

# MAJOR PLAYERS OF THE INTERNATIONAL FOOD TRADE AND THE WORLD FOOD SECURITY

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## Résumé

Depuis 2008, les flambées des prix sur les marchés internationaux de produits alimentaires et la crainte d'une crise alimentaire mondiale ont attiré l'attention sur la relation entre les politiques agricoles et commerciales des grands pays agricoles et la sécurité alimentaire mondiale. Cette attention illustre l'idée largement répandue selon laquelle il existe quelques grands pays qui sont les acteurs dominants des marchés internationaux et qui seraient en position d'influencer, par leur politique, la sécurité alimentaire mondiale. L'objectif de notre papier est de discuter cette hypothèse. Il montre qu'effectivement, par le passé les Etats Unis, d'abord seul puis conjointement avec l'Union Européenne, ont pu contrôler les prix sur les marchés internationaux mais qu'il y a eu, au cours de la dernière décennie, multiplication du nombre de grands pays importateurs et/ou exportateurs. Ainsi aujourd'hui, plusieurs pays sont en situation d'influencer les prix internationaux mais aucun d'entre eux ne peut, ni ne veut, les contrôler. Le papier montre par ailleurs, que si les grands pays influent grandement et intentionnellement sur la sécurité alimentaire de leur propre population (qui compte pour presque la moitié des individus en insécurité alimentaire de la planète), leur influence sur la sécurité alimentaire du reste du monde est limitée par le faible degré d'intégration des marchés domestiques avec les marchés internationaux dans la plupart des pays en insécurité alimentaire.

## 1. Introduction

Since 2008, price spikes on international food markets, increasing international price volatility and the fear of global food crisis have attracted attention on the links between the agricultural and food policies of big exporting and importing countries and food security at the global level. It reflects the widespread perception that there are a few key countries which are the "major actors" on international food markets, as are commonly mentioned in international economics (among many others Bhagwati 2004, Aksoy and Ng 2010), and that they are in a position to influence world food security through their agricultural and trade policies. If this assumption were true, then there would be a hope of solving a large part of world food insecurity by reforming the policies of those few countries.

This paper aims to discuss this assumption. The paper is organized in three parts. The first part proposes a short historical recall which covers the post-WWII period when the USA held a dominant position in residual international food trade. It helps framing the debate on the identity and responsibility of big player over world food security. The second part describes and analysis the recent changes in the structure of international food trade. Finally the third part, deals with the influence of big players policies on world food security.

The main findings of this paper are the following:

- First, in the past the European Union (EU) and the United States of America (USA) have indeed been dominant players on international food markets with a strong influence on world food prices and world food security. But there has been a multiplication of large food exporting and importing countries, called "big players" in this paper, and nowadays even though they are in position to influence international food prices none of them has the will or power to control them.
- Second, if big players greatly and intentionally influence the food security of their own population – accounting for almost half of the world undernourished people – their influence on the food security of the rest of the world is more limited than expected because of the low integration of domestic markets with international market in many food insecure countries. Hence, there is little hope of solving global food insecurity solely through policy reforms of those big players.

## **2 Leadership on international food markets and responsibility over world food security: framing the subject through an historical vision (1945-1994)**

After 1945, following two world wars and a very severe economic crisis, food markets were mostly organized on a national basis. At that time, food security was considered to depend on national self-sufficiency and regulation of domestic prices. Some exchanges between countries however took place, Europe being the main importing region. Because of the omnipresence of public institutions administrating foreign trade, the corresponding international markets were characterized by an oligopolistic structure of nation/states. In many of these oligopolies, a leading country acted as a residual supplier, taking over a large part of world stocks and trying to stabilize international prices. The USA played such a role on the cereal and oilseeds markets. Beside commercial transaction, an important amount of concessional trade took place in the form of “food aid”, in particular for cereals, organizing the transfer of surpluses from the USA, and later the EU, to food deficit like India or later Egypt.

### **2.1 The post-war II international food security regime under US leadership**

The first globalization period of international food markets took place from 1850s. It is characterized by the emergence global markets for a series of commodities and the creation of an international division of labor. Some countries specialized in agricultural export and others in manufacturing exports importing the majority of their food. Europe was clearly the masterpiece of international food markets accounting for 72% of world food imports. UK is the best illustration of such a strategy of “food dependence”. In 1913, it imported 81% of its wheat consumption and 42% of its meat and, alone, accounted for 25% of the world food imports (Perren 1995).

World War I brutally put an end to this equilibrium. For the European nations, it was a decisive experience. Food blockages and naval wars demonstrated the danger of being dependent on long distance trade to guarantee food security. From then on, they were convinced that total war (Shaw 1988) required economically self-sufficient nations, and the mobilization of public resources to that end. In agriculture, it meant applying protective trade measures and adopting domestic support measures. A new stage was reached with the 1929 depression. By then, food surplus had been accumulated in many countries and international prices brutally fell. In reaction, a whole range of state interventions aimed at further controlling foreign trade and the domestic market, including by increasing customs duties (see Perren 1995 for Britain; Tracy 1989 for Europe; Taylor, Taylor et al. 1943 and Malenbaum 1953 for the rest of the world). By favoring self-centered growth, a fair proportion of these measures guaranteed not only national independence but also aimed at stabilizing domestic prices and producers' incomes. Total war and over-production kept being perceived as permanent threats until 1989 (the “short XXth century” according to Hobsbawm 1994), not only by European countries but also by many countries in the world, including, of course, the USA. As a consequence, those countries pursued a high degree of national self-sufficiency and actively supported their domestic prices and isolated them from international prices.

However, in developing countries (Latin and South American countries first and then newly independent African and Asian countries) agricultural and trade policies differed from that of developed countries. A large strand of the literature starting with Lipton (1977) has identified an “urban bias” in those policies. This bias is traduced by the discriminatory macroeconomic, sectoral and trade policies that increasingly favored urban consumers at the expense of farms households, taxing exportable crops in order to develop industries and setting low prices to crops, principally food crops, in favor of urban consumers, either explicitly or implicitly through exchange rate distortions and marketing boards. This anti-agricultural bias of domestic policies included anti-market bias that has been measured by the recent research program on agricultural distortions of the World Bank confirming earlier analyses of Krueger, Schiff and Valdes (1988) and Lindert 1991.

During this period, international markets operated like canal locks between national markets, handling the transfer of products between countries with strong agricultural policies (Johnson 1973). International food trade did expand, but lower than world production. Feedstuffs played a major role in this dynamic with growing imports first from Europe, then from Japan and later from developing countries, especially oil exporting countries, and socialist countries. Beside, cereals imports for human consumption increased at the beginning of the 1960s because of the Asian deficit but the Green Revolution success slowed down this movement.

International flows were characterized by a very specific organization, in hierarchic and/or co-operative oligopolies, which explains that the international prices of most food products displayed a noticeable stability from the end of the 1950s to 1972, in spite of the residual nature of trade. Indeed, the management of foreign trade overseen and centralized at national level gave the countries the status of basic units on the international food products markets. Furthermore, the mastery of foreign trade was accompanied by states taking control of stocks.

Market power hence switched from firms to states. In this context, practically all the international markets assumed the structure of nation-state oligopolies.

In fact a number of initiatives emerged during the decade following the Korean War, such as international agreements on wheat, sugar or coffee or the GATT (General Agreement on Tariffs and Trade) regulation on dairy products. These initiatives can be considered as co-operation devices. They were usually based on a solidly established hierarchy between countries and the existence of an uncontested leader. This/these dominant country/countries guaranteed their stability by acting as residual supplier(s), i.e. limiting their export supplies with the aim of supporting international prices. It is the equivalent of the 'dominant firm price leadership' found in industrial organisation economics (Scherer 1970). In international food markets, this strategy can be detected through the growing share of world stocks own by the countries following it. As stated by McCall (1966) the "storage capacity and the *willingness* [...] to hold stocks" gave them additional market power in international food markets.

During this whole period, it is the USA that dominated the exports of wheat, maize, soybean and rice. It played a pivotal role by adopting residual suppliers strategies, alone or in cooperation with one other country ( for grains see Mitchell and Duncan 1987, for wheat see McCalla 1966, for corn see Bredahl and Green 1983, for rice Karp and Perloff 1989). In the mid 1960s the USA controlled 70 % of world stocks for corn, 65 % for soybean and 33% for wheat.

