

Economic and Social Commission for Western Asia

User guide for the Arab Trade Simulator Interface – (ATSI)



United Nations
Beirut

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Introduction

Trade reform is complex to analyse, as it combines direct and indirect effects concurrently. Some effects are specific to short-term adjustments while some trends reflect long-term effects through factor reallocation.

Theory alone cannot identify optimal economic policies; in-depth empirical analysis based on consistent and detailed evidence from the concerned economies is essential.

The purpose of this user guide is to support United Nations Economic and Social Commission for Western Asia (ESCWA) member States' trade negotiators in using the Arab Trade Simulator Interface (ATSI) for trade policy analysis by presenting its major features and the steps to be followed in performing an ex-ante assessment of alternative trade policies and external shocks.

This user guide is prepared by ESCWA Cluster 3 in the context of its work programme in facilitating the negotiations of preferential trade agreements.¹ This analysis does not aim to evaluate trade agreements in force, but rather aims to provide insight into the potential implications of concluding new preferential trade agreements under alternative scenarios or of revisiting in force agreements.

This document comprises four sections. Section 1 reviews the main modelling approaches used in ex-ante assessments of trade policies. Section 2 is devoted to a presentation of the ATSI model and its major features. Section 3 presents how to undertake simulations using simplified examples. Section 4 focuses on how to interpret and use the results of simulations in policy analysis.

¹ The user guide has been prepared by Mohamed Chemingui (senior economist and project coordinator at ESCWA (Cluster 3) and Nancy Daccache (Research Assistant at Cluster 3).

Section 1. Major ex-ante quantitative approaches for trade policy analysis

1.1 The gravity model

The gravity model is generally used for understanding bilateral trade among countries. It assumes that trade flow between two countries is a function of their respective country sizes, represented by their gross aggregate income or gross domestic product (GDP) and the distance between partners, a proxy for transportation costs. This implies that larger countries have an incentive to trade more with each other, while the further away two countries are from one another, the less trade occurs.²

1.2 Partial equilibrium trade model

Due to its being partial, this type of model only looks at one sector of the economy. Many important effects are not addressed in the model, but results can be rapidly derived.

This type of model can be used if the effects of the tested reforms on the rest of the economy are small. When the sector is small, the income effects of any reforms or changes are limited. This type of modelling is recommended when the link between the considered sector with the rest of the economy is limited, such as with agriculture, for example. In this case, backward and forward linkages and their corresponding feedback effects are limited.³

1.3 Computable general equilibrium model

Computable general equilibrium (CGE) models are computer simulation models that use data to explore the economic impacts of changes in policy, technology and other factors. They show how different sectors inside an economy are linked, how several economies are connected to each other, and how resources such as labour, capital and natural resources are best allocated across all economic activities.

A CGE model allows for considering large-scale policy changes using the present economic situation as a benchmark. CGE models are generally preferable to partial equilibrium models when the scope of the

2 For further details on gravity models see Chemingui M.; Y. Surry, and C. Thabet, 2018. "TOOLS FOR EXANTE TRADE IMPACT ANALYSIS", Technical paper, UNESCWA, Beirut.

3 Ibid.

economic policy experiment is large and when inter-market linkages and income constraint effects are expected to be significant.

These characteristics are generally present in trade policy analysis, especially when it comes to examining the effects of regional and global integration reforms. Even a scale change in a single industry has the potential to cause drastic and unexpected consequences given backward and forward linkages within the economy. The interdependencies between industries need to be considered in order to analyse the full impact of (trade) policy changes.

Unlike gravity and partial equilibrium models, CGE models offer a rigorous and theoretically consistent framework for analysing trade policy questions. There are three categories of CGE models, starting from a single model (for one country), a regional model (for two or more countries), to a global one covering most countries in the world through tailored regional aggregation. The ATSI model belongs to the third category.

Section 2. ATSI

2.1 Model features

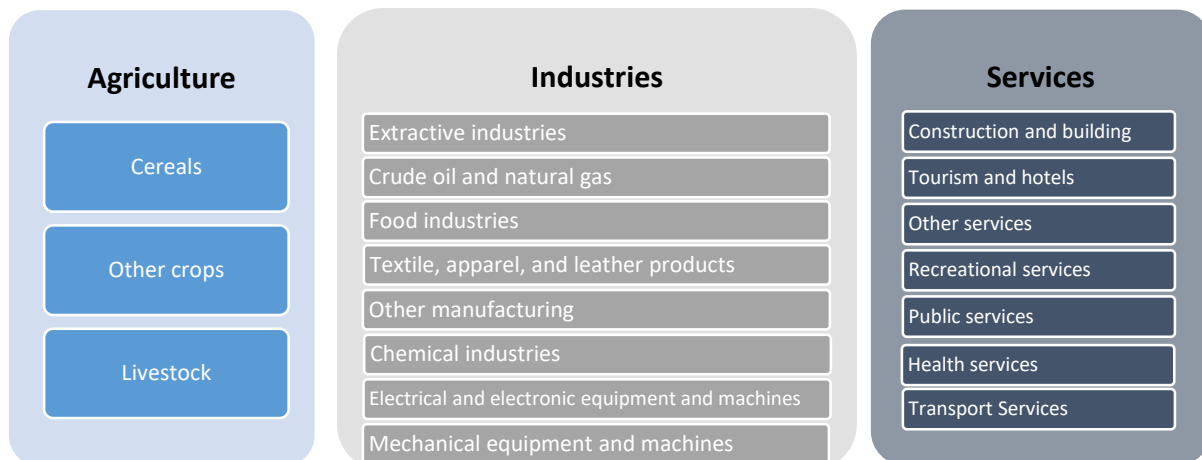
ATSI was based on the prototype model developed by the Centre d'Études Prospectives et d'Informations Internationales (CEPII).⁴ ATSI is a multi-region, multi-sector, CGE model with perfect competition and constant returns to scale. It is calibrated using a modified version of the Global Trade Analysis Project (GTAP) Data Base.

The latest published GTAP Data Base (release 10.0) reflects the world's economic interlinkages for the year 2014. It includes 65 sectors and 141 countries of the world. Among the 141 countries, 10 Arab countries were included in the original version and an additional eight Arab countries have been integrated into the current version.

To reduce the time needed for solving the model and the long calibration process, modelers adopt the specific aggregation of sectors and countries that best match their policy needs. For ATSI, the sectoral and geographical dimensions are displayed in the two next sections.

