Train for Trade II
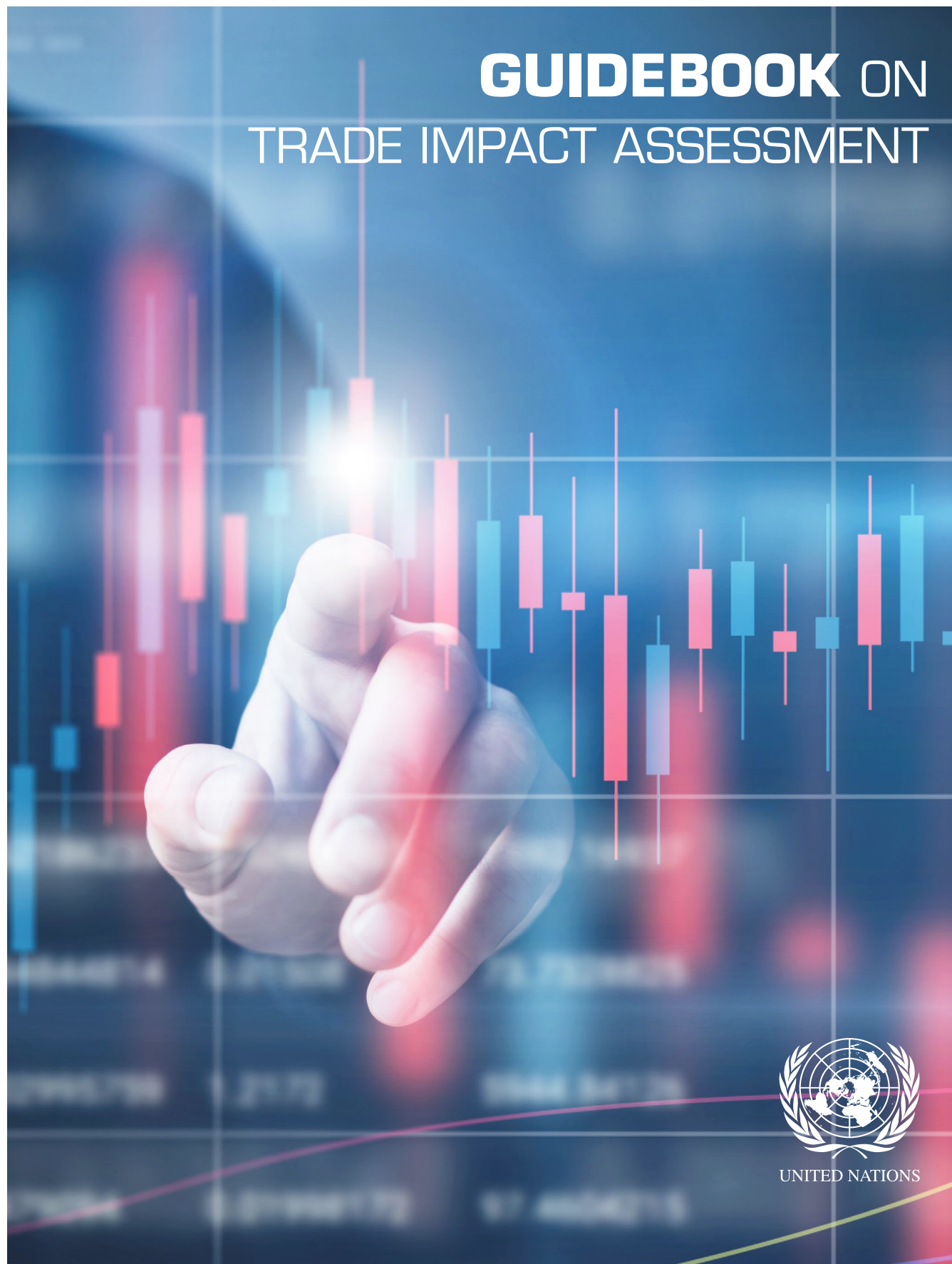EU-UNCTAD joint Programme for **Angola**

GUIDEBOOK ON
TRADE IMPACT ASSESSMENT

UNITED NATIONS

Train for **Trade II**
EU-UNCTAD joint Programme for **Angola**

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Geneva, 2022

ACKNOWLEDGEMENTS

ABBREVIATIONS AND ACRONYMS

CBD	Convention on Biological Diversity
CCA	Causal Chain Analysis
CEPII	Centre d'études prospectives et d'informations internationales
CGE	Computable general equilibrium
COMTRADE	Commodity Trade Statistics Database
CPIA	Country Policy and Institutional Assessment
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization
FTA	Free trade agreement
GDP	Gross domestic product
HHI	Herfindahl-Hirschman Index
IEMP	Index of Export Market Penetration
MEA	Multilateral environmental agreement
MFN	Most-favoured nation
NTB	Non-tariff barrier
NTM	Non-tariff measure
OECD	Organisation for Economic Cooperation and Development
RTA	Regional trade agreement
SMART	Software for Market Analysis and Restrictions on Trade
SMEs	Small and medium-sized enterprises
SPS	Sanitary and phytosanitary
TAO	Tariff Analysis Online
TCI	Trade Complementarity Index
TII	Trade Intensity Index
TRAINS	Trade Analysis Information System
UNCTAD	United Nations Conference on Trade and Development
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistics Division
WHO	World Health Organisation
WITS	World Integrated Trade Solution
WTO	World Trade Organisation

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Introduction to trade impact assessments

An impact assessment is an essential component of policy formulation and policy management. It supports policymaking by gathering and analyzing evidence, verifying the existence of a problem, identifying its underlying causes, assessing which action is needed, and analyzing the advantages and disadvantages of available solutions (OECD, 2014). It is also a vital instrument for channeling stakeholder engagement and communicating the ramifications of policy changes.

This *Guidebook on Trade Impact Assessment* is designed to help trade policymakers and practitioners in developing countries to have comprehensive information on:

- When and how to conduct an impact assessment;

- Where to obtain detailed and technical information on the conduct and use of impact assessments; and

- How the results of the impact assessments may be interpreted and put into practice.

It is not meant to provide technical methodologies to conduct impact assessments but rather to provide a practical guide for non-specialist policy practitioners to steer through some of the most commonly used quantitative and qualitative assessment methods, concepts, and processes.

A. Why conduct an impact assessment?

An impact assessment is an important step in understanding the broader socio-economic impact of trade policies, such as a negotiated trade agreement. This can be done *via* a full analysis of a policy's political, legal, economic, social, and environmental implications. It will provide an in-depth analysis of the likely changes caused by the underlying trade policy on economies, social development, and the environment in any potentially affected geographical areas.

The outcomes of an impact assessment will provide information to help clarify trade-offs derived from different trade policy positions, and a complete package of complementary policies. Ideally, impact assessments or feasibility studies are undertaken at the macroeconomic, sector, regional, and household levels.

To ensure a quality outcome, the principles of impartiality, transparency, stakeholder participation, among others, should be followed when conducting an impact assessment (Box 1).

The use of an impact assessment can come at different stages of the policymaking process.

Before: An impact assessment can be conducted before implementing a trade policy, before a free trade agreement (FTA) is negotiated, or to identify potential risks, opportunities, trade-offs, and other interests. An *ex-ante* impact assessment, *i.e.*, conducted before a change in trade policy occurs, aims to gauge the value of tying up resources in the implementation process and making a preliminary assessment of the expected impact, the potential implications for other related areas (for example, environmental protection, employment, investment, etc.).

During: An impact assessment can be conducted during the policymaking process to help policymakers identify priority policy areas, the degree of differential treatment needed, sectors to take on new commitments and the timeframe. Impact assessments can also inform policymakers on the necessary governance structure, the national institutional framework, and stakeholders' readiness to take advantage of the proposed policy. Impact assessments can also provide guidance on the best institutional framework and the kind of indicators to be tracked. Impact assessments are also instrumental in determining the offensive and defensive interests during the negotiation of an FTA.

Primarily, an impact assessment should inform the design of the necessary conditions for a balanced and beneficial trade policy outcome for all parties for such trade policies to be implementable and sustainable.

After: Impact assessments can also be conducted once the policy is formulated and implemented to measure its socio-economic impact against the objectives of the given policy, which should provide a useful insight into the subsequent cycles of public policy formulation.

Box 1.   **Principles for conducting impact assessments**
• **Impartiality and independence** of the analysis from the policy implementation functions;
• **Transparency** of the process, including wide dissemination of results by appropriately skilled and independent experts;
• **Participation of stakeholders** in the process to ensure that impact assessments incorporate different perspectives and views; and
• **Timeliness** of the presentation of relevant, clear, and concise information to policymakers.

B. Process and scope

An impact assessment assesses in-depth the potential economic, social, human rights, and environmental impacts of policy changes resulting from the trade agreement under negotiation.

Trade impact assessments consist of two complementary components of equal importance:

1) A robust analysis of economic, social, human rights, and environmental impacts, using, among other methods, modelling techniques and causal chain analysis; and

2) A consultation process involving stakeholders in FTA member countries to gather information and disseminate results (European Union, 2016).

The different steps involved in the impact assessment process are outlined in Figure 1.

The impact assessment process consists of three main phases. The first **Inception Phase** is to clarify the methodology, analyze the policy texts, propose different scenarios, map out and consult key stakeholders and vulnerable groups. This is the phase to agree on the scope of the study, assess the availability and quality of data, and conduct a full literature review and preliminary case studies.

The next phase combines activities necessary for producing the **Interim Report**. The second-phase activities include setting up models for quantitative analysis, refining scenarios, elaborating assumptions and risks of the quantitative work, and extensive consultations with various stakeholders from line ministries, the private sector, civil society, and academia. Focus groups, expert panels, workshops, or inputs of policymakers can test and validate the assumptions made in the impact assessment. This is the phase to develop an effective communication strategy to reach out to different constituents, propose indicators for Monitoring and Evaluation (M&E), and identify areas of regulatory reform necessary to implement policy changes (implementation gaps).

The third phase is to generate the **Final Report**. In addition to the economic impact of the policy change in question, the report should highlight potential social and environmental impacts and propose flanking policies. The report can highlight risks to labour rights, social conditions, and gender imbalances and suggest, if possible, measures to mitigate such risks. Finally, the impact assessment should provide information on the limitations of the study and suggestions for further work.

Figure 1.   Trade impact assessment methodological steps

- Outline **methodology** to be employed and proposed **scenarios**
- Draft **consultation plan** and **communication strategy**
- **Map stakeholders**
- **Literature review**
- **Initial discussion with some key stakeholders (negotiation team, other trade officials/line ministries, private sector associations, think tanks)**
- **Initial data collection and analysis of complementarity/intensity of trade between partners**
- **Initial scope of work based on the depth of FTA**
- Identify **sectors** and **CCA**
- Identify **case studies** and **groups**

INCEPTION REPORT

- **Quantitative and qualitative data collection and review**
- Establish **baseline indicators** (and projections)
- Develop **scenarios** and **output** from analytical modelling
- **Verify quantitative results**
- **Detailed discussion with key stakeholders and complete case studies**
- **Further screening and scoping, CCA**
- Identify main **sustainability risks** and **opportunities**
- Development of **M&E indicators**
- Identify likely **implementation gaps** (current versus future regulatory convergence) requirements, institutional mechanisms for dispute, etc.)

INTERIM REPORT

- Refine **analysis** based on feedback
- **Review assumptions underlying quantitative analysis**
- Exit strategy for **communication**
- **Summarise key findings with easy to understand infographics and visualisations**
- **M&E framework, with indicators for monitoring risks**
- **Support and flanking measures to mitigate externalities from FTA**
- Identify **outstanding analysis needs**, if any
- Clearly state the **limitations of the study** and highlight **differences** with other studies

FINAL REPORT

Source: Baker (2018).
Note: CCA = Causal Chain Analysis; M&E = Monitoring & Evaluation; FTA = Free trade agreement.

An impact assessment typically concludes with a section with recommendations – or a "way forward" – and an implementation plan. However, while all those recommendations might be relevant to a particular scenario, the recipient of such proposals may not be able to carry out all recommendations due to a lack of human capacity or financial resources. In this context, a committee is usually established with the public and private sector members to prioritize the recommendations, oversee performance, and monitor the implementation of the agreed trade agreements.

It is important to emphasize that an impact assessment should not be a one-off exercise, but rather a cyclical exercise providing the policymakers, stakeholders, and the general public with valuable information over the policy direction. The modelling work should incorporate changes in policy direction to provide new results and feedback into the process.

