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Simulating labour market transitions in EUROMOD: EUROMOD LMA Add-on and COVID-related policies

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1 Introduction

In response to the COVID-19 pandemic, the EU Member States not only relied on already existing wage compensation schemes and other automatic stabilisers but have also implemented ad-hoc measures aimed at cushioning the income loss of employed and self-employed. While some of these COVID-related policies are simulated in a standard way in EUROMOD, the simulation of monetary compensation schemes requires the simulation of labour market transitions.

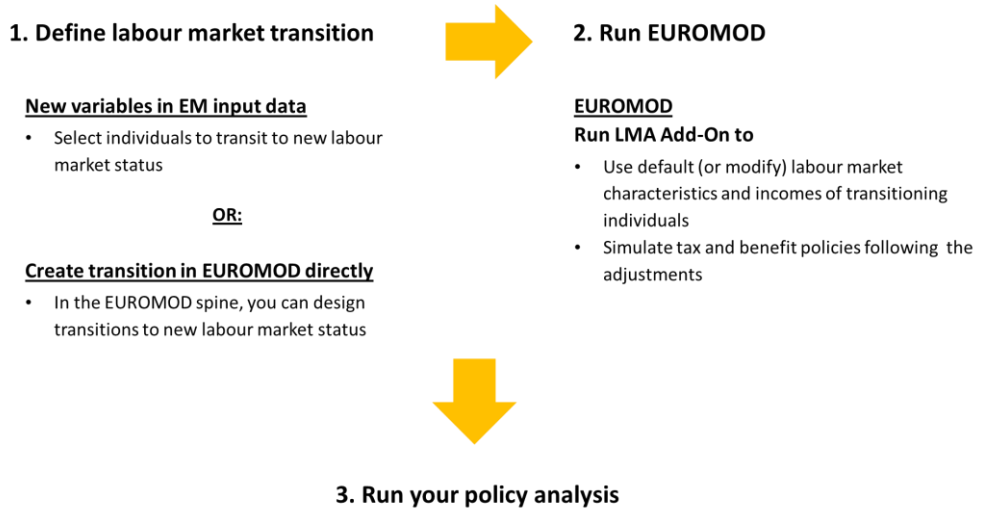
In line with the standard EUROMOD practices of keeping socio-demographic characteristics as observed in the underlying input datasets, EUROMOD baseline simulations keep the observed labour market status of individuals unchanged and, consequently, do not allow for the simulation of monetary compensation schemes and new COVID-19 related unemployment benefits.

Given the importance of such policies for budgetary and distributional analysis, EUROMOD, since version I3.0+ includes features allowing users to design and implement labour market transitions from work to either unemployment or monetary compensations schemes. The transitions are made operational through the Labour Market Adjustment (LMA) Add-on and allow for the simulation of policies triggered by changes in the labour market status of individuals.

This document provides an overview on how to implement labour market transitions in EUROMOD making use of the LMA Add-on, with a focus on the simulation of monetary compensation schemes and new unemployment benefits. Figure 1 describes the necessary steps.

The document is organised as follows. Section 2 provides a general overview of the LMA Add-on; section 3 describes how to define labour market transitions in EUROMOD; section 4 explains how to run EUROMOD with the LMA Add-on; section 5 concludes with specific aspects and assumptions applied in the LMA Add-on.

Figure 1: Implementing labour market transitions in EUROMOD



2 General Information about the new LMA Add-on

The LMA Add-on was initially developed as part of the Nowcasting toolkit. Nowcasting refers to the estimation of timely indicators for monitoring income inequality and poverty. It is a microsimulation-based methodology for estimating changes in the income distribution over time if income microdata is not yet available. The labour market situation of observations in the most recent EUROMOD input dataset is adjusted based on the latest information from the European Labour Force Survey. Together with the modelled policy changes in EUROMOD, this allows users to simulate the current income distribution and poverty risk taking policy and labour market changes into account. For a general overview of the LMA Add-on, please see Gasior and Rastrigina (2019). For more information on nowcasting please see: Gasior and Rastrigina (2017); Rastrigina, Leventi, and Sutherland (2015b); Rastrigina, Leventi, and Sutherland (2015a); Leventi et al. (2014); Navicke, Rastrigina, and Sutherland (2014).

