

16TH WORKSHOP ON LABOUR FORCE SURVEY METHODOLOGY

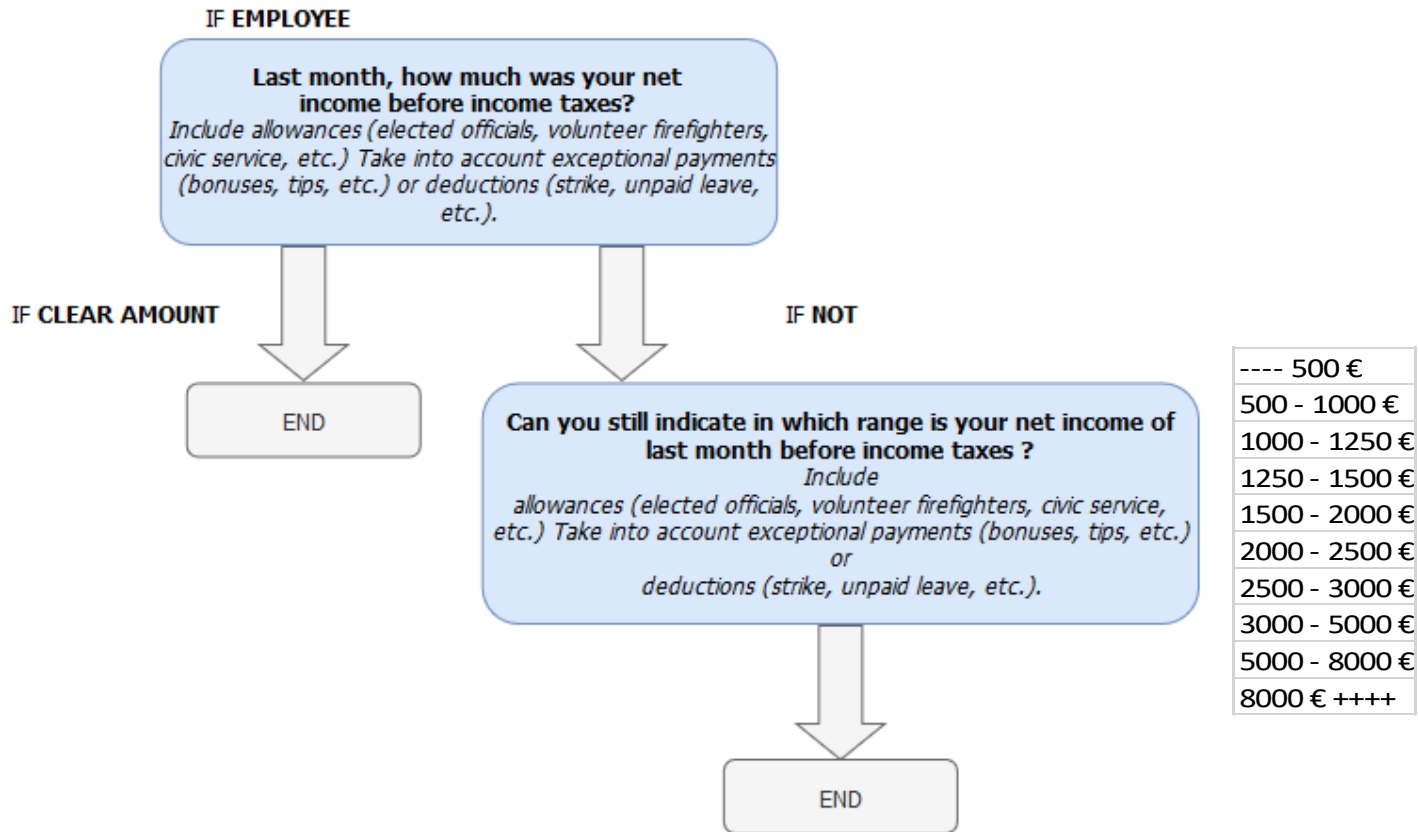
INCGROSS methodology, collection
and results



- 1 SURVEY : WHAT IS COLLECTED?**
- 2 NET INCOME IMPUTATION METHOD**
- 3 NET-TO-GROSS CONVERSION AND RESULTS**

01 SURVEY : WHAT IS COLLECTED?

FRENCH LFS : LAST MONTH'S NET INCOME IS COLLECTED...

