



Flow statistics

**Work towards longitudinal analyses
based on the LFS**

Frank.Espelage@ec.europa.eu

Hannah.Kiiver@ec.europa.eu



Labour Force Survey data and flows

The LFS is by design a cross-sectional household sample survey

Most countries (exception: DE, BE, LU) collect data using rotational sampling designs leading to quarterly and annual overlap

→ Potential to exploit overlap and produce rich longitudinal data





Policy interest (DG Employment, ECB)

Labour market status transitions

Transitions education – labour market

Transitions NEET – employment

Job-to-job mobility

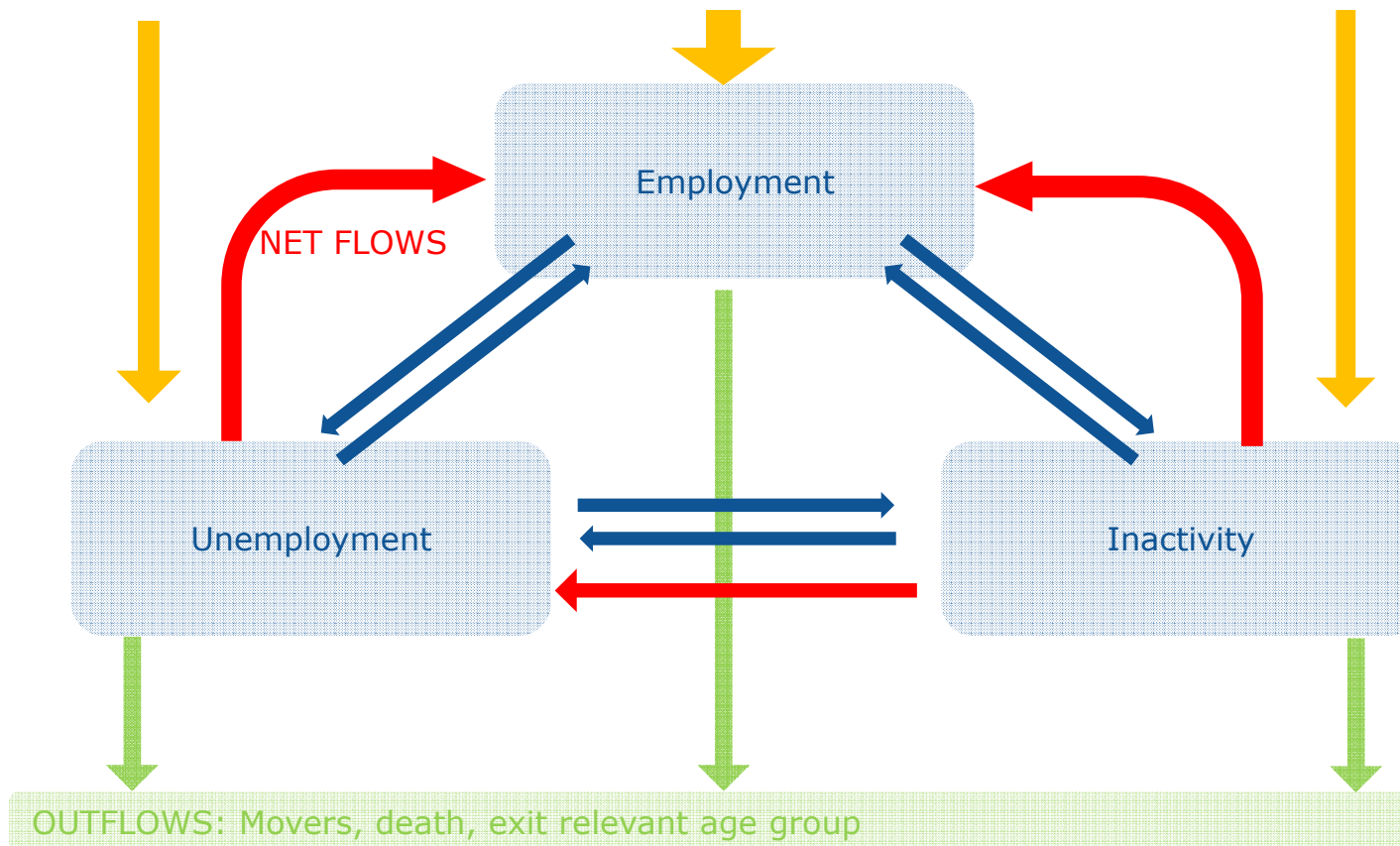
Who moves where?

