



Universiteit Antwerpen
**CSB | Centrum voor Sociaal
Beleid Herman Deleeck**

Wiemer Salverda and Veerle Rook

The vicious entanglement of labour-market and income inequalities in Europe

WORKING PAPER

No. 23/02

February 2023



University of Antwerp
Herman Deleeck Centre for Social Policy
<https://www.uantwerpen.be/en/research-groups/csb/>



The vicious entanglement of labour-market and income inequalities in Europe

Wiemer Salverda^{1*} and Veerle Rook¹

¹ AIAS-HIS, University of Amsterdam (The Netherlands)

Working Paper No. 23/02

February 2023

Abstract

Though labour-market earnings are the most important component of household incomes, the relationship between the two distributions remains underresearched. This contribution aims to examine this association with a descriptive analysis. We focus particularly on low-wage and high-wage employment which define two different but still interlinked types of the vicious entanglement. We present the results for the average EU country, as all 27 countries appear to largely share the same fundamentals (Annex 2).

There to we examine how ‘labour households’ (who depend primarily on wage earnings), are spread over the income distribution of all households and how the individuals providing those earnings are distributed over the overall distribution of hourly wages. Their household incomes appear to crowd towards the top while a significant share of those individuals crowd towards low wages. Thus, low pay is found all over the income distribution. This contrasts with the single-earner world and depends predominantly on ‘Additional earners’ (persons earning less than the main ‘Primary earners’ in their households), who are the defining constituent of the dual-earner world. Note though that the dual-earner world has much more progressed in the labour market, as three quarters of earners share a household with one or more other earners, than in the income distribution as single-earner households still make up close to half of all labour households.

Additional earners’ personal characteristics differ significantly but they sort almost identical effects on hourly pay – suggesting that the earner’s position in the household overrides all characteristics. Their low wages spread also over the entire wage distribution of corresponding Primary earners. Consequently, the first element of mutually increasing inequalities is that middle- and high-educated Additional earners make up a large majority of low-wage employment. They mount strong job competition to the low educated based on qualifications, working time and the leeway offered by higher household incomes. A brief country comparison suggests a growing exclusion of the low-educated from employment as a result. As the second element of inequality is that high-educated homogamy drives a modest share of households towards the very top of the income distribution, especially when these earners are also jointly high paid. Another country comparison suggests that the rapid expansion of tertiary educational attainment reinforces both the second and the first type of entanglement.

Clearly, the two distributions in incomes and wages should be considered in conjunction in analysis as well as policy making. We conclude with a short discussion of the implications for wage formation as well as the role of education.

Acknowledgments: the authors are grateful for comments and suggestions made by Paul de Beer, Brian Nolan and seminar participants at the CSB, University of Antwerp, and AIAS-HSI. We also thank Eurostat for allowing the use of the SILC data (RPP 158/2018-LFS-EU-SILC-SES). This paper is version 20221228.

***Corresponding author:** Wiemer Salverda, W.Salverda@uva.nl

Contents

1. Introduction.....	3
Lay out	3
2. Our approach: method, data and presentation.....	4
Method	4
Data	5
Presentation.....	6
3. Distributions of household incomes and individual wages in a dual-earner world.....	7
The role of different earners in the household: Single, Primary and Additional earners.....	8
The distributions of hourly wages and annual incomes	10
Households and the distribution of hourly wages	12
4. Personal characteristics and labour-market behaviour of Additional earners.....	15
Demographics characteristics: Gender, age and partnership	17
Educational attainment: Low, middle and high educated	18
Interrelated low-wage and high-wage trends	21
5. The competitive effects of Additional earners in the labour market: Closing the circle.....	23
Low-wage employment.....	24
Educational qualifications.....	25
Part-time working hours.....	25
Employment competition in the low-wage segment.....	27
High-wage employment.....	28
The perspective of growing high educated homogeneity at the top.....	30
6. Conclusions and discussion	31
Wage formation and protection.....	31
Education	32
References.....	35
Annex 1 Our approximation of missing hourly wages in SILC.....	37
Annex 2 Variation across EU countries (2014)	42
Household incomes	42
Hourly wages	45
Annex 3 Differences between Single earners in single-person and more-person households.....	47

1. Introduction

There can be little doubt that labour-market earnings are the most important determinant of household incomes. Nonetheless, the nature of the linkage between the distribution of earnings on the one hand and the distribution of incomes on the other hand remains underresearched (Salverda and Checchi, 2014, 1540-60). Specifically, the question may be posed whether the two inequalities are actually so entangled that they both affect each other: from earnings inequality to income inequality and also vice-versa (Salverda, 2015; 2018). That would generate a vicious circle of mutual reinforcement between the two inequalities. Evidently, such entanglement would complicate policy attempts to reduce inequalities on both sides separately and imply the need for a synchronised approach, however difficult that may be.

The very possibility to pose this question reflects the demise of the single-breadwinner world and its replacement (in progress) by a dual-earner world.¹ In the former world, characterised by one full-time earner in each household, the distribution of incomes basically mirrored the distribution of wages: low hourly pay implied low annual earnings which implied low incomes. In the latter world, by contrast, incomes draw not only on the earnings of the individual persons in the household but their earning behaviour may also be influenced by that of the others in the household. This behaviour relates to the nature of the job and its hourly earnings and also its working hours and annual earnings. This complicates the relationship between individual wage earnings and household incomes and, as a result, also between the inequalities of the two distributions of incomes and wages respectively (Salverda and Haas, 2014; Salverda, 2015, 2018). Consequently, a household's income may now depend on wages originating from very different positions in the wage distribution and also from significantly different hours worked. In addition, a job in the labour market may now be chosen dependent on conditions that take into account the household context in addition to the labour market context, possibly even prioritising the former over the latter. Dependent on its frequency this process may come to sort the cards differently in the labour market and thereby affect other households' involvement in employment. More concretely, households with higher incomes may supply labour that competes for jobs at lower levels of skill and pay, affecting labour-market outcomes to the disadvantage of labour supply from lower-income households – e.g., depressing pay or working hours or diminishing job opportunities available to others altogether. Also, higher-income households can have an advantage in securing higher-wage/skill jobs, increasing the household concentration of such jobs. This identifies two possible mechanisms, one in the low-wage labour market and the other in the high-wage labour market. Both take their starting point at higher household incomes. That seems to be the only plausible direction in which the two might work out as the inverse mechanism, of lower-income labour supply affecting higher earnings or higher incomes, seems particularly unrealistic (as will be borne out below).

With the present contribution we aim to scrutinise these interrelationships with a descriptive analysis of 27 EU (or formerly) countries, including the UK but excluding Croatia. We think that for a start the complex of contrasting trends is best analysed descriptively. Such analysis can offer a broader, more comprehensive grasp of main similarities and divergencies, naturally without establishing causalities. Thus, it may lay the basis for subsequent analysis that can model the role of personal and household characteristics and scrutinise causalities in more detail.

Lay out

¹ The popular term 'dual-earner' includes here multiple earners in a household, i.e. more than two earners.

Section 2 describes our method, the data, and the way we will present the results. Section 3 shows, first, how individual (annual) earnings link with the distribution of household (annual) incomes and, second, compares this with the very different way that hourly earnings appear to be linked. The two are reconciled by looking at the allocation of individual earners over households in the income distribution. It considers particularly two types of households: Single-earner households and More-earner households, and at three corresponding types of individual earners: Single earners in the former household type, and Primary earners and Additional earners who share the latter type. Additional earners are found to be the prime vector for the entanglement of the two inequalities. They massively combine lower levels of individual pay with higher levels of household incomes but, unsurprisingly, high-paid Additional earners also flock together with high-paid Primary earners at the top of the income distribution. Next, section 4 scrutinises whether these concentrations can be explained by characteristics of Additional earners – gender, age, partnership, and educational attainment in particular. However, their household position as Additional earners appears to largely override any effects of these characteristics. Section 5 examines this from the perspective of the labour market, especially for the two segments of low-wage employment and high-wage employment. It considers the effects on job competition via the match of individual qualifications with job requirements and also via labour conditions, particularly working time, and it takes a brief look their quantitative significance across EU countries for low-educated labour supply on the one hand and the growth of high-educated high-wage homogeneity at the top of the distribution. Section 6 concludes and discusses some of the implications. Three annexes defend the imputation of missing hourly wages, validate the focus on the average EU27 country, and dwell on variation in the household position of Single earners.

2. Our approach: method, data and presentation

Method

We provide a descriptive analysis based on cell aggregates that we derive from an analysis of the microdata of the European Survey of Income and Living Conditions (SILC). The focus is ‘Labour households’, which we view against the background of the overall distribution of all household incomes. Incomes are always annual and they are gross, before deduction of income tax and social contributions but after payment of (gross) social transfers. This is the most encompassing concept of income. It generally concerns all households in a country in a meaningful way, and it is also the currency of the literature on top incomes and the World Inequality Database (wid.world; see, e.g., Atkinson and Piketty, 2007). Labour households are defined as households which draw the most important part of their incomes from employee earnings in the labour market.² On average in the 27 EU countries, they constitute a 54% majority of all households and receive 73% of all incomes, 77% of which are generated by their annual earnings. Labour households contain 89% of all employees. The remaining 11% of employees are members of non-labour households, where their earnings are not the most important type of income by definition. They receive only 5% of total wage earnings, or on average less than half the wage earnings captured in the labour households.

We examine, first, how Labour households are spread over the countries’ full income distributions given the wage earnings that they receive from their employee-members. This leads us to the spread of earners over the distribution of household incomes. We focus on the contributions of earnings, leaving aside

² In 95% of these households earnings cover more than half their incomes. Out of the EU27 total of 215 million households, 134 million receive some earnings from the EU’s total of 210 million employees; among them Labour households as defined here number 113 million and contain 186 million employees. We disregard the self-employed as their earnings and working hours data are insufficiently reliable.

other types of incomes. We disregard the spending of incomes and their distribution over individual members within the household. Second, we consider how the individual employee-members are ranked in terms of the distribution of hourly wages in the labour market. Hourly wages are a core variable in the labour market – increasingly joined by the hours of work in recent decades. Hourly wages are determined as much by the demand side: the occupations offered by employers with preferred levels of skill and pay, as by the supply side: employees seeking employment dependent on their experience, skills and educational attainment. This interactive framework allows for the possibility of skill mismatch, i.e., over- and undereducation of individuals relative to the demands of the job, in contrast with the canonical human capital approach, which ignores the demand side (Hartog, 2000). Interestingly, the extent of mismatch seems to differ by (gendered) positions in the household (Frank, 1978) and may relate to jobs with greater time-flexibility jobs (Addison et al., 2020; Goldin, 2021), which tend to be lower paid. For a start, we consider hourly pay a good indicator for the skill level and the concomitant educational demands of the jobs on offer, albeit with some variation across individuals on the job (Hartog, 1985). Given hourly pay, annual earnings depend on the hours worked over the week and ultimately the year.

Note that we look at systematic differences in actual wage outcomes and their labour-market effects while ignoring the preferences people may have regarding their labour-market behaviour. Thus, we cannot say whether they act voluntarily or out of necessity – an important caveat on causality. The aim is to scrutinize the effects that are actually realised in both directions, from wages to incomes and the other way around, and their interrelation.

Data

We utilize microdata from Eurostat’s Statistics of Income and Living Conditions (SILC) using the survey’s 2015 wave – the latest one available at the time we started this research.³ We think our results are structural and bear in much the same way on preceding and following years.⁴ In particular, we use annual incomes and annual earnings which relate to the year 2014 which were surveyed in the 2015 wave.⁵ Their coverage is nearly complete as the measurement of poverty and living standards based on incomes is the very purpose of SILC.⁶ This contrasts with hourly wages, our equally important variable. These are not directly available in the survey but can be calculated in principle from the labour-market information that SILC provides. Unfortunately, this is hampered by one problem of principle and one of practice. The former problem occurs because the survey’s detailed labour-market information relates to the time of the survey, in 2015, and cannot be fully aligned with the annual data of the labour market in 2014. The practical problem arises because much of the information needed, especially regarding working time appears to be actually missing from the survey.⁷ As a result hourly pay is missing for 18% of all earners in Labour households in the average country, mainly because of missing hours usually worked at the time of the survey (15%). This may seem modest, but it comes with significant variation between countries (4% to 33%) as well as with an intense bias against low-income households (55% missing for income decile 1 and 38% for decile 2) and also against Additional earners (25%), who are

³ In our version of the dataset, unfortunately, youths are missing for Malta and pensioners for Denmark, but quantitative effects on EU-average outcomes seem negligible. We leave out Malta when analysing youth, while pensioners are not analysed separately.

⁴ Salverda and Haas (2014) find similar outcomes using SILC data for 2010.

⁵ We disregard that the calendar timing of annual incomes deviates for Ireland and the UK.

⁶ Still, SILC might miss out on low-income households (Ozdemir and Ward, 2015, 7).

⁷ For this reason analyses of low wages using SILC data are often restricted to full-timers, with the further, implicit assumption that they all work the same hours.

of particular interest to our research, compared with other earners (12%). It suggests a strong under-estimation of the incidence of low pay and a truncated distribution of hourly wages as a result. Fortunately, the comprehensive coverage of household annual incomes and corresponding individual characteristics offers an Archimedean point on which we can stand to find a solution that provides reasonable estimates for the missing values. In our view, such an estimation, even if approximate, is to be preferred to outcomes leaving out the missing values as these would either be strongly biased between variables and countries or drastically reduce the number of countries that can be analysed (only four have less than 10% missing values). It is better to be roughly right than precisely wrong. We consider this charting of hourly wages having imputed missing values to be an important contribution of this paper and spell out the necessary details in Annex I regarding the problems, principal and practical, and the approach to imputation that we have adopted. Although based on individual data we do not analyse the results at the individual level but aggregated over deciles, types of earners and several personal characteristics, as we think the data do not allow finer detail and because such aggregation may also mitigate problem by evening out potential individual errors of our imputation approach. Finally, given the importance of educational attainment for our analysis we stick as much as possible to the slightly reduced sample (-2%) without the missing values for educational attainment.⁸ We use the terms ‘earners’ and ‘employees’ interchangeably.

Presentation

For the ease of presentation we focus on the average of all 27 EU countries utilising relative proportions within the countries to enable international comparability of earnings and incomes, and also unweighted for country size to prevent the results from being unduly influenced by one or more of the large countries. Our contention is that the mechanisms work out sufficiently similarly between the countries to allow this simplification, which we argue briefly in Annex II. The same holds for the category of Single earners used in our presentation, who can be earners of either single-person households consisting of the particular employee only, or of more-person households encompassing other members. Those other members may contribute incomes to the household but, by our definition of Single earners, those cannot be from earnings nor can they be the most important contribution to the household income, by our definition of labour households. We lump Single earners in single-person households together in the presentation with those in more-person households, justified by a brief comparison of the two categories (see Annex III). More generally, we reduce three types of households to two: Single-earner and More-earner ones, by subsuming dual-earner and multiple-earner households in the second category. Likewise, we reduce seven earner types that we actually used in our analysis⁹ to three types in this presentation, distinguishing Single earners, Primary earners, and Additional earners regardless of whether the latter two are from dual-earner or multiple-earner households.

Finally, we spell out the argument almost entirely by means of graphs and summary tables. We conclude with a few remarks on terminology. ‘Incomes’ always refer to households while ‘earnings’ are also aggregate and can be for households or individuals. ‘Wages’ though refer always to individuals and are always hourly. All monetary amounts of wages are always gross and before taxes and social contributions. ‘Low pay’ and ‘high pay’ refer to wages that are below two-thirds of the median wage for low-wage employment (LWE) and above the median wage and a half for high-wage employment

⁸ Youth are slightly overrepresented among those missing values.

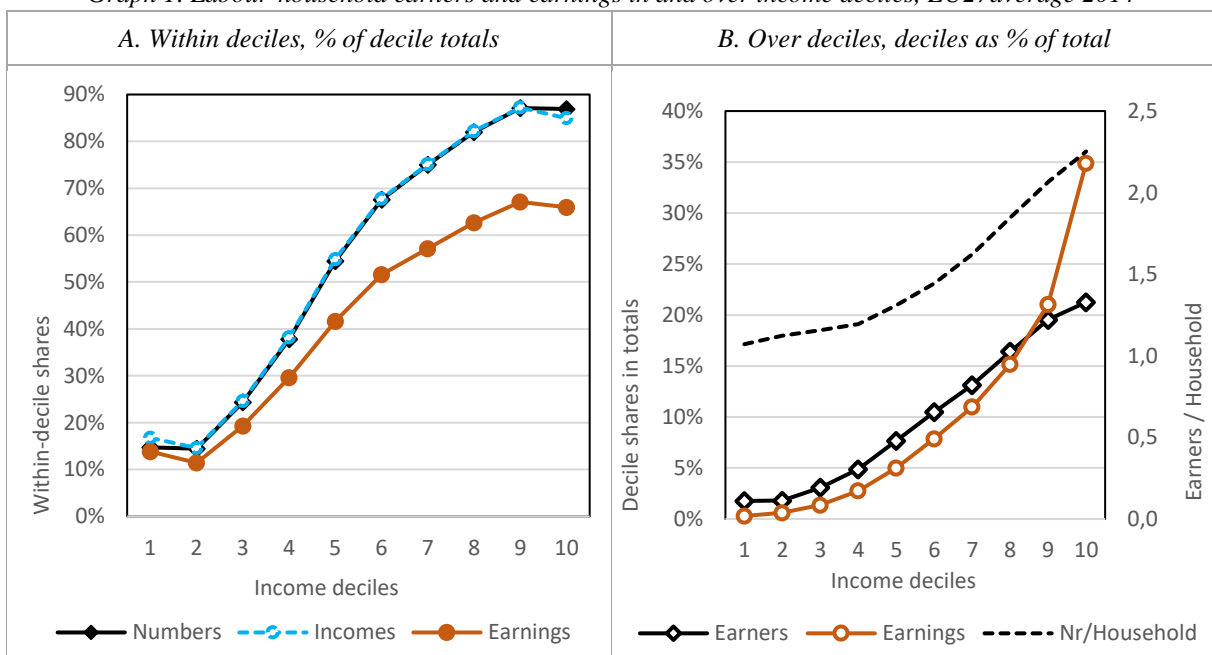
⁹ 1. Single earners in single-person households, or 2. in more-person households, 3. Primary earners and 4. second earners in dual-earner households, 5. Primary earners, 6. second earners, and 7. third earners in multiple-earner households. More than three earners in a household are few and we disregard their number but include their incomes and earnings.

(HWE). ‘Bottom’ and ‘top’ are used to indicate deciles 1 and 10 respectively. ‘Lower’ and ‘higher’ incomes and wages refer to those in ‘lower-half’ (deciles 1-5) and ‘upper-half’ (deciles 6-10) of the relevant distribution. Crossed with each other they define four quadrants: north-east: higher incomes with higher wages, south-east: higher with lower, north-west: lower with higher, and south-west: lower with lower. Finally, the ‘better educated’ take the middle educated and high educated together and as longer educated than the low educated.

3. Distributions of household incomes and individual wages in a dual-earner world

The spread of Labour households and their earnings is clearly skewed towards the high end of the income distribution of all households (graph 1A). At the lower end, in deciles 1 and 2, Labour households comprise only 15% of all households, while at the higher end, in deciles 9 and 10, they make up 87%. As the total number of households is the same in all deciles, those percentages simultaneously indicate the spread of Labour households over the income distribution. The distributions of household numbers and of household incomes are virtually identical. This is no surprise as all household incomes in a particular decile are ranged within the same narrow boundaries.

Graph 1. Labour-household earners and earnings in and over income deciles, EU27 average 2014



Reading notes: Earnings and incomes respectively of Labour households in the first decile of household gross incomes comprise 14% and 17% respectively of all incomes in that decile, and they number 15% of all households in graph 1A. These households comprise 2% of all earners in all Labour households and receive 0.3% of all earnings in graph 1B.

Explanatory notes: Constructed as the average of 27 national percentages as absolute amounts of different currencies are incomparable across countries. Labour households only, which are defined as those households whose major source of income is from wage earnings. Incomes and earnings are on an annual basis and gross before payment of tax and social contributions but after receipt of applicable social benefits. The income deciles are country-specific and concern all households. All 28 EU countries at the time (including the UK) except Croatia.

Source: Authors' calculations on EU-SILC, survey wave 2015 with annual data for 2014.¹⁰

Only the deciles at the two extremes, which have no boundaries on the outer sides, are explicable exceptions. They show slightly higher incomes for Labour households compared to other households at the bottom and somewhat lower ones at the top. Plausibly, these differences are due to negative incomes from enterprise and wealth at the bottom and to higher incomes from the same sources at the top. Among Labour households wage earnings are the main component of incomes, contributing between 76% and 79% of their total incomes in each of the ten deciles.