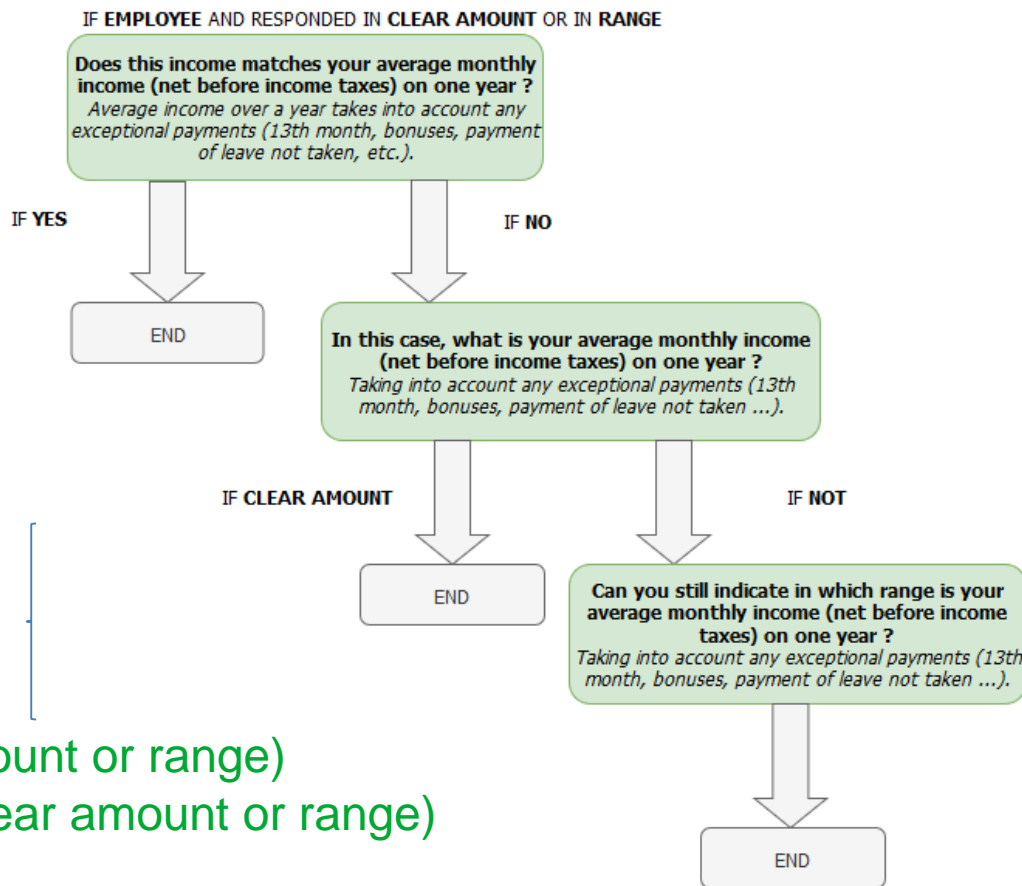


FRENCH LFS : ... CONSISTENT WITH AVERAGE MONTHLY NET INCOME

average monthly net income =
last month's net income

average monthly net
income

INCNET = last month's net income (clear amount or range)
or average monthly net income (clear amount or range)



AVERAGE MONTHLY NET INCOME VARIABLE

	2021
Clear amount	75 %
Range	16 %
Missing	8 %
Total	100 %

*Imputation is needed
because there is more than
5% of non-response and
there is response by range*

NON RESPONSE RATE IS LINKED TO THE TYPE OF CONTRACT...

