

Globalization through trade in food products: structural trends and an explorative prospective analysis

The *MOND'Alim 2030* exercise led by the Centre for Studies and Strategic Foresight is aimed at characterizing the current phase in globalization and documenting the main dynamics at work. One of its chapters is devoted to international trade, which plays a major role in supply system globalization. The present *Analysis* draws out the main characteristics and trends in agrifood trade: increasing numbers of flows, countries and products, an expanding role for private-sector actors, value chain segmentation and an important role for public policies, increasing interdependency, etc. Based on data from retrospective analysis, this paper also formulates hypotheses for the next fifteen years.

Exports of food products are currently worth over USD1,200bn. At constant prices, this figure is seven times greater than 50 years ago, amounting to an average annual growth rate of around 3.8%. Over the same period, the percentage of food goods in international trade fell from approximately 20% to under 8%. The circulation of farm and food products is both a manifestation and a major vector of food system globalization. It intensifies the interdependence of importing and exporting countries and, in addition to the products involved, helps spread normative standards, values, innovations, risks, and so on. Although world trade in goods and services has levelled out in recent years (cf. Box 1), what is the future outlook for trade in agricultural and food products in particular?

The present paper, which is based on the *MOND'Alim 2030*¹ strategic foresight exercise, describes the deep-seated and emerging trends in international trade in food products. We do not go over again here the geographical changes in that trade (rising importance of the emerging nations, relative decline of Europe and Japan, stagnation in the

least-advanced countries), nor the changes in the “basket of traded goods” (major expansion of oilseed and protein crops and processed products, etc.). Readers with an interest in these aspects should refer to chapter 2 of the *MOND'Alim 2030* report.

Conversely, we discuss here a number of changes relating to the very nature of this globalization of trade and the forms of interdependence it generates. In this connection, Jean-Marc Siroën² calls for a distinction to be made between “internationalization” and “globalization”. The first of these terms refers to a progressive, reversible deepening of trade relations between nation states with geographical borders, and the second to a finalized process tending toward a situation in which

1. Centre d'études et de prospective, 2017, *MOND'Alim 2030. Panorama prospectif de la mondialisation des systèmes alimentaires*, Paris, La Documentation française, 230 pages : <http://www.ladocumentationfrancaise.fr/catalogue/978211103314/index.shtml>.

2. Siroën J.-M., 2004, “L'international n'est pas le global. Pour un usage raisonné du concept de globalisation”, *Revue d'économie politique*, 114 (6), pp. 681-698.

Box 1 – The end of an era for international trade

The intensity of international commerce, that is to say the ratio between world trade and world GDP, is a key indicator for globalization. It allows fairly easy long-term comparisons to be made between trading activity and economic activity in general. Over a period of almost 200 years, it shows a fairly clear upward trend, one that does however include downturns of variable duration, such as between the two world wars. The 1990s and the early 2000s were a period of sharp expansion in trade, which outstripped GDP by a factor of two or three. This came to a sudden halt in 2009. Since then, while international trade continues to grow on average faster than world GDP, the ratio between the two variables has fallen to less than 1.3 (i.e. 100% growth in GDP relates to growth in trade of 130%) and the results for more recent years (2014-2016) show an even sharper slowdown. The experts are uncertain as to the precise structural or cyclical determinants of this slowing of growth but they do agree that, on balance, the exception is the period between 1990 and 2008.

national frontiers and, ultimately, national economies blend *into one* vast planetary market (a process described as “economic integration”). By virtue of their very design, international trade statistics are more informative on internationalization than globalization. Their existence testifies to the fact that the world continues to have tangible frontiers – especially so for agriculture and food. But what will tomorrow bring? Should we be expecting an intensification of trade in the coming years? Will this be one more stage in the internationalization process? Or is it possible in the medium term to imagine a sharp break with the past, with more

radical integration of agricultural and food markets?