As will be discussed in the subsequent sections of this Guidebook, each analytical approach has strengths and limitations in quantifying and identifying the impact and effect of trade policies. An important principle is to ensure that the impact assessment is undertaken in a clear, objective, proportionate, and evidence-based manner. Each analytical step should follow a logical flow such as:

- Identifying the CCA and baseline scenario;

- Screening trade measures that are likely to have significant positive or negative impacts;

- Scoping the components of the trade measures likely to be the main drivers of the predicted impact; and

- Analysing overall impact in the broad aspects (economic, social, human rights, environmental, any other cross-cutting aspects) and sectoral aspects.

The analytical process will end with conclusions and recommendations drawn from the overall and sectoral impact analyses.

C. Analytical approaches

An impact assessment requires a mix of quantitative and qualitative analytical approaches. As an overview, quantitative research produces data in the form of numbers that can be aggregated and analyzed to describe and predict relationships. In contrast, qualitative research produces data and information stated in prose or textual forms that can help to probe and explain those relationships and the contextual differences in the quality of those relationships (Garbarino and Holland, 2009). The analysis starts with a screening and scoping exercise, followed by overall and sectoral impact analyses (see details below) leading to conclusions and recommendations.

The **quantitative approach** will rely on data and indicators to analyze the patterns of change to estimate the magnitudes and areas of impact generated by a policy change. The modelling for the quantitative analysis can take a static approach, which examines the effect of moving from one equilibrium point to another due to the policy change. Alternatively, it can take a dynamic approach that examines the adjustment path brought about by changes in the trade policy variables.

The **qualitative approach** based on stakeholder consultations is useful to verify assumptions made, benchmark the results against the data, and overcome and correct some of the limitations in data used in the qualitative analysis. The following section will discuss the use of qualitative and quantitative analysis.

The choice of methods and approaches needs to be flexible. It depends on country conditions, the answers sought, the stage of the negotiations, and the data availability. The choice of methodology and the subject of the study will then determine the tools for data collection and analysis and the data sources to be accessed. The choice of tools will also depend on the data sources available.

The approach to stakeholder consultation will depend on factors specific to the stakeholders, the level of their interest, and influence concerning the issue at hand. Stakeholder consultations are crucial for engaging stakeholders and disseminating study outcomes. Finally, one should take steps to ensure the protection, security, and confidentiality of data.

In the following sections of the Guidebook, the readers will find detailed information on approaches and processes associated with conducting impact assessments: Quantitative approach (Chapter II); Qualitative approach (Chapter III); and Use of the impact assessment results (Chapter IV).

Further readings

European Union (2016). *Handbook for Trade Sustainability Impact Assessment (2nd edition),* Luxembourg: European Union. Chapter II — *SIAs: an integrated process.*

Baker, P., (2018). *Handbook on Negotiating Sustainable Development Provisions in Preferential Trade Agreements.* Bangkok: United Nations Economic and Social Commission for Asia.

Kirkpatrick et al. (2014). *Regulatory Impact Assessments in Developing and Transition Economies: A Survey of Current Practice.* Centre on Regulation and Competition, Institute for Development Policy and Management, University of Manchester.

OECD (2008). *Introductory Handbook for Undertaking Regulatory Impact Analysis (RIA).* Paris: OECD.
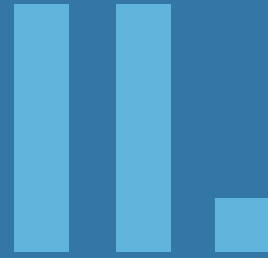
Quantitative approach to the impact assessment

There are several empirical methods to quantify the economic impact of trade policy, including trade indicators, partial equilibrium, computable general equilibrium (CGE), and gravity models. These methods can be used separately or combined in a trade policy impact analysis depending on the type of questions asked (Table 1) and the availability of data at different levels of aggregation.

Trade indicators are useful for an ex-ante assessment of the country's standing in international and regional trade. However, its capacity to quantifying the effects of trade policy change is limited.

Partial equilibrium can quantify the effects of a policy change on a specific market at the most disaggregated level with relatively few data points. However, it cannot examine how the resulting market change affects other sectors of the economy. It is a useful tool to identify gains at the product-specific level and an excellent complement to the CGE model.

CGE and gravity models can assess the impacts of trade policy upon the economy. However, as they are more technically sophisticated and complex than partial equilibrium models, they require a significantly higher level of data. CGE models are generally suitable for ex-ante analysis, as gravity models are for ex-post analysis.

In summary, trade indicators can help measure a country's trading capacity to benefit from new market openings *e.g.*, through a new RTA. The partial equilibrium and the CGE analysis can estimate the size of the impact from trade liberalization, either specifically on a product sector (partial equilibrium models) or generally on the whole economy (CGE models). After concluding trade deals, one may still use trade indicators to track the progress in the country's trade performance or a gravity model to test whether an agreement boosted trade or FDI flows among RTA members.

The following sections will introduce each of these analytical approaches and possible data sources.

Table 1. Basic characteristics of analytical methods

	Trade indicators	Partial equilibrium	General equilibrium	Gravity model
Examples of questions answered	• Does a new FTA provide new trading opportunities? • What are the sectors of comparative advantage of each FTA member? • Are a country's exports of a good regionally oriented? • Do FTA members export the products other members are importing? • How similar/different are the exports of a given pair of FTA members?	• How much more will imports & exports [in a specific product] increase? • By how much will trade with [imports & exports in a specific product] from regional partners increase? • By how much will trade [imports & exports in a specific product] from outside the FTA decrease? • By how much will tariff revenue fall?	• How does real gross domestic product (GDP) change in a country that joins an FTA? • How does the country's trade balance and the terms of trade change? • What's the impact of the FTA on employment and wages? • How do prices in a broad sector change? • How do output and trade in different sectors within the country change? • What are the revenue implications from lowering tariffs? • How does the country's welfare change? • Where do these welfare effects come from?	• What are the impacts of trade costs (transport costs, tariff and non-tariff barriers, etc.) on trade flows? • Has the FTA boosted trade between FTA contracting parties? • Has the FTA reduced exports from non-FTA contracting parties? • What policy changes affected the trade most? • How does institutional strength/weakness or institutional similarity among RTA members affect trade?
Advantage	• A simplest method with minimal data requirements	• Ability to quantify the effects in a specific market at the most disaggregated level with relatively few data points	• Sophisticated method with capacity to quantitatively capture the effects of changes on all markets	• Sophisticated method with capacity to control many trade-related variables to quantify changes in a country's trade
Disadvantage	• Limited capacity to quantify drivers and effects	• Limited capacity to explain interactions among markets	• Complexity in modelling • Significant data requirements	• Relatively complex modelling in terms of data errors, variable specifications, and interpretation of the outcome

Source: Author's compilation, based on Plummer *et al.* (2010).

A. Trade and tariff data

1. Trade data

A variety of trade data source exists, from national, regional, and multilateral sources, and association and sectoral organizations. The main database for information on world trade in goods is the United Nations Commodity Trade Statistics (COMTRADE) database.

Additionally, several other databases are used in the academic literature covering aspects of global trade, such as the databases provided by the World Bank, the International Trade Centre (ITC), the World Trade Organisation (WTO), UNCTAD, the Food and Agriculture Organization (FAO) (for agricultural trade), the *Centre d'études prospectives et d'informations internationales* (CEPII), etc. The following sub-sections describe some of the major sources of data for trade in goods. Table 2 provides the links to other useful trade data sources.

Table 2. Most frequently used trade databases	
Trade database	**Access link**
African Development Bank (AfDB) Data Finder Repository	https://dataportal.opendataforafrica.org/
Centre d'études prospectives et d'informations internationales (CEPII)	http://www.cepii.fr/cepii/en/bdd_modele/bdd.asp
European Statistical Office (Eurostat)	https://ec.europa.eu/eurostat/
ePing (WTO, ITC & United Nations)	https://www.epingalert.org/en
Food and Agriculture Organisation (FAO)	http://www.fao.org/faostat/en/
International Monetary Fund (IMF)	https://data.imf.org/
International Trade Centre (ITC)[1]	https://www.trademap.org/
Organisation for Economic Cooperation and Development (OECD) Statistics	https://stats.oecd.org/
UNCTAD - Trade Analysis Information System (TRAINS)	https://trains.unctad.org/
UNCTADStat	https://unctadstat.unctad.org/
United Nations COMTRADE	https://comtrade.un.org/
United States International Trade Commission	http://dataweb.usitc.gov/
World Bank	http://data.worldbank.org/
World Integrated Trade Solution (WITS)	https://wits.worldbank.org/
World Trade Organisation	https://data.wto.org/

Source: Author's compilation.
Note: The above list is not exhaustive and is arranged in alphabetical order.

UN COMTRADE is the largest repository of international trade data. It contains well over 40 billion data records since 1962 and is available publicly on the internet. Its database covers annual total and bilateral import and export statistics (in value and volume) for over 170 reporter countries/areas for different classification systems, detailed by commodities/service categories and partner countries. All commodity values are converted from national currency into United States dollars using exchange rates supplied by the reporter countries or derived from monthly market rates and trade volume. Quantities are converted into metric units whenever possible. Commodities are classified according to Standard International Trade Classification (SITC) (four revisions from Rev. 1 to Rev. 4), HS (6 revisions of 1992, 1996, 2002, 2007, 2012, and 2017), and Broad Economic Categories (BEC) (United Nations, 2021).

UNCTADStat is the database maintained by UNCTAD. It compiles a wide range of data collected from national and international sources into statistics and indicators of international merchandise and services trade, investment, commodity prices, transport costs, and creative economy. UNCTAD produces more than 150 indicators and statistical time series essential for analysing international trade, economic trends, foreign direct investment, external financial resources, population and labour force, commodities, the information economy, and maritime transport (UNCTAD, 2021).

WITS is a software developed by the World Bank in collaboration with UNCTAD and in consultation with ITC, UNSD and WTO. It includes several databases provided by international organizations and other sources (*i.e.*, the UNCTAD TRAINS, the WTO Trade Intelligence Portal (TIP), and the UNSD COMTRADE). WITS portal (https://wits.worldbank.org/) has two major features: a gateway to trade and protection raw data (Quick Search feature); and an analytical tool to produce aggregated statistics (Advanced Queries feature) and to simulate the impact of tariff changes on trade flows, tariff revenues and welfare (Software for Market Analysis and Restrictions on Trade - SMART).

UNCTAD TRAINS is an application for retrieving UNCTAD Non-Tariff Measures (NTMs) data and integrated analysis. The TRAINS application allows users to display NTMs data by measures, affected products, countries applying the NTMs, and trading partners affected. Users can access UNCTAD TRAINS from WITS or can separately access the TRAINS database at https://trains.unctad.org/ to download data, using search and query functions.[2]

ITC Market Analysis Tools include a suite of different data repositories on various aspects of international trade, as summarized in Table 3 below. The ITC Trade Map may be one of the most user-friendly tools to access trade data. It provides trade flow information, indicators on national export performance, international demand, alternative markets, and the role of competitors from both the product and country perspectives. Yearly trade data available in Trade Map is mainly based on UN COMTRADE and integrated with data collected by ITC. Trade Map presents data for around 220 countries and territories by using both reported and mirror statistics.[3]

Table 3. ITC market analysis tools	
Database	**Access link**
Trade map	https://www.trademap.org/
Market access map	https://www.macmap.org/
Standard map	https://www.standardsmap.org/
Rules of origin facilitator	https://findrulesoforigin.org/
Export potential map	https://exportpotential.intracen.org/en/
Sustainability map	https://www.sustainabilitymap.org/
Investment map	https://www.investmentmap.org/
Procurement map	https://procurementmap.intracen.org/
Market price information	https://mpi.intracen.org/
EuroMed Trade and Investment Facilitation Mechanism	https://euromed.tradehelpdesk.org/euromed

Source: Author's compilation.

2. Tariff data

There are three main tools to help access tariff data.

The **WTO's Tariff Analysis Online (TAO)** (accessible at https://tao.wto.org/) provides access to bound, applied, and preferential tariffs. It also provides access to a number of databases containing information on NTMs notified to the WTO by its members. The TAO interface allows generating various reports on bound, applied, or preferential tariffs for one country at a time. Users can select information by user-defined tariff and trade criteria, compile 12 types of reports (including tariff line level reports and summary reports) and export report information to the desktop.

The **World Integrated Trade Solutions (WITS)** portal (accessible at http://wits.worldbank.org/) provides access to bound, applied, and preferential tariffs as well as to an NTM database (TRAINS). The TRAINS database contains data on most-favoured nation (MFN) (applied) and preferential tariffs, NTMs, and imports at the national tariff line level. NTM data is collected from official sources, complemented by firm surveys and a web portal. WITS provides two sorts of tariffs: (1) applied MFN tariffs; and (2) applied tariffs, which may vary across partner countries depending on preferences granted and FTAs. WITS also calculates *ad valorem* equivalents for specific tariffs. The World Bank's WITS Solution is one of the complete databases, integrating a conglomerate of tariff and trade indicators, indicating the main export partners and export

products. The tool also provides trade, tariff, and development indicators and allows users to compare then across countries.