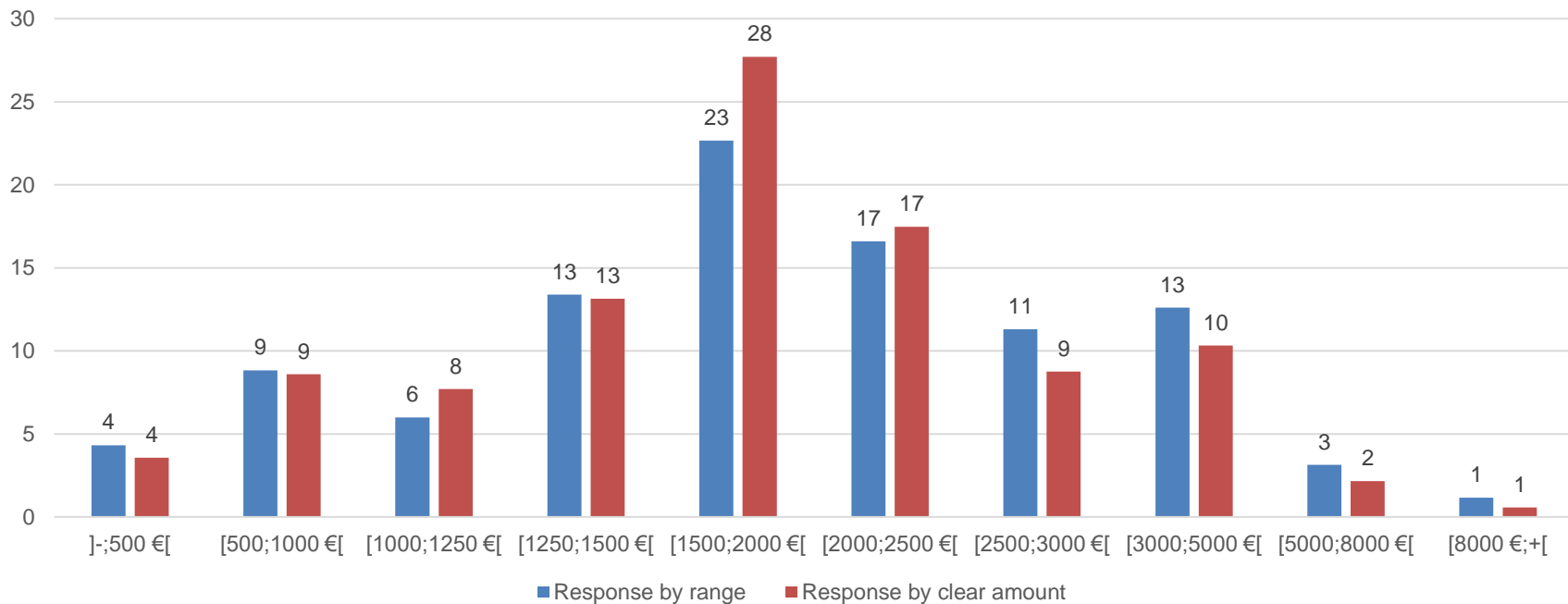
TYPE OF CONTRACT	Non response	By range	Clear amount	Total
Permanent contract, civil servant	7	16	76	100
Fixed-term contract	11	17	72	100
Temporary worker	19	19	62	100
Internship	7	15	78	100
Without contract nor internship	9	16	76	100
Total	8	16	75	100

More non-response for fixed-term contract and temporary workers

... BUT ALSO TO THE TYPE OF OCCUPATION

International Standard Classification of Occupations (ISCO)	Non response	By range	Clear amount	Total
Farmers and skilled workers in agriculture forestry and fishing	12	11	76	100
Plant and machine operators and assembly workers	10	13	77	100
Senior executives and managers	10	21	69	100
Administrative employees	8	16	77	100
Skilled trades in industry and crafts	8	14	78	100
Staff in direct services to individuals, traders and sellers	9	16	75	100
Elementary professions	9	15	75	100
Intellectual and scientific professions	8	19	74	100
Intermediate professions	7	16	76	100
Military professions	8	12	80	100
Total	8	17	75	100

REPARTITION OF RESPONDENTS BY CLEAR AMOUNT OR RANGE



02

NET INCOME IMPUTATION METHOD

FROM 2021 : REDESIGN OF THE SURVEY

– Questionnaire

- Only net amounts are collected
- Only one question which includes exceptional payments (13th months, bonuses, etc.)

– Why change the imputation method ?

- To simplify it : only on average monthly net income
- Reduce the processing time for a quarterly production

– Two types of net income imputation

- Multiple linear regression model for non-response
- Hot-deck imputation for response by income range

A. IMPUTATION OF NON-RESPONSE : MULTIPLE LINEAR REGRESSION MODEL

- 2 multiple linear regressions
 - Executive employees
 - Non-executive employees
- Explanatory variables relies on the imputation model of French SILC
 - Sex, age, residency, level of education
 - Seniority, number of hours usually worked, sector of economic activity, number of employees in the company, management tasks indicator
- Imputation of negatives incomes and outliers : 0.08% in 2021

B. IMPUTATION OF RESPONSE BY RANGE : RANDOM HOT-DECK METHOD

- Unweighted and with replacement
- Income range x French socio-professional category

Income range	Socio-professional category
]-;500 €[Non coded
[500;1000 €[Farmer operators
[1000;1250 €[Artisans, retail trader and managing director
[1250;1500 €[Executives and higher intellectual professions
[1500;2000 €[Intermediate professions
[2000;2500 €[Qualified employees
[2500;3000 €[Low qualified employees
[3000;5000 €[Qualified workers
[5000;8000 €[Low qualified workers
[8000 €;+[

- If no donor, the median value of the range is imputed : 0.05% in 2021

Figure : Distribution of income amount by type of imputation in 2021

Information on the amount of income	%
Clear amount	75,12
Clear amount outlier according to the model and imputed by the regression model	0,08
Range, imputed by the Hot-Deck method	16,44
Range, without donor, imputed by the median of the range	0,05
Non-response, imputed by the regression model	8,31
Total	100

Field : France except Mayotte, people living in ordinary housing, employees aged 15 or over, unweighted data.