Graph 1B presents a different take on the data, complementary to graph 1A. It indicates how all individual earners in Labour households and their total earnings are apportioned across the ten income deciles. Earners in income deciles 1 and 2 form tiny percentages, 2% each, of all earners in Labour households. Just 19% of all individual earners are found in the bottom half of the income distribution (deciles 1 to 5). This contrasts strongly with deciles 9 and 10, which each comprise 20% to 21% of earners.¹¹ It mirrors the increasing number of Labour households of graph 1A together with the increasing number of earners within the household, shown by the dashed line in graph 1B which more than doubles from 1.1 in decile 1 to 2.3 in decile 10.

Next to the numbers in this graph, the earnings increase largely in parallel. However, they show a much stronger gradient: from next to nothing in decile 1 (0.3% of all earnings) and 10% in total for deciles 1 to 5 combined, up to 21% for decile 9, which, very importantly, is followed by a massively larger share of 35% for decile 10 alone. Notably, this points to much higher levels of average earnings in decile 10 because the number of earners differs little from decile 9.

The role of different earners in the household: Single, Primary and Additional earners

The two graphs raise intriguing questions about individual earnings and their combination into households, which motivate us to distinguish between two types of Labour households depending on the number of wage earners among their members: 'Single-earner households' and 'More-earner households'. Along with these household types we distinguish three categories of wage earners in relation to their household positions, which we term 'earner types':¹²

- *Single earners*, who are the only person with a wage income in a household which is also the household's most important income,
- *Primary earners*, who concern the one person with the largest annual earnings in a household which they share with one or more other wage earners, and
- *Additional earners*, one or more, in a household shared with a Primary earner. They can be either second earners in both dual- and multiple-earner households or third earners in multiple-earner households.¹³

Primary earners are distinguished from Additional ones by the simple fact that within the household they obtain the highest annual earnings irrespective of any other personal characteristic. Note that the two types relate to earnings only and disregard other attributes, such as family relations. For example,

¹⁰ This is the source of all graphs and tables in this paper and will not be repeated below. Explanatory notes will continue to highlight relevant issues regarding the data. Subsamples of SILC are sometimes used - see Annexes I and II.

¹¹ Note that this means that the first decile of Labour households ranked alone stretches from the first up to the fourth decile of all household incomes while the median lies in the eighth income decile and their ninth and tenth deciles fit together within the top income decile alone.

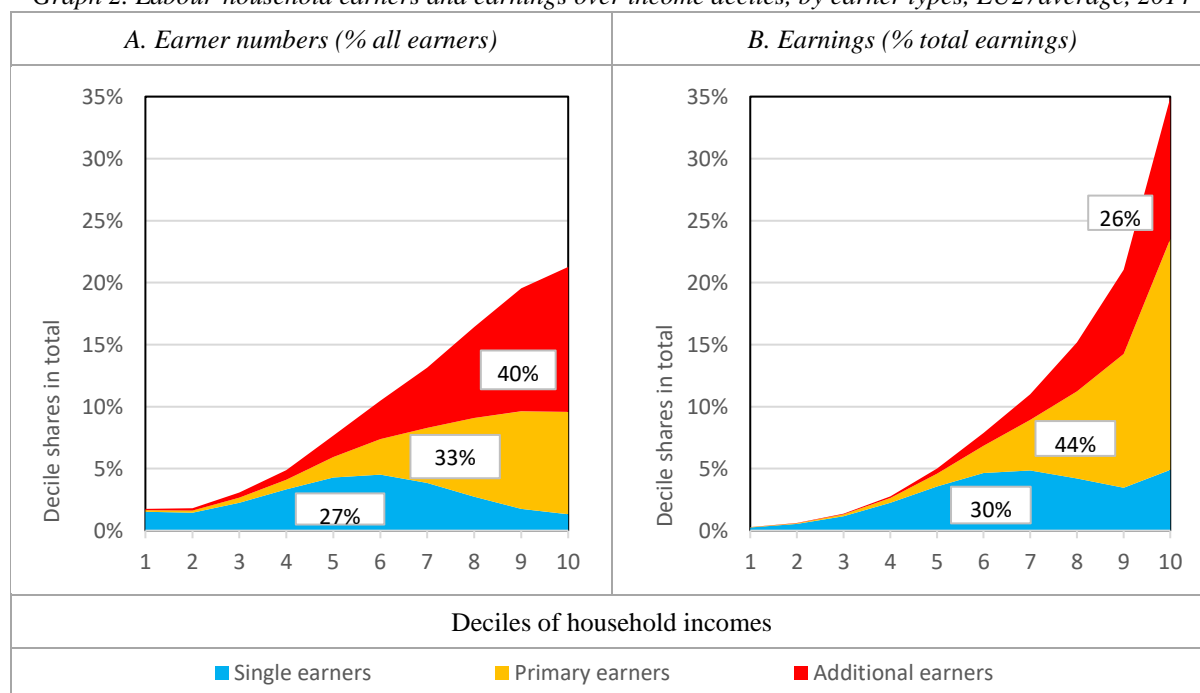
¹² Of 186 million employees in EU27 labour households Single, Primary and Additional earners account for 51, 60 and 72 million respectively.

¹³ We disregard the very few earners who are fourth or higher.

two earners in one household may not be partners but parent and child, or adults without a family relationship. Later we discuss gender, age, educational attainment and partnership as earner characteristics.

Single earners make up 27% of all earners and receive 30% of total earnings (graph 2). The remainder is provided by Primary earners (33% of the number and 44% of the earnings) and Additional earners (40% and 26% respectively). Obviously, and surprisingly given the little attention that they normally get, Additional earners are numerically the largest category among employees, but they have also the lowest average annual earnings: 65% of the overall average as against 111% for Single earners and 135% for Primary earners.¹⁴ Nowadays, viewed from the employees' perspective More-earner households dominate. Three quarters of all individual employees share their households with one or more other employees. We label that as the 'dual-earner world'. This state of affairs contrasts sharply with the traditional single-breadwinner world, which – as somewhat a caricature – is characterised by the presence of one wage earner only in each household, none of them sharing the household with another wage-earning person. Nonetheless, though Single earners comprise no more than 27% of all individual earners, Single-earner households still comprise 45% of all Labour households, of whom less than half are single-person households (20%). More-earner households make up 55%. Single earners may no longer be dominant in the labour market but they are still quite important from a societal point of view. In that sense incomes and earnings together make up a hybrid world where the demise of the single breadwinner is largely accomplished in the labour market while it still has quite some way to go in the world of households and incomes – as we said, a dual-earner world in progress. This adds significant complexity to both analysis and policy making.

Graph 2. Labour-household earners and earnings over income deciles, by earner types, EU27 average, 2014



Reading notes: In decile 1 Single earners make up 2% of all earners, in decile 10 Primary earners comprise 8% (graph 2A); of total earnings they receive 0.3% and 19% respectively (graph 2B) of all. Shares mentioned in the boxes are the aggregate shares of the three earner types in the number and earnings totals.

Explanatory notes and Source: see graph 1.

The skewed prevalence of Labour households and their earnings can be explained to a large extent from the combination of wage earners within households. Primary earners and Additional earners concentrate

¹⁴ On average, each Primary earner goes together with 1.22 Additional earners, whose annual earnings equal 48% of those of Primary earners.

almost entirely in the upper half of the income distribution compared to Single earners whose numbers show a rather normal distribution. The earner-type differences are particularly large for the top decile, where Single earners comprise a mere 1% of all earners and receive 5% of total earnings, as against 8% for Primary with 19% of earnings and 12% for Additional earners with 11% of earnings. Ostensibly, Single earners who make it to the top obtain rather high individual earnings that match the combined earnings of Primary and Additional earners found there. In the earlier single-breadwinner world, the distribution of individual wage earnings essentially determined the distribution of incomes, whilst the current combination of earnings brings many households significantly higher up the income distribution than individual wage earnings would often warrant.

The distributions of hourly wages and annual incomes

So far, we have considered earnings on an annual basis which are at the core of household incomes. Hourly wages, however, are the core variable in the functioning of the labour market and also in earnings inequality. They can be considered a major indicator of the skill requirements of the jobs that people occupy, and they can also serve to control for the much-increased effects of part-time hours on a person's earnings. As single breadwinners in their world supposedly all worked roughly the same number of (full-time) hours, their annual earnings basically reflected their hourly pay. In other words, low-paid (by the hour) workers corresponded then with low-income households.¹⁵ Because currently many workers, especially those combining earnings in their households, are working a broad variety of (part-time) hours, this simple relationship from hourly to annual pay, and therewith to income, has vanished. In addition to this, but not unrelated as part-time employment is often low paid, individual earners in households with similar incomes may nowadays be in very different positions in the distribution of hourly earnings.

Graph 3 provides a detailed split of the distribution of earnings over the income distribution of all earners as a 10x10 deciles matrix with cell sizes dependent on their shares in the total. It shows how the earnings of households in each income decile derive from the ten deciles of individual hourly wages, for both the number of earners (graph 3A) and the amount of earnings (graph 3B). This comprehensive charting of hourly wages is an important contribution, in its own right, that we seek to make to the literature.¹⁶ Note that wage deciles contain some 10% of wage earners each, by definition, while income decile shares of earners vary strongly – from a few per cent in lower income deciles to much higher percentages of around 20% in deciles 9 and 10 as we have already seen. The decile boundaries are based on the overall distribution of hourly wages, including Single earners and also earners outside Labour households, rather than referring to 10%-shares of specific earners types.

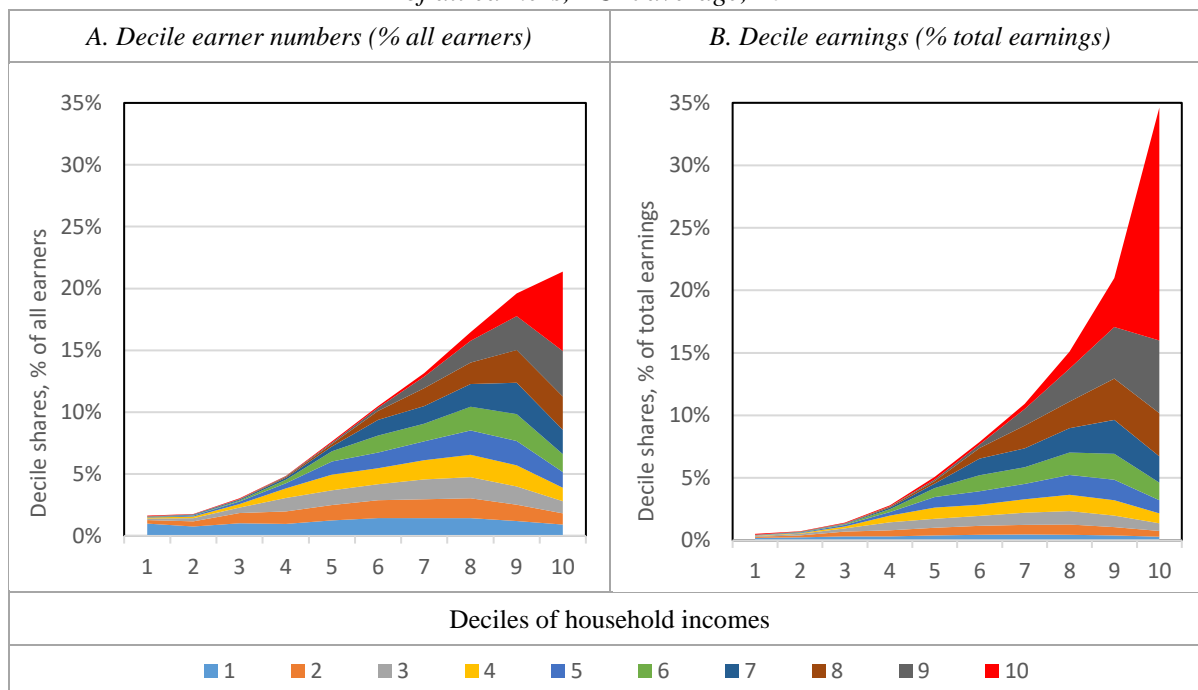
All ten wage deciles cross with all ten income deciles, albeit sometimes very thinly. Higher wages clearly concentrate at higher incomes, witness, e.g., the remarkable red areas on top of the two graphs. Particularly, low wages from the first and second wage deciles, which are the mainstay of low pay as we will see, have an amazingly stable presence across all ten income deciles. Conversely, ninth-decile and tenth-decile wages are found down to the first income decile. Of all earners 6% belong to both top deciles at the same time, constituting 60% of the top-wage earners and 30% of top-income earners. Nonetheless, there appears to be no simple relationship that higher incomes would correspond with

¹⁵ We ignore entries into and exits from the labour market during the year throughout the paper.

¹⁶ The most extensive study of low pay using SILC (Maitre et al., 2012) focuses on full-time full-year workers for which missing values are few. Ozdemir and Ward (2015) seek a solution in combining SILC with the Labour Force Survey. However, bias against low pay found in the present paper shows that much of low pay is missed by minimizing the missing values; it undermines also the basic assumption that SILC's distribution of earnings is sufficiently reliable to be projected on the LFS.

higher wages. Virtually half of all earners have both an upper-half income and an upper-half wage – north-east quadrant – but a significant minority of 36% combine a lower wage with a higher income (south-east) and only one-sixth combine lower wages and lower incomes (south-west) while very few populate the north-west. The eight wage deciles in the middle demonstrate more visibly that higher incomes do not simply correspond with higher hourly pay as the single-breadwinner world would have it.

Graph 3. Labour-household earners and earnings over income deciles, by deciles of hourly wages, % of all earners, EU27average, 2014



Reading note: The first income decile comprises 1.7% of all earners of whom 1.0% earn a first-decile wage (graph 3A), they receive 0.2% of all earnings (graph 3B).

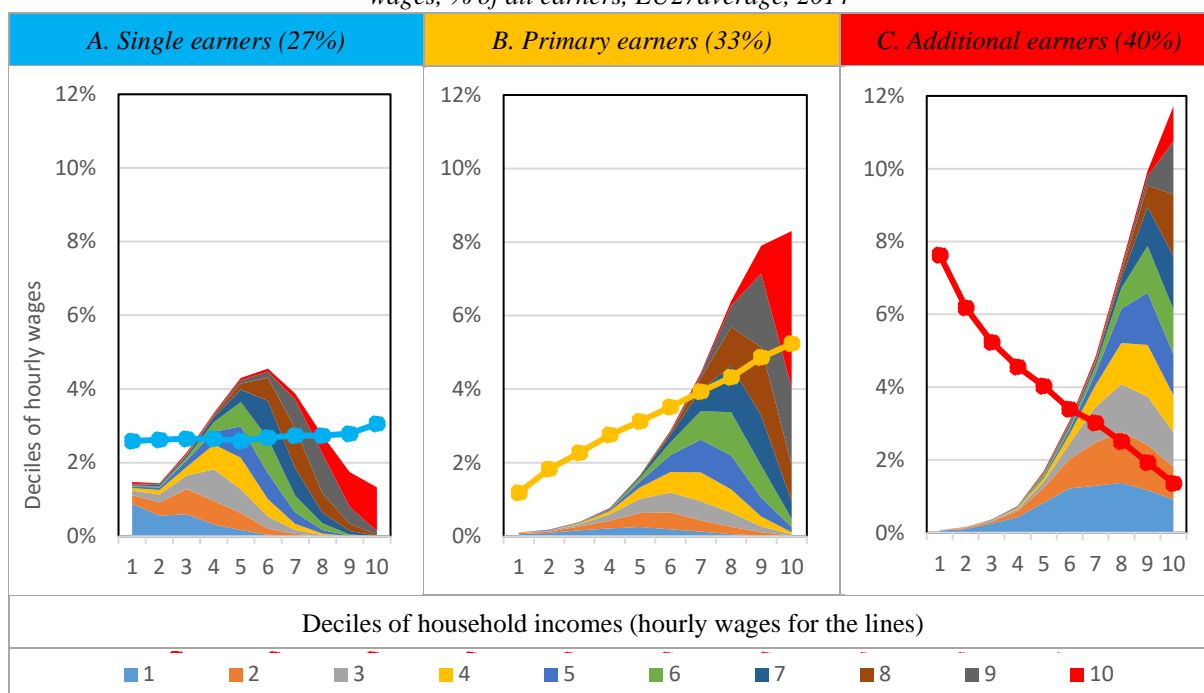
Explanatory notes: The decile boundaries are based on hours worked, including employees outside Labour households, and may contain more or less than 10% of individuals depending on working hours. Earnings are weekly: hourly earnings x weekly hours worked.¹⁷

The distribution of earnings (graph 3B) follows roughly the same pattern but is, naturally, much more skewed towards the higher echelons. Top wages alone contribute more than half of all earnings received by top incomes: 19% out of the 35% share. This is by far the largest cell size of the 100-cell matrix, the next largest being less than 6%. Nonetheless, still more than one-fifth of all earnings (22%) concern lower-half wages that are obtained by higher-income household (south-east). Higher incomes combined with higher wages comprise more than two-thirds of total earnings (68%) (north-east).

That most income deciles cross with earnings from a broad range of wage deciles holds for each of the three earner types, but with important variation (graph 4). Single earners follow a pretty normal distribution, but, surprisingly, they show the same share on the diagonal of the wage-income matrix as Primary earners (both 26%), who both differ strongly from Additional earners (4%). By necessity, top incomes overlap more with top wages (89%) for Single-earners than for Primary earners (51%), let alone Additional earners (8%).

¹⁷ Weekly observations disregard flows into and out of the labour market during the year, which do influence annual earnings. Such flows likely pertain more strongly to lower wages and our estimation of missing values may offer some compensation for the difference (Annex I).

Graph 4. Labour-household earner types over wage deciles and income deciles crossed with deciles of hourly wages, % of all earners, EU27 average, 2014



Reading note: The lines indicate the wage distribution for each type.

Notes: See graph 3.

The sharpest picture is drawn by Additional earners. They combine a strong concentration to the right, in higher income deciles, together with the largest presence at the bottom of the wage deciles. More than 40% of all Additional earners with top incomes receive pay in the lower half of the wage distribution. The overall combination of lower wages and higher incomes (36%) (south-east) is largely provided by Additional earners (25%) and much less by Primary earners (8%) or Single earners (3%). For Primary and Additional earners, the overlap between lower-half pay and lower-half incomes is virtually non-existent (north-west). The earner-types' presence over the wage distribution is shown by the lines in the graphs. For Single earners it is almost flat while Primary earners unequivocally grow to the right and Additional earners decline even more. Single earners combine lower incomes and lower wages to a substantial extent (39%) (south-east). This contrast with Primary earners of whom only 9% do so, while they have large but different majorities among higher income numbers (91%) and higher earnings (66%), with a 65% overlap (north-east). The share of higher incomes among them is even larger (96%) and concentrates in great majority among higher wages (82%). The picture deviates most radically for Additional earners, who have similar large majorities of higher incomes (92%) but then in combination with lower wages (69%) – overlapping for 62% (southeast) – and a similarly small overlap of lower incomes and lower wages (7%).

Households and the distribution of hourly wages

Evidently, households may receive similar levels of annual earnings that relate to very different levels in the distribution of hourly wages,¹⁸ depending on the earner(s) they contain. It is important to consider how households 'feed' their labour supply into the wage distribution via the three earner types that act

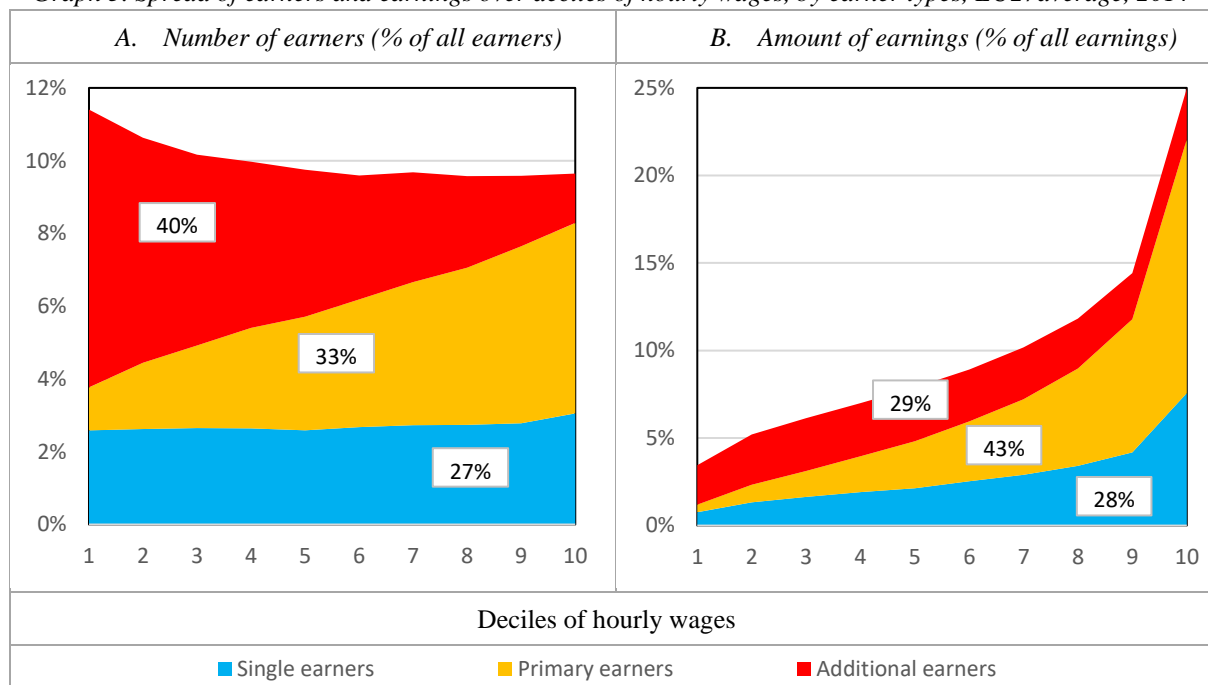
¹⁸ See Annex I for the approximation of missing values of hourly wages.

as conduits between households and jobs. It comes as no surprise that the spread of earner types over the hourly-wage distribution (graph 5A) differs radically from incomes (graph 2A).¹⁹

The role of Additional earners is most striking indeed. The lower the wage the more prominent they are. They have an overwhelming presence, accounting for more than two-thirds, in lower-half wage deciles, and thus make up more than half (53%) of all lower-half earners. It is a glaring contrast that at the same time virtually all of them (92%) are members of higher-income households. They are responsible for 70% of the higher-income-lower-pay linkage (south-east).