2.2 Sectoral composition

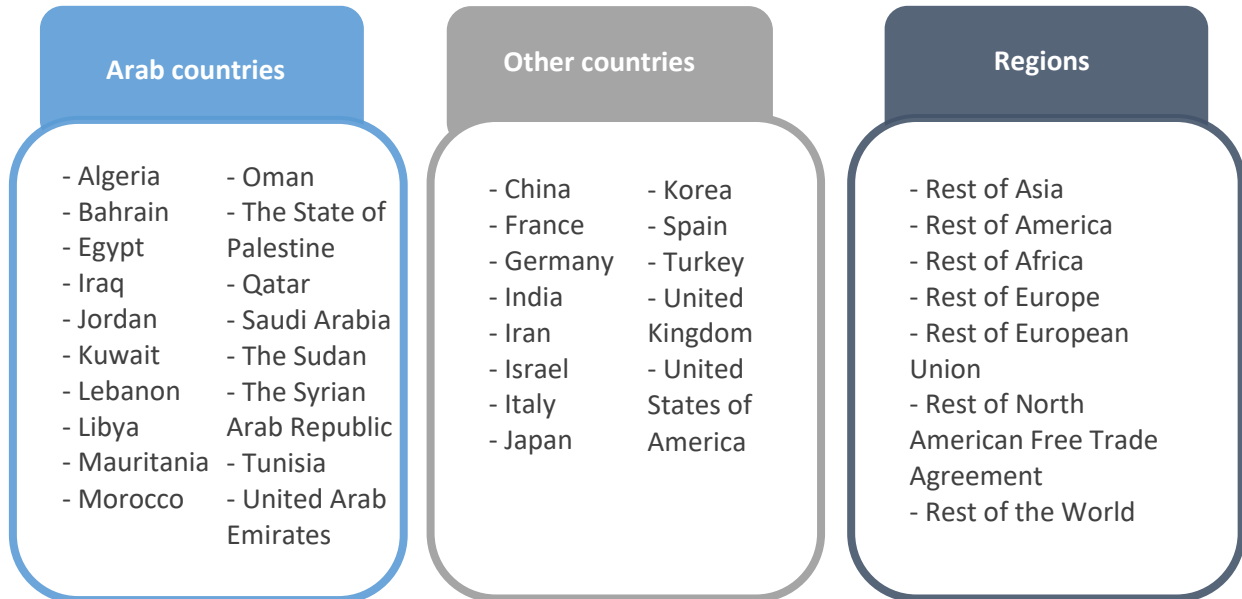
The current version of the model includes the following sectors:



4 Bchir, M.A; Y. Decreux, J-L Guérin & S. Jean, 2002. "MIRAGE, a Computable General Equilibrium Model for Trade Policy Analysis", CEPII, Paris.

2.3 Geographical composition

The current model includes the following countries and regions:



2.4 Dynamic setting

The model's dynamic is sequential: the equilibrium can be solved successively for each period. The timespan can be set by the user, usually at around 15 to 20 years. Except for physical capital, the growth rates of production factors (labour and natural capital) are set exogenously. For each period, mobile factors adjust instantaneously while capital stock only adjusts through investment. The new version of ATSI allows simulations up until the year 2030.

2.5 The technology

ATSI was developed using the General Algebraic Modeling Language (GAMS) Model Interface with Rapid Orchestration (MIRO) software. GAMS MIRO makes facilitates turning all GAMS models into interactive end user applications that developers can distribute to different users or that can be hosted on a web server.

The user-friendly interface allows all users (modelers and non-technical users) to interact with the underlying GAMS model, quickly create different scenarios, compare results and much more. The extensive data visualization capabilities of MIRO enable users to create charts, time series, maps and widgets with ease.

Section 3. Implementing ATSI-based trade policy scenarios

3.1 Login section

Users can access ATSI either through the Arab Trade Gateway (ATG) website, a one-stop shop for trade policymakers developed by ESCWA, or directly through the dedicated ESCWA simulations website link.



3.2 Steps to perform a simulation

The screenshot shows the ESCWA simulation interface. The left sidebar contains navigation options: Input, Output, GAMS interaction, Load scenarios, and Compare scenarios. The main area is titled '<New Scenario>' and contains the following fields:

- Importer:** Dropdown menu with 'All' selected, marked with a red circle 1.
- Exporter:** Dropdown menu with 'All' selected, marked with a red circle 2.
- Policy:** Dropdown menu with 'Tariffs' selected, marked with a red circle 3.
- Sector:** Dropdown menu with 'All' selected, marked with a red circle 4.
- From:** Dropdown menu with '2022' selected, marked with a red circle 5.
- To:** Dropdown menu with '2030' selected, marked with a red circle 5.
- Percentage:** Input field with '0' entered, marked with a red circle 6.
- Offset:** Input field with '0' entered.

Below the form are two buttons: 'Add shock' (marked with a red circle 7) and 'Clear shocks'. At the bottom, there is a table with the following columns: Importer, Exporter, Policy, From, To, Sector/Product, and Percentage / Absolute migration.

For each country, the interface allows users to perform simulations on four trade policy instruments: tariffs, trade cost, number of skilled migrants and number of unskilled migrants. The user can apply policy reform(s) (one or many) on the country of interest (importer) with a partner country(ies) (one or more exporters), or on a third country (importer versus exporter) with a partner country(ies) (one or more) or on both (domestic reforms and external shocks). In addition to tariffs, other trade costs and the number of migrants, the model adds another important dimension by modeling the links between trade reforms and external shocks with foreign direct investment (FDI) flows by origin, destination and sector.

To perform a simulation, users should follow these steps:

1. Select the *country(ies) of interest* (one or more countries and/or regions from Importer list).
2. Select the *partner(s)* (one or more countries and/or regions from Exporter list).
3. Select the *policy instrument(s)* (one or multiple instruments).
4. Select the *sector(s)* (one, multiple, or all sectors).

5. Select the **year(s) of scenario implementation** (*one or multiple values*): Simulations can be implemented over the period 2023 to 2030.
6. Select the **amplitude of the policy change** (*one or multiple values*): After selecting the **policy instrument**, the user will select either the percentage change to be implemented, either in a single year or progressively over a period, or the offset change (directly apply the alternative tariff rate).
7. Add the **shock(s)** (*one or multiple shocks*), which will appear in the table at the end of the window.
8. Run the defined scenario by clicking the “**Solve model**” button.

Once done, the results will be generated for the user to perform analysis. They will be split into seven main tabs, each one specific to the intended analysis.



Dashboard: a general overview of each country’s simulation results with a focus on major macroeconomic variables and changes by 2030.

Macro reports: impacts on macro-economic indicators per country and per year.

Economic integration performance: overview of impacts on economic integration channels (trade, FDI, remittances) and dependency index between two selected countries.

GHG emissions: linking trade policy shocks to changes in greenhouse gas (GHG) emissions by country, year and type of emissions (Nitrous oxide, Methane, Fluorinated Gases, and Carbon dioxide).

Sectoral Reports: impacts on a country’s domestic economy in terms of investment, production and labour, by sector and year.

Integration Variables: impacts on aggregate trade, FDI and remittances by country of origin and destination, and by year.

Sectoral trade reports: impacts on sectoral trade by country of origin and destination and year.

3.3 Examples of applications

Five scenarios have been designed and tested using the ATSI for illustrative purposes:

Scenario 1: unilateral trade liberalization on all goods

Scenario 2: bilateral trade liberalization on all goods

Scenario 3: bilateral trade liberalization with sector excluded (negative list)

Scenario 4: bilateral trade liberalization on all goods alongside reduction in other trade costs

