of no further decline of the Gini index, or at most a very slight increase (from 53.7 in 2008 to 54.8 in 2016, or only 1.0 Gini point). Taking into account the large components of the pie, which are poorly visible, or even not visible, in the household income surveys, definitely produces a U-shaped pattern of inequality in pre-tax factor income.

We now investigate the contribution of each of the four income sources to overall pre-tax factor income inequality, and how it differs when we use survey data only, or rescale them to NA levels.

[19] There are some exceptions for income from financial assets, and these are documented in Capéau et al. (2023b).

[20] The share of observed financial capital income in the surveys is relatively low and there are a large proportion of households reporting zero financial capital income (e.g. 55 per cent in the SILC survey of 2020, income year 2019). In combination with the rising trend of the share of financial capital income and undistributed profits in NNI, the standard DINA method of rescaling risks biasing the level and trend of overall inequality. However, our findings still indicate an increase in pre-tax factor income inequality when constructing DINA using the distribution of financial capital incomes derived from household asset information in the Household Finance and Consumption Survey (HFCS). This survey is under the supervision of the European Central Bank and is especially designed to obtain better information on households' possession of assets in the Euro countries. These results are not included in the present paper. Inequality levels of pre-tax factor income in this sensitivity analysis are even higher than those reported here.

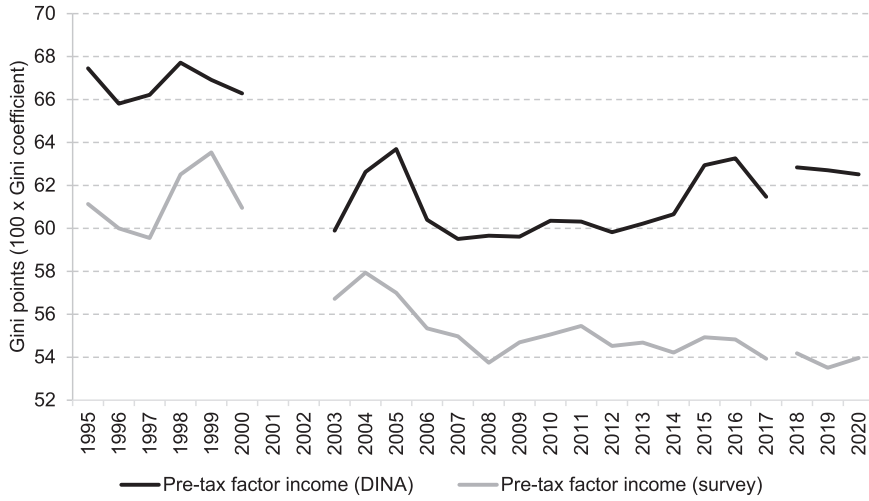

FIGURE 7 Gini index of pre-tax factor income: DINA versus survey (population aged 20+). *Note*: The figure shows the overall Gini index of pre-tax factor income according to DINA (black line) and its survey counterpart (grey line). Earnings are assigned individually, and capital income is equally split across household members aged 20 or older.

We use the Lerman and Yitzhaki (1985) decomposition, which expresses the contribution of each income source as a percentage of the pre-tax factor income Gini.[21] According to this decomposition, the contribution of an income source depends on two factors: the share of that source of income in the total pre-tax factor income, and the degree to which relatively low (high) incomes from that particular source are accruing to people who are ranked relatively low (high) in the overall income distribution.

As mentioned before, the distribution of the income components in the survey is largely unaffected by the rescaling operation. The difference between the contribution of the four income sources to overall inequality according to the survey and according to the rescaled data then depends, to a large extent, on two factors: (i) the share of the component in total income, which is obviously affected by the differential rescaling of the income components; (ii) the correlation between the income component and the rank in the distribution of total income. As the rescaling operation might affect the rank of individuals in the total income distribution, this correlation might differ before and after the rescaling.

Figure 8 shows the relative contribution of the two components of factor income that contribute most to overall pre-tax factor income inequality: compensation of employees in black and income from financial capital in grey. The dashed lines apply to the survey variables, while the solid lines apply to the rescaled variables. In order to interpret correctly the contribution of the factor components to overall inequality, it is worthwhile to signal that the benchmark of no contribution to inequality is attained when that component is perfectly equally distributed (Shorrocks, 1982). If individuals ranked higher in the total income distribution also obtain higher incomes from a factor, that factor will positively contribute to inequality.