Primary earners show completely the opposite pattern for wages, which is also very similar to their income distribution. Two thirds of their wages and 91% of their incomes concentrate in the upper half of the wage and income distribution respectively. This provides an almost perfect complement to Additional earners. The combined wage distribution of the Primary and Additional earners taken together is almost flat, with a clear uptick for numbers at the bottom end (due to part-time jobs) (graph 5A). Obviously, the wage distribution of Single earners is then equally flat, with a small uptick for the top decile.

Graph 5. Spread of earners and earnings over deciles of hourly wages, by earner types, EU27 average, 2014



Reading note: The first decile comprises 11.4% of all earners: 2.6% Single, 1.2% Primary and 7.6% Additional earners (graph 5A); they receive 0.8%, 0.4% and 2.3% respectively of all earnings (graph 5B).

Explanatory note: See graph 3. Decile 1 to 3 number shares exceed 10% (graph 5A), reflecting the higher incidence of part-time earners at lower wages. Earnings are weekly totals for all hours worked.

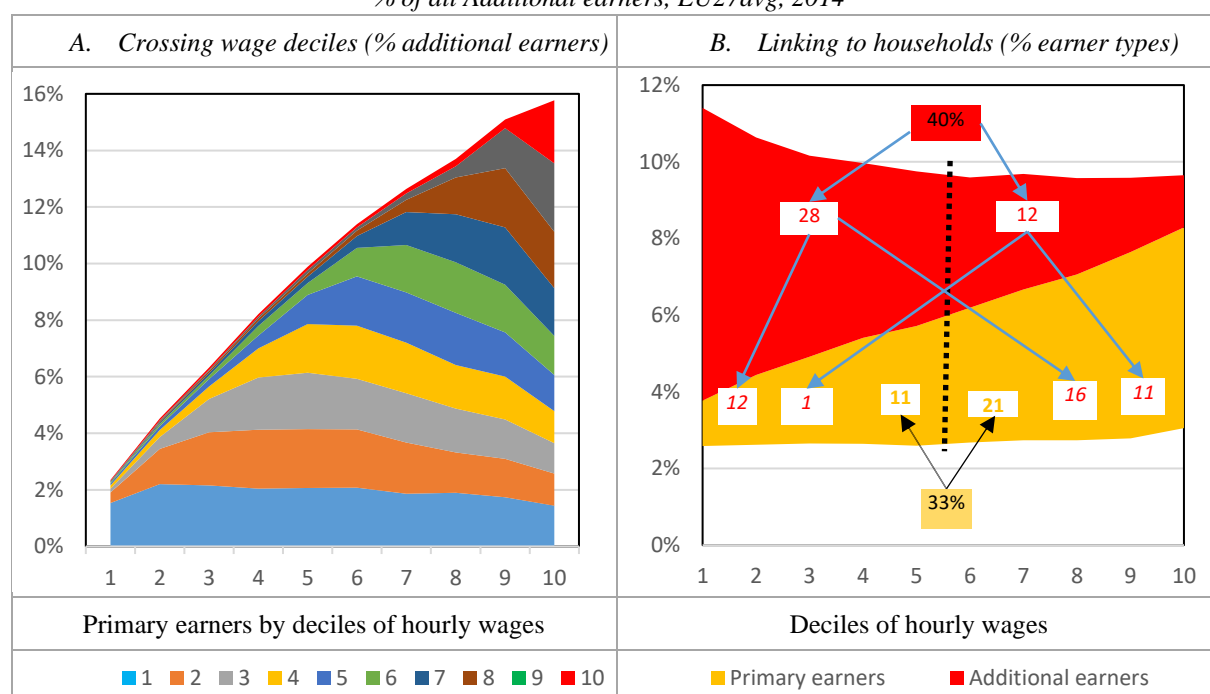
Evidently, compared to these numbers the spread of earnings is much more skewed toward higher wages (graph 5B). All top wage earners put together receive 25% of the total, and those in the bottom wage decile 3.5%. This contrasts notably with the shares of incomes at the top (35%) and bottom (0.3%-0.5%, graphs 2B and 3B). Remember though that hourly-wage deciles each comprise 10% of earners while that percentage varies strongly between income deciles. The issue, however, is how the two distributions hang together and not whether one is more (un)equal than the other. The graph reveals the essential role played by More-earner households for uplifting lower individual-wage positions to higher household-income positions, and, conversely, for the supply of labour from higher-income households to lower-wage labour markets. This differs fundamentally from the straightforward link from individual

¹⁹ Weekly earnings lend a slightly higher share to Additional earners than graph 2, which may perhaps be attributed to a relatively strong effect of entries and exits on their annual earnings

wages to household incomes of the single-breadwinner world – as is still illustrated by the flat pattern of Single earners.

Though graph 5A’s complementary spread of wages for Primary and Additional earners seems suggestive, it does not tell how wage levels actually combine with each other within households. For example, the highest on the one side may combine with the lowest on the other side, or the lowest and the highest of one side may go together with the same from the other side. Their direct relationships can be scrutinised with the help of graph 6A which crosses Additional earners according to their own wage levels with the wage levels of their corresponding Primary earners in, again, a 10x10 matrix.²⁰ All ten wage deciles of the one side interact with all ten deciles of the other side. Only a modest minority of 13%-14% is found on the diagonal where the hourly wages of the two sides equal each other. Again, the diagonal overlap is highest in the top decile (2.2%). In the far majority of cases (89%) Primary-earner hourly wages exceed those of Additional earners. Conversely, only 8% of all Additional earners obtain hourly wages in excess of their Primary earners. This goes together with shorter working hours as otherwise those Additional earners would be Primary earners by the definition on an annual basis.

Graph 6. Spread of Additional earners by deciles of own hourly earnings over deciles of Primary earner wages, % of all Additional earners, EU27avg, 2014



Reading notes: The first wage decile comprises 1.9% of earners of whom 1.1% earn a first-decile wage (graph 6A). The vertical dashed line (graph 6B) indicates the median wage.

Explanatory notes: Decile levels of hourly wages are based on all earners and identical for all types of earners. Additional-earner numbers exceed Primary-earner numbers by 21%. Third and second Additional earners are combined with the same Primary earners. Graph 6B: Replicates graph 5A while allocating Additional earners to the corresponding Primary earners.

Graph 6B projects the implications of this on the preceding graph 5A. Additional earners, 40% of all earners, concentrate on lower pay (28%) which they combine to a large extent (16%) with higher-paid Primary earners. Higher pay Additional earners (12%) do so almost exclusively (11%) with higher-paid Primary earners. It means that virtually all lower-paid Primary earners (11%) combine with lower-paid Additional earners while a large share of higher-paid Primary earners combine with lower-paid Additional earners. Thus, lower Additional wages – be there one or more in the household²¹ – may lift

²⁰ This is not applicable to Single earners, by definition.

²¹ The ratio of Additional earners to higher-paid Primary earners (1.25) exceeds that to lower-paid Primary earners (1.14), which contributes to higher incomes.

household incomes above the median income in combination with a lower Primary-earner wage. The higher-lower combination is still almost negligible (1%) (north-west).

4. Personal characteristics and labour-market behaviour of Additional earners

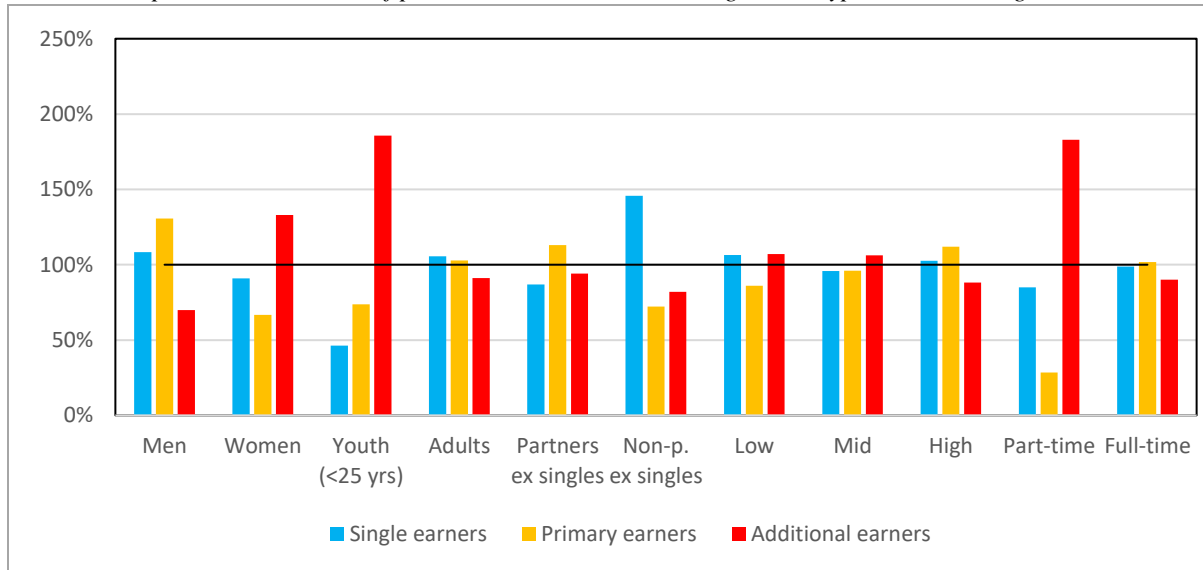
Obviously, Additional earners act as the principal conduit for the downward wage operations entertained by higher-income households. The main question now is whether specific characteristics of the Additional earners can explain their different labour-market position as revealed by their concentration in lower wages? Do they deviate from the other types of earners (their Primary earners in the first place)? And if so, can this explain their wages? We look at the usual personal characteristics that affect labour-market behaviour: gender and age, as well as partnership with other household members, and also level of educational attainment. For the ease of presentation, we show also working time here but discuss this in the next section, as it is not a characteristic of the person but of the jobs that people occupy but still highly relevant for the interaction between household and labour market.

The demographic characteristics of gender, age and partnership pertain to the division of labour within the household, while educational attainment regards the qualifications that people bring to the market, and informs about the way these match with the qualifications that are needed for their jobs. Assumedly, the latter are signalled by the level of hourly pay. The lower the pay the less the necessary qualification for the job.

Concentration ratios (graph 7) express the extent to which characteristics are overrepresented (>100%) or underrepresented (<100%) among the three earner types. Indeed, strong differences occur between Additional and other earners. Women (133%) are significantly overrepresented among Additional earners. Men, by contrast, are equally overrepresented among Primary earners (130%). Earners in general split almost fifty-fifty by gender (47% of all earners to 53% for men), but among Additional earners the ratio is 2:1 for women (64%) compared to men (36%) while the inverse holds among Primary earners (38% and 62%). It confirms the well-known gendered division of earner positions in More-earner households.

Similarly, youth (defined up to the age of 24 years) appear to be fiercely overrepresented among Additional earners (186%) and considerably underrepresented among Primary earners (38%) as well as Single earners (46%). Young employees make up 10% of all earners in total, but three quarters of them are Additional earners. It gives them a 19% share among Additional earners as against only 4% to 5% among Primary earners and Single earners. Because adults are a much larger group they are only slightly underrepresented among Additional earners (90%).

Graph 7. Concentration of personal characteristics among earner types, EU27 average, 2014



Reading note: At 108% men are 8% overrepresented among Single earners. ‘Non-p.’ regard Adults who are not partnered to another member of the household, they are estimated here as the complement to partners and all youth.

Explanatory notes: The share of each characteristic among all earners equals 100%, except for partners where the share is taken over all earners excluding single-person Single earners, who cannot be partners by definition. Youth are aged 15 to 24 years, while older persons are termed Adults.

Third, the partnership relation of household members – defined as either married or in consensual union – concerns 67% of all earners (excluding single-person households). The large majority of partners are found in More-earner households. Only 15% are Single earners in more-person households, implying a slight underrepresentation (87%) likely due to the inclusion of single-parent households. The concentration of partners among Additional earners is close to average (94%), while Primary earners are more often partners (113%). Evidently, the absolute number of partners is similar between these two types (51-52 million) but they make up a lower share of the more numerous Additional earners (71%) than of Primary earners (85%). The overlap of partners with youth appears to be virtually nil, only 3% of all Additional partners being younger than 25 years. We leave that overlap aside here – the group is too small to reliably analyse with the available data – and consider all partners as adults, and, conversely, all youth as non-partnered. Thus, partners make up 87% of all adults in this category. As a result, partners (71%), youth (19%) and non-partnered adults (11%) together make up 100% of Additional earners. Non-partnered adults are found much less among Primary and Additional earners and concentrate strongly among Single earners (226%).

Fourth, as to educational attainment, earners are spread over the three often-used levels of low (17%), middle (48%) and high educated (35%) following the International Standard Classification of Education (ISCED). Additional earners are less often high educated (88%) than average and more often middle or low educated (106% to 107%) but only slightly. Single earners are as often low educated as Additional earners, as often middle educated as Primary earners and slightly more often high educated than average (103%) but less than Primary earners. Primary earners are less often low educated (86%) and more often high educated (112%). However, the number of high-educated Additional earners is almost as large as among Primary earners: 12.4% and 13.1% respectively of all earners, both clearly larger than among Single earners (10%). In comparison to gender and age the differences by educational attainment seem modest – particularly so in view of the very substantial wage differences between Additional and Primary earners, on which educational attainment is generally thought to bear.

Finally, the working-time dimension shows the largest differences. Part-timers make up 16% of all earners, of which 10% are Additional earners. They show a very strong overrepresentation among

Additional workers (183%), and a very strongly underrepresentation among Primary earners (29%), but are close to average among Single earners (85%). Their full-time complement shows the inverse pattern albeit less outspoken as they are a much larger group: underrepresented among Additional earners (88%), overrepresented among Primary earners (104%), and average for Single earners.

So, these characteristics affect the selection into the type of earner, especially for Additional earners. But how do the differences subsequently work out over the distributions of wages and incomes? We briefly consider demographics first: the effects of gender, age and partnership. Next, we discuss educational attainment, also in conjunction with these demographics, as the most pressing issue seems to be how educational qualifications match with jobs – or not – and what the earner position in the household contributes in that respect.

Demographics characteristics: Gender, age and partnership

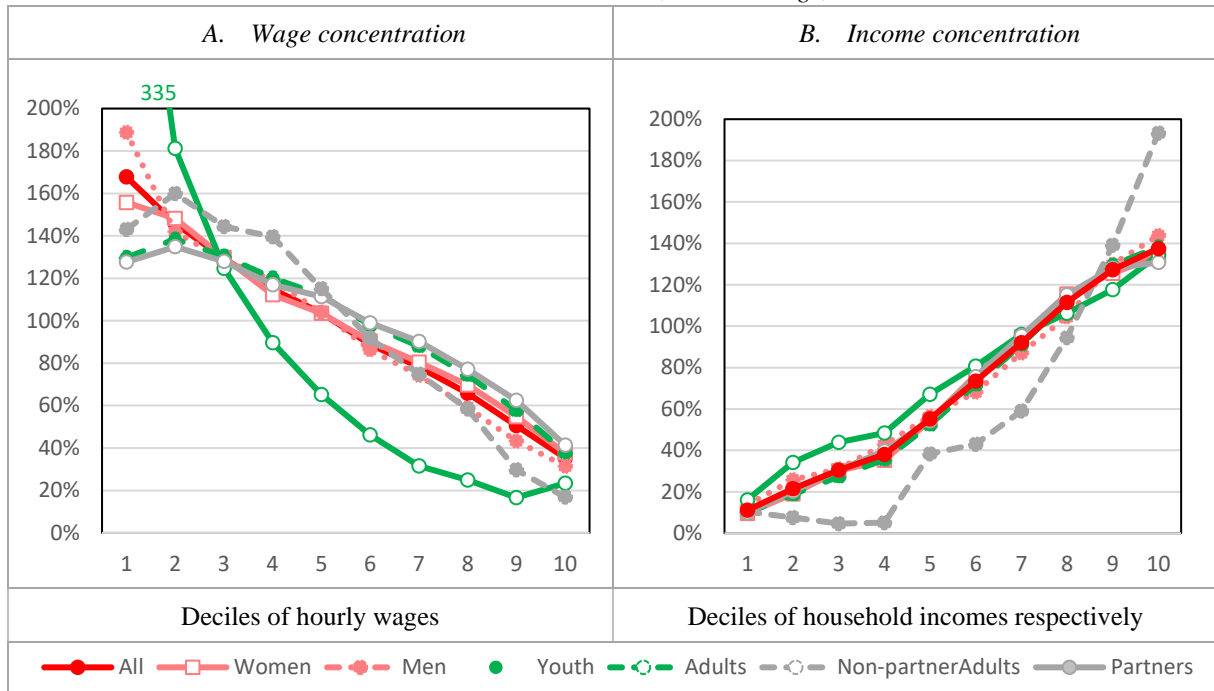
Graph 8 shows for Additional earners how these characteristics concentrate over the deciles relative to the overall distributions of wages or incomes. The ratios indicate how the pattern of a particular characteristic among Additional earners deviates from the general pattern of all earners for that same characteristic.

Importantly, men, women, adults, and partners all share virtually the same, clearly downward wage pattern (graph 8A), with a slight fanning out at the bottom and limited deviations for non-partnered adults in the lower half and at the top. A notable exception is for youth, who start from a strong overrepresentation at the bottom (335%)²² and end with a low presence at the top (24%). On the income side (graph 8B) the patterns evolve upwardly within an even narrower band, with hardly any deviation also for youth. Non-partnered adults are the odd ones out here, with a strong concentration at the top of the income distribution (193%) – plausibly as members of multiple-earner households, and perhaps disturbed by the relatively small number of observations. Interestingly, when combining partnership with gender, women and men appear to follow the same wage patterns and income patterns with little difference between the genders (not shown). For each and every characteristic Additional earners are much more often lower paid and they do so much more often in combination with higher incomes. The combination of higher incomes with higher wages (north-east) is certainly non-trivial, especially among partners (44%) but also among men, women and adults (28% to 34%). It is small, however, among youth (13%) and negligible among non-partnered adults (2%).

We infer from the close resemblances that the very household position of being an Additional earner overrides the effects of all three characteristics, gender, age and partnership, regardless of their own importance among Additional earners. Apparently, the household position seems the main driving factor behind the striking wage-income combinations of Additional earners. The argument finds further support in similarities in the wage and income patterns among Primary earners and Single earners too (not shown). Thus, though the demographic characteristics clearly affect the selection into the category of Additional earners, once selected they have little or no specific effect on labour-market outcomes. Additional earners all show a rather similar pattern of earnings, regardless of their gender, age or partnership. Thus, these characteristics are of little significance for predicting the earnings or income position of Additional earners.

²² The exception proves the rule: high-educated youth, who have completed education, closely follow the wage patterns of the other characteristics (189% to 40%), in contrast with the low and middle educated who occupy a specific position in the household as they may still participate in education.

Graph 8. Shares and concentration ratios of Additional earners over hourly wages and household incomes, by demographic characteristics, shares % of all earners and concentration % of decile shares among all earners with the relevant characteristic, EU27 average, 2014



Reading note: All female Additional earners in wage decile 1 show a concentration ratio of 156%, meaning that they are found there 56% more often than all female earners.

Explanatory note: The concentration ratio compares a decile's share among a given kind of Additional earner type with the same share among all earners; e.g., female Additional earners in wage decile 1 (4.5%) make up 18% of all female Additional earners (25.4%), equal to 156% of the first-decile share among all earners (11%).