In its original form, the LMA Add-on covered the transition from employment to unemployment (short-term or long-term), and the transition from unemployment to employment. In relation to the COVID crisis, the LMA Add-on has been modified by including additional features. In particular, the enhanced LMA Add-on also covers transitions to monetary compensation schemes[1]; it also relaxes the assumption of yearly transitions to unemployment (or employment) by allowing users to set-up the duration of transitions. Please note that for the time being the latter is only possible for workers who transit to monetary compensation schemes and for employees entering into unemployment. As regards self-employed who transit to unemployment, only yearly transitions are available.

Intuitively, the LMA Add-on modifies the values of specific socio-demographic variables of observations eligible for transitions in order to reflect their new labour market status. These include variables such as earnings, months in work, labour market characteristics, etc. See the "Summary note for the EUROMOD Labour Market Add-on", included in EUROMOD documentation, for detailed information on the LMA Add-on.

Since the identification of observations eligible to change labour market status is essential in the functioning of the LMA Add-on, the next section describes the two existing ways of doing so.

[1] An analysis of the effectiveness of monetary compensation schemes during the COVID pandemic, based on the LMA Add-on, can be found in Christl et al. (2022).

3 Defining transitions

Users can modify the labour market status of individuals in two different ways. The first option involves the modification of the EUROMOD input dataset, via introducing, among others, specific indicator variables that the LMA Add-on recognises as "transition indicators." The second option allows users to design labour transitions directly in the EUROMOD spine making use of the policy TransLMA_cc, where the suffix _cc stands for a specific country. Intuitively, this policy allows users to set the shares[2] of workers transiting to new labour market statuses and produces the indicators/variables needed by the LMA Add-on to make the transitions operational. To facilitate the use of labour transitions, TransLMA_cc already includes statistics on those transitions for 2020 and 2021.

The next subsections analyse in more detail the two options.

3.1 Defining transitions in the input data

For users wishing to define transitions in the input data, specific policy year transition variables need to be added to the standard EUROMOD input file. These variables are called *lma and lmc*. The categorical variables identify the following transitions:

Table 1: Specific transition variables in the LMA Add-on

lma	**Original labour market status[3]**	**New labour market status**
0	No transition	
1	Non-employed	Employed
2	Employed	Short-term unemployed
3	Employed	Long-term unemployed
4	Unemployed	Long-term unemployed
lmc	**Original labour market status**	**New labour market status**
0	No transition	
1	Employment	Monetary compensation
2	Self-employed	Monetary compensation (for SE)

In addition to these transition variables, the modified input dataset needs to include a variable with information on (imputed) employment income for individuals transiting to employment (*yem_a*) and a variable with information on working hours (*lhw_a*) for these new employed. Additionally, the months in employment (*yemmy_a*) need to be defined both for employees transiting to unemployment and for new employed. Please note that the monetary value of *yem_a* refers to the income year of the input dataset and, thus, is uprated to the year of interest using an adequate uprating factor.

For the transition to monetary compensation (*lmc*=1 or 2) imputed months in monetary compensation (*bwkmcmy_a*), as well as the share of hours worked during monetary compensation (*lhwsr_a*) need to be defined.

[2] The shares defined in the LMA refer to the sample rather than the population. Since the EUROMOD input data uses personal weights, the effective weighted transition shares may not accurately reflect the sample shares.

[3] Observations with incomes from employment, self-employment or unemployment are selected for transition. This means that students, working-age individuals with permanent disability or in retirement and mothers with children aged below two are excluded from the estimation, unless they report employment income in the underlying data.

3.2 Defining transitions in EUROMOD

EUROMOD also allows for the modelling of transitions on the basis of aggregate statistics using (informed) random allocation. The transition to unemployment, employment and monetary compensation are defined in the policy TransLMA_cc.

To facilitate the use of labour transitions, TransLMA_cc already includes statistics on transitions for 2020 and 2021 policy years. Two main sources of data are used: administrative data collected by national teams and developers, and data provided by Eurostat[4]. Information about the source of data by type of transition is included in the EUROMOD Country Reports, as well as in the comments' column of the TransLMA_cc policy. In the case of transitions to unemployment and employment, the statistics that have been included in the vast majority of models were provided by Eurostat. Please note that those statistics are dataset-specific and correspond to pre-COVID datasets (in the vast majority of countries they correspond to EUROMOD input datasets based on SILC 2020).

