

LM-EM User Guide

Draft
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About LM-EM

Establishing a credible institutional mechanism for skills planning is a key goal of the third National Skills Development Strategy (NSDS III). The main objective of the joint REAL-ADRS project was to support the NSDS III and policymaking in general at the Department of Higher Education and Training (DHET) by increasing the Department's capacity, as well as that of the Sector Education and Training Authorities (SETAs), to anticipate trends in the demand for and supply of skills from the education and training sector.

The Linked Macro-Education Model (LM-EM), a forecasting tool for strategic decision-making, is the end product of the joint REAL-ADRS project. Specifically, LM-EM enables users to design economic and education policy scenarios, quantify their impact, and project future trends in economic indicators and the demand for and supply of educational qualifications.

To capture the interactions between macro-economics and the education sector, LM-EM was created by linking the Applied Development Research Solutions (ADRS) multi-sector Macro-Economic Model of South Africa (MEMSA) to models of supply and demand for occupations and educational qualifications.

The macroeconomic basis of LM-EM provides users with insight on the working of the economy and its direct and indirect connections to the education sector. By accessing the model, users can introduce policy parameter changes and/or shocks, and LM-EM will instantly simulate the impact of the scenario on the South African economy and the education sector. LM-EM provides foresight through its comprehensive and consistent forecasts of economic indicators, demand for occupations, and demand and supply of educational qualifications.

Overall, as a tool for skills forecasting and planning, LM-EM projections of important economic and skills demand and supply indicators offer the necessary intelligence for detailed and systematic decision making. The model produces forecasts in six principle categories: macroeconomic and industry indicators, employment, demand/supply of educational qualifications, demand for occupations, skills (im)balances by educational qualifications, and (im)balances in the labour market.

1 Getting Started

Accessing LM-EM

To start using LM-EM, first log-in from the home page at adrs-global.com using your username and password. Once logged in, choose **1** *Economic Models*, then **2** *LMEM*. The **3** *About* page will appear as the default to provide some basic information regarding the model before getting started.

The screenshot shows the ADRS website interface. The header includes the ADRS logo and the tagline 'Applied Development Research Solutions'. The navigation menu is highlighted with three numbered callouts: **1** points to 'ECONOMIC MODELS', **2** points to 'LMEM', and **3** points to the 'ABOUT' link in the sub-menu. The main content area displays the 'LMEM Education Model' page, which includes a description of the model and a 'More About LM-EM' section with several FAQ-style questions and answers.

ADRS Applied Development Research Solutions
Bridging Research and Development

ABOUT US ADRS **1** ECONOMIC MODELS ECONOMIC MODEL **2** LMEM MEMSA SATTSIM SATTSIM PLUS
ABOUT ADRS MODELS SHOW ME BUY A SUBSCRIPTION **2** LMEM MEMSA SATTSIM SATTSIM PLUS
ABOUT CHANGE MACRO PARAMETERS LABOUR FORCE CHOICES RESOURCE CENTER VIEW LABOUR FORCE OUTPUT VIEW MACRO OUTPUT RUN SETTINGS

LMEM Education Model

LM-EM enables users to design economic and education policy scenarios, quantify their impact, and project future trends in economic indicators and the demand for and supply of occupations and educational qualifications. The model links the **ADRS multi-sector Macro-Economic Model of South Africa (MEMSA)** to models of supply and demand for occupations and educational qualifications. LM-EM produces forecasts in six principle categories: macroeconomic and industry indicators, employment at sector and SETA levels, demand/supply of educational qualifications, demand for occupations, skills (i)m)balances by educational qualifications, and (i)m)balances in the labour market.

3 More About LM-EM

Who is LMEM designed for?
Education policy analysts, economists, human resource specialists, SETA authorities and other professionals in national or provincial government departments, research or academic institutions.

What is LMEM's research and policy focus?
Measuring short and long term impact of current or alternative economic and education policy scenarios.

What is the forecast period for LMEM?
A simulation period of between 1 and 15 years.

What kind of output does LMEM generate?
Output includes both labour force and macroeconomic impacts of your policy choices. Results for job openings, job seekers, and employment trends are available by occupation and educational qualification. Employment results can be broken down by economic sectors and SETAs with SETA results cross tabulated by occupation and educational qualification. Key macroeconomic indicators are also provided for each scenario.

How current is LMEM model?
Parameter settings and database reflect current data and policy measures. The database also incorporates the demographic structure of South Africa for every year until 2030.

What are the sources of LMEM's data?
Reserve Bank time series data, Statistics South Africa's sectoral time series data, Quarterly Labour Force Surveys of Statistics South Africa, population data from Statistics South Africa, and matric and graduation data from the South African Department of Higher Education and Training.