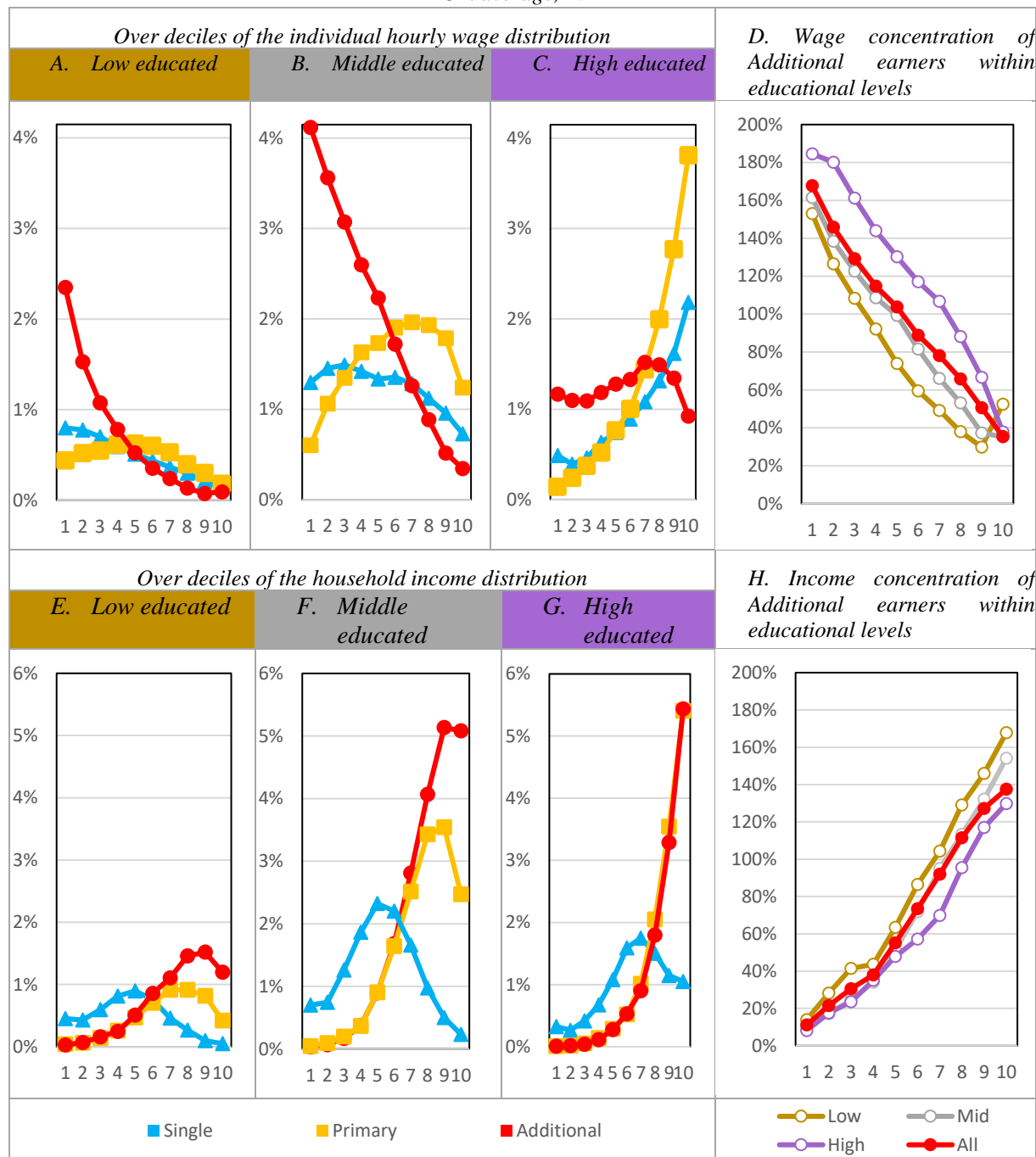
Educational attainment: Low, middle and high educated

The striking way these different kinds of Additional earners combine lower wages and higher incomes is telling, but it does not in itself imply a different labour-market behaviour. After all, lower qualifications may still match the lower wages and lower occupational levels they imply. Therefore, we check the effects of educational attainment on the distributions of wages and incomes for Additional earners against other earners with similar qualifications of low, middle, or high educational attainment, following the common levels from the ISCED classification.

Clear compositional differences arise. Over the wage distribution, the shares of low- and middle-educated Additional earners decline continuously and pretty steeply while the high educated ones spread out more evenly, being roughly as often lower paid as higher paid (graphs 9A to C). Even at the bottom the low educated provide only 30% of labour supply and face fierce competition from better-educated Additional earners. Additional earners' shares also contrast strongly with other earners at each of the three educational levels, especially with Primary earners. Thus, in spite of equal educational qualifications many Additional earners are paid much lower wages than the other earner types. Note also that the steady rise of Primary earners' wages towards the top (see line in graph 4B) depends crucially on the high educated (graph 9C). They leave the middle-educated Primary earners far behind, let alone the low educated. On the income side (graphs 9E to G), the familiar rising shares are found at all attainment levels. High-educated Additional and Primary earners follow almost identical trajectories up to the very top. Low-educated and middle-educated Additional earners exceed the equally educated Primary earners in deciles 8 to 10 – a clear illustration that the two earner types relate to each other at

different levels of education and not only at the same level. Likely, portions of the low- or middle-educated Additional earners combine into households with better educated Primary earners.

Graph 9. Earner numbers by types and educational level, % of all earners, and concentration rates of Additional earners to all earners with same educational level, over hourly wages and household incomes, EU27 average, 2014



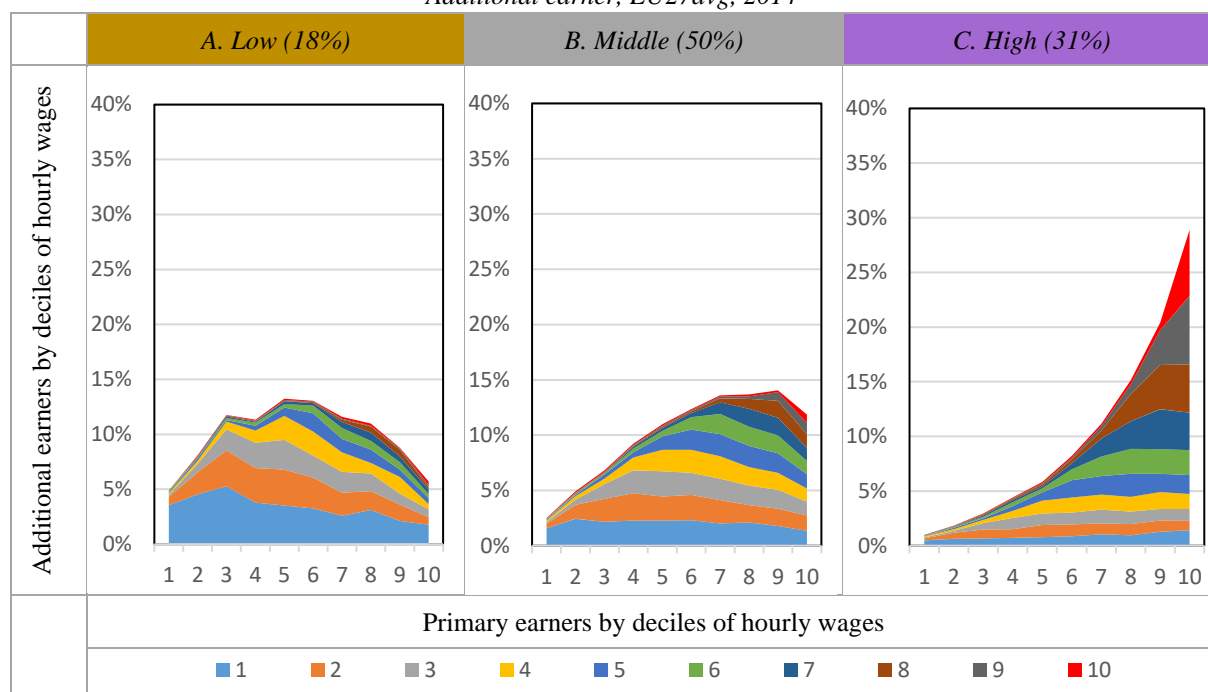
Reading note: A – C and E - G: The number share of all low-educated Additional earners in wage decile 1 equals 2.3% of all earners, and in income decile 1 0%; D and H: The number of high-educated Additional earners in wage decile 1 show a 185% concentration ratio relative to all high-educated earners, and a 138% rate in income decile 10.

However, the compositional differences all produce the same labour-market outcomes. Viewed at each level of education separately (graph 9D – similar to graph 8), the concentration ratios for wages show virtually the same similarities as for the demographic characteristics. The high-educated pattern even falls more steeply than the low- and middle-educated. Apparently, Additional earners among the high

educated receive lower wages relatively more often than among the middle or low educated. Thus, though the contribution of high-educated Additional earners to lower wages seems modest in general it is surprisingly elevated relative to their high-educated peers in comparison with the middle or low educated. This reinforces the conclusion drawn earlier for gender, age and partnership that the household position is the main issue. Additional earners do not really lag in their educational accomplishments but nonetheless occupy jobs that are paid much less. On the income side the slightly smaller concentration of high-educated Additional earners (graph 9H) suggests that their households follow more closely their peers than the middle and low educated.

The combination of lower pay and higher incomes remains significantly more important for high-educated Additional earners compared to Primary and Single earners. Virtually all (93%) of the lower-paid high-educated Additional earners are members of higher-income households. Because Primary earners partly also combine lower wages with higher incomes, some Additional earners operate with a Primary earner in the background who is also lower paid, while jointly their households rise to higher incomes.

Graph 10. Additional earners crossed with Primary earners by deciles of hourly earnings, by education of Additional earner, EU27avg, 2014



Reading note: The first wage decile comprises 4.9% of low-educated Additional earners of whom 3.5% earn a first-decile wage (graph 10A).

Explanatory notes: Hourly wages deciles concern all wage earners and are identical on both axes. Additional earners are second earners in Dual-earner households and second and third earners in Multiple-earner households. The educational level of Primary earners can be any of the three. Additional-earner numbers exceed Primary-earner numbers, on average by 21%. See also notes to graphs 1 and 2.

We have examined also the dimensions of gender, age and partnership in conjunction with educational attainment (not shown). This does not change the general picture of graph 8. The pattern of decrease over wages versus increase over incomes remains fully intact, and the high educated reach the highest concentration ratios for wages for all characteristics, including partners and partners split by gender. Again, the level of educational attainment makes little difference for the wage structure beyond the very fact of being Additional earners, confirming the household position as the main driver of the particular wage distribution, even when qualifications are the same. Thus, the better educated Additional earners with their elevated qualifications and mainly coming from higher-income households exert strong pressure on the low-wage labour market. The great majority of them are not youths but adults: 79% of

the middle educated and 94% of the high educated. Among them female partners account for 57% and 82% respectively.

Interrelated low-wage and high-wage trends

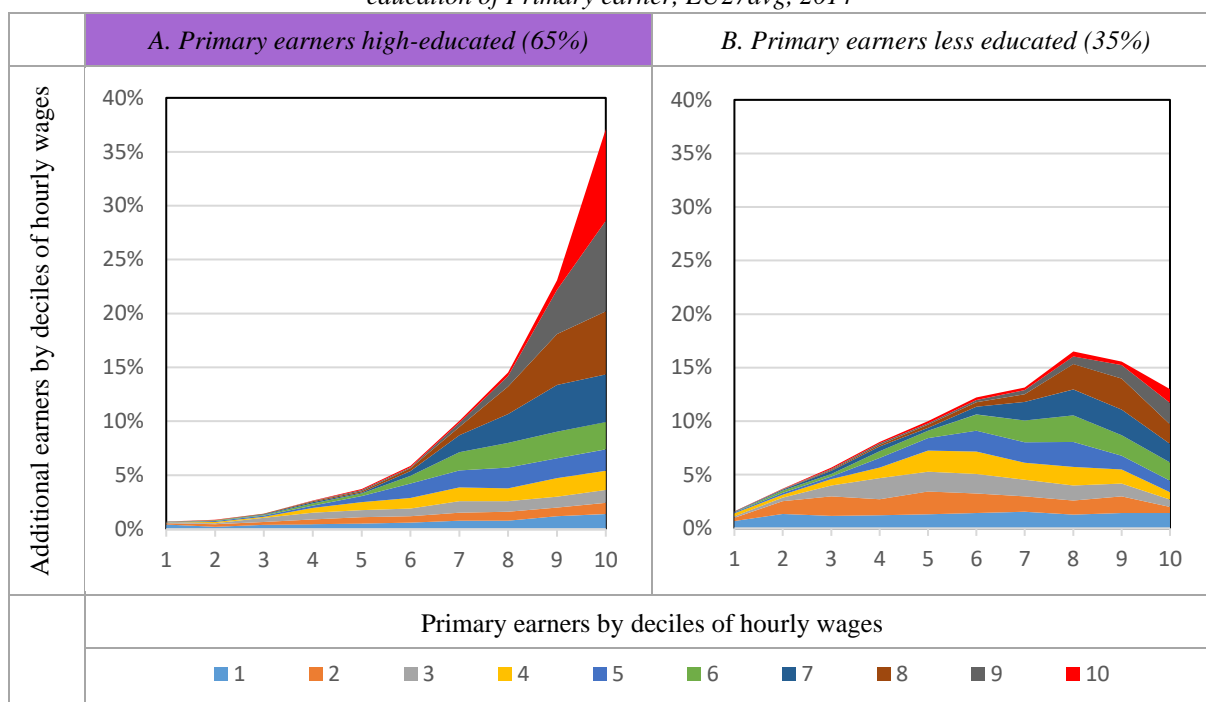
The above compares Primary and Additional earners by education independently of each other. Graph 10 puts the spotlight on their interrelationship, adding educational detail to the overall picture of graph 6A. Each graph shows how the own wage levels of Additional earners (with the specific education) combine with the corresponding Primary earners (with any education)²³, again in a 10x10 matrix. The precise combination depends significantly on the level of education. The low educated follow a rather normal distribution, reaching a top in the middle of the Primary-earner wage distribution, while the middle educated skew upward to deciles 7 – 9 and the high educated tilt strongly to Primary-earner top wages. The vast majority of Additional earners receive wages below those of the Primary earners: 74% among the high educated, 81% among both the middle and low educated. The largest fraction (40%) of all Additional earners combine their own lower wages with higher wages of corresponding Primary earners (south-east), albeit less among the high educated (32%) than the middle-educated (44%) or low-educated (41%). Only 28% combine higher pay on both sides (north-east), but here the high educated have a substantial advantage (52%), in strong contrast with the low educated (9%) and the middle educated (21%). Still, close to half (45%) of all high-educated Additional earners are lower paid – 13% of them in combination with lower-paid Primary earners (south-west) and one third with Primary earners who are higher paid (south-east). The remaining 3% (north-west) combine higher Additional pay with lower Primary pay.

Many more lower-paid Additional earners combine with Primary earners who are lower paid (29%) than who are on lower incomes (7%) while, conversely, many more combine lower pay with higher incomes (62%) than with higher pay of Primary earners (40%). Apparently, a substantial part of lower-paid Additional earners and lower-paid Primary earners manage to reach higher up the income distribution jointly, by combining their earnings. Almost half of all low-educated Additional earners and one third of the middle-educated ones share a household with a lower-paid Primary earner and still attain a higher household income. For the high educated this involves no more than 13% - they reach higher up already on the basis of their own pay.

The very top of the steep peak (graph 10C) indicates that 29% of high-educated Additional earners combine with top-wage Primary earners, many more than among the middle educated (12%) or the low educated (6%). Among high-educated Additional earners who also earn top wages a great majority (78%) combine with top-wage Primary earners. Conversely, among top-wage Primary earners only 21% of their corresponding Additional earners receive a top wage too. Apparently, if Additional earners are high paid then their Primary earners tend to be too, but not necessarily the other way around.

²³ Of Primary earners with top wages 73% are high educated but they are spread over the three graphs, which depend on Additional earners' education.

Graph 11. High-educated Additional earners crossed with Primary earners by deciles of hourly earnings, by education of Primary earner, EU27avg, 2014



Reading note: A.: The first wage decile comprises 6.7% of high-educated Additional earners with a high-educated Primary earner, 1.4% of whom with a top-decile Primary earner (graph 11A); similarly for graph 11B: 13.1% and 1.4%.

The spectacular top rests almost entirely on the portion of high-educated Additional earners who combine with Primary earners who are also high educated, as is shown by graph 11A in comparison to 11B where they combine with middle-educated and low-educated Primary earners taken together. The peak of the former graph (37%) exceeds that of graph 10C (33%) while the latter graph largely resembles graphs 10A and 10B for the low- and middle educated Additional earners. Of the high-educated Additional earners with top wages 84% combine with Primary earners who receive top wages too. Considered from the perspective of Additional earners not only is strong earner homogamy found among the high educated at the top, but there is also little else beyond that.

The findings support the idea of two different trends among high-educated Additional earners. One part is involved in significant competition at lower wages while another part strongly bundles high earnings at the top. The former trend joins the effects that are exerted by the low- and middle-educated Additional earners on inequalities in the access to and the competition in the labour market, with wider income inequality as an indirect result via wider labour-market inequalities. On balance, this may bring individuals with lower and higher annual and hourly earnings together in the same households and reduce inequality among the individuals involved in that combining process, but not between them and the other households (Salverda and Checchi, 2014). The second trend increases the particular household incomes relative to all other incomes and directly boosts income inequality.

There is good reason to think that those Additional earners, who expectedly are as qualified as other high- and middle-educated earners, occupy jobs at much lower wages and lower qualifications primarily as a result of their household position and not at all because of their individual educational attainment. This implies, that they supply labour to lower-level wage jobs that is better qualified compared to low-educated labour supply, for whom these jobs would seem suited and who are paid the same. Plausibly, those elevated qualifications may tilt low-wage job competition towards Additional earners, to the disadvantage of low-educated Single earners. The effects can be quantitatively significant as Additional earners with middle or high education who also belong to higher-income households take responsibility

for half of the total 35% of all earners who combine lower individual wage and higher household incomes. At the higher end of the distributions, however, we find a strong combination of high-paid Additional and Primary earners, far away from that low-wage segment of the labour market. Thus, the high educated Additional earners seem to harbour behaviours in two different directions, downward as well as upward towards the top of the wage distribution.²⁴

Building on this, the next section shifts the perspective to the labour market and seeks to answer the important question how these behaviours affect the workings of the labour market, in particular in the segment of low-wage employment on the one hand and of high-wage employment on the other.

5. The competitive effects of Additional earners in the labour market: Closing the circle

This complex interlinking of incomes and wages raises essential questions with regard to the relationship between income inequality and labour-market inequality. The operations of higher-income households in the low-wage labour market are unmistakable, but do they make a difference to job competition in that segment and thus affect labour-market inequality? They may make low-wage job opportunities less accessible and less attractive or less feasible for low-educated Single earners and lower-income households. First, to the extent that they increase labour supply relative to demand it may have a simple and general quantitative effect, irrespective of its specific nature, that diminishes individual low-skill employment chances. Increased supply can also pressurise the level of pay of the low-skill jobs and result in reduced earnings that may no longer provide a living wage for households that fully depend on those, while that would be no problem or less of a problem for the labour supply coming from higher-income more-earner households. Second, the effect may be qualitative, because the additional supply offers better educational qualifications for the jobs that outcompete the low educated, and/or because it originates from the household position of Additional earners who may be interested in fewer working hours to enable the combination of employment with other activities such as household care or participation in education. That may incite a shift towards part-time hours, especially when this would also be of interest to employers in the low-wage segment (e.g., Salverda, 2018, figure 3.3.A). Even if the level of (hourly) pay is not affected the jobs may no longer provide a living wage for individuals and households who fully depend on it. Any of these effects would mean that income inequality, which initially arises from the labour market, feeds back into that very labour market by effectively shifting employment toward higher-income households which would increase income inequality. It would create a vicious circle bolstering labour-market inequality, which in turn would again reinforce income inequality itself, and so on.

Next to this a direct but equally significant effect on income inequality may arise from the strong coincidence of high pay and high incomes in joint high-educated households, pointing to a concentration of the highest-paid jobs to the disadvantage of other households.