Among initiatives to manage international markets, beside those related to commercial transactions, several formally established food aid as a mean to dispose of surplus such as the Food and Agriculture Organization (FAO) Consultative Sub-Committee on Surplus Disposal or the Food Aid Convention. The USA played an important role by providing very large amount of food aid through its Commodity Credit Corporation (still influential today), especially in wheat, rice and vegetable oil. At the beginning of the 1960s food aid accounted for 55% of developing countries cereal imports and 80 to 100% for Taiwan, South Korea, India, Iran, Pakistan, Egypt and Tunisia (Hopkins and Puchala 1980).

## **2.2 The destabilization of the international food markets, the short-lived food security momentum and the trade liberalization project**

In the early 1970s, bad climatic conditions led to the reduction of global cereal production. International food price soared, ignited by massive soviet purchases of cereals in the context of decreasing world stocks. The fear of those rising food prices, together with the drought-induced hunger in Sahel, created a momentum for an array of international initiatives on food security. This "food crisis" was the first signal that the post-WWII food security regime was coming to an end.

In 1974 the United Nations World Food conference recognized for the first time that food security was a global concern, and proposed the establishment of several new institutions of which the Committee on Food Security (CFS) and the International Fund for Agricultural Development (IFAD). Despite an increasing recognition of Sen's argumentation putting the access dimension forward in research, food security were mostly seen by actors as an availability problem with complex logistical dimension needed to be resolved in the case of emergency food aid interventions (Simon 2012). But, many components of this project lost momentum before they had any significant impact on global food security in the following years.

Indeed after 1982, the economic downturn, created by the U-turn in monetary policy of the USA and the following debt crisis, initiated a brand new situation on international food markets. The brutal demand contraction from developing and socialist countries generated a fierce competition between suppliers in a context where new exporters were emerging. The dominant position of the USA was progressively eroded by new competitors, of which the major and most dangerous was the EU. Benefitting from an equivalent level of financial and institutional resources than the USA, the EU was able to compete with the USA on a peer to peer basis. Some fast rising developing countries also gradually became serious competitors of the USA such as Brazil and later Argentina on soybean, Indonesia and Malaysia on vegetable oil, or Thailand on rice.

International prices reflected this new situation immediately. They fell sharply on a scale unequalled since the depression of the 1930s. The effect of the fall in international prices for the developed countries and their domestic agricultural market systems resulted automatically in the rocketing of the cost of support testing the limitations the model. In developing countries with no financial reserves, the price fall of export products caused the bankruptcy of numerous state marketing boards and initiated the wane of state interventionism.

The multiplication of trade conflicts between food exporting countries was increasingly seen as the major problem to be solved, to the extent that it was agreed to tackle the issue for the first time in a GATT negotiations.

The Uruguay Round negotiations started in 1985 marked the end of the “agricultural exception”. It brought about the biggest reform of the food trading system since GATT was created at the end of the Second World War. Indeed, with the successful conclusion of the “Uruguay Round” in 1994, the World Trade Organization was established and the Agreement on Agriculture (AoA), signed. For the first time, negotiated international rules started applying to international trade of agricultural products and more importantly to agricultural domestic policies. The content of the negotiations was profoundly influenced by the situation of structural overproduction in developed countries. One of the main issues under negotiations was the ability of countries to define and control exports subsidies in agriculture. It was the first attempt to try and ban exports subsidies. The main objective pursued being to guarantee fairness of competition between suppliers and market access for exporters.

The most important and long-lasting consequence of the Uruguay Round remains the influence of the classification system of the various components of agricultural policies (trade control measures, direct payments, research grants, loan programs, storage programs, etc). The Round established “three pillars” for basis of the negotiations: market access, export subsidies, and domestic support. They have only marginally evolved in the current Doha Round discussions.

i. The market access provisions required, among other things, tariffication; that is, all non-tariff trade barriers had to be replaced by tariffs and bounds were set upon those tariffs, with a commitment to reduce them. Tariffication clearly called into question the watertightness of national markets, which enabled countries to disconnect domestic and international price variations. Even if domestic prices remained distinctly higher than international prices, they were now supposed to vary in line with world prices. The EU price of wheat exemplifies this change. A first step was therefore taken towards a certain reunification of the world market.

ii. The export subsidy provisions established maximum ceilings on the trade quantity and budgetary expenditures for export subsidies and implemented reductions in those ceilings over time.

iii. Another innovative feature of the Agreement was to set rules and commitments on all the other aspects of domestic agricultural policies. The domestic support provisions outlined various types of support, classified them according to their considered trade effects, and limited those measures deemed the most trade-distorting. All measures considered as minimally trade distorting belong to the “Green Box”, with specific guidelines for the structure of such programs but no limits on program expenditures by member countries. “Blue Box” measures are considered more trade distorting, but the programs have production limits embedded in them and are not limited. All other trade distorting measures belong to the “Amber Box” and are limited over a certain threshold called *de minimis*.

The adoption of this classification on the way agricultural policies are designed is often considered in policy debates as one of the main breakthroughs of the WTO. In particular, it is interesting to see how the 1996 and 2002 Farm Bills in the United States and the Agenda 2000 and 2003 Common Agricultural Policy (CAP) reforms in the European Union were all designed to fit under the guidelines of the domestic support provisions. Both WTO members progressively moved most of their agricultural support to direct decoupled payments, the U.S. direct payments and the E.U. Single Farm Payments filed as Green Box, while the U.S. countercyclical payments were meant to go in the Blue Box.

It must be added in that poorer countries did adopt this classification as they gradually became members of the WTO. But as we will see in the next section the policy changes, especially for African and Latin American countries, were mostly caused by the structural adjustment programs of the International Monetary Fund and the World Bank.

### 2.3 Part 1 conclusion

After WWII, food security was considered foremost as a domestic matter. Most countries viewed food self-sufficiency as the obvious objective of agricultural and trade policy, and domestic food prices were actively disconnected from international prices. Nevertheless, until the 1970s, the USA did influence international trade in food product through its residual supplier policy, and thus marginally impacted global food security but mostly thanks to its food aid policy. It is from this state of play that the idea that big players on international food markets have a responsibility towards global food insecure people strongly emerged. And it is long lasting.

But as we have seen, this configuration was then destabilized in two stages. The food crisis of the 1970s, mainly due to the disappearance of surpluses in the USA and the sudden increase of soviet imports and later oil exporting countries, gave birth to a wave of initiatives, projects and negotiation aiming at creating a new institutional framework to deal with food security issues. Because of the economic downturn on international food markets after 1982, many components of this project lost momentum before they had any significant impact on global food security in the following years.

The emergence of new exporters – the EU, Thailand and Vietnam for grains and dairy products, Brazil, Argentina, Indonesia and Malaysia for oilseed and oilseed products – weakened the leading place of the USA. Although the USA did not fully lose the influence on international market, they gradually lost their ability to stabilize them. Conflicts, violent competition, and falling price, characterized international food market for the following years.

The Uruguay Round was launched at that period with the aim of bringing peace on markets... and reducing the booming public agricultural expenditure of developed countries. The Agreement on Agriculture (AoA), elaborated by the USA and the EU is supposed to be a major turning point towards finally implementing the trade liberalization agenda in agriculture. The trade liberalization project aimed at defining rules for fairer competition between exporting countries and a better access to market in importing countries. The next section will show that it has turned out to be ill-adapted to the fast changing structure of international trade.

Moreover, the complexity of the determinants of food security emerged, leading to the adoption of a commonly accepted new definition based on four pillars at the FAO summit of 1996. As a consequence, the availability dimension which had dominated the thinking on food security until then, was progressively replaced by the economic access dimension, questioning the benefits of low international food market prices and food aid for global food security, hence of the key policies that major players on international food markets were undertaking then. The last section will analyze the impacts of their policies today.

### 3 The multiplication of “big players” in international food trade, and their diminishing ability to control international prices (1995-2012)

The signature of an Agreement on Agriculture (AoA) in 1994 is usually considered a breakpoint in the history of international food trade, both in agricultural economics (Anderson 2009, Bureau and Jean 2012) and rural sociology (Holt Gimenez and Shattuck 2011; Sage 2013). It is supposed to have opened a new era of food trade growth and liberalized agricultural policies. Yet, looking at policy discussions today, about a fear of rising protectionism, of higher and more volatile agricultural prices and less predictable (and maybe reliable) international markets, what actually happened seems indeed quite different of what was planned.

A close analysis of the evolution of the players on international food markets reveals that since 1995, the number of “big players” has further increased, with many new countries quickly turning into important importers or exporters of food commodities. But what has been the impact on the extension of food trade?

This multiplication of actors came along with an apparent convergence in farm and trade policies toward a low level of support or levies. Have they really stopped intervening on their domestic markets? What has been the consequence on their capacity to control international prices?

