

Please cite this paper as:

Liapis, P. (2013-07-04), "How Export Restrictive Measures Affect Trade of Agricultural Commodities", *OECD Food, Agriculture and Fisheries Papers*, No. 63, OECD Publishing, Paris.
<http://dx.doi.org/10.1787/5k43mktw305f-en>



OECD Food, Agriculture and Fisheries
Papers No. 63

How Export Restrictive Measures Affect Trade of Agricultural Commodities

Peter S. Liapis

OECD FOOD, AGRICULTURE AND FISHERIES PAPERS

The OECD Food, Agriculture and Fisheries Papers series is designed to make available to a wide readership selected studies by OECD staff or by outside consultants. This series continues that originally entitled OECD Food, Agriculture and Fisheries Working Papers.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

This document has been declassified on the responsibility of the Working Party on Agricultural Policies and Markets under OECD reference number TAD/CA/APM/WP(2012)4/FINAL.

Comments on the series are welcome and should be sent to tad.contact@oecd.org.

OECD FOOD, AGRICULTURE AND FISHERIES PAPERS

are published on www.oecd.org/agriculture

© OECD (2013)

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for commercial use and translation rights should be submitted to rights@oecd.org.

Abstract

**HOW EXPORT RESTRICTIVE MEASURES
AFFECT TRADE OF AGRICULTURAL COMMODITIES**

Peter Liapis

Information on export restrictive measures was collected from 16 countries for the period 2007 to 2011 or 2012 depending on the country. The data indicate that export measures were applied across the whole spectrum of agricultural and food products, but grains, oilseeds and vegetable oils were particularly targeted. A variety of measures were employed at least one time on at least one product. Export bans were used by most (13) of the countries in the inventory while nine countries used export duties and export quotas were used by eight. The various measures were often used sequentially or concurrently. The data indicate that in most years, world trade of the commodities of interest rose suggesting that when restrictive measures lowered exports from intervening countries, competitors were able to compensate. For the world rice market, however, export restrictions significantly lowered exports of interfering countries, but other rice suppliers filled the gap as total imports were not affected.

JEL codes: Q02 Q17 Q18

Key words: Agricultural trade, food trade, grains, vegetable oils, export restrictions, agricultural policy

Table of contents

Executive Summary.....	5
Export restrictions in the multilateral trading system.....	8
Overview of targeted agricultural products.....	9
Overview of export measures used on agricultural products.....	10
Timeline of actions taken in selected major agricultural products.....	11
Rice.....	12
Wheat.....	12
Maize.....	14
Other Coarse Grains.....	15
Soybeans.....	16
Other Oilseeds.....	16
Vegetable Oils.....	17
Market Developments.....	19
Agricultural Markets.....	20
World indicative price of selected products.....	20
World production and consumption.....	23
Total exports of selected products.....	25
Collective production and export share of countries with export measures.....	28
Do export restrictions reduce exports?.....	31
World unit values.....	32
Country specific export and producer price of selected commodities.....	34
Wheat.....	34
Rice.....	36
Maize.....	37
Soybeans.....	38
Vegetable oils.....	39
Effects of export restrictive measures on importers.....	39
Summary.....	41
References.....	45
Annex I. Detailed Account of Export Restrictive Measures Taken by Selected Countries.....	46
Argentina.....	46
China.....	48
India.....	51
Indonesia.....	53
Russia.....	54
Viet Nam.....	56
Ukraine.....	56
Belarus.....	57
Kazakhstan.....	58
Egypt.....	58
Pakistan.....	59
Republic of the Union of Myanmar.....	60
Other Countries.....	60
Annex II. Production, Consumption and Trade Developments for Selected Commodities and Countries.....	61