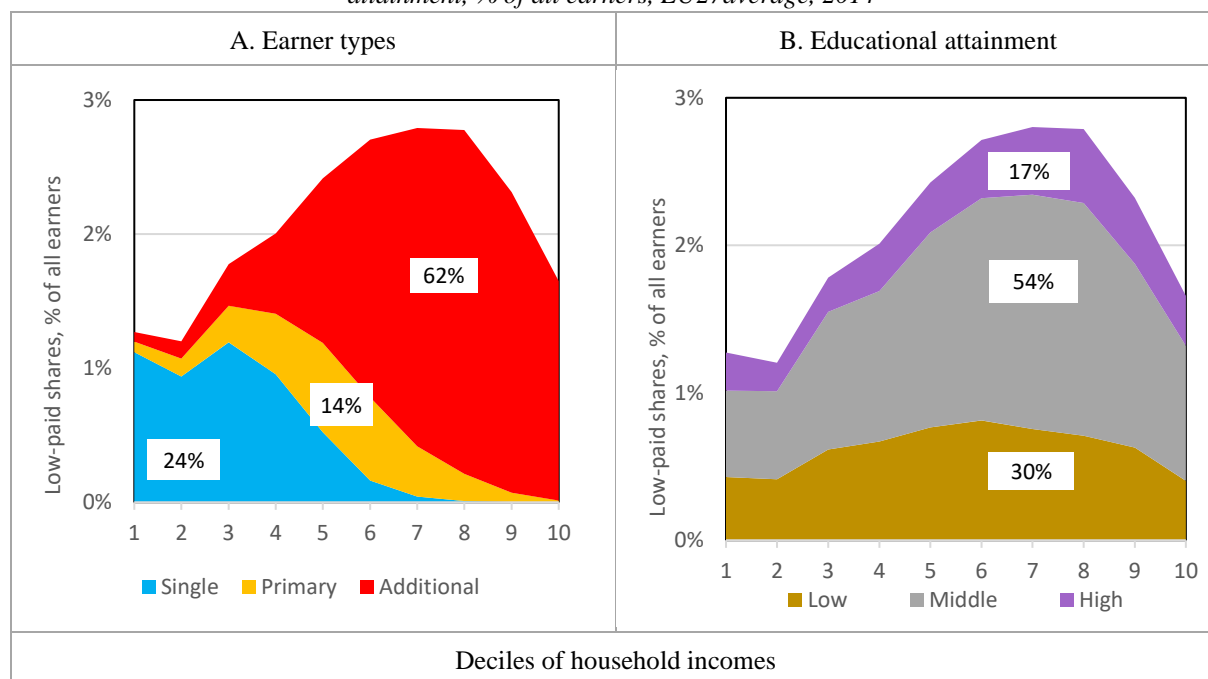
Obviously, this prompts a change of perspective: from the effects of wage contributions on income inequality to the opposite effects of incomes on wage inequality. Thereto we turn to the two specific segments of the labour market at both ends of the wage distribution: the much-discussed low-wage employment (LWE) and the less discussed but equally important high-wage employment (HWE), to fathom how the two effects work out.

²⁴ It may be a generational divide, but we do not discuss that here.

Low-wage employment

Low-wage employment is the segment of the labour market where low-skill jobs concentrate, which are found particularly in agriculture, retail trade and other consumer services. Politically important, it is the place where policy measures such as statutory minimum wages and social benefits meet, and where the debates on in-work poverty and living wages find their origin. We grasp low pay statistically by endorsing the common definition as all hourly wages below a threshold of two-thirds of the median hourly wage.²⁵ In the average EU country LWE roughly coincides with the wage deciles 1 and 2, which both spread over the entire income distribution in largely the same pattern (graph 3A). More precisely, LWE comprises 21% of all employees, a significant part of the lower half of the wage distribution.²⁶ The majority of the low paid appear to be members of higher-income households (12% out of 21%). The number of low-wage earners is actually larger at the top income-decile (1.7% of all earners) than at the bottom two income-deciles (1.2% each). The low paid receive 8% of total earnings (graph 3B), of which the majority (5% out of 8%) goes to those from higher-income households – again, with a larger share for the top income-decile (0.6%) compared to deciles 1 (0.3%) and 2 (0.4%).

Graph 12. Spread of LWE numbers over deciles of household incomes, by earner types and educational attainment, % of all earners, EU27 average, 2014



Reading note: Low-paid earners in the first income decile comprise 1.3% of all earners: 1.1% Single, 0.1% Primary and 0.1% Additional earners.

Additional earners have an overwhelming presence in LWE indeed, contributing a 63% majority of all low-wage earners (graph 12A). The incidence of low pay among them (33%) is well above the 21% average, lending them a 157% overrepresentation in the low-wage segment. This contrasts sharply with Primary earners' share of LWE (14%) and a LWE incidence only 9% that makes them as strongly *underrepresented* in low pay (42%) as the Additional earners are *overrepresented*. The two types are supplemented by Single earners who occupy a 24% share of LWE and are slightly underrepresented (87%). As they are all paid similar low wages, the picture is very similar for the earnings of LWE with only a small shift (3% to 4%) from Additional earners to Primary earners, who may work longer hours.

²⁵ [Earnings and wages - Wage levels - OECD Data](#). Also for the definition of high pay.

²⁶ LWE comprises 19% of working hours, implying shorter than average working hours.

Notably, low-paid Additional earners are strongly skewed to the right of the income distribution as their far majority (83%) is based in higher-income households, even though this lags somewhat behind the same share among all Additional earners (92%). Low-wage Primary earners occupy the middle of the income distribution with about a fifty-fifty split around the median. Single earners skew to the left and virtually all of them (96%) are from lower-income households. Clearly, Additional earners supply their low-wage labour largely from a much more favourable financial background compared to Single earners.

The role of the demographic characteristics among Additional LWE is in line with previous findings. Unsurprisingly, the share of women among LWE (61%) far exceeds that of men (39%), but as they have also a much larger share among all Additional earners, the incidence of low pay among those women (32%) remains actually just below that of men (35%). Both genders are equally often from higher income households (81%-83%). Youth make up 30% of the low-paid and do face a very high incidence (57%). They are slightly more often found in higher-income households (88%). A good half (54%) of the Additional low paid are partners, clearly less than among all Additional earners (71%). After deduction of youth this leaves 16% for non-partners.

Educational qualifications

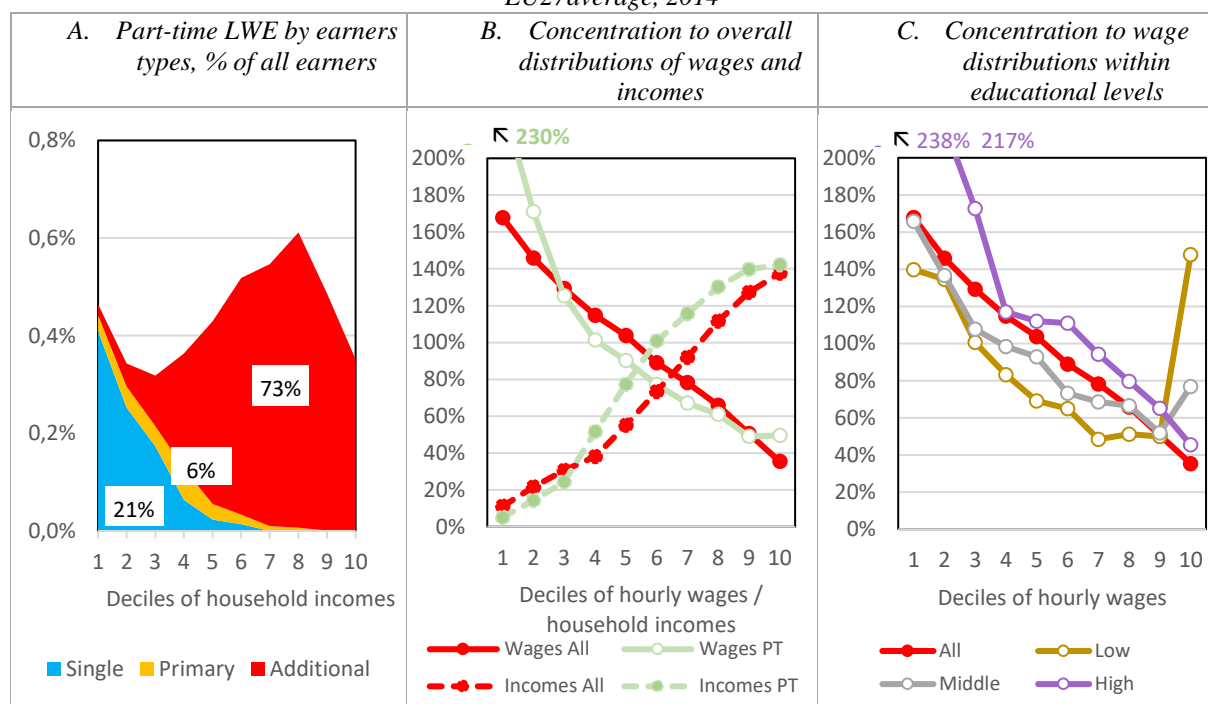
The prime characteristic to consider for evaluating the labour-market effects regards the qualifications that people bring to the job. The educational composition of LWE is shown in graph 12B. The low educated are a minority of only 30%, and LWE is certainly not their preserve. Instead, they face massive job competition from the middle and high educated. The middle educated occupy more than half (54%) of all LWE jobs and the high educated hold the rest (17%). The latter share is modest but still important. Notably, each of the three levels spans the entire width of LWE over the income distribution. Additional low-wage earners are less often (28%) low educated compared to Primary earners (33%) and Single earners (32%), and clearly more often (17%) high educated than Primary earners (13%). This provides them with better qualifications in the low-wage segment's job competition. At each of the three levels of education they reach higher up the income distribution than Primary and Single earners, particularly so at the highest level of education. The high educated also link to better-paid Primary earners, 60% of whom receive upper-half wages as against 50% for the middle educated and 42% for the low educated. Primary earners who combine with the high-educated Additional low paid are on average paid a full wage decile above those who combine with the low educated. So, the advance in qualifications of the Additional low-wage earners is further boosted by the better incomes of their households and the better wages of their household's Primary earners.

Part-time working hours

The working time of a job is an element of job competition that has gained traction with rise of the dual-earner world. Especially in the low-wage segment, earnings from part-time employment alone will fall short of providing a household with sufficient income for a living. However, in households where the earnings of the main earner provide sufficient income for a basic living part-time hours may offer members of the household the option of combining paid work with other activities, such as household care or participation in education.

Among all earners the incidence of part-time employment amounts to 18%; among all LWE earners it amounts to 25%.²⁷ It is significantly higher than average among Additional earners (30%) and lower among Primary earners (6%) and Single earners (15%). Additional earners supply the lion's share of all part-time earners (65%). As to educational attainment it is particularly higher for the high educated in LWE (25%), almost twice their average incidence. Among LWE the part-time incidence is significantly higher (28%), which makes them responsible for 5 percentage-points of the share of LWE among all earners (graph 13A). It implies that part-time employment is largely low paid while LWE is still mostly full-time. Additional earners have yet a higher share of 73% of all part-time low paid. It suggests that not only LWE in general but particularly LWE at shorter hours fits the interaction of these household members with the labour market. Again, the earner position in the household seems to be the deciding factor. The part-time employed show the by now familiar combination of a steep decline of their decile shares over the wage distribution with an equally steep increase over the income distribution. Part-time employment among Additional earners follows virtually the same patterns of wage and income concentration (graph 13B) as their demographics (graph 8). In particular, the important similarity between the three educational levels (graphs 13C compared to graphs 9D and 9H) indicates that it is a wide-spread process and supports again the idea that it has to do with the household situation.²⁸

Graph 13. Concentration ratios of part-time Additional earner numbers by wage and income deciles, EU27 average, 2014



Reading note: A.: The share of the first wage decile among part-time Additional earners equals 230% of the share among all earners. B: The share of the first decile among low-educated part-time Additional earners equals 140% of the share among all low-educated earners.

Part-time employment is particularly important for the LWE end of the wage distribution, where low-skill jobs amass on which the low educated depend primarily. The more these become part-time jobs, the more difficult it will be for the low educated to secure sufficient income from employment. As a result, they may either accept the restricted hours out of necessity and adapt their household behaviour or perhaps their household formation (Autor et al., 2017) or withdraw from the labour market altogether.

²⁷ Note that country differences for part-time employment can be substantial, especially between West and East, more so than differences for Additional earners or for levels of education. For caveats see Annex II.

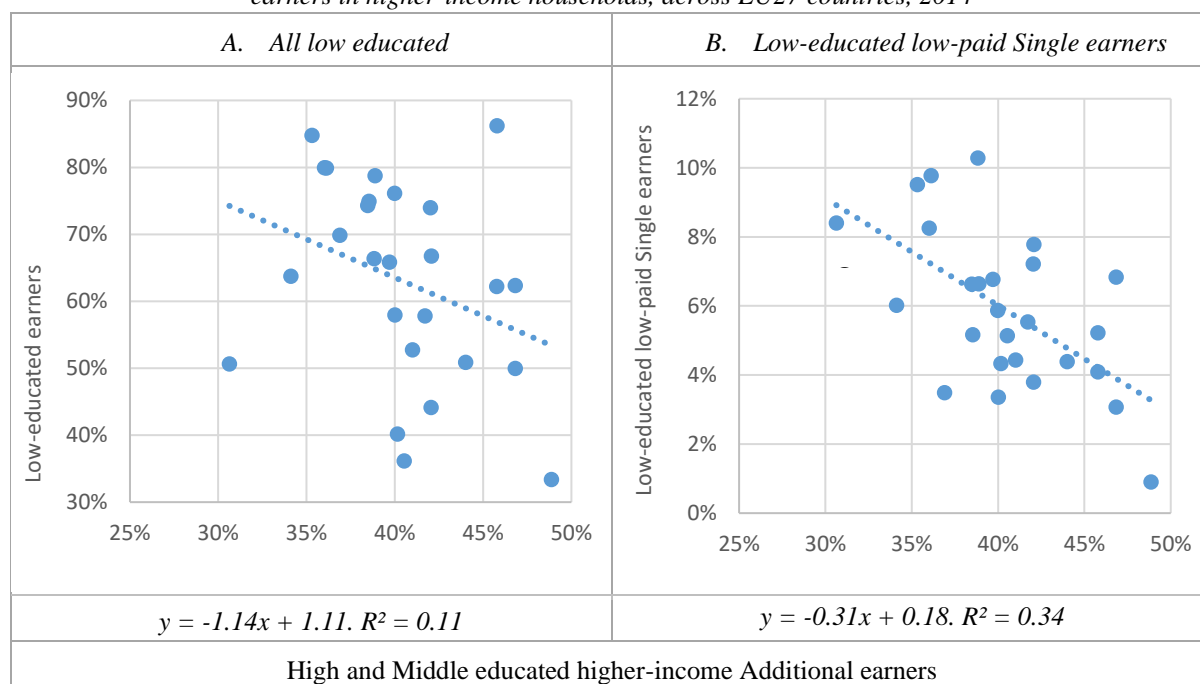
²⁸ Effects are different among part-time Primary earners. Their wage distribution goes up as before but their income distribution declines – unsurprisingly, as their hourly wages will correspond with less income.

In both cases their employment opportunities shrink. Evidently, we cannot say whether these outcomes for Additional earners are voluntary. Though it seems plausible that they might indeed often want to work shorter hours for the purpose of combining with other activities, we have no certainty about their preferences. It may effectively be a two-way process, where employers offer part-time jobs in the labour market primarily for low-paid and low-skill jobs, which generate insufficient income for those depending on it. As a consequence, these are increasingly picked up by the supply of labour from households already having a sufficient income. Thus, interested earners who prefer part-time employment may have little choice as to the kind of job type and the level of pay. Even so, it is clear that working time constitutes an important element of Additional-earner job competition that reinforces the fragmentation of such jobs into fewer hours of work and shrinks the availability of full-time opportunities the more the lower the level of pay is.

Employment competition in the low-wage segment

Because of both their better household incomes and the higher wages of their Primary earners Additional earners may be more inclined to seek jobs that are less demanding and remunerated and have compatible working hours. Because of their higher qualifications and their greater working-time flexibility, better educated Additional earners can be considered more attractive by employers compared to labour supply with lower skills

Graph 14. Employment chances of low educated depending on presence of middle and high educated Additional earners in higher-income households, across EU27 countries, 2014



Reading note: The employment/population ratio for low-educated earners relative to all low-educated person and divided by the overall employment ratio is regressed on the same ratio for middle- and high-educated Additional earners from households in income deciles 6 to 10 to all middle- and high-educated persons (graph 14A). Ibidem for low-educated Single earners with a low-wage job (graph 14B).

Explanatory notes: All for ages 15-64. Malta is excluded as youth are missing from population numbers.

with a strong need of working full-time to secure their living. As a result, there will be little or no need for them to compete individually on the level of pay, which may often also be difficult to square with obligations of equal treatment, fairness in the organisation, and stipulations of collective labour

agreements (and, in addition, difficult to scrutinise with the data we have at hand). In any case, the level of pay may become depressed to the advantage of employers because of the enhanced labour supply that Additional earners provide. Therefore, we leave pay aside and focus on the chances of finding employment for the persons who may be disadvantaged by this situation. Given the fact that we examine the data for a single year only, this is best done in cross-section between the 27 countries.

We look at the issue by comparing employment-to-population (EPOP) ratios of the low educated with those of the category that we singled out from the above as the prime channel of such competition: the medium- and high-educated Additional earners from households with incomes in the upper half of the income distribution. We take these EPOPs for the population (ages 15-64) of all low educated and all middle and high educated respectively. We control for the significant international differences in overall employment performance by taking these EPOPs relative to the aggregate EPOP of all earners. From the simple regression in graph 14A it appears indeed that more employment for better educated Additional earners goes together with less for the low educated. The effect is not overwhelming, with an R2 of 0.11, but it is there nevertheless. Graph 18B shows how this finding is significantly reinforced when we look for the effects where the low educated seem most at risk of the mechanism that we have sketched: Single earners employed in low-wage jobs (as percentage of the low-educated population). Here the antagonistic employment relationship is established substantially more convincingly (R2=0.34).

High-wage employment

High-wage employment (HWE) is found at the top end of the distribution. High levels of pay are receiving growing attention in analysis and policy debates. They are often identified with CEO pay²⁹ but the OECD's definition of HWE as all employment at wages in excess of a threshold of 1.5 times the median hourly wage (symmetrical to LWE) casts its net wider over employees. On this measure, the total HWE share of employment numbers amounts to 20%, which is virtually identical to wage deciles 9 and 10 in graph 3 and surprisingly similar in size to the share of LWE.³⁰ The HWE receive almost half (46%) of all earnings, more than twice the share of numbers and almost six times larger than the LWE earnings share. Obviously, this is due to the higher level of high pay but, importantly, also to longer working hours of HWE earners.³¹

HWE concentrates strongly in a few higher income deciles (graph 15A), in contrast to LWE which is spread over all incomes. High pay overlaps strongly with high incomes, while high incomes spread over all wage deciles. The two HWE income deciles 9 and 10 differ strongly from each other, showing a clear concentration of earners and earnings in the tenth income decile, which is again different from the mutually equal-sized income deciles 1 and 2 of LWE. So HWE in itself is much more skewed over the income distribution than LWE. The top decile comprises 50% of all HWE numbers, twice as much as the ninth decile (26%) while the other eight deciles obtain the remaining 24%. Those high-paid earners cover almost half of all top-decile earners, 10% out of 21% (compare graph 3A). The earnings of HWE are yet more skewed towards the top incomes (57%).

Primary earners are the predominant type of high-wage earners, as they make up 52% of all high paid and the incidence of high pay among them is 32%. This situation almost mirrors that of Additional earners in LWE (63% share, 30% incidence). Additional earners have a share of 18% of HWE and only

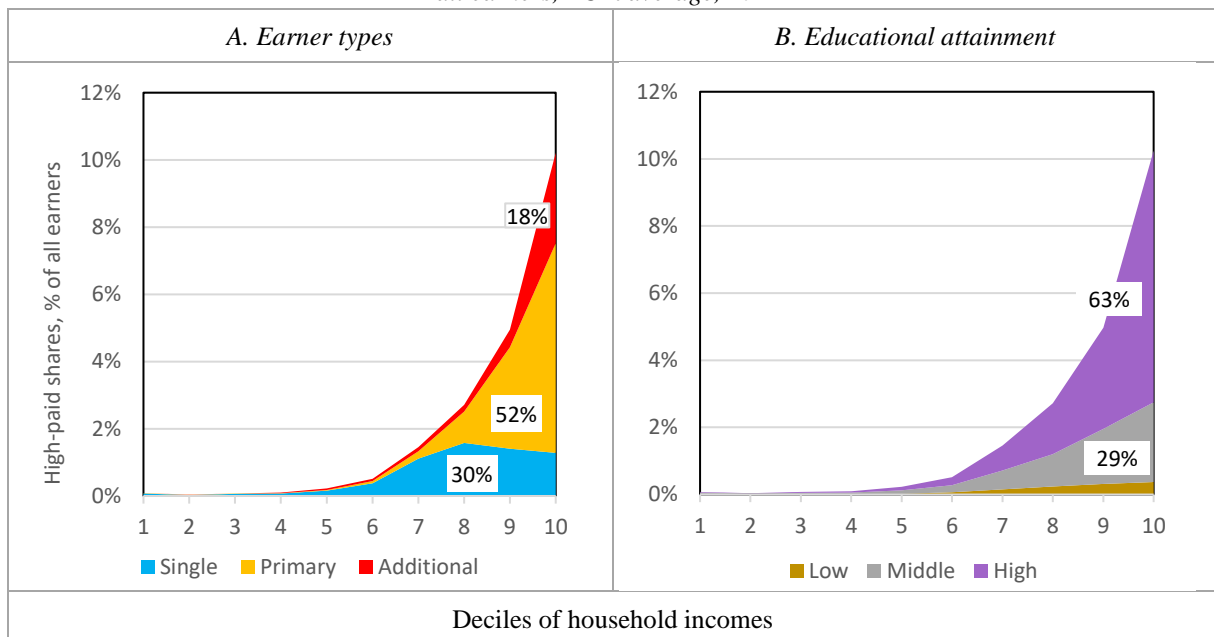
²⁹ See, e.g., Hargreaves et al., (2011).