#### 3.1 A multiplication of importing and exporting countries but a limited expansion of global markets

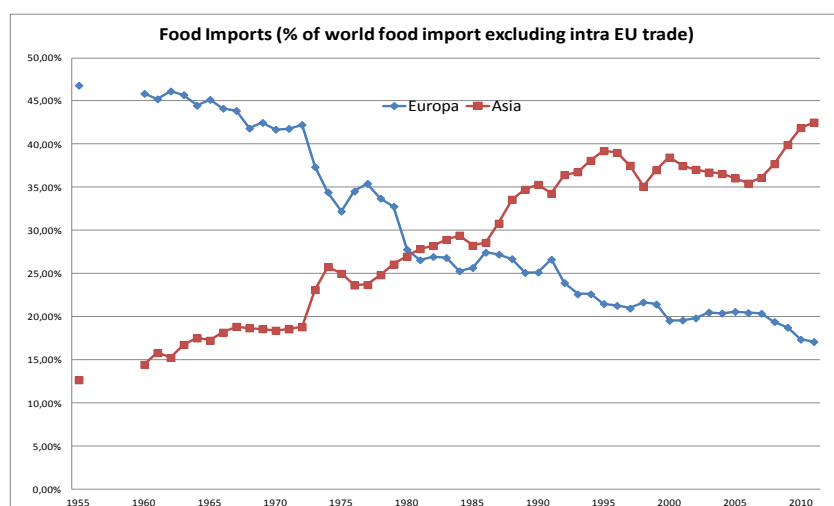
Since 1995, the geography of trade has changed very quickly, even more since the 2008 financial crisis. Many previous analyses, even recent ones, have thus been challenged by these evolutions.

A straightforward illustration of the number of players on international food markets and their respective market shares is the Herfindahl Index. By computing it for selected food commodities (based on the number of trading countries), Liapis (2012) shows trade diversification on the import and export sides. He concludes that “*for all commodities other than raw sugar, the Herfindahl Index for exporters fell during the last 40 years indicating along with a larger number of participants over time, concentration fell as market share of each exporter declined and international markets become more competitive. On the import side as well, increased number of participants resulted in lower concentration but from a much smaller level suggesting that competition in import market increased*” (op.cit. p.14).

Looking more precisely at the demand side, one of the major changes of the last two decades has been the changeover from Europe to Asia. For centuries Europe had been the center of long distance food trade. The continent kept this leading position after the world wars, but since the mid-1980s Asia has become the first importing continent (Figure 1).

*Figure 1: European and Asian food imports (share of world food imports excluding intra EU trade), 1955-2011*





Source: Based on COMTRADE data

Until the mid-1990s, the Asian share of demand grew steadily greatly supported by a booming import demand from Japan. Then, due to the long economic crisis Japanese imports began stagnating before decreasing. The economic crisis was strong enough to reduce food consumption. Over that period, the share of Japan in world food import had increased from 10% of world food imports in 1985 to 15% in 1994 before falling down to 7% in 2011.

But, in the meantime, the role of Japan as a motor of food trade had been taken over by various Asian developing countries. Those countries even gained importance since the start of the most recent financial crisis. It is striking to acknowledge that today the Asian developing countries import more food than the EU, the USA and Japan taken together.

China is, by far, the most emblematic country of this new phase. The quantities of food imported by China have more than tripled during the 2000s. China's market share has increased from 3% to almost 8% of world food imports.

Oleaginous products (oils, oilseed and oleaginous fruits) occupy a central role in the growth of Chinese food imports. They represent about 56% of the food imports with a stable share for oil (more or less 15% of total food imports) and a growing one for oilseeds (currently 40% of total food imports). Imported oils are mainly composed of palm oil (70%) and soybean oil (15%) and imported oilseeds are quasi-exclusively composed of soybean (97%). China now weighs about 60% of world soybean imports. The country's import strategy clearly gives priority to importing products in a state as raw as possible. Compared to oleaginous products, cereals occupy now a minor place in Chinese food import, which is a stark contrast with 20 years ago when wheat imports briefly surged.

India has also been increasing its food import but at a much slower pace compared to China or South East Asia. Representing now almost 18% of the world population, it only accounts for less than 2% of world imports. For this country too, oleaginous products are now representing an essential part of food imports, composed almost exclusively of vegetable oil (56% of all food imports).

Table 1: Grains, vegetables oils and dairy products: Major importing countries, 1990-1992 and 2009-2011

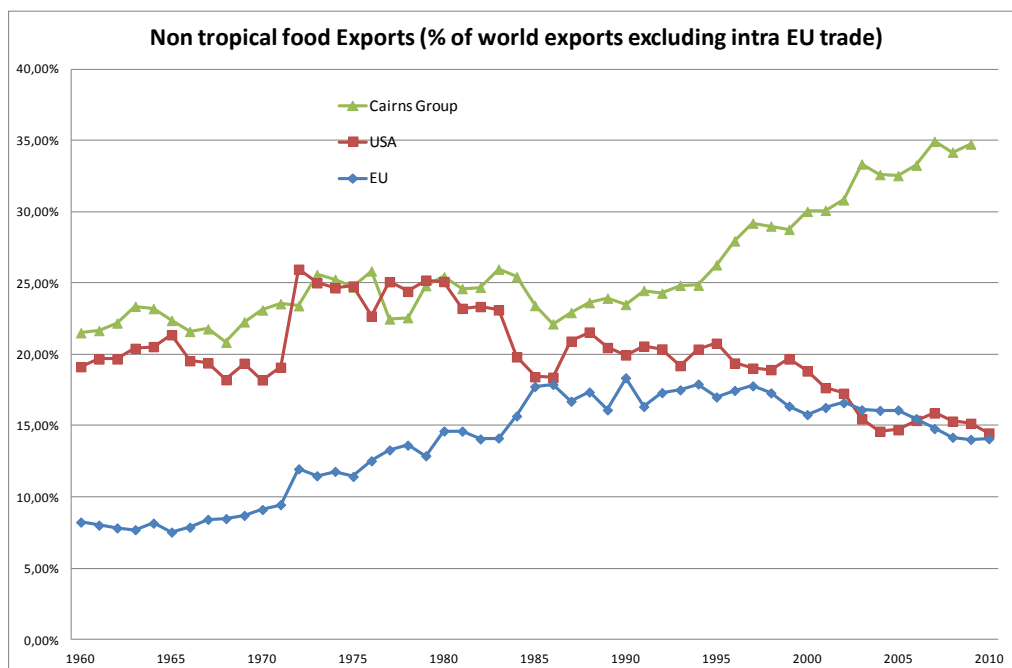
	1990-1992			2010-2012		
	Three major importing countries	Market share of the leader	Sum of their market share	Three major importing countries	Market share of the leader	Sum of their market share
<b>Corn</b>	Japan, South Korea, Russia	27%	46%	Japan, Mexico, EU	16%	33%
<b>Rice</b>	Iran, Brazil, Saudi Arabia	9%	20%	Nigeria, Indonesia, China	8%	19%
<b>Wheat</b>	Russie, Chine, Egypte	12%	28%	Egypte, Brésil, Indonésie	7%	17%
<b>Oilseeds</b>	EU, Japan, Taiwan	45%	72%	China, EU, Japan	55%	75%
<b>Vegetable oil</b>	EU, Chine, Pakistan	14%	29%	India, China, EU	16%	46%

Source: Based on USDA PSD data and COMTRADE data for dairy products

The evolution of food exports have been characterized by the disappearance of a clear leadership as it existed after WWII with the USA and later with the duopoly USA/EU.

The evolution of the respective shares in world not tropical food exports of the USA, the EU and the Cairns group<sup>1</sup> is represented in Figure 2. It shows how the launch of the Uruguay Round coincided with the moment when the EU caught up with the USA in the competition on world food markets. It also shows very clearly the declining role of the USA and the EU in food exports since then to the benefit of the Cairns group.

Figure 2: The USA, the EU and Cairns Group Non tropical food export (% of world exports excluding intra EU trade)



Source: Based on COMTRADE data

Even focusing on the grain market, it is clear that since the end of the 1980s the USA has lost the dominant position it once occupied. The market share of the USA in corn exports has fallen from 80% in 1990 to 30% in 2012. Less spectacular, the falls on the soybean, wheat and rice markets have been also important: respectively from 60% to 30%, from 35% to 20% and from 20% to 10% during the same period.

But still focusing on the markets on which the USA had a dominant position (corn, soybean and wheat), no clear leader has emerged so far (see Table 2). Concerning the soybean and corn markets, Brazil has been a very offensive competitor but hasn't secured yet a market share equivalent to the one that the USA used to control. The wheat market is characterized by a growing dispersion of exporters, with the emergence of new exporting countries like Russia, Ukraine or occasionally India and Pakistan, and the decreasing importance of the USA and the EU.