Scenario 5: extension of preferential trade arrangement to a third partner

3.3.1 Scenario 1: Unilateral trade liberalization between India and the United States of America on trade of goods

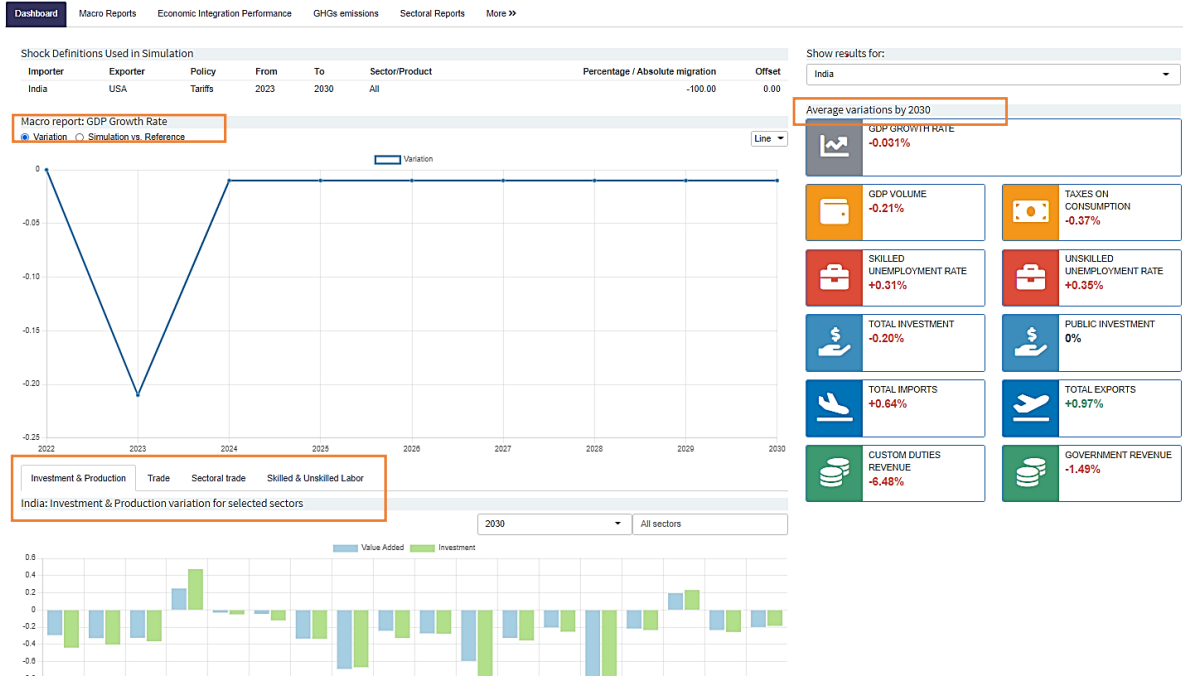
India will remove all of its tariffs on imports from the United States of America starting 2023 until 2030, unilaterally.

A. Building the shock and solving the model

The screenshot shows the ESCWA GAMS interface for building a shock. The interface is divided into a sidebar on the left and a main panel on the right. The sidebar contains navigation options: Input, Output, GAMS interaction, Load scenarios, Compare scenarios, Load data, and Solve model. The main panel contains input fields for the shock configuration, with orange circles highlighting specific fields. The fields are: Importer (India), Exporter (USA), Policy (Tariffs), Sector (All), From (2023), To (2030), Percentage (-100), and Offset (0). Below the input fields are two buttons: Add shock and Clear shocks. At the bottom, a table displays the configured shock parameters.

	Importer	Exporter	Policy	From	To	Sector/Product	Percentage / Absolute migration
1	India	USA	Tariffs	2023	2030	All	-100.00

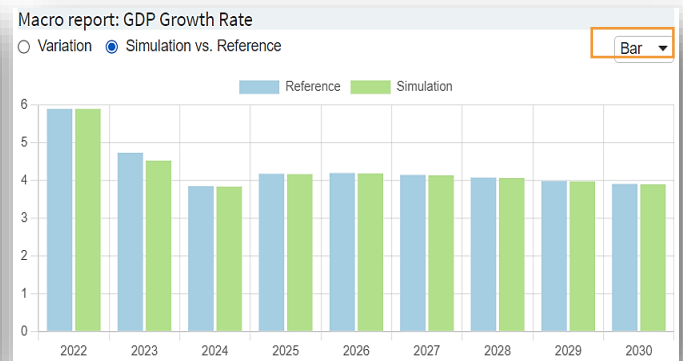
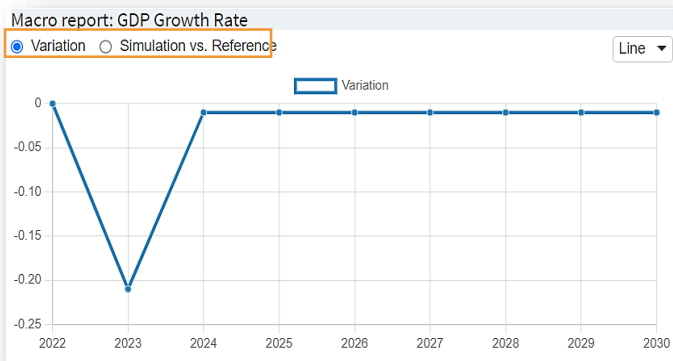
B. Results generated: the tabs



- The Dashboard tab:** on the right side of the dashboard, the user gains insight into the average change of the main macro-economic indicators achieved by a country by 2030 should a policy change occur, as compared to the baseline, such as *GDP growth rate*, *GDP volume*, *Unemployment skilled*, *Unemployment unskilled*, *Taxes on consumption*, *Total investment*, *Total exports*, *Total imports*, *Tariff revenues*, *Public investment*, *Government revenues*, allowing for a longer-term perspective on the impact of policy changes on the economy of that country.

The user can change the chart type and choose whether to see the variation graph (% change from the reference scenario) or the simulation value versus reference value in one graph.

The user can right click on every graph to download it and save it as an image.



- **Macro reports tab:** the user can see all the indicators mentioned in the dashboard and choose the chart type from a list of options. They can download the data in Excel.

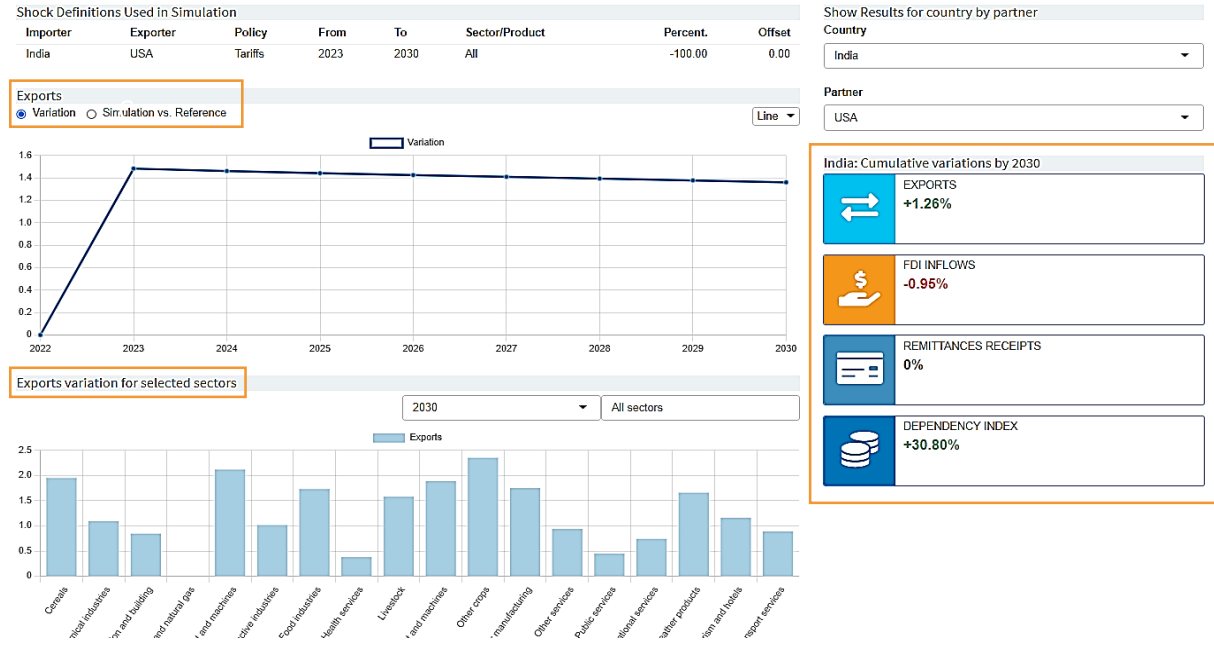
The screenshot displays the 'Macro Reports' section of a dashboard. At the top, there are navigation tabs: Dashboard, Macro Reports (active), Economic Integration Performance, Gas Emission, Sectoral Reports, and More. Below the navigation, there are several interactive elements: a 'Filter' section with a 'Load view' dropdown set to 'Table', a 'Download Excel' button, and an 'Aggregate' dropdown set to 'Sum'. A 'Header' section contains a search bar and a dropdown set to 'All'. The main data table shows indicators for Algeria in 2022, with columns for Country, Year, Variable, ref, sim, and variation. Below the table, there are filters for Country, Year, and Variable. A 'View options' menu is open, showing a list of chart types (Table, Heatmap, Bar chart, Stacked bar chart, Line chart, Scatter chart, Area chart, Stacked area chart) and a list of indicators with edit and delete icons. A text box on the right explains that users can filter results by dragging components from left to above or to the 'Filter' case.