What technical capacity does LMEM require?
Good access to the Internet and an e-mail address.

1 Getting Started

Adjusting Run Settings

The **1** *Run Settings* option on the far right allows you to **2** name your specific run, **3** choose the end run year of your forecast period and **4** choose to receive an email notification when the model run completes. Once you have selected your run settings, click **5** *Submit*. Now you are ready to enter parameter changes to the model. The *Run Settings* page also records all **6** previous model runs made through your account. You can choose to re-run a past configuration by selecting **7** *Make current* on the far right, or you can choose to **8** *Delete* a previous run.

The screenshot shows the 'Run Settings' page with the following elements:

- 1**: Navigation menu with 'RUN SETTINGS' highlighted.
- 6**: 'Previous Runs' table with columns: Submission Time, Model, Start Year, End Year, Description, and actions (Make Current, Delete).
- 7**: 'Make Current' button for a specific run.
- 8**: 'Delete' button for a specific run.
- 2**: 'Give your run a name' text input field.
- 3**: 'End Year' dropdown menu.
- 4**: 'Get completion notification by email' checkbox.
- 5**: 'Submit' button.

Submission Time	Model	Start Year	End Year	Description	Make Current	Delete
2015-12-21 19:46:25	LMEM	2015	2020	test		
2016-01-29 23:48:34	LMEM	2015	2020	run created: Monday, 21 December 2015, 19:46 model LMEM type na id 2		
2016-01-29 23:49:24	LMEM	2015	2020	run created: Friday, 29 January 2016, 23:48 model LMEM type na id 3		
2016-02-04 20:21:08	LMEM	2015	2020	Copy of: test		
2016-02-05 19:49:47	LMEM	2015	2025	run created: Thursday, 04 February 2016, 20:21 model LMEM type na id 6		
2016-02-07 05:15:48	LMEM	2015	2025	run created: Friday, 05 February 2016, 19:49 model LMEM type na id 7		
2016-02-07 05:17:21	LMEM	2015	2018	run created: Sunday, 07 February 2016, 05:15 model LMEM type na id 8		

Select the settings for your run:

- select the forecast period by entering the End Year (e.g., 2010). Note that the maximum forecast period for this model is 2015;
- give a name to the simulation run you are designing in this session;
- decide whether you want to make active one of your previous runs, if there are any, so you can re-edit it or view the output from it; and
- delete previous runs;

Click on the Submit button to register your changes.

Model: LMEM
Give your run a name: run created: Sunday, 07 February 2016, 05:17 model LMEM typ
End Year: 2018
Get completion notification by email:
Submit

2 Making Changes

Navigating the Menu

There are two categories of changes you can make to the model, **1** macroeconomic parameter changes and **2** labour force parameter changes. Both types of changes can be made in the same run. (Note: Changes only need to be made to parameters specific to your scenario, all other parameters will be run on the default value.) Each category has various subcategories of parameters that appear in a **3** second tier menu after choosing **1** or **2**.



LMEM : Graduation Rates : By Matriculation Ratio

By Race

On this page you can make the macroeconomic assumptions for your scenario. If you choose to specify employment changes directly, click on the key button (⇒) after the variable *Annual Employment Change* to enter the requested information directly. If you choose the *Indirectly* option, click on the key button after the variables *Growth Rate* and *Employment Elasticity* to enter the requested information necessary to determine annual additions to employment indirectly. You can also choose the inflation rates and changes to average salaries for the forecast period by clicking the relevant key button. The bottom part of the page allows you to choose the criteria to be used for allocating annual additions to total employment among the unemployed. After completing your policy changes on this and other pages, select the Run button to run the model. Use the Reset button to revert to the default values for the items on this page or all pages.

More information is available.

Key: ⇒ Change this parameter Displayed value changed Other values changed

See all parameters for this page

African 0.316 ⇒
Asian 0.489 ⇒
Coloured 0.320 ⇒
White 0.703 ⇒

Run Run Model Reset These items All items

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2 Making Changes

Identifying Parameters

Some pages have **1** secondary parameter options available. Once you locate the **2** specific parameter you would like to change, click the **3** small arrow icon to the right. This will open up a new window.

Fiscal Policy Rules

Here you can choose from options for fiscal policy rules and specify the relevant parameters. The values shown next to the parameters reflect the current values. Select the key (↔) buttons to enter the magnitude and period of shock to that variable. You can introduce shocks one variable at a time. You can review your parameter changes on this and other pages, use the Run button to run the model. Use the Reset button to revert to the default values for the items on this page or all pages.