Beside wheat, the EU use to have a dominant position on the international market of dairy products. On this market, the decline of the EU share has been particularly important, from 52% of world food exports in 1995 to 29% in 2011.

<sup>1</sup> The Cairns Group is a unique coalition of 19 agricultural exporting countries with a commitment to reforming agricultural trade. Created in 1986, it has been influential in the agricultural reform debate pressing the trade liberalization agenda at the WTO. Member countries include Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Pakistan, Paraguay, Peru, Philippines, South Africa, Thailand and Uruguay. <http://cairnsgroup.org/Pages/default.aspx>

Table 2 : Grains, vegetables oils and dairy products: Major exporting countries, 1990-1992 and 2009-2011

	1990-1992			2009-2011		
	Three major exporting countries	Market share of the leader	Sum of their market share	Three major exporting countries	Market share of the leader	Sum of their market share
<b>Corn</b>	USA, China, Argentina	69%	92%	USA, Argentina, Brazil	36%	61%
<b>Rice</b>	Thailand, USA, Vietnam	33%	61%	Thailand, Vietnam, India	23%	62%
<b>Wheat</b>	USA, UE, Canada	31%	72%	USA, EU, Australia	21%	49%
<b>Oilseeds</b>	USA (soybean), Brazil (soybean), Argentina (soybean)	55%	76%	USA (soybean), Brazil (soybean), Canada (rapeseed)	33%	76%
<b>Vegetable oil</b>	Malaysia (palm), Argentina (soybean), Indonesia (palm)	32%	58%	Indonesia (palm), Malaysia (palm), Argentina (soybean)	32%	68%
<b>Dairy products</b>	EU, New Zealand, Australia	52%	74%	EU, New Zealand, USA	29%	61%

Source: Based on USDA PSD data and COMTRADE data for dairy products

The rice market is very important for global food security. Hence, it deserves a specific comment. The rice market has been the most dynamic market for cereal for the last 30 years. Thailand has been historically the dominant exporting country, with 40% of the world export at the end of the 1980s. At that time, the USA was the second rice exporting country. But as in the case of wheat, supply dispersion has been a strong tendency as new exporters have entered the market: Vietnam, then India and more recently Pakistan. In 2011/12 India exported more than Thailand (10 millions tons against 7) and Pakistan more than the USA (3.5 millions against 3.2).

Table 3: Growth rate of international food trade and world food production in volume (excluding intra-EU trade), 1990-2011

	1990-1994	1995-1999	2000-2004	2005-2009	2010-2011
<b>International Food trade</b>	3.5%	4.2%	4.2%	1.6%	1.8%
<b>World Food Production</b>	2.0%	2.4%	2.4%	2.8%	2.8%

Source: Authors' calculation based on data from COMTRADE, FAOSTAT and WorldBank

Note: The growth rate of world food production has been calculated by using the FAO index. The growth rate of international food trade has been calculated on values excluding intra-EU trade. To convert the value (given by COMTRADE) in volume we have used the international food prices index provided by the World Bank (Pink Sheet).

Although food trade did grow faster after the conclusion of the Uruguay Round, since 2000 its growth is decelerating. Coherently with Aksoy and Ng, analyzing the evolution of agricultural trade between 1990-2000 and 2000-2006 (Aksoy and Ng 2010), we find that deceleration based on COMTRADE data (Table 3). Moreover, the deceleration is particularly important since the financial crisis, when international trade even started growing more slowly than world food production.

But the situation has been quite contrasted for the different groups of food products. In the case of cereals, since the beginning of the 1990s, the exports-to-production ratio has been fluctuating but has followed an increasing trend and seems to have more or less stabilized around 12%. For oilseeds/protein crops, in relation to the Asian booming demand, the ratio has increased very quickly, even more for oil seed than for vegetable oils.

Comparing the period 1970-1994 with the period 1995-2010 Liapis (2012) finds that the market became thinner for maize and butter, did not change for wheat soybean and beef, and became more fluid for rice, sugar, milk powder and soybean oil. He states: "For most of the selected products, the share over the 40 plus years is rather constant. Among the crops, soybeans and sugar are the deepest (most "liquid") or least "thin products with exports representing between 30% to 35% of production of production between 2000 and 2010 while rice is the "thinnest" with exports representing around 5% production, although in the more recent years the share has increased slightly to around 7%" and he concludes "In most markets and in most cases the export share of production has not changed dramatically between decades" (Liapis 2012: 22)

### 3.2 Old and new "big players" still pursue active trade and agricultural policies but are not able to control prices

Since 1994, most countries have largely restructured their agricultural policies. But what has been the real impact of those changes?

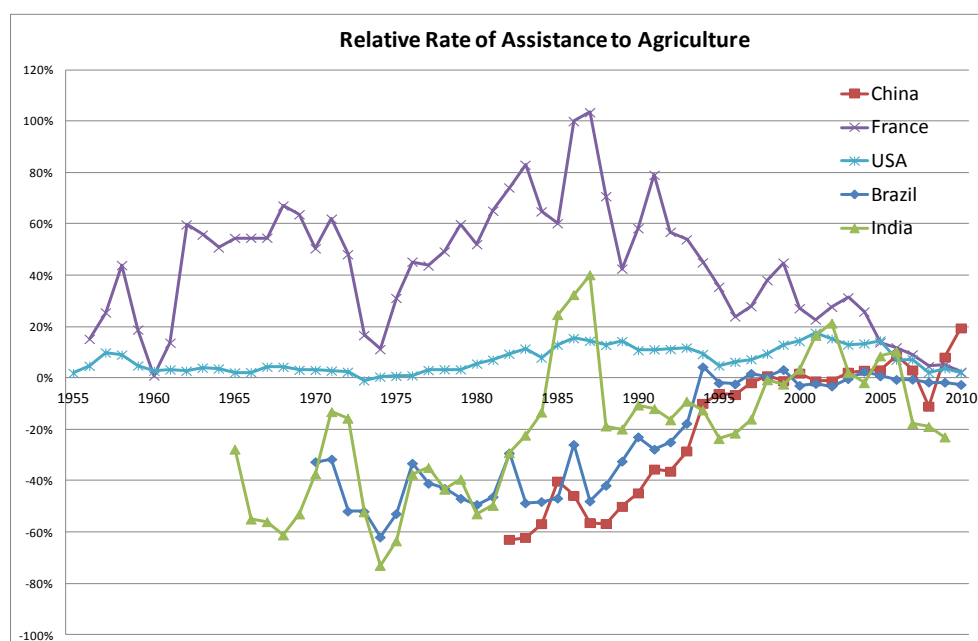


### 3.2.1 The apparent convergence of trade and farm policies toward a low level of support/taxation

WTO member states have reformed their agricultural policies, following their AoA commitments but one should not overestimate this impact of the AoA. Many other factors also contributed to the policy reforms since the 1990s, of which the structural adjustments policies, the increasing number of regional trade agreements and the evolution of the market conditions. Indeed, the deregulation policies have been successful in reducing domestic bias against agriculture (Jensen, Robinson et al. 2010). In the case of African countries, Anderson and Masters (2009) find a gradual improvement in the pricing environment for farmers between 1975 and 2004 but there is considerable diversity across countries, with some occasional reversals of the trend. The rise in agricultural prices on the international markets for the last 10 years has also contributed significantly to make some policy instruments inactive, such as the EU intervention system and the USA and Canadian countercyclical instruments.

The most drastic change concerns the evolution of export subsidies. The EU, the USA and a few other countries provided export support through subsidized export credits, price-discriminating state monopoly marketing boards and through foreign food aid. In the early 2000s, the EU export subsidies represented around 90% of global expenditure on formal export subsidies (Bureau and Jean 2013). Pressure to reform was high enough during the Uruguay Round, and at the launch of the Doha Round in 2001, that the EU agreed to give them up in 2004, conditional to a global agreement. But the recent rise in agricultural prices on international markets largely contributed to a de facto reduction of this policy instrument, with neither the EU nor the USA formally needing to dismantle them. For instance, the EU used export subsidies in response to the crisis in the pork sector in 2008 and dairy sector in 2009, but quantities exported remained very limited. Overall the EU budget devoted to this instrument decreased from more than €10 billion per year in the early 1990s to less than €140 million in 2012 (planned budget). In practice the few export subsidies left are those that compensate exporters of processed products for the extra cost of using more expensive EU sugar.