Country	Year	Variable	ref	sim	variation
Algeria	2022	AGRICULTURAL IMPORTS	9,480.95	9,480.95	0.00
		Capital price	0.15	0.15	0.00
		Capital Supply	614,924.50	614,924.50	0.00
		CUSTOM DUTIES Revenue	4,609.95	4,609.95	0.00
		DIVERSIFICATION INDEX	15.07	15.07	0.00
		EXPORTS OF AGRICULTURAL PRODUCTS	9,694.25	9,694.25	0.00
		GDP GROWTH RATE	4.24	4.24	0.00
		GDP per capita	4,412,275.49	4,412,275.49	0.00
		GDP Volume	200,097.35	200,097.35	0.00
		Government Account Balance	-32,566.34	-32,566.34	0.00
		GOVERNMENT BUDGET	46,123.87	46,123.87	0.00

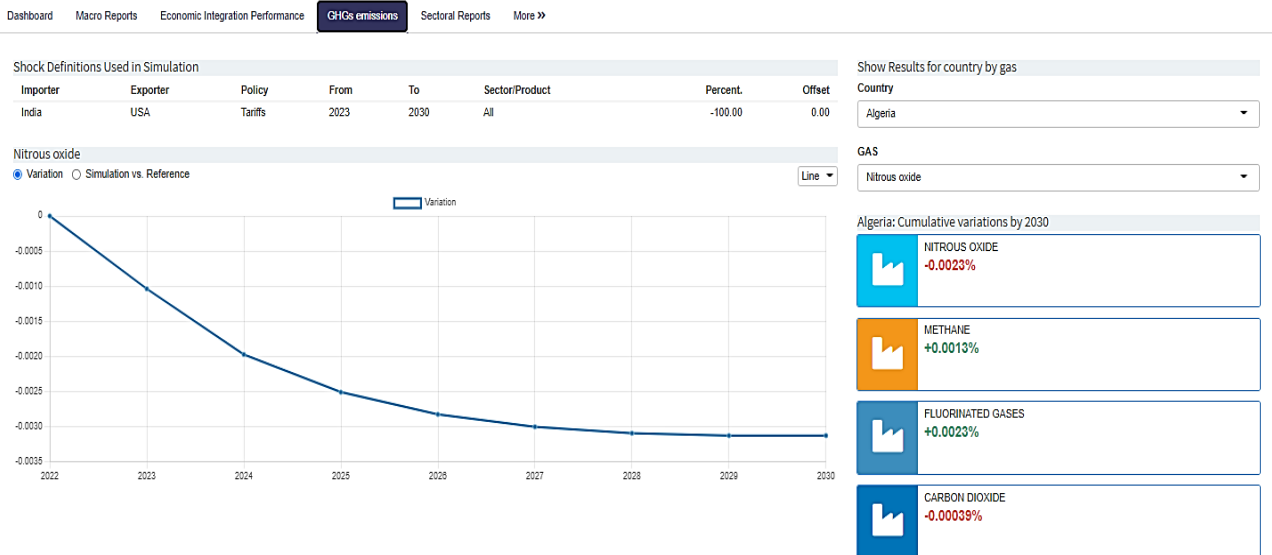
Showing 1 to 11 of 10,737 entries

View options: the user can filter results by dragging the components of the table from left to above or to the "Filter" case

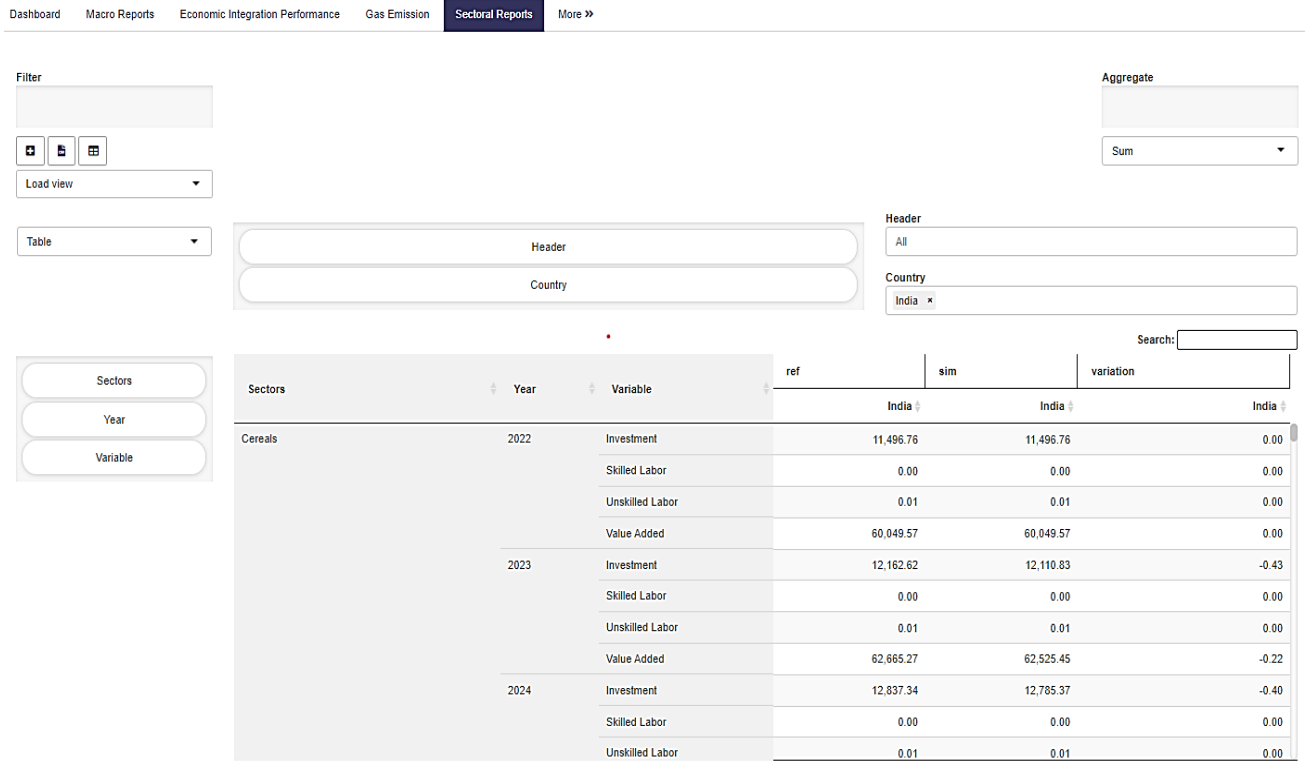
- **Economic integration performance tab:** the user can see the impacts of policy change between a country and its partner on the following bilateral economic integration channels, which represent the major expected gains from integration schemes: FDI, exports and remittances, disaggregated by sectors for exports and FDI.



