Panorama du

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CEPII Region Profiles:
indicators, databases and classifications

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The CEPII Region Profiles put forward an original tool to analyse the insertion in international trade of eighth large regions composing the world, as well as ten aggregated trade areas using databases developed by the CEPII. Thus, CHELEM which provides a complete and consistent representation of international trade flows, balance of payments and world revenues since the 1960s; EconMap which allows to project by 2050 or 2100 GDP with its components in a global context and taking into account climate scenarios; EQCHANGE which includes nominal, real and equilibrium effective exchange rates since the 1970s; MAcMap-HS6 which estimates the average regions' protection; BACI which offers harmonised statistics on values and quantities at a very detailed level of products since the late 1980s; and WTFC which defines type and price range of trade flows since 2000, are used to present a consistent set of indicators. Tables and figures are grouped under seven thematic sections: broad patterns; projections; balance & forex; tariff protection; comparative advantages; types & ranges; products & partners. This document specifies the indicators, databases and classifications used in the CEPII Region Profiles.

Summary

- **CEPII's indicators**

    Broad patterns / Projections / Balance & Forex / Tariff protection / Comparative advantages / Types & Ranges / Products & Partners

- **Database**

    BACI / CHELEM / EconMap / EQCHANGE / MAcMap / WTFC

- **Classifications**

    Composition of the regions / Sectoral classifications

RECHERCHE ET EXPERTISE
SUR L'ÉCONOMIE MONDIALE

◼ **CEPII's indicators**

BROAD PATTERNS

This section presents region's integration in the world economy over the long run. Data sets start in 1960 for GDP and population, and in 1967 for trade flows. However, for the Community of Independent States (CIS region), trade data start in 1996 for reasons of availability and quality. In Europe region, trade for successor states of the former USSR, the former Czechoslovakia, the former Yugoslavia and for Belgium and Luxembourg was estimated at the start of the period, based on more aggregated data.

Table 1
Population, gross domestic product (GDP) and trade in goods and services
(latest available year [t] and average annual growth rate from [t-10] to [t])

Sources: CEPII, CHELEM – GDP - International Trade - Balance of Payments databases.

Notes:

Data are displayed for the region and the world (see the **Classifications section** for the composition of the regions).

Population: millions of inhabitants at mid-year.

Current GDP: Gross Domestic Product in billions of current US$.

PPP GDP: Gross Domestic Product at 2017 prices and purchasing power parity, in billions of international dollars.

Current GDP per capita: Gross Domestic Product per inhabitant at current prices, in current US$.

PPP GDP per capita: Gross Domestic Product per inhabitant at 2017 prices and purchasing power parity, in international dollars.

Exports and imports of goods: Free on board flows (FOB − transportation and insurance costs excluded) within the region (intra) and with the rest of the world (extra), in billions of current US$.

Exports and imports of services: all partners flows (excluding processing), in billions of current US$.

Average annual growth rate:* in %.

*In Table 1.B, thanks to the harmonisation of countries' declarations in the CHELEM – International Trade database, the average annual growth rate of world exports is equal to that of world imports in goods. Trade data in services (CHELEM - Balance of Payments database) are not harmonised. The average annual growth rate for world exports in services, as well as for world imports, is here calculated on the average of world exports and imports (see **Databases section**).

Figure 1
Population, GDP and GDP per capita
(1960- latest available year [t])

Source: CEPII, CHELEM – GDP database.

Notes:

Population: share of the region in the world's population (inhabitants at mid-year), in %.

PPP GDP: share of the region in the world's GDP in purchasing power parity (at 2017 prices and purchase power parity rates), in %.

PPP GDP per capita: region's GDP per inhabitant in purchasing power parity relative to the world's one (at 2017 prices and purchase power parity), in %.

Figure 2
Openness, share in world trade and trade balance relative to GDP
(goods and services, 1967- latest available year [t])

Sources: CEPII, CHELEM – International Trade - Balance of Payments - GDP databases.

Notes:

Processing is not included.

Openness degree

- detailed by the intra- and the extra-regional trade in the 4 goods' sectors $$o_i^g = 100 \frac{(X_{i.}^g + M_{.i}^g)/2}{GDP_i}$$

- all partners in the sector of services $$o_i^s = 100 \frac{(X_{i.}^s + M_{.i}^s)/2}{GDP_i}$$

with

X_{ij}^g goods exports in sector g from the region i to the region j ($intra$; $j = i$) or to the rest of the world ($extra$; $j = world - i$), at current US$

M_{ji}^g goods imports in sector g by the region i from the region j ($intra$; $j = i$) or from the rest of the world ($extra$; $j = world - i$), at current US$

$X_{i.}^s$ services (s) exports from the region i to the world (.) at current US$

$M_{.i}^s$ services (s) imports by the region i from the world (.) at current US$

g, s sectors of goods and services of the CHELEM database (see the **Classifications section**)

GDP_i GDP of region i at current US$

Share in world trade

- intra-regional flows in goods $$x_{ii}^g = 100 \frac{X_{ii}^g}{X_{..}} \qquad m_{ii}^g = 100 \frac{M_{ii}^g}{M_{..}}$$

- extra-regional exports and imports in goods $$x_{ij}^g = 100 \frac{X_{ij}^g}{X_{..}} \qquad m_{ji}^g = 100 \frac{M_{ji}^g}{M_{..}}$$

- all partners' exports and imports in services $$x_{i.}^s = 100 \frac{X_{i.}^s}{X_{..}} \qquad m_{.i}^s = 100 \frac{M_{.i}^s}{M_{..}}$$

with

X_{ii}^g exports (M_{ii}^g imports) in goods in sector g between the countries of the region i at current US$

X_{ij}^g goods exports in sector g from the region i to the rest of the world ($j = world - i$) at current US$

M_{ji}^g goods imports in sector g by the region i from the rest of the world ($j = world - i$) at current US$

$X_{i.}^s$ services exports from the region i to the world at current US$

$M_{j.}^s$ services imports by the region i from the world at current US$

$X_{..}$ world exports in goods and services at current dollars

$M_{..}$ world imports in goods and services at current dollars

Trade balance in % of GDP $b_i = 100 \frac{X^{.}_{i.} - M^{.}_{.i}}{GDP_i}$

with

$X^{.}_{i.}$ exports of region i in goods and services to the world at current US\$

$M^{.}_{i.}$ imports of region i in goods and services from the world at current US\$

GDP_i GDP of region i at current US\$

Figure 3
Geographic breakdown of the region's exports and imports
(goods, latest available year [t], [t-10], [t-20], [t-30], [t-40], [t-50])

Source: CEPII, CHELEM – International Trade database.

Notes:

The share of intra-regional trade is always displayed here. In the case of another geographical aggregate as EU28, the rest of the countries of its regional aggregate (Europe) appears with « Other » followed by the name of the regional aggregate.

Only the regions that made up more than 5% in the region's exports (or imports) in the latest year or that allowed for more than 10% in the preceding selected years are individualised. The remained regions are grouped in "Rest of the world" (see the **Classifications section** for the composition of the regions).

Figure 4
Breakdown of the region's exports and imports by industry group
(goods, latest available year [t], [t-10], [t-20], [t-30], [t-40], [t-50])

Sources: CEPII, CHELEM – International Trade - Balance of Payments databases.

Notes:

Three panels are displayed here: exports excluding intra-regional trade = 100; imports excluding intra-regional trade =100; intra-regional trade=100.

Only the industry groups that made up more than 5% in the region's exports (or imports) in the latest year or that allowed for more than 10% in the preceding selected years are individualised. "Rest of goods and services" aggregate includes remaining groups.

Industry groups are defined according to the sectoral classification of the CHELEM database (see the **Classifications section**).

Processing is not included in services in sections **Broad patterns** and **Comparative advantages**.

PROJECTIONS

This section presents a projection exercise to fuel the reflections on the world economy by 2050 in terms of GDP and its main determinants. It also contains a particularly useful component on climate change issues with alternative scenarios of economic growth by 2100.

Table 1
Population and Gross Domestic Product (2015, 2025, 2050)

Source: CEPII, EconMap database.

Notes:

Projections start in 2018.

GDP at constant prices: Gross Domestic Product in billions of constant 2011 US$

PPP GDP per capita: Gross Domestic Product per capita at purchasing power parity prices of 2011

Population: in millions of inhabitants

Figure 1
Breakdown of the GDP growth
(average growth 1995-2015, 2015-2025, 2025-2050)

Source: CEPII, EconMap database.

Notes:

Projections start in 2018.

The contribution to growth of the different components of GDP is computed according to following MaGE (Macroeconometrics of the Global Economy) model's production function, which is used to produce the statistical projections in the EconMap database (**Fontagné et al., 2021**):

$$Y_{i,t} = \left[1 - \left(\frac{B_{i,t}}{p_{E_t}} \right)^{\sigma-1} \right]^{\frac{\sigma}{1-\sigma}} A_{i,t} K_{i,t}^{\alpha} L_{i,t}^{1-\alpha}$$

with
$Y_{i,t}$ GDP of region i at time t, in constant US$

$K_{i,t}$ capital stock

$L_{i,t}$ active population

$A_{i,t}$ productivity of capital and labor

p_{E_t} world average price of energy, approximated by oil price

$B_{i,t}$ productivity of energy

α share of capital in value added

σ elasticity of substitution between energy and the capital-labor aggregate.