Figure 3: Convergence in the big players Relative Rate of Assistance to Agriculture, 1955-2010

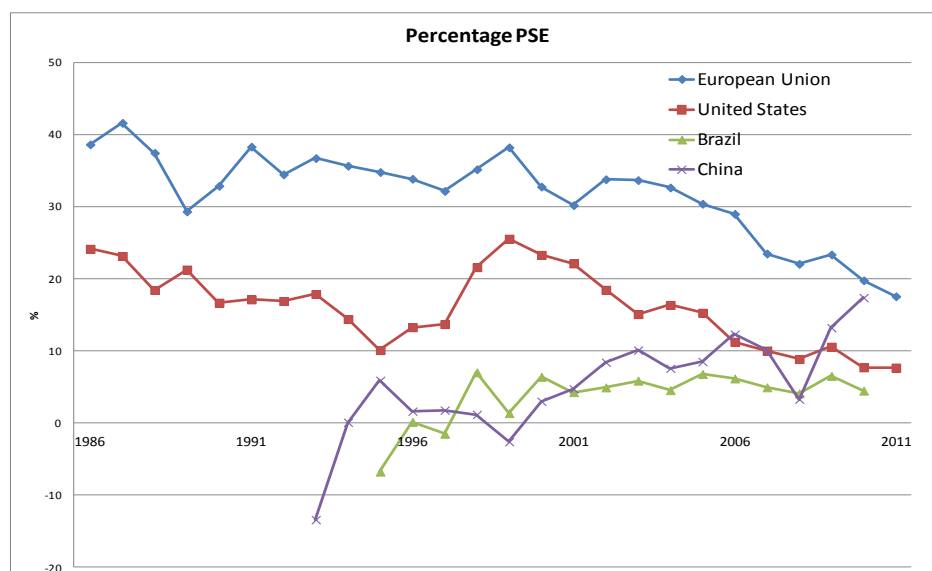


Source: Anderson and Nelgen 2012

While most OECD countries reduced the most distorting forms of agricultural support, including production coupled subsidies and price support, by contrast, some emerging countries have rapidly increased their subsidies to farmers, using instruments that are largely coupled to production. Those evolutions can be measured in several different ways. According to the World Bank estimates, the nominal rate of assistance (NRA) (the percentage by which government policies have raised gross returns to farmers above what they would be without the government's intervention) of the High Income Countries has fallen a little since the 1980s. Comparatively, NRA for emerging economies has been on the rise (see Figure 3). Looking at the gap between the domestic prices in developed countries and the world prices, it appears that for the OECD as a whole, the ratio between domestic and border (i.e., world) prices went down from 1.70 to 1.12 between 1986 and 2010 (Bureau and Jean

2013). The OECD also reports a spectacular increase in support to agriculture, as measured by the Producer Support Estimate (PSE) and Total Support Estimate (TSE), in emerging countries, contrasting with the decline of PSE in developed economies (see Figure 4). Russia and China now support their farmers at levels that are similar or higher than the OECD average for PSE (with a doubling of support in China between 2007 and 2010) and much higher for TSE, which has to be linked with the higher number of farmers in developing countries). At PPP exchanges rates, Chinese TSE alone was almost equal to the sum of OECD members' ones in 2010. Brazil has also increased its direct support visible in its PSE, although much less. But the budget for general support has been growing in Brazil reaching 0.5% of GDP in 2010, as reflected in the TSE.

Figure 4: Some big players PSE, 1986-2011



Source: OECD database

### 3.2.2 With the end of surplus, the use of stocks and food aid, the main agricultural policy tools used to control international prices, has almost disappear

According to McCalla (1966) the market power of a state on an international agricultural market is based on its stocks and storage capacity more than on its market share. Indeed, since it is impossible to control the exact level of yearly production (scattered producers, climatic uncertainties, response time of production, etc.), a country that has neither storage capacity nor stocks is bound to trade the difference between what it consumes and what it produces. It therefore has no short-term room of maneuvers on its export supplies or import demands and it cannot influence on purpose either prices or the volumes traded on the international market.

As we have seen above, although at the beginning of the 1960s, the USA was controlling about 60% of global cereal stocks and about 80% of soybean stocks, it now only controls respectively 10% and 8%. The EU has played the same role of central storekeeper on the dairy products markets controlling permanently in the 1960s about 60 % to 70% of global stocks for butter, dry milk and cheese. Nowadays its share of world stocks is less than 10%.

In both cases, the decreasing share of such big players in global stocks illustrates the change in domestic support policies which have led to the quasi-disappearance of structural production surpluses for those products that had characterized their agricultural markets for decades. More fundamentally this radical change has been caused by the slowdown of their agricultural production growth and by the boom of their domestic demand, for cereal (corn) in the USA and for vegetable oils in the EU, created by biofuel support policies.

The current distribution of stocks illustrates, one more time, the dispersion of “power” on international food markets. The rising share of China is the only counter-tendency seems to be this dispersion process. This evolution could create a radically new situation where stocks would not be located in the exporting countries but in an importing or potentially importing one. Such stocks would not represent real availability for the world.

One spectacular consequence of the disappearance of the surplus in the EU and the USA has been the rapid decrease of in kind food aid. Whatever the product, cereal, oil or milk, the volumes exported today as food aid are five times lower than they were 10 years ago.

So far, the no emerging country has really implemented a food aid policy. In 2005, China officially made the transition from food recipient to food donor (Morton 2012: 27) and it became very briefly the third largest food donor. But most of the Chinese food aid has been directed as emergency aid to North Korea.

### 3.2.3 Policy induced demand shocks and destabilizing trade policies (including export bans)

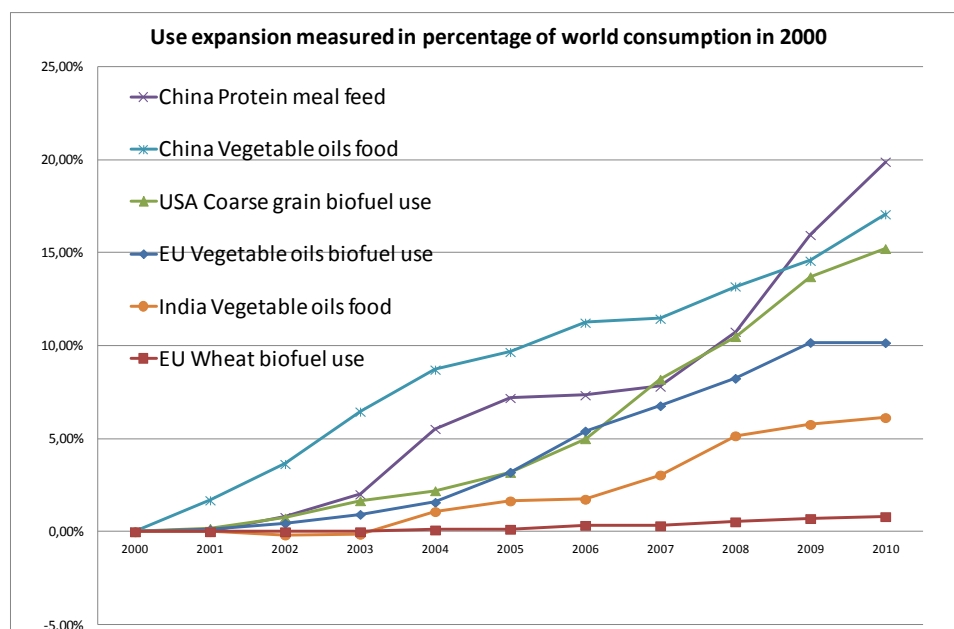
In spite of the AoA and of the convergence toward a low level of support to agriculture, big player still pursue policies that can have important consequences on international commodity availability and prices by at least three ways: by generating demand shocks, by using international markets as a buffer stock and finally by restricting exports.

#### i. Demand policies

The first type of policies induces demand changes big enough to influence world consumption. Several examples of such policies are currently used by big players: Chinese import policies influences world protein and vegetable oil consumptions, the USA biofuel policy the world coarse grain consumption, the EU biofuel policy the world vegetable oil and wheat consumptions and Indian import policy the world vegetable oil consumption.

Figure 5 illustrates that the biggest shocks have been generated by the evolution of, one a one hand, the use of protein meals and vegetable oil in China, and on the other hand, the use of coarse grain for biofuel in the USA. For example the growth of the Chinese protein meal consumption between 2000 and 2010 is equivalent to one fifth of the total world consumption in 2000. The evolution of the EU vegetable oil consumption for biofuel and the evolution of vegetable consumption in India are relatively smaller shocks (respectively about one tenth and one twentieth of the total world consumption in 2000).