First, not surprisingly, the contribution of financial capital income increases substantially: from less than 6 per cent in the survey data to between 20 per cent and 30 per cent after the rescaling operation. The inclusion of undistributed profits, and, to a lesser extent, the rise in dividends are the driving forces of this evolution. Second, we observe a substantial rise of 7 percentage points in the contribution of financial capital income during the period 2011–16: from 19 per cent in 2011 to almost 26 per cent in 2016. This corresponds roughly to the period where we discovered a substantial increase in overall inequality after rescaling the survey information.

[21] The principles of this decomposition are explained in online Appendix A.

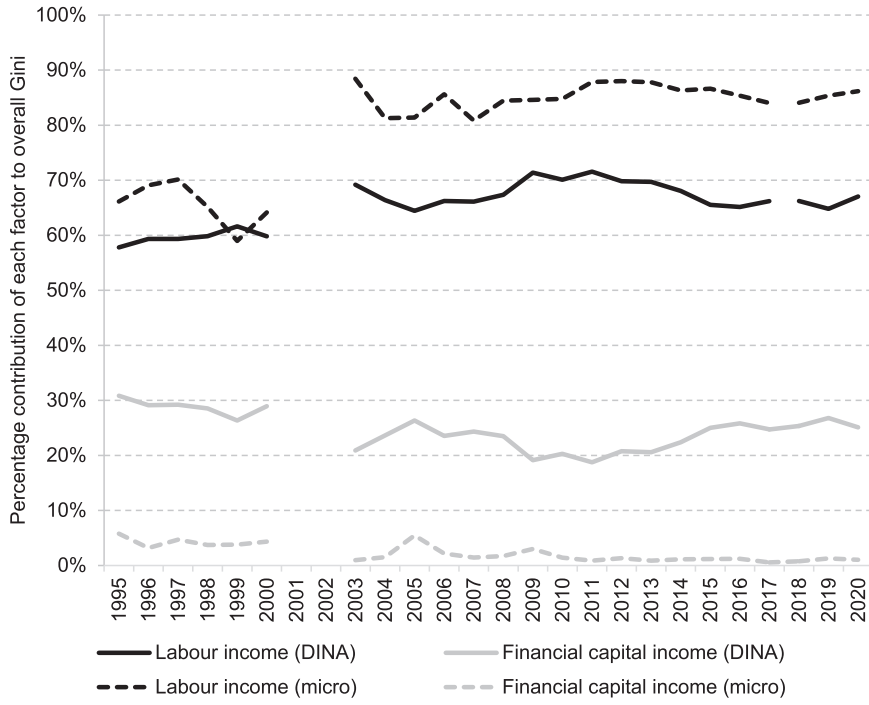

FIGURE 8 Pre-tax factor income decomposition: percentage contribution to overall Gini (population aged 20+).
Note: The lines give the relative contribution of the labour (black lines) and financial capital (grey lines) income distribution to the overall pre-tax factor income Gini coefficient according to the Lerman and Yitzhaki (1985) decomposition explained in online Appendix A. The figures represent the percentage contribution of an income source to the overall Gini. The dashed lines apply to the survey variables, while the solid lines apply to the rescaled variables.

The increase in the importance of financial capital income for overall pre-tax factor income inequality is, in the first place, at the expense of the contribution of labour income (the solid black line is far below the dashed black line). Still, in levels, labour income continues to contribute most to pre-tax factor inequality, simply because of its larger share in total pre-tax factor income. Note, however, that in the period 2011–16, rising inequality in income from financial capital has been an important explanatory factor for the overall increase in pre-tax factor income inequality.

When relying only on survey data, self-employment income is the second most important source of pre-tax factor income inequality. The DINA operation even increases its contribution for the EU-SILC years, but, still, it is surpassed by the larger contribution of financial capital income. The contribution of self-employment to pre-tax factor income inequality has been rather stable during the last two decades and equals somewhat less than 10 per cent. Property income, which includes imputed rents for owner-occupiers, plays a negligible role in the Gini of pre-tax factor income inequality.[22]

4.3 | Summary of pre-tax factor income inequality

We conclude that income from financial capital does play an important role in the overall inequality of pre-tax factor income. Unfortunately, the information on financial capital income in surveys is rather rough, and only covers a small part of the corresponding aggregate in the NA. After trying to correct for