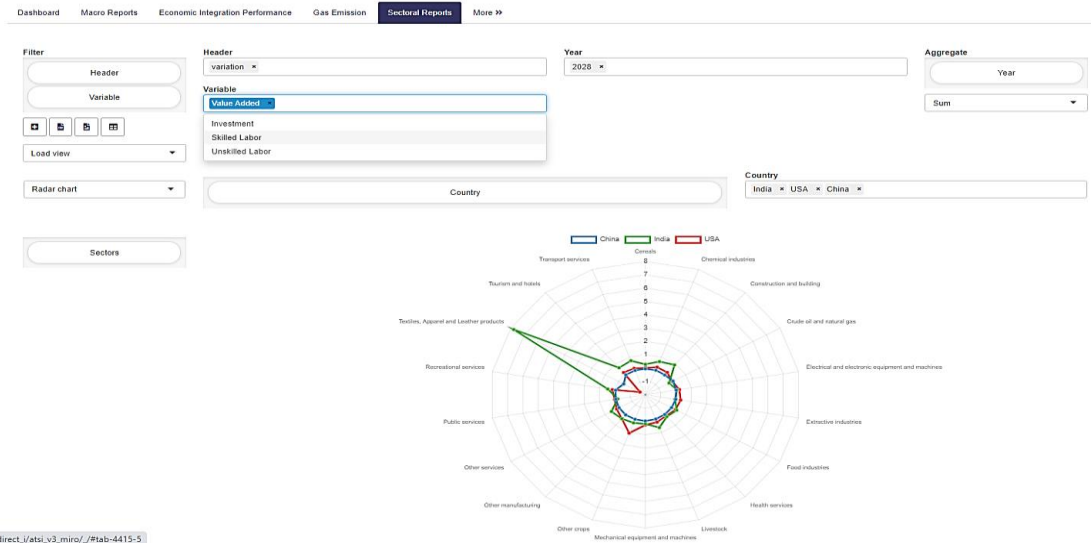
- **GHG emissions:** the user can view the impacts of each GHG emission type, as deviations between alternative and reference scenarios or by comparing the simulation and reference levels.



- **Sectoral reports tab:** this tab shows the impacts on sectoral domestic production, investment and labour (skilled and unskilled), by showing the reference, simulation and variation results.



The user can see the result in the form of a table or a chart, as shown in the figure below.



- Integration Variables tab:** this tab shows the impacts on integration variables such as trade, FDI and remittances by country of origin, for example, the United States of America, and destination, India, and by year.

Dashboard Macro Reports Economic Integration Performance GHGs emissions Sectoral Reports **Integration Variables**

Filter: Trade Trade x

Aggregate: Sum

Table: Table

Header: All

Search:

Importer	Exporter	Year	ref	sim	variation
India	USA	2023	33,309.77	48,772.90	46.42
		2024	34,037.08	49,850.43	46.46
		2025	34,806.41	50,996.19	46.51
		2026	35,639.28	52,233.14	46.56
		2027	36,483.73	53,484.88	46.60
		2028	37,317.15	54,711.00	46.61
		2029	38,116.29	55,883.64	46.61
	Yemen	2022	28.86	28.86	0.00
		2023	25.65	25.54	-0.43

Another way of viewing the results is through a heatmap, which enables the user to quickly identify the partners with whom the changes in bilateral trade were the highest and lowest.

Dashboard Macro Reports Economic Integration Performance Gas Emission Sectoral Reports **Integration Report**

Load view

Search:

Exporter	2023 variation														
	Algeria	BAHRAIN	China	Egypt	France	Germany	India	Iran	Iraq	Israel	Italy	Japan	Jordan	Korea	Kuwait
Algeria		0.00	-0.03	-0.05	-0.01	-0.01	-0.95	-0.04	-0.06	0.00	-0.01	-0.01	-0.14	-0.04	0.00
BAHRAIN	0.11		0.05	0.07	0.11	0.06	-2.14	0.00	0.04	0.00	0.09	0.08	0.00	0.07	-0.05
China	-0.01	-0.11		-0.04	0.00	-0.00	-2.39	-0.08	-0.05	-0.02	-0.01	0.02	-0.04	0.00	-0.10
Egypt	0.02	-0.11	0.03		0.04	0.01	-0.33	-0.02	-0.03	0.03	0.06	0.06	-0.04	0.04	-0.13
France	-0.01	-0.06	-0.01	-0.04		-0.00	-2.24	-0.07	-0.06	0.00	-0.02	0.01	-0.06	-0.01	-0.08
Germany	-0.02	-0.06	-0.01	-0.05	0.01		-2.30	-0.08	-0.04	0.00	-0.01	0.01	-0.03	-0.00	-0.06
India	1.40	1.30	1.12	1.23	1.05	1.03		1.13	1.07	1.31	1.08	1.02	0.95	1.00	1.23
Iran	0.04	-0.04	0.11	0.03	0.05	0.05	-0.58		0.03	0.05	0.06	0.14	0.00	0.13	-0.10
Iraq	0.04	-0.11	-0.02	-0.04	0.02	0.02	-0.41	-0.01		0.04	0.01	0.01	-0.00	-0.02	-0.10
Israel	0.00	0.00	-0.00	-0.04	0.01	-0.00	-1.40	-0.04	-0.06		-0.01	0.01	-0.03	-0.01	-0.08
Italy	-0.01	-0.10	-0.00	-0.04	0.00	0.00	-2.16	-0.07	-0.04	-0.03		0.02	-0.05	-0.00	-0.09

Showing 1 to 11 of 39 entries

Rows: Trade Filter: Trade Exporter atsi_v3_miro/ /#

Columns: Year 2023 Filter: Header variation

Aggregation (Sum) Filter:

- **Sectoral trade reports tab:** the user can see the impacts of the shock on bilateral trade between the country of origin, for example, the United States of America, and destination, India, by year and sectors, as shown in the figure.

Dashboard Macro Reports Economic Integration Performance Gas Emission Sectoral Reports **Sectoral Trade Reports**

Show **15** entries Search:

Variable	Sectors	Exporter	Importer	Year	Ref	Sim	Variation
Trade	Cereals	USA	India	2022	0.83	0.83	0.00
Trade	Cereals	USA	India	2023	0.87	1.68	93.10
Trade	Cereals	USA	India	2024	0.91	1.75	92.31
Trade	Cereals	USA	India	2025	0.95	1.84	93.68
Trade	Cereals	USA	India	2026	0.99	1.92	93.94
Trade	Cereals	USA	India	2027	1.04	2.01	93.27
Trade	Cereals	USA	India	2028	1.09	2.11	93.58
Trade	Cereals	USA	India	2029	1.14	2.20	92.98
Trade	Cereals	USA	India	2030	1.19	2.30	93.28
Trade	Other crops	USA	India	2022	1,330.75	1,330.75	0.00
Trade	Other crops	USA	India	2023	1,383.30	3,373.14	143.85
Trade	Other crops	USA	India	2024	1,439.64	3,517.62	144.34
Trade	Other crops	USA	India	2025	1,499.56	3,669.01	144.67
Trade	Other crops	USA	India	2026	1,564.63	3,831.46	144.88
Trade	Other crops	USA	India	2027	1,632.32	3,999.37	145.01