Figure 5: Use expansion measured in percentage of 2000 world consumption



Source: data from OECD database

Of course, this analysis raises many questions. If it is quite easy to associate the USA rising maize consumption for biofuel to various measures implemented by the government, it is much more complicated to do so for the Chinese protein meal consumption. However, it should be noted that, beside the rising level of meat consumption in China, the use of protein meal in animal feeding is “abnormally” high if we compare with the EU or the USA. In China the ratio protein meal/cereal equals 0,3 when in the EU or the USA it respectively

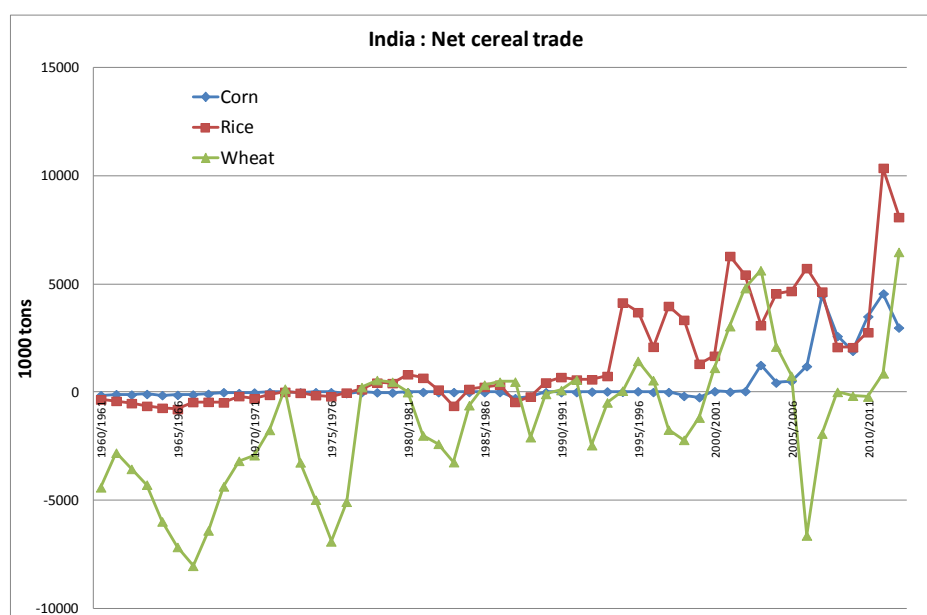
equals 0.17 and 0.2. This “little” difference entails huge amount of soybean consumption and imports and it can be linked to the clearly differentiated price policy between cereals and oilseeds.

i. Trade as a buffer

The use of trade as an instrument to balance domestic market is the second way big players policies influence international markets. This behavior is of course a major source of instability on international markets, since variations in the volume of net trade can be substantial. India is the best illustration of such a behavior on cereal markets. For instance, variations of the net trade of wheat are over 10 million tons for India, when only about 140 million tons are traded internationally.

China is experiencing slower changes in its trading position with long period of wheat imports (between 1975 and 2005), or corn exports (between 1985 and 2005). Its huge storage capacity explains partially the lower variability of its trading position.

Figure 6: India net cereals trade, 1960-2012



i. Export restrictions and other measures to shelter domestic markets from price rise

Finally big player also impact international markets when they adopt trade measures in reaction to food price rise. Indeed, many authors point to abrupt changes in trade policy as one major explanation for the 2007/2008 price spikes.

It is clear that export restrictions and bans were a significant factor in the 2007/08 food price crisis, particularly in relation to rice. Several authors (Slayton 2009; Dawe and Slayton 2010; Headey 2011a) have proposed detailed accounts of the sequence of export restrictions implemented by exporting countries (India, Vietnam, Thailand) and the panic buying they generated on the international market. Yang, Qiu et al. 2008 describe the different measures adopted by the Chinese government to limit the transmission of the 2007/08 price rise to the domestic markets, including the release of stock from public reserves, the elimination of subsidies for corn exports, the implementation of a new export levy and, ultimately, a grain export ban.

The FAO has given an account of the policy measures taken in 2007 and 2008 by governments to reduce the impact of soaring prices (see Demeke, Pangrazio et al. 2009; Sharma, 2011). According to this survey, 25 of the 81 developing countries surveyed imposed export taxes or restrictions. In general, they exacerbated price increases and added to the uncertainty food importing countries faced as to the availability of supply. (See Sharma, 2011 for a review of the studies and price effects in rice, wheat and soy). More recently, the 2010 wheat price rise was in part caused by an export ban imposed by the Russian government after the severe drought and raging fires in Russia that summer.

The export restrictions imposed by exporters sent a strong signal to importing countries that the international market remains primarily a residual market, in which domestic interests were still paramount.

### 3.3 Part 2 Conclusion

The recent history of international food markets is characterized by the growing number of “big players”, i.e. countries able to influence availability on international markets and prices by their policy. International food trade has become even more dispersed. From this point of view, the evolution of international food trade since the reaching of the AoA could look rather as an extension of the previous sub-period. However, on the import side, the increasing importance of Asia came along with a brutal fall of the Japanese market share, and a very big rise of the so-called developing countries share, mainly from South-East Asia and Western Asia and China. On the export side, the growing dispersion has been marked by the declining position of the USA and the EU and the increasing market share of the Latin American and South East Asian members of the Cairn Groups. But the drawback is that none of those countries is able to actually control international prices as is reflected by the decreasing level of stocks and non concessional food aid, two of the major instruments historically used by big players to control/manage international food prices. This is a typical unstable oligopolistic situation. To some extent international food markets just reflect what is happening today in all economic and political spheres: the emergence of a multipolar world where the so-called developing countries are catching up with the supposed “developed countries”, a world where instability is the rule.

Indeed, this growing number of players on international food markets has not been accompanied, as expected, with an expansion of international trade. International food markets are still thin compared to world food production and consumption and thus they are very sensitive to shocks.

Furthermore, despite an apparent convergence of policies towards low level on state intervention, those countries still actively intervene on domestic markets and regulate trade inducing demand and supply shocks on international markets that destabilize international prices, such as the USA and EU biofuel policies, the oilseed Chinese policy and the Indian rice policy played certainly a decisive role in the recent spikes of international prices.

The hand-off policy promoted by WTO negotiations was supposed to solve the problem by suppressing the government ability to influence prices. These negotiations are currently failing and it is very difficult to imagine, after what has been happening on international markets since 2005 that countries like India or China will accept to abandon their ability to control their domestic markets.

Despite the renewed political international interest for the subject of food price volatility and global food security since 2008 (as can be seen with at the successive G8 and G20 summits), little has been done so far, apart from the WTO negotiations, to really change the condition prevailing on international markets and to regulate international price formation, beside setting up a new agricultural market information system (AMIS), and reforming the “global governance of food security” through the Committee for World Food Security (CFS) (see Margulis 2013). This is striking difference with what happened in the 1970s. But to what extent are international food price spikes threatening world food security? What are the comparative impacts of those “serious players” policies on world food security?

## 4 « Big players » have a strong and intended influence on the food security of their own citizens but it is a lower than expected on the food security of the rest of the world

Although the narratives have changed over time, big players on international markets have continuously been considered to have had a strong influence on global food security mostly through the impacts of their policies on food availability on markets and thus on international prices and through their provision of in-kind food aid.

As we have seen, until the end of the 1980s, availability of cheap food products had been the main lens through which food security had been considered. Big player such as the USA and the EU that provided huge surplus on global markets and in-kind food aid were considered to have a positive impact on global food security.

But since then the economic access dimension (linked to income) has gradually gained weight and before the price rise of the 2000s, low international prices had started being pointed out as a major problem for the food security of poor countries and poor farmers, and a large alliance of farmer unions and non-governmental organization (NGOs) had called for an end to the supports to agriculture in OECD countries. Even in-kind food aid had become more and more denounced for its long term negative impacts on farm incomes and agricultural production in the beneficiary countries. Since the price spike of 2008, it is rather the export bans and the biofuel policies that have been blamed for brutally rising food prices, increasing global food insecurity.



All those narratives assume the existence of a global food system. This perspective can be found in agricultural economics as well as in rural sociology. In both literatures, the notion of « global system » carries the idea that there is, at the global level, a strong interdependence between people that produce and/or consume food. It is linked to the assumption of the existence of a global value chain for each commodity linking the consumers buying a product on one side of the planet to the farmers producing it possibly located on the other side of the planet. This view has been dominant in the analysis of food security of this project as is best exemplified by the conceptual framework of Laborde, Tokgoz and Torero (2013) who describe the food system through a system of equations linking food security at the household level to the global market level.