Tables

Table 1.	Summary of export measures takes on agricultural products	10
Table 2.	Export measures used on agricultural products, 2007-2011	11
Table 3.	Timeline of export measures on rice and wheat markets for selected countries 2007-2011 ...	13
Table 4.	Timeline of export measures on maize and other coarse grain markets for selected countries 2007-2011	15
Table 5.	Timeline of export measures on soybeans and other oilseed markets for selected countries 2007-2011	17
Table 6.	Timeline of export measures on vegetable oil markets for selected countries 2007-2011	18
Table 7.	Number of countries, actions and collective share of production and exports	29
Table 8.	Effects of export measures on exports.....	32
Table 9.	Estimated import demand for rice wheat and maize.....	41
Table A.I.1.	Actions in selected markets taken by Argentina (2007-2011).....	47
Table A.I.2.	Actions in selected markets taken by China (2007-2011)	50
Table A.I.3.	Actions in selected markets taken by India (2007-2010)	52
Table A.I.4.	Actions in selected markets taken by Indonesia (2007--2012).....	54
Table A.I.5.	Actions in selected markets taken by Russia (2007-2012).....	55
Table A.I. 6.	Actions in the rice market taken by Viet Nam (2007-2010).....	56
Table A.I.7.	Actions in the maize and wheat markets taken by Ukraine (2006-2011).....	57
Table A.I.8.	Actions taken by Belarus (2010-2011).....	58
Table A.I.9.	Actions taken by Kazakhstan (2008 and 2010)	58
Table A.I.10.	Actions taken by Egypt (2008 - 2011).....	59
Table A.I.11.	Actions taken by Pakistan (2006 - 2011).....	60

Figures

Figure 1.	Total merchandise and agricultural trade 2004 -2010	19
Figure 2.	Monthly Food price index January 2000 to July 2012	20
Figure 3.	International rice, wheat, maize and soybean prices: January 2000 to July 2012	21
Figure 4.	International soybean oil, rapeseed oil and palm oil prices: January 2000 to July 2012	22
Figure 5.	Total production and consumption of selected crops: 2004-2011	23
Figure 6.	Stocks to use ratio for selected commodities: 2004-2011	24
Figure 7.	Total production and consumption of selected vegetable oils: 2004-2011	24
Figure 8.	Exports of selected products in physical units: 2004-2011	25
Figure 9.	Value of exports of selected products: 2004-2010	26
Figure 10.	World unit values and world indicative price of selected crops	33
Figure 11.	World unit values and world indicative price of selected vegetable oils.....	34
Figure 12.	Average world fob price and fob and producer price of selected countries: wheat 2004-2011	35
Figure 13.	Average world fob price and fob and producer price of selected countries: rice 2004-2011	36
Figure 14.	Average world fob price and fob and producer price of selected countries: maize 2004-2011	37
Figure 15.	Average world fob price and fob and producer price of selected countries: soybeans, 2004- 2011	38
Figure II.A.1.	Exportable surplus, exports and ending stocks selected countries in the inventory: rice	62
Figure II.A.2.	Exportable surplus, exports and ending stocks selected countries in the inventory: wheat.....	63
Figure II.A.3.	Exportable surplus, exports and ending stocks selected countries in the inventory: maize.....	65
Figure II.A.4.	Exportable surplus, exports and ending stocks selected countries in the inventory: soybeans.....	66

Executive Summary

Information on export measures has been collected from 16 countries - Argentina, Belarus, China, Former Yugoslav Republic of Macedonia, Egypt, India, Indonesia, Kazakhstan, Kyrgyz Republic, Moldova, Myanmar, Pakistan, Russia, Tajikistan, Ukraine and Viet Nam. The inventory contains all information identified, but the report focuses on measures from 2007 to 2011 or 2012 depending on the country.

The data indicate that export measures have been applied across the whole spectrum of agricultural products, but bulk commodities such as wheat, rice and maize have been particularly targeted. Hence, most of the empirical assessments in the report focus on these products.

The measures that have been identified include export duties (either ad valorem or specific, including variable duties that change depending on specified conditions), minimum export prices, state trading, tax rebates on exported goods, export quotas, licensing requirements and outright export bans. Prohibiting exports was the instrument of choice of most of the countries in the inventory. Thirteen of the 16 countries banned exports of at least one product at least one time. Export duties were the second most popular instrument used by nine countries, followed by export quotas which were used by eight countries. At times countries use a combination of these measures either concurrently or sequentially. When used sequentially, measures that were initially intended to last a relative short time become measures that can last longer than one year.