All All usa india All All All All

Showing 1 to 15 of 324 entries (filtered from 492,804 total entries) Previous **1** 2 3 4 5 ... 22 Next

3.3.2 Scenario 2: Bilateral trade liberalization between India and the United States of America on trade in goods

	Importer	Exporter	Policy	From	To	Sector/Product	Percentage / Absolute migration
1	India	USA	Tariffs	2023	2030	All	-100.00
2	USA	India	Tariffs	2023	2030	All	-100.00

3.3.3 Scenario 3: Bilateral trade liberalization between India and the United States of America with negative list

Removal of all tariffs on trade between India and the United States of America from 2023 until 2030, with a negative list covering all agricultural products

	Importer	Exporter	Policy	From	To	Sector/Product	Percentage / Absolute migration
1	India	USA	Tariffs	2023	2030	Extractive industries	-100.00
2	India	USA	Tariffs	2023	2030	Crude oil and natural gas	-100.00
3	India	USA	Tariffs	2023	2030	Food industries	-100.00
4	India	USA	Tariffs	2023	2030	Textiles, Apparel and Leather products	-100.00
5	India	USA	Tariffs	2023 *	2030	Other manufacturing	-100.00
6	India	USA	Tariffs	2023	2030	Chemical industries	-100.00
7	India	USA	Tariffs	2023	2030	Electrical and electronic equipment and machines	-100.00
8	India	USA	Tariffs	2023	2030	Mechanical equipment and machines	-100.00
9	USA	India	Tariffs	2023	2030	Extractive industries	-100.00
10	USA	India	Tariffs	2023	2030	Crude oil and natural gas	-100.00
11	USA	India	Tariffs	2023	2030	Food industries	-100.00
12	USA	India	Tariffs	2023	2030	Textiles, Apparel and Leather products	-100.00
13	USA	India	Tariffs	2023	2030	Other manufacturing	-100.00
14	USA	India	Tariffs	2023	2030	Chemical industries	-100.00
15	USA	India	Tariffs	2023	2030	Electrical and electronic equipment and machines	-100.00
16	USA	India	Tariffs	2023	2030	Mechanical equipment and machines	-100.00

3.3.4 Scenario 4: Bilateral trade liberalization between India and the United States of America coupled with reduction in transport costs

Removal of all tariffs on trade between India and the United States of America from 2023 until 2030, with a reduction of transport costs gradually by 5 per cent every year

	Importer	Exporter	Policy	From	To	Sector/Product	Percentage / Absolute migration
1	India	USA	Tariffs	2023	2030	All	-100.00
2	USA	India	Tariffs	2023	2030	All	-100.00
3	India	USA	Trade Cost	2023	2023	All	-5.00
4	India	USA	Trade Cost	2024	2024	All	-10.00
5	India	USA	Trade Cost	2025	2025	All	-15.00
6	India	USA	Trade Cost	2026	2026	All	-20.00
7	India	USA	Trade Cost	2027	2027	All	-25.00
8	India	USA	Trade Cost	2028	2028	All	-30.00
9	India	USA	Trade Cost	2029	2029	All	-35.00
10	India	USA	Trade Cost	2030	2030	All	-40.00
11	USA	India	Trade Cost	2023	2023	All	-5.00
12	USA	India	Trade Cost	2024	2024	All	-10.00
13	USA	India	Trade Cost	2025	2025	All	-15.00
14	USA	India	Trade Cost	2026	2026	All	-20.00
15	USA	India	Trade Cost	2027	2027	All	-25.00
16	USA	India	Trade Cost	2028	2028	All	-30.00
17	USA	India	Trade Cost	2029	2029	All	-35.00
18	USA	India	Trade Cost	2030	2030	All	-40.00

3.3.5 Scenario 5: Scenario 2 + FTA between India and the European Union 27 (similar commitments as between India and the United States of America)

	Importer	Exporter	Policy	From	To	Sector/Product	Percentage / Absolute migration
1	India	USA	Tariffs	2023	2030	All	-100.00
2	USA	India	Tariffs	2023	2030	All	-100.00
3	India	France	Tariffs	2030	2030	All	-100.00
4	India	Germany	Tariffs	2030	2030	All	-100.00
5	India	Italy	Tariffs	2030	2030	All	-100.00
6	India	Spain	Tariffs	2030	2030	All	-100.00
7	India	Rest of European Union Member countries	Tariffs	2030	2030	All	-100.00
8	France	India	Tariffs	2030	2030	All	-100.00
9	Germany	India	Tariffs	2030	2030	All	-100.00
10	Italy	India	Tariffs	2030	2030	All	-100.00
11	Spain	India	Tariffs	2030	2030	All	-100.00
12	Rest of European Union Member countries	India	Tariffs	2030	2030	All	-100.00

Section 4. Features of the simulator

4.1 Extracting all the data of a scenario

The user can download data as GAMS or MIRO “...” (if appropriate software is available on the computer) or as an Excel file.

The screenshot shows the simulator's main interface with a 'Scenario' dropdown menu open. The 'Export' option is highlighted with an orange box. An orange arrow points from the 'Export' option to a dialog box titled 'Export scenario'. The dialog box has a 'Select a file type' section with a dropdown menu showing 'MIRO Scenario (MIROSCEN)'. Below the dropdown are four options: 'MIRO Scenario (MIROSCEN)', 'GAMS Data eXchange (GDx)', 'Comma-separated values (CSV)', and 'Microsoft Excel (XLSX)'. To the right of these options are 'Cancel' and 'Export' buttons, with the 'Export' button highlighted with an orange box.

Importer	Exporter	Policy	From	To	Sector/Product	Percentage / Absolute migration	
1	India	USA	Tariffs	2023	2030	All	-100.00

4.2 Saving a scenario for future use

“Save as” when saving a new scenario. “Save” when saving new modifications made on an already saved scenario.

The screenshot shows the GAMS interface with the 'Scenario' dropdown menu open. The menu options are: Edit metadata, Save, Save As, Export, and Delete. An arrow points from the 'Save As' option to the 'New scenario' dialog box. The dialog box has the following fields and options:

- Please enter a name for the scenario:** Example 1: unilateral trade liberalization, Ind
- Add tag(s) to your scenario (optional):** (empty text box)
- Discard attachments?**
- Discard views?**
- Discard permissions?**
- Buttons:** Cancel, Ok

The background interface shows the 'Scenario' dropdown menu with the following options: Edit metadata, Save, Save As, Export, and Delete. The main interface shows the 'Input' tab with the following settings:

- Importer:** India
- Exporter:** USA
- Policy:** Tariffs
- Sector:** All
- From:** 2023
- To:** 2030
- Percentage:** -100
- Other:** 0

Buttons: Add shock, Clear shocks

	Importer	Exporter	Policy	From	To	Sector/Product	Percentage / Absolute migration
1	India	USA	Tariffs	2023	2030	All	-100.00

4.3 Load scenarios

At the left of the window, the user has access to all saved scenarios in the “load scenarios” button. The user can choose to search for scenarios by name, time, or all scenarios under their account (owner) by following the four steps, as shown below.