The **ITC's Market Access Map (MacMap)** portal (accessible at http://www.macmap.org/) provides access to bound, applied, and preferential tariffs and tariff-quotas, anti-dumping duties, and rules of origin. The MAcMap facility allows the extraction of one or several tariffs at a time for one or more countries. It also proposes various reports on trade regimes or on a country's trade and tariffs as well as a tool to simulate tariff cuts.

B. Trade indicators

Trade indicators are useful in measuring how a country performs vis-à-vis other countries in international trade. Some of the most typical indicators can be use in impact analysis are explained below.

1. What do I export competitively? - Revealed comparative advantage index

The revealed comparative advantage (RCA) index can be used to discover the products in which a country has a comparative advantage. Comparative advantage is an economy's ability to produce a particular good or service at a lower opportunity cost than its trading partners.

The *RCA* index of a country for a specific product *k* is defined as the ratio of a country's share of product *k* in the country's total exports to the percentage of world exports of product *k* in total world exports:

$$RCA_k^i = \frac{X_k^i/X^i}{X_k/X}$$

where X_k^i is country i's exports of sector product *k*, X^i is the sum of i's total exports, X_k is world exports of sector product k, X is the world's total exports.

A country is said to have a "revealed" comparative advantage if the value of the index exceeds 1, *i.e.*, if the share of exports of product *k* in total export is greater than the share of total world exports of *k* in the world trade. It can also provide useful information about potential trade prospects with new partners: the larger the difference is in RCA structures (*i.e.*, the distribution of above 1 and below 1 in RCA), the more suitable they are as trading partners.

Figure 2 illustrates the RCA index of the top ten countries with the highest RCA for exports of HS27 (Mineral fuels, mineral oils, and products of their distillation, etc.). For example, the index shows that Angola, ranked 3rd by RCA, is a competitive producer and exporter of mineral fuels.[4]

Figure 2.   Top ten countries with highest revealed comparative advantage in petroleum exports, 2019
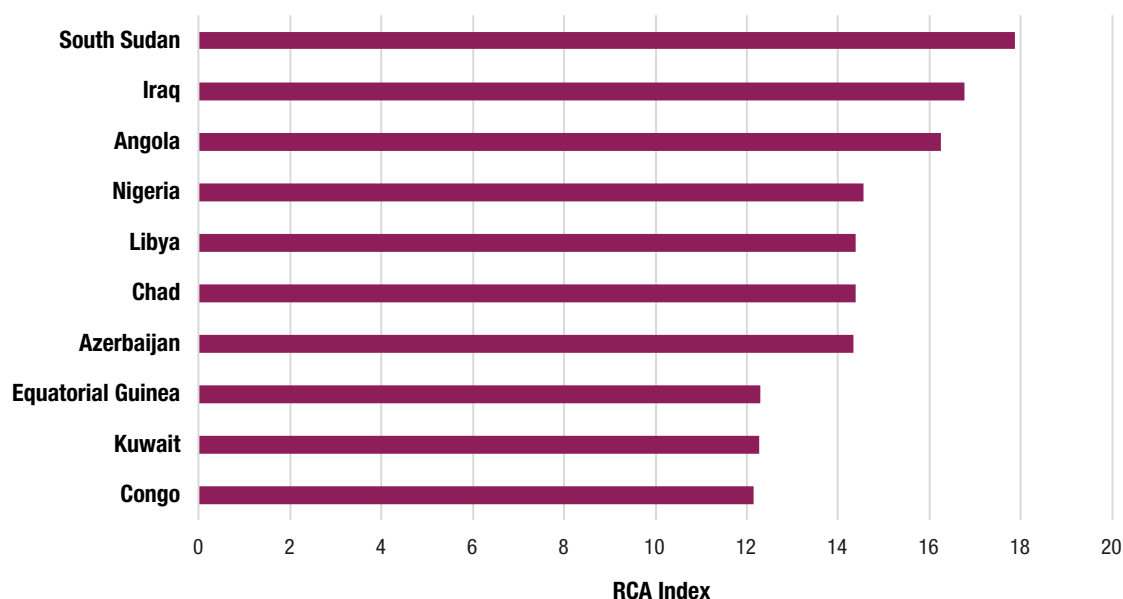
Source: UNCTADStat.

With the RCA index, users can gauge the possible impact of future RTAs on the trade flows of the member countries. A trade deal among countries that possess RCAs in different sets of products is likely to create more trade than similar countries.

2. Where do I export more? - Trade Intensity Index

The Trade Intensity Index (TII) indicates whether a country exports its products more intensively, as a percentage, to a partner than the world does on average. In other words, it is a measure of how much more (or less) a country exports to a specific market compared to the rest of the world.

It is measured as country i's exports to country j relative to its total exports divided by the world's exports to country j relative to the world's total exports. The formula is as below:

$$TII_{ij} = \left[\frac{X_{ij}}{X_i} \bigg/ \frac{X_{wj}}{X_w}\right]$$

where X_{ij} is the value of country i exports to destination j, X_i is total exports of country i; subscript w indicates the world as an exporter.

When the value of a Trade Intensity Index is greater than 1, it indicates that a bilateral trade flow is more extensive than expected, given the partner country's importance in world trade.

Figure 3 provides an example of the TII between Australia–New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) member countries during 1992-2002. The example shows that granting preferential access to particular countries under trade agreements promotes trade intensity between members. In this example, on average, trade intensity between these two countries was six times the world average in 2002.

Figure 3. Trade intensity index for Australia–New Zealand Closer Economic Relations Trade Agreement, 1992–2002
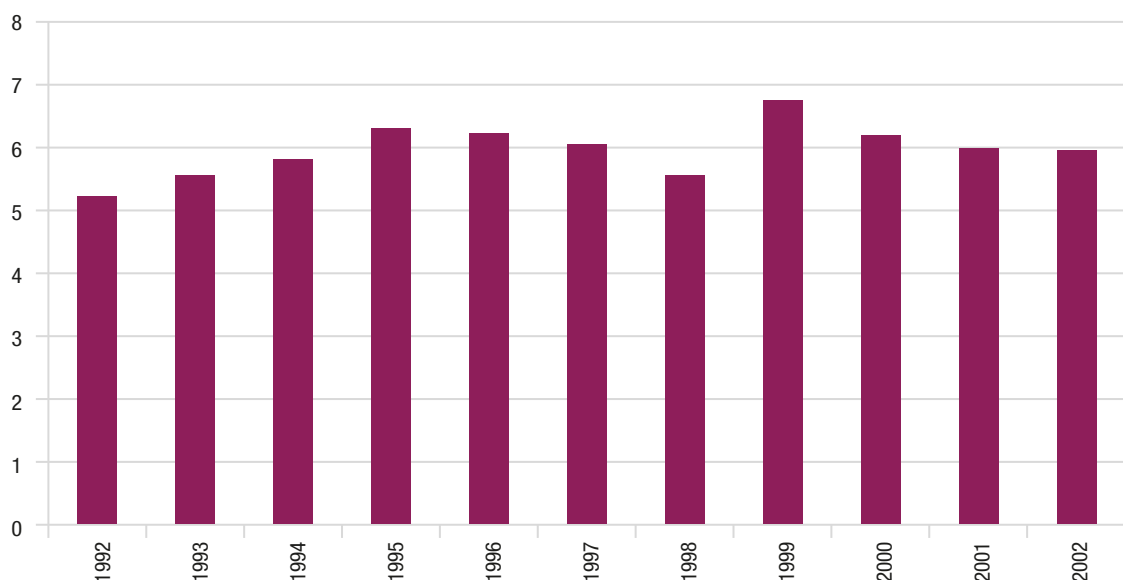
Source: ESCAP (2009).

3. Do I export what my partner needs? - Trade Complementarity Index

The Trade Complementarity Index (TCI) measures to what extent the export profile of one country (*i.e.*, supply) matches the import profile of another country (*i.e.*, demand). As in the case with RCA, TCI can measure the possible trade effects of proposed RTAs. A trade agreement among countries with high trade complimentary index is likely to create more trade and welfare gains than countries with low TCI.

The TCI between countries i and j compares country j's export (supply) to country i's import (demand) by calculating the extent to which country i's import matches that of country j's exports. The TCI between countries i and j is defined as:

$$TCI_{ij} = 100 * \left[1 - \sum_k \left| m_k^i - x_k^j \right| / 2 \right]$$

where m_k^i is sector k's share in country i's total imports from the world and x_k^j is its share in j's total exports to the world.

A high index may indicate that two countries would gain from increased trade and may be particularly useful in evaluating prospective bilateral or regional trade agreements. The index is zero when no goods are exported by country j and imported by country i (*i.e.*, there is 'no overlap'), while the index equals 100 when the export and import shares exactly match ('perfect match').

Figure 4 provides an example of the TCI between India and Sri Lanka during 1992–2002. It suggests that the composition of exports of India is "complementary" to the import demand of Sri Lanka, but not the other way round. Over 60 per cent of what India exported in 2002 overlaps with what Sri Lanka imported in the same year, but the figure falls to less than 30 per cent when the overlap of Sri Lanka's exports and India's imports in the same year is considered.

Figure 4.   Trade complementarity indices between India/Sri Lanka, 1992–2002

- India
- Sri Lanka

Source: ESCAP (2009).

4. How dependent am I on my export products? - Export diversification (or concentration) index

The export diversification index signals a country's dependence on a small number of export items in terms of export earnings. A low level of export diversification might indicate a high risk of exposure to trade shocks caused by unstable prices for these commodities.

There are a few methods to calculate an economy's export diversification or concentration.

The most commonly used measure is **Herfindahl-Hirschman Index** (HHI) which expresses the degree of concentration of a country's exports. The formula is as follows:

$$H_j = \sqrt{\left(\sum_k \left(\frac{x_k}{X}\right)^2\right)}$$

where X_{ik} is the export value of product k by country i, X_i is the total export value of all products of the country i.

The index value is between 1/N to 1. As the index value approaches 1, the concentration increases.

A critical issue of the standard HHI is its dependence on the number of available products in the product classification used to compute the statistics. As the index ranges between 1/N and 1, the denominator N becomes bigger if products are further disaggregated (e.g., moving from the 4-digit Harmonized System of product classification to the 6-digit). The **normalized HHI** can normalize all Herfindahl-Hirschman indices to range between zero to one by using the following formula:

$$h_i = \frac{\sqrt{\sum_{k=1}^{N} \left(\frac{X_{i,k}}{X_i}\right)^2} - \sqrt{\frac{1}{N}}}{1 - \sqrt{\frac{1}{N}}}$$

where hi is the product concentration index of exports for country i, $X_{i,k}$ is the value of exports of product k by country i, X_i is the total value of exports of country i, and N is the number of products exported.

This index ranges from zero to one. A value closer to 1 indicates a higher concentration of exports (UNCTAD, 2019). In a hypothetical case that a country's exports of each product are identical, the concentration index takes value zero.

Figure 5 illustrates the normalized Herfindahl-Hirschman export product concentration index for selected sub-Saharan African countries in 2000 and 2019. Natural resource exporters Nigeria and Angola top the list as the least diversified economies in the sample. South Africa is the most diversified economy. During the last two decades, the countries showed very different paths of export diversification. While exports of some economies like Ethiopia, Central African Republic, and Nigeria became more diversified, the concentration index increased in Botswana, Zambia, and the United Republic of Tanzania.

Figure 5.   Export concentration index in selected Sub-Saharan African countries, 2000 and 2019
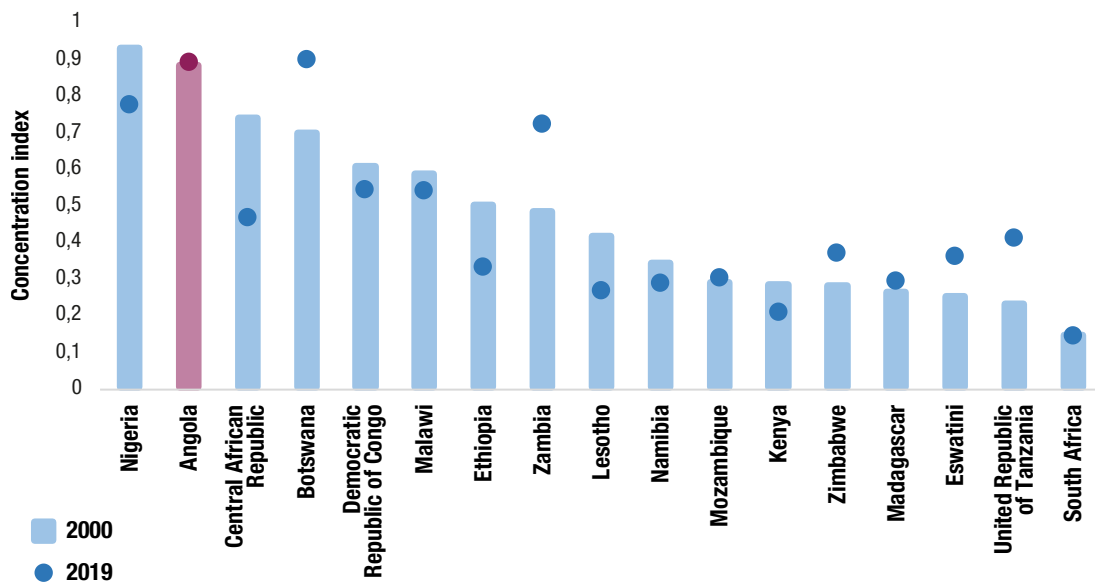
Source: UNCTADStat.