Breakdown by sex, age, education, unemployment duration, type of contract,...



| First step: basic issues flow indicators | Second step: improve indicators, longitudinal micro-data |
|--|--|
| Decide on longitudinal population | Longitudinal data checks |
| Methodology for longitudinal weights - ILO status | Longitudinal weights – more detail in calibration |
| Ensure consistency stocks-flows | Tackle attrition bias, non-response bias, population changes via weighting |
| Yearly flows | Role of econometric modelling |
| Seasonal adjustment | Precision requirements |

INFLOWS: Movers, enter relevant age group



| | | <u>Labour status final period</u> | | | |
|--|-------------------------------|-----------------------------------|------------|----------|-------------------------------|
| | | Employed | Unemployed | Inactive | Total longitudinal population |
| <u>Labour status initial period</u> | Employed | | | | |
| | Unemployed | | | | |
| | Inactive | | | | |
| | Total longitudinal population | | | | |
| Individuals leaving population: age, death, move | | | | | |
| Total population final period | | | | | |

Individuals entering population

Total population initial period

| | | <u>Labour status final period</u> | | | Total longitudinal population | Total population initial period |
|-------------------------------------|-------------------------------|-----------------------------------|------------|----------|------------------------------------|---------------------------------|
| | | Employed | Unemployed | Inactive | | |
| <u>Labour status initial period</u> | Employed | | | | d | D |
| | Unemployed | | | | e | E |
| | Inactive | | | | f | F |
| | Total longitudinal population | a | b | c | sum(abc) ≠ sum(def) due to weights | sum(DEF) |
| Total population final period | | A | B | C | sum(ABC) | |