Contribution of capital $\qquad\qquad c^K = \alpha \left(\frac{K_{i,t}}{K_{i,t-1}} - 1 \right)$

with
$K_{i,t}$ capital stock
α share of capital in value added

Contribution of labour $\qquad\qquad c^L = (1-\alpha) \left(\frac{L_{i,t}}{L_{i,t-1}} - 1 \right)$

with
$L_{i,t}$ active population
α share of capital in value added

Contribution of labour-capital productivity $\qquad c^A = \left(\frac{A_{i,t}}{A_{i,t-1}} - 1 \right)$

with
$A_{i,t}$ productivity of capital and labor

Contribution of energy efficiency $\quad c^E = \left(\dfrac{\left[1-\left(\frac{B_{i,t}}{p_{E_t}}\right)^{\sigma-1} \right]^{\frac{\sigma}{1-\sigma}}}{\left[1-\left(\frac{B_{i,t-1}}{p_{E_{t-1}}}\right)^{\sigma-1} \right]^{\frac{\sigma}{1-\sigma}}} - 1 \right)$

with

$B_{i,t}$ productivity of energy

p_{E_t} world average price of energy, approximated by oil price

σ elasticity of substitution between energy and the capital-labor aggregate.

Table 2
Active population, education and saving rate
(2015, 2025, 2050)

Source: CEPII, EconMap database.

Notes:

Active population: percentage of active population over total population, in percentage points

Savings rate: share of gross domestic product that is saved

Secondary- or tertiary-educated population: share in working age population

Tertiary-educated population: share in working age population

Figure 2
Age pyramid
(total population and active population by age range, two years to be chosen)

Source: CEPII, EconMap database.

Note:

Total and active population: in millions of inhabitants by age group and gender, according to employment status

Figure 3
GDP in the five IPCC scenarios (Intergovernmental Panel on Climate Change)
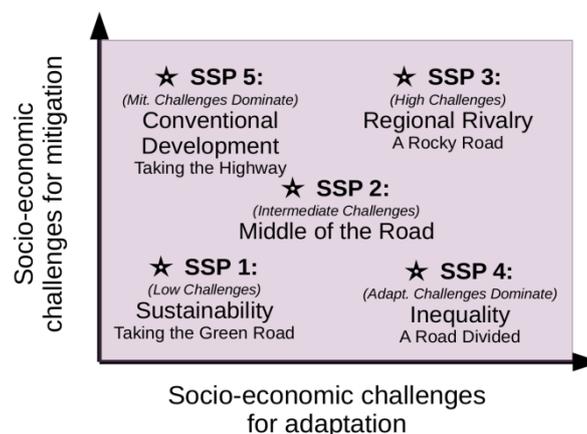## (average growth rate by decade, GDP in % of the region, GDP in % of world, 1980-2100)

Source: CEPII, EconMap database.

Notes:

GDP projections to 2100 by the CEPII start as of 2013 and are designed after the narratives described in O'Neill *et alii* (**2017**), which will notably be used as a basis for the next Intergovernmental Panel on Climate Change (IPCC) report expected by 2022.

O'Neill *et alii* offer five different narratives for the world economy by the end of the 21st century according to climatic changes, known as the "Shared Socioeconomic Pathways" (SSPs), that encompass both population, productivity or inequalities. Presented on a double axis of socio-economic challenges to be tackled —to mitigate the deterioration of the climatic conditions, on the one hand, and to adapt to them, on the other hand— these five scenarios are the following:

**Five shared socioeconomic pathways (SSPs)
representing different combinations of challenges to mitigation and to adaptation**

Source: O'Neill *et alii* (2017).

Quotations from O'Neill **et alii** *(2017)*

▪ *SSP1 Sustainability—Taking the green road (low challenges): This is a world making relatively good progress towards sustainability, with sustained efforts to achieve development goals, while reducing resource intensity and fossil fuel dependency. (…) The combination of directed development of environmentally friendly technologies, a favourable outlook for renewable energy, institutions that can facilitate international cooperation, and relatively low energy demand results in relatively low challenges to mitigation. At the same time, the improvements in human well-being, along with strong and flexible global, regional, and national institutions imply low challenges to adaptation.*

▪ *SSP2 Middle of the road (intermediate challenges): The world follows a path in which social, economic, and technological trends do not shift markedly from historical patterns. Development and income growth proceeds unevenly, with some countries making relatively good progress while others fall short of expectations. (…) These moderate development trends leave the world, on average, facing moderate challenges to mitigation and adaptation, but with significant heterogeneities across and within countries.*

▪ *SSP3 Regional rivalry—A rocky road (high challenges): A resurgent nationalism, concerns about competitiveness and security, and regional conflicts push countries to increasingly focus on domestic or, at most, regional issues. (…) Growing resource intensity and fossil fuel dependency along with difficulty in achieving international cooperation and slow technological change imply high challenges to mitigation. The limited progress on human development, slow income growth, and lack of effective institutions, especially those that can act across regions, implies high challenges to adaptation for many groups in all regions.*

▪ *SSP4 Inequality—A road divided (adaptation challenges dominate): Highly unequal investments in human capital, combined with increasing disparities in economic opportunity and political power, lead to increasing inequalities and stratification both across and within countries. (…) Environmental policies focus on local issues around middle and high income areas. The combination of some development of low carbon supply options and expertise, and a well-integrated international political and business class capable of acting quickly and decisively, implies low challenges to mitigation. Challenges to adaptation are high for the substantial proportions of populations at low levels of development and with limited access to effective institutions for coping with economic or environmental stresses.*

▪ *SSP5 Fossil-fuelled development—Taking the highway (mitigation challenges dominate): Driven by the economic success of industrialised and emerging economies, this world places increasing faith in competitive markets, innovation and participatory societies to produce rapid technological progress and development of human capital as the path to sustainable development. (…)The strong reliance on fossil fuels and the lack of global environmental concern result in potentially high challenges to mitigation. The attainment of human development goals, robust economic growth, and highly engineered infrastructure results in relatively low challenges to adaptation to any potential climate change for all but a few.*

The [EconMap](#) database proposes a quantification of these five very contrasted *scenarios* (**Fontagné & Fouré, 2016**). Two indicators are presented here:

Average growth rate by decade

Ten-year average of Gross Domestic Product growth at constant prices, measured in percentage points. Data for every decade is displayed at the median year.

In % of the world GDP

Share of gross domestic product at constant price in world total, expressed in percentage points. For every decade, the share is computed for the median year.

BALANCE & FOREX

This section presents indicators related to current transactions (trade in goods and services, movements of income based on compensation of inputs to the production process or on one-way transfers) from the CHELEM – Balance of Payments database; to effective exchange rates form the EQCHANGE database; and to terms of trade from the WTFC database.

CURRENT ACCOUNT

The current account of the balance of payments is broken down as follows:

- Trade in goods displayed for the total of goods;
- Trade in services shown in three headings (transportation, travel and other services), the last one, delineated in 10 items, being basically business services;
- The primary income account concerning, in national accounts, the return of economic units in exchange for their supply of labour (compensation of employees), of capital (investment income and interest) or natural resources (rents). The primary income balance, added to GDP, makes up the gross national income of the countries which form the region;
- The secondary income account includes transfers without quid pro quo ─ not related to the production process, contrary to the primary income account ─ with international cooperation one of the main items.

Table 1
Major flows of the region's current account
(credits, debits and balance in billions of dollars, latest available year [t])

Source: CEPII, CHELEM – Balance of Payments database.

Note:

The four accounts (goods, services, primary and secondary income) sum up to the current account. For goods and services, credits tally with exports, and debits with imports.

Figure 1
Major flows of the region's current account
(credits, debits and balance in % of GDP, 1967- latest available year [t])

Source: CEPII, CHELEM – Balance of Payments database.

Note:

The four accounts (goods, services, primary and secondary income) sum to the current account. For goods and services, credits tally with exports, and debits with imports.

Figure 2
Trade in services of the region shown in three broad categories
(credits, debits and balance in % of GDP, 1967- latest available year [t])

Source: CEPII, CHELEM – Balance of Payments database.

Note:

This breakdown highlights usual services ─ transportation (delivery of goods and passengers) and travel (tourism) ─ and the other services that are mainly business services and traded through the new technologies. "Other services" is an aggregate that results from the difference between services and the sum of "transport" and "travel". It can happen that the sum of all sub-items of "other services" (processing..., cultural services) doesn't tally with the "other services" aggregate. This occurs when services are not fully distributed across the "other services" components for confidentiality reasons. An example is Ireland in 1996.

Figure 3
Breakdown of trade in "other services"
(credits, debits and balance in % of GDP, 2005- latest available year [t])

Source: CEPII, CHELEM – Balance of Payments database.