Export concentration or diversification indices help assess the vulnerability of a country's export growth. In addition to other indicators, Concentration indices may be used to identify possible structural issues of their economies and develop appropriate policy measures.

5. Am I taking advantage of market potential? - Index of Export Market Penetration

The Index of Export Market Penetration (IEMP) measures the extent to which a country is exploiting the market opportunities for its exported products (Brenton & Newfarmer, 2007).

The IEMP is calculated with the following formula:

$$IEMP^i = \frac{\sum_{k=W_i} \sum_j Y_{kj}^i}{\sum_{k=W_i} \sum_j Z_{kj}}$$

where w_i is the set of products exported by country i, j indexes importers, $Y = 1$ if i exports product k to j, $Z = 1$ if j imports good k.

For the given range of products that a country exports, the IEMP will be higher for the country *i* if it exports to many markets of those products. Low export market penetration indices of a country may indicate that it faces trade barriers in international markets.

Figure 6 illustrates the IEMP of the selected Member States of the Southern African Development Community (SADC). In 2015, Angola had an IEMP of 1.67, ranked seventh out of the nine SADC Member States, indicating a lower outreach level to international markets than its SADC peers.

Figure 6.   Index of export market penetration of the Southern African Development Community countries, 2015
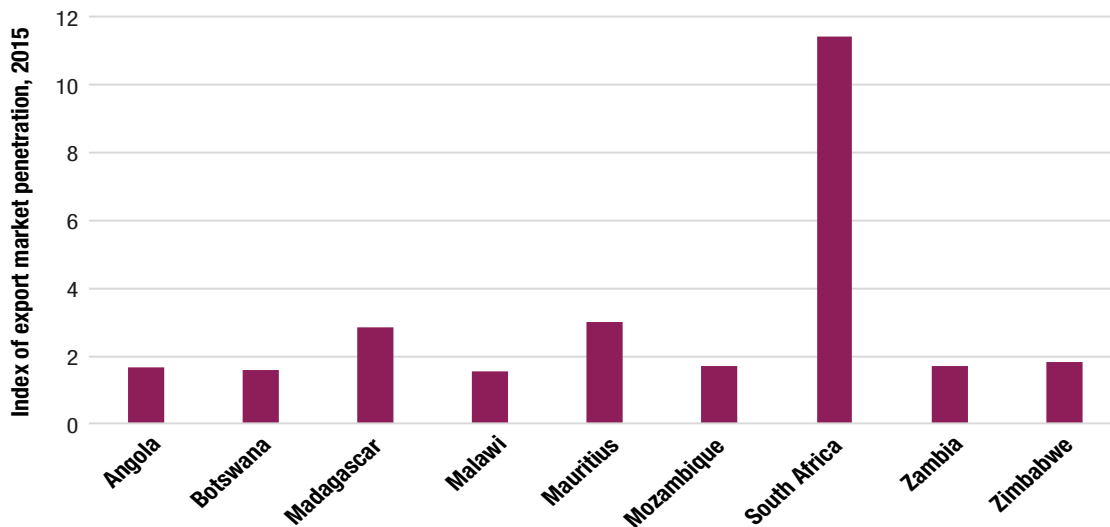
Source: World Bank (2021).
Note: Data for Lesotho, Namibia, Eswatini, Congo and Democratic Republic of the Congo is not available.

The IEMP is better suited to measure how much a country actually realizes its full market potential in exports. Low IEMP is a sign of significant barriers that domestic producers face in accessing international markets.

6. How much do we trade each other in similar products? - Grubel-Lloyd Intra-Industry Index on intra-industry trade

The intra-industry trade index is another measure that can capture the extent of simultaneous exports and imports in similar products belonging to the same product group. Intra-industry trade is a common characteristic of the trade pattern of higher middle- to high-income countries. For example, while China is importing cars from India, India is also importing cars from China simultaneously. This happens as consumers in China and India see cars produced in China are not the same as those produced in India. That is, cars are highly differentiated products.

The Grubel-Lloyd Index (*GLI*) for trade between country *i* and *j* in product group *k* is measured as:

$$GLI_{ij}^k = 1 - \frac{\left| X_{ij}^k - M_{ij}^k \right|}{X_{ij}^k + M_{ij}^k}$$

where X_{ij}^k and M_{ij}^k are exports of good k by country *i* to country *j*, and imports of good *k* by country *i* from country *j*, respectively.

If two countries export and import the same value of product k, *GLI* becomes one. If there is no overlap in exports and imports of good k, then the index gets value zero. Therefore, the higher the index value, the larger the overlap in export structures (*i.e.*, the intra-industry trade) of two countries in product group k.

This index can be used to assess the impact of trade concessions in a particular product group. If two countries show a high intra-industry index value in the given product group, tariff reduction affecting the product group is likely to boost bilateral trade flows.

There is also a link between the product concentration of exports and the intra-industry index. When the numerator and the denominator of the ratio on the right-hand side of the GLI index are summed across all products, the intra-industry index at the country level can be obtained as follows:

$$GLI_i = 1 - \frac{\sum_k \left| X_i^k - M_i^k \right|}{\sum_k \left(X_i^k + M_i^k \right)}$$

The overall intra-industry trade index increases as countries diversify their export baskets with a broad spectrum of differentiated products.

Further readings

UNESCAP (2009). *Trade Statistics in Policymaking - A Handbook of Commonly Used Trade Indices and Indicators.*

World Bank (2010). *A Guide to Trade Data Analysis.*

UNCTAD and WTO (2012)**.** *A Practical Guide to Trade Policy Analysis;* Chapter 1 (Analyzing trade flows).

Reis, José Guilherme; Farole, Thomas (2012). *Trade Competitiveness Diagnostic Toolkit.* World Bank.

C. Partial equilibrium model

The partial equilibrium framework is a modelling tool for estimating the impact of a given policy change, *e.g.*, tariff reduction under a new trade agreement, upon the factors directly affected by the change, such as the price, demand, and supply of the products concerned.

The advantage of partial equilibrium model is that it helps us conduct an impact assessment on a specific product(s) within specific trade partners. The model is also relatively simple to use and requires a relatively simple dataset such as data for the trade flows, the tariff level, and demand and supply elasticities associated with the products concerned.

The model only looks at the "partial" equilibrium, *i.e.*, at the demand-supply equilibrium level of prices within a specific product-market. It does not consider how the trade policy change in one product sector influences other sectors of the economy. It is thus helpful to combine partial equilibrium analysis with the CGE analysis to better understand the product-level impact (through partial equilibrium analysis) and the cross-sectoral, economy-wide impact (through CGE analysis).

A basic partial equilibrium model essentially has three equations, specifying demand (1), supply (2), and market-clearing condition (3) (where demand is equal to supply). Additionally, the price linkage equation (4) shows how import prices relate to export prices.

$$M = \alpha_M PM^{\varepsilon} \qquad (1)$$
$$X = \alpha_X PM^{\mu} \qquad (2)$$
$$X = M \qquad (3)$$
$$PM = PX \times (1 + t) \qquad (4)$$
$$TR = PX \times t \times M \qquad (5)$$

where, M is the quantity of imports, X is the quantity of exports, PM is the price of imports, PX is the price of exports, α_X and α_M are shift parameters ($\alpha_M > 0$ and $\alpha_X > 0$), and ε and μ are price elasticities of import demand and export supply functions respectively ($\varepsilon < 0$ and $\mu > 0$). Finally, t signifies *ad valorem* tariff rate.

The first equation represents a negatively sloped import demand curve ($\varepsilon < 0$), while the second denotes an upward sloping export supply curve ($\mu > 0$).[5]

Given the parameter values ε, μ, α_M, α_X and the policy variable t, equations (1) to (4) are a system of four equations in four unknowns, PM, PX, M, and X. Using estimated elasticity parameters and observed trade and price statistics, this system of equations can simulate possible changes in export and import values and product prices under different tariff change scenarios.

Once the equilibrium prices and quantities are determined, the equation (5) can estimate change in tariff revenues. The change in the size of consumer, producer and total welfare can also be estimated by using these results.

A partial equilibrium model can cater for different types of trade policy-change scenarios, such as a change in the tariffs facing multiple exporting countries/regions; the removal (or the application of) of NTMs and other trade costs; and trade creation or trade diversion effects of an FTA.[6]

A ready-to-use partial equilibrium model, known as **the SMART model**, to assess the trade, tariff revenue, and welfare effects of an FTA, is available on the WITS trade database and software suite provided jointly by the World Bank and the UNCTAD.

International Economics Consulting Ltd (IEC) has also built a partial equilibrium model for more granular analysis of tariff and non-tariff measures at the product line level. This partial equilibrium model can be applied to multiple products, as many as the 5,387 products at the HS 6-digit level or 1,222 product clusters at HS 4-digit level, and to multiple countries. IEC's model, which is structurally similar to the SMART model, can be extended to include imports from different sources and tariffs that vary by source of imports. Extensions to the model also allow the inclusion of parameters other than tariffs, such as NTMs in *ad valorem* equivalent (AVE).

Box 2.   Example: Assessing the impact of tariff liberalisation using partial equilibrium model

Using the partial equilibrium model, Chiunjira (2020) analyses the trade effects arising from the liberalisation of trade in the African Continental Free Trade Area (AfCFTA) on exports from the Common Market for Eastern and Southern Africa (COMESA).

The findings of the study suggest significant increases in exports from COMESA into Africa but significant trade diversion from the rest of the world. There is a considerable loss of tariff revenue collected as a result of the dismantling of tariffs.

In addition to these tools, various national and international organizations provide tools for partial equilibrium analysis. Among those are:

- International Food Policy Research Institute.
  Available at: https://www.ifpri.org/project/ifpri-impact-model
- The United States International Trade Commission.
  Available at: https://www.usitc.gov/data/pe_modeling/index.htm
- The World Bank. Available at: https://wits.worldbank.org/simulationtool.html

Further readings

World Bank and UNCTAD (2011). SMART – Theoretical Framework, *World Bank Integrated Trade Solution User's Manual.*

Gilbert, J. (2017). *Partial Equilibrium Analysis Part I. A Basic Partial Equilibrium Model.* United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).

D. Computable general equilibrium model

The CGE model considers the impact of trade policy changes on the whole economy, including potential interactions across all markets.

The conceptual starting point for a CGE model is the circular flow of economic parameters among markets and economic agents (see Figure 7). The main economic agents in the circular flow are (i) households, who own the factors of production and are the final consumers of products, and (ii) firms, who receive the factors of production from the households to produce goods and services households then consume.

Many CGE models also include the government as an actor. Still, its role in the circular flow is often passive, *i.e.*, to collect taxes and disburse these revenues to firms and households as subsidies and lump-sum transfers, subject to rules of budgetary balance that are specified by the analyst (Wing I. S., 2006; UNCTAD and WTO, 2012).