[22] According to the survey information, property incomes did contribute 6–8.5 per cent to the pre-tax factor income Gini during the period 1995–2000, but this contribution drops to less than 1 per cent after the rescaling to national aggregates. The fact that, in Belgium, ownership of the one's own dwelling is widespread may be an explanation for this observation.

this defect, we observe that pre-tax factor income inequality rose substantially between 2009 and 2016, a finding that was not obvious when relying solely on the information in the surveys. A more in-depth analysis of the contribution of the different income sources to pre-tax factor income inequality reveals that it is the increasing inequality of financial capital incomes, where higher financial capital incomes tend to go more and more to those with higher overall pre-tax factor income, which is the driving force behind this increase in pre-tax factor income inequality between 2011 and 2016. However, even after the DINA rescaling, the contribution of the compensation of employees to overall inequality remains between 60 per cent and 70 per cent.[23]

5 | REDISTRIBUTIVE EFFORTS OF THE WELFARE STATE

Up to now, we have investigated the evolution of pre-tax factor inequality and its components. The next major step to move from pre-tax factor incomes to disposable income is to consider the effect of the tax–benefit system. Belgium has an extensive welfare state and many services are either publicly financed or substantially subsidised (e.g. education). In this section, we do not account for the distributive effect of the use of tax revenues to provide public goods.[24] We only pay attention to the redistributive effects of the tax and benefits side of the welfare system, including the social security system. We stick to the DINA dataset (1995–2020), which we discussed in the previous section, and thus our discussion applies to the population of individuals aged 20 or older. We calculate two additional income concepts. The first is obtained by subtracting from the pre-tax factor income, analysed in the previous section, social security contributions, and adding earnings-related social security benefits (public pensions, unemployment benefits, and sickness and invalidity benefits). Other benefits such as child allowances and social assistance are not included. The income thus obtained is called the pre-tax post-replacement income in the DINA terminology. The second income concept is disposable income, which is obtained from pre-tax post-replacement income by deducting all taxes (income taxes and indirect taxes) and adding remaining benefits (social assistance, child allowances, etc.). Contrary to pre-tax factor income and pre-tax post replacement income, disposable income does not aggregate up to NNI.

To convert disposable income, which is measured at the household level, into an individual income measure, we have divided it equally among the household members aged 20 or older. In order to ensure that comparisons with the distribution of the other two income concepts, pre-tax factor income and pre-tax post-replacement income, are not affected by an asymmetric treatment of the assignment of incomes within the household, we followed a similar procedure for pre-tax factor income and pre-tax post replacement income. Individual incomes of household members aged 20 or older (earnings and social security benefits where applicable) were added to household incomes (capital incomes) and the total was then divided equally among all the household members aged 20 or older.

Figure 9 shows the Gini index for the three income concepts.[25] Unsurprisingly, the pre-tax post-replacement income and disposable income are more equally distributed than the pre-tax factor income. The drop in inequality from pre-tax factor income to pre-tax post-replacement income is more substantial than the additional decline from pre-tax post-replacement income to disposable income. For the sake of comparison, we also report the Gini coefficient of disposable income when using survey data only (dotted green line in Figure 9). Contrary to the disposable income concept derived from the

[23] Such cardinal interpretations of inequality decompositions should be interpreted with caution. When we would have used the Shorrocks (1982) decomposition, based on the contribution of the covariance between income from a particular source and total income, in the variance of total income, financial capital income would have contributed most to gross income inequality for almost all years.

[24] The data we dispose of do not allow us to easily assess differential access to those public goods. Some first attempts to quantify inequality in access to public goods show that this issue should not be neglected (Verbist and Förster, 2020; Castanheira and Mariani, 2024).

[25] The Gini for pre-tax factor income differs from the one presented in Figure 7 because of the equal split procedure.