³⁰ Note that OECD measures the incidence among full-time workers only. This leads to a gross underestimation of LWE (15%) but not of HWE (21%).

³¹ HWE comprises 21% of hours worked, implying a 14% longer average duration per person than for LWE.

9% of them are high paid (similarly, only 9% of Primary earners were low paid). Primary and Additional earners taken together make up the great mass (70%) of HWE. The earnings are comparably distributed over the two earner types (55%, 16%) – after all, these earners are all high paid. The tilt of HWE towards top incomes is much stronger than average for Additional earners for both earners (73%) and earnings (79%), and a bit stronger for Primary earners (59% and 65%) and much less for Single earners (21% and 29%). Apparently, though only 9% of all Additional earners are actually high paid, those who are pile up among the top incomes. Clearly, Additional and Primary earners bear major responsibility for the sharp peak at top incomes (compare graph 4) with a significant role for Additional earners. It underlines the second, direct mechanism of inequality that we have mentioned.

Graph 15. Spread of HWE over deciles of household incomes, by earner types and educational attainment, % of all earners, EU27 average, 2014



Reading note: A. Low-paid earners in the first income decile comprise 1.3% of all earners, and 30% of all low paid (graph 15A). 1.2% Low educated, 6.0% Middle educated and 13.2% High educated (graph 15B).

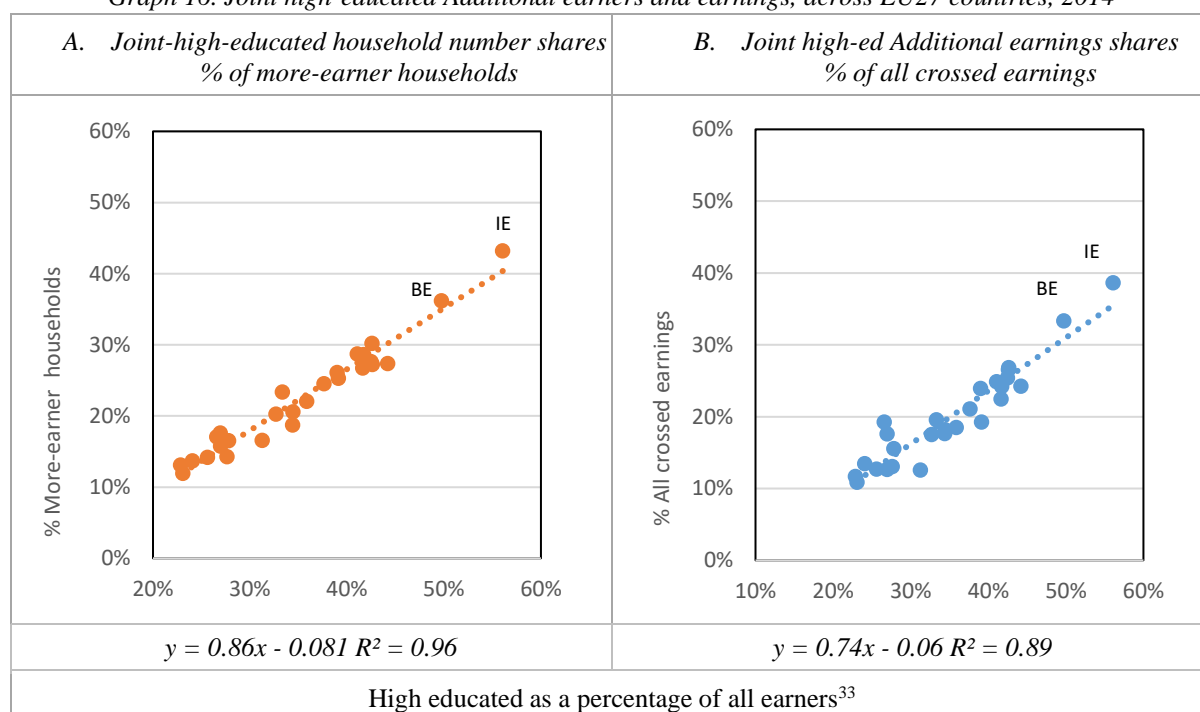
This can be further illuminated by looking at Primary and Additional earners no longer independently from each other but combined in the same households. Three quarters of high-paid Additional earners have corresponding Primary earners who are also high paid (graph 6A). Conversely, only one quarter of high-paid Primary earners are related to high-wage Additional earners. Additional earners play a crucial role in the occurrence of joint high pay in labour households.

The high educated account for the large majority (63%) of high-paid numbers (graph 15B), more than twice their overall share, while the low educated barely count (6%) and the middle educated (29%) are significantly underrepresented. This share of the high educated in HWE is somewhat higher for Additional earners (68%) and then also strongly tilted towards top incomes (80%). No less than 84% of these high-paid high-educated Additional earners share the household with a high-paid high-educated Primary earner (graph 11A). These homogamous high-paid *and* high-educated Additional earners account for 50% of total Additional earners' HWE, even though they make up only 5.3% of all Additional earners, or 2.1% of all earners. The corresponding number of Primary earners involved is somewhat smaller so in total close to 4% of all earners are involved in this category.

The perspective of growing high educated homogamy at the top

However sharply the mechanism of high-educated high-paid homogamy may already be operating, the effect on the overall distribution of incomes is still limited as they comprise only 4% of all earners. Nonetheless, time seems to be on its side. Its importance may be expected to increase, given the rapidly growing levels of tertiary educational attainment in most countries. Currently, there is substantial international variation in the levels of tertiary educational attainment obtained by all earners in labour households, running from 23%-24% in the Czech Republic, Italy and Portugal up to 50% in Belgium and 56% in Ireland.³² This may help us to speculate about future trends in the evolution and effects of such high-educated high-paid homogamy, as that shows also substantial variation.

Graph 16. Joint high-educated Additional earners and earnings, across EU27 countries, 2014



Reading note: The share of jointly high-educated-earner households among all more-earner households is regressed on the share of all high-educated earners among all earners (graph 16A).

There to graph 16A correlates countries' levels of tertiary attainment among all earners with the shares of the homogamy currently reached by more-earner labour households. The more a country's population is high educated, the higher the incidence of homogamy among the relevant households. A very steep trajectory is found which suggests that virtually all of the growth of tertiary attainment may go to households that already have a high-educated earner. Graph 16B points out the possible effects on the earnings distribution. Indeed, joint high educational attainment goes together with substantially larger shares of those high-educated Additional earners in all earnings that are received by the relevant households. The effect is again very substantial though slightly smaller than for the numbers, which seems to imply that not all of the added high educated will also be high paid.

³² Levels are largely compatible with employees 15-64 of the European Labour Force Survey.

³³ European Labour Force Survey data give somewhat smaller percentage of the high educated among employees aged 16-64 for Belgium and Ireland, and a much larger one for Luxembourg.

6. Conclusions and discussion

With a descriptive analysis we have scrutinised how the shift from a single-breadwinner world to a dual-earner one has fundamentally altered the relationship between individual wages earned in the labour market and incomes garnered by households on the basis of these wages. For the ease of presentation, the argument has focused on the average EU27 country, but the basics are surprisingly widely shared across the individual countries. A category of Additional earners in households has risen to prominence and become the largest group (40%) of all employees compared to Primary earners and Single earners. Additional earners act as the main vector of two new kinds of labour-market behaviour.

On the one side, it massively links higher household incomes with lower hourly wages. This spreads low-wage employment over the entire distribution of incomes, no longer restricting it to low-income households as in the single-breadwinner world. Simultaneously, it lends an overwhelming role in low-wage employment to individuals from higher-income households who take a greater interest in and also have more financial leeway for accepting jobs with reduced working times. These individuals come also with better (secondary and tertiary) qualifications and mount severe job competition to the low educated in general and the Single earners among them in particular, who face declining employment chances and insufficient generation of household income from labour-market activities. This first mechanism spurs a vicious circle of growing income inequality that feeds into increased labour market inequality by ousting the low educated from employment, which in turn again feeds into increased income inequality. Among the individuals directly involved, however, it may reduce income inequality as it brings together different levels of pay in one household.

On the other side, the rise of Additional earners increasingly brings high-educated earners together with each other in households. This concerns particularly the high-paid among them, who tend to dominate top incomes. Though the scale of this phenomenon is still modest in many countries, it can only become stronger with the relentless growth of tertiary educational attainment in the population. Most of that growth adds new high-educated earners to households that already have one. This second process tends to widen income inequality, by increasing the gap between this category of households and the rest.

The altered interdependence of the two inequalities has strong implications for wage formation and wage protection, but also for the role of education.³⁴ The implications are also complex, because the dual-earner world has progressed much more in the labour market: nowadays three quarters of all employees share a household with one or more other earners, than among households: still close to half of all households (45%) have one earner only, precisely because such a large proportion of earners cluster together into the majority of more-earner households (55%) with 2.2 earners on average. This situation necessitates a thorough re-evaluation of traditional policy making in these fields.

Wage formation and protection

Macroeconomically, the expanded labour supply of Additional earners to low-wage employment may in itself add downward pressure on low wages, reinforced by the fact that a considerable 33% of their supply is on a part-time basis. It is beyond the purpose of this contribution to estimate the size of these effects. Directly based on our argument is the observation that the household context of their supply likely affects the use and effects of traditional measures of wage formation, read collective agreements

³⁴ In addition, it may affect social protection and social support for households, e.g. with a concentration of unemployment benefits among higher incomes (on our data top-income labour households receive 16% of the gross amount), or a Matthew effect of childcare provisions (Pavolini and Van Lancker, 2018).

concluded between trade unions and employer associations, and wage protection, read government measures such as a statutory minimum wage. The ‘one-household-one-worker’ of the single-breadwinner world implied ‘one-worker-one-household’ at the same time. This made the income effects of wage formation transparent and understandable and gave a clear and interconnected meaning to the concepts of minimum pay and minimum income. This made it possible for the social partners and government policy to influence and limit income inequality by means of market incomes.³⁵

Nowadays, however, as Additional earners contribute two thirds of all low-wage employment that simple transparency has been lost. Low-paid jobs have spread widely and even become more important at the top of the income distribution than at the bottom. This has blunted the traditional instruments even though they may be needed more in the current hybrid world where Single earners, who count more for households than for earners, are faced with increasing pressure on the pay and working time of low-skill jobs. Almost one quarter of all households (9% single-earner and 15% more-earner ones) comprise one or more low-paid earners. Any general increase of low pay to the benefit of a living wage for those Single earners now carries strong deadweight costs as it will largely benefit higher-income more-earner households, sometimes two times over. It might diminish wage inequality but would at the same time sort the adverse effect of increasing income inequality. Clearly, the large and growing contribution of part-time jobs to Lowe only adds to the ineffectiveness as a part-time living wage is no living wage. It is important to also realise that due to the dominant role of Additional earners most low pay goes to higher-income households and leaves only a modest link between low pay and in-work poverty.³⁶ The new situation is much more complex and clearly demands addressing the two inequalities of wages and incomes simultaneously. Lessons for policy making are beyond this contribution but see Salverda (2021) for a discussion.

Education

The results show a highly significant contribution of the better educated to low-skill occupations, that low wages imply. Evidently, this largely overlaps with low-wage Additional earners: 70% of them are middle or high educated.

At the same time a significant part is played at the top end of the wage distribution by high-educated earners who join each other in households high up the income distribution, especially when both are also high paid. Top-income households comprise 21% of all earners, of whom 56% are high-educated, massively (50%) from more-earner households. Of those, in turn, 78% are jointly high educated, of whom, finally, 32% are also jointly high paid. However, many of the high-educated Primary earners are high paid while many of the high-educated Additional earners are not as they feed substantially into low-wage and middle-wage jobs. The joint high-paid high educated concern a fraction of only 2.7% of all earners, and, likely, receive 5.4% of all earnings. Nonetheless, high-educated homogamy plays a strikingly important role at the top, even if nationally their role is still modest.³⁷ Apparently, country differences suggest that the high educated do feed into HWE but at the same time also into Lowe, both in strong and significant ways (graph 17). Unsurprisingly, a split between Primary earners and Additional earners (not shown) indicates for Lowe equal and only slightly less significant roles for both,

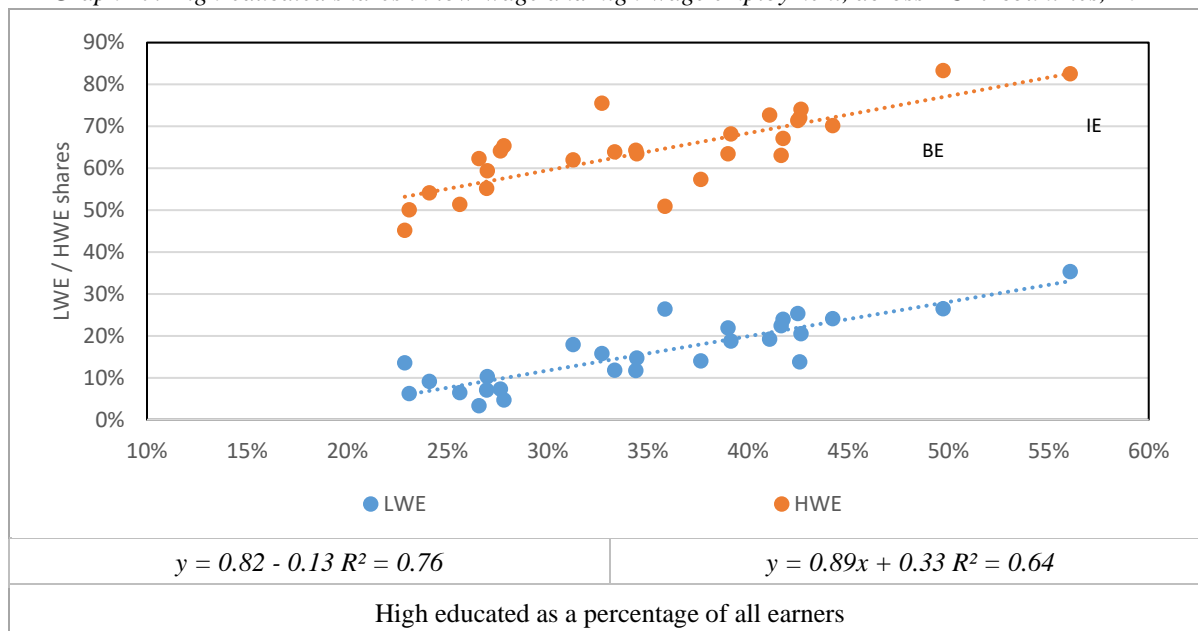
³⁵ For example, unions and employers in the Netherlands agreed in 1945 that the (full-time) wage should be sufficient at least for a low-skill worker in a larger city to maintain a family with two children (De Beer et al., 2017).

³⁶ In-work poverty being based on the size and composition of the worker’s household, a sizeable part of the workers involved may earn higher wages and have higher incomes, extending up to the 7th decile of gross incomes (Salverda, 2021, 532-535; Salverda, 2018; Gardiner and Millar, 2006).

³⁷ Their largest role in earnings (10%) is found in Cyprus.

a large one for Additional earners and a small one for Primary earners. The opposite holds for HWE, strong for Primary earners and weak for Additional earners, albeit with a lower significance (0.38 and 0.28). The aggregated picture of both types in graph 17 suggests some cumulative effect of the two types together.

Graph 17. High-educated shares in low-wage and high-wage employment, across EU27 countries, 2014



The first mechanism, of a clear presence of the best educated at the lower end of the wage distribution, casts important doubt on the principle of meritocracy that is behind the surge of tertiary education. This asserts that the talents that people nurture by improving their educational attainment will be used accordingly to the benefit of their own good as well as that of society. Instead, their talents appear to remain significantly underutilised in the labour market. One may surmise that the supply of adequate jobs – not even part-time – seems to be on the losing side in Tinbergen’s race, compared to the supply of personal talents. The country differences suggest that the growth of high-educated labour supply in countries with lower levels of tertiary attainment may continue to bifurcate for years to come. It is primarily an economic failure but at the same time also a moral failure. Even if they are adequately skilled for the low-wage jobs the less educated are increasingly ousted from employment and therewith from contributing to society, due to the competing supply of the better educated. The flip side of the economic failure for the better educated is the moral failure for the less educated, who have equally invested in the development of their talents.

By contrast, the second mechanism of growing homogamy at the top casts doubt primarily on the moral side of meritocracy because of its very economic success, as they may focus exclusively on the benefit to their own good while leaving society behind with a growing inequality of incomes (Wooldridge, 2021). They may also be hoarding (Reeves, 2017) the better paid jobs in their households to the disadvantage of other adequately high-skilled labour who would prefer to work part-time – remember that average working hours in high-wage employment exceed those in LWE by 14%. Note that the Primary earners with whom Additional earners join, on average already receive above-average earnings.

The two-pronged effect may throw light on the riddle that the development of assortative mating contributes little to changing income inequality (Erola and Kilpi-Jakonen, 2021). In view of the economic failure mentioned above it is too easily assumed that increased high-educated homogamy will be correspondingly better remunerated and therewith augment income inequality. Actually, the frequent combination of a low wage and a high wage in households with two high-educated earners will reduce inequality between the persons involved (Salverda and Checchi, 2014). Likely, it may also mitigate

inequality between this category and other households. By contrast, the joint high-paid high-educated and their households seem to run away from the rest, as the sharp peaks of top incomes (graph 2B) and top wages (graphs 3B and 5B) illustrate.

Let us conclude with a remark on causality first. The above draws a picture in aggregated categories without considering forces and causalities at work at the level of individual earners or their households. It remains to be studied how actual individual behaviour reflects constraints that people face (e.g., a lack of part-time high-skill jobs, or of childcare) or voluntary preferences (e.g., combining paid work and household care or education), and how such preferences are determined. The absence of causal relations extends to interlinkages between the aggregated categories (e.g., are low-skill Single earners constrained in their household formation and the shift towards a more-earner household) by the ousting of suitable low-skill partners with whom they can join? (Kearney and Wilson, 2017; Autor, Dorn and Hanson, 2017).³⁸

All in all, there is good reason to fear that the rise to dominance of Additional earners, the essential feature of present dual-earner world, is no free lunch but comes at a price paid by others, the low educated who are outcompeted on their own turf by better skills and flexible working hours. And that a small but likely growing part of dual earners hoard high-wage opportunities and contribute significantly to the eye-catching peaks of top wages and top incomes.

Finally, we stress as a caveat that the entire argument focuses on the working of the labour market and therefore relates to gross incomes and wages before redistribution. The latter may not only shrink the peaks at the top of the two distributions but also increase country differences.

³⁸ Note that these authors focus primarily on males in spite of the fact the lack of employment seems more severe for low-educated women (e.g. Salverda and Brals, 2016).