Figure 7.   Computable general equilibrium model illustration
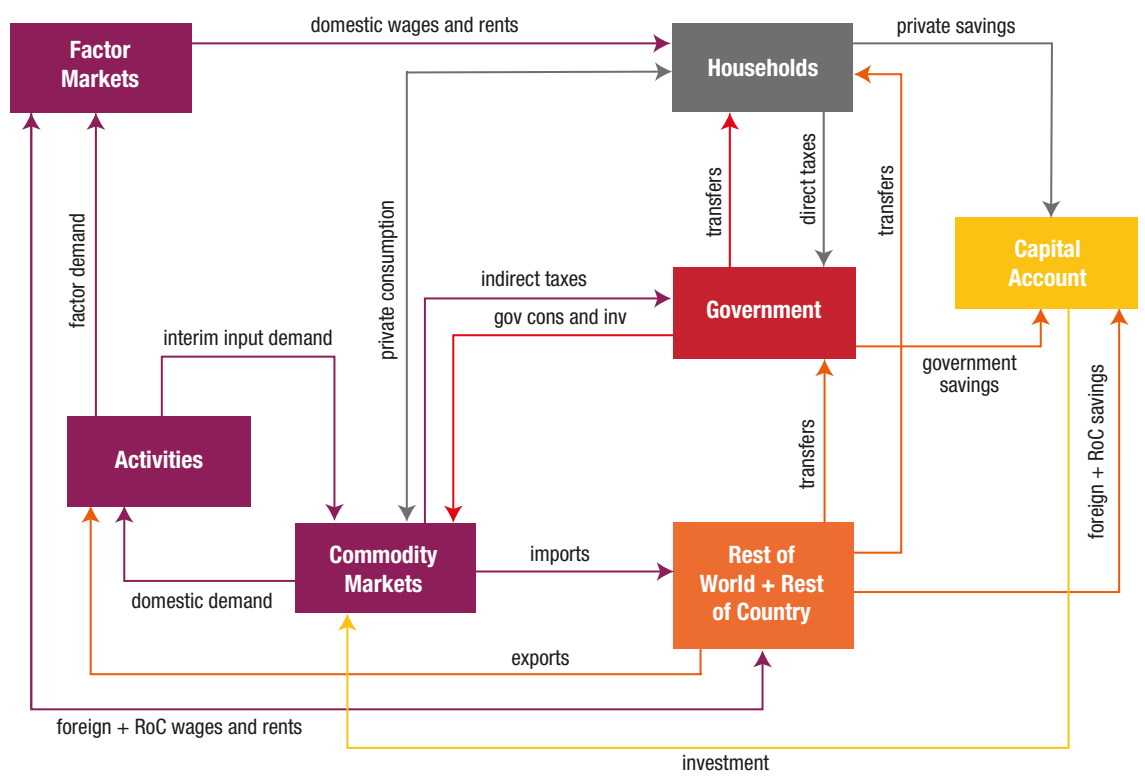
Source: Banerjee *et al.* (2016).

The CGE is a system of equations describing an economy as a whole and the interactions among different actors, typically organized into blocks related to consumption, production, factor markets (*i.e.*, capital and labour), international trade, and taxation (Burfisher, 2011). Because of the massive data requirement, a CGE analysis is conducted using a computer application, thus the term "computable" in its name.

The **Global Trade Analysis Project (GTAP)** model, originally formulated by Hertel (1997), is the most widely used CGE model for analyzing trade policy.[7]

The standard GTAP model is a static, multiregional, and multi-sector CGE model that assumes perfect competition and constant returns to scale. Bilateral trade is estimated with the Armington assumption that differentiates imports by source. Input-output tables reflect the links between sectors.[8]

GTAP is suited for analyzing FTAs involving the preferential liberalization of bilateral tariffs, which are likely to cause inter-sectoral effects. The input-output tables capture the inter-sectoral indirect effects, while the bilateral trade flows capture the linkages between countries.

A shock or policy change in any sector has effects throughout the whole economy. Raising tariffs in the textiles sector, for example, can negatively affect downstream sectors such as apparel by raising prices and costs. Trade policy changes in sectors such as motor vehicles have economy-wide effects on consumer welfare through impacts on productive activities. Support in one market often has an effect on others because industries compete for factor inputs — capital, labour, land, and natural resources. CGE models attempt to capture these effects.

The reverse scenario is also possible. Trade liberalization in one sector may benefit downstream producers in the country that use imported inputs. Reciprocal trade deals also foster output growth and employment in the sectors that receive better market access conditions in international markets. Even if they are not covered under the trade agreement, other industries can benefit from soaring overall economic activity through indirect channels.

Tariff changes are phased in over a number of years. The year when tariffs concessions are complete can differ from product to product. In practice, by the time the tariff changes are implemented, the world economy has expanded. To take this into account, there is a need to inflate the baseline data by observed or estimated changes in labour force, capital, land, natural resources, and productivity until future dates (say 2035) and report the impacts at five-year intervals (say 2025, 2030 and 2035).[9]

CGE models also have certain limitations. They require significant amount of detailed data and parameter estimates that are not readily available. Some CGE models are based on very restrictive assumptions regarding market structures and parameters such as perfect competition, full employment, and free movement of capital. Moreover, the CGE model estimates are prone to the well-known aggregation bias where broad sectoral figures conceal varied effects at sub-sectoral or product levels. However, despite all these weaknesses, the CGE models remain very useful to study economy-wide impacts of trade policy changes.

Box 3.   Example: Assessing potential impacts of negotiated free trade agreement using the computable general equilibrium model

Baker & Vanzetti (2019) used a recursive dynamic CGE model to estimate the economic impact of the EU-Viet Nam FTA on the United Kingdom and Viet Nam.

They estimate that, by 2030, the FTA will increase the United Kingdom's annual GDP by £391 million (or 0.01 per cent) and will boost Viet Nam's annual GDP by £1.6 billion (or 1.2 per cent) compared to the baseline of no FTA between the European Union and Viet Nam. By 2030, the United Kingdom's overall national welfare would increase by £293 million, and bilateral trade would increase by an estimated 60 per cent (or £486 million) compared to the baseline for United Kingdom exports to Viet Nam. Similarly, United Kingdom imports from Viet Nam would increase by 33 per cent (£1.7 billion) by 2030.

Further readings

Burfisher, M. (2011). *Introduction to Computable General Equilibrium Models.*
        Cambridge University Press.

Hertel, T. (1997). *Global Trade Analysis: Modelling and applications.* Cambridge University Press.

Wing, S. (2004). Computable General Equilibrium Models and Their Use in Economy-Wide Policy
        Analysis. Joint Program Technical Note TN #6.

UNCTAD & WTO. (2012). *A Practical Guide to Trade Policy Analysis.* Geneva. *Chapter 5 – General
        equilibrium.*

E. Gravity model

The gravity model is a popular econometric model in international trade. In contrast to the partial equilibrium and the CGE models, they are best suited for ex-post analysis of policy changes. First proposed by Jan Tinbergen in 1962, the model's name came from its use of the Newtonian gravitational force concept as an analogy to explain the volume of bilateral trade flows. Just as planets are mutually attracted in proportion to their sizes and proximity, the gravity model of trade predicts that the volume of trade between any two countries will be positively related to the size of their economies (usually measured by GDP) and inversely related to the trade costs between them (UNCTAD and WTO, 2012).

This model has been used to analyze the impact of trade liberations at the multilateral, regional, and bilateral levels, currency unions, migration flows, foreign direct investment, and even disasters (Plummer *et al.*, 2009). It allows for controlling the effects of as many trade determinants as necessary and can therefore isolate the effects of the FTA in question on trade.

The traditional gravity model[10] for trade predicts that trade between two countries depends on their economic masses and negatively relates to trade costs. The following formula explains the relationship among these factors:

$$X_{ij} = C \frac{Y_i Y_j}{t_{ij}}$$

where X_{ij} refers to exports (or trade) from country i to country j, C is a constant, Y refers to the economic mass (the GDP) of the countries being studied, and t is trade costs between two countries (distance, adjacency, policy factors, etc.). This function indicates that: (i) a pair of two large economies would trade more than a pair of small economies; and (ii) a pair of countries that are further apart would trade less (due to higher transport costs between them) than a pair of countries proximate to each other.

A log-linear form (taking the natural logarithms of the variables) is a standard estimation procedure of the gravity model. The specification will be the following:

$$ln(X_{ij}) = b_0 + b_1 ln(Y_i) + b_2 ln(Y_j) + b_3 ln(t_{ij}) + e_{ij}$$

$$b_1, b_2 > 0 \; ; \; b_3 < 0$$

The function indicates that a 1 per cent change in Y_i is associated with a b_1 per cent change in X_{ij}, and so on. In addition to distance, proxies for trade costs in the gravity model include common language, colonial links, common currency, island or landlocked status, bilateral trade barriers, institutions, infrastructure, migration flows, among others.

The gravity model has become the workhorse of empirical trade literature due to its success in estimating bilateral trade and investment flows. The model and its specification evolved to address the method's primary weaknesses. For example, the basic gravity model failed to account for the trade costs of third parties that could affect trade between the two partners and the relative trade costs. An example of related trade cost is that when the oil price declines, transportation costs will go down for products of all countries. In that case, despite declining trade costs, relative prices between all bilateral trade routes do not change under the gravity model. Without due consideration of the relative prices, a mechanical application of the gravity equation could lead to the naïve assumption that the decreasing trade cost would result in proportional increases in trade across all bilateral routes.

Moreover, the basic gravity model did not always consider the trade creation and trade diversion effects of reducing trade costs on one bilateral route on other routes. An example of such a change might be that when countries *i* and *j* enter into a preferential trade agreement that lowers tariffs on their respective goods, they also raise the relative cost of products exported by other countries to *i* and *j*.

The issues mentioned above have called for some alternations of the basic model to a theoretically grounded gravity model. The most famous model is "**gravity with gravitas**" developed by Anderson and Van Wincoop (2003), which coined the term "multilateral trade resistance" to denote the distance between

the pair vis-à-vis the rest of the world: the higher the multilateral resistance, the more the pair of countries should trade with each other and vice versa. Multilateral resistance can be included in the basic gravity equation as a set of fixed importer effects (MTR_j) and exporter effects (MTR_i). The gravity equation is thus changed as follows:

$$In(X_{ij}) = b_0 + b_1 In(Y_i) + b_2 In(Y_j) + b_3 In(t_{ij}) + +MTR_i + MTR_j + e_{ij}$$

At a minimum, the model is estimated with data on bilateral trade, GDP, and distance, using linear regression (ordinary least squares) performed by statistical software packages (*e.g.*, Stata, E-Views, R).

Box 4.   Example: Assessing the impact of several barriers to trade performance using the gravity model

Despite many intra-regional trade and investment protocols in place, the trade and economic integration progress among the Economic Community of West African States (ECOWAS) member countries remain insignificant. The low share of intra-regional exports is evidence of this.

Using the gravity model, Osabuohien *et al.* (2019) explored various bilateral trade barriers that affect the extent of trade flows among ECOWAS members.

The study found that, among others, trade complementarity had a positive and significant effect on bilateral trade within the sub-region. That is, ECOWAS members tend to trade more if they can complement each other in terms of export commodities. Economic integration agreements are another important determinant of intra-regional trade. Countries with some form of agreement like the West African Economic and Monetary Union (WAEMU) tend to trade more among themselves than other countries in the region. Finally, improving the efficiency of customs procedures (especially for the importing country) will lead to higher trade among member countries.

The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) maintains a Trade Analytics Portal on its website (https://trade.unescap.org/analytics/), which provides an online platform for users to run their gravity model. The portal allows users to quantify the impacts of a broad set of policies from tariffs to behind-the-border measures or institutional arrangements on bilateral trade flows.

Further readings

UNCTAD & WTO (2012). *A Practical Guide to Trade Policy Analysis.* Chapter 3 – Analyzing bilateral trade using the gravity equation.

UNCTAD and WTO (2016). *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model.*

Piermartini, R. & Teh, R. (2005). *Demystifying Modelling Methods for Trade Policy. Discussion Paper No. 10.* World Trade Organisation.

Shepherd, B., Doytchinova, H. S. & Kravchenko, A., (2019). *The gravity model of international trade: a user guide [R version].* Bangkok: United Nations ESCAP.

III.
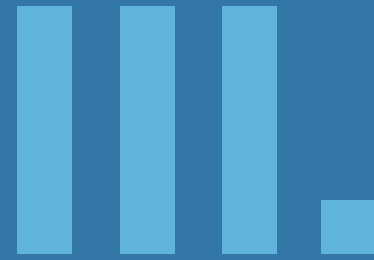
Qualitative approach to the impact assessment

A trade policy, specifically a negotiated FTA, can impact the broad socio-economic landscape of a country, covering economic, social, human rights, and environmental aspects. As discussed in the previous sections, there are several quantitative methods to model the impact of trade policy. However, data availability is a critical prerequisite for quantitative analysis. Where quantitative data is unavailable or unsatisfactory, qualitative analysis based on existing and past trends, and lessons learned from other assessment efforts, may be employed. If qualitative data is not available, policymakers may consider conducting a set of surveys as part of the impact assessment to fill the gap.

The analysis of environmental, social, and governance impacts will primarily rely on qualitative analysis, given the difficulty of modelling causal linkages between trade policy change and environmental, social, or institutional change. Similarly, due to the difficulties in quantifying the regulatory impacts, the regulatory analysis is generally qualitative and descriptive. In most cases, quantitative and qualitative approaches will complement each other to give an in-depth analysis of the underlying issues.