Note:

Other services" are delineated in 10 items: manufacturing services on physical inputs owned by others (Processing, for the shortcut), maintenance and repair services n.e.s. (Maintenance), construction services (Construction), insurance and pension services (Insurance), financial services, charges for the use of intellectual property n.e.s. (Licensing), telecommunications, computer, and information services (Telecom), other business services (Other business serv.), personal, cultural, and recreational services (Culture), government goods and services n.e.s. (Government).

Figure 4
Region's primary income with a focus on investment
(credits, debits and balance in % of GDP, 2005- latest available year [t])

Source: CEPII, CHELEM –- Balance of Payments database.

Note:

Primary income is broken down into investment income, compensation of employees and other primary income. Moreover, investment income is further classified by direct investment income, portfolio income, and other investment income (mainly interests on loans and trade credit), and by income on reserve assets as well.

EFFECTIVE EXCHANGE RATES

This section proposes a multiple and original reading of the currencies' effective exchange rates evolutions since 1973: nominal *versus* real rates; equilibrium real effective exchange rate; and the deviation of the real effective exchange rate to its equilibrium level.

Data is available only for the Euro Area.

Figure 5
Effective exchange rates
(1999- latest available year [t])

Source: CEPII, EQCHANGE database.

Notes:

Nominal and real effective exchange rates (2010=100)

An effective exchange rate measures the rate at which a country's (monetary area's) currency exchanges against a basket of other currencies, in either nominal or real terms.

The nominal effective exchange rate of country (monetary area) i in period t ($NEER_{i,t}$) measures the value of the currency of country (monetary area) i against a weighted average of foreign currencies:

$$NEER_{i,t} = \prod_{j=1}^{N} NER_{ij,t}^{w_{ij,t}}$$

where $NER_{ij,t}$ is the index of the nominal bilateral exchange rate between the currency of country (monetary area) i and the currency of its trade partner j in period t, N denotes the number of trading partners and $w_{ij,t}$ is the trade-based weight associated to the partner j. These weights are normalised so that their sum is equal to one, i.e. $\sum_{j=1}^{N} w_{ij,t} = 1$ (see see **Couharde et alii, 2018**; **Grekou, 2021**).

The real effective exchange rate of country (monetary area) i in period t ($REER_{i,t}$) is calculated as the weighted average of real bilateral exchange rates against each of its N trading partners j:

$$REER_{i,t} = \prod_{j=1}^{N} RER_{ij,t}^{w_{ij,t}}$$

where $RER_{ij,t} = \frac{NER_{ij,t} \times P_{i,t}}{P_{j,t}}$ is an index of the real exchange rate of the currency of the country (monetary area) i vis-à-vis the currency of the trading partner j in period t. $P_{i,t}$ and $P_{j,t}$ stand respectively for the price index of country (monetary area) i and of country j.

With these definitions, a real (nominal) appreciation of the domestic currency is recorded as an increase in the real (nominal) effective exchange rate index.

Equilibrium effective real exchange rate (and its 95% confidence interval)

The series correspond to the average of the estimated equilibrium effective real exchange rates over different models and samples. The equilibrium exchange rates have been derived relying on the Behavioral Equilibrium Exchange Rate approach (BEER approach; see **Clark & MacDonald, 1998**). Hence, the obtained series correspond to the equilibrium levels of the exchange rates suggested by the fundamentals of the economies. In deriving the equilibrium exchange rates, we consider several determinants among which, the relative productivity (the ratio of the tradable to the non-tradable sectors productivity of each country computed relative to that of its trading partners). The higher this relative productivity, the higher the equilibrium exchange rate (**Couharde et alii, 2018**; **Grekou, 2021**). Other long-term determinants of exchange rates are considered: the net foreign asset position, the terms of trade, the public spending and the trade openness.

Since they are estimated, the equilibrium real exchange rates are unitless and cannot be considered as indices. In contrast, the equilibrium series have a scale similar to that of the effective exchange rates. The lines below and above the series respectively indicate the lower and upper bounds of the 95% confidence interval.

The estimated equilibrium exchange rates serve as the benchmark for the derivation of the currency misalignments.

Real exchange rate misalignment (in %)

Real exchange rate misalignments correspond to the departures of the exchange rates from the equilibrium exchange rates as defined by the evolutions of the fundamentals. They reflect macroeconomic imbalances in the broad sense, i.e., both fundamental imbalances such as current account imbalances or imbalances not directly related to the fundamentals.

The misalignments' values then give the magnitude of the real exchange rate adjustment that would restore equilibrium. The series correspond to the average of the estimated currency misalignments (in percentage) over different samples and models. Each currency misalignment series has been calculated as the log-difference between the actual real effective exchange rate ($reer_{i,t}$) and its estimated equilibrium level ($erer_{i,t}$) at date t.

$$Mis_{i,t} = reer_{i,t} - erer_{i,t}$$

Given the definition of the real effective exchange rate, a negative sign of the misalignment ($reer_{i,t} < erer_{i,t}$) indicates an undervaluation (the real exchange rate must appreciate to converge towards its long-run equilibrium value), whereas a positive sign ($reer_{i,t} > erer_{i,t}$) indicates an overvaluation of the real effective exchange rate (the real exchange rate must depreciate to converge towards its long-run equilibrium value).

TERMS OF TRADE

This section presents the evolution of regions' unit values in exports and imports, intra-regional trade excluded, as well as their terms of trade, in all and manufactured goods since 2000.

Figure 6
Terms of trade evolution in all products and their breakdown
(export and import unit values, terms of trade, 2000- latest available year [t], 2000=100)

Source: CEPII, WTFC database.

Note:

Unit values are defined at the 6-digit level of the Harmonised System (HS) classification in WTFC database and are then aggregated.

Terms of trade are defined as the ratio of export to import price. The terms of trade index is here equal to the ratio of the Laspeyres unit value indices of exports and imports of a given country or region:

$$TE_i = \frac{L_i^x}{L_i^m}$$

with L_i^x and L_i^m Laspeyres indices for respectively exports and imports of region i. The Laspeyres index is the arithmetical average of the ratio of unit values at time t and at the time of reference t_0 (2000), weighted by the share of the country j and product k in each country i' of region i's trade at t_0. Index j describes all of their partners except region i countries.

$$L_i^x = \sum_{i'jk} \frac{uv_{i'jkt}}{uv_{i'jkt_0}} \times w_{i'jkt_0}$$

with

country i' in region i,

j partner countries except those located in region i

$uv_{i'jkt}$ unit value of exports of country i' to country j for the product k at time t

$uv_{i'jkt_0}$ unit value of exports of country i' to country j for the product k at the time of reference t_0

$w_{i'jkt_0} = \dfrac{v_{i'jkt_0}}{\sum_{jk} v_{i'jkt_0}}$ share of the product k and the destination j in country i' s exports at the time of reference t_0

Figure 7
Terms of trade evolution in manufacturing products and its breakdown
(export and import unit values, terms of trade, 2000- latest available year [t], 2000=100)

Source: CEPII, WTFC database.

Note:

Unit values are defined at the 6-digit level of the Harmonised System (HS) classification in WTFC database and are then aggregated. Manufacturing products correspond to BA to GI and KA to KI categories of the CHELEM nomenclature (see the **Classifications** section).

Terms of trade are defined as the ratio of export to import price. The terms of trade index is here equal to the ratio of the Laspeyres unit value indices of exports and imports of a given country or region:

$$TE_i = \frac{L_i^x}{L_i^m}$$

with L_i^x and L_i^m Laspeyres indices for respectively exports and imports of region i. The Laspeyres index is the arithmetical average of the ratio of unit values at time t and at the time of reference t_0 (2000), weighted by the share of the country j and product k in each country i' of region i's trade at t_0. Index j describes all of their partners except region i countries.

$$L_i^x = \sum_{i'jk} \frac{uv_{i'jkt}}{uv_{i'jkt_0}} \times w_{i'jkt_0}$$

with

country i' in region i,

j partner countries except those located in region i

$uv_{i'jkt}$ unit value of exports of country i' to country j for the product k at time t

$uv_{i'jkt_0}$ unit value of exports of country i' to country j for the product k at the time of reference t_0

$w_{i'jkt_0} = \dfrac{v_{i'jkt_0}}{\sum_{jk} v_{i'jkt_0}}$ share of the product k and the destination j in country i' s exports at the time of reference t_0

TARIFF PROTECTION

Table 1
Average Tariffs by sector
(in %, latest available year [t])

Source: CEPII-ITC, MAcMap-HS6 2016 v 1.0 database

Notes:

The sectors are classified according to the CEPII's CHELEM database nomenclature (see the **Classifications section**).

The average rate corresponds to weighted averages computed with the MAcMap-HS6 methodology, called the "reference groups" (**Guimbard et alii, 2012b**, p. 102).

The rates are calculated by including intra-regional flows, except in the cases of the EU-27, EU28, Euro Area and European Economic Area for which they will be calculated excluding the intra trade flows.

Preferential applied and faced tariff by the region and the world

Column 1: average preferential tariff applied by the region to the rest of the world.

Column 2: average preferential tariff faced by the region on the rest of the world.

Column 3: world's average preferential applied tariff

Notes:

Preferential applied tariff: the lowest rate applicable to a region, taking into account the preferential agreements.

Faced applied tariff: the lowest rate applicable faced by the region, taking into account the preferential agreements.