Key: ↔ Change this parameter ■ Displayed value changed ■ Other values changed ■ Endogenous ■ Exogenous

1 Debt/GDP Targeting Stabilisation of Economic Activity Stabilisation and Debt GDP Ratio Targetting
[See all parameters for this page](#)

Debt-GDP Ratio Targeting

2 Target Debt-GDP Ratio 37.00 ↔

Debt Ratio Stabilisation Parameter 0.50 ↔ **3**

Run Run Model Reset These items All items

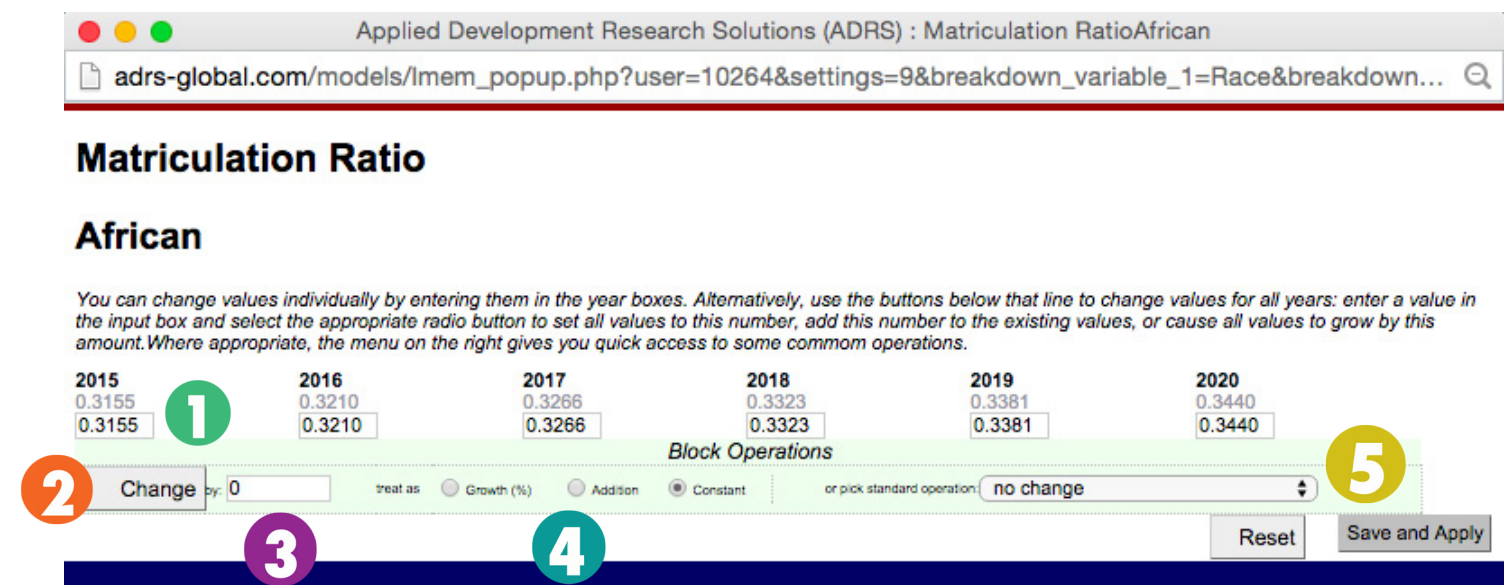
Welcome Emma [Logout](#)

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2 Making Changes

Making Changes to Parameters

In the small pop-up window, there are three ways to change the parameter values. You can change each year's value manually in the **1** value boxes. You can also use the **2** *Change by* option under the *Block Operations*. To do so, enter a value in the **3** box and choose the corresponding **4** *treat as* option (either growth, addition, or constant). You can also change a parameter value by choosing a **5** standard operation under *Block Operations*. The second and third options will be applied to all year values.



Applied Development Research Solutions (ADRS) : Matriculation RatioAfrican

adrs-global.com/models/lmem_popup.php?user=10264&settings=9&breakdown_variable_1=Race&breakdown...

Matriculation Ratio

African

You can change values individually by entering them in the year boxes. Alternatively, use the buttons below that line to change values for all years: enter a value in the input box and select the appropriate radio button to set all values to this number, add this number to the existing values, or cause all values to grow by this amount. Where appropriate, the menu on the right gives you quick access to some common operations.

