Simulating labour market transitions in EUROMOD:

EUROMOD LMA Add-on and COVID-related policies

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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 I3.0+ includes new 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.

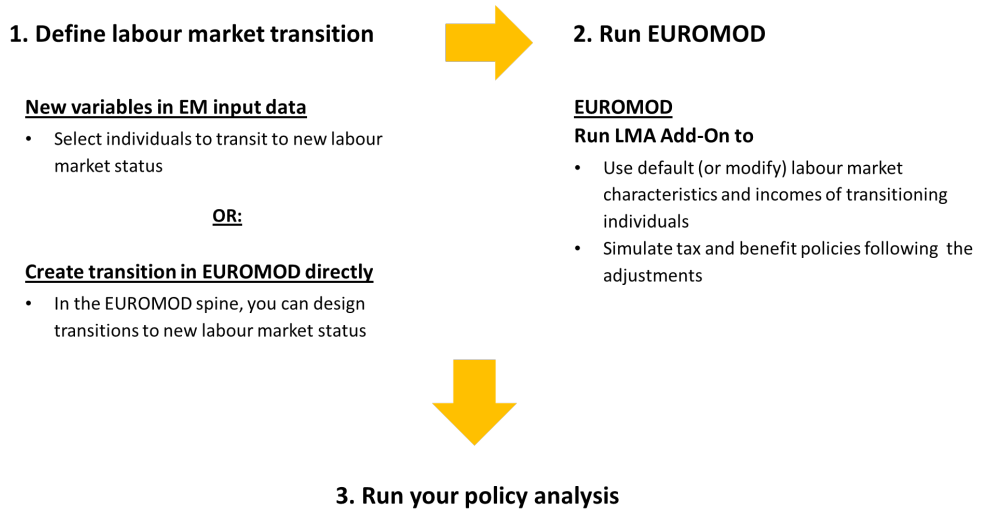
This document provides an overview on how to implement labour market transitions in EUROMOD making use of the LMA Add-On, with a focus on the simulation of monetary compensation schemes and new unemployment benefits. Figure 1 describes the necessary steps.

The document is organised as follows. Section 1 provides a general overview of the LMA Add-on; section 2 describes how to design labour market transitions in EUROMOD; section 3 explains how to run EUROMOD with the LMA Add-On; section 4 lists the policies triggered by labour market transitions in EUROMOD I3.0+; section 5 concludes with specific aspects and assumptions applied in the LMA Add-on.

Please note that the simulation of labour market transitions in the UK departs from the general methodology and is described at the end of section 3.

As a note of caution, please be aware that the simulation of COVID-related policies through labour market transitions is considered as experimental and is only partly validated due to the lack of external data. EUROMOD users are encouraged to contact the JRC with comments or questions regarding the simulation of those policies.

Figure 1: Implementing labour market transitions in EUROMOD



1. 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; and 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.

2. 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, newly developed, 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 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 transitions aimed at replicating the 2020 labour market conditions.

The next subsections analyse in more detail the two options.

a. Defining transitions in the input data

The LMA Add-on uses policy year specific transition variables that need to be added to the standard EUROMOD input file. These variables are called *lmaYY and lmcYY*, where YY refers to the policy year (e.g., *lma20* for 2020 transitions). The categorical variables identify the following transitions:

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

lmaYY	**Original labour market status**[1]	**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
lmcYY	**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 (*yemYY_a*) and a variable with information on working hours (*lhwYY_a*) for these new employed. Additionally, the months in employment (*yemmyYY_a*) need to be defined both for employees transiting to unemployment and for new employed. Please note that the monetary value of *yemYY_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 (*lmcYY*=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.

[1] 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.

b. 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 aimed at replicating the 2020 labour market conditions. For the transitions to monetary compensation schemes or to unemployment, two main sources of data are used: administrative data collected by national teams and developers, and data provided by Eurostat[2]. Table 2 summarizes the sources of data by the type of transition (either to unemployment or to monetary compensation schemes) and by country. Please note that the data used should be considered as provisional. The level of detail of the simulated transitions depends on the country and on the type of transitions simulated.