The following bullet points describe two examples of how the policy TransLMA_cc simulates transitions from work into unemployment and from employment into monetary compensation schemes.

- **Transition from employment to unemployment**

EUROMOD users can adjust the transition data directly in the TransLMA_cc policy. In the first/second DefConst function of the policy (depending on the income reference year of the input dataset), users can define the share of employees and self-employed that move to unemployment by gender and educational level ($er_dgnX_dehX_XX), where dgn0 stands for females, dgn1 for males; deh1 stands for low level of education (i.e. up to primary), deh2 for medium level of education (i.e. lower/upper secondary), deh3 for high level of education (i.e. post-secondary/tertiary); and the suffixes _ee for employees and _se for self-employed[5]. Additionally, $er_yemmyX identifies the cumulative share of individuals that worked less or equal than X months (X = 2, 5 or 8) before becoming unemployed.

- **Transition from employment/self-employment to monetary compensation**

In countries that use the statistics provided by Eurostat, the transition from employment to monetary compensation is modelled in a very similar way to the one to unemployment. Information on external data is included in the third/fourth DefConst function of the TransLMA_cc policy. Transitions are defined by gender and economic sector (variable lindi). The constants $sh_mcee_lX_dgnX define the share of male/female workers in sector X that move to monetary compensation; constants $sh_mceemy_X define the share of employees that stayed for less than X months in monetary compensation; finally, constants $sh_Xhours_ee define the share of employees that work zero hours ($sh_0hours_ee), work 30% of less of their usual number of hours ($sh_15hours_ee), or work 60% or less of their usual number of hours ($sh_45hours_ee) during monetary compensation.

The fifth/sixth DefConst function of the TransLMA_cc policy defines all the information mentioned above, but for self-employed individuals. Please note that, for comparability reasons, this function is present even in countries that have not implemented any monetary compensation schemes for self-employed.

The implementation of labour transitions to monetary compensation schemes based on data provided by national teams may follow slightly different approaches, depending on the available statistics. Detailed information on the modelling of such transitions with the use of national data can be found in the EUROMOD Country Reports.

[4] In Eurostat data, labour transitions are produced by Eurostat, using detailed distributional information on the loss of jobs and short-term work schemes from the Labour Force Survey and administrative data. The impact across different categories of individuals, the duration of unemployment/absence and percentage of hours worked are modelled using the EU-LFS longitudinal and quarterly transitions as target. For more information please consult the methodological note available here. For cases where national administrative data are used, please check the corresponding Country Reports.

[5] In Eurostat data, transitions to unemployment are based on yearly forecasts.

4 Running EUROMOD with the LMA Add-on

This section explains how to run the LMA Add-on in EUROMOD and make operational the transitions defined in the previous section. The procedure for transitions defined in the input data differs slightly (see end of this section).

To run the LMA Add-on, users should access the **Run** Menu, select the country of interest and, as shown in Figure 2, tick the relevant LMA box after having activated the Add-on from the menu "View/Filter/Add-Ons". The Add-on runs starting from policy year 2020.[6] Please note that, as mentioned in the previous section, prefilled statistics on labour market transitions are available for 2020 and 2021, and only if those systems are run in combination with pre-COVID input data.