The inventory collects information on the rationale provided by a country for any of its export measures taken when available. The information suggests that in most cases, the rationale provided includes concerns about food security, the stability of the domestic prices and to fight food inflation. Occasionally the promotion of domestic value added activities and to assure input supply is also given as a rationale for policies that restrict exports. Unfortunately, this type of information is spotty in the inventory as not all countries provided the information for all their measures.

Only a few countries notified their export intervention measures to the WTO as specified in Article 12 of the URAA. In some cases, interventions were scheduled to last a short amount of time as stipulated under GATT Article XI paragraph 2(a) which permits export restrictions when they are temporary (without stipulating what this means) and are imposed to prevent or relieve critical shortages of foodstuffs. Nonetheless, the relevance of the notifications comes into question when they are submitted after the fact. Furthermore, when temporary measures are invoked frequently within short periods of time, they probably contribute to market instability and ambiguity.

Undoubtedly, such interventions create uncertainty in the domestic and international markets for these commodities. These can influence supply decisions domestically and raise concerns about supplier reliability in import dependent countries that may last long beyond the duration of the policy.

The analysis examined the effects of export restrictions on trade. Although export restrictions were justified on fulfilling domestic goals such as food security or to stabilize prices, the effects of the policies on domestic markets was not investigated. It is not possible, therefore, to ascertain whether or not the policies achieved their goals. Other OECD work

suggests that results were mixed depending on the country, the crop and the measure. But, whether or not the goals were attained, it is well known that policies targeted to the specific objective are more efficient than non-targeted policies such as border measures.

The data indicate that export supply for the products examined is very concentrated with only a handful of countries supplying most of the world's needs. On the import side, trade is less concentrated implying that many different countries depend on a few countries for their import needs. Export restrictions by even one of the major exporters may create havoc in international markets and this can be significantly magnified when several exporters intervene at the same time.

The data indicate that in most years, worldwide trade of the commodities of interest increased suggesting that when the restrictive measures lowered exports from intervening countries, competitors were able to compensate. In some cases because of the type of measure or its duration, exports from countries imposing measures continued flowing and even increased. In other cases however, exports from countries applying export measures were substantially reduced relative to their level in the previous year. But, in some of the countries, when their exports were below previous levels, often it was also the case that the domestic markets were tight suggesting lower available export supply. It is therefore difficult to discern what the export level from the various countries would have been absent the export measures. Nonetheless, the results do suggest that in the rice market, the restrictive measures significantly lowered exports from the countries imposing the restrictions, but other suppliers must have filled the gap as imports were not substantially lower.

Assessing the trade effects of the export restrictions is confounded by the periodicity of the data (analysis is based on annual data and not to within year or season effects on volumes or prices) and developments in the local markets of countries imposing the restrictions as well as developments in markets of competitors.

From an importer's perspective, results indicate that rice importing countries increased the number of partners with whom they traded during the 2007 to 2010 period, possibly as a risk management strategy to diversify and mitigate supply shocks from ad hoc restrictions.

Undoubtedly, unless the export measures are totally ineffective, they constrain exports, at least for a time, and they affect perceptions of market reliability and stability. These likely contributed to market uncertainty possibly contributing to the volatility witnessed at the time. The frequent changes to the measures and in their levels may also have sparked panic buying compounding potential shortages in international markets possibly contributing to the large oscillations in monthly prices. The effect of interventions on market psychology is also a factor that should be considered in assessing their market impacts.

Introduction

Information on export taxes and other export restrictions is rather *ad hoc*, scattered among various sources and does not seem to be collected systematically or consistently.¹ The first step in building the database was to identify the countries that used any export restrictive instrument during the relevant time period (a few years prior to the 2007/08 price run-up to the latest year possible). This was accomplished by an examination of the literature, including the popular press. According to Sharma (2011), an FAO survey of 105 countries found that between 2007 and the end of March 2011, 33 countries restricted exports of at least one agricultural product. But, the analytics of export restrictions suggest that the focus should be on major exporters whose export restrictions spill over into the international markets. Hence, several countries that imposed export restrictions will not be included in the database unless resources are augmented. However, all countries, irrespective of their relative importance in trade that notify under Article 12 of the Uruguay Round Agreement on Agriculture (URAA), are included.