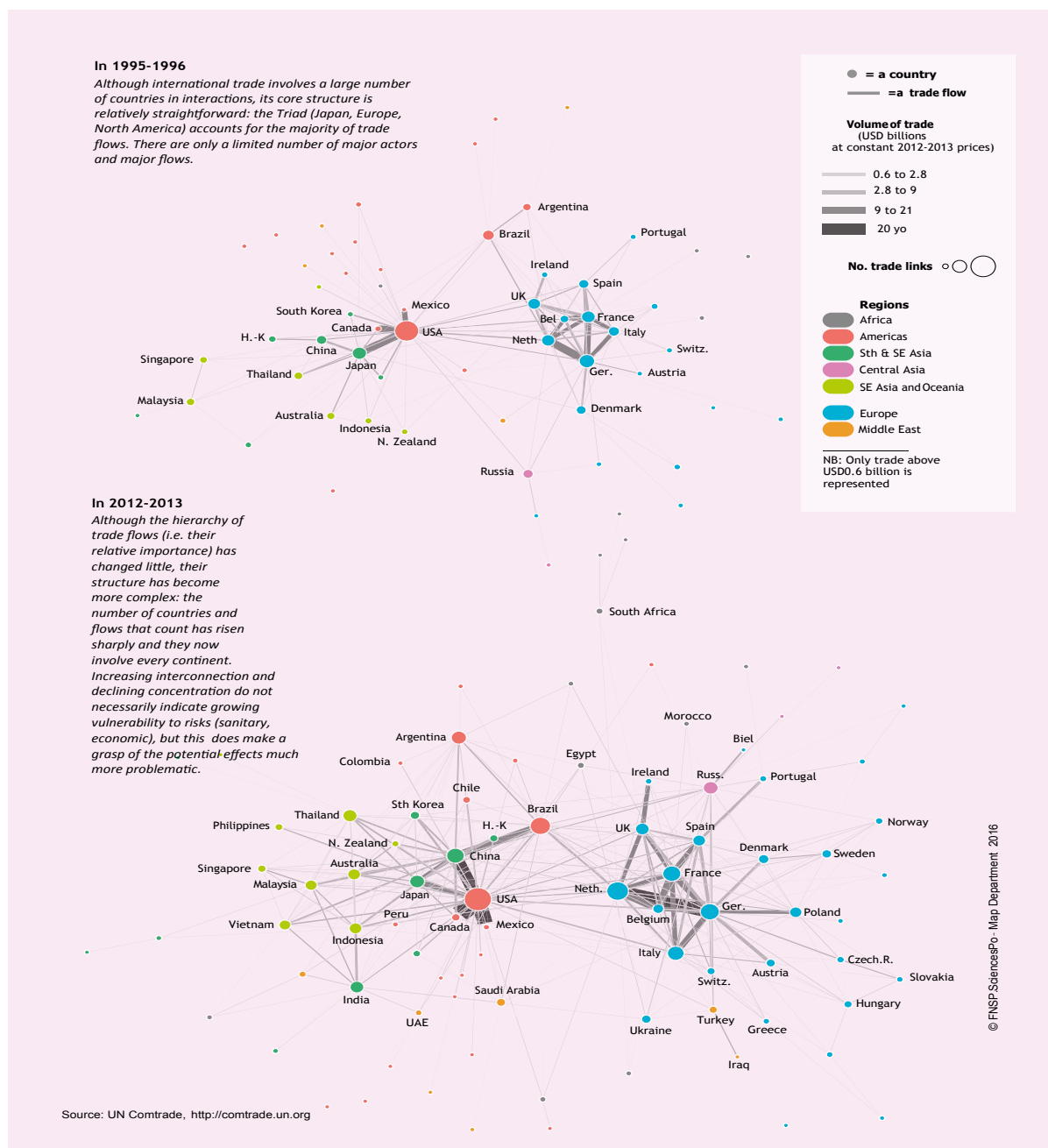
To answer these questions, we begin by showing that international trade is characterized by increasing numbers of flows, participating countries and products traded. We go on to make some observations on the development of global value chains, which increase the interdependence of national economies. Despite this, we see in a third development that complete integration of agricultural economies should not be expected by 2030. This is so because the agrifood sector is faced with high trading costs, most of which are attributable to

differences in public policies that hold back the integration of agricultural and food economies. We conclude with some thoughts on possible scenarios for the future.

1 – Increasing numbers of flows, participating countries and products traded

The share of trade in farm and food products by the 5, 10 or 20 leading countries testifies to an erosion of concentration in this trade. This “fragmentation” of commerce is however more marked for imports than for exports. Within the food product category, some agricultural

Figure 1 –The structure of international trade in agricultural and food products : 1995-1996 and 2012-2013



exports continue to be highly concentrated due to production-related constraints: maize, soya and sugar, for example. But all these types of production have seen a continuous decline in their concentration since the 1970s³. The OECD, in its projections to 2025⁴, forecasts a continuation of this trend towards fragmentation of imports, but a return to concentration in exports. A forecast that is not necessarily valid for processed products.

Another sign of the expansion of trade flows: in the mid-1990s, only one country in four was trading in agricultural and food products with half of the other countries in the world (for both imports and exports). Today, this proportion has risen to 43 % for exports and 46 % for imports. In 2030, the proportion of countries trading food products with half of the other countries on the planet will undoubtedly be above 50 %. There are several possible explanations for this trend: most notably, more numerous national strategies for diversification of supplies, as in Japan, for example, which has been actively seeking to reduce its dependence on American imports.