For products subject to tariff rate quotas, the outside rate is used.

MFN applied and faced tariff by the region and the world

Column 1: average MFN tariff applied by the region to the rest of the world.

Column 2: average MFN tariff faced by the region on the rest of the world.

Column 3: world's average MFN applied tariff.

Notes:

MFN tariff: applied tariff under the Most Favoured Nation clause. For a member country of the World Trade Organization (WTO), this is the standard non-discriminatory tariff on imported products from its WTO partners (excluding preferential tariffs under free trade agreements and other arrangements or tariffs applied within the limits of a quota).

Table 2
Average Tariffs by production stages
(in %, latest available year [t])

Source: CEPII-ITC, MAcMap-HS6 2016 v 1.0 database

Notes:

Stages are defined according to the sectoral classification of the CHELEM database, and stages according to the UN-BEC classification (see the **Classifications section**).

The average rate corresponds to weighted averages computed with the MAcMap-HS6 methodology, called the "reference groups" (**Guimbard et alii, 2012b**, p. 102).

The rates are calculated by including intra-regional flows, except in the cases of the EU-27, EU28, Euro Area and European Economic Area for which they will be calculated excluding the intra trade flows.

Preferential applied and faced tariff by the region

Column 1: average preferential tariff applied by the region to the rest of the world.

Column 2: average preferential tariff faced by the region on the rest of the world.

Notes:

Preferential applied tariff: the lowest rate applicable to a region, taking into account the preferential agreements.

Faced applied tariff: the lowest rate applicable faced by the region, taking into account the preferential agreements.

For products subject to tariff rate quotas, the outside rate is used.

MFN applied and faced tariff by the region

Column 1: average MFN tariff applied by the region to the rest of the world.

Column 2: average MFN tariff faced by the region on the rest of the world.

Notes:

MFN tariff: applied tariff under the Most Favoured Nation clause. For a member country of the World Trade Organization (WTO), this is the standard non-discriminatory tariff on imported products from its WTO partners (excluding preferential tariffs under free trade agreements and other arrangements or tariffs applied within the limits of a quota).

Table 3
Average Tariffs by industries
(in %, latest available year [t])

Source: CEPII-ITC, MAcMap-HS6 2016 v 1.0 database

Notes:

Industries are defined according to the sectoral classification of the CHELEM database (see the **Classifications section**).

The average rate corresponds to weighted averages computed with the MAcMap-HS6 methodology, called the "reference groups" (**Guimbard *et alii*, 2012b**, p. 102).

The rates are calculated by including intra-regional flows, except in the cases of the EU-27, EU28, Euro Area and European Economic Area for which they will be calculated excluding the intra trade flows.

Preferential applied and faced tariff by the region

Column 1: average preferential tariff applied by the region to the rest of the world.

Column 2: average preferential tariff faced by the region on the rest of the world.

Notes:

Preferential applied tariff: the lowest rate applicable to a region, taking into account the preferential agreements.

Faced applied tariff: the lowest rate applicable faced by the region, taking into account the preferential agreements.

For products subject to tariff rate quotas, the outside rate is used.

MFN applied and faced tariff by the region

Column 1: average MFN tariff applied by the region to the rest of the world.

Column 2: average MFN tariff faced by the region on the rest of the world

Notes:

MFN tariff: applied tariff under the Most Favoured Nation clause. For a member country of the World Trade Organization (WTO), this is the standard non-discriminatory tariff on imported products from its WTO partners (excluding preferential tariffs under free trade agreements and other arrangements or tariffs applied within the limits of a quota).

COMPARATIVE ADVANTAGES: TRADE SPECIALISATION

International specialisation is measured by the contribution to the trade balance. For each region, this indicator calculates the revealed comparative advantages (RCA), *i.e.* its advantages/disadvantages revealed by international trade. Considering both exports and imports, it shows the key and weak points of the area, regardless of the impact of the macroeconomic frameworks on its trade balance.

$$RCA_i^k = \frac{1000}{GDP_i} \times \left[\left(X_i^k - M_i^k \right) - \left(X_i^{total} - M_i^{total} \right) \times \left(\frac{X_i^k + M_i^k}{X_i^{total} + M_i^{total}} \right) \right]$$

with

i region

k product (good or service)

X exports in value

M imports in value

GDP Gross Domestic Product in value

Trade balance of a product k is compared to a "theoretical balance" resulting from the distribution of the global balance observed between the various products in total trade of region i. This theoretical balance is, by construction, neutral towards any advantage or disadvantage of the region on the various products. So the distance between effective balance and theoretical balance on each of the products reveals the key or weak points of the region. The indicator is additive and the sum on all the products is equal to zero. To facilitate the comparisons between regions, the indicator is expressed in thousandths of the region's Gross Domestic Product.

Figure 1
Trade specialisation of the region in large sectors and industries
(contribution to the balance, in thousandths of the region's GDP,
1967- latest available year [t])

Sources: CEPII, CHELEM – International Trade - Balance of Payments - GDP databases.

Notes:

Trade data before 1996 are not available or of sufficient quality for the Community of Independent States (CIS region).

By large sectors

Three large sectors correspond to the groupings of products in the CHELEM database (see the **Classifications section**).

Primary goods: ores, energy and agriculture (sections H, I and J).

Manufactured goods: other goods (sections B, C, D, E, F, G, K).

Services: all services (processing excluded).

Top 3 advantages and disadvantages by industry group

This figure displays the first 3 comparative advantages and disadvantages of the country between 11 industry groups in goods and 3 in services.

Industry groups are defined according to the sectoral classification of the CHELEM database (see the **Classifications section**).

NES are not included in goods, and processing in services.

Table 1
Trade specialisation by category: Top 10 comparative advantages and disadvantages
(contribution to the balance, in thousandths of the region's GDP,
latest available year [t], change [t-10]-[t]
and [t-10], change [t-20]-[t-10])

Sources: CEPII, CHELEM – International Trade - Balance of Payments - GDP databases.

Notes:

Key points (comparative advantages) and weak points (comparative disadvantages) are computed for the 70 categories of goods (NES excluded) and for the 12 categories of services of CHELEM (see the **Classifications section**). NES are not included in goods, and processing in services.

Sometimes, there are less than ten key points or ten weak points.

The changes over the period (final year – initial year) are points of thousandths of GDP.

TYPES & RANGES

This section offers original measures on the nature of the regions' manufactured trade, listing them first by type and then by range of trade.

The types of trade are analysed through two approaches:

- first by considering intra-industry trade (simultaneous trade of bilateral flows within a single industry) since 1967, as measured by the Grubel and Lloyd index, using data from the CHELEM database, at a relatively aggregated level of 240 industries;
- then by classifying trade flows in one-way trade of different products and two-way trade of similar products, by using very detailed data (almost 5,000 products) from the WTFC database since 2000.

The unit value ranges make it possible to identify the regions' international trade through a 'quality/price' criterion (low, medium and high unit value ranges) from the data of this latter database.

INTRA-INDUSTRY TRADE

Figure 1
Intra-industry trade (Grubel-Lloyd index)
(1967- latest available year [t])

Source: CEPII, CHELEM – International Trade database.

Notes:

Trade data before 1996 are not available or of sufficient quality for the Community of Independent States (CIS region). In Europe region, trade for successor states of the former USSR, the former Czechoslovakia, the former Yugoslavia and for Belgium and Luxembourg was estimated at the start of the period, based on more aggregated data.

Grubel-Lloyd index (Grubel & Lloyd, 1975) is used to measure intra-industry trade (IIT) between two countries:

$$GL_{i'j'}^{k} = \frac{\left(X_{i'j'}^{k} + M_{i'j'}^{k}\right) - |X_{i'j'}^{k} - M_{i'j'}^{k}|}{X_{i'j'}^{k} + M_{i'j'}^{k}} = 1 - \frac{|X_{i'j'}^{k} - M_{i'j'}^{k}|}{X_{i'j'}^{k} + M_{i'j'}^{k}}$$

with

$X_{i'j'}^{k}$ exports value in industry k from country i' to partner j'

$M_{i'j'}^{k}$ imports value in industry k by country i' from partner j'

GL varies between 0 (exclusive trade between the industries) and 1 (exclusive IIT).

The indicator calculated at the level of bilateral flows with partner countries in 240 manufacturing industries (excluding minerals, energy and agricultural industries, jewellery, non-monetary gold and not elsewhere specified products) is presented here in three aggregated forms:

G&L by partner regions

$$GL_{ij} = \sum_{i'j'k} GL_{i'j'}^{k} * \frac{\left(X_{i'j'}^{k} + M_{i'j'}^{k}\right)}{(X_{ij} + XM_{ij})}$$

with i' describing the countries in the considered region i; j', the partner countries in region j; and k, the industries.

Only the regions that made up more than 5% in the region's exports (or imports) in the latest year or that allows for more than 10% in the preceding selected years are displayed (see the **Classifications section** for the composition of the regions).

G&L by broad production stages

$$GL_{i}^{K} = \sum_{i'j'k} GL_{i'}^{k} \times \frac{\left(X_{i'j'}^{k} + M_{i'j'}^{k}\right)}{(X_{i}^{K} + M_{i}^{K})}$$

with i' describing the countries in the considered region i; j', the partner countries in region j (including region i); and k, the industries classified in the broad production stage K (see the **Classifications section**).