2015	2016	2017	2018	2019	2020
0.3155	0.3210	0.3266	0.3323	0.3381	0.3440
0.3155	0.3210	0.3266	0.3323	0.3381	0.3440

Block Operations

2 Change by: 0

treat as: Growth (%) Addition Constant

or pick standard operation: no change **5**

3 **4** **Reset** **Save and Apply**

2 Making Changes

Applying Changes

After the correct changes have been selected, choose **1** *Save and Apply*. If necessary, the **2** *Reset to Defaults* option will reset all year values with no effect on other parameters. Once you have chosen **1** *Save and Apply*, the values in the pop-up window will turn gold to register the changes. If the values are correct, you can click out of the separate window.

Applied Development Research Solutions (ADRS) : Matriculation RatioAfrican

adrs-global.com/models/lmem_popup.php?session_random_key=nssjwrv6dfd84mefmryd&user=10264&index=...

Matriculation Ratio

African

You can change values individually by entering them in the year boxes. Alternatively, use the buttons below that line to change values for all years: enter a value in the input box and select the appropriate radio button to set all values to this number, add this number to the existing values, or cause all values to grow by this amount. Where appropriate, the menu on the right gives you quick access to some common operations.

2015	2016	2017	2018	2019	2020
0.3155	0.3210	0.3266	0.3323	0.3381	0.3440
0.3155	0.3313	0.3478	0.3652	0.3835	0.4027

Block Operations

Change by: 0

treat as: Growth (%) Addition Constant

or pick standard operation: no change

Reset Save and Apply

2 Making Changes

Running the Model

After modifying a parameter, the **1** value will appear highlighted in green on the parameter page to indicate it has been successfully changed. The **2** *Reset* option at the bottom of each parameter page allows you to either reset the parameter values for **3** *These items*, meaning only the parameters on this specific page, or for **4** *All items*, meaning all parameters in the model. Once you have made all your desired changes to both macroeconomic and labour force parameters, choose **5** *Run* at the bottom of any of the parameter change pages to run the model. This will initiate a **6** processing bar at the top of the page indicating that the model is being run.

6 [Progress bar: 2015, 2016, 2017, Abort, 2018, 2019, 2020]

LMEM : Graduation Rates : By Matriculation Ratio

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African	0.316 ⇨	1
Asian	0.489 ⇨	
Coloured	0.320 ⇨	
White	0.703 ⇨	