Table 2: Data information used to model transitions in the LMA Add-on

Country	Data on transition to unemployment	Data on transition to monetary compensation
AT	ESTAT	ESTAT
BE	ESTAT	NT
BG	ESTAT	NT
CY	ESTAT	ESTAT
CZ	ESTAT	NT
DE	n.a.	n.a.
DK	ESTAT	ESTAT
EE	ESTAT	NT
EL	ESTAT	NT
ES	ESTAT	NT
FI	ESTAT	NT
FR	ESTAT	NT
HR	ESTAT	NT
HU	ESTAT	NT
IE	NT	NT
IT	ESTAT	ESTAT
LT	ESTAT	NT
LU	ESTAT	NT
LV	NT	NT
MT	ESTAT	NT
NL	ESTAT	NT
PL	ESTAT	NT
PT	ESTAT	ESTAT
RO	ESTAT	NT
SE	ESTAT	NT
SI	ESTAT	ESTAT
SK	ESTAT	NT

Note: NT –data from a national team; ESTAT – data from Eurostat[3]; n.a. – no statistics available

[2] In Eurostat data, transitions to unemployment are based on yearly forecasts, while transitions to monetary compensations reflects only the first quarter and are based on administrative and LFS data. For cases where national administrative data are used, please check the corresponding Country Report.

[3] Eurostat estimations based on the combination of administrative-based data on beneficiaries of governmental measures in the context of the COVID crisis and LFS data.

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 DefConst function (marked by the comment "ESTAT data unemployment"), users can define the share of employees and self-employed that move to unemployment by sex ($er_dgnX_XX), where dgn0 stands for females and dgn1 for males, and the suffixes _ee for employees and _se for self-employed[4]. Additionally, $yemmyX identifies the cumulative share of individuals that worked less than X months (X = 2, 5 or 8) before becoming unemployed. Figure 2 shows the transition information in the EUROMOD spine and highlights where EUROMOD users can modify the values of the employment-unemployment transition. E.g., in the example of Spain in Figure 2, 5.9% of the female and 6.3% of male employees moved to unemployment. 17% of people worked less than 2 months before becoming unemployed, 76% worked less than 5 months and 93% worked less than 8 months.

Figure 2: Employment to unemployment transition (Spain)

TransLMA_es		n/a	off	**DEF: Modelling labour market transitions (DO NOT SWITCH ON; ONLY WORKS WITH THE LMA ADD-ON)**
fx DefConst		n/a	on	ESTAT data unemployment
$er_dgn0_ee	1	n/a	0.059	
$er_dgn1_ee	2	n/a	0.063	
$er_dgn0_se	3	n/a	0.023	
$er_dgn1_se	4	n/a	0.036	
$yemmy2	5	n/a	0.17	
$yemmy5	6	n/a	0.76	
$yemmy8	7	n/a	0.83	
fx Elig		n/a	on	step 1: eligibility conditions - transition non-empl to employed

- **Transition from employment to monetary compensation**

In countries that use the data 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 2nd DefConst function (marked with the comment ESTAT data MC). When data is available by sector of activity, the transition can be modelled at sector level. In this case $sh_mcee_lX defines the share of workers in sector X that move to monetary compensation, $sh_mceemy_X defines the share of employees that stayed for less than X months in monetary compensation and $sh_Xhours_ee defines the share of employees that keep working less than X% of the usual number of hours during monetary compensation. Figure 3 shows how the transition is defined in Denmark, e.g., 0.9% of workers in sector 1 and 7.9% in sector 2 are sent to monetary compensation; 33% of workers stayed less than 1 month in monetary compensation and 62% stayed less than 3 months; 71% worked 0 hours while being in monetary compensation, 76% worked less than 30% of the usual number of hours and so on.