Once a country is identified, its official governmental sources are used to collect the information, which like the database on raw materials, is based on the Harmonized System (HS) of classifying traded products.² The product description and HS code provided in the official information is entered into the database. However, some countries describe their products at detailed level of HS8 or more digits while other countries report at a more aggregate (2 or 4 digit level). Internationally, the HS system is standardised at the HS6 digit level. Therefore, the database standardises the information at the HS6 digit level and provides the product description of that level of disaggregation for international comparisons. In most cases, this means that the original HS code is truncated to the 6 digit level. But, in cases where the description is more aggregate, the information is expanded to include each HS6 digit code relevant for the product on the assumption that the measure is applied to each HS6 digit product in that category.

Information on export measures has been collected from 16 countries - Argentina, Belarus, China, Former Yugoslav Republic of Macedonia, Egypt, India, Indonesia, Kazakhstan, Kyrgyz Republic, Moldova, Myanmar, Pakistan, Russia, Tajikistan, Ukraine and Viet Nam. The information is from 2002 to 2012 depending on the country³. For Argentina, Belarus, China, Egypt, Indonesia, India, Kazakhstan, Myanmar, Pakistan, Russia, Ukraine and Viet Nam the information is from official national government sources. For Ukraine this information is supplemented with information from its notifications to the WTO under Article 12 of the URAA. Information for Russia and Viet Nam is supplemented with information from their accession to the WTO and from the FAO. The WTO notifications are the source for the remaining countries in the database.

The database contains more than 3 800 lines of export measures taken by the 16 countries during the relevant time period. These cover the whole range of agricultural products as defined by the WTO. In general, export restrictive measures were applied to a wide range of agricultural products, but grains, oilseeds and vegetable oils were among the most frequently targeted and the source of social unrest in some countries. Due to the nature of the inventory, it is not meaningful to calculate frequency counts on the number of export restrictive measures a country uses. For example, Argentina, at least since 2002 has export duties on all

-
1. The Agricultural Market Information System (AMIS) will ameliorate this for wheat, rice, maize and soybeans.
 2. The inventory on export restrictions on raw materials can be found at: <http://qdd.oecd.org/Subject.aspx?subject=1189A691-9375-461C-89BC-48362D375AD5>.
 3. In the case of Pakistan, some information from 1996 is provided.

of its agricultural products as defined at the HS8 digit level. The policy is that each product has an export duty of 5% except selected products. The inventory contains the information on the exceptional products (580 at the HS8 digit level) and the changes to those rates since.

A variety of reasons motivate countries to impose export restrictions, including food security concerns, reduce inflation in food prices during periods of rising international prices, or to promote downstream industries through lower input prices. The inventory collects information on the rationale provided by a country for any of its export measures taken when available. The information suggests that in most cases, the rationale provided includes concerns about food security, the stability of the domestic prices and to fight food inflation. Occasionally the promotion of domestic value added activities and to assure input supply is also given as a rationale for policies that restrict exports. Unfortunately, this type of information is spotty in the inventory as not all countries provided the information for all their measures.

The next section provides a brief overview of export restrictions in the context of the multilateral trading system. The following two sections provide an overview of the scope of the agricultural products subject to export measures and an overview of the instruments employed by the countries in the database. Next is a summary of the timeline of measures taken by individual countries during the five year period from 2007 to 2011 on selected major commodities followed by a discussion of market developments for these products. The last section summarises the findings. Two Annexes provide more detailed information for individual countries.

Export restrictions in the multilateral trading system

Export duties, taxes or other charges are not prohibited under WTO rules but unlike their importing counterparts - import duties or tariffs - they are not bound and do not seem to be disciplined and can therefore be unilaterally adjusted. The WTO accession process however may impose disciplines as was the case for China, Viet Nam and Russia. For example, in its accession agreement, China committed to eliminate all export duties except for 84 specific items (Kim, 2010).

