



Quarterly Survey of Employment (JobStat) - how to take into account demographical changes in the enterprise population

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Summary



Goals of Swiss Job Statistics (JobStat)

- ▶ Measuring various conjunctural indicators (since 1925). Providing information on short term evolution of employment.
- ▶ Quarterly survey of currently (before revision) 63'500 establishments in the second and third sector.
- ▶ Various variables like number of employees by gender, full-time equivalents etc.
- ▶ Results on different levels (f.e. NACE2 Aggregates, NUTS2).

Detailed description of current methodology (before revision) provided in [5] and [6].





Aspects of the Revision 2015

JobStat is currently under revision. Some aspects:

- ▶ integration of JobStat into FSO sample coordination system
- ▶ coordination system is on enterprise level
- ▶ cluster sample : first stage enterprises, second stage establishments
- ▶ treatment of demographical changes on enterprise level.



Renewal of the sample

Plan:

- ▶ yearly draw a new sample
 - ▶ based on same / similar sample design
 - ▶ positively coordinated with old one
- ▶ double sample (old / new) for first quarterly estimates
- ▶ model based revision of quarterly estimates to make them in a smooth way coherent with estimates observed for the new sample.



The new sample for Q2, 2015

| | Population size | Sample size | Profiling |
|--------|------------------------------|-------------|-----------|
| Sector | Primary sampling units (ent) | | |
| 2 | 95'887 | 5'776 | 283 |
| 3 | 479'673 | 13'004 | 1'278 |
| Total | 575'560 | 18'780 | 1'561 |
| Sector | Establishments (est) | | |
| 2 | 102'648 | 8'276 | 1'620 |
| 3 | 566'156 | 57'750 | 38'818 |
| Total | 668'804 | 66'026 | 40'438 |

Table: Population and sample sizes according sampling frame from December 2014.



Structural changes

The Business Register is updated on an ongoing basis. The updates concern

- ▶ demographical changes like death, birth, successions, fusions etc
- ▶ codifications (NACE, region)

which we summarize as structural changes.



Overview of demographical changes

| Codes | Description | Enterprises | | in Profiling |
|-------|---------------------------|-------------|----------|--------------|
| | | absolute | relative | |
| 0 | no change | 550'329 | 91.2% | 1'486 |
| 1,5 | death without successor | 22'656 | 3.8% | 62 |
| 7,8,9 | new without predecessor | 25'315 | 4.2% | 31 |
| 2 | death with successor | 2'591 | 0.4% | 13 |
| 6a | new, one predecessor | 2'535 | 0.4% | 7 |
| 6b | new, several predecessors | 24 | 0.0% | 1 |

Table: Analysis based on the union of population frames based on BR December 14 and July 15 and reporting information.





Treatment structural changes: general idea

Possible / planned treatment strategy regarding structural changes (demographical and codification changes):

- ▶ Profiling: (most) changes timely, apply to the current quarter → update extrapolation frame
- ▶ Non-Profiling : changes not always timely (administrative processes) reflected in BR → no update of extrapolation frame.

Once a year, model based revision of estimates to take into account structural changes using estimations based on double sample old / new frame (methodology used in past described in [7]).



Treatment structural changes for non-profiling units: concrete cases

- ▶ «death without successor» , «new without predecessor» :
 - ▶ ignored for extrapolation
 - ▶ taken into account for data collection.
- ▶ «death with one successor» :
 - ▶ original units replaced by successor
 - ▶ sample: questionnaire sent to successor.



Treatment structural changes for non-profiling units: concrete cases

- ▶ «death with several successors »:
 - ▶ original units replaced by successors
 - ▶ successor in sample, if at least one predecessor in sample
 - ▶ Generalized Weight Share Method ([2]) to calculate extrapolation weights for successors.
- ▶ Frame variables like NACE-code may also change for «no change ». For extrapolation these changes are only taken into account in case of profiling units.



Profiling Units

- ▶ Exhaustive strata in sampling design.
- ▶ JobStat based on Profiling information (no additional data collection)
- ▶ Updated information on structural changes in extrapolation frame.
- ▶ Profiling population for JobStat fixed by profiling groups at status of original frame. Movements between Non-Profiling and Profiling Units within the year are ignored for extrapolation (stability).



Extrapolation frame (T1)

| prof | sector | N(T0) | fte(T0) | N(T1) | fte(T1) |
|-------|--------|---------|-----------|---------|-----------|
| 0 | 2 | 95'604 | 890'250 | 95'615 | 890'313 |
| 0 | 3 | 478'395 | 1'974'607 | 478'353 | 1'974'544 |
| 0 | Total | 573'999 | 2'864'857 | 573'968 | 2'864'857 |
| 1 | 2 | 283 | 119'758 | 277 | 116'531 |
| 1 | 3 | 1'278 | 871'119 | 1'248 | 864'141 |
| 1 | Total | 1'561 | 990'877 | 1'525 | 980'672 |
| Total | . | 575'560 | 3'855'734 | 575'493 | 3'845'529 |

Table: Population total sampling (T0, December 14) vs extrapolation frame (T1, July 15); fte = variable full-time equivalent, used for calibration.





Summary

Structural changes raise questions regarding estimation and maintainance of the sample.

- ▶ Wish: produce reliable estimates of quarterly evolutions, not affected by administrative processes to update structural information.
- ▶ Profiling units: information on structural changes considered as timely - reflected in estimates.
- ▶ Non-Profiling units: information on structural changes may be delayed - structural changes not reflected in first estimates, but used to maintain the sample.
- ▶ Once a year, double sample (new / old frame) allows for model based (smooth) revision of results reflecting structural changes.





Summary (2)

The big majority of identified demographical events (incl. «no change») between December 2014 and July 2015 concerned cases for which the planned treatment remains rather simple:

- ▶ almost 92 % one-to-one relationships
- ▶ 3.8 % death vs 4.2 % birth (hence, a slight population increase, not reflected in first estimates)
- ▶ just a few complex cases. Treatment with Generalized Weight Sharing Method leads to slight impact in extrapolation frame.



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Thank you very much for your attention!