G&L by Industry groups

$$GL_{i}^{K} = \sum_{i'j'k} GL_{i'}^{k} \times \frac{\left(X_{i'j'}^{k} + M_{i'j'}^{k}\right)}{(X_{i}^{K} + M_{i}^{K})}$$

with i' describing the countries in the considered region i; j', the partner countries in region j (including region i); and k, the industries classified in industry group K (see the **Classifications section**).

Only the industry groups that made up more than 5% in the region's exports (or imports) in the latest year or that or that allows for more than 10% in the preceding selected years are displayed.

ONE-WAY & TWO-WAY TRADE IN PRODUCT LEVEL

Types of trade are distinguished according to Fontagné & Freudenberg (**1997**) methodology.

Two-way versus one-way trade

Two partners may export and import the same product. For example, French producers may export cotton men's shirts to Spain, while Spanish producers may export the same category of products to France. There is thus a trade *overlap*. If the overlap is above a given threshold, then the flow is defined as two-way trade.

Trade at a country – partner – product – year level is considered to be two-way when the value of the minority flow (the smallest value between the export and import flows) represents at least 10% of the majority flow:

$$\frac{Min\left(X_{ij}^{k}, M_{ij}^{k}\right)}{Max\left(X_{ij}^{k}, M_{ij}^{k}\right)} > 10\%$$

with

X_{ij} exports in value from country i to country j
M_{ij} imports in value by country i from country j
k product

If the ratio is below this 10% threshold, the flow in considered one-way.

Product similarity

Products of a pair of flows (imports and exports for a country – partner – product – year) are considered to be similar (or *horizontally differentiated*) if their relative unit values differ by less than 15%, i.e. if they fulfil the following condition:

$$\frac{1}{1.15} \leq \frac{UV_{ijk}^{X}}{UV_{ijk}^{M}} \leq 1.15$$

with

UV unit value (ratio value/quantity*)*

UV_{ij}^{X} export unit value from country i to country j

UV_{ij}^{M} import unit value of country i from country j

k product

When this is not the case, products are considered to be *vertically differentiated*.

According to the conditions summarised in the following table, each pair of flows (exports and imports) is associated with one of the four types of trade:

- one-way,
- two-way trade in variety or in horizontally differentiated (similar) products,
- two-way trade in vertically differentiated products,
- unallocated two-way trade (without information on unit values).

Trade overlap: does the minority flow represent at least 10% of the majority flow?	Product similarity: do export and import unit values differ from less than 15%?		
	Yes Horizontal differentiation	**No** Vertical differentiation	Missing unit value
Yes Two-Way Trade	Trade horizontally differentiated	Trade vertically differentiated	Unallocated Two-Way Trade
No One-Way Trade	One-Way Trade		

Figure 2
Breakdown of the region's manufactured trade by type
(in % of total of exports and imports of manufactured goods,
2000- latest available year [t])

Source: CEPII, WTFC database.

Notes:

One-Way Trade: trade of products with different characteristics.

Two-Way Trade in quality: two-way trade of *vertically differentiated* products (similar characteristics but different unit values).

Two-Way Trade in variety: two-way trade of *horizontally differentiated* products (similar characteristics and unit values).

Unallocated Two-Way Trade: two-way trade without information on unit values.

The WTFC database provides the type of each flow at the most disaggregated level: exporting country – importing country – product. We select manufactured goods using the CHELEM nomenclature (sectors BA to GI and KA to KI, see the **Classifications section**).

The share in regional trade of each of the four types (one-way, two-way in quality, two-way in variety, unallocated two-way) is the ratio between the total value of trade flows of the region corresponding to a given type of trade (imports and exports) and the total value of trade flows of the region (imports and exports).

We distinguish between partner countries belonging to the same region (intra-regional trade flows) and partner countries outside of the region (extra-regional trade flows).

Table 1
Breakdown of the region's manufactured trade by type and industry group
(in % of total of manufactured exports and imports of the industry group,
3 years average at the beginning and the end of the last decade)

Source: CEPII, WTFC database.

Notes:

One-Way Trade: trade of products with different characteristics.

Two-Way Trade in quality: two-way trade of *vertically differentiated* products (similar characteristics but different unit values).

Two-Way Trade in variety: two-way trade of *horizontally differentiated* products (similar characteristics and unit values).

Unallocated Two-Way Trade: two-way trade without information on unit values.

The WTFC database provides the type of each flow at the most disaggregated level: exporting country – importing country – product. We select manufactured goods using the CHELEM nomenclature (sectors BA to GI and KA to KI, see the **Classifications section**).

For each industry group, the repartition by type of trade is the ratio between the total value of trade flows of the region corresponding to a given type of trade (imports and exports), in the industry group, and the total value of trade flows of the region in the industry group (imports and exports).

We distinguish between partner countries belonging to the same region (intra-regional trade flows) and partner countries outside of the region (extra-regional trade flows).

UNIT VALUE RANGES

We follow the Fontagné, Freudenberg and Péridy (**1997**) methodology.

A unit value range is assigned to each elementary flow depending on its unit value relatively to a world reference. This reference corresponds to the world median of all unit values weighted by the value of their flow for a given year. The three unit value ranges for each flow at the country-partner-product-year level are defined as follows:

- High unit value range, if the product unit value exceeds the world reference by at least 15%,

- Medium unit value range, if the product unit value ranges between +/-15% around the reference,

- Low unit value range, if the product unit value is below the reference by at least 15%.

Figure 3
Breakdown of the region's manufactured exports and imports by unit value range
(in % of total exports or imports of manufactured goods,
2000- latest available year [t])

Source: CEPII, WTFC database.

Notes:

The WTFC database provides the unit value range of each flow at the most disaggregated level: exporting country – importing country – product. We select manufactured goods using the CHELEM nomenclature (sectors BA to GI and KA to KI, see the **Classifications section**).

The repartition by unit value range of the exports of the region is the ratio between the total value of exports of the region in a given range and the total value of exports of the region. We proceed similarly to compute the repartition by range of the imports of the region.

We distinguish between partner countries belonging to the same region (intra-regional trade flows) and partner countries outside of the region (extra-regional trade flows).

Table 2
Breakdown of the region's manufactured exports and imports by unit value range and industry group
(in % of manufactured exports or imports of the industry group,
3 years average at the beginning and the end of the last decade)

Source: CEPII, WTFC database.

Notes:

The WTFC database provides the unit value range of each flow at the most disaggregated level: exporting country – importing country – product. We select manufactured goods using the CHELEM nomenclature (sectors BA to GI and KA to KI, see the **Classifications section**).

For each industry group, the repartition by unit value range of the exports of the region is the ratio between the total value of exports of the region corresponding to a given range, in the industry group, and the total value of exports

of the region in the industry group. We proceed similarly to compute the repartition by range of the imports of the region.

We distinguish between partner countries belonging to the same region (intra-regional trade flows) and partner countries outside of the region (extra-regional trade flows).

PRODUCTS AND PARTNERS

Products correspond to the 4-digits level in the Harmonised System (HS4) of the product classification. It contains 1,241 categories of products.

Table 1
Concentration of trade in goods by partner country and product (HS4), (latest available year [t])

Source: CEPII, BACI database.

Notes:

The two columns present the export and import concentration of the region or the world.

Share of the first one: share of the first partner or product in the region's or world's total exports or imports. Similarly the share of the first four represents the share of the four most important partners or products.

Number corresponding to 50% (90%) of exports (imports): number of partners or products which covers 50% (90%) of the region's or world's exports (imports).

Intra-regional flows are excluded.

Table 2
Share of the first 10 partners in extra- or intra-regional exports and imports
(in % of the region's all partners exports or imports in goods,
latest available year [t] and [t-10])

Source: CEPII, BACI database.

The share of each country is computed using the sum of exports (or imports) of the region as a denominator.

Table 3
Share of the first 10 products (HS4) in extra- or intra-regional exports and imports
(in % of the region's all partners exports or imports in goods,
latest available year [t] and [t-10])

Source: CEPII, BACI database.

The share of each product is computed using the sum of exports (or imports) of the region as a denominator.

Table 4
Share of the first 10 flows (partner/HS4 product) in extra- or intra-regional exports and imports
(in % of the region's all partners exports or imports in goods,
latest available year [t] and [t-10])

Source: CEPII, BACI database.

The share of each country – product is computed using the sum of exports (or imports) of the region as a denominator.

■ **Databases**

BACI

BACI provides bilateral export values (in thousands of US dollars) and quantities (in tons) at the 6-digit level of Harmonised System (5,018 products), for more than 254 countries since 1989. Original data come from the United Nations Statistical Division (COMTRADE database). This source database provides the declarations of the exporter and the importer, that gives double information for each flow (exporter-importer-product-year).