The screenshot shows the GAMS interface with the 'Load scenarios' button highlighted. The 'Load scenarios' dialog box has the following steps:

- 1:** Add condition... (dropdown)
- 2:** Owner: is (dropdown), atsi_yem (text box)
- 3:** Add block, Fetch results (button)
- 4:** Show 10 entries (dropdown)

The dialog box displays a table of scenarios:

Owner	Name	Time created
atsi_yem	Example 3: India-USA negative listing all agricultural products	10/19/2022, 2:07:34 PM
atsi_yem	Example 1: unilateral trade liberalization, India-USA	10/19/2022, 2:09:19 PM
atsi_yem	Example 2: Bilateral Trade Liberalization India-USA	10/20/2022, 6:23:27 PM

Buttons: All, All, All

Showing 1 to 3 of 3 entries

Buttons: Choose selected scenarios, Choose current page, Choose all

The 'Select action' dialog box has the following options:

- What would you like to do with the selected scenarios?**
- Select columns for naming scenarios:** (text box)
- Download data (GDX):** (dropdown)
- Load into sandbox:** (button)
- Compare (Pivot):** (dropdown)
- Buttons:** Cancel, Delete scenarios

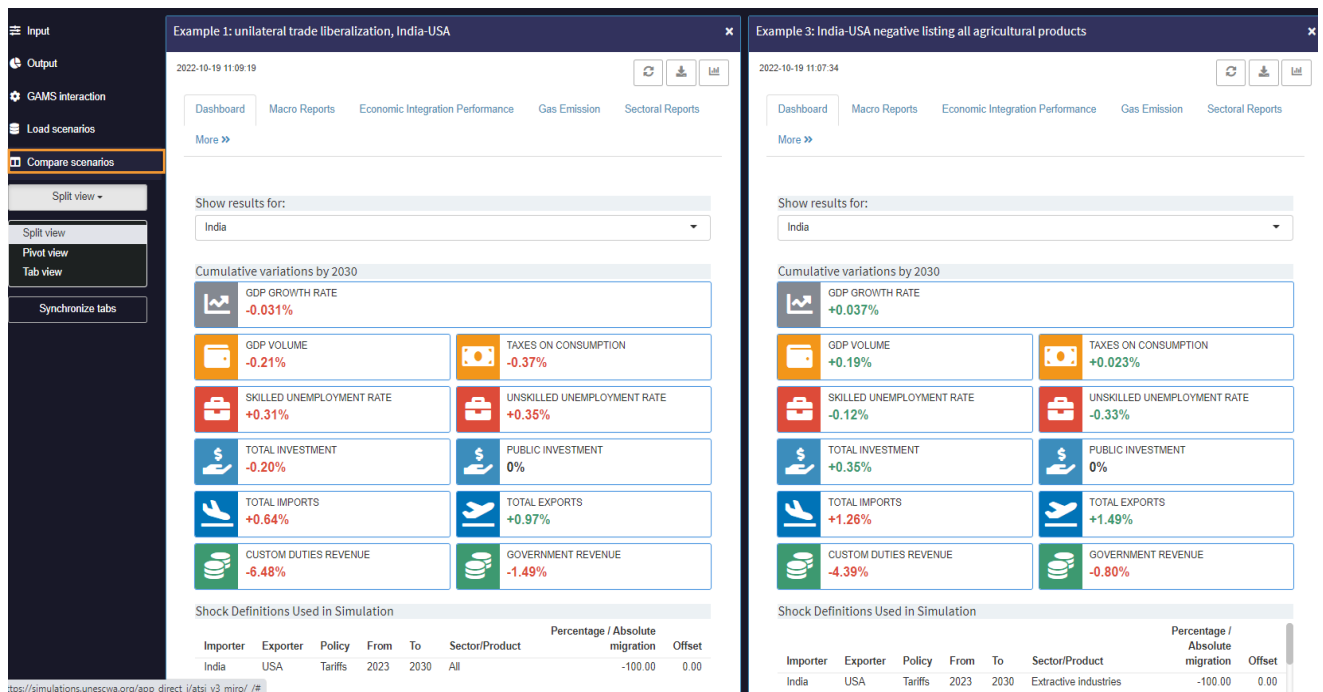
- “Load into sandbox”: generate the data into results tabs.
- “Download data (GDX)”: download data in Excel.
- “Compare (Pivot)”: compare different saved scenarios (please refer to the next sub-section).

4.4 Compare Scenarios

When doing ex-ante assessments, policymakers analyse the potential implications of concluding new preferential trade agreements under alternative scenarios or of revisiting in force agreements. To choose the most appropriate one for the country, the user should compare the different scenarios with each other. This feature allows them to compare the results of already saved scenarios.

1. Click on Compare (Pivot), as seen below.
2. The results of the selected scenarios will show in one window.
3. Two ways to see the comparison: Split view or Pivot view, as seen in the figures below.

Split view



Pivot view

- Input
- Output
- GAMS interaction
- Load scenarios
- Compare scenarios
- Pivot view
- Split view
- Pivot view
- Tab view

Filter

country:

country:

Load view:

Aggregate

Sum

Scenario

All

Search:

variables_macro

year

header

variables_macro	year	header	Example 1: unilateral trade liberalization, India-USA	Example 2: India-USA negative listing all agricultural products	Example 3: India-USA negative listing all agricultural products (Sandbox)
AGRICULTURAL IMPORTS	2022	Ref			
		Sim	133,515.77	133,515.77	133,515.77
		Variation	133,515.77	133,515.77	133,515.77
	2023	Ref	0.00	0.00	0.00
		Sim	136,377.60	136,377.60	136,377.60
		Variation	137,084.71	136,630.48	136,630.48
	2024	Ref	0.52	0.19	0.19
		Sim	139,691.57	139,691.57	139,691.57
		Variation	140,477.35	139,970.48	139,970.48
2025	Ref	0.56	0.20	0.20	
	Sim	143,004.71	143,004.71	143,004.71	
	Sim	143,859.68	143,301.66	143,301.66	

Section 5. Analysing ATSI-based trade policy scenarios

ATSI measures the economic impacts of a policy shock on a given economy. Full analysis is required in order to properly understand the significance of any changes, their directions (gains vs losses) and magnitudes. This section highlights major expected changes; further investigations should be undertaken by interested users to gain further understanding of any change that might occur as a result of a policy scenario. This section analyses the main macroeconomic changes due to the implementation by India of unilateral trade liberalization with the United States of America on trade of goods (scenario 1).

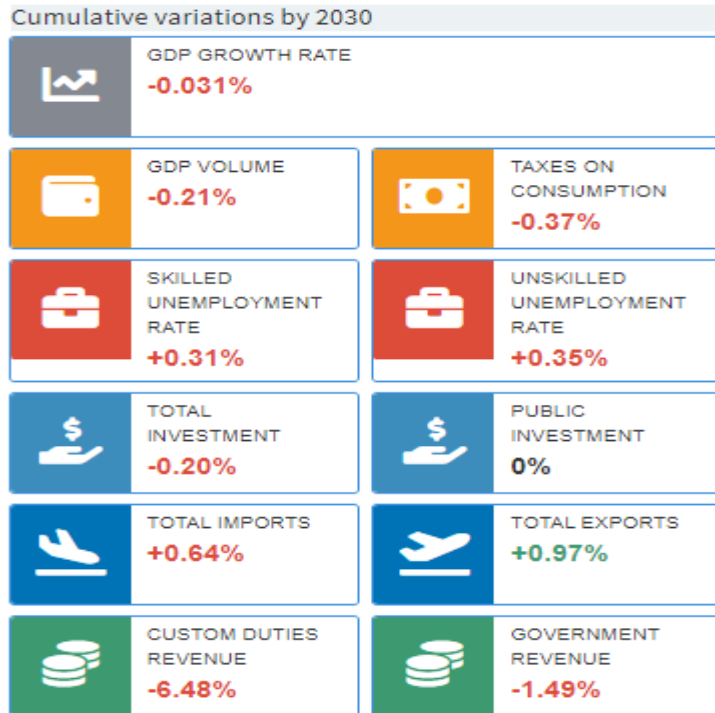
The results show that the overall long-term macroeconomic impact on India is expected to be slightly negative (figure 1). The average growth rate of GDP, unemployment, investment, imports and government revenues are expected to be negative.