In this last section we would like to challenge the relevance of this vision with respect to food security issues. Previously, we have shown that trade is still representing a very low share of world production and consumption. Here, first we show that, on one hand, big players account for a very large share of the undernourished people of the world and on the other hand the farm and trade policies have a strong influence on the food security of their own population. From this point of view, they do have a strong influence on the world food security. Secondly, we point out the fact that local food prices in the rest of the world where most undernourished people are living, are not that connected, at least in the short to medium term, to international prices. This situation can be explained by the existence of active public interventions, but also by the importance of non tradable products in food consumption.

#### 4.1 Big players account for a very large share of world food unsecured people

Even if some groups of people living in the developed countries face strong difficulties in meeting adequate nutritional needs, undernourished people live mostly in poor countries, some of which are big players on international food markets themselves.

According to FAO 2010-2012 figures, the 10 “biggest” countries in relation to food insecurity (India, China, Pakistan, DR of Congo, Ethiopia, Bangladesh, Indonesia, Sudan, United Republic of Tanzania, Philippines) concentrate the two third of the world population of undernourished. The rest is much more dispersed and a total list of 40 countries is necessary to include 90% of the world population of undernourished. The six big players of this list (India, China, Indonesia, Nigeria, Brazil and Thailand) account for 50 % of the world undernourished, with India and China, concentrating 43% with respectively 217 and 158 millions of undernourished.

To simplify our analysis, we assume that this sample of 40 countries enables us to discuss the connection between undernourished and big players policy.

#### 4.2 “Big players” implement strong domestic food security policy

Far from pretending to give a full account of the various instruments used by the governments of big players to secure access to food for their populations, this section aims at illustrating that they do. It is focused on two of such instruments (domestic price stabilization and domestic food aid).

##### 4.2.1 Domestic price stabilization

In most cases, the governments of big players have been very active in isolating the domestic market from international price variations. Export taxation, export quota or embargo, stock release and consumption subsidies have been the instrument mostly used to do so, as was illustrated above in the case of China and India.

India, where the largest number of undernourished are living, is an important example of a net exporting country that has been able to limit drastically the transmission of the price rise. According to Acharya and Chand’s analysis, « *there is no cointegration between domestic and international rice prices* ». They add that “*during 2007 to 2009, the movement in global prices and domestic prices of rice and wheat was almost in contrast to each other*” (Acharya, Chand et al. 2012: 31). Gosh who analyzed price transmission for five products (rice, wheat, soybean, sugarcane and groundnut oil) concludes “*We observe that out of the five commodities that we have undertaken for our study only one, that is soybean, shows integration between domestic and international prices*” (Ghosh 2012: 21).

China, the second country with the largest number of undernourished, illustrates like India the ability of a country to limit price transmission between the international and the domestic (see Appendix 4). Thanks to low level of cereals import - 6.7 kg per capita with a large part of maize for animal feeding –and large financial resources, the Chinese government has been protecting the consumers from international price fluctuations. Jen and Miller who studied the consequences of the 2006 price rise write: “*The divergence between the world and*

*domestic price is substantial. The primary explanation for this divergence appears to be government policies that moderated domestic grain prices increases, including the release of grain from government grain stocks and introduction of export controls such as quotas and increased tariffs*“ and conclude “*We find that, at least in its early stage, the world food price crisis had little to no impact on the nutrition of the poor in the two provinces we surveyed [Hunan and Gansu]*” (Jensen and Miller 2008: 474). Lu and Yi make the same observation: “*It seems that China’s domestic market of major staple crops (rice, wheat and maize) is shielded from the volatility of the international market, and the tremendous fluctuations in the international market were not echoed in the domestic market between 2006 and 2008*” (Lu and Yu 2011: 689).

#### 4.2.2 Food aid and cash transfers

Brazil and the USA are the best example of domestic food aid and cash transfers.

In Brazil, such measures are part of the governmental strategy “*Fome Zero*” (Zero Hunger) that has been implemented since 2003 to reduce hunger, malnutrition and overall food insecurity in the country. It includes three major components: conditional cash transfers (names *Bolsa Familia*), a school meals program, and actions to support family agriculture (Rocha 2009). From 6.5 million families in 2004, *Bolsa Familia* was subsidizing almost 13 million families by 2010. With an average family size of four, *Bolsa Familia* was affecting an estimated 52 million citizens, or 27 % of the Brazilian population. Official annual expenditures on the program have increased to US \$7 billion in 2010.

In the USA, the nutrition assistance program dates back from the 1930s. It initially consisted of the ability of the U.S. Department of Agriculture (USDA) to acquire surplus commodities and to distribute those commodities through local schools and other institutions. Since then, the U.S. government has developed an array of programs designed to help low-income individuals or households afford sufficient food. The largest programs are the Supplemental Nutrition Assistance Program (SNAP), formerly the Food Stamp Program; National School Lunch Program (NSLP); School Breakfast Program; and Supplemental Nutrition Program for Women, Infants, and Children (WIC). These four programs have cost together more than \$70 billion annually on average between 2007 and 2011. The SNAP is the Nation's largest domestic food and nutrition assistance program for low-income Americans. It is administered by USDA. In 2012, due to the economic crisis the cost of the program was estimated at 78.4 billion US\$ (see annex 2) and the participation has increased to more than 45 millions people.

#### 4.3 Big players have a limited influence on the food security of the “rest of the world”

The influence of big players on food security outside their own territory through their agricultural and trade policies is twofold: first through their influence of international availability and prices, secondly through in-kind food aid. But this last mean has greatly diminished as was described above. Nevertheless, the decreasing trend of in-kind food aid should not be interpreted as necessarily having negative consequences on global food security, as it also coincides with the acknowledgement that in-kind food aid had had very detrimental impacts on local markets in some instances, and that food aid hence should rather be provided by richer countries in cash to the World Food Program. Thus it rather represents an opportunity for OECD countries to better design their food aid interventions independently from their own interest of getting rid of surplus. Such change in mindset could in theory have very beneficial impacts on the way global food insecurity is tackled, as long as OECD countries dedicate enough means to it.

This section will thus focus on the international price channel, questioning whether shocks on international markets transmit on the domestic prices of the food insecure countries. We will focus on short term transmission of consumption prices, considering that they are some complex supply side constraints that hamper most poor farmers in those countries from integrating in the global agricultural supply chains. Indeed, the review of the numerous ex-post micro-level analysis of the supply response of farmers in developing countries to the increased agricultural prices of 2006-2008 (Askoy and Hoeckman 2010) highlights that the limited production expansion was due to several factors such as credit constraints, and a general asymmetries in responses to price, where farmers would expand output with a lag only if price increase is sustained enough (and might answer more rapidly to price drops).

We use the list of food insecure countries from the previous section, excluding those that are big players. This group includes 34 countries. We rely on a literature review of existing econometric analysis of price transmission. This analysis is limited by the fact that most of the literature on the subject for the countries under consideration has been produced to study the short term transmission of the 2008 price spike (see Table 4). Although, a thorough synthesis is still to be done, at this stage, two categories of countries can be identified.

*Table 4 : References on price transmission in the countries under consideration*

Country	Number of undernourished	References of price transmission analysis
Pakistan	35	GHAFOOR AND ASLAM 2012
Ethiopia	34	Admassie 2013 ; MINOT 2011
Bangladesh	25	MAHMUD AND WADOOD 2012
United republic of Tanzania	18	Minot 2011 ; DELGADO, MINOT ET AL. 2005
Nigeria	14	Oloma 2013
Kenya	13	MAKAU NZUMA 2013 ; MINOT 2011
Uganda	12	BESON, MUGARURA ET AL. 2008 ; MINOT 2011
Mozambique	9	Minot 2011
Iraq	9	IANCHOVOCHINA, LOENING ET AL. 2012
Yemen	8	IANCHOVOCHINA, LOENING ET AL. 2012
Zambia	6	Chapoto 2012 ; MINOT 2011
Malawi	4	CHIRVA AND CHINSINGA 2013 ; MINOT 2011
Iran (islamic republic of)	4	IANCHOVOCHINA, LOENING ET AL. 2012
Guatemala	4	DE JANVRY AND SADOULET 2010
Cameroon	3	Meuriot, Temple et al. 2011

Source: author's compilation

#### 4.3.1 Many food insecure countries are naturally sheltered from short term fluctuations

By comparing food consumption profiles of the countries under consideration, defined as the importance of different crops in food supply (measured in calories, according to FAOSTAT data, note that data are missing for Afghanistan, DR of Congo, Iraq and Somalia) we can highlight a high dependence of many countries to one single type of crop, with regional disparities between:

- East Asian countries (and Madagascar) highly depend on rice,
- South and West Asian countries on wheat,
- Sub-Saharan African countries on sorghum, millet, white maize and starchy roots,
- Guatemala on maize,
- And other central and South American and Caribbean countries on a more diverse balance of those various crops.