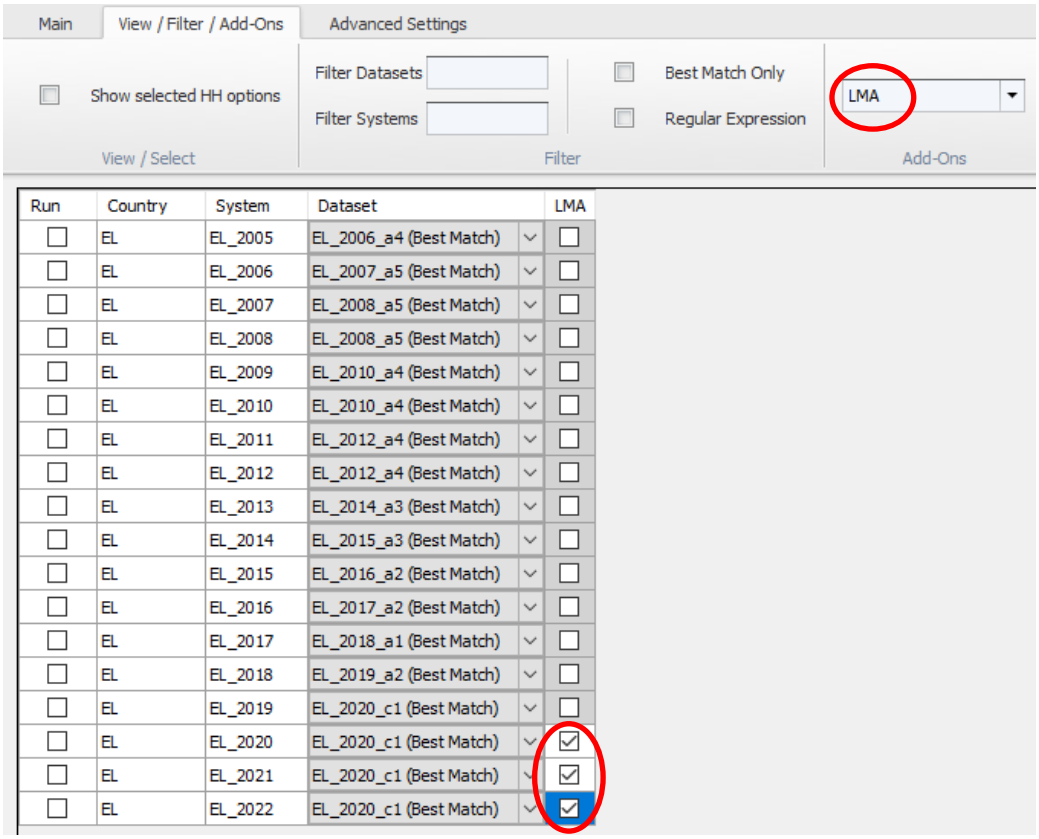
Ticking the LMA Add-on to on and running EUROMOD will instruct the model to perform the labour market transitions defined by the user (or as already pre-defined if the user does not want to change anything) and EUROMOD will produce an output that relies on the new labour market conditions.

The most common policies that are triggered when running the model with the LMA Add-on are monetary compensation schemes for employees and self-employed. In some countries, the Add-on also triggers the simulation of childcare schemes and/or new unemployment benefits. Intuitively, these are policies that do not produce any results except if run with the LMA Add-on, which sets in motions the transitions that make individuals become eligible for them. The EUROMOD Country Reports provide detailed information on the policies that are triggered by the LMA Add-on in each country.

Please note that running the LMA Add-on is sufficient for the transitions defined in TransLMA_cc to be implemented and relevant polices to be run. No policy needs to be manually switched ON or OFF in the spine.

IMPORTANT: To run the LMA Add-on when transition variables are defined in the EUROMOD input data (see section 2.a), users need to access the LMA Add-on (section Add-ons) and switch off policy 2 ('LMA_DATA').

Figure 2: Running the LMA Add-on in EUROMOD



[6] Previous years can be run using the standard LMA Add-on (available upon request).

5 Specific aspects and assumptions applied in the Add-on

Labour market characteristics and sources of income are adjusted for observations that are subject to transitions only.

For employees who transit to unemployment, employment income is adjusted considering the reduction in the number of months in employment.

For self-employed who transit to unemployment, self-employment income is set to zero. They are assumed to be unemployed for a period equal to the number of months they were self-employed.

For individuals moving into employment, earnings are set equal to the value of yem_a.

In case transitions into employment are modelled, all newly employed individuals are assumed to be employees (rather than self-employed). The new number of months in employment is imputed through the variable yemmy_a.

For individuals moving out of employment, eligibility for unemployment benefits is defined according to the country rules. If the rules require assessment of earnings and number of months in work for several years preceding unemployment, we assume that these remain unchanged throughout the assessment period and equal to the values observed in the income reference period.

In case transitions into long-term unemployment are modelled, for those moving into long-term unemployment the eligibility is adjusted assuming that the duration of the unemployment spell is more than one year. In some countries long-term unemployed are not eligible to any unemployment benefits (e.g., Latvia); in other countries they are not eligible for unemployment insurance but still qualify for unemployment assistance (e.g., Greece); in countries with long duration of unemployment insurance (e.g., Finland) we assume that long-term unemployed continue to receive unemployment insurance.

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