Gross Monthly Pay in the Austrian LFS

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Preliminary Notes

Since reference period 2009 the European Labour Force Surveys also provide information on the monthly income of employees with the objective to measure the effects of individual and labour market characteristics on monthly income. For the years 2009 to 2020 the decile order of the monthly take-home pay from the main job had to be calculated. Since 2021, the effective date of the IESS, the income variable was changed to the amount of the gross monthly pay from the main job. For Austria this amendment was not as challenging as the first implementation of the income in 2009, as the general procedure was not fundamentally changed, but only adjusted. Nevertheless, it brought several tasks with it. However, the change also fulfilled a long-standing wish of data users, especially from social and economic sciences, who have been asking for gross income for a long time – and of course wanted as long a time series as possible. Since some analysis require net income, the gross income does not replace but complement the net income. In other words, STATISTICS AUSTRIA provides now monthly net and gross income of employees for the reference years since 2009.

Definitions

Except for the inherent difference between gross and net income, i.e. the inclusion or exclusion of income tax and national insurance contributions, the new gross monthly pay is basically the same as the old monthly take-home pay when it comes to the components of the remuneration payed by an employer to an employee. According to the *EU Labour Force Survey Explanatory Notes (to be applied from 2021q1 onwards)* it includes regular overtime, extra compensation for shift work, seniority bonuses, regular travel allowances and per diem allowances, tips and commission and compensation for meals in cash. All payments received in the reference month plus the appropriate proportion of yearly or quarterly payments (like 13th month or holiday pay) should be included.

In Austria, the reference month is the month containing the reference week. Austrian employees are not legally entitled to holiday pay or Christmas remuneration, although most of them receive 13th and 14th month pay and one twelfth is added to the monthly income.

Data Source and Data Linking

Austria, with its register-based census (since 2011), has the legal basis, the corresponding data bases and the technical know-how to use administrative data for statistical purposes and STATISTICS AUSTRIA uses all this to create the income characteristics for the LFS and has been doing so since 2009. Crucial for the income variable are administrative data from the Federation of Social Insurances and the tax register. In both administrative data sources, the statistical units are employment relationships or pay slips, i.e. employment cases or jobs and not employed persons are included. Tax data comprise annual pay slips, i.e. the yearly gross income and information on annual income tax, annual social insurance contributions etcetera is included. Social insurance data comprise, amongst others, the start and end dates of a job – which is essential to identify the job(s) in a certain month and to calculate a correct monthly income from the annual income.

These data sets are linked together. All data linking is done using the branch-specific personal identification number for official statistics (bPIN-OS)[1]. In a first step tax and social insurance data are linked together, then - knowing which pay slip belongs to which job - in a second step the linked tax and social insurance data at the job level are linked to the person level LFS data. Finally, for each LFS employee who can be found in this administrative data, the main job and the appropriate monthly income in the reference month is identified and selected.

Over the years, about 90% of the LFS employees[2] of a quarter can be linked to the tax and social insurance data. For the remaining 10%, plus those with e.g. implausible income values – resulting in a good 12% in total – the monthly gross pay has to be estimated. Approximately half of the 10% that cannot be linked do not have a bPIN-OS and the other half do have a bPIN-OS but still cannot be found in the administrative data, e.g. because they work abroad.

Plausibility Checks and Imputation

Austrian tax register and social insurance data are of high quality, nevertheless for some persons LFS survey data and linked administrative data do not fit together very well. The reasons are manifold and it is not always possible to decide which information is correct. Often it is not even possible to decide whether one of them is wrong at all. Not everything that is unlikely or unreliable is a mistake. And of course, we do not want to intervene too much. The general strategy is the following: as the LFS data are well checked and consistent, they are always considered correct in case of inconsistencies with the administrative data. Only register incomes are removed and replaced by estimated values if necessary.

However, on the individual level it is often quite difficult to decide whether a certain income value is right or wrong, or rather whether the income (from administrative data) belongs to the job (from survey data). This applies especially for precarious employment relationships or in case of changes in the working life within the reference month, like a change of the job or even the employment status or changes of the working time. An accurate, efficient and automated plausibility check would need the implementation of a squillion of decision rules and in the end, there will still be individual cases where the rules do not work or do not lead to the right decision. Therefore, a rather simple routine is used[3], gross hourly incomes are computed, using the LFS information on the usually hours worked, and the lowest 0.4% and the highest 0.1% of them are deleted and treated as missing values.[4]

Whatever the circumstances are that lead to missing values, there are basically two different ways for imputation, depending on what information is available.