Methods of qualitative analysis include, among others, screening and scoping exercises, regulatory and institutional reviews, case studies, and stakeholder consultations.

A. Qualitative assessment of economic impact

Various qualitative approaches can be employed during impact assessments to complement the quantitative analysis or to help address some limitations inherent in quantitative modelling. For example, the high level of sectoral and regional aggregation used in the CGE database requires qualitative approaches to better understand the nature of the impact on various sub-sectors and regions.

Qualitative review is particularly relevant to NTMs impacting trade since the CGE model may not provide robust estimates of these regulatory measures. The review may cover NTMs measures such as sanitary and phytosanitary (SPS) measures, technical regulations, local content requirements, export restrictions (*e.g.*,

export taxes, licences, prohibitions, quantitative restrictions), customs procedures, import licensing, and intellectual property protection for trade in goods, among others.

With respect to barriers to services trade, impact assessment may need qualitative analysis on barriers to labour mobility and mutual recognition of professional qualifications. In addition, a qualitative analysis helps examine "horizontal issues", including investment barriers, barriers to access to public procurement, competition policy (including subsidies), special conditions or privileges given to or by State-owned enterprises, and restrictions on e-commerce. Such reviews feed into the construction of the different liberalization scenarios (of the modelling work) while highlighting the areas most likely to be impacted by an agreement.

The choice of the qualitative methods to be applied depends on the sector under consideration and is determined independently for each sector selected for in-depth analysis. For example, to assess the potential impact on small and medium-sized enterprises (SMEs) and review available data on domestic SMEs, *stakeholder consultation* is vital to uncover the components of the proposed agreement that may affect domestic SMEs and the expected magnitude of these impacts. Particular consideration may be given to the agreement's impact on SMEs' competitiveness, compliance costs, administrative costs, and market entry costs. Where required, case studies can help illustrate a case in point.

B. Qualitative assessment of social impact

The primary basis for quantitatively assessing social impacts from a negotiated agreement is derived directly from estimates provided by the CGE model. The model's ability to estimate wages and labour costs, both for skilled and unskilled labour, and the anticipated reallocation of jobs and labour demand across economic sectors can inform the expected overall and sector-specific social impacts. However, the exact extent to which FTAs influence social factors in developing countries may remain ambiguous to an extent.

Further, the new "generation" FTAs include legally binding provisions on social elements, *e.g.*, international labour laws, labour standards, and working conditions (ILO, 2018; ILO, 2016; ILO, 2017). Highlighting the potential social impact of such FTAs needs qualitative regulatory analysis.

For example, a qualitative assessment can be conducted to examine the FTA's potential to effectuate the implementation of the International Labour Organisation (ILO) Core Labour Standards and fundamental conventions, and internationally-agreed principles and guidelines on corporate social responsibility (CSR) and responsible business conduct (RBC).

To achieve these objectives, a comprehensive *screening and scoping exercise* can highlight: (i) the relevant social issues in the FTA member countries (see Table 4); (ii) the components of a potential FTA that may enhance or exacerbate these existing social issues; and (iii) the particular groups most likely to be impacted by the agreement (*e.g.*, women, low income, youths, people with disabilities, ethnic minorities, indigenous peoples, skilled and unskilled workers and older or less educated consumers, among others). *Stakeholder consultations* also play an important role in this process.

Table 4. Preliminary list of indicators for the social impact assessment		
Indicator	Description	Source
Employment	Employment-to-population ratio to measure the proportion of the country's working-age population that is employed.	National statistics / United Nations Development Programme (UNDP)
Female employment	Share of women in wage employment	World Bank Data; National statistics

Indicator	Description	Source
Youth unemployment	The unemployment rate for the age group 15 to 24 years	ILO; National statistics
Wages	Average real wages; minimum wage, and average real wage growth	National statistics
Social Protection Rating	Assessment of government policies in social protection and labour market regulation that reduce the risk of becoming poor, assist those who are poor to manage further risks, and ensure a minimum level of welfare to all people	Country Policy and Institutional Assessment (CPIA) World Bank
Poverty rate	The proportion of the population below the international poverty line of $1.90 per day	World Bank/ National Statistics
Civil Liberties Index	Assessment of civil liberties in a country covering indicators on freedom of expression and belief; associational and organizational rights; the rule of law; and personal autonomy and individual rights	Freedom House
Inequality rate	Gini coefficient	World Bank
Education	Expenditure on education as a percentage of GDP Average years of schooling, by gender Adult Literacy rates Net enrolment rate, primary and secondary, by gender and overall	World Bank; United Nations
Health	Universal health coverage Expenditure on healthcare as a percentage of GDP	World Health Organisation (WHO)
Implementation of ILO Core Labour Standards	Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87) Right to Organise and Collective Bargaining Convention, 1949 (No. 98) Equal Remuneration Convention, 1951 (No. 100) Forced Labour Convention, 1930 (No. 29) Abolition of Forced Labour Convention (No. 105), 1957 Minimum Age Convention, 1973 (No. 138)	ILO

Source: Author's compilation.

C. Qualitative assessment of human rights impact

Since quantification of the impacts associated with human rights is often difficult, the primary analysis will be qualitative, possibly with the aid of *case studies* and *field surveys*, where appropriate. Quantitative results from the formal economic modelling and detailed sector analyses can be used where relevant, with additional data from relevant indicators employed. Table 5 provides a non-exhaustive list of human rights indicators that may be employed in qualitative analysis.

The European Commission's *Guidelines on the analysis of human rights impacts in impact assessments for trade-related policy initiatives* can be a practical guide for assessing the human rights impact of FTA. According to this guideline, the first step is conducting a *screening and scoping exercise*. This exercise aims to identify the policy measures that are most likely to impact human rights and the specific rights and groups that are most likely to be affected.

Within this exercise, the list of identified rights is classified according to "direct versus indirect" and "major versus minor", while focusing on the existing regulatory framework in the FTA member countries. *Stakeholder consultations* are also important in identifying the groups that may be more affected – either positively or negatively – by the FTA.

Table 5. Preliminary list of indicators for human rights assessment

Preliminary indicators	Description of indicators	Source
Status of ratification of the 18 international human rights treaties and optional protocols	Expression by the State of its consent to be bound by a human rights treaty under international law	OHCHR
Number of communications (individual cases) transmitted by the United Nations Working Group on Enforced or Involuntary Disappearances and the proportion of these responded to effectively by the Government (clarified or closed)	The proportion of individual cases transmitted by the United Nations Working Group (WG) on Enforced or Involuntary Disappearances during the reference period, for which the clarification provided by the Government, based on its investigations and information, clearly establishes the whereabouts of the disappeared person according to the WG The indicator serves as a proxy for the State's respect and protection to the right to life in conformity with article 6 of the ICCPR.	United Nations Working Group on Enforced or Involuntary Disappearances
Proportion of the targeted population covered under public nutrition supplement programmes	Proxy for fulfilment of the right to adequate food The indicator captures efforts by the State in promoting and providing nutrition supplement programmes and ensuring that such programmes adequately cover vulnerable or undernourished population groups. It is also relevant to the right to health.	FAO
Infant mortality rate	According to the OHCHR, "infant mortality rate is a key socioeconomic statistic for many human rights, including the right to life, the right to health and the right to adequate food.	WHO, United Nations Children's Fund (UNICEF)
Social protection rating	Assessment of government policies in social protection and labour market regulation that reduce the risk of becoming poor, assist those who are poor to manage further risks and ensure a minimum level of welfare to all people	ILO
Social inclusion rating	Assessment of policies for social inclusion and equity cluster, including gender equality, equity of public resource use, building human resources, social protection, labour policies, and institutions for environmental sustainability	CPIA World Bank
Poverty rate	Proportion of the population below the international poverty line of $ 1.90 per day	World Bank
Civil Liberties Index	Assessment of civil liberties in a country The indicator captures freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy and individual rights.	Freedom House
Gender Equality Rating	Assessment of the extent to which a country has installed institutions and programs that promote equal access for men and women in education, health, the economy, and social protection through enforceable laws and policies.	CPIA World Bank
Voice and Accountability Index	Assessment of citizens' ability to select their government, freedom of expression, freedom of association, and a free media The indicator captures press freedom, electoral process, freedom of association and assembly, etc.	World Bank
Political Stability Index	Assessment of the likelihood of political instability and politically motivated violence, including terrorism The indicator can capture armed conflict, social unrest, violent demonstrations, government stability etc.	World Bank

Preliminary indicators	Description of indicators	Source
Government Effectiveness Index	Assessment of the quality of public services, civil service, policy formulation and implementation, and the government's commitment to its policies The indicator can capture quality of bureaucracy, quality of education, citizen satisfaction, etc.	World Bank
Regulatory Quality Index	Assessment of the government's ability to formulate and implement policy and regulations that permit and promote private sector development The indicator can capture the presence of discriminatory tariffs and taxes, price controls, investment freedom, burden of government regulations etc.	World Bank
Rule of Law Index	Assessment of agents' confidence in and abide by the rules of society and likelihood of crime and violence The indicator can capture crime, property rights, confidence in the police force and judicial system, the informal sector, etc.	World Bank
Corruption Perceptions Index	Assessment of the perceived level of public sector corruption in a country on a scale of 0 (highly corrupt) to 100 (very clean)	Transparency International
Control of Corruption Index	Assessment of the extent to which public power is exercised for private gain and involvement in the state by elites and private interests The indicator can capture corruption, irregular payments, public trust, etc.	World Bank
Civil Liberties Index	Assessment of political rights in a country The indicator can capture the electoral process, political pluralism and participation, and functioning of government.	Freedom House

Source: Author's compilation.
Notes: OHCHR (Office of High Commissioner of Human Rights); ICCPR (International Covenant of Civil and Political Rights); CPIA (Country Policy and Institutional Assessment).

D. Qualitative assessment of environmental impact

The quantitative analysis of environmental impact can utilize estimates from the CGE model on the expected changes in carbon emissions resulting from the agreement and those on changes in sectoral output. Environmental effects will, in this regard, be derived from estimated changes in production and trade arising from the negotiated agreement.

Additionally, some qualitative approaches can complement the quantitative estimates to illustrate the potential environmental impacts from the FTA.

As a first step, a *screening and scoping exercise* can be undertaken to identify: (i) the key environmental issues to sustainability in the FTA member countries; (ii) the regions and sectors most impacted by these issues; (iii) the components of a potential agreement that are likely to produce the greatest impact (positively and negatively) on these issues, regions, and sectors; and (iv) the existing environmental regulatory framework of the FTA member countries.

The overall extent of FTA's influence on environmental factors remains ambiguous, especially in developing countries. By increasing long-distance trade, FTAs could influence the level of CO_2 emissions in the transport sector and the risk of unsustainable resource depletion. FTAs could reduce the effectiveness of environmental standards in one member country if other members trade products that are produced with lower and less

stringent environmental standards. The Organisation for Economic Cooperation and Development (OECD) has further clarified the relationship between RTAs and the environment (OECD, 2018).

Taking the screening and scoping exercise as a reference, the predicted changes in sectoral output derived from the CGE model can be used to quantitatively assess the potential environmental impacts concerning scale, structural, technological, and product effects that may arise because of the FTA. In the case of scale effects, the quantitative estimates related to economic growth can determine the impact on resource use and biodiversity and the potential for increased access to resources that may contribute to environmental protection.

Changes in sectoral output will be instrumental in performing a qualitative assessment of potential structural effects through changes in production and consumption patterns and the use of specific goods and services that may arise because of the FTA. A preliminary list of the key indicators is provided in Table 6.

Table 6. Preliminary list of indicators for environmental impact assessment		
Indicator	**Description**	**Source**
Greenhouse gas (GHG) emissions	United Nations Sustainable Development Goals (SDGs) indicator on total CO2 emissions and per capita emissions	United Nations; International Energy Agency (IEA) Country Profiles
Air quality	PM2.5 exposure Sulphur dioxide Nitrous oxide emissions	WHO; World Bank; National statistics
Energy use	Energy consumption by sector and fuel type; intensity of energy use	National statistics; United Nations; IEA Country Profiles
Water quality and resources	Freshwater quality: wastewater treatment connection rates Intensity of use of Freshwater resources Microplastic particles per square metre	World Bank/United Nations Environment Programme (UNEP)
Land use	Increased competition for land resources (and potential resource scarcity) between staple crops, commodity crops and livestock; leading to either intensification of crop/livestock production (where inputs are available) or agricultural expansion for increased cropland and grassland (leading to deforestation, soil erosion, loss of biodiversity and various others)	FAOSTAT (available up until 2014/2015); FAO Global Resources Assessment
Waste and waste management	Municipal waste per capita, municipal waste recovery rates	IEA Country Profiles
Biodiversity	Proportion of terrestrial and marine areas protected; number of threatened species; number of invasive alien species	Convention on Biological Diversity (CBD), Global Biodiversity Information Facility (GBIF) and United Nations Information Portal on Multilateral Environmental Agreements (InforMEA) Country Profiles
Forest area coverage	Forest area as a percentage of land area, tree cover loss/gain, tree cover percentage, coverage of area burned peatland, peatland-related emissions deforestation/reforestation rates, Land Use, Land-Use Change and Forestry (LULUCF) -related CO2 emissions, carbon stocks	World Bank (available up until 2015); FAO Global Resources Assessment; Global Forest Watch

Source: Author's compilation.