Such flow diversification is also true of the types of products in circulation. In terms of tonnage, the ten leading types of traded production accounted for 67 % of total trade in 1980, but for only 57 % in the early 2010s. In value terms, this proportion fell from 46 % to 37 %. The development of urban populations with purchasing power everywhere in the world is likely to consolidate this trend and lead to a diversification in food, attracting imports of a rising number of products.

This tendency toward more numerous, dispersed flows is resulting in an increasingly complex, intertwined system in which countries' imports also form part of their subsequent exports. This raises questions concerning the resilience or, alternatively, the vulnerability of this global networking process⁵ (cf. Figure 1).

3. Liapis P, 2015, "Structural changes in commodity markets: have agricultural markets become thinner?", OECD Food, Agriculture and Fisheries Papers.

4. OECD/FAO (2016), OECD-FAO Agricultural Outlook 2016-2025, OECD Publishing, Paris. http://dx.doi.org/10.1787/agr_outlook-2016-en

5. Puma M. *et al.*, 2015, "Assessing the evolving fragility of the global food system", *Environ. Res. Lett.*, 10, n° 2.

6. Gereffi G., Fernandez-Stark K., 2011, *Global value chain analysis: a primer*, Center on Globalization, Governance and Competitiveness (CGGC), Duke University.

7. Lanz R., Miroudot S., 2011, "Intra-Firm Trade: Patterns, Determinants and Policy Implications", *OECD Trade Policy Papers*, n° 114.

8. De Backer K., Miroudot S., 2013, "Mapping Global Value Chains", *OECD Trade Policy Papers*, n° 159, October.

2 – Global value chains make national economies more interdependent

The conventional approach to international trade focuses attention on the importer/product/exporter complex. Given the ongoing changes described above, this way of looking at the situation has some limitations. It masks substantive changes that are in fact revealed by an analysis in terms of "global value chain" (GVC). A value chain can be defined as "the full range of activities that firms and workers perform to bring a product from its conception to end use and beyond"⁶. Seen from this angle, imports and exports cannot be isolated as distinct flows of products from one country to another, but rather as individual stages in a ramified process of creating consumer goods and value-added (cf. Box 2).

The literature on GVCs underscores the importance of private sector logics, first and foremost of which is that applied by "lead firms" in such chains, the firms organizing international production networks by exploiting the comparative advantages of different countries for supplies of raw materials, locations of processing and R&D facilities, development of marketing strategies, and so on. The authors point to a phenomenon of fragmentation of these different tasks at a level that is increasingly global. This new trading economy is reflected in a number of trends:

- for a single end product, there are a large number of production stages and contributing countries. Described simply, a frozen pizza may incorporate Chinese tomato sauce, French wheat and Dutch cheddar, along with American R&D, Swiss logistics, and more, before it is eventually sold in India. In 2011, 22 % of the value of agrifood exports (14 % in the case of agriculture) had been previously imported in this way;

- an expanding share of international trade is carried out within the same company or between a parent company and a subsidiary. In the United States, 48 % of imports and 30 % of exports fall into this category. The available literature⁷ does however indicate that this phenomenon is less marked for food products;

- there is a rising proportion of service activity (e.g. marketing, R&D, logistics, insurance) in exported value-added (24 % for agricultural products and 37 % for processed food products).

The available research and indicators show that while these trends are certainly operating in the agricultural and food sectors, those sectors are less impacted than some others (cf. Figure 2).

Many experts explain the current slowdown in international trade (across all sectors, cf. Box 1) by an "end of cycle" phase in this value chain fragmentation logic: the coordination costs may be too high and the comparative advantages may be tending to shrink (notably due to the phenomenon of wage catch-up). We even see a number of onshoring operations associated, in the case of food products, with consumers' increasingly explicit expectations with regard to product provenance and sanitary quality, and countries seeking to reduce their dependence on trade. It is too soon to know whether these recent developments constitute a lasting break with the past trend, but it is likely that we have entered a period of several years in which this phenomenon will slow rather than accelerate.