Weighting and calibration

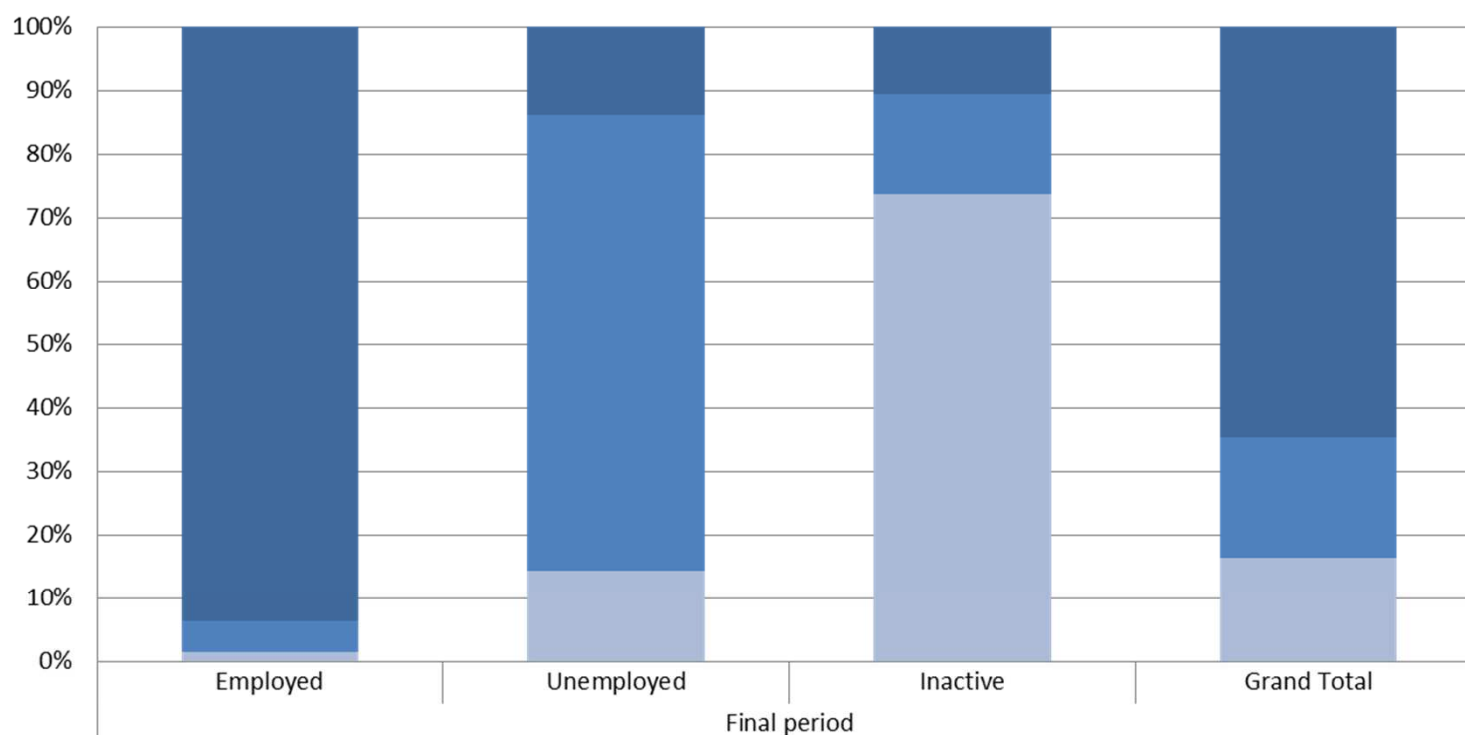
Which weights?

Calibration to

- *the initial period (as the respective period is the starting point of the analysis);*
