The political adequacy of quantitative impact assessment in the social field by means of micro-simulation models (Vienna, 4-5 December 2014)

Belgium

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Preliminary remarks:
To fill in the questionnaire one could follow a country perspective or an organisation perspective. We deem the organisation perspective the most appropriate for Belgium. We therefore distinguish each time two items per question. These items cover the experience of the organisations for which the respondents serve as a representative: the Federal Public Service (FPS) Social Security and the Federal Planning Bureau. Both operate on the Federal level. Hence experiences on the regional level with this kind of instruments are not covered by these responses on the questionnaire.

Next to these non-academic experiences, an important part of the experience on the use of these models for quantitative impact assessment is situated in the Belgian academic world. This academic experience is not integrated in the responses on the questionnaire that follows.

1. In which policy areas does your country apply microsimulation for the purposes of social impact assessment?

How would you rate its usefulness?

The Federal Public Service Social Security maintains a pure static model with administrative data. The Federal Planning Bureau develops and maintains a dynamic model with both administrative and survey data. Since the models differ in nature and are used for different purposes we distinguish them in the responses below.

Federal Public Service Social Security

Question 1:
The FPS Social Security uses a static microsimulation model, called MIMOSIS (MIcrosimulation MOdel for Belgian Social Insurance Systems). Behavioural responses are not integrated in a routine fashion in the model, but for certain simulations behavioural response estimates have been used.

The model runs on a large sample of administrative data and covers a) family allowances, b) unemployment benefits, c) sickness and disability benefits, allowances for industrial accidents and occupational diseases, d) welfare

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adaptations of pensions but no recomputation of pensions according to the pension rules and e) a number of means tested benefits. It also simulates social security contributions on income from labour, withholdings on replacement income and personal income taxes paid by fiscal unit.

This model is used for one recurrent exercise, being the estimation of some itemised tax rates (ESSPROS). However, most often the model is consulted on an ad hoc basis. It has been used to simulate proposals to reform the system of unemployment benefits (limiting benefits in time), means tested benefits (stimulating labour market activity in combination with the benefit), survival pensions and a number of child benefit reforms. Some of these reform proposals were simulated before introduction or non-introduction of the reform others were simulated afterwards, to estimate the possible impact on some output and outcome measures.

**Question 2:**
For those questions for which the model has been used so far, it was very useful to run some simulations and provide quantitative results not only on the level of the budget but also on the level of the distributional impact of the reform measure under study. However, most of these reform questions were general enough (affecting potentially a considerable amount of people) and close enough to the policy domains covered by the model (data were readily available and no large reprogramming of the model was required).

If the model would be called upon in the framework of a Regulatory Impact Assessment, even limited to measures on the federal level within the social security field, the model in its current form would often turn out to be inappropriate for this task. Either the target group (at population level) will be very small with no impact on the aggregated level that is monitored or the necessary data will be lacking to estimate the possible impact. This does not mean that for such very targeted measures, modelling experience could not be useful. Relying on the analysis of some type cases in case of small groups or with lacking data, might learn something on the impact of the reform on the level of the affected individual.

**Federal Planning Bureau**

**Question 1:**
The Federal Planning Bureau uses a dynamic microsimulation model, MIDAS (Microsimulation for the Development of Adequacy and Sustainability), including reduced-form behavioural equations. A discerning characteristic is the extensive use of alignment, allowing the model to be used in conjunction with the output generated by (semi-)aggregate models (see Dekkers, Inagaki and Desmet, 2010). This allows us to jointly assess the budgetary and social consequences of social or fiscal policy. This model is used primarily in the assessment of pension policy and social security policy. For example, its simulation results are included in the annual report of the Study Committee of Ageing (High Council of Finances, 2014). This is a group of high-ranked officials and experts, who report to the minister of pensions on the budgetary and social consequences of ageing. Furthermore, MIDAS has been used to assess the consequences of the reform in the pension systems, unemployment schemes and Conventional Early Leavers’ Scheme decided by the Di Rupo Administration (Dekkers et al., forthcoming). Furthermore, the model has been used to support the work of the Pension Reform Commission 2014², and MIDAS has also been used in a more static context to assess the consequences of

fiscal reform, more specifically the impact of the 2013 increases of the “work bonus”.

**Question 2:**
The model MIDAS is considered very useful, especially as it is used in conjunction with the other models. This is why the FPB invests a great deal in further development, among other things including immigration through the Pageant algorithm, and structural labour market behaviour of the RURO-type\(^3\).