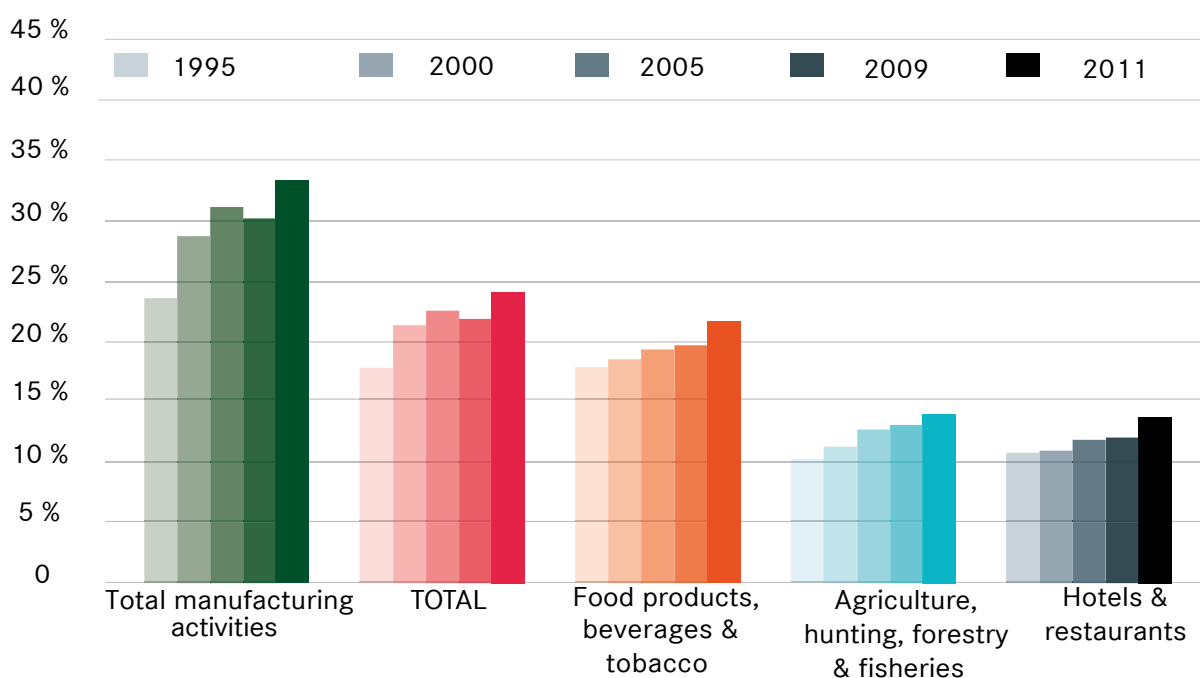
3 – The integration of agricultural economies will not be complete by 2030

Are the intensification of international trade and the growing complexity of value chains leading to deeper integration of the agricultural economies connected in this way? According to the so-called "*the law of one price*" paradigm, trade flows allow economic actors to choose between local and imported products, theoretically leading to an alignment of domestic and international prices, setting aside transport costs. This price synchronization is even considered to be the principal indicator for the shift from an economy that is simply internationalized to one that is genuinely global.

Box 2 – New trade value-added statistics: what is the difference?

The value-chain approach has shown that international trade statistics overestimate the value of trade (because a product imported from A to B, processed in B and then reexported to C will be counted more than once), while simultaneously underestimating the importance of the associated interdependence phenomena. In the previous example there are not two distinct, completely separate flows – "A → B" followed by "B → C" – but rather a chain "A → B → C". The data for trade in terms of value-added estimated by the WTO and OECD⁸, correct for these effects by isolating the "net" value-added generated at each stage.

Figure 2 – Evolution of foreign value-added content of exports for different countries



Source: the authors, based on WTO/ OECD data

NB: A figure of 20% indicates that 20% of the value of the exports of a given country had been previously imported by that same country (e.g. mineral nitrogen and seeds, raw materials, as well as services).

Successive agricultural crises since 2007 have demonstrated that although interdependence has become more marked in recent years, national borders continue to exist and still to a large extent isolate domestic prices from global movements. In the view of the MOND'Alim group, one of the brakes on such integration relates to the heterogeneity of consumer expectations and habits. For example, maize is a product that is consumed in many countries in both North and South and a global market exists with a base price (Chicago) serving as a commercial reference. But despite this, the white maize consumed in East Africa and Mexico is not the yellow maize in Europe or the United States traded on the international market; price movements for the two products evidence little correlation.

Other factors contribute to the isolation of domestic prices: transaction costs and lead-times, currency exchange rates, concentration of actors in the value chain, among others. Mc Laren⁹ shows that for the supply of a given market actors in a situation of oligopsony will adjust their margins in accordance with price fluctuations, passing

on price reductions more readily than price rises. But the main factor contributing to the desynchronization of international and domestic prices continues to be the policies applied at national borders (cf. *infra*). Not only do these tend to increase transaction costs on average, but they are frequently adjusted to reflect a prevailing situation with the aim of isolating domestic markets from international crises (e.g. revision of customs duty, export taxes).