- *the final period (consistency with most recent data, highest interest);*
- *both marginal distributions.*

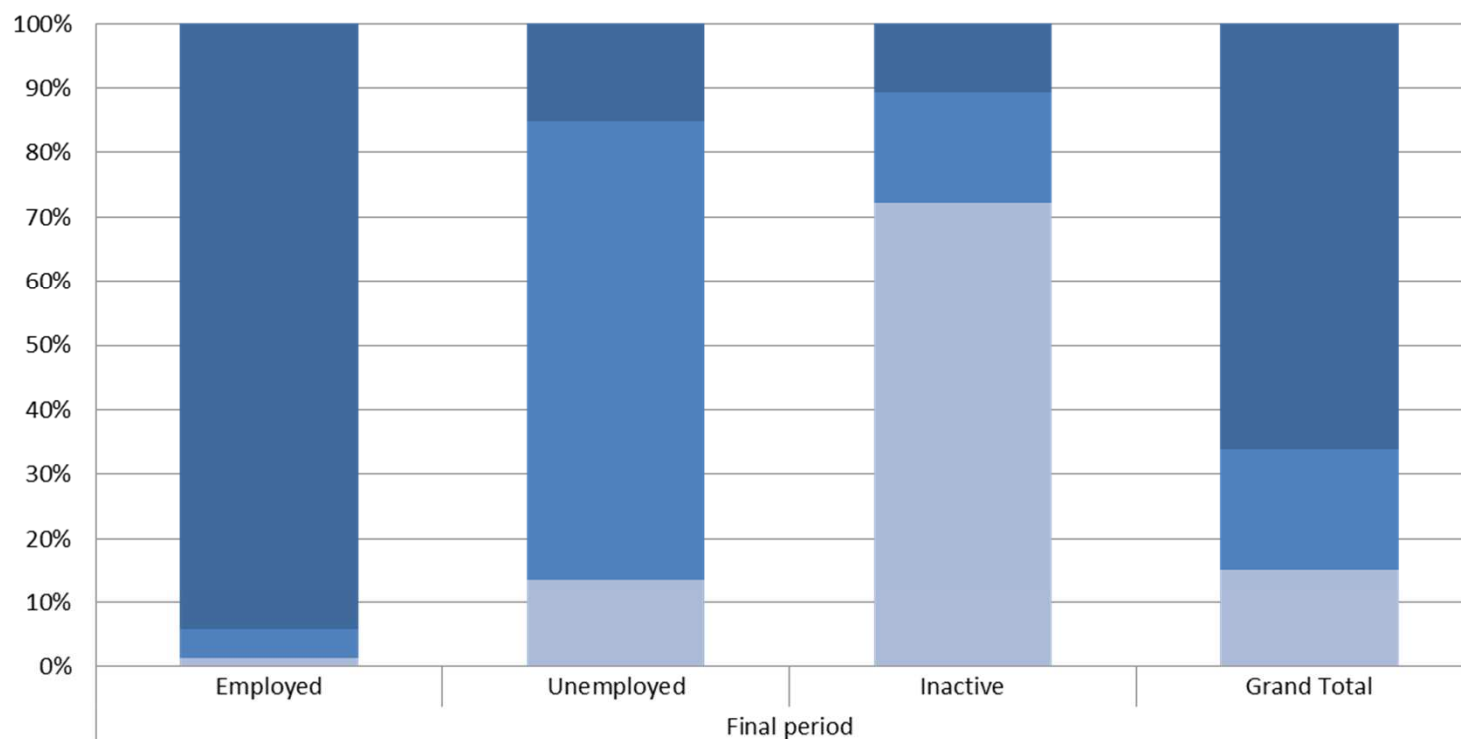
How to ensure consistency flows – stocks?