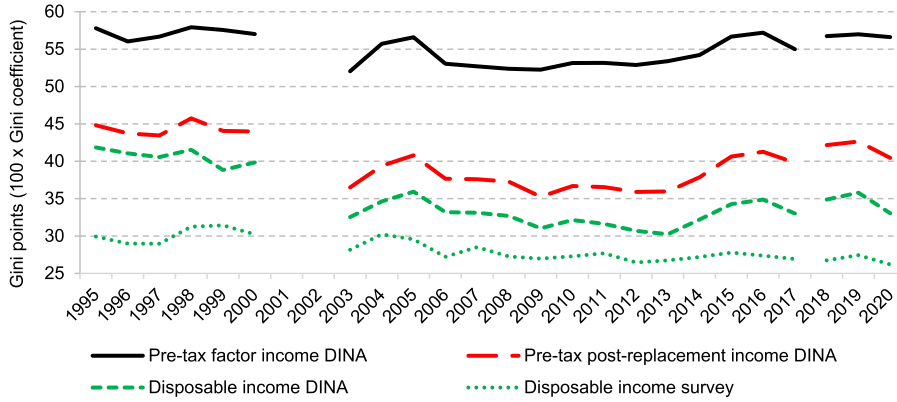

FIGURE 9 Gini index pre-tax factor income, pre-tax post-replacement income and disposable income (population aged 20+). *Note*: Pre-tax post-replacement income is obtained by subtracting social security contributions from pre-tax factor income and adding earnings-related social security benefits. Disposable income is obtained by subtracting taxes from pre-tax post-replacement income and adding non-earnings-related benefits, such as child allowances and social assistance. Incomes are equally split among household members aged 20 or older. The dotted green line refers to the Gini of the disposable income as registered in the survey. [Colour figure can be viewed at wileyonlinelibrary.com]

DINA, the survey equivalent does not contain imputed rents for owner-occupiers, nor undistributed profits from the corporate sector, but it includes indirect taxes.

At first sight, the evolution in inequality of both pre-tax post-replacement income and disposable income, follows that of pre-tax factor income in the sense that, starting in 2004, some U-shaped pattern of first declining inequality and then increasing inequality appears. Yet, the turning point at which inequality starts to increase falls later for both income concepts, pre-tax post-replacement income and disposable income. Certainly for disposable income the difference is substantial: inequality only starts rising in 2014, compared with 2009–10 for pre-tax factor income. Notice that the survey disposable income Gini exhibits only a mild increase in inequality between 2012 and 2015. Again, the poor coverage of financial capital income in the surveys, and the inclusion of undistributed profits in the DINA concept are the main reasons.

In order to inspect that observation more closely, Figure 10 displays the difference in the Gini coefficients of pre-tax factor income and pre-tax post-replacement income (red dashed line) and the difference between pre-tax post-replacement income and disposable income (green dotted line). The black solid line is the sum of both and is therefore equal to the difference in the Gini coefficients of pre-tax factor income and disposable income. The difference in Gini coefficients between two income distributions (e.g. pre- and post-tax) is also known as the Reynolds–Smolensky index.

Our first observation is that the additional redistributive effect of taxes and not social insurance related benefits shows an increasing trend (green dotted line in Figure 10).[26] Here, the increase in the employment rate may also be an explanatory factor. While it has potentially a decreasing effect on earnings inequality, when including the zero earners, it might increase the redistributive effect of taxes as the incomes and, therefore, the average tax rate of employed people are on average higher than those of, for example, the unemployed.

The evolution of the redistributive effect of the social insurance related contributions and benefits is much more irregular (red dashed line in Figure 10). We notice an upward jump in 2009 (the

[26] For the period 2014–20, this seems to be in contradiction with Decoster et al. (2018) who find a decline in the redistributive effect in 2020 when compared with 2014, which they accredit to an income tax reform that did not affect much the progressivity of the system but caused a drop in the average tax rate of more than 2 percentage points. However, their exercise is of a different nature than the present one. They study the impact of different social policies and tax systems by applying them to the same underlying primary income distribution. In our paper though, the redistributive effect is the result of a mix of changes in policies, changes in the primary (in our case, pre-tax factor) income distribution, and demographic evolutions.