Article XI of GATT 1994 on the other hand explicitly prohibits quantitative export restrictions whether through quotas, import or export licenses or other measures. It states that “No prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas, import or export licences or other measures, shall be instituted or maintained by any contracting party on the importation of any product of the territory of any other contracting party or on the exportation or sale for export of any product destined for the territory of any other contracting party.” However, Article XI also provides some exceptions to the general rule including under paragraph 2(a) “export prohibitions or restrictions temporarily applied to prevent or relieve critical shortages of foodstuffs or other products essential to the exporting contracting party” and paragraph 2(b) “import and export prohibitions or restrictions necessary to the application of standards or regulations for the classification, grading or marketing of commodities in international trade”.

A further basis for imposing export restraints is found in Article XX, the “general exceptions” provision. Paragraph (h) allows an exemption from other GATT disciplines in pursuing commodity agreements which conform to accepted conditions of such agreements, paragraph (i) allows an exemption for (raw) material used in domestic processing (Mitra and Josling, 2009).

As recent experience suggests countries routinely apply export restrictions or bans under the exemption banner as there is not an agreement on how long temporary is, what is critical, nor what is essential in determining whether the export ban is allowable. In any case, since export duties are not disciplined, a prohibitive export tax can be equivalent to an export ban.

Article 12 of the Uruguay Round Agreement on Agriculture (URAA) stipulates that in cases where countries institute new export prohibitions on foodstuffs in accordance with paragraph 2(a) of Article XI of GATT 1994, they must take into account the effects of such prohibitions on importing Members' food security and should give notice in writing as far in advance as practicable to the Committee on Agriculture indicating the nature and duration of the measure. Specifically a Member instituting new export prohibitions must observe the following provisions:

- the Member instituting the export prohibition or restriction shall give due consideration to the effects of such prohibition or restriction on importing Members' food security;
- before any Member institutes an export prohibition or restriction, it shall give notice in writing, as far in advance as practicable, to the Committee on Agriculture comprising such information as the nature and the duration of such measure, and shall consult, upon request, with any other Member having a substantial interest as an importer with respect to any matter related to the measure in question. The Member instituting such export prohibition or restriction shall provide, upon request, such a Member with necessary information.

Paragraph 2 of Article 12 of the URAA then exempts developing country Members from the notification and consultation requirements, unless the measure is taken by a developing country Member which is a net-food exporter of the specific foodstuff concerned. In any case, it seems that there are no penalties for failure to notify (Mitra and Josling 2009).

Overview of targeted agricultural products

To provide a general overview of the diversity of agricultural products subject to export restraining measures, the products in the inventory were segregated into four broad categories, bulk, horticultural, processed and semi-processed.⁴ Table 1 summarises the results. Although data prior to 2007 and for 2012 are available for some countries, the most complete information is for the period 2007 to 2011. The table contains information for each year, the number of countries that took action in that particular product category and the total number of actions taken. The column - Number of Varieties/Actions Taken - is the sum of the different agricultural products defined at the detailed level reported by a country and the action taken whether it is more restrictive or more liberalising (following a restrictive measure). For example, under bulk products, if a country imposed an export ban on several varieties of wheat (say three) defined at the HS8 digit and maize (say one variety defined at the HS6 digit) the number of countries would be one and the number of varieties/actions taken is four. If that country in the following year removed the export ban the columns under bulk products would once again contain one for the number of countries and four for the number of actions/varieties. If, instead, the country imposed the export ban and then removed it in the same year, the column would report one country and eight actions/varieties. Thus all actions, whether more or less restrictive are counted and a general product say wheat, will be counted more than once if defined at a very precise level, if the level of the instrument changes or if the instrument changes⁵.

4. See Liapis (2011) for the breakdown of the commodities into the various categories.

5. This level of aggregation is clearly too broad but presented to illustrate that the database contains information on the entirety of the agricultural sector. More detailed discussion will focus on individual commodities.