1. Identify matching cases in both quarters, by 10 year age group and sex (nr of cases)



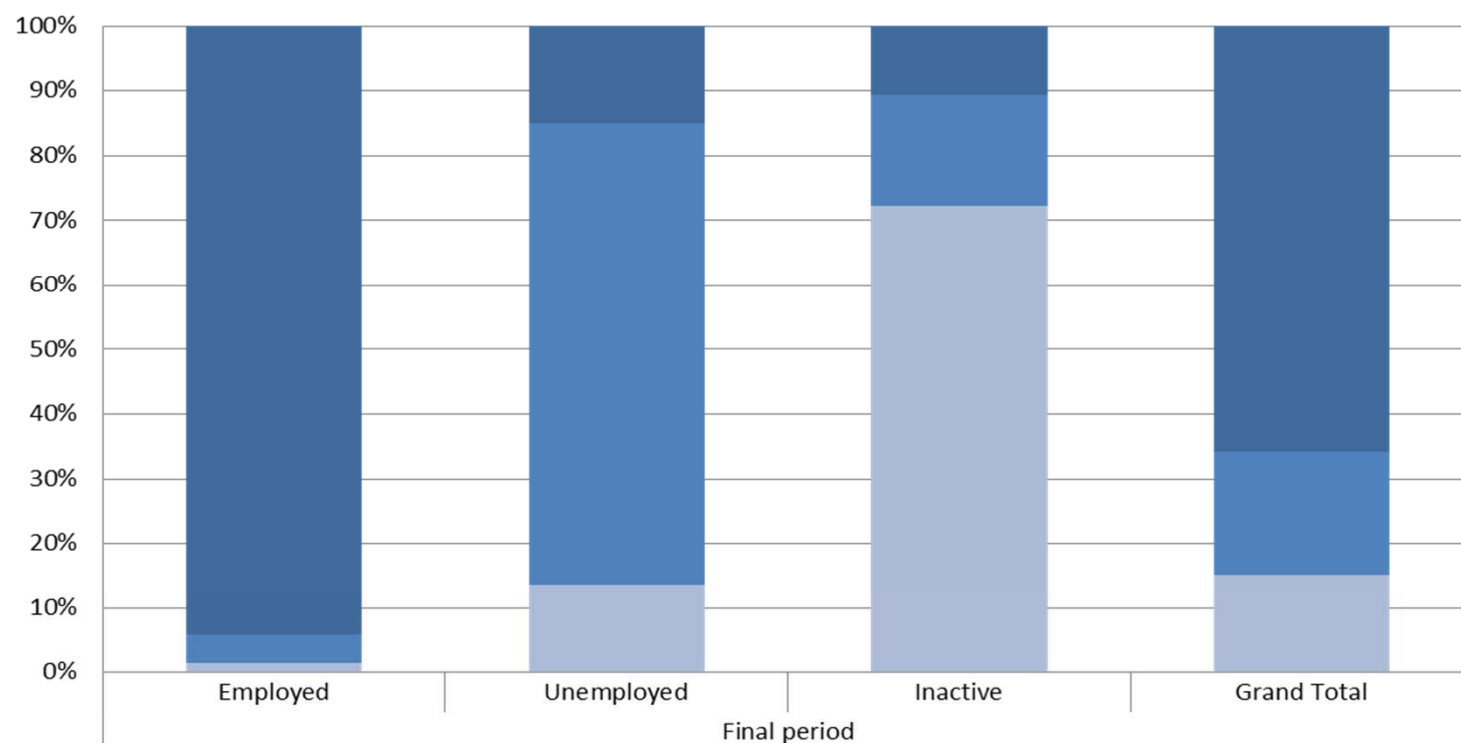
| | Employed | Unemployed | Inactive | Grand Total |
|-----------------------------|----------|------------|----------|-------------|
| Employed- initial period | 3056 | 130 | 93 | 3278 |
| Unemployed - initial period | 155 | 675 | 137 | 967 |
| Inactive - initial period | 52 | 136 | 644 | 831 |