1) “Estimation” using random regression models. For different groups of employees (salaried earners, wage earners, civil servants, contract employees, apprentices) different regression models, i.e. using different independent variables, are used.
2) “Calculation” using net-to-gross and gross-to-net conversions. Special net-to-gross and gross-to-net calculators based on somewhat simplified rules for calculating payroll taxes and social security contributions have been developed.

[1] bPIN-OS is a pseudonym, it is generated by the Data Protection Commission and does not allow any conclusions to be drawn about individual persons. Using bPIN-OS, data linkage is performed without names, dates of birth or other personal information. (www.statistik.gv.at > About us > Surveys > Register-based census > Population census).
[2] without persons on parental leave and quasi freelancers, both are coded with Blank, i.e. incgross “not stated”.
[3] This applies to the net income, for the years 2009 to 2020, also.
[4] Furthermore, the largest 1% of all income values are not shown, but replaced by the median of this group.

Monthly (Take-Home) Pay and Gross Monthly Pay

Offering gross and net income bears the challenge, that on a macro as well as on a micro level both incomes should match. In most cases, when gross and net income come directly from administrative data, and the employment is not somehow atypical, gross and net income match well. Nevertheless, even in these cases there are uncertainties that have their origin in Austrian tax law. For example, tax relief (e.g. for commuters or sole earners) can in some cases be considered directly by the employer, or the claims are subsequently made by the employee directly to the tax authorities – and the procedure may change during the year. Gross income includes income tax and is therefore not affected by whether or not such tax benefits are already considered by the employer.

Technically speaking, gross and net income are computed using key figures directly from yearly pay slips, this gives yearly income, using the number of working days from the second administrative data source gives a daily income and a monthly income.

- Gross income: Gross = KZ210 – FIX
- Net income: Net = KZ210 – FIX – SI_{tot} + KZ226 – KZ260.
    - KZ210 … Gross income
    - FIX … tax free or with fixed rates taxed income (e.g. severance pay)
    - SI_{tot} … total social insurance contributions
    - KZ226 … social insurance contributions for FIX
    - KZ260 … income tax

Depending on the specific situation of available data for each person (pay slips from tax data, no pay slips but contribution base for the calculation of payroll tax from social insurance data[5], implausible (calculated) hourly gross wage rates, or no administrative data at all), final monthly gross and net income variables come either directly from administrative data, or are predicted values of a regression model plus a residuum, or are estimated using a net-to-gross or a gross-to-net conversions. Whenever gross monthly pay is imputed using the random regression model, net monthly pay comes from the gross-to-net conversion. This guarantees that a person's gross and net income match – at least from 2021 onwards.

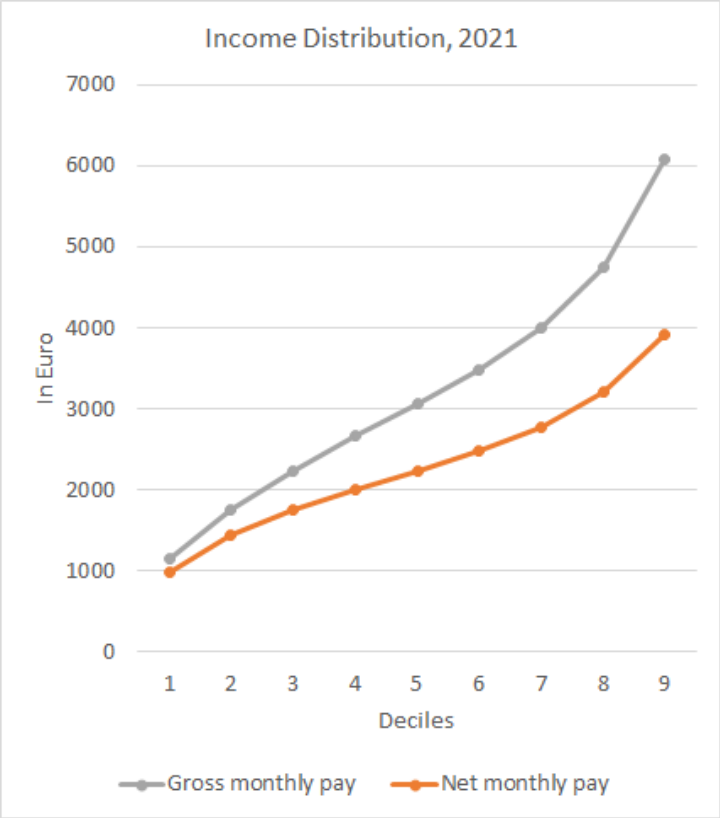
Back-Calculation and Results

In order to meet the wishes and needs of the users as much as possible, the gross monthly income has been added to all datasets from 2009 onwards. The existing net income 2009 to 2020 was not recalculated (according to the new proceeding) for external users, i.e. the retrospectively calculated gross income might not match the already published net income in every single case. For STATISTICS AUSTRIA internal purposes, net incomes were recalculated and they are used for quality checks.