The degree to which movements in international prices are passed on to domestic markets varies by product and country. Such transmission is often delayed and incomplete. Although the literature in this area is patchy and inconclusive, a number of points can nevertheless be extracted from it. Firstly, internal markets in developed countries are usually more integrated into international markets than the internal markets of developing countries. Secondly, in the case of developing countries, rice markets are more integrated than wheat markets and even more than those for maize. Soya prices tend to be fairly closely correlated, unlike pork

prices. Thirdly, for the main commodities, a substantial delay is observed in developing countries in the transmission of international prices: three to six months, and in some cases up nine to twelve months, may elapse before movements in international prices make themselves felt locally. Lastly, even in the case of “connected” countries, movements in international prices are cushioned: a 10 % fluctuation in international prices will often be reflected in an internal fluctuation of between 2 % and 7 %, and sometimes less (cf. Figure 3).

While the available literature makes any trend analysis problematic, the present situation and the foreseeable evolution of the various factors indicate that it would be illusory to expect complete integration of agricultural markets by 2030.

9. Mc Laren A., 2013, “Asymmetry in price transmission in agricultural markets”, *University of Geneva Economics Department Working Paper Series*, 13-12-2.

4 – High trading costs hold back the integration of agricultural and food economies

International trade and the degree to which it is economically integrated are particularly sensitive to a series of parameters forming what is known as “trade cost”¹⁰, i.e. the difference between the price paid on leaving country A and the price for the product paid by the importer in country B. Inferred from analysis of international trade flows (using so-called “gravity” models), these costs are specific to each country pairing (i.e. A, B). They are dependent on their geographical and historical proximity: distance, existence of a common border, shared colonial past, common language, attachment to the same cultural context, existence of direct sea or air routes, and so on. Some cost headings have seen sharp falls in recent decades (freight, communications). Where freight is concerned, its high price volatility is worth noting.

A specific feature of trade in food products is also to be found in the high “costs” due to political and administrative factors. Trade policies, and more generally measures applied at national borders, play a crucial role in movements in these costs. Agricultural products are subject to customs duties that are high on average and have declined less than

for other products. Despite eight successive rounds of GATT and WTO negotiations, which have helped reduce customs duty on industrial products, only the Uruguay Round has contributed to a reduction in barriers to agricultural trade. Bureau and Jean¹¹ point out that in actual fact the Uruguay Round agreement “has not led to any significant liberalization of market access”. Unilateral, bilateral and regional reductions, like reductions under preferential agreements, do nevertheless help lower the duty actually applied to food products, halving it over a period of twenty years.

Food products are also more affected than others by the rise in non-tariff measures such as “technical barriers to trade” (TBT), especially in the area of sanitary and phytosanitary safety. The lowering of explicit barriers to trade (quotas, customs duty, etc.) has thus gone hand in hand with increasing numbers of rules, standards, controls, requirements, etc. Such technical, procedural and regulatory provisions controlling commercial flows are the new front line in future negotiations. However, Beghin, Disdier and Marette¹² demonstrate that such non-tariff measures are not simply a new manifestation of protectionism (and they are often justified in fact by legitimate risk prevention concerns). They also have, in certain cases, a positive impact insofar

as they encourage flows. They recall that some of these measures enable information asymmetry to be reduced (e.g. rules for the certification of organic products, presence of GMOs, etc.). By enhancing the value of information on imported products, such measures also contribute in some cases to restoring trust in commerce.