The average GDP growth rate during the period 2023-2030 is expected to reach 4.30 per cent in the simulation against 4.33 per cent in the baseline scenario. Similarly to any unilateral discriminatory tariff removal initiative, exports will grow but at a very low level due to the absence of any improvement in market access conditions for Indian exports to the American market. The additional growth of exports due to the free trade agreement (FTA) is estimated at 0.03 per cent (0.94 per cent in the simulation against 0.64 per cent in the baseline scenario) due to a more efficient allocation of productive resources among sectors.

Due to the negative impacts on growth, unemployment rates are expected to increase. The results show that unemployment rates for skilled and unskilled workers are expected to increase by 0.31 per cent and 0.35 per cent respectively compared with the reference scenario over the period 2023-2030. Total investment and production will be also slightly negatively affected, recording an average of -0.23 per cent and -0.224 per cent over the period 2022-2030.

Due to the nature of the shock itself, removing tariffs on Indian imports from the United States of America will directly reduce customs revenues by around -6.48 per cent compared to the reference scenario. Other indirect taxes will be also negatively affected, as is the case with taxes on consumption but to a lower extent than with custom revenues (-0.37 per cent). The overall impacts on government revenues will also be negative (-1.49 per cent).

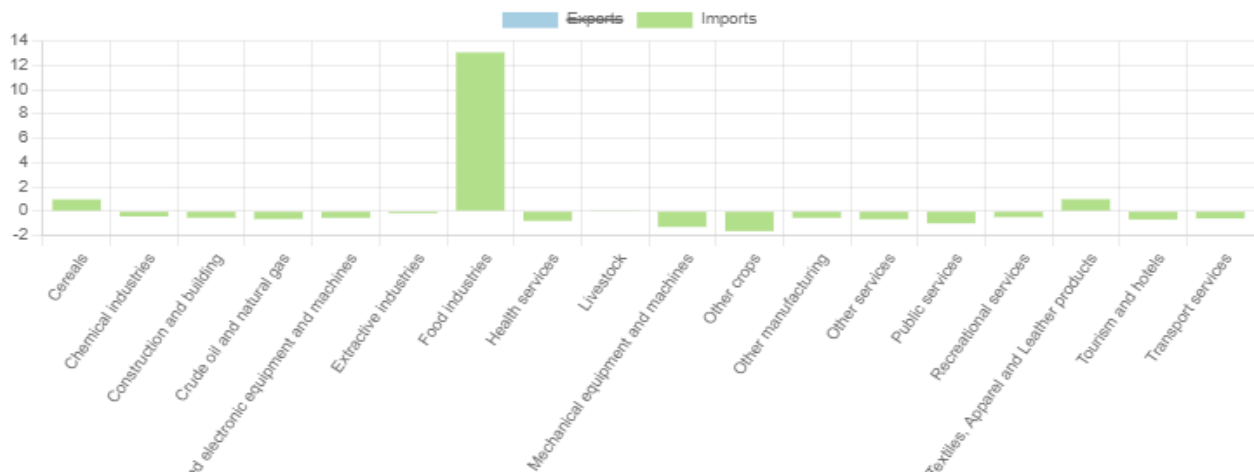
Figure 1. Average variations of macro-economic variables by 2030



Source: simulation on ATSI tool, 2022.

For sectoral imports (figure 2), the unilateral removal of tariffs produced a negative impact for India in almost all sectors for the period 2023-2030 except for textiles and apparel (+0.98 per cent), cereals (+0.96 per cent) and food industries (+13 per cent). The most negatively affected sectors were other crops (-1.64 per cent), mechanical equipment and machines (-1.28 per cent) and public services (-1 per cent).

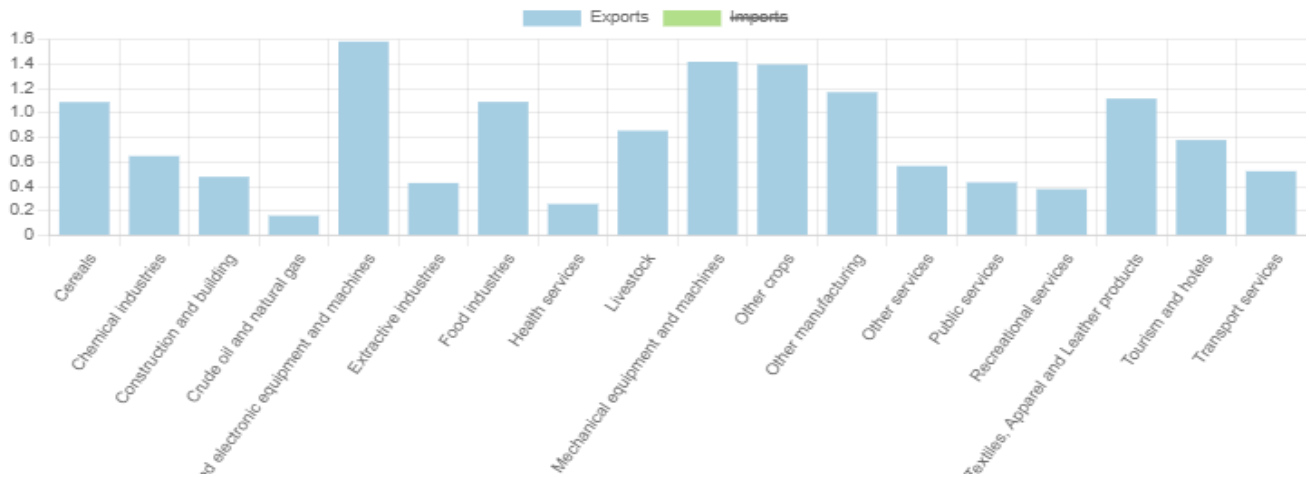
Figure 2. Average variation of sectoral imports 2023-2030



Source: simulation on ATSI tool, 2022.

For sectoral exports (figure 3), many sectors will be positively impacted by the removal of Indian tariffs on imports from the United States of America. The most positively impacted sectors are electronic equipment and machines (+1.6 per cent), mechanical equipment and machines (+1.42 per cent) and other crops (+1.4 per cent).

Figure 3. Average variation of sectoral exports 2023-2030



Source: simulation on ATSI tool, 2022.

In addition to the major macro variables above, ATSI offers detailed results on a large set of additional variables that can be used to understand the sources and the magnitude of impacts through a closer look at the sectoral effects on production, investment, employment and consumption. It offers users the opportunity to analyse sectoral trade impacts by origin and destination, providing an important tool for designing the most suitable and balanced trade integration schemes. It also allows users to test trade remedy instruments with selected partners before their actual implementation.

Conclusions and way forward

ATSI is a unique, interactive platform that allows non-specialized users to test and evaluate a large set of alternative trade policies at national, bilateral and multilateral levels. It allows users to undertake early evaluations of the impacts of global shocks and integration schemes on Arab economies.

With its innovative and unique features, the development of ATSI is a dynamic process. The tool must be kept up-to-date in terms of its database and also the relevance of policies through extending its uses to include additional policy instruments such as trade in services and non-tariff barriers.