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

Figure 3: Transition from employment to monetary compensation (Denmark)

Policy	Grp/No	dk_2020	Comment
IlDef_dk		on	**DEF: INCOME CONCEPTS**
TransLMA_dk		off	**DEF: Modelling labour market transitions (DO NOT SWITCH ON; ONLY WORKS WITH THE LMA ADD-ON)**
fx DefConst		on	ESTAT data unemployment
fx DefConst		on	ESTAT data MC
$sh_mcee_l1	1	0.009	Share of employees in lay-off in sector 1
$sh_mcee_l2	2	0.079	.. sector 2
$sh_mcee_l3	3	0.021	.. sector 3
$sh_mcee_l4	4	0.149	.. sector 4
$sh_mcee_l5	5	0.440	.. sector 5
$sh_mcee_l6	6	0.093	.. sector 6
$sh_mcee_l7_8	7	0.055	.. sector 7 and 8
$sh_mcee_l9_12	8	0.056	.. sector 9, 10, 11 and 12
$sh_mceemy_1	9	0.33	Share of workers in lay-off for 1 months
$sh_mceemy_2	10	0.33	.. for 1 or 2 months
$sh_mceemy_3	11	0.62	.. for less than 3 months
$sh_0hours_ee	14	0.71	Share of hours worked in compensation (0 hours)
$sh_15hours_ee	15	0.76	..30% or less
$sh_45hours_ee	16	0.89	..60% or less
fx DefConst		on	ESTAT data MC
$sh_mcse	1	0.171	Share of self-employed in lay-off
$avg_mcsemy	9	3	average duration
$sh_0hours_se	10	0.438	
fx Elig		on	step 1: eligibility conditions - transition non-empl to employed

In some countries, the transition to monetary compensation is possible not only for employees, but also for self-employed. In the case of Denmark (see also Figure 3), the third DefConst (marked with the comment ESTAT data MC) defines the share of self-employed that move to monetary compensation ($sh_mcse), the duration in months ($avg_mcsemy) and the share of those that worked zero hours ($sh_0hours_se). Please note that the data on self-employed is typically less accurate due to several data collection issues related, for example, to the available information on the number of hours worked and number of months in monetary compensation.

The implementation of labour transitions to monetary compensation schemes based on data provided by national teams may follow a slightly different approach (see Table 2 for a list of countries). In Spain, a function *Elig* defines eligibility to wage compensation schemes while step 2 identifies the share of workers expected to transit into wage compensation (e.g., 0.7% of workers in Agriculture and Fishing, and 75% in Hotels and Restaurants).

Figure 4: Transition from employment to monetary compensation (Spain)

Policy	Grp/No	ES_2020	Comment
fx Elig		on	set lhw_a
fx ArithOp		on	set lhw_a / hours worked per week (based on external statistics and/or assumptions)
fx BenCalc		on	set yemmy_a (enhanced LMA)
fx Elig		on	step 1: eligibility conditions YEMCOMP
fx BenCalc		on	step 2: random allocation (based on external statistics by sector)
fx Elig		on	selected in step 2 -> eligible for step 3
fx BenCalc		on	step 3a: random allocation of months in compensation scheme
fx ArithOp		on	step 3b: months out of compensation scheme (based on step 3a)
fx Elig		on	selected in step 3 -> eligible for step 4
fx BenCalc		on	step 4: share of hours worked in compensation
fx Elig		on	step 1: eligibility conditions (YSECOMP)
fx BenCalc		on	step 2: random allocation (based on external statistics)
fx Elig		on	selected in step 2 -> eligible for step 3
fx BenCalc		on	step 3a: random allocation of months in compensation scheme
fx ArithOp		on	step 3b: months out of compensation scheme (based on step 3a)
fx Elig		on	selected in step 3 -> eligible for step 4
fx BenCalc		on	step 4: share of hours worked in compensation
tudef_es		on	DEF: ASSESSMENT UNITS