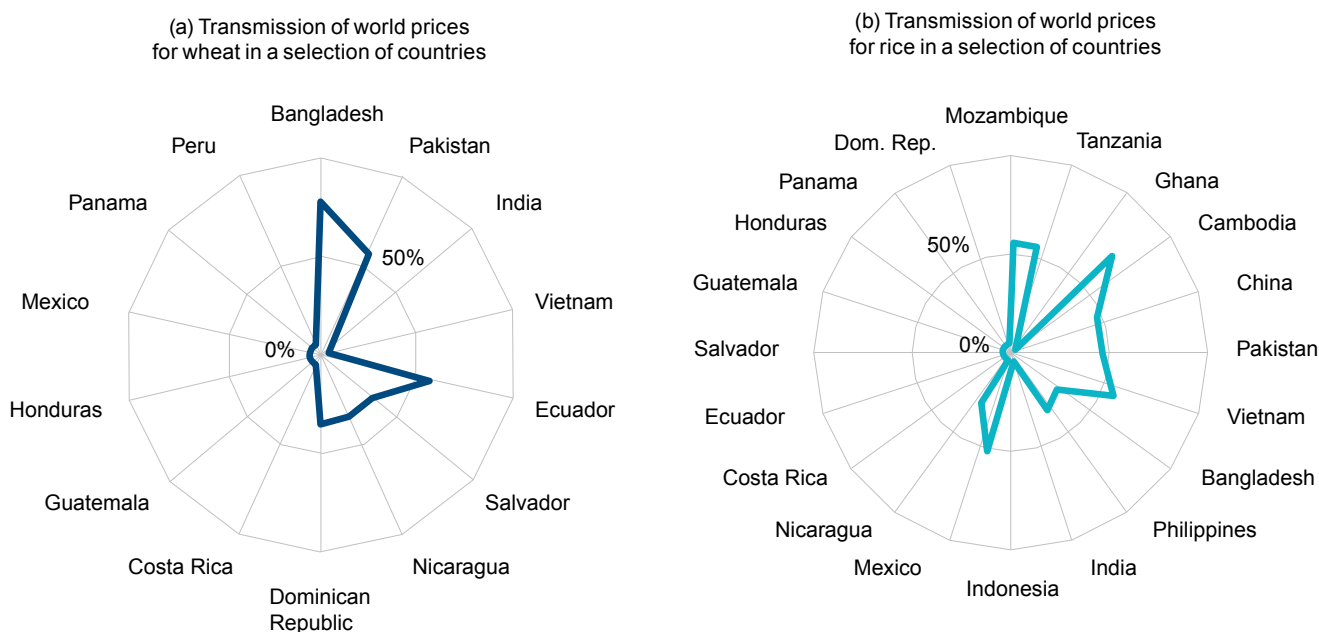
All in all, trade costs are generally higher for farm and food products than for other categories (cf. Figure 4). Estimates by the World Bank show that such costs have declined less over the last fifteen years. They are also lower for developed countries than for low-income countries, a gap that has even widened in the last fifteen years. Some emerging countries have on the other hand seen very substantial reductions in costs: “trade costs” between China and Brazil and between Russia and South Africa have halved over the same period, for example.

10. Arvis J. F. et al., 2013, “Trade Costs in the Developing World: 1995-2010”, *Policy Research Working Paper* n° 6309, World Bank.

11. Bureau J.-C., Jean S., 2013, “Les transformations des échanges agricoles bousculent l’agenda multilatéral”, *La lettre du CEPII*, n° 336.

12. Beghin J., Disdier A. C., Marette S. et al., 2014, “Trade Restrictiveness Indices in Presence of Externalities: An Application to Non-Tariff Measures”, *CESifo Working Paper Series* n° 4968.

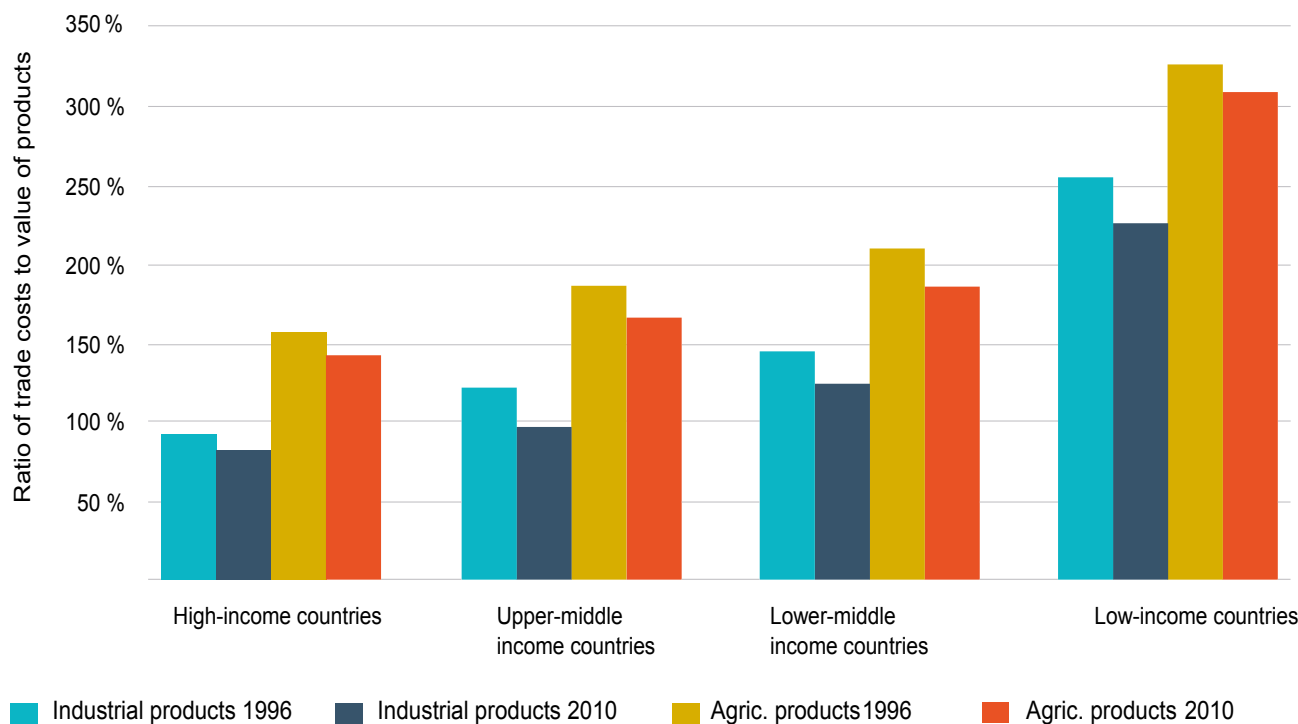
Figure 3 – Degree of transmission of international prices for wheat (a) and rice (b) for range of countries