Additionally, countries can examine the potential interaction between the FTA and the multilateral environmental agreements (MEAs) to which any of the FTA member countries is a signatory. Or qualitative assessment can be used to evaluate if and by how much a potential FTA may contribute to greening the economy, improving resource efficiency, and promoting sustainable consumption and production. Wherever relevant, case studies can be conducted towards these ends. A non-exhaustive list of MEAs to be considered in qualitative analysis is given below:

- Convention on Biological Diversity (CBD)

- United Nations Framework Convention on Climate Change (UNFCCC)

- Kyoto Protocol to the UNFCCC

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- United Nations Convention on the Law of the Sea (UNCLOS)

- Vienna Convention for the Protection of the Ozone Layer

- The Association of Southeast Asian Nations (ASEAN) Agreement on Transboundary Haze viii. Convention on Wetlands of International Importance (Ramsar Convention)

- Tropical Forestry Action Plan (TFAP)

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

- Cartagena Protocol on Biosafety to the Convention on Biological Diversity

  ○ Montreal Protocol on Substances that Deplete the Ozone Layer

  ○ Paris Agreement

  ○ Rotterdam Convention

  ○ Stockholm Convention on Persistent Organic Pollutants

  ○ United Nations Convention to Combat Desertification

Box 5.   Example: Assessing potential environmental impacts of negotiated free trade agreements

In examining the potential social and environmental impacts of Chilean FTAs, O'Ryan *et al.* (2010) find that some sectors in the extractive industries significantly increase their exports to the European Union and the United States under the negotiated FTAs.

Despite the increase in the production levels of extractive industries and general gains in bilateral trade levels, emissions of CO_2 and PM-10 are not significantly larger than in the case of the baseline analysis. As such, the increases in CO_2 over time reflect Chile's economic growth as a whole rather than the FTAs themselves.

E. An approach of qualitative impact assessment: stakeholder consultation

Stakeholder consultation is a critical tool for qualitative impact assessment. The objective of the consultation is twofold: to gain information so that policies can be shaped to support the public interest and educate the public about the need for such policies (CTPL, 2005). With regard to trade agreements, the stakeholder consultation process will serve to collect invaluable information and insights from a wide range of stakeholders to feed into the impact assessment to support FTA negotiations, and to further raise awareness of the progress of these negotiations among relevant stakeholders.

At the beginning of the stakeholder consultation process, it is important to develop a Stakeholder Consultation Plan that will:

1) Set out the objectives and scope of the consultation;

2) Map key stakeholders;

3) Establish consultation methods and tools to ensure a comprehensive, balanced, timely, tailored, and incorporated stakeholder consultation process; and

4) Identify the main risks to participation and mitigation strategies.

1. Objectives and scope of the consultation

The objectives and scope of the consultation are to be defined by the specific circumstances of each negotiated agreement. In general, the objectives of the stakeholder consultation process for impact assessment in support of FTA negotiations are to:

- Activate engagement of a wide range of stakeholders to reflect their experience, priorities, and concerns;

- Contribute to the transparency of the impact assessment analysis; and

- Identify priority areas and critical issues relating to the possible economic, social, environmental, and human rights impacts in the negotiations.

2. Stakeholder mapping

Once the consultation objectives and scope are developed, identify the preliminary list of key stakeholders in broad categories, such as the following:

- **National and regional government administrations** - ministries, legislative bodies as well as relevant entities of the national and regional administrations involved with trade and trade-related activities;

- **Business sector** – chambers of commerce, SME organisations, business associations, and trade associations;

- **Social partners** –employers' federations and trade unions;

- **International organisations** –international organisations involved with social rights, human rights, and environmental protection;

- **Civil society** – non-governmental organisations, such as human rights organisations, women's rights, and gender equality organisations and other relevant civil society groups involved with social rights, human rights, and environmental protection; and

- **Research institutes** – academic and research institutions that analyse trade, social, environmental, and human rights.

3. Stakeholder outreach and tools

There is a wide range of consultation activities and tools to aid a comprehensive and well-balanced consultation process. The activities and tools may include a dedicated project website and electronic outreach tools, an online public consultation, interviews and meetings with relevant stakeholders, civil society dialogues, and local stakeholder workshops. Figure 8 provides an overview of the consultative framework approach.

Figure 8.   Possible consultative framework approach
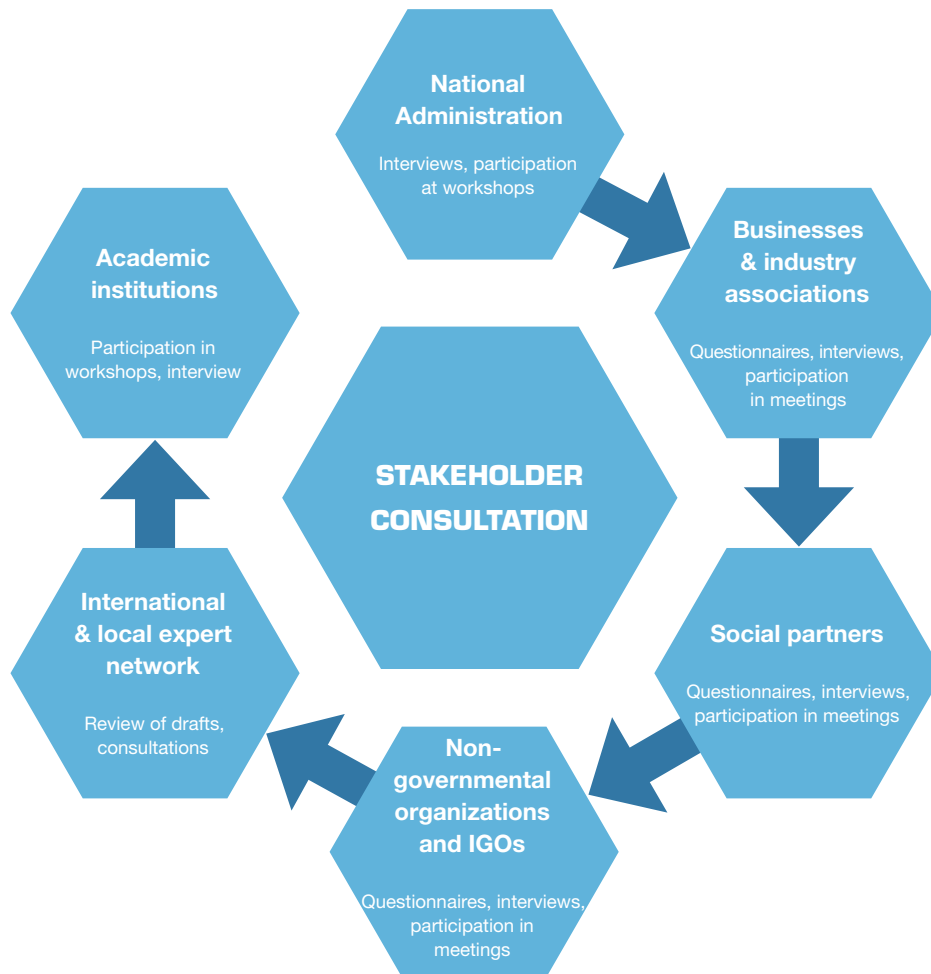
Source: Author's compilation.

Local stakeholder workshop: Priority stakeholders should be selected from the preliminary list to attend the local stakeholder workshop. Correctly assessing the adequate participants to attend and speak at the workshop is of utmost importance, as the quality of the data gathered from the workshop relies on this. The priority stakeholders may include, among others, organizations that administer trade and trade-related matters, the private sectors deeply involved in trade with potential FTA partners, and social groups likely to receive significant impact from the FTA.

Questionnaire: A questionnaire can be developed and disseminated to all relevant stakeholders. The main advantage of using questionnaires is their ability to gather large volumes of standardized information with relatively efficient use of budgetary and personnel resources. In addition, stakeholders are given more time to prepare responses, allowing them to collect and use information that may not be readily available during an interview. Two major drawbacks of using questionnaires include the possibility of low response rates and rigidity in the form of feedback. Inevitably, in some cases, the questions asked may not be entirely applicable to the stakeholders. To compensate for a low response rate, one can follow up on survey recipients with telephone calls where feasible to receive more detailed feedback.

Interviews and meetings: Interviews conducted over telephone, virtual and face-to-face meetings will constitute the most direct form of stakeholder engagement throughout the consultative process. Structured interviews will allow for direct interaction with the stakeholder groups and obtain detailed information

and overall experience. The main objective of these interviews is to facilitate detailed discussions with stakeholders on the potential impact of the negotiated agreement. Additionally, interviews will allow the study team to obtain in-depth qualitative data on the subject and insight into a range of different perspectives.

Interviews will also be the main form of consultation when engaging with the identified stakeholders. Response rates tend to be higher in interviews than in the alternative method of distributing surveys. Interviews can also mitigate against internet access and usage constraints that may negatively impact the response rate to web-based feedback. One major drawback of interviews is that they can be time-consuming to hold and process. Preparing a standard list of questions while allowing a degree of flexibility for the interviewer to interact with the interviewees will help conduct an efficient interview.

Civil society dialogues: The impact assessment study team and relevant ministries need to regularly meet with civil society to discuss the upcoming trade policy. Public meetings can be held in a different phase of the impact assessment study, for example, the first public meeting to discuss the draft inception report, the second meeting to discuss the draft interim report, and the third meeting to discuss the draft final report. The participants need to receive the draft reports before each meeting.

Meeting with FTA Steering Committee: In addition to the above-listed forms of consultation, the impact assessment study team may arrange and attend meetings with government officials and the FTA Steering Committee (the name might be different depending on each country's institutional structure) throughout the study. The meetings may cover, among others, a detailed update on the progress and consultation about priorities to be addressed. These meetings will be important in ensuring that the impact assessment remains highly relevant to the country's initial objectives.

A dedicated project website can serve as the primary platform for conducting online consultations as well as for regularly informing stakeholders about the progress of the impact assessment. The website can provide all relevant information and reports (both draft and final versions) concerning the impact assessment's progress, minutes of Civil Society Dialogues and the local workshop, background information and newsletters (as approved by the relevant authorities), questionnaire functionalities for the online stakeholder consultation, publication of stakeholder input (permission-based), detailed information on the local workshop and Civil Society Dialogues, dedicated email address for the impact assessment, and data collection tools built on the website's back-end to collect and collate information on website usage.

Electronic stakeholder outreach tools can disseminate information on the progress of the impact assessment, namely electronic newsletters, social media channels such as Twitter and LinkedIn, and an electronic documentation e-library.

Further readings

European Union (2015). *Better Regulation Toolbox. Chapter 7* – Stakeholder Consultation.

CTPL. (2005). *Background paper on Public Consultation and Trade Policy.* Centre for Trade Policy and Law.

OECD. (2001). *Engaging Citizens in policy-making: Information, Consultation, and Public Participation.* Organisation for Economic Co-operation and Development.

IV.

Using the results of an impact assessment

It is important to note that impact assessments do not produce a clear-cut Yes/No answer to whether trade liberalization under an FTA is good or bad to the economy and society, nor do they present a single quantitative result.

They produce quantitative and qualitative results that describe possible effects on economic, social, human rights, and environmental aspects.

Conclusions of an impact assessment may present opportunities and challenges resulting from the prospective trade and investment agreement between potential FTA member states. An impact assessment may recommend the areas and the degree of concessions in the future trade and investment agreement, as well as flanking measures to accompany the implementation of the future agreement.

For example, regarding the economic aspect, a reduction in tariffs and NTMs as a result of the prospective FTA could be expected to lead to overall increases in welfare, GDP, and trade for both FTA parties, with the size of gains positively correlated with the degree of liberalization. The greater the removal of tariffs and other barriers, the larger the overall economic gains from the FTA.