BACI is constructed using an original procedure that reconciles the declarations. This harmonisation procedure enables to extend considerably the number of countries for which trade data are available, as compared to the original dataset. First, as import values are reported CIF (Cost, Insurance and Freight) while exports are reported FOB (Free On Board), insurance and freight costs are estimated and removed from imports values to compute all flows free on board. Second, the reliability of country reporting is assessed based on the reporting distances among partners. These reporting qualities are used as weights in the reconciliation of each bilateral trade flow twice reported (Gaulier & Zignago, 2010).

CHELEM

For several decades now, the CHELEM database ["*Comptes Harmonisés sur les Echanges et L'Economie Mondiale*", *ie* harmonised international trade flows, balances of payments and world revenues], developed by the CEPII, has been recognised as one of the most useful tools to analyse global economic trends in a framework combining consistency, exhaustiveness and reliability. The CHELEM database is composed of three databases: CHELEM – International Trade, CHELEM – Gross Domestic Product and CHELEM – Balance of Payments. These three databases contain annual data on long periods, going back to either 1960 or 1967. The three databases are interlinked by a common worldwide geographical classification organised in 95 elementary zones, one "not specified" zone and one "total world", and by specific indicators.

International Trade (TRADE)

The CHELEM – International Trade database contains the bilateral flow of all traded goods expressed in millions of current dollars since 1967. The sectoral nomenclature has been chosen to provide the optimal fit with international trade and production classifications. The data from the different sources are harmonised and rendered consistent in a framework spanning the entire world and all goods. For each year and product category, trade between the 95 geographical zones (countries or group of countries) is therefore represented by a unique and harmonised matrix (see de Saint Vaulry, 2008 and 2013). In particular, freight and insurance costs, as well as re-exports and re-imports, are removed.

The flows of goods are detailed in either 71 TRADE-CHELEM product categories, 43 TRADE-GTAP categories or 147 TRADE-ISIC categories, to which are added the non-allocated product category and the total products. Product categories may be aggregated by industries, by stages in the production process, by intermediate sections, by sectors or by technological levels. Geographical aggregates are also available. The sectoral and geographical classifications used in the CEPII Region Profiles are presented below in the classifications section.

Balance of Payments (BOP)

The CHELEM – Balance of Payments database contains all partner flows for 194 countries since 1967. Accounts are aggregated using the data and the classification of the IMF 6th manual of the balance of payments (Nayman, 2014). As flows are not broken down by partners in this database, they are not harmonised. Globally, exports (credits) differ then from imports (debits), contrary to the harmonised flows in the CHELEM – International Trade, BACI and WTFC databases.

The Region Profiles are focused on the current account of the balance of payments that group together trade in goods, services, and income (primary and secondary).

Since several publications by the CEPII have analysed investment income within primary income (Nayman & Vicard, 2018a, b, c & d), investment income is thus shown at a detailed level in the CEPII Region Profiles, unlike the CHELEM – Balance of Payments database where the aggregate is not broken down.

Gross Domestic Products (GDP)

The CHELEM – Gross Domestic Product database consists of five series among which three are estimations of Gross Domestic Products: GDP in value (current prices and dollar); GDP in volume (constant, 2017 prices and dollar); GDP based on Purchasing Power Parity (PPP, constant, 2017 prices and international dollar). The series of total population and nominal exchange rate complete the database.

The CHELEM – GDP series begin in 1960. The data posterior to the last available year in CHELEM – International Trade and Balance of payments databases are based on estimations of the IMF (World Economic Outlook). As the two other CHELEM databases, it covers the whole world at the level of the common classification of 95 elementary zones, but also presents a more detailed level with 201 countries or individualised statistical territories (for an example of using this database, see Ünal, 2019).

EconMap

The EconMap database is developed by the CEPII (Fontagné et alii, 2021 ; Fouré et alii, 2012 & 2013) to consider the global economy by 2050 or 2100. It contains statistics on GDP at constant and current prices and on factors of production and technical progress for around 170 countries over the period 1980-2050.

It is based on the CEPII MaGE (Macroeconometrics of the Global Economy) model which combines the projections of the United Nations and of the International Labour Organization with the econometric estimates relative to: (i) the saving rate, (ii) the relationship between capital and savings, (iii) education, (iv) women's participation in the labour market, and (v) technical progress (global factor productivity and productivity specific to energy use).

EQCHANGE

EQCHANGE is a database containing the effective exchange rates calculated by the CEPII for more than 180 countries from 1973 to the present day. It includes (i) nominal and real effective exchange rates, (ii) real equilibrium exchange rates and corresponding misalignments (Couharde et alii, 2017 ; Coudert et alii, 2019; Grekou, 2021).

MAcMap-HS6

Initially, Market Access Map HS6 (MAcMap-HS6) was a database jointly developed by the International Trade Centre (ITC, Geneva) and the CEPII, for years 2001, 2004 and 2007. It provides a comprehensive measure of bilateral tariffs (through *ad valorem* equivalents of the tariff protection) applied by 190 importing countries to 220 exporting countries, on 5,113 products at the 6 digit level of the Harmonised System (Guimbard et alii, 2012a & b). Applied tariffs take account of trade preferences applied by each importer and of all regional agreements in which it is involved (Bouët et alii, 2008). It also contains the tariffs applied under the Most-Favoured-Nation clause (MFN) by the members of the World Trade Organization.

For Region Profiles, MAcMap-HS6 2016 v1.0 is built using raw data coming from ITC. However, as information is not yet available, for products subject to tariff rate quotas, the so-called "exterior" rates (i.e. higher rate of the contingent) are used.

World Trade Flows Characterisation

The World Trade Flows Characterisation (WTFC) database developed by the CEPII associates each flow with a trade type (one-way trade, two-way trade in similar products or in differentiated products) and a price range (low, middle or high range). Trade characteristics are computed using an harmonised version of CEPII's Trade Unit Values (TUV) database which contains import and export unit value information (in US dollars per ton), at the 6-digit level of Harmonised System (5,113 products) for 182 reporters and 253 partners, from 2000 to the latest year available (Berthou & Emlinger, 2011a & b). The comparison of trade flows and the unit values analysis allow to distinguish one-way trade from two-way trade and to determine whether it corresponds to trade in similar or differentiated products according to the Fontagné & Freudenberg index (1997). A price range is also assigned to each elementary flow depending on its unit value relatively to a world reference (**Emlinger & Piton, 2014**).

■ Classifications

COMPOSITION OF THE REGIONS

Tables and figures are presented for the following regions, the first 8 ones with the "not specified zones" summing up to the world:

Alpha code	Num. code	Region	Composition by countries
		THE LARGE REGIONS COMPOSING THE WORLD	
AMN	1100	North America	Canada, Mexico, United States of America
AMS	1200	South & central America	Americas, excluding Canada, Mexico and United States
UE+EUA	2100	Europe	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany (former East Germany included), Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Albania, Iceland, Norway, Switzerland, Turkey, United Kingdom; Bosnia Herzegovina, North Macedonia, Serbia-Montenegro (calculated before the partition of former Yugoslavia)
CEI	2200	Commonwealth of Independent States (CIS)	Armenia, Azerbaijan, Belarus, Georgia*, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine*, Uzbekistan Trade data available from 1996 *Georgia and Ukraine, now non-members, are retained in the area here
MENA	3100	Middle East & North Africa	Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen (and State of Palestine in GDP and TRADE), Algeria, Egypt, Libya, Morocco, Tunisia
AFS	3200	Sub-Saharan Africa	Africa, excluding North Africa
	4100	Asia-Oceania advanced	Australia, Hong Kong, Japan, New Zealand, Singapore, South Korea, Taiwan
	4200	Asia-Oceania emergent & development.	Afghanistan, Bangladesh, Bhutan, Brunei, Cambodia, China, Fiji, French Polynesia (in GDP and TRADE), Guam (in GDP and TRADE), India, Indonesia, Kiribati, Lao PDR, Macao, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Caledonia (in GDP and TRADE), New Zealand North Korea, Pacific Islands (in GDP and TRADE), Pakistan, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka, Thailand, Tonga, US Samoa (in GDP and TRADE), Vanuatu, Viet Nam, Western Samoa, and all others in Asia and Oceania (in GDP and TRADE only)
XXX	990 or 5000	Not specified	Not specified zones
WLD	000	World	North America + South & central America + Europe + CIS + MENA + Sub-Saharan Africa + Asia-Oceania advanced + Asia-Oceania emergent & development + Not specified
		OTHER GEOGRAPHIC AREAS	
MER	1510	Mercosur	Argentina, Brazil, Paraguay, Uruguay, Venezuela
-	1520	Andean Community	Bolivia, Colombia, Ecuador, Peru
E28	2510	EU-28	EU-27 and United Kingdom
E27	2520	EU-27	European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden
EUR	2530	Euro Area	Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain
EEE	2540	European Economic Area	EU-27, Iceland, Liechtenstein, Norway
ASE	4510	ASEAN	Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar (except in Broad patterns, Comparative advantages and Types & Ranges Figure 1), Philippines, Singapore, Thailand, Vietnam
-	4520	China & Hong Kong	China, Hong Kong
ANZ	4530	Australia & New Zealand	Australia, New Zealand
-	4540	RCEP	Regional Comprehensive Economic Partnership: Australia, Brunei, Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Myanmar (except in Broad patterns, Comparative advantages and Types & Ranges figure 1), New Zealand, Philippines, Singapore, South Korea, Thailand, Vietnam

SECTORAL CLASSIFICATIONS

By product category

Products are listed according to the CHELEM classifications in 72 categories for the goods in the International Trade database and in 13 categories for the services in the Balance of Payments database, except in **Products & Partners section**'s tables where the Harmonised System (HS4) is retained.