NB: The figures shown above indicate the elasticity of domestic prices in relation to international prices. A figure of 40% for elasticity indicates that only 40% of a movement in world prices of 100% is passed on to domestic prices.

Source: the authors based on World Bank 2012

Figure 4 – Trading costs for industrial and agricultural products according to country income level



Source: the authors, after OECD/WTO, 2015

5 – What is the outlook for the period to 2030?

Successive phases of openness and isolation

International trade has alternated between phases of openness and rapid expansion and phases typified by a slowdown and a desire for independence¹³. In a context dominated and structured by and for the EU countries, the “first globalization” (1870-1914) as defined by S. Berger¹⁴ was characterized by the emergence of global markets for certain commodities and a deliberate division of labour between exporting and importing countries. The United Kingdom provides a perfect example of this in that in 1913 it was importing up to 80 % of its wheat and 40 % of its meat.

Conversely, in many countries the First World War, followed by the 1929 crisis, led to the deployment of measures directed at

ensuring self-sufficiency and isolation from the world market. This trend persisted after the Second World War. During that period, trade slowly expanded, based on a “lock gate” approach: each country sought to stabilize its domestic prices by making appropriate adjustments to its imports and exports. Initially (until 1972), international markets remained relatively stable due to cooperation that was despite everything extensive between countries on markets subject to the domination, the hegemony in some cases, of a single leader (the United States for cereals and oilseed crops) that had taken on a stabilizing role, using its levels of stock or exports to regulate the global price.

This particular configuration was gradually undermined, following rocketing international prices in 1973, by the emergence of new exporters, initially in Europe but later in Brazil, Argentina and elsewhere. The increase in numbers of trade conflicts in the 1980s was resolved partially and temporarily by the Marrakesh Agreement in 1994. This moved international trade in food products on to a new phase, the one in which we are still living twenty years on: multilateral discipline (WTO), rising multipolarity and the end of hegemony, the increasing power of the private sector and “global value chains”,

the slow, partial liberalization of international trade and sustained growth.

What can we expect over the period to 2030?

The succession of crises over the last ten years, the institution of a lasting regime of price volatility, a degree of return to protectionist policies and state intervention in the food domain, are all factors that might indicate a new change of phase. The future of international agricultural and food trade is uncertain and a number of scenarios are possible to 2030. A study of the dynamics at work leads us to set aside the most extreme options, options frequently the subject of vivid imaginings, such as a general return to self-sufficiency, an outcome that is illusory given the structural imbalances between supply and demand (cf. *infra*), or the emergence of a vast, globalized single market. In fact, two scenarios, possibly combinable for certain products, appear more likely.

Scenario A is one in which there is a partial, controlled and gradual opening up of a global space. The trends operating between 1995 and 2007 continue, assuming that the upsets we have seen since that time do not last. Its establishment will be facilitated by

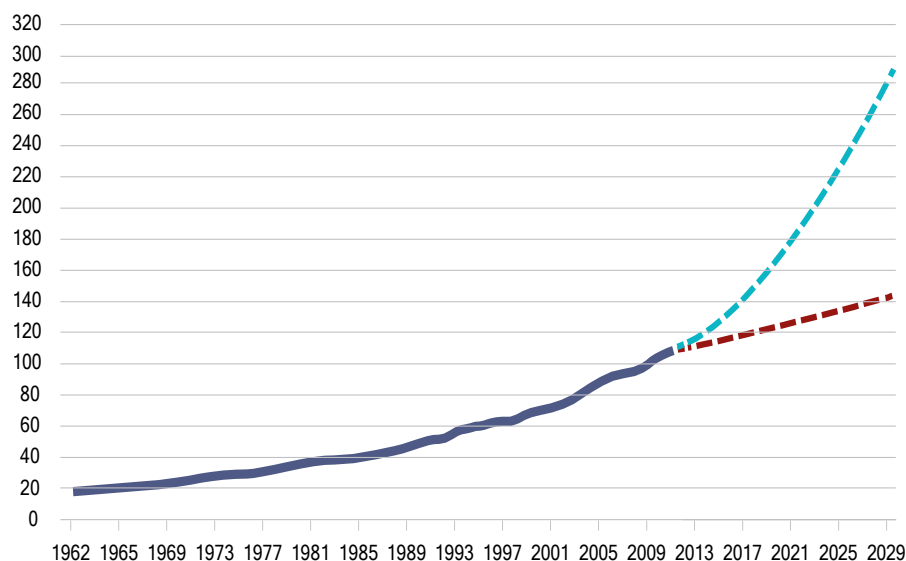
13. Daviron B., Douillet M., 2013, “Major players of the international food trade and food security”, *FOODSECURE Working paper* n° 13.