Policy		Grp/No	ES_2020	Comment
fx Elig			on	set lhw_a
fx ArithOp			on	set lhw_a / hours worked per week (based on external statistics and/or assumptions)
fx BenCalc			on	set yemmy_a (enhanced LMA)
fx Elig			on	step 1: eligibility conditions YEMCOMP
fx BenCalc			on	step 2: random allocation (based on external statistics by sector)
	Who_M...		one	Based on aggregate statistics by sector published by the Ministry of Inclusion and Social Security. Data corresponding to the maximum number of beneficiaries (April 30)
	Comp_...	1	(lindi = 1) & (i_mc_rand_1 < 0.007)	0.7% workers in Agriculture and Fishing
	Comp_...	2	(lindi = 2) & (i_mc_rand_1 < 0.122)	12.2% workers in Mining, Manifact. and Utilities
	Comp_...	3	(lindi = 3) & (i_mc_rand_1 < 0.10)	10% workers in Construction
	Comp_...	4	(lindi = 4) & (i_mc_rand_1 < 0.31)	31% workers in Wholesale and retail
	Comp_...	5	(lindi = 5) & (i_mc_ra	75% workers in Hotels and restaurants

Step 3 defines the months in monetary compensation and step 4 defines the assumptions on the hours worked during the monetary compensation. Detailed information on the data can be found in the comment part in the spine. Please note that due to different administrative data used, the implementation can differ across countries.

3. 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 chapter).

To run the LMA-AddOn, users should access the **Run** Menu, select the country of interest and, as shown in Figure 5, tick the relevant LMA box after having activated the Add-On from the menu "View/Filter/Add-Ons". The add-on runs only with the 2020 system[5].

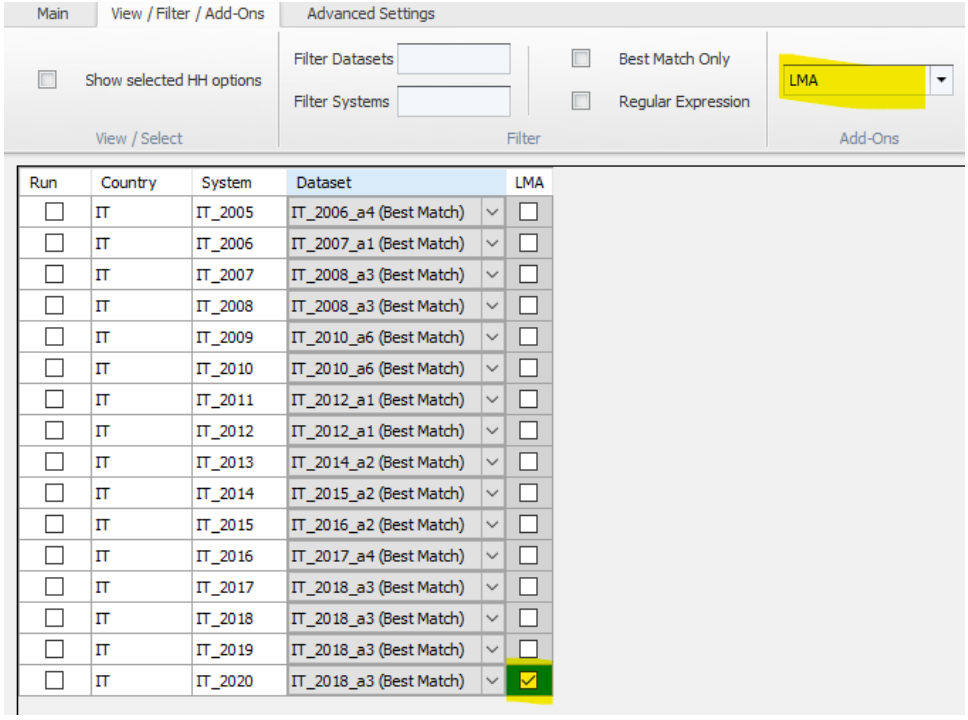
Ticking the LMA Add-On to on and running EUROMOD will instruct EUROMOD to perform the labour market transitions defined by the user (or as already pre-defined if the user does not want to change anything) and EUROMOD will produce an output that relies on the new labour market conditions.