2. **Are the conditions under which tax-benefit microsimulation models can meaningfully be used for policy monitoring and to inform policy making well enough understood by policy-makers and the general public?**

   **What more can be done to improve the understanding of the potential and limitations of these models?**

**Federal Public Service Social Security**

**Question 1:**
This question is very general, while the answer on it and the fact that assumptions are understood and bought by the one who enters a simulation request, depend on the simulation that has to be carried out and the assumptions necessary to produce these simulation results.

When the reform under study will generate none or only limited behavioural reactions and has a direct cash impact, this reform seems suited to be simulated with a static model without behavioural responses included. A direct cash impact can quite easily be explained and the fact that, for example, the tax benefit rules for certain more specific groups are not modelled and thus neglected in an exercise can be defended. Most changes in family allowances seem to obey these simulation conditions.

Once moving away from this setting, it becomes more difficult to explain what is simulated. Either one has to make very simple assumptions (no behavioural reactions or everybody reacting in a similar way) or one has to use a more sophisticated option in the form of an estimated behavioural model. In the latter case the model should be explained, and then scepticism rules to accept the behavioural model as a tool to capture “real” behaviour.

A constraint that is generally accepted quite easily is that for the simulation exercise not the most recent data available are used and even that the population structure is kept constant if there is a reasonable delay of a number of years between the year of registration and the year of simulation.

**Question 2:**
At least three things could be done to improve the understanding of the simulation results in the social policy field. The first is to invest in a template to phrase simulation requests, explaining what can be considered as parameters, exogenous and endogenous variables. The second is to invest in a limited set of indicators that cover both aspects of financial and social sustainability and explain a) why the reform will or will not influence these indicators and b) why the model will or will

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\(^3\) RURO stands for “Random Utility, Random Opportunities”. Developed by Dagsvik (1994) and first applied to labour supply behaviour by Aaberge et al. (1995), this (static) model assigns a richer role to heterogeneity in choice sets through conceiving labour supply behaviour as the result of a choice from latent choice sets consisting of job offers.
not generate simulation results that capture these expected changes. The third is to frame the simulation in papers and notes.\(^4\)

**Federal Planning Bureau**

*Question 1:*
Although the assessments made by MIDAS rarely reach the public at large, those directly involved in policy making seem to have a reasonable view on what models such as MIDAS can and cannot deliver. Still it remains a challenge to explain the simulation results and to reach an equilibrium between usefulness and too high expectations.

*Question 2:*
Once the model will be in a more stable version, more time will have to be invested than before in producing all kinds of output that serves to present and validate the model. This includes scientific papers, but also extensive code reports, validation reports, reports on the estimation procedures and results of the behavioural equations, and so forth. This more traditional way of disseminating the knowledge generated by a microsimulation model might be quite cost efficient.

3. **Is there demand for nowcast or forecast estimates of risk of poverty using microsimulation?**

   **Are these estimates and the methodology behind them generally available?**

The Federal Public Service Social Security mainly has a need for quantitative input for its reporting purposes but has no intention to develop models that provide real nowcasted results. A spin off of the tools developed by the Federal Planning Bureau could be used to provide such results.

**Federal Public Service Social Security**

*Question 1:*
Currently there is a delay of two to one year between a) the point of registration of data on the at risk of poverty indicator in either surveys or in administrative sources and b) the time the data become available. It should not be expected that the more intensive use of administrative data will lead to a disappearance of the timeliness issue or even lead to a gap between points a) and b) that is considerably different from the one realised with survey data. Nonetheless there is a need to report on the at risk of poverty indicator, its breakdowns and some other indicators with data that are as recent as possible. Among other things to see how we are evolving in the direction of the target on the at risk of poverty or social exclusion indicator.

We therefore consider three objectives equally important for the data providers (the National Statistical Office and other providers of data):

1) to reduce the time gap between a) and b),
2) assuring measurement quality and
3) in the case of the SILC-survey enlarging the sample size for some groups (in particular Brussels).

Since the rate of success in reducing this time gap are uncertain, simulating the possible impact on among other things the at risk of poverty indicator of policy measures that have been taken after the last measurement point of a survey or an administrative source, are considered most welcome. Probably investing in this simulation option is also much cheaper than trying to speed up the process of collecting real data. Of course, simulations will never replace the real data, but they can help to reduce the knowledge gap that exists because of the lack of real observations by offering educated guesses. An alternative that could complement these nowcasting simulations would be to think about and invest in the collection of prucoror indicators.