In 2021 the median of the gross monthly income was 3 050 Euro (+83 Euro compared to 2020), the median of the net monthly income was 2 224 Euro (+42 Euro compared to 2020). The distributions, here the deciles, of gross and net monthly income are shown in Figure 1. This nicely illustrates the Austrian system of progressive taxation of income, i.e. the tax rate increases with rising income. The gap between gross and net income widens with the level of income.

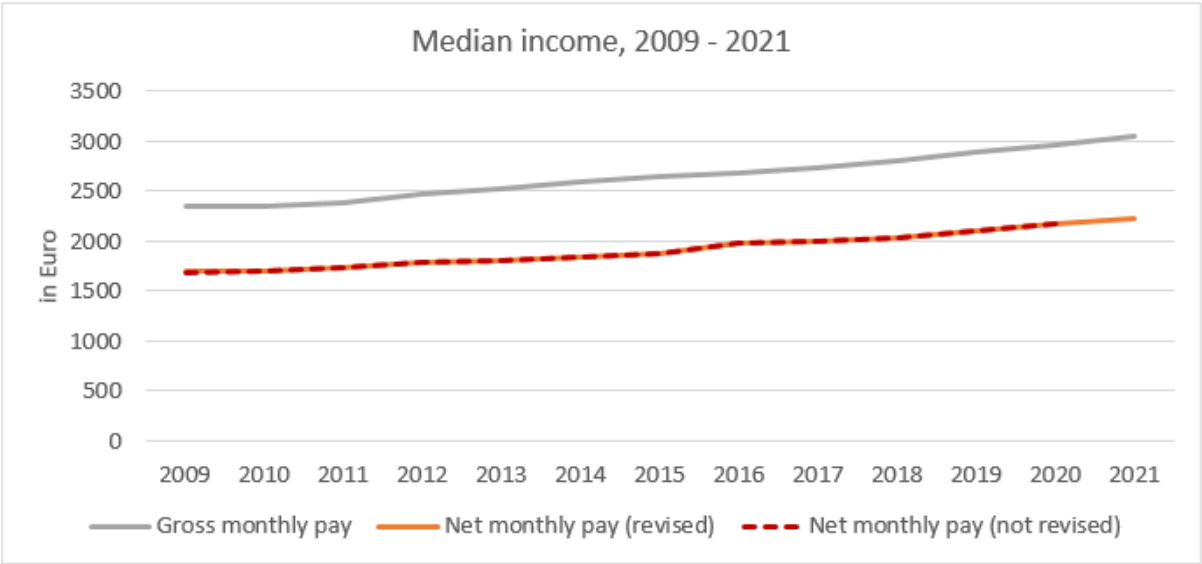
[5] If this contribution base is available and within a certain range, a net income can be computed using appropriate calculation formula.

Figure 1: Income distribution (deciles) gross monthly pay and net monthly pay, 2021.



The development of the median gross- and net monthly income over the years are shown in Figure 2. Income steadily increases over time. For the net income both versions are shown. Firstly, the net income based on the new mode of calculation. This one is used in the years 2009 to 2022 only for quality checks and not for publication. Secondly, the one that was calculated and published in recent years and was not revised when the IESS became law. The comparison of the two net income series shows that the old and the new calculation lead to very similar results and there is no discernible break in the time series when the changeover takes place in 2021.

Figure 2: Median gross and net income, 2009 – 2021.



Within the LFS data, the income results are plausible and consistent in both the cross-sectional and longitudinal dimensions. When compared with other sources, however, the differences can sometimes be quite noticeable. If one compares the income of the employees from the LFS with the figures from the General Income Report, the differences are sometimes several hundred euros – although here, too, wage slip data are the basis of the income calculation. If one looks at the whole thing in a more differentiated way and takes into account the conceptual differences, the results – where they are comparable – agree well.

Summary

The new legal requirements for income information in the LFS provided a good opportunity to offer more data and thus also meet users' needs. STATISTICS AUSTRIA has decided to continue with net income and to make gross income available for previous years as well. This allows users to select the more appropriate income characteristics, depending on the research question. For example, if one is interested in the actual purchasing power, the net income can be used. If, however, one wants to compare incomes before the state intervenes through taxes and duties, gross income can be used.

Of course, the LFS is still not the main source for income analysis – which is also not the aim – but due to the good quality of the administrative data and the gross and net income information derived from them and the linkage to LFS survey data, now STATISTICS AUSTRIA has even better data to offer researchers.

References

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