TRADE IN GOODS		
CHELEM code	**Product category**	**Description**
BA	Cement	Cement and derived products
BB	Ceramics	Ceramics (including manufactured mineral articles not elsewhere specified)
BC	Glass	Glass (flatware and hollow-ware)
CA	Iron and steel	Iron and steel-making (including pig iron and sheet steel)
CB	Tubes	Tubes and first-stage processing products
CC	Non-ferrous metals	Non-ferrous metals
DA	Yarns and fabrics	Yarns and fabrics
DB	Clothing	Clothing (with fabrics as the main input)
DC	Knitwear	Knitwear (made directly from yarns)
DD	Carpets	Carpets and textile furnishings
DE	Leather	Leather, fur skins and footwear
EA	Wood articles	Articles in wood
EB	Furniture	Furniture (made of wood or other materials)
EC	Paper	Paper and pulp
ED	Printing	Printing and publications
EE	Miscell. manuf.	Toys, sports equipment and miscellaneous manufactured articles
FA	Metallic structures	Large metallic structures
FB	Miscell. hardware	Miscellaneous hardware
FC	Engines	Engines, turbines and pumps
FD	Agricultural equip.	Agricultural equipment
FE	Machine tools	Machine tools
FF	Construction equip.	Construction and public works equipment
FG	Specialised mach.	Specialised machines
FH	Arms	Arms and weaponry
FI	Precision inst.	Precision instruments
FJ	Clock making	Watch and clock making
FK	Optics	Optics and photographic and cinematographic equipment
FL	Electronic comp.	Electronic components
FM	Consumer electro.	Consumer electronics
FN	Telecom. Equip.	Telecommunications equipment
FO	Computer equipment	Computer equipment (including office equipment)
FP	Domestic electrical app.	Domestic electrical appliances
FQ	Electrical equip.	Heavy electrical equipment
FR	Electrical app.	Electrical apparatus (including passive devices)
FS	Vehicle comp.	Vehicle components
FT	Cars and cycles	Cars (including motorcycles)
FU	Commercial vehic.	Commercial vehicles and transport equipment (including public transport vehicles and railway equipment)
FV	Ships	Ships (including oil rigs)
FW	Aeronautics	Products of the aircraft and spatial manufacturing
GA	Basic inorg. chem.	Basic inorganic chemicals
GB	Fertilizers	Fertilizers
GC	Basic org. chem..	Basic organic chemicals
GD	Paints	Paints, colorings and intermediate chemical products not elsewhere specified
GE	Toiletries	Toilet products, soaps and perfumes (including chemical preparations not elsewhere specified)
GF	Pharmaceuticals	Pharmaceuticals products (including veterinary products)

	TRADE IN GOODS (continuing)	
CHELEM code	**Product category**	**Description**
GG	Plastics	Plastics, fibers and synthetic resins
GH	Plastic articles	Plastic articles
GI	Rubber articles	Rubber articles (including tyres)
HA	Iron ores	Iron ores and scrap
HB	Non-ferrous ores	Non-ferrous ores and scrap
HC	Unproces. min. nes	Unprocessed minerals not elsewhere specified
IA	Coals	Coal (including lignite and other primary energy products)
IB	Crude oil	Crude oil
IC	Natural gas	Natural gas (including all petroleum gases)
IG	Coke	Coke
IH	Refined petrol. Pr.	Refined petroleum products
II	Electricity	Electricity
JA	Cereals	Cereals
JB	Oth. ed. agr. pr.	Other edible agricultural products
JC	Non-edible agr. pr.	Non-edible agricultural products
KA	Cereal products	Cereal products
KB	Fats	Fats (of vegetable or animal origin)
KC	Meat and fish	Meat and fish
KD	Preserved meat	Preserved meat and fish products
KE	Preserved fruit	Preserved fruit and vegetable products
KF	Sugar	Sugar products (including chocolate)
KG	Animal food	Animal foodstuffs
KH	Beverages	Beverages
KI	Manuf. tobaccos	Manufactured tobaccos
NA*	Jewel., works of art	Precious stones, jewellery, works of art
NB*	Non-monetary gold	Non-monetary gold
NV*	Not specified	Not specified
TT	Total	Total

* Not included in **Comparative advantages section**.

	TRADE IN SERVICES	
CHELEM Code	**MBP6* Code**	**Service**
120	BS_BP6_USD	Services
121	BSTR_BP6_USD	Transport
122	BSTV_BP6_USD	Travel
123	120-(121+122)**	Other services
123b	BSR_BP6_USD	Maintenance and repair services n.e.s.
123c	BSOCN_BP6_USD	Construction services
123d	BSOIN_BP6_USD	Insurance and pension services
123e	BSOFI_BP6_USD	Financial services
123f	BSORL_BP6_USD	Charges for the use of intellectual property n.e.s.
123g	BSOTCM_BP6_USD	Telecommunications, computer, and information services
123h	BSOOB_BP6_USD	Other business services
123i	BSOPCR_BP6_USD	Personal, cultural, and recreational services
123j	BSOGGS_BP6_USD	Government goods and services n.e.s.
123nv	123-sum(123a:123j)	Other services n.e.s.

* 6th Manuel of the Balance of Payments (IMF)

** Processing (123a) is not included in **Broad patterns** and **Comparative advantages sections**.

By sector

CHELEM code	Sector	Composition (CHELEM categories)
AL	Food, agriculture	JA+JB+JC+KA+KB+KC+KD+KE+KF+KG+KH+KI
H + I	Mining & Energy	HA+HB+HC+ IA+IB+IC+IG+IH+II
M	Manufacturing minimum	BA+BB+BC+CA+CB+CC+DA+DB+DC+DD+DE+EA+EB+EC+ED+EE+FA+FB+FC+FD+FE+FF+FG+FH+FI+ FJ+FK+FL+FM+FN+FO+FP+FQ+FR+FS+FT+FU+FV+FW+GA+GB+GC+GD+GE+GF+GG+GH+GI
NDA	NES	NA+NB+NV
120*	Services*	121+122+123*

* Processing (123a) is not included in sections **Broad patterns** and **Comparative advantages**.

By industry group

In the CEPII Region Profiles, for trade in goods, the grouping of products in 11 industry groups (with an additional grouping for the not elsewhere specified trade) comes from CHELEM – International Trade database. A group including all services from the Balance of Payments database is joined to the other ones in **Figure 4** in **Broad patterns** section.

CHELEM code	Industry group	Composition (CHELEM categories)
R01	Energy	IA+IB+IC+IG+IH+II
R02	Food, agriculture	JA+JB+JC+KA+KB+KC+KD+KE+KF+KG+KH+KI
R03	Textiles	DA+DB+DC+DD+DE
R04	Wood, paper	EA+EB+EC+ED+EE
R05	Chemicals	GA+GB+GC+GD+GE+GF+GG+GH+GI+BA+BB+BC+HC
R06	Iron & steel	HA+CA+CB
R07	Non-ferrous	HB+CC
R08	Machinery	FA+FB+FC+FD+FE+FF+FG+FH+FV+FW
R09	Vehicles	FS+FT+FU
R10	Electrical	FP+FQ+FR
R11	Electronic	FI+FJ+FK+FL+FM+FN+FO
NDA	NES	NA+NB+NV
120*	Services*	121+122+123*

* Processing (123a) is not included in sections **Broad patterns** and **Comparative advantages**.

In the illustrations where the "industry groups" contain only non-energy manufactured products (BA to GI and KA to KI), "Energy", "NES" or "Services" groups are excluded, and some groups are different from those in the table above. "Food" includes categories KA to KI; "Chemical", categories GA to GI and BA to BC; "Steel", categories CA and CB; "Non-ferrous", category CC.

By stage in the production process

According to the BEC classification

Production stages	BEC* Code	BEC Name
Commodities	111 21 31	Food & beverages, primary, mainly for industry Industrial supplies n.e.s.**, primary Fuels & lubricants, primary
Semi-finished products	121 22 322	Food & beverages, processed, mainly for industry Industrial supplies n.e.s., processed Fuels & lubricants, processed
Parts & components	42 53	Of capital goods, except transport equipment Of transport equipment
Capital goods	41 521	Capital goods except transport equipment Other industrial transport equipment
Consumption goods	112 122 51 522 61 62 63	Food & beverages, primary, mainly for household consumption Food & beverages, processed, for household consumption Passenger motor cars Other non-industrial transport equipment Durable consumer goods n.e.s. Semi-durable consumer goods n.e.s. Non-durable consumer goods n.e.s.

* Broad Economic Categories of the United Nations. ** Not elsewhere specified.
Source: United Nations Statistics Division (https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp).