Please note that running the LMA Add-On is sufficient for the transitions defined in TransLMA_cc to be implemented and polices such as monetary compensation and COVID-19 unemployment schemes to be run. No policy needs to be 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 5: Running the LMA Add-On in EUROMOD

[5] Previous years can be run using the standard LMA add-on (available on demand).



4. Policies triggered by the LMA add-on

This section lists which policies are triggered by the LMA Add-On in each country (Table 3). Intuitively, these are policies that do not produce any results except if run with the LMA Add-On, which implement transitions that make individuals eligible for the policies. The list contains information on the nature of the policies. The most common policies consist of monetary compensation schemes for employees and monetary compensation for self-employed. In some countries, transitions to either childcare schemes or new unemployment benefit schemes are modelled. See the EUROMOD Country Reports for a more detailed description of these policies.**Error! Reference source not found.**

Table 3: Types of schemes and policies triggered by the LMA Add-on

Country	Types of schemes	Policies
AT	MCSE MC	ysecomp_at (producing bwkmcse_s), yemcomp_at (producing bwkmcee_s, yemmc_s)
BE	MC MCSE	yemcomp_be (producing bwkmcee_s) ysecomp_be (producing bwkmcse_s)
BG	MC	yemcomp_bg (producing bwkmcee_s, yemmc_s)
CY	MC MCSE	yemcomp_cy (producing bwkmcee_s) ysecomp_cy (producing bwkmcse_s)
CZ	MC MCSE SIC	yemcomp_cz (producing bwkmcee_s, yemmc_s) ysecomp_cz (producing bwkmcse_s) part of tscct_cz (producing tsccterpi_s, tsccterhl_s, tscctersi_s, tsccterui_s)
DE	MC	bwkcee_de (producing bwkmcee_s)
DK	MC MCSE	yemcomp_dk ysecomp_dk
EE	MC	yemcomp_ee
EL	MC MCSE	yemcomp_el (producing bwkmcee_s) ysecomp_el (producing bwkmcse_s)

	SIC SIC	tsccter_el (producing tsccter_s) tsccte_el (producing tsccte_s)
ES	MC MCSE	yemcomp_es yemcomp_es
FI	MCSE	ysecomp_fi (producing bwkmcse_s)
FR	MC MCSE	yemcomp_fr (producing bwkmcee_s) ysecomp_fr (producing bwkmcse_s)
HR	MC MCSE	covidcomp_hr (producing bwkmcee_s) covidcomp_hr (producing bwkmcse_s)
HU	MC	yemcomp_hu (producing bwkmcee_s)
IE	MC NUB	yemcomp_ie bunctec_ie
IT	MC MCSE	bunct01_it bls_it
LT*	CCB MCSE MC MC	sickcomp_lt (producing bhl_s) (Sickness benefit for parents for taking care of children) ysecomp_lt (producing ysemc_s) yemdowncomp_lt (producing bwkmcee1_s) yemcomp_lt (producing bwkmcee2_s)
LU	MC	yemcomp_lu (producing bwkmcee_s)
LV	MC MCSE CCB	yemcomp_lv (producing bwkmcee_s) ysecomp_lv (producing bwkmcse_s) ycompdep_lv (producing bwkmcch_s (Supplementary payment to compensation scheme for dependent children))
MT	MC MCSE	yemcomp_mt ysecomp_mt
NL	MC	yemcomp_nl
PL	MC MCSE	yemcomp_pl (producing bwkmcee_s) yemcompst_pl (producing bwkmcst_s)
PT	MC MCSE	yemcomp_pt ysecomp_pt
RO	MC MCSE	yemcomp_ro (producing bwkmcee_s), ysecomp_ro (producing bwkmcse_s)
SE	MC	yemcomp_se (producing bwkmcee_s)
SI	MC MCSE	yemcomp_si (producing bwkmcee_s) ysecomp_si (producing bwkmcse_s)
SK	MC MCSE CCB	yemcomp_sk (producing bwkmcee_s) ysecomp_sk (producing bwkmcse_s) bccmc_sk (producing bccmc_s (Pandemic nursing benefit))