However, specific sectors may experience declines in output or exports as a result of the negotiated FTA. In that case, an impact assessment may provide backup evidence on the feasibility and effectiveness of actions to alleviate the possible negative impacts, such as the following:

- Phasing in of reductions, with a longer transition period for products where economic impacts and adjustment costs can be greater; and

- Promoting bilateral cooperation and capacity building in the area where specific industries in one partner county might face challenges as a result of the FTA implementation (*e.g.*, in terms of stricter SPS standards, conformity assessment, trade facilitation, etc.);

- Facilitating the development of programmes that assist SMEs to build capacity and integrate effectively into regional and global supply chains.

Regarding the social impact, an FTA may generate positive implications on social aspects, such as education, living standards, and social protections, depending on the government's policies. However, shifts in employment caused by the FTA can also result in job losses for affected sectors, exacerbating the problem of skills mismatch and working conditions, especially to vulnerable groups, such as SMEs, women, and youth.

Through qualitative assessment addressing the specific situation and severity of the impacts, an impact assessment can provide information necessary for policymakers to design flanking policies to mitigate the potential adverse effect of the FTA upon the country's social and environmental situation.

For example, remedies regarding job losses may include a transition period for the full tariff liberalization for the affected sectors. Other measures can include expanding safeguards and capacity development assistance to the national technical and vocational education and training system and service providers.

Ultimately, it is up to policymakers to formulate a trade liberalization approach and design appropriate flanking measures to cushion any adverse effects of market opening and policy reforms on the economy, society, and environment. If adequately designed and effectively executed, an impact assessment, can provide policymakers with evidence, estimates, and other findings necessary for them to make informed decisions.

Further readings

European Union (2015). Better Regulation Toolbox.

European Union (2016). *Handbook for Trade Sustainability Impact Assessment (2nd edition), Luxembourg: European Union.*

European Union. (2019). *Sustainability Impact Assessment (SIA) in support of Free Trade Agreement (FTA) negotiations between the European Union and Republic of Indonesia. Draft Interim Report.*

Department for International Trade. (2021). *Final Impact Assessment of the Agreement between the United Kingdom of Great Britain and Northern Ireland and Japan for a Comprehensive Economic Partnership.*

REFERENCES

Anderson, J. E., & van Wincoop, E. (2003). *Gravity with Gravitas: A Solution to the Border Puzzle.* American Eonomic Review, Vol 93, No. 1. Retrieved from https://www.nber.org/system/files/working_papers/w8079/w8079.pdf

Baker, P. (2018). *Handbook on Negotiating Sustainable Development Provisions in Preferential Trade Agreements.* Bangkok: United Nations Economic and Social Commission for Asia. Retrieved from https://www.unescap.org/sites/default/files/Handbook%20SD-PTA_final.pdf

Baker, P., & Vanzetti, D. (2019). *Impact Assessment of EU-Vietnam FTA on the UK economy.* London: DIT.

Banerjee, O., Cicowiez, M., Horridge, M., & Vargas, R. (2016). A Conceptual Framework for Integrated Economic–Environmental Modeling. *Journal of Environment & Development*, 1-30.

Brenton, P., & Newfarmer, R. (2007). *Watching More than the Discovery Channel: Export Cycles and Diversification in Development.* Washington: World Bank. Retrieved from https://openknowledge.worldbank.org/handle/10986/7493

Burfisher, M. (2011). *Introduction to Computable General Equilibrium Models.* Cambridge University Press.

Chiunjira, K. (2020). *Modelling COMESA's Exports into the AfCFTA by Product Sectors: A Partial Equilibrium Analysis.* Lusaka: COMESA. Retrieved from https://www.comesa.int/wp-content/uploads/2020/10/Modelling-COMESAs-Exports-into-the-AfCFTA-by-Product-Sectors-A-partial-equilibrium-analysis.pdf

CTPL. (2005). *Background paper on Public Consultation and Trade Policy.* Centre for Trade Policy and Law. Retrieved from https://vi.unctad.org/resources-mainmenu-64/digital-library?task=dl_doc&doc_name=pubconsultintrade

Department for International Trade. (2021). *Final Impact Assessment of the Agreement between the United Kingdom of Great Britain and Northern Ireland and Japan for a Comprehensive Economic Partnership.* Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/965154/UK-Japan-impact-assessment-comprehensive-economic-parternship.pdf

ESCAP. (2009). *Trade Statistics in Policymaking - A Handbook of Commonly Used Trade Indices and Indicators (Revised Edition).* New York: United Nations. Retrieved from https://www.unescap.org/sites/default/files/0%20-%20Full%20Report_27.pdf

European Union. (2015). *Better Regulation Toolbox.* Retrieved from https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox/better-regulation-toolbox_en

European Union. (2016). *Handbook for Trade Sustainability Impact Assessment (2nd edition).* Luxembourg: European Union. Retrieved from http://trade.ec.europa.eu/doclib/docs/2016/april/tradoc_154464.PDF

European Union. (2019). *Sustainability Impact Assessment (SIA) in support of Free Trade Agreement (FTA) negotiations between the European Union and the Republic of Indonesia. Final Report.* Retrieved from https://trade.ec.europa.eu/doclib/docs/2020/july/tradoc_158901.pdf

Garbarino, S., & Holland, J. (2009). *Quantitative and Qualitative Methods in Impact Evaluation and Measuring Results.* Governance and Social Development Resource Center. Retrieved from https://gsdrc.org/docs/open/eirs4.pdf

Gilbert, J. (2017). *Partial Equilibrium Analysis Part I. A Basic Partial Equilibrium Model.* United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Retrieved from https://www.unescap.org/sites/default/files/09_PE_I.pdf

Hertel, T. (1997). *Global Trade Analysis: Modeling and applications. .* Cambridge University Press.

ILO. (2016). *Assessment of Labour Provisions in Trade and Investment Arrangements.* International Labour Organisation. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_498944.pdf

ILO. (2017). *Handbook on Assessment of Labour Provisions in Trade and Investment Arrangements.* International Labour Organisation. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_564702.pdf

ILO. (2018). *Social Dimensions of Free Trade Agreements.* International Labour Organisation. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_228965.pdf

ITC. (2014). *Trade Map User Guide.* Market Analysis and Research (MAR), Division of Market Development, International Trade Center. Retrieved from https://www.trademap.org/Docs/TradeMap-Userguide-EN.pdf

ITC. (2021). *ITC Trade Competitive Map.* International Trade Center. Retrieved from https://tradecompetitivenessmap.intracen.org

ITC. (2021). *ITC Trademap (Database).* International Trade Center. Retrieved from https://www.trademap.org/

Kirkpatrick, C., Parker, D., & Zhang, Y.-F. (2014). *Regulatory Impact Assessments in Developing and Transition Economies: A Survey of Current Practice.* Centre on Regulation and Competition, Institute for Development Policy and Management, University of Manchester.

OECD. (2001). *Engaging Citizens in policy-making: Information, Consultation, and Public Participation*. Organisation for Economic Co-operation and Development.

OECD. (2008). *Introductory Handbook for Undertaking Regulatory Impact Analysis.* Retrieved from https://www.oecd.org/gov/regulatory-policy/44789472.pdf

OECD. (2014). *What is Impact Assessment?* Organisation for Economic Co-operation and Development. Retrieved from https://www.oecd.org/sti/inno/What-is-impact-assessment-OECDImpact.pdf

OECD. (2018). *Environment and Regional Trade Agreements.* The Organisation for Economic Co-operation and Development. Retrieved from http://www.oecd.org/env/environment-and-regional-trade-agreements.htm

O'Ryan, R. D. (2010). The socioeconomic and environmental effects of FTAs: A dynamic CGE analysis for Chile. *Environment and Development Economics*, 305-327.

Osabuohien, E. S., Efobi, U. R., Odebiyi, J. T., Fayomi, O. O., & Salami, A. O. (2019). Bilateral Trade Performance in West Africa: A Gravity Model Estimation. *African Development Review, 31*(1), 1-14.

Piermartini, R., & Teh, R. (2005). *Demystifying Modelling Methods for Trade Policy. Discussion Paper No. 10.* World Trade Organisation. Retrieved from https://www.wto.org/english/res_e/booksp_e/discussion_papers10_e.pdf

Plummer, M. G., Cheong, D., & Hamanaka, S. (2010). *Methodology for Impact Assessment of Free Trade Agreement.* Asian Development Bank. Retrieved from https://aric.adb.org/pdf/FTA_Impact_Assessment.pdf

Reis, J. G., & Farole, T. (2012). *Trade Competitiveness Diagnostic Toolkit.* World Bank. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/2248/673620PUB0EPI007869B009780821389379.pdf

Shepherd, B., Doytchinova, H. S., & Kravchenko, A. (2019). *The gravity model of international trade: a user guide [R version].* Bangkok: United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Retrieved from https://www.unescap.org/sites/default/files/Gravity-model-in-R_1.pdf

UNCTAD. (2019). *Indicators Explained #3. Export Product Concentration Index.* United Nation Conference on Trade and Development. Retrieved from https://unctadstat.unctad.org/en/IndicatorsExplained/statie2019d1_en.pdf

UNCTAD. (2021). Retrieved October 6, 2021, from United Nations Conference on Trade and Development: https://unctad.org/statistics

UNCTAD and WTO. (2012). *A Practical Guide to Trade Policy Analysis.* Geneva. Retrieved from https://www.wto.org/english/res_e/publications_e/wto_unctad12_e.pdf

United Nations. (2021). *What is UN Comtrade?* Retrieved from UNSTATS: https://unstats.un.org/unsd/tradekb/Knowledgebase/What-is-UN-Comtrade

United Nations and World Trade Organization. (2016). *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model.* Retrieved from https://vi.unctad.org/tpa/web/docs/vol2/book.pdf

Wing, I. S. (2006). *Computable General Equilibrium Models and Their Use in Economy-Wide Policy Analysis.* MIT Joint Program on the Science and Policy of Global Change. Retrieved from http://web.mit.edu/globalchange/www/MITJPSPGC_TechNote6.pdf

Wing, S. (2004). *Computable General Equilibrium Models and Their Use in Economy-Wide Policy Analysis.* oint Program Technical Note TN #6. Retrieved from https://globalchange.mit.edu/publication/13808

World Bank. (2010). *A Guide to Trade Data Analysis.* Retrieved from http://wits.worldbank.org/WITS/docs/snapshot%20brochure_sep%202010.pdf

World Bank. (2010). *Trade Indicators.* World Bank. Retrieved from https://wits.worldbank.org/wits/wits/witshelp/Content/Utilities/e1.trade_indicators.htm

World Bank. (2021). *TCdata360 (database).* Retrieved October 7, 2021, from https://tcdata360.worldbank.org/

World Bank and UNCTAD. (2011). *World Bank Integrated Trade Solutions User's Manual.* Retrieved from https://wits.worldbank.org/data/public/WITS_User_Manual.pdf

ENDNOTES

1   The ITC link is for ITC Trademap, which further include links to other ITC tools. See more details in Table 3 of this Guidebook.

2   For a detailed introduction and guide on how to access data on TRAINS, please refer to the UNCTAD TRAINS User Guide and step-by-step guide at https://trains.unctad.org/Forms/HowTo.aspx

3   Mirror data refers to trade data of countries that do not report their trade data and was reconstructed on the basis of data reported by their partner countries.

4   Petroleum oils, oils obtained from bituminous minerals , crude.

5   Empirically log-linear forms of these equations (taking logarithm of both left- and right-hand sides of the equations) are calibrated for simulation purposes. Therefore, ε and μ measures percentage change in imports and exports as a result of one per cent increase in prices, respectively.

6   Trade creation refers to an increase of trade among a group of countries as a result of tariff reduction (or elimination) under a trade agreement. Trade diversion occurs when trade is diverted from countries outside the trade agreement to countries within the trade agreement, as a result of lowering the tariff level.

7   The model is multi-market, with markets for final goods, intermediate goods, traded goods, and factors of production. It is also multiregional, with a region representing a country or a group of countries. The quantity of endowments—land, skilled labour, unskilled labour, natural resources, and initial capital—in each region is fixed exogenously within the GTAP model. The main agents in this model are producers, consumers, and the government.

8   To split imports across different exporters, the well-known Armington equation is used where the shift parameter, import shares of each country, and the degree of substitution between imports from different countries are the key variables. From the model, it is straightforward to determine the changes in imports, tariff revenue, and welfare following differential changes in bilateral tariffs.

9   It is important to note that the results from a computable general equilibrium for fast-growing economies (such as Ethiopia, Rwanda, and Ghana, which double every 8 to 12 years), may appear to contract in a static framework but may be merely growing at a slower rate when the growth of the economy is taken into account. From the point of view of adjustment, it is much easier to adapt to a slowing of growth rather than a contraction.

10 The traditional gravity model is also sometimes referred to as the 'intuitive' model. 'Intuitive' refer to the fact that some of the models have been based largely on intuitive ideas as to which variables are likely to influence trade.