Table 1. Summary of export measures takes on agricultural products

	Bulk		Horticulture		Semi processed		Processed	
	Number of countries	Number of varieties/ actions	Number of countries	Number of varieties/ actions	Number of countries	Number of varieties/ actions	Number of countries	Number of varieties/ actions
2007	8	155	4	126	7	339	6	188
2008	11	320	2	97	7	332	6	169
2009	7	139	1	17	6	197	6	230
2010	11	126	0	0	10	142	5	20
2011	9	60	1	1	10	164	5	16

The results indicate that few countries took measures to restrain exports of horticultural products especially in the last two years. More countries intervened in the export markets of bulk commodities such as grains and oilseeds compared to the others, while more varieties or actions were aimed at the semi processed products such as vegetable oils, live animals or hides and skins.⁶

Overview of export measures used on agricultural products

The export restrictive instruments used by the countries in the inventory include export duties (either *ad valorem* or specific, including variable duties that change depending on specified conditions), tax rebates on exported goods, quotas, bans, licensing requirements, and minimum export price. At times, countries use a combination of these measures, either concurrently or sequentially. In certain cases, despite the export ban, some exports were allowed of more specialised products or to select trading partners.

Table 2 provides a broad overview of the major instruments used at least once to constrain exports of agricultural products. Reading down a column, one finds the different countries that used that instrument at least once during the period, on at least one product. Reading across a row, one finds the different instruments that any one country used at least once during the period on at least one product. Thirteen of the 16 countries banned exports of at least one product in at least one of the five years between 2007 and 2011. Export taxes were used by nine countries while export quotas were used by eight.

This level of aggregation is useful for a broad overview but does not indicate the products covered the frequency or duration of the restraint, the importance of the country in world markets, nor the importing countries that may have been adversely impacted. More information is provided below.

6. This may also reflect the fact that more goods are classified as semi-processed rather than bulk.

Table 2. Export measures used on agricultural products, 2007-2011

Export tax (includes variable tax)	Export quota	Export ban	Export licensing requirements [*]	Minimum export price	Tax rebates on exported goods
Argentina	Argentina	Argentina Belarus	Argentina		
China	China	Former Yugoslav Republic of Macedonia	China		China
Egypt	Egypt	Egypt			
	India	India		India	
Indonesia	Indonesia	Indonesia Kazakhstan	Indonesia		
Kyrgyz Republic		Republic of Moldova			
		Republic of the Union of Myanmar	Republic of the Union of Myanmar		
Pakistan	Pakistan	Pakistan		Pakistan	
Russia		Russia Tajikistan			
Ukraine	Ukraine				
Viet Nam	Viet Nam	Viet Nam		Viet Nam	

^{*} Excludes countries that use export licenses to allocate quotas.

Timeline of actions taken in selected major agricultural products

As indicated in Table 1, export restrictive measures have been applied on a large variety of agricultural products influencing their exports. Among major grains (maize, rice, wheat) oilseeds, (soybeans, sunflower seeds among others) and vegetable oils are products for which many of the measures listed in Table 2 have been employed and for which most of the countries in the inventory applied measures. These are also products that provide most of the calories to people in developing countries either directly or indirectly via vegetable oils and feed to livestock and they were among the commodities whose shortages and high prices led to social discontent in some countries. These are also among the more traded agricultural products in value and in the number of countries importing those products. Additionally, rice, wheat, maize and soybeans are the products of interest to the Agricultural Market Information System (AMIS) and the Rapid Response Forum. Hence, the timeline summary below focuses on those products. Interested readers will be able to construct their own summaries for any commodity from the database. Additional information organised by the country imposing the export measures including broader commodity coverage is provided in Annex I. The reader is reminded that although commodity names such as rice or wheat for example are used below, countries targeted their interventions to very specific varieties, often at the HS8 or HS10 digit level. The presentation below represents a summary of all the actions taken on the specific varieties of rice or wheat for example.

Rice

In 2007, among the countries in the database, three—Argentina, India and Viet Nam—intervened in their rice export markets. Argentina had in place already an export tax of 10%, while India and Viet Nam banned rice exports. In India’s case however, the ban did not apply to exports destined for Russia or the Maldives. The ban was also conditional on a minimum export price (MEP) USD 500/t and exports to some countries were also allowed under country specific quotas.