2. Matched cases using final quarter weights (in 1 000s)



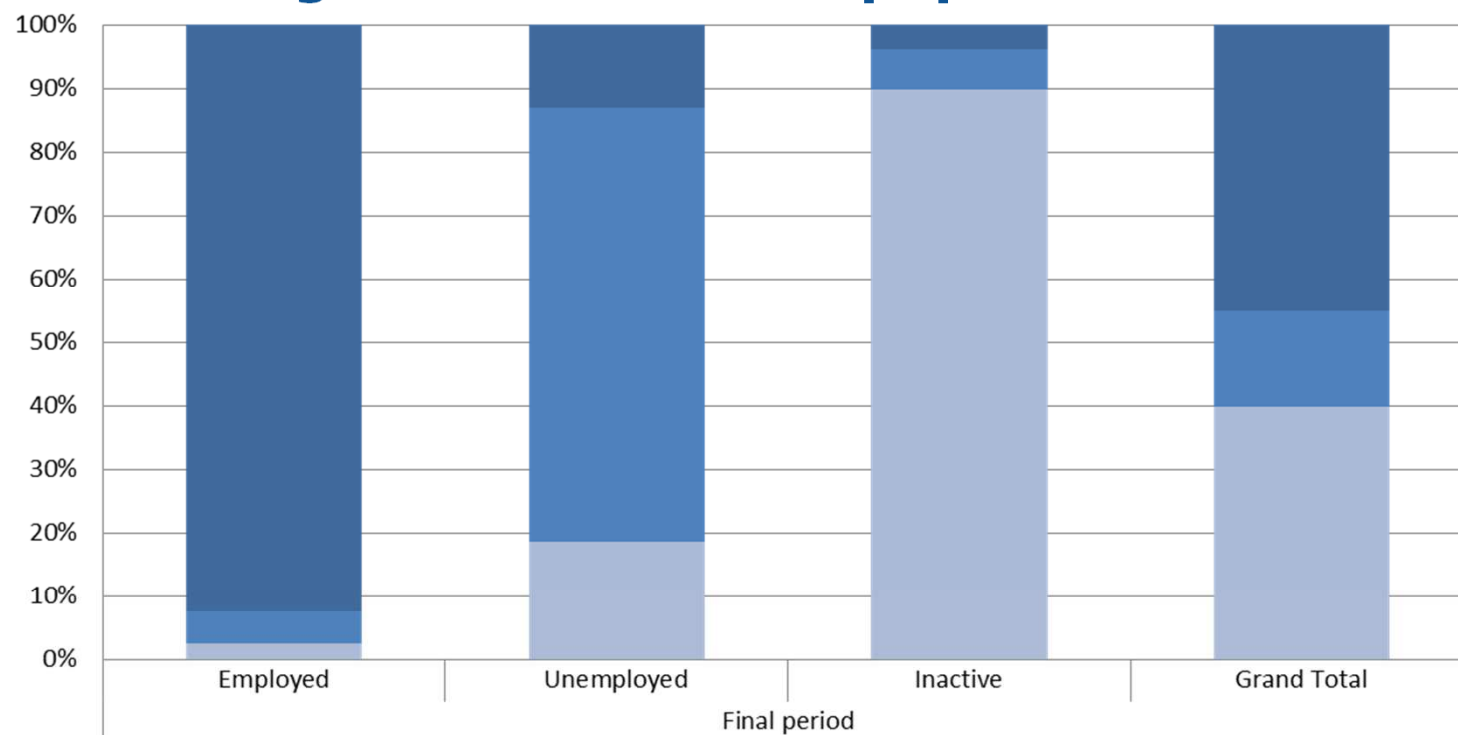
| | Final period | | | |
|-----------------------------|--------------|-----|-----|-------|
| Employed- initial period | 933 | 42 | 26 | 1,001 |
| Unemployed - initial period | 43 | 198 | 42 | 283 |
| Inactive - initial period | 14 | 38 | 178 | 230 |