Run Run Model Reset These items **3** All items **4**

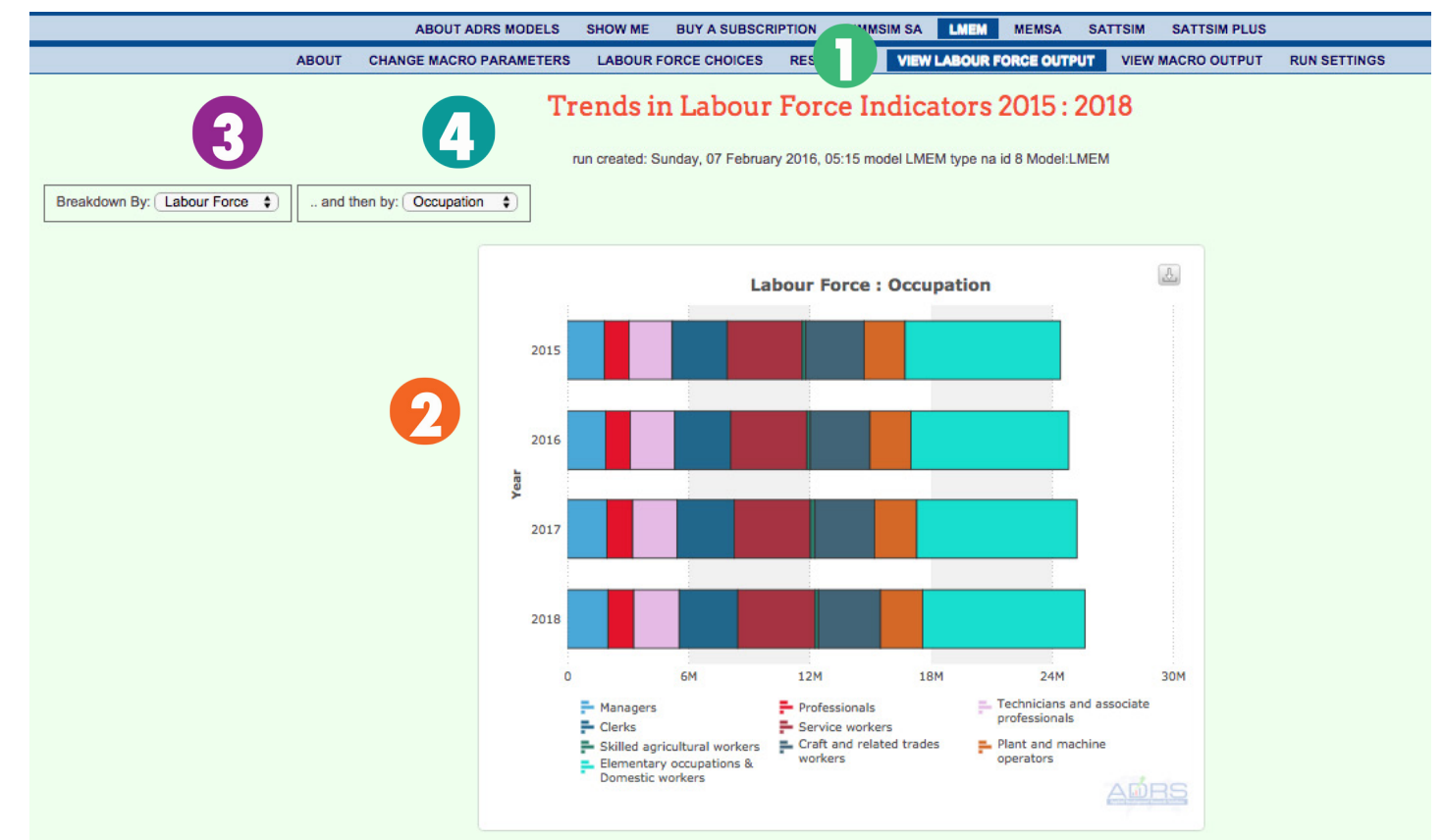
5 **2** **4**

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3 Viewing Results

Viewing Labour Force Output

Once the model has finished running your scenario and parameter changes, you will be automatically brought to the **1** *View Labour Force Output* page. This page displays the education results in both **2** graph and table form. The results can also be broken down by different indicators and categories. To see different types of model results in the Labour Force output, click the **3** drop down menu and choose an indicator. You can then further customize the results by clicking the **4** secondary drop down menu and selecting a second category by which to break down the forecasting projections. For some categories, third and fourth break down options are available.



3 Viewing Results

Viewing Macroeconomic Output

You can also choose to **1** *View Macro Output* in the menu bar, which will bring you to a page of selected macroeconomic indicators. Charts for each individual indicator can be viewed by clicking the **2** chart icon to the right of the table. The whole table or portions of the table can be copied and pasted into any document by highlighting the desired sections with your cursor.



The screenshot shows a web interface with a menu bar at the top. The menu bar includes options like 'ABOUT ADRS MODELS', 'SHOW ME', 'BUY A SUBSCRIPTION', 'DIMMSIM SA', 'LMEM', 'MEMSA', 'SATTSIM', and 'SATTSIM PLUS'. Below the menu bar, there are navigation links: 'ABOUT', 'CHANGE MACRO PARAMETERS', 'LABOUR FORCE CHOICES', 'RESOURCES', 'VIEW LABOUR FORCE C', 'VIEW MACRO OUTPUT' (highlighted with a green circle and '1'), and 'RUN SETTINGS'. The main content area is titled 'Selected Macroeconomic Indicators' and contains a table with columns for years 2015, 2016, 2017, 2018, Average, and Growth (%). A red circle with '2' is placed over the chart icon in the 'Growth (%)' column.

	2015	2016	2017	2018	Average	(%) Growth	
Real expenditure (Rmn at constant 2010 market prices)							
GDP at Market Prices	3,213,999.78	3,086,030.35	3,179,917.20	3,094,342.40	3,143,572.43	-1.26	
Private consumption	1,795,228.85	1,891,339.08	1,887,888.32	2,009,408.25	1,895,966.13	3.83	
Government consumption	907,473.97	607,719.91	818,079.81	546,842.63	720,029.08	-15.54	
Investment	543,646.16	590,066.99	566,507.02	690,911.74	597,782.98	8.32	
Exports of goods and services	904,960.15	743,220.56	785,749.70	659,844.36	773,443.69	-9.99	
Imports of goods and services	909,127.57	811,775.70	882,027.97	814,393.82	854,331.26	-3.60	
Gross Domestic Expenditure	3,218,167.20	3,154,585.49	3,276,195.47	3,248,891.87	3,224,460.01	0.32	

4 Accessing Support

Finding More Resources

Finding More Resources

For additional resources regarding the Linked Macro-Education Model, including a glossary of terms, technical reports on the individual modules, and examples of model application, see the *Model resources* page. If you can't find the answer to your question, feel free to contact us at info@adrs-global.com!