According to the CHELEM classification

CHELEM code	Stage in the production process	Composition (CHELEM categories)
ST1	Primary	HA+HB+HC+IA+IB+IC+JA+JB+JC
ST2	Basic manufacturing	BA+BB+BC+CA+CC+GA+GC+IG
ST3	Intermediate goods	CB+DA+EA+EC+FA+FB+FC+FL+FS+GB+GD+GG+GI
ST4	Equipment goods	FD+FE+FF+FG+FH+FI+FN+FO+FQ+FR+FU+FV+FW
ST5	Mixed products	DE+EB+ED+GH+IH+II+KB+KC+KF+KG
ST6	Consumption goods	DB+DC+DD+EE+FJ+FK+FM+FP+FT+GE+GF+KA+KD+KE+KH+KI
NDA	NES	NA+NB+NV

By broad stage in the production process (non-energetical manufactured products)

CHELEM Code	Stage in the production process	Composition (CHELEM categories)
ST4	Equipment goods	FD+FE+FF+FG+FH+FI+FN+FO+FQ+FR+FU+FV+FW
ST6	Consumption goods	DB+DC+DD+EE+FJ+FK+FM+FP+FT+GE+GF+KA+KD+KE+KH+KI
ST7	Intermediate goods*	BA+BB+BC+CA+CB+CC +DA+EA+EC+FA+FB+FC+FL+FS+GA+GB+GC+GD+GG+GI

* The broad stage "Intermediate goods*" contains two stages: ST2 (basic manufacturing) and ST3 (Intermediate goods) excluding IG (coke).

By large sector: primary goods, manufactured goods and services

Large sector	Composition (CHELEM stages in the production process)
Primary goods	ST1
Manufactured goods	ST2+ ST3+ ST4+ ST5+ ST6+NDA
Services*	120*

* Processing (123a) is not included in sections **Broad patterns** and **Comparative advantages**.

By item of the current transactions account in the balance of payments

Code CHELEM	Code MBP6*	Item	Short name
100	BCA_BP6_USD	Current transactions	
110	BG_BP6_USD	Goods	
120	BS_BP6_USD	Services	
121	BSTR_BP6_USD	Transport	
122	BSTV_BP6_USD	Travel	
123	120-(121+122)	Other services	
123a	BSM_BP6_USD	Processing	
123b	BSR_BP6_USD	Maintenance & repair services	Maintenance
123c	BSOCN_BP6_USD	Construction	
123d	BSOIN_BP6_USD	Insurance & pension services	Insurance
123e	BSOFI_BP6_USD	Financial services	
123f	BSORL_BP6_USD	Charges for the use of intellectual property (licensing)	Licensing
123g	BSOTCM_BP6_USD	Telecommunications, computer & information services	Telcom
123h	BSOOB_BP6_USD	Other business services	Other business serv.
123i	BSOPCR_BP6_USD	Personal, cultural & recreational services	Culture
123j	BSOGGS_BP6_USD	Government goods & services	Government
123nv	123-(123a:123j)	Other services non allocated	
130	BIP_BP6_USD	Primary income	Primary income
130a	BIPCE_BP6_USD	Compensation of employees	
130b	BIPID_BP6_USD	Direct investment income	
130b	BIPIP_BP6_USD	Portfolio investment income	
130b	BIPIO_BP6_USD	Other investment income	
130b	BXIPIR_BP6_USD	Reserve assets	
130c	BIPO_BP6_USD	Other primary income	
140	BIS_BP6_USD	Secondary income	

* 6th Manual of the IMF Balance of Payments. To remain clear, only MBP6 codes related to balances are shown here.

■ References

Allegret J.-P., Le Merrer P. & Ünal D. (2020), *Économie de la mondialisation - Une reconfiguration en marche*, De Boeck Supérieur.

Berthou, A. & Emlinger, C. (2011a), "The Trade Unit Values Database", *CEPII Working Paper,* N°2011-10.

Berthou, A. & Emlinger, C (2011b), "The Trade Unit Values Database", *International Economics*, N°128, Q4, 2011.

Bouët, A., Decreux, Y., Fontagné, L., Jean, S. & Laborde, D. (2008), "Assessing applied protection across the world", *Review of International Economics*, 16(5): 850-863.

Clark, P. & MacDonald, R. (1998). "Exchange rates and economic fundamentals: a methodological comparison of BEERs and FEERs", *IMF working paper*, N°98/00.

Coudert, V., Couharde C., Grekou, G. & Mignon, V. (2019), "Heterogeneity within the Euro Area: New Insights into an Old Story", *CEPII Working Paper,* N°2019-05.

Couharde, C., Delatte, A.-L., Grekou, C., Mignon, V. & Morvillier, F. (2017), "EQCHANGE: A World Database on Actual and Equilibrium Effective Exchange Rates", *CEPII Working Paper,* N°2017-14.

Couharde, C., Delatte, A-L., Grekou, C., Mignon, V. & Morvillier, F. (2018). "EQCHANGE: A world database on actual and equilibrium effective exchange rates", *International Economics*, N°156, Q4, 2018, p. 206-230.

Emlinger, C. & Piton, S. (2014), "World Trade Flows Characterization: Unit Values, Trade Types and Price Ranges", *CEPII Working Paper,* N°2014-26.

Fontagné, L. & Freudenberg, M. (1997), "Intra-Industry Trade: Methodological Issues Reconsidered", *CEPII Working Paper,* N°1997-01.

Fontagné, L., Freudenberg, M. & Péridy, N. (1997), "Trade Patterns inside the Single Market", *CEPII Working Paper*, N°1997-07.

Fontagné, L., Perego E., Santoni G. (2021). "MaGE 3.1: Long-Term Macroeconomic Projections of the World Economy", *CEPII Working Paper,* N°2021-12.

Fouré, J., Bénassy-Quéré, A. & Fontagné, L. (2012), "The Great Shift: Macroeconomic Projections for the World Economy at the 2050 Horizon", *CEPII Working Paper,* N°2012-03.

Fouré, J., Bénassy-Quéré, A. & Fontagné, L. (2013), "Modelling the world economy at the 2050 horizon", *Economics of Transition*, 21 (4), p. 617-654.

Fouré, J. & Fontagné, L. (2016), "Long term socio-economic scenarios for Representative Concentration Pathways defining alternative CO2 emission trajectories", *CEPII Research Report*, N° 2016-01.

Gaulier, G. & Zignago, S. (2010), "BACI: International Trade Database at the Product-Level. The 1994-2007 Version", *Document de travail du CEPII*, N°2010-23.

Grubel, H.G. & Lloyd, P.J. (1975), *Intra-industry Trade: The Theory and Measurement of International Trade in Differentiated Products*, London, McMillan.

Grekou, C. (2021), "EQCHANGE annual assessment 2021", *CEPII Working Paper,* N°2021-13.

Guimbard, H., Jean, S., Mimouni, M. & Pichot, X. (2012a), "MacMap-HS6 2007, an exhaustive and consistent measure of applied protection in 2007", *CEPII Working Paper,* N°2012-10, mai.

Guimbard, H., Jean, S., Mimouni, M. & Pichot, X. (2012b), "MacMap-HS6 2007, an exhaustive and consistent measure of applied protection in 2007", *International Economics,* N°130, Q2, 2012, p. 99-122.

Nayman, L. (2014), "Méthodologie CHELEM - Balance des paiements - Principaux changements intervenus dans le passage de la Balance des Paiements de la version Manuel 5 au Manuel 6 du FMI", *Miméo*, janvier.

Nayman, L. & Vicard, V. (2018a), "Profits des multinationales à l'étranger : mesure et impact sur leur pays d'origine", *Panorama du CEPII*, N°2018-01, mai.

Nayman, L. & Vicard, V. (2018b), "À qui profitent les revenus des investissements des multinationales ?", *Blog du CEPII*, billet du 18 juin.

Nayman, L. & Vicard, V. (2018c), "Les revenus des multinationales dans les paradis fiscaux", *Blog du CEPII*, billet du 14 septembre.

Nayman, L. & Vicard, V. (2018d), "À quoi reconnaît-on un paradis fiscal ?", *Blog du CEPII*, billet du 11 décembre.

O'Neill, B.C., Kriegler, E., Ebi, K.L., Kemp-Benedict, E., Riahi, K., Rothman, D.S., van Ruijven B.J., van Vuuren, D.P, Birkmannj, J., Kokk, K., Levyl, M. & Solecki, W. (2017), "The roads ahead: Narratives for shared socioeconomic pathways describing world futures in the 21st century", *Global Environmental Change*, 42: 169-180.

de Saint Vaulry, A. (2008), "Base de données CHELEM - Commerce international du CEPII", *Document de travail du CEPII*, N°2008-09.

de Saint Vaulry, A. (2013), "CHELEM - Commerce International - Méthodes de construction de la base de données du CEPII", *Miméo*, novembre.

Ünal, D. (2019), "L'onde de choc du Brexit sur la maison Europe et la France", *Blog du CEPII*, billet du 20 mars.

Ünal, D. (2020), "USA-Chine : Une guerre économique à front renversé", *Blog du CEPII*, vidéo du 20 octobre.

Ünal, D. (2021), "La crise devrait recomposer les spécialisations économiques dans le monde", *Blog du CEPII*, billet du 16 juin.

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