3. Matrix calibrated to final quarter distribution



| | Final period | | | |
|-----------------------------|--------------|------------|----------|-------------|
| | Employed | Unemployed | Inactive | Grand Total |
| Employed - initial period | 1,176 | 55 | 33 | 1,264 |
| Unemployed - initial period | 54 | 259 | 53 | 366 |
| Inactive - initial period | 18 | 49 | 224 | 292 |

4. Sum over age groups, correct initial quarter value for inactives to get the same total population

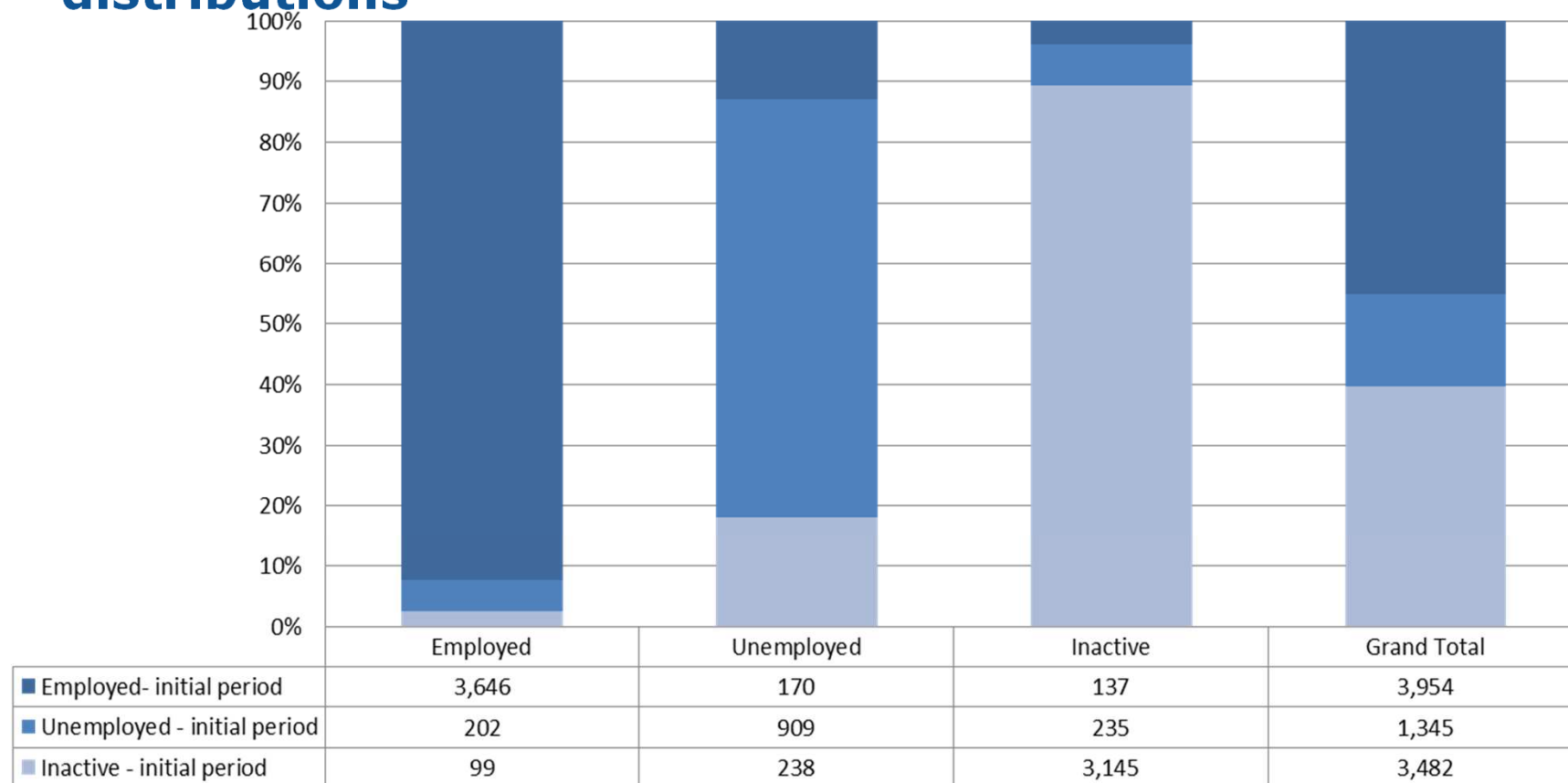


| | Final period | | | |
|-----------------------------|--------------|-----|-------|-------|
| Employed - initial period | 3,650 | 173 | 135 | 3,958 |
| Unemployed - initial period | 196 | 898 | 225 | 1,319 |
| Inactive - initial period | 100 | 246 | 3,157 | 3,503 |



European
Commission

5. Iterative raking redistributes the row-/column-differences to reach consistency with both marginal distributions





Next steps:

2nd half of 2015: Publication of 3x3 transition matrices for 15-74, by sex, quarter-on-quarter

2016: seasonal adjustment, yearly flows





Longitudinal micro-data

Methodological considerations

- *Investigation of longitudinal weights*
- *Consistency checks, longitudinal data validation*

Procedural considerations

- *agreement of Member States necessary (access to linked data)*
- *assess implications of consistency checks and data validation rules on stocks*





Consistency checks: example

Inactivity vs unemployment: unemployment duration

Inactivity = neither employed nor unemployed

Unemployed = not working, wanting to work, actively searching work, available for work

Duration of unemployment = $\min(\text{search duration, time since last employment})$





| Initial labour status | Final labour status | Duration of unemployment |
|-----------------------|---------------------|--------------------------|
| inactive | unemployed | 2 years |

- *PROXY interview in one of the quarters?*
- *Duration of job search, or time since last employment?
How do they compare?*
- *During inactivity, willing to work? Not available, or not searching?*
- *Situation with regard to activity one year before survey*
- *Try to match with other overlapping period (q, y)*
- *DECIDE: "false flow" or not? What about stocks?*





Timeline:

2nd half of 2015: Publication of 3x3 transition matrices for 15-74, by sex, quarter-on-quarter

2016: seasonal adjustment, yearly flows

Future work (2016-2019):

Improved weighting

Role of econometric modelling

Panel attrition

Longitudinal micro-data