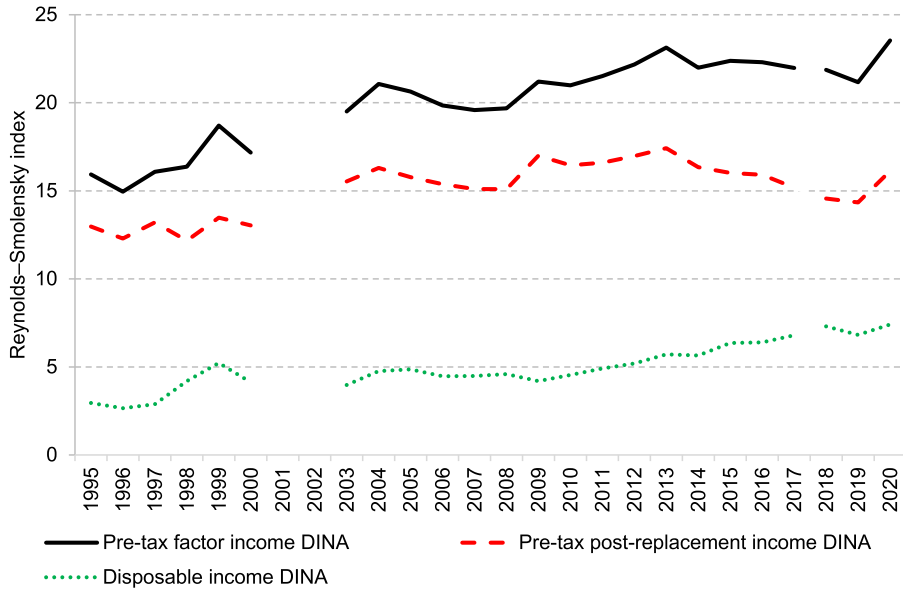

FIGURE 10 Redistributive effect of social security and taxes (population aged 20 or older). *Note*: The Reynolds–Smolensky index is the difference in Gini points between two distributions. [Colour figure can be viewed at wileyonlinelibrary.com]

year following the financial crisis) and in 2020 (the first year of the COVID-19 pandemic). The latter is almost surely a consequence of the massive use of the temporary unemployment scheme for workers during the pandemic-related lockdowns.[27] For the former, the explanation is less obvious. In 2005, a structural mechanism was installed that fixes a two-yearly budget that serves to increase replacement incomes on top of inflation adjustments, which are legally guaranteed in Belgium. Which benefits are affected is subject to a discretionary decision by the social partners (unions and employer representatives). The mechanism became effective as of 2007. Given the evolution of the redistributive effect of the social insurance related benefits (and contributions) after 2010, which first increased until 2013 (from 16.5 in 2010 to 17.4 in 2013), and then declined to 14.3 in 2019, there is, at first sight, little evidence that this mechanism had a persistent influence on inequality. However, a detailed analysis of exactly which benefits have been adjusted is needed in order to make more conclusive statements. Another factor that may have had an impact is the more rapid decrease of unemployment benefits, effective as of November 2012. Unemployment benefits start to decline after the third month (whereas previously it was six months) and decline more rapidly than before.

We conclude that the redistributive effect of taxes and benefits changed considerably during the last three decades. Nevertheless, also the evolution of inequality of incomes after the intervention of the social insurance mechanism, as well as that of disposable income, roughly follows the same U-shaped pattern of the inequality of pre-tax factor incomes. More specifically, in the previous section, the highlighted increase in pre-tax factor income inequality between 2009 and 2016, after adding and grossing-up capital income, is partly reflected in pre-tax post-replacement and disposable income inequality. It seems to have been somewhat mitigated by taxes and benefits during the period 2009–13,

[27] In Belgium, the system of temporary unemployment is a scheme that allows businesses who face temporary difficulties to employ all their contractually engaged workers, to put (some of) them on benefits without breaking their contracts. This system was used to guarantee incomes and job security for the employees of businesses who had to go into lockdown during the pandemic period, or who bore indirectly the consequences of the lockdowns. About 1.2 million out of 4 million employees benefited from this system in April 2020. Moreover, the replacement rate of the unemployment benefit of the people under this regime was increased from 65 per cent to 70 per cent of their previous wage (with a cap), and they received some additional premia.

but between 2013 and 2016 the Gini of both pre-tax post-replacement income and disposable income rose by roughly five Gini points. It is at this stage unclear whether the changes in the redistributive effect are due to policy changes or rather a consequence of the extent to which the redistributive effect of the existing policies in vigour is affected by the changes in the distribution and composition of the primary pre-tax factor incomes.

6 | COUPLES AND THE ROLE OF ASSORTATIVE MATCHING

In Section 3 and 4, we considered all earnings as individual income. This implies that we neglected the fact that people live in households, and the impacts thereof on their labour market choices and how they share individually earned income. In Section 5, we went to the other extreme and neglected within-household inequality completely, as we considered all within-household income on a per capita basis (among the population aged 20+). There is by now a large literature on the sharing of economic resources within the household (see Browning, Chiappori and Weiss, 2014, for an overview). Obviously, this resource sharing and the potential economies of scale within the household have implications for the assessment of overall inequality in society (Chiappori and Meghir, 2015).