References

- Addison, J.T., L. Chen, and O. D. Ozturk (2020). Occupational Skill Mismatch: Differences by Gender and Cohort'. *ILR Review* 73.3, 730-767.
- Atkinson, A.B., and Thomas Piketty, eds (2007). *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English-Speaking Countries*. Oxford University Press
- Autor, D., D. Dorn, and G. Hanson (2017). "When Work Disappears: Manufacturing Decline and the Falling Marriage-Market Value of Men," NBER working paper 23173.
- Beer, P. de, W. Been and W. Salverda (2017). *The interplay between the minimum wage and collective bargaining in the Netherlands*. Working Paper 173. Amsterdam Institute for Advanced Labour Studies. <http://www.uva-aias.net/nl/working-papers/aias/2017/the-interplay-between-the-minimum-wage-and-collective-bargaining-in-the-netherlands>
- Erola, J., and E. Kilpi-Jakonen (2021). "The role of partnering and assortative mating for income inequality: The case of Finland 1991-2014." *Acta Sociologica*.
- Frank, R. (1978). "Why women earn less: The theory and estimation of differential overqualification." *American Economic Review* 68(3): 360–373.
- Gardiner, K. and Millar, J., 2006. "How low-paid employees avoid poverty: An analysis by family type and household structure." *Journal of Social Policy*, 35 (3), pp. 351-369.
- Goldin, C. (2021). *Career and Family. Women's century-long journey toward equity*. Princeton UP.
- Hargreaves, D. et al. (2011). *Cheques With Balances: Why tackling high pay is in the national interest*. Final report of the High Pay Commission. [Home • High Pay Centre](http://www.highpaycentre.org.uk/)
- Hartog, J. (1985). "Earnings Functions. Testing for the Demand Side." *Economics Letters* 19:281–285.
- Hartog, J. (2000). "Over-education and earnings: where are we, where should we go?" *Economics of Education Review* 19: 131–147.
- Kearney, M., and R. Wilson (2017). "Male Earnings, Marriageable Men, and Nonmarital Fertility: Evidence from the Fracking Boom." NBER Working Paper 23408
- Maitre, B., B. Nolan and C. Whelan (2012). Low Pay, In-Work Poverty and Economic Vulnerability: A Comparative Analysis using Eu-SILC. *The Manchester School* Vol 80 No. 1 99–116.
- Ozdemir, E., and T. Ward (2015). *The Characteristics of Workers on Low Wages*. Research Note 9/2015, Social Situation Monitor, European Commission.
- Pavolini, E., and W. Van Lancker (2018). "The Matthew effect in childcare use: a matter of policies or preferences?" *Journal of European Public Policy*, 25:6, 878-893, DOI: 10.1080/13501763.2017.1401108
- Reeves, R.V. (2017). *Dream Hoarders. How the American Upper Middle Class Is Leaving Everyone Else in the Dust, Why That Is a Problem, and What to Do About It*. Brookings Institution Press.
- Salverda, W. (2015). "Individual Earnings and Household Incomes: Mutually Reinforcing Inequalities?" *European Journal of Economics and Economic Policies*, 2015, 12:2, 190–203.
- Salverda, W. (2018). "Household income inequalities and labour market position in the European Union." *CES Ifo Forum*, 2018, June, 19:2, 35–43. <https://www.cesifo-group.de/DocDL/CESifo-Forum-2018-2-salverda-income%20inequality-june.pdf>
- Salverda, W. (2018). "Low earnings and their drivers in relation to in-work poverty." In H. Lohmann & I. Marx, eds. *Handbook of Research on In-Work Poverty*. Chapter 3, 26-49. Edward Elgar.
- Salverda, W. (2021). "Can the Europe Union maintain and improve income inequality?" In: G. Fischer and R. Strauss, eds. *Income, wealth, consumption, well-being and inequality in Europe*. Oxford University Press
- Salverda, W., and D. Brals (2016). "Opleiding, deeltijdarbeid en huishouden : meritocratie op de arbeidsmarkt sinds 1990." In: P. de Beer and M. van Pinxteren, eds. *Meritocratie. Op weg naar een nieuwe klassensamenleving?* Chapter 6, 135-164. Amsterdam University Press
- Salverda, W., and C. Haas (2014). "Earnings, Employment and Income Inequality." In: W. Salverda, B. Nolan, D. Checchi, I. Marx, A. McKnight, I. G. Tóth, and H. van de Werfhorst, editors. *Changing Inequalities in Rich Countries: Analytical and Comparative Perspectives*. Oxford University Press, Chapter 3, 49–81.

- Salverda, W., and D. Checchi (2014). “Labour-Market Institutions and the Dispersion of Wage Earnings”. In: A.B. Atkinson and F. Bourguignon, editors. *Handbook of Income Distribution*. Volume 2B, Chapter 18, 1535–1727. Handbooks in Economics, Elsevier/North Holland
- Wooldridge, A. (2021). *The Aristocracy of Talent. How meritocracy made the modern world*. Alan Lane.

Annex 1 Our approximation of missing hourly wages in SILC

Our examination starts from the distribution of annual earnings but lends a central role to the corresponding distribution of hourly wages for a proper analysis of the linkages to the labour market. Unfortunately, these wages are not directly observed in Eurostat's Statistics on Incomes and Living Conditions (SILC) – for our purpose the best dataset available for Europe. In principle, they can be estimated from the information on (weekly) working hours and (monthly) pay. In practice, however, this is complicated for two reasons. First, there is a notorious disconnection in SILC between the annual earnings information, which relates to the year preceding the time of the survey (2014 in this case), and the hours and monthly pay information, which relates to the time of the survey (some time in 2015). It is a known unknown whether between the two moments people have changed jobs, hours on the job, or level of remuneration. Second, as far as hourly wages can actually be determined the results are missing for a considerable fraction of all earners, 18% on average (table A1.1). Importantly, the missing values seem particularly biased against the part-time employed (up to 64%), the low educated (53%) and Additional earners (48%). This plausibly implies a significant bias against low levels of hourly pay – one of our two main interests – which results in a distorted picture of the distribution of hourly pay. Both problems should be mended as much as possible to draw a more reliable picture.

In this Annex we propose a way around the first problem and construct a simple method to solve the second. Though the results may have a quantitative margin of error we are confident that they are qualitatively robust, especially regarding the remarkable pay differences between Primary and Additional earners, which are at the core of our argument. Notably, we think that it is better to be imperfectly right than perfectly wrong. It would put the cart before the horse if all missing values were left out from the analysis, or all part-time workers as is often done. With this improved charting of hourly wages, which is scarcely researched, we aim to make an important contribution in its own right to the literature.

In both cases we make use of the fact that SILC aims to provide information for the population as a whole on household incomes and poverty in the preceding year for the benefit of European policy making on poverty. Because of this *raison d'être*, the dataset offers virtually complete coverage of annual incomes, including the sources of income such as wage earnings, and of demographics: age (15 years and over), gender, and household position of all individuals. On the demographic side SILC offers also a high coverage of individuals' educational attainment with less than 2% of missing values on average for the 27 countries (more drastically though for Poland (11%) and the UK (5%)).

For the first problem, SILC's basic asynchrony between the annual earnings (PY010G) asked for the year preceding the survey, and the (usual) hours worked (PL060) and full-time or part-time status (PL031) at the time that the survey is actually held. We bridge the gap by making use of the registration of people's job activities (PL211A – L) during each of the twelve months of the preceding year. The variable identifies people working as full-time or part-time employees. We select in accordance with the current self-defined full-time or part-time status (PL031) the corresponding number of months – choosing the most recent months in the year in case of change during the year. Multiplied to the corresponding number of weeks, we use this to divide the corresponding annual earnings to receive an estimate of weekly wages, which we then divide by the number of weekly hours usually worked (PL060) to arrive at an hourly wage that seems as consistent with the annual earnings as possible.³⁹

The second problem arises from this approach as the hourly wages determined on these assumptions show large white spots in their coverage compared to what we know about annual earnings (table A1.1). These shortcomings seem largely due to SILC's highly inadequate observation of (small) part-time hours,⁴⁰ which are often also low paid. As a result, we have complete information on earners by their type and their household income decile for annual earnings on the one hand and incomplete but equally

³⁹ Brandolini et al. (2017) use the same variables with PL043 and PL074 instead of PL2011, to construct full-year full-time equivalent wages but not hourly wages and not for individual countries but for EU as a whole instead.

⁴⁰ PL031 and PL060 have both 13% missings among labour household employees, PL211 has 6% missing among all respondents.

detailed information for the same in conjunction with hourly earnings. We fill the gap using as a single assumption that the detailed decile distributions of hourly earnings that we observe apply also to the missing hourly earnings. We build this up from the bottom utilising the spread of individual employees by 6 earner types which underlie the above distinction into three types, and by 10 household income deciles. This combines into 60 cells for each of which we then also know the dispersion over the ten hourly-wage deciles. Consequently, the numbers observed are augmented uniformly in all ten hourly-wage deciles using the fraction of the specific income decile as a whole that is missing for hourly wages in comparison with annual earnings. This build-up from the most detailed level accounts for the different spread of the absolute numbers of earners in general as well as by their type (graphs 1B and 2A) and the substantial variation in the rates of missing values (table A1.1, parts B and C combined).

This disaggregated approach offers a very nuanced method that does not impose any a priori condition regarding the level of pay in general or specific types of earners. Instead, it makes use of the established differences derived from the full information for the preceding year. Some aggregate effects are shown in graph A1.1 comparing to graphs 3A and 5A respectively. The correction shifts the distribution somewhat to the left, augmenting indeed the incidence of low pay, and it clearly affects the position of Additional earners. It should be stressed, however, that the main outcomes that we discussed above do not depend on the correction for the missing hourly wages. In all instances, the basic picture remains unchanged: the upwardly skewed distribution of earners, borne by Additional earners and Primary earners, the spread of low pay over the entire income distribution, and the complementary wage patterns of Primary and Additional earners.

Effectively, the correction brings the much stronger cross-country variation found on the basis of the observed hourly wages for the income deciles 1 to 4 (almost) down to the original one based on the annual earnings (Table A1.2). The small remaining differences reflect that numbers too small to observe cannot be corrected. The approach makes little difference to deciles 5 to 10 where numbers are large and the variation is much smaller anyway.

We proceed in the same fashion for each personal characteristic separately: gender (focused on women), age (focused on youths), and position in the household position (focused on partnership with main earner) and cross these with educational attainment which we consider an essential characteristic for household formation and labour market behaviour.⁴¹

⁴¹ For part-time employees the repair needs an additional step as the working-time status is also underreported in the annual data. We assume the part-time/full-time split of the missing values equals the one observed, again within each of the 60 cells. This may be an underestimation.

Table A1.1 Missing values for hourly wages, percentages of MLHH-earners by characteristics, 2014

	Total	A. Demographics							B. Earner types						C. Income deciles									
		Men	Women	Youths	Partners	Education			Single	Dual		Multiple			1	2	3	4	5	6	7	8	9	10
						low	middle	high		Primary	Second	Primary	Second	Other										
						<i>1e</i>	<i>2e1</i>	<i>2e2</i>	<i>3e1</i>	<i>3e2</i>	<i>3e3+</i>													
AT	-22%	-17%	-29%	-45%	-18%	-29%	-22%	-20%	15%	-10%	-36%	-8%	-18%	-51%	-64%	-41%	-32%	-20%	-19%	-22%	-19%	-22%	-19%	-21%
BE	-12%	-10%	-14%	-30%	-10%	-17%	-12%	-10%	12%	-6%	-16%	-7%	-9%	-29%	-60%	-49%	-36%	-19%	-16%	-12%	-14%	-11%	-10%	-9%
BG	-19%	-19%	-20%	-49%	-17%	-41%	-17%	-13%	15%	-8%	-27%	-9%	-20%	-46%	-74%	-58%	-39%	-23%	-21%	-21%	-17%	-17%	-16%	-13%
CY	-15%	-18%	-12%	-51%	-10%	-20%	-20%	-9%	8%	-6%	-23%	-4%	-11%	-51%	-26%	-23%	-25%	-15%	-20%	-14%	-17%	-12%	-13%	-12%
CZ	-8%	-6%	-11%	-31%	-6%	-25%	-7%	-8%	6%	-2%	-15%	-1%	-7%	-24%	-67%	-11%	-13%	-9%	-12%	-9%	-8%	-7%	-6%	-5%
DE	-15%	-12%	-18%	-34%	-13%	-20%	-15%	-14%	13%	-8%	-20%	-10%	-13%	-37%	-51%	-32%	-19%	-19%	-13%	-12%	-14%	-13%	-15%	-13%
DK	-33%	-26%	-40%	-72%	-27%	-50%	-32%	-26%	32%	-16%	-43%	-13%	-31%	-79%	-75%	-100%	-83%	-74%	-40%	-30%	-34%	-31%	-26%	-24%
EE	-20%	-21%	-20%	-47%	-19%	-27%	-20%	-17%	16%	-12%	-28%	-11%	-17%	-46%	-48%	-38%	-44%	-22%	-22%	-22%	-19%	-17%	-18%	-18%
EL	-10%	-9%	-10%	-22%	-8%	-15%	-10%	-7%	9%	-5%	-16%	-6%	-12%	-19%	-68%	-33%	-17%	-18%	-13%	-9%	-7%	-9%	-5%	-4%
ES	-27%	-27%	-27%	-65%	-24%	-35%	-30%	-20%	20%	-16%	-35%	-24%	-38%	-62%	-46%	-58%	-47%	-35%	-31%	-32%	-25%	-22%	-19%	-22%
FI	-25%	-27%	-24%	-62%	-21%	-53%	-26%	-15%	19%	-12%	-35%	-12%	-26%	-79%	-82%	-68%	-50%	-34%	-29%	-25%	-26%	-21%	-21%	-18%
FR	-21%	-21%	-21%	-48%	-17%	-28%	-23%	-15%	19%	-12%	-26%	-13%	-26%	-59%	-58%	-31%	-29%	-17%	-25%	-22%	-20%	-17%	-16%	-22%
HU	-16%	-16%	-15%	-29%	-15%	-31%	-16%	-8%	13%	-10%	-24%	-7%	-17%	-27%	-45%	-42%	-25%	-24%	-24%	-18%	-14%	-12%	-12%	-10%
IE	-9%	-9%	-9%	-23%	-7%	-11%	-14%	-6%	7%	-5%	-13%	-4%	-8%	-28%	-33%	-15%	-10%	-13%	-14%	-9%	-11%	-8%	-7%	-7%
IT	-18%	-16%	-20%	-49%	-15%	-23%	-17%	-12%	14%	-8%	-26%	-15%	-27%	-45%	-60%	-26%	-23%	-24%	-20%	-18%	-18%	-16%	-14%	-13%
LT	-17%	-18%	-15%	-48%	-12%	-39%	-18%	-9%	16%	-6%	-21%	-8%	-11%	-44%	-60%	-47%	-38%	-19%	-22%	-14%	-13%	-14%	-13%	-15%
LU	-13%	-11%	-15%	-18%	-13%	-13%	-12%	-14%	12%	-9%	-16%	-8%	-12%	-27%	-29%	-10%	-16%	-14%	-8%	-12%	-11%	-11%	-10%	-17%
LV	-25%	-24%	-25%	-53%	-21%	-38%	-23%	-16%	18%	-14%	-35%	-9%	-18%	-54%	-71%	-58%	-32%	-23%	-29%	-25%	-27%	-24%	-18%	-22%
MT	-19%	-17%	-22%	0%	-10%	-15%	-30%	-10%	9%	-5%	-25%	-4%	-15%	-56%	-57%	-24%	-28%	-22%	-23%	-21%	-20%	-16%	-17%	-17%
NL	-28%	-27%	-30%	-67%	-20%	-39%	-29%	-22%	24%	-18%	-30%	-13%	-28%	-73%	-70%	-39%	-27%	-33%	-24%	-27%	-23%	-26%	-27%	-29%
PL	-23%	-25%	-20%	-41%	-10%	-22%	-11%	-8%	18%	-17%	-25%	-26%	-28%	-41%	-48%	-25%	-23%	-21%	-20%	-21%	-21%	-23%	-23%	-24%
PT	-11%	-12%	-11%	-25%	-10%	-12%	-10%	-10%	11%	-7%	-14%	-8%	-15%	-25%	-35%	-26%	-17%	-17%	-16%	-12%	-9%	-8%	-10%	-9%
RO	-4%	-4%	-3%	-6%	-4%	-4%	-4%	-2%	5%	-3%	-3%	-3%	-3%	-7%	-60%	-32%	-11%	-5%	-1%	-4%	-4%	-3%	-3%	-3%
SE	-25%	-26%	-23%	-62%	-18%	-41%	-24%	-18%	23%	-14%	-27%	-16%	-23%	-76%	-68%	-55%	-33%	-32%	-25%	-24%	-21%	-20%	-19%	-25%
SI	-24%	-22%	-26%	-81%	-15%	-38%	-26%	-16%	14%	-7%	-31%	-6%	-23%	-73%	-76%	-47%	-29%	-26%	-28%	-27%	-22%	-22%	-23%	-21%
SK	-12%	-10%	-13%	-39%	-8%	-35%	-11%	-10%	6%	-5%	-16%	-6%	-10%	-27%	-45%	-24%	-11%	-6%	-13%	-9%	-11%	-13%	-11%	-12%
UK	-4%	-4%	-4%	-16%	-2%	-7%	-4%	-2%	3%	-2%	-4%	-1%	-3%	-14%	-11%	-5%	-6%	-5%	-5%	-4%	-4%	-3%	-4%	-3%
Av	-18%	-17%	-18%	-41%	-13%	-27%	-18%	-13%	-14%	-9%	-23%	-9%	-17%	-44%	-55%	-38%	-28%	-22%	-20%	-18%	-17%	-15%	-15%	-15%
<i>1e</i>	14%														51%	33%	22%	15%	11%	8%	8%	8%	9%	10%
<i>2e1</i>	9%														58%	41%	31%	21%	16%	11%	9%	7%	6%	7%
<i>2e2</i>	23%														71%	57%	60%	52%	46%	36%	28%	20%	16%	14%
<i>3e1</i>	9%														11%	14%	24%	24%	22%	16%	10%	9%	7%	9%
<i>3e2</i>	17%														11%	17%	30%	57%	47%	38%	32%	20%	14%	12%
<i>3e3+</i>	44%														11%	21%	36%	63%	70%	58%	59%	51%	45%	37%

Graph A1.1 Corrections to distribution of hourly wages, EU27 average, 2014

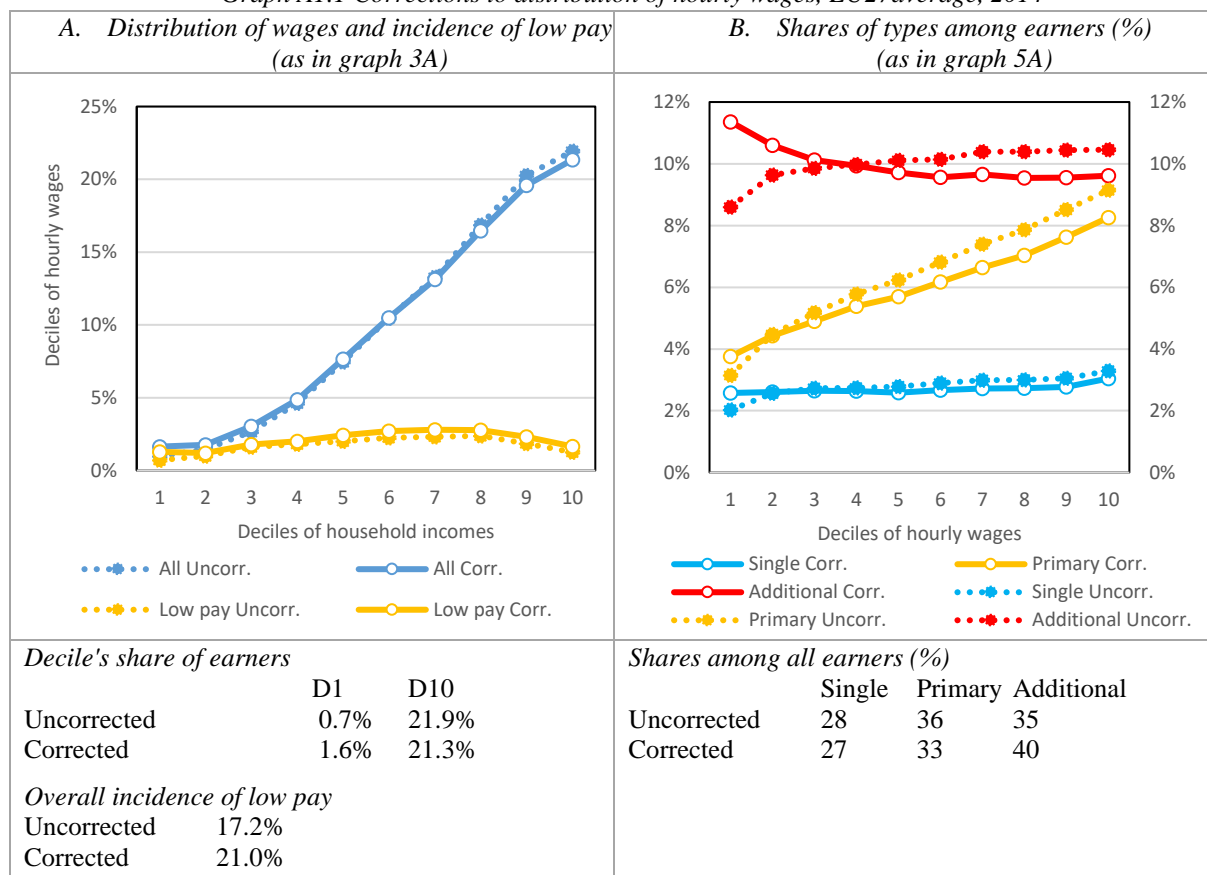


Table A1.2 Distribution of earners over the income deciles, Coefficients of variation across 27 countries

Deciles of income	of	Annual	Hourly	
			Uncorrected	Corrected
1		48%	70%	53%
2		69%	83%	71%
3		35%	41%	35%
4		23%	28%	23%
5		12%	13%	13%
6		10%	10%	10%
7		7%	7%	7%
8		7%	7%	7%
9		8%	8%	8%
10		11%	12%	11%

Annex 2 Variation across EU countries (2014)