Source : Insee, French LFS 2021.

03

NET-TO-GROSS CONVERSION METHOD AND RESULTS

NET-TO-GROSS CONVERSION METHOD : APPLICATION OF A RATIO

- Before 2021
 - Unique ratio : 80 %
- In France, social contributions depend on the status of the employee
- From 2021, application of ratios estimated by a micro-simulation model (INES) with a delay of one year
 - Apprentices : 100%
 - Permanent civil servants : 81,9%
 - Non-executive employees : 80,6%
 - Employees of the general executive scheme : 79,3%
 - Non-executive general scheme employees : 79,6%

$$Ratio = \frac{\text{Net income}}{\text{Gross income}}$$

NET-TO-GROSS CONVERSION AND RESULTS

Figure : Distribution of final INCGROSS variable according to whether the amount has been collected in clear amount or imputed by regression or by Hot-Deck, by group

Net to gross conversion group	INCGROSS	Number	D1	Q1	Median	Q3	D9	Mean
Apprentices	Clear amount	552	437	660	836	1 100	1 400	891
	Imputed by regression	51	674	759	906	1 014	1 144	933
	Imputed by Hotdeck	103	500	669	816	1 063	1 300	889
	Imputed (regression + Hotdeck)	154	600	700	861	1 014	1 295	904
	Final (clear amount + imputed)	706	470	668	843	1 080	1 350	894
Permanent civil servants	Clear amount	2 986	1 707	2 073	2 490	3 048	3 902	2 735
	Imputed by regression	239	1 647	1 963	2 270	2 839	3 853	2 539
	Imputed by Hotdeck	628	1 707	2 028	2 536	3 292	4 024	2 824
	Imputed (regression + Hotdeck)	867	1 707	2 012	2 439	3 170	4 024	2 746
	Final (clear amount + imputed)	3 853	1 707	2 057	2 463	3 058	3 902	2 737
Non-permanent civil servants	Clear amount	1 206	773	1 239	1 858	2 391	3 345	2 024
	Imputed by regression	103	930	1 242	1 790	2 392	2 904	1 888
	Imputed by Hotdeck	233	718	1 088	1 734	2 354	3 221	1 901
	Imputed (regression + Hotdeck)	336	743	1 115	1 757	2 373	3 122	1 897
	Final (clear amount + imputed)	1 542	768	1 239	1 832	2 391	3 283	1 996
Private executives	Clear amount	2 535	2 480	2 993	3 786	4 921	6 309	4 257
	Imputed by regression	310	2 309	2 972	3 895	4 781	5 598	3 938
	Imputed by Hotdeck	779	2 524	3 092	3 786	5 048	7 193	4 399
	Imputed (regression + Hotdeck)	1 089	2 482	3 029	3 786	5 048	6 366	4 268
	Final (clear amount + imputed)	3 624	2 482	3 027	3 786	5 041	6 309	4 260
Non-executive private sector employees	Clear amount	10 009	1 005	1 583	2 010	2 513	3 016	2 059
	Imputed by regression	1 165	981	1 468	1 909	2 320	2 744	1 905
	Imputed by Hotdeck	2 033	880	1 571	1 960	2 513	3 141	2 075
	Imputed (regression + Hotdeck)	3 198	922	1 524	1 940	2 450	3 016	2 013
	Final (clear amount + imputed)	13 207	1 005	1 571	1 985	2 496	3 016	2 048
Total	Clear amount	17 288	1 016	1 642	2 183	2 894	3 980	2 458
	Imputed by regression	1 868	1 019	1 563	2 090	2 715	3 983	2 296
	Imputed by Hotdeck	3 776	999	1 684	2 262	3 155	4 417	2 636
	Imputed (regression + Hotdeck)	5 644	1 005	1 634	2 195	3 048	4 286	2 524
	Final (clear amount + imputed)	22 932	1 005	1 634	2 192	2 926	4 038	2 474

Field : France except Mayotte, people living in ordinary housing, employees aged 15 or over, unweighted data.

Source : Insee, French LFS 2021.

CONCLUSION

- The method meets production constraints
 - No long calculation times
 - INCGROSS variable closest to the collected data in the French LFS
- Not the reference source on income for data exploitation
- In the long term, we plan to initiate work on the pairing of French LFS with administrative sources

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