Lise and Seitz (2011) find, for example, that the rise in consumption inequality in the UK during the period 1968–2001 was a result of a decline in within-household inequality and an increase of inequality between households. They ascribe this evolution to the increase in assortative matching of couples with respect to education. While in the early years of their observation period (1968–2001) marriages between high-educated men and low- or middle-educated women were much more common, by the end of the observation period, marriages among equally educated partners had become dominant. The impact of changes in the assortative mating behaviour of couples on income inequality has received increasing attention recently.[28]

Our data do not allow us to investigate within-household inequality. We give instead a picture of the assortative mating patterns in terms of education during the last 35 years. Together with the impact of education on earning inequality described in Section 3, this allows us to reflect on the evolution of between-household inequalities.

Figure 11 shows the evolution of the relative number of couples in which the partners have an equal education level (black solid line); it breaks this number down into couples in which both partners have low (red long-dashed line), middle (blue short-dashed line) and high (green dotted line) education levels. The overall pattern of couples with equal education is U-shaped. It declines sharply between 1985 and 1997, and is more or less constant during the second half of the 1990s. It starts increasing again at the beginning of the 21st century. This overall evolution is composed of a decline in the number of couples in which both partners are low educated, and an increase in the number of couples in which both partners are high educated. This is not unexpected, given the evolution of the education levels of the population shown in Figure B.3 of online Appendix B. The group of high-educated people is increasing sharply at the expense of those who attain only a lower education level.

Therefore, the evolution shown in Figure 11 is to a large extent driven by the change in education levels of the overall population. Consequently, those figures do not give direct evidence of changes in partner choice behaviour over time and the potential differential rewards of assortative meeting over time underlying such choices (see Chiappori, Costa Dias and Meghir, 2020b). In almost all years, partners with equal education occur more frequently than would be obtained if they were randomly matched. This might indicate that there are economic advantages from mating with a partner with equal education. The deviation from random matching declined over the period 1985–2007 and started to increase again afterwards.

In Section 3, we showed that the between education earnings inequality in Belgium is rising over time. Therefore, given the observed rise in assortative mating, we could conjecture that between

[28] See, for example, Chiappori et al. (2020a) for the UK.

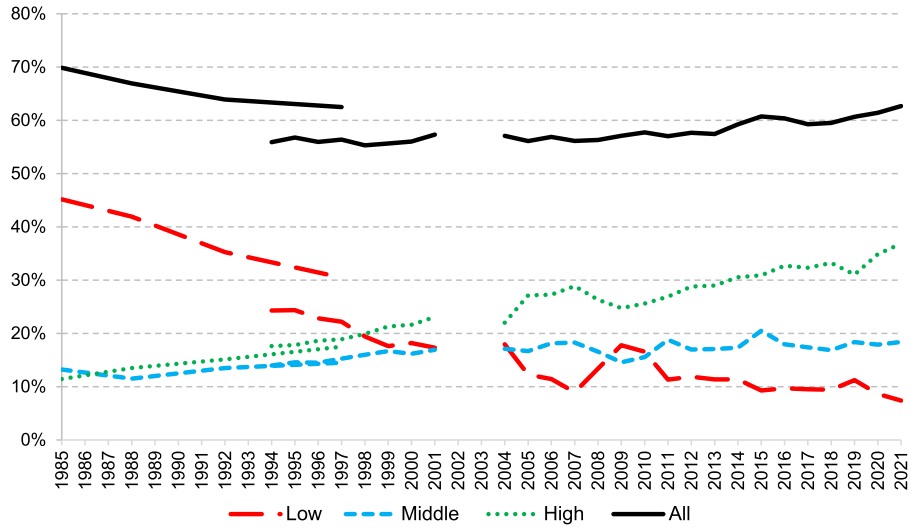

FIGURE 11 Percentage of partners with equal education level among the population aged 20+. *Note*: The split of education levels into low, middle and high is explained in the note to Figure 3. The black solid line gives the percentage of couples with an equal education level. It is the sum of the three other lines, which represent, respectively, the percentage of couples where both partners have low (red long-dashed line), middle (blue short-dashed line) and high (green dotted line) education levels. *Source*: Authors' own calculations based on the SEP (1988–97), ECHP (1994–2001) and EU-SILC (2004–21). [Colour figure can be viewed at wileyonlinelibrary.com]

household inequality would also rise during the last two decades. But in Section 3 we already warned that this rise in between-group inequality not only results from divergences in means, but is also driven by the change in the number of people belonging to those different education groups. As more and more people become highly educated, there might be a turning point where the divergence of the mean incomes of different groups will no longer exert an upward pressure on the between education component of earnings inequality.