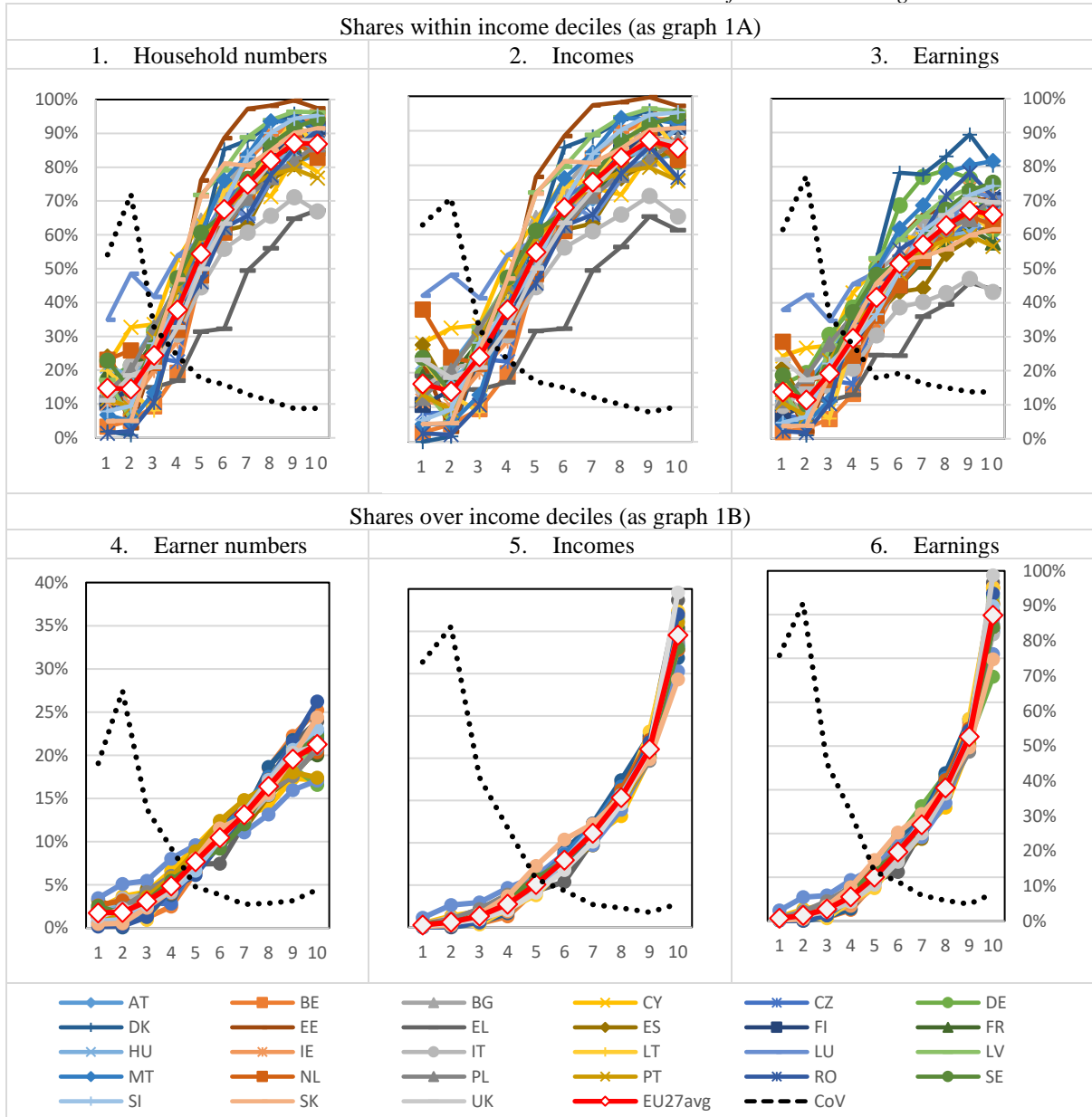
This annex presents some of the national outcomes to show that the EU27 averages utilised in the argument are qualitatively representative for all countries. They share the same mechanisms to modestly varying degrees. The most important graphs are replicated without further analysis or explanation of possible differences and similarities between countries. First incomes are considered, next hourly wages.

Household incomes

In all countries the incidence of labour household numbers and incomes within income deciles (graphs A2.1, 1-3) and wage earnings separately always lag behind incomes. Estonia beats the lot with 97% shares in numbers and incomes for deciles 7 to 10. This contrasts with clearly lower levels, around two thirds, higher up the distribution for Greece and Italy, while wage earnings in these two countries comprise less than half of all top-decile incomes. The two countries have much lower shares of labour households among all households (36% and 45% as against 54% on average). Especially, self-employed play a larger and plausible well-earning role. The strong declines in the coefficients of variation demonstrate that the cross-country similarity of patterns increases with income and concern the great majority of individual earners (78% or more are in deciles 5 to 10).

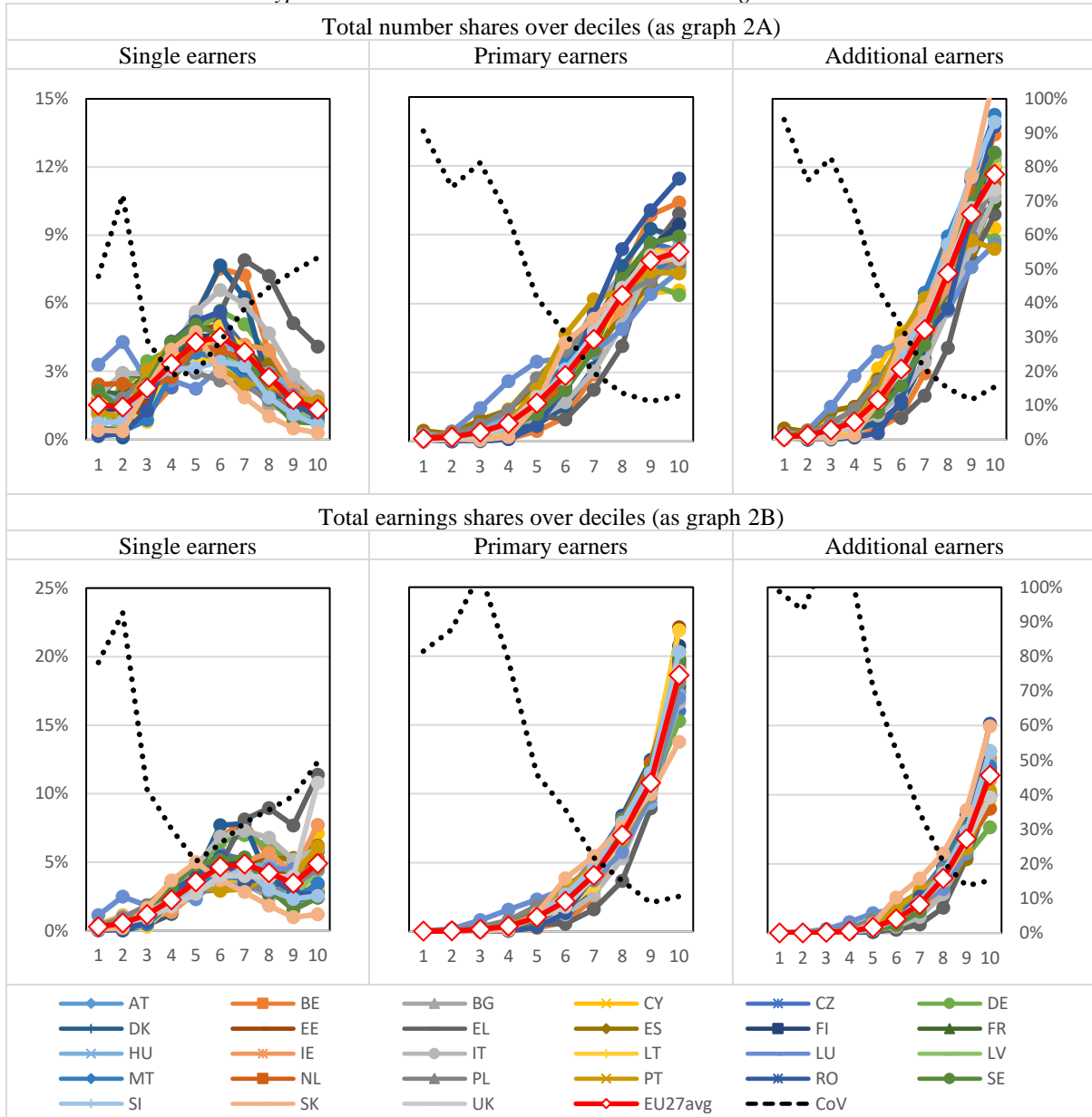
The national dispersions of individual earners *over* deciles (graphs A2.1, 4-6) share patterns that are even more comparable and, again, are much more similar higher up the distribution. Interestingly, the spread increases somewhat towards the top, but more for numbers than for incomes and earnings. Greece and Italy fit in with the rest. So, their labour households as a whole may deviate but among them trends are the same. Instead, Germany, Luxembourg, Poland and Portugal show somewhat lower numbers at the top. There is no clear case that certain countries deviate from the rest across the board.

A2.1 Labour households and their earners and the distribution of total household gross incomes



Note: CoV on right-hand axes.

A2.2 Earner types in Labour households and total household gross-incomes distribution



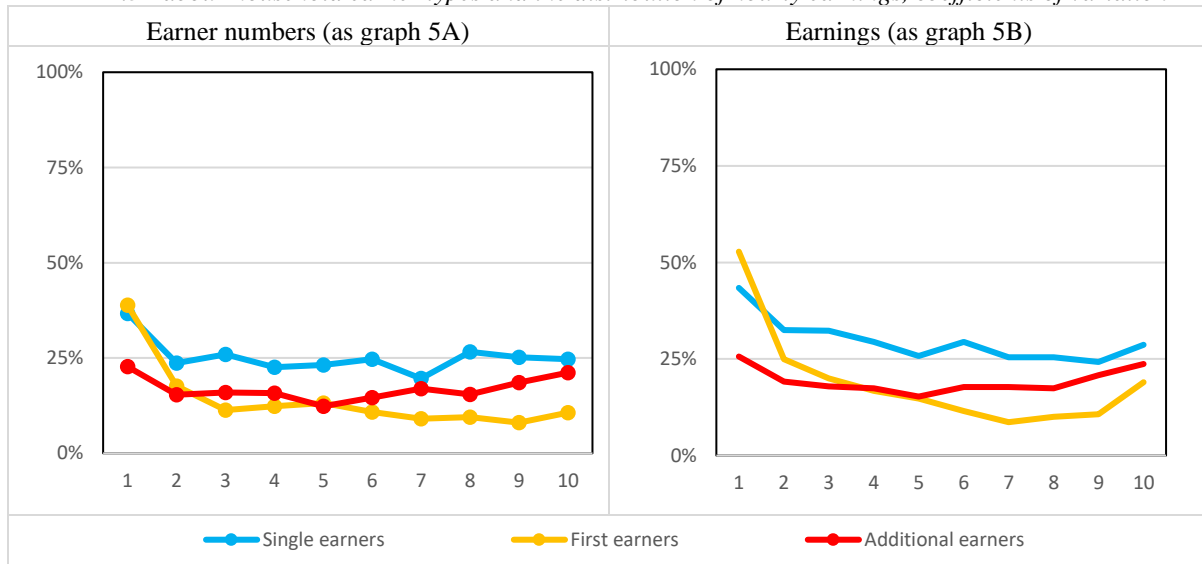
Note: CoV on right-hand axes.

Graph A2.2 breaks the dispersions down by the three main earner types, for their numbers and earnings respectively. All countries share the patterns depicted in graph 2. Among Single earners there is substantial variation higher up the distribution. This is to a large extent driven by the strong presence of Single earners at the top in Greece, amidst small numbers in the rest which cause more volatility like the low numbers found at the bottom, especially for Primary and Additional earners. Additional-earner shares in deciles 5 to 10 exceed Primary earners with the exception of Romania and, again, Greece, and their earnings always lag those of Primary earners.

Hourly wages

Graph A2.3 looks at the underlying situation of the distribution of hourly wages over the distribution of incomes as in graph 5, for numbers as well as earnings. For the ease of presentation only coefficients of variation are indicated. They are modest and mainly flat with the exception of the first and second decile, where the outcomes are more erratic because of estimation from small numbers of observations. The coefficients are generally somewhat larger for Single earners pointing to stronger country variation while the role of more-earner households is more comparable. The implication is that the situation of graph 5 is found in all 27 countries.

A2.3 Labour household earner types and the distribution of hourly earnings, coefficients of variation

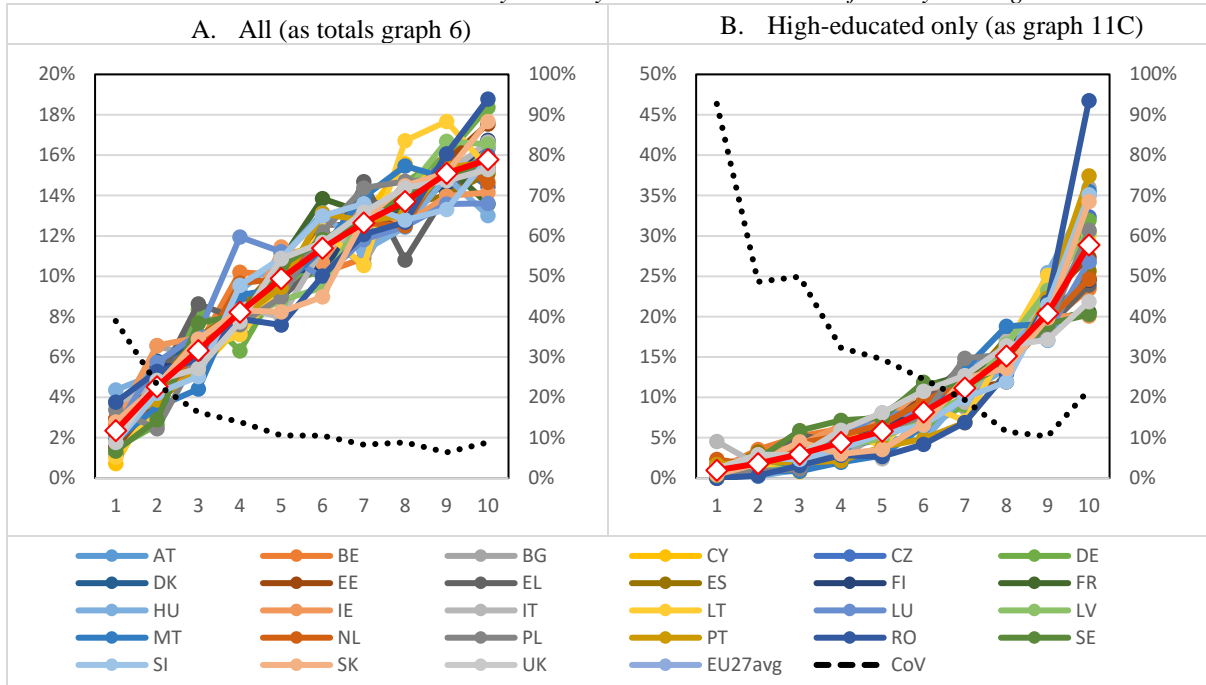


Graph A2.4 spells out how Additional earners relate to corresponding Primary earners over the deciles of hourly wages. It compares to the totals of graph 6 without the breakdown of Additional earners by their own wage deciles. All countries show the same trajectory with little variation. The same holds for the much steeper patterns followed by high-educated Additional earners in the combination with their Primary earners.

Next, graph A2.5 takes a look at the incidence of low-wage employment and high-wage employment in the individual countries. It shows considerable cross-country variation for the former, and remarkably little for the latter. Nonetheless, LWE always shows the broad spread over the entire distribution of incomes that we have found with a similar trajectory of increase and decrease and, in most countries, also a slightly higher incidence in the top decile compared to the bottom. Of all low paid substantial majorities are Additional earners, except in Hungary, Italy and Romania (half or slightly more) and Greece (40%). The high educated make up a significant share of the low paid in many countries, up to more than one third in Ireland and between one fifth and a quarter in Belgium, Cyprus, Estonia, France, Greece, Spain, Sweden and the UK.

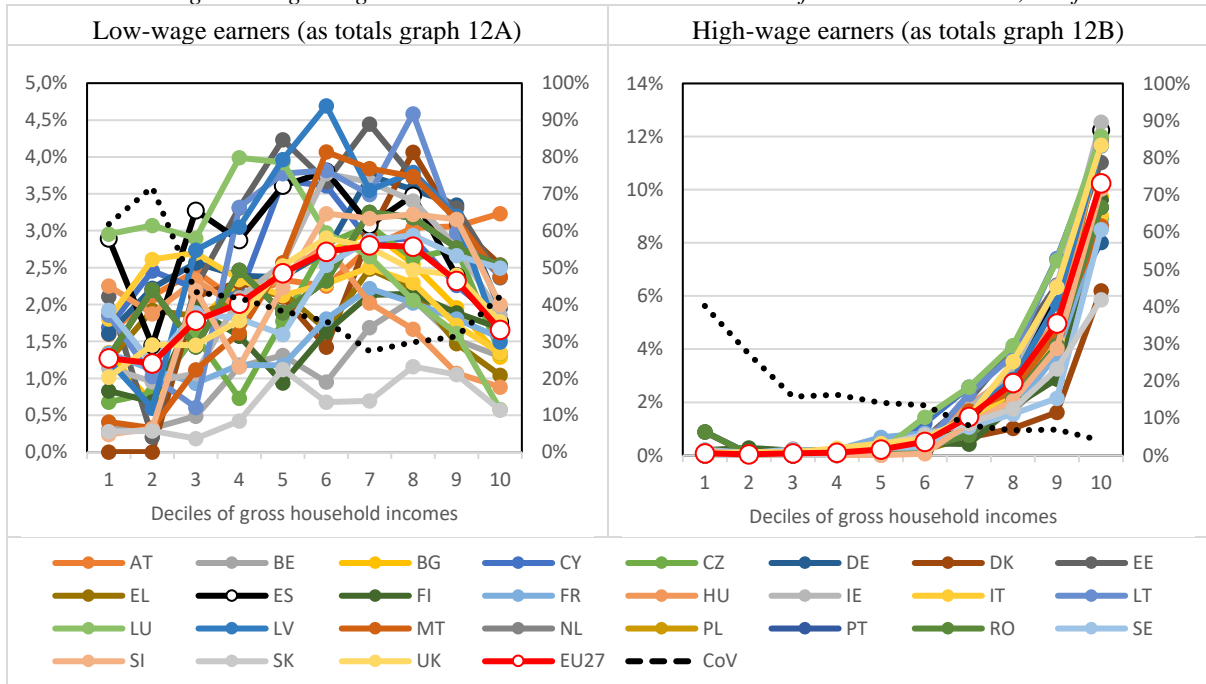
High-wage employment replicates the steep rise towards the top, albeit that the total incidence of HWE and the top share are comparatively lower in Denmark and Slovakia.

A2.4 Additional earners by Primary earners over deciles of hourly earnings



Note: CoV on right-hand axes.

A2.5 Low-wage and high-wage earner numbers over the distribution of household incomes, % of all earners.



Annex 3 Differences between Single earners in single-person and more-person households

In the presentation we have lumped all Single earners together regardless of the nature of their household, i.e., the number of persons contained: one or more. This can be justified by two reasons, certainly if we hardly analyse Single-earner behaviour but focus on the differences between Primary earners and Additional earners.

First, the correction for missing values across the countries is very similar for both (table A3.1), meaning little distortion to the EU27 average of the category as a whole. Note also that their rates of missing values are below average – and well below Additional earners (25%), which is understandable, as they will know best and will likely be more frequently the respondent to the survey.

Table A3.1 Missing values for hourly wages of Single earners by types of their households, % of earners in category

	All earners	Single earners	
		single person	more persons
AT	-22%	-16%	-13%
BE	-12%	-11%	-12%
BG	-19%	-13%	-16%
CY	-15%	-8%	-8%
CZ	-8%	-9%	-5%
DE	-15%	-13%	-13%
DK	-33%	-32%	-34%
EE	-20%	-14%	-18%
EL	-10%	-12%	-8%
ES	-27%	-21%	-20%
FI	-25%	-22%	-13%
FR	-21%	-19%	-18%
HU	-16%	-17%	-11%
IE	-9%	-5%	-7%
IT	-18%	-15%	-13%
LT	-17%	-17%	-15%
LU	-13%	-12%	-12%
LV	-25%	-18%	-18%
MT	-19%	-7%	-10%
NL	-28%	-25%	-22%
PL	-23%	-13%	-20%
PT	-11%	-12%	-11%
RO	-4%	-2%	-6%
SE	-25%	-25%	-18%
SI	-24%	-18%	-11%
SK	-12%	-6%	-7%
UK	-4%	-2%	-4%
Av	-18%	-14%	-13%

Certainly, some differences arise in the distributions of the two subcategories. Those from more-persons households have a stronger presence among higher incomes (A), particularly when they are high paid (D). One could speculate if the latter are more traditional as to having other earners in the household, while those on lower incomes and earnings may be more constrained in finding another earner to join them. The spread

of hourly wages is almost flat for both, except at the top decile (B). Those who are single persons and low paid concentrate somewhat more in lower incomes. This just adds more detail to the main argument and it could be kept in mind even though the percentage-point differences are rather small, never more than 0.6% of all earners. Generally, the split between single-person households and more-person households is reasonably even: 12 (single) and 15% (more) respectively for all earners (sub A and B), 11% and 12% for LWE (sub C.) and 12% and 18% for HWE (sub D.).

Graph A.3.1 Income and wage distributions of Single earners by types of their households (% of all earners)