14. Berger S., 2003, *Notre première mondialisation : leçons d'un échec oublié*, Paris, Seuil.

high rates of growth, low oil prices, relative geopolitical calm and maintenance of collective discipline, which will not however prevent a few circumscribed conflicts. This context would favour strong expansion of international trade, and especially so in the case of high value-added products. In a world typified by an absence of hegemony, national governments would focus their action on a small number of products for which they would adopt strategies based on prudence and control with regard to dependency (sanitary safety and food) while at the same time gradually liberalizing the other sectors. Private companies would become even more important, shaping international trade according to their own logic: optimization of geographical task allocation, standardization or differentiation, etc.

Scenario B is one in which there is a world fragmented into a multiplicity of zones of influence with limited interactions. This conjecture extrapolates recent trends operating since 2007, assuming that they constitute a new and lasting regime. Its realization would be facilitated by weak economic growth plus rather high and volatile prices for energy and agricultural products. It would also be favoured by tensions in a geo-economic context in which the major global and regional powers are at odds in numerous domains. In this scenario, expansion in farm and food trade would be slow. National governments would step up their food security strategies, develop self-sufficiency and control dependence effects, notably by deepening regional trade or consolidating zones of influence around the major powers (United States, China, Russia, etc.). Confirming the decline of multilateralism, international trade would segment into broad regional complexes without however preventing structural imbalances between supply and demand and therefore interactions between these major blocs. The influence of

Figure 5 – Growth in international trade in food products: past movements and CEPII projections
Changes in volume of trade in food products (base 100 in 2010)



Source: the authors, after FAOSTAT and CEPII data

private-sector actors would be much reduced compared with the first scenario.

The above considerations relate more to the nature of the world market than to the volumes traded. In both these cases trade in food products is likely to continue to develop in the future. In connection with its prospective studies of international trade, CEPII defined its own scenarios in 2013¹⁵. The two most extreme, a “low” scenario for slow growth plus “trade war”, and a “high” scenario for high growth plus accelerated liberalization, appear to define credible boundaries for possible changes in trade flows over the next fifteen years (at constant prices). Nevertheless, even in the most pessimistic case (i.e. the “low” scenario), trade continues to expand (cf. Figure 5).

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Despite the major differences in their underlying assumptions, objectives and methods, most foresight studies and modelling exercises on food security agree on the fact that in the future trade will play a major role in compensating for imbalances in supply and demand in many countries and regions.

The growing importance of imports in feeding the population does not arise simply from unavoidable imbalances but also from imbalances that are accepted or even deliberate: for many national governments, international trade represents an opportunity

(e.g. for the acquisition of commodities at less cost, specialization in other sectors, etc.) more than a necessity. Fader¹⁶ considers for example that only half of net importing countries currently have insufficient water and land resources to feed their populations. Tomorrow, we will therefore see the world’s producers and consumers depending increasingly on international trade.

Such dependence does not involve importing countries alone. It is also apparent in increased dependence on exports in a number of countries. In any case, various authors emphasize that this dependence on trade has contributed to an overall improvement in food security for the populations concerned. Porkka¹⁷ sums up this past process of change as follows: “In the space of 50 years, the world has moved from food insufficiency to increasing dependency on trade in food”. This brings with it a degree of security but it also presents risks. The degree of such dependence must however been put into perspective: the proportion of the world’s population for which imports represent over 500 kcal per head per day¹⁸ rose from 13 % in 1965 to just 19 % in 2005.

15. Fontagne L., Fouré J., 2013, “Opening a Pandora’s Box: Modelling World Trade Patterns at the 2035 Horizon”, *Document de Travail du CEPII*, n° 2013-22.

16. Fader M. et al., 2013, “Spatial decoupling of agricultural production and consumption: quantifying dependences of countries on food imports due to domestic land and water constraints”, *Environmental Research Letters*.

17. Porkka M. et al., 2013, “From Food Insufficiency towards Trade Dependency: A Historical Analysis of Global Food Availability”, *PLoS ONE*, 8 (12).

18. Approximately 20% of recommended daily intake on average.

19. At the time of writing this note.

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