In summary, we found that that the actual evolution of assortative mating patterns is largely driven by the convergent evolution in the high education levels of men and women. Because the earnings distributions of different education groups are growing apart, we can derive that between household inequality is also on the rise. But given that the widening of the education gap in earnings is not only a consequence of divergent mean earnings between groups, but also depends on the change in the number of people belonging to the different education groups, it is possible that a further increase in the education level of the population lowers between household inequality in the future, even if mean earnings of different education groups continue to diverge.

7 | CONCLUSION

The answer given in this paper to the question of whether Belgium withstood the storm of rising inequalities deviates from the answer one mostly gets when relying exclusively on the disposable income concept revealed by household surveys. Indeed, the Gini of disposable income obtained from these household surveys shows a steady decline over the last decades. However, if we not only consider disposable income (i.e. income after taxes and transfers), but also look at pre-tax factor income, and especially if we adjust that income for income components such as capital income, which might be poorly recorded or even invisible in the survey information, then we get a different picture.

To study inequality in income before taxes and redistribution take place, we started with an analysis of earnings inequality. We found that, since 2000, earnings inequality (income of employees and self-

employed) in Belgium, as measured by the Gini, decreased. We have claimed that this decrease in earnings inequality is partly due to rising employment figures. This is based on our finding that the evolution of earnings inequality is different when one includes zero earnings in the calculation of inequality statistics, compared to the results excluding these zeroes. It is not unreasonable to ascribe part of the change in the proportion of zero earners to changing employment rates. Among positive income earners, inequality in earnings has not risen in the last two decades. Several factors exert opposing pressures on overall earnings inequality: the gender gap in earnings is decreasing, while the inequality in earnings between education levels is increasing. However, more people, especially women, obtain a higher level of education, so that in the longer run this trend may revert, even if the mean earnings per education level continue to grow apart. We have also found no evidence that excessive remunerations of top managers had an impact on earnings inequality in Belgium.

To obtain a picture of inequality of total pre-tax factor income, one has to add capital income to earnings. Inequality of financial capital income as revealed in surveys increased significantly since the financial crisis of 2008–09. Adding this capital income registered in surveys did not affect the pattern of declining inequality that we found for earnings. However, financial capital income from surveys only covers only a small part of financial capital income in the NA. And there are good reasons also to consider undistributed profits of the corporate sector as part of the income people enjoy. The latter has been on the rise in the last years and grew much faster than the compensation of employees.

Grossing up financial capital income (and other income components) in the surveys to NA levels affects our assessment of income inequality considerably. First, the level of inequality is higher than before the correction with the DINA methodology. Second, a U-shaped pattern in the evolution of inequality in pre-tax factor income emerges. After the decline in inequality up to 2009, the Gini of pre-tax factor income rose by five points between 2009 and 2016.

Inequality of disposable income follows a similar U-shaped pattern as that of pre-tax factor income, although the turning point when inequality starts to rise is found later in time. During the subperiod when pre-tax factor income became more unequal, and the decline in inequality of disposable income still continued, the redistributive impact of the tax system had to increase. We observe an increasing tendency of the redistributive effect of taxes and non-social insurance related benefits throughout the last 35 years. For the period 2014–20, we conjecture that this is not, in the first place, a consequence of changes in the income tax system (though these have been substantial), but that this is also affected by changes in the income composition. Here again, the increase in the employment rate may have mechanically contributed to an increase in the redistributive effect of taxes.

According to Lise and Seitz (2011), the increase in assortative mating raised consumption inequality in the UK. In Belgium, the evolution of the number of partners with equal education (more couples with both partners being highly educated and fewer with both partners being low-educated) seems at first to be a mechanical consequence of the changing pattern of education among the population. Given that the earnings gap between education groups is widening, we may expect that between household inequality is also on the rise. Nevertheless, the increase in the education level of the population, and especially of women, may entail that a similar concentration of high-educated couples will decrease between household inequality in the longer term.

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DATA AVAILABILITY STATEMENT

This paper uses micro-data from household surveys. Access to part of these data was granted under confidentiality contracts concluded with Eurostat and the Belgian statistical office, Statbel. According to these contracts we are not allowed to share these microdata. People who have access to those data and want to replicate our results can contact us for obtaining replication files.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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