Note: MC - monetary compensation schemes for employees, MCSE – monetary compensation for self-employed, NUB - new unemployment benefit, CCB – childcare-related benefit, SIC - social insurance contributions.
LT* - _adj policies are simulated in spine instead of in LMA Add-on because of the interdependencies between monetary compensation schemes[6].

UK approach

To run labour transions in the UK it is not necessary to run the LMA Add-on. All labour market adjustments are done within the spine of the model by switching on the extensions c19_x, which includes a central, downside and upside scenario. The following transitions are modelled: becoming

[6] First, individuals cannot receive both monetary compensation for employees and sickness benefit for parents for taking care of children at the same time. As the latter policy is more generous, first, individuals with children are transited to childcare benefit scheme and only the rest would transit to monetary compensation scheme. Second, the monetary wage compensation during the quarantine (yemdowncomp_lt) has to be simulated before the wage compensation after the quarantine period (yemcomp_lt).

unemployed, receiving support from the Coronavirus Job Retention Scheme (CJRS) and from the Self-Employment Income Support Scheme (SEISS)[7].

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.
Self-employment income is set to zero for individuals moving out of employment. They are assumed to be unemployed for the whole year (for the ysemy months).
For individuals moving into employment, earnings are set equal to the value of yemYY_a..
In case transitions into work are modelled, all newly employed 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 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 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.

6. References:

Gasior, Katrin, and Olga Rastrigina. 2019. “Summary note for EUROMOD Labour Marker Adjustment Add-on". Last updated 7 November 2019.

Gasior, Katrin, and Olga Rastrigina. 2017. “Nowcasting: Timely Indicators for Monitoring Risk of Poverty in 2014-2016.” EM 7/17. EUROMOD Working Paper Series.

Leventi, Chrysa, Jekaterina Navicke, Olga Rastrigina, and Holly Sutherland. 2014. “Nowcasting Risk of Poverty and Income Distribution in the EU in 2013.” EM 11/14. EUROMOD Working Paper Series.

Navicke, Jekaterina, Olga Rastrigina, and Holly Sutherland. 2014. “Nowcasting indicators of poverty risk in the European Union: a microsimulation approach.” Social Indicators Research 119(1): 101-119.

[7] For the assumptions of the transitions, we use data from the Office for Budget Responsibility (OBR) 14 July 2020 fiscal sustainability report for unemployment (included in the constant $p_un) and for the proportion of furloughed workers ($p_furlough). For SEISS, we use information from HM Revenue & Customs published in August 2020 ($p_seiss). The constants controlling the assumptions for becoming furloughed and receiving the SEISS are conditioned on the month of interview. In the absence of data on self-employed who get a grant while still earning from self-employment and furloughed workers who still work some hours, assumption are made. All constants can be modified by users.

Rastrigina, Olga, Chrysa Leventi, and Holly Sutherland. 2015a. “Nowcasting Risk of Poverty and Low Work Intensity in Europe.” EM 9/15. EUROMOD Working Paper Series.

Rastrigina, Olga, Chrysa Leventi, and Holly Sutherland. 2015b. “Nowcasting: Estimating Developments in the Risk of Poverty and Income Distribution in 2013 and 2014.” EM 12/15. EUROMOD Working Paper Series.