Question 2:
Currently no nowcasting results are available.

**Federal Planning Bureau**

There might be a need for a nowcasting model, of which the output might consist of two parts. First, the updated indicators of poverty and social exclusion, both for the population as a whole and for particular subgroups. Secondly, the synthetic data produced by such a nowcasting model. This might itself be made available to others, to perform additional analyses. This would allow policy makers and policy analysts to make use of EU-SILC even more than today, because the main handicap of the SILC, the lag by which it becomes available, would to a large extent be resolved.

One way to achieve this at limited costs is to develop a fully dynamic microsimulation model specifically for nowcasting purposes, based on EU-SILC and using experience and technical modules from existing microsimulation models with a modular structure and extensive alignment or calibration technology.

In a second step, the nowcasting model might be extended in order to produce short-term projections of indicators of poverty and social exclusion five years ahead in time (i.e. at least up to 2020). This would allow the users of these indicators to assess current developments in the light of the EU2020 goals and strategy.

4. **Is there experience in relation to technical improvements, extensions in policy scope or quality assurance that can usefully be shared?**

   For example in relation to:
   - Modelling behavioural response for routine purposes;
   - Combining micro data from several sources in order to extend policy scope;
   - Modelling non take-up of benefits or evasion of taxes.

**Federal Public Service Social Security**

*Modelling behavioural response for routine purposes:*

“General” behavioural responses (e.g. labour supply of persons in married couples, single men, single women) are not considered to be very useful since most measures cover more specific groups (long term unemployed, beneficiaries of means tested benefits, ...) for which the general estimates are not trustworthy. Hence for what behavioural responses is concerned an exercise specific approach, using appropriate data to estimate the behavioural reactions of the target group and an ad hoc inclusion of these estimates in the model, seems more appropriate.
Combining micro data from several sources in order to extend policy scope:

There is experience in a) using administrative data micro data in addition to survey data (providing so-called “satellite-indicators”) and b) exact matches on a micro level of survey data and the administrative sources. These efforts have not been done to enlarge the policy scope (i.e. modelling policy domains that were not covered before) but to solve either modelling issues for given policy domains (certain variables are available in administrative sources and not in survey’s) or to enlarge the sample size.

Administrative data are collected on the level of the whole population within a Datawarehouse. For research purposes samples can be drawn from this source, but the variables provided for the observation units (individuals or households) are generally less accurate (i.e. classified values) than what is available from the primary source.

Modelling non take-up of benefits or evasion of taxes:

No modelling of non take-up or false take up is done. In the simulation exercises two options are possible. Either the impact of a reform is simulated for all those observed as take up units on the basis of administrative sources or the impact is simulated for all those satisfying the conditions for take up on the basis of the available data (hence assuming full take up).

Recently some efforts have been made to collect information on the subject. One of the conclusions being that even for means tested benefits alone, a clear distinction should be made between the non-take up process of the means tested benefits of those still available for the labour market, old aged people and disabled people.

Federal Planning Bureau

There are many, many possibilities for sharing technical improvements and tacit knowledge through the shared use of the open-source model development framework LIAM2 (De Menten et al., 2014) This development language was designed and developed by the Federal Planning Bureau, and is currently being used by in various places for the development of different kind of models, mostly microsimulation. Moreover, the dynamic microsimulation model MIDAS for Belgium has been ‘exported’ to Hungary and Luxembourg. This results in several teams of model developers, sharing tacit knowledge through the use of LIAM2 and sharing codified knowledge through the exchange of model code and experiences in the development and use of microsimulation.

Another important tool for knowledge sharing is the International Journal of Microsimulation (http://www.microsimulation.org/ijm/) which allows not only researchers and modellers, but also model managers and users, to remain up to date on developments in all aspects of microsimulation.

On a more practical level, the Federal Planning Bureau has extensive experience in combining micro-level behavioural equations with so-called alignment procedures. This allows the results of the microsimulation model to be as consistent as possible with exogenous (semi-)aggregate information, for example coming from the AWG or from in-house models (see Dekkers, Inagaki and Desmet, 2012, for a more extensive discussion). We use this to assess the consequences of socio-demographic trends and social and fiscal policy on the budgetary cost of ageing as well as adequacy of social benefits including pensions.

5 This includes NZL, Japan, France, Belgium, Hungary, Luxembourg, and Hong Kong.
5. References