Interestingly, the crops considered differ by their “tradability”. Indeed, if wheat and rice can be qualified as tradable with no hesitation, it is more complicated for maize and sorghum in particular in Africa where the maize used for human consumption differs greatly from the one exchanged in international trade (Delgado and al.2005). Importantly, it is not the case for Latin American maize. Furthermore, the starchy roots and millet consumed in the countries considered are mostly locally or regionally traded and can also be considered “non internationally tradable”.

Among the 20 African countries under consideration, the share of tradable – excluding maize - in the total food supply varies between a minimum of 4% in Burundi and Malawi and a maximum of 53% in Madagascar. If we exclude Madagascar, the maximum decreases to 27% in Côte d’Ivoire.

For those non tradable food products, the price transmission from international markets to the domestic market is very limited in the short term, depending on the substitution with other tradable products.

Minot, after studying food markets in 9 African countries observes: “*It is surprising to note that only seven of the 67 prices tested showed a statistically significant increase in volatility between 2003-2003 and 2007-2010. Furthermore, there are 17 prices which show a statistically significant decrease in volatility between these two periods. For example, price volatility fell for maize in Maputo, rice in Ndjamena, and sorghum in Nouakchott. The remaining 43 prices tested did not show any statistically significant change in volatility between 2003-2006 and 2007-2010*” (Minot 2012:15)

Meuriot and her colleague find, in Cameroun, the same absence of transmission from the international rice price to the domestic prices for cassava and plantain (Meuriot, Temple et al. 2011).

#### 4.3.2 Transmission happens in poor countries highly dependent on imports

Most of the 34 food insecure countries under consideration are net importers of the staple crops they consume, the most important importers in terms of volumes being Iran, Colombia, Philippines, Iraq, Nigeria, Bangladesh. Interestingly, most African countries are small importers on international markets, except for the Ethiopia,

Sudan, and above all Nigeria, who are all dependant on wheat imports, and rice for the later. As we have seen above, this is coherent with the result that most of what they consume is non tradable.

Based on our literature review, international price shocks are only transmitted to the domestic markets of few countries. Those are the poorest and most trade dependant countries, such as wheat importing Bangladesh and other South and Western Asian countries, Iran, Yemen and Iraq, with respectively 132, 148 and 153 kg of cereal imports per capita. In spite of high government subsidies, domestic prices for staple food increased tremendously. Ianchovichina, Loenig and Wood point out that it exists “*some degree of vulnerability to international food price increases for virtually most of the MENA countries*” (Ianchovichina, Loening et al. 2012: 18). For these authors, among the MENA countries, only Algeria and Tunisia have the resources necessary to limit the transmission.

Summing all undernourished from those countries, they only account for around 1% of global undernourished.

#### 4.4 Part 3 conclusion

Many undernourished live in big players on international food markets. India and China alone account for more than 40% of world undernourished. We have seen that governments of big players tend to actively intervene on their domestic markets, and those for which food insecurity is an issue pursue specific policies aiming at reducing food insecurity of their citizens. Obviously, trade integration (first off domestically, but also international trade) can help release availability constraints of the lean season. But most countries also rely on other solutions, such as increasing stockholdings, undertaking social protection programs and increasing domestic production when possible as was described in the previous part.

As far as the impact of big player agricultural and trade policies on the rest of the world food security is concerned, transmission through international food prices shocks is far from being the rule. As a consequence of governmental interventions and the existence of non tradable food commodities the share of food transiting through international transactions is still limited compared to total food consumption. At the commodity level, we only find price transmission for very poor countries highly dependent on imports. But they only account for around 1% of the world undernourished. Hence our main conclusion is that international reference prices used in international transactions and domestic prices tend to be poorly interlinked in the short term. Hence, in general, price shocks caused by big players sudden policy changes have little chance to impact a large number of undernourished people outside their own citizens.

Obviously, if we were to study medium and long term price transmission, the situation might be more contrasted, but its interpretation would also be much more complex. Indeed, some degree of supply response would be likely to happen, although it is very likely that it would also be also strongly determined by other factors such as incentives from complementary agricultural policy measures. Indeed, many analyses have highlighted the complexity of the determinants and constraints to farmers’ response to market incentives. For instance, Cadot, Dutoit et al. (2006) have looked at the entry cost of moving out of subsistence farming into commercial farming in Madagascar and find that the extent of those costs hampers the poorest farmers from switching to commercial agriculture. Focusing on the impacts of market power along the supply chain on farmers in low-income countries, Chauvin and Olarreaga (2011) have shown that the absence of competition among the providers of key inputs, intermediates or services and storage, apparent in all their case studies, is detrimental to farmers, and beyond them to the society as a whole.

Hence, we find that although the big players do strongly influence – and thus have a responsibility over - the food security of their own populations, it is much less clear in relation to the food security of the rest of world, at least in the short term.

## 5 Conclusion

Over the years, the USA and the EU have growingly been held accountable by civil society organizations for the impacts of their agricultural and trade policies on poor countries and global food security. Coherently with this view, many analyses assume that a few key countries are the major actors on international food markets, and that they are in a position to influence world food security through their agricultural and trade policies. If this assumption were true, then there would be a hope of solving a large part of world food insecurity by reforming the policies of those few countries.

The first part of this paper has explained the origin of such an assumption. Indeed, until the 1980s, the USA and the EU strongly influenced international trade of the main staple food products through their residual supplier

policy, and impacted global food security mostly thanks to their food aid policy. But it also has shown how the dominant positions of the USA and the EU have been gradually eroded since. Part two has even listed the growing number of countries that can be seen as big players in international food trade today, and has explained why we think none is longer able to manage international food prices.

Considering these changes on international food markets, the related dispersion of market power, should countries be held accountable for their impacts on international food markets? How?

Since 2008, the fact that the exports bans placed by some major food exporters is considered to have fueled the price spike on international markets, has raised awareness on this subject and triggered a lot of discussions on the responsibility of major food exporters like India towards third countries' food security. There are now many proposals on the table to ensure that trade disciplines on export restrictions are implemented through the WTO in order to make sure that trade measures taken by countries enhance rather than threaten food security both at the national and global levels.

More generally, another way this notion of accountability has been spread is through the "Policy coherence for development" framework which is usually applied to rich countries, and defined by the OECD as "*ensuring to the least that a government's development policies toward developing countries are not undermined by other policies of that government, and if feasible that these other policies support development objectives*". The notion of accountability has for instance specifically been included in the G8 negotiations in order to follow whether the countries which had committed to act on food security at l'Alquila in 2008 were indeed devoting the committed amount of aid to food security actions.

But bringing together the major producing, consuming and exporting countries of main food commodities and making them collaborate is not an easy task, as the Agricultural Market Information System (AMIS), a G20 initiative to enhance food market transparency and encourage coordination of policy action in response to market uncertainty, launched following the 2008 price spikes, has proved.

The last part of this paper has questioned the channels through which big players on international food markets might influence global food security. Looking at undernourishment data, it has clearly identified a direct link between those big players and their own undernourished citizens which account for more than half of world undernourished. Beyond this direct link, this section has challenged the assumption that a large part of undernourished people could be directly affected by short term price shocks on the global food markets. Indeed, in the countries hosting most of the undernourished people, domestic markets are still isolated from international markets for several reasons including the fact that there are governmental measures to control the domestic markets (although not always effective), agricultural markets are poorly integrated or because of the importance of non-tradable food in the production and consumption patterns. The only countries where we find evidence of price transmission are the poor countries that are highly dependent on food imports, but their undernourished population only account for 1% of world undernourished.

In the long term it is much more costly for governments to prevent their domestic markets from being influenced by the conditions on the international markets. Some governments actually seek trade openness, when others try to avoid it, with different level of success mostly depending on their level of food self sufficiency, their agricultural potential and policies and their trade dependence. They can implement structural policies to try and prevent price transmission (through agricultural development, trade, exchange rate policies) or rather implement mitigation policies to shelter their most vulnerable population from the fluctuations through social protection policy.

In the end, this paper puts into perspective the influence of major actors of international food markets on global food security. We argue that international markets conditions and prices are far from being the main drivers of global food security, other very local shocks and constraints seem determinant in the realization of household level food security. A more thorough analysis of those drivers is necessary in order to better tackle food insecurity at the global level.

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