In 2008, a total of eight countries imposed measures to restrain their rice exports, with China, Egypt, Indonesia, the Republic of the Union of Myanmar and Pakistan joining the three countries listed above. Argentina and India continued their 2007 policies. China imposed an export tax of 5% while Viet Nam initially set an export quota of 4.5 million tons and a minimum export price which was later switched to a variable export tax from USD 30/ton to USD 175/ton, depending upon the freight on board (fob) price. Egypt initially imposed an export tax of Egyptian pounds 300/ton but subsequently banned all exports, while in Pakistan’s case, a minimum export price ranging from USD 750/t to USD 1500/t depending on the variety was established. In any year, rice exports from Myanmar can only be undertaken by the State owned Economic Enterprise. Since information is not available on how this may influence exports, its existence is not explicitly taken into account (but its existence is indicated in the database). However, in May 2008, Myanmar temporarily banned exports of rice until November of 2008. Indonesia, although a large net importer, imposed licensing requirements on exporters.

For 2009, Argentina, India and Indonesia retain the same export policies as the previous years. China however, reduced the export tax to 3% on route to removing it while imposing an export licensing requirement. Egypt initially re-enacted an export tax of Egyptian pounds 300/t which was followed by an export ban that was removed in favour of an export tax of Egyptian pounds 2 000/t.

Argentina, India and Indonesia maintained their respective export policies in 2010, but India’s export ban with country specific export quotas was eventually lifted. China continued requiring an export license and Egypt established an export quota initially of 100 000 tons which was supplemented with an additional quota of 128 000 tons but later in the year, all exports were banned. Viet Nam intruded into its export market with a minimum export price ranging from USD 300/t to USD 540/t depending upon the rice variety.

In 2011, Argentina continued taxing rice exports, China continued demanding export licenses and Egypt continued its ban on rice exports. Myanmar put a temporary ban on rice exports starting in February and ending in May. A summary of the timeline is shown in Table 3.

Wheat

In 2007, five countries; Argentina, India, Pakistan, Russia and Ukraine, intervened in their respective wheat export markets. Argentina’s export tax increased from 20% to 28% during the year and there was an export quota of 15 000 tons for organic wheat and 20,000 tons for wheat in bags not exceeding 50kg. India and Pakistan banned wheat exports, although in Pakistan’s case, the ban was partially lifted to allow 800 000 tons to be exported. Russia imposed an export tax initially of 10% but not less than (BNL) EUR 22/t which was later increased to 40% BNL EUR 105/t and Ukraine imposed an export quota of 3 million tons.

Table 3. Timeline of export measures on rice and wheat markets for selected countries 2007-2011

Rice		Wheat	
2007		2007	
Argentina	Export Tax (10%)	Argentina	Export Tax (20% increased to 28%) Export Quota (15,000 for organic wheat and 20,000 for wheat in bags not exceeding 50 kg.)
India	Export Ban (conditional on minimum export price (USD 500/t) and with exceptions for country specific quotas)	India	Export Ban
Viet Nam	Export Ban (July)	Pakistan	Export Ban (ban was lifted part of year allowed 800,000 tons to be exported)
		Russia	Export Tax (10% but not less than EUR 22/t increased to 40% but not less than EUR 105/t)
		Ukraine	Export Quota (3 million mt)
2008		2008	
Argentina	Export Tax (10%)	Argentina	Export Tax (variable switched to 28% or 23% depending on variety at HS8 level)
China	Export Tax (5%)	China	Export Quota (4.4 million mt)
Egypt	Export Tax (300 Egyptian pounds/ton) Export Ban	India	Export Tax (20%) Export Ban
India	Export Ban (conditional on minimum export price and with exceptions for country specific quotas)	Kyrgyz Republic	Export Tax (15 LC/kg)
Indonesia	Export License	Kazakhstan	Export Ban
Myanmar	Export Ban		
Pakistan	Minimum Export Price (from 750 USD/t to 1500 USD/t based on variety)	Pakistan	Export Ban
Viet Nam	Export Quota (4.5 million tons) and Minimum Export Price (from 360 USD/t to 800 USD/t depending on variety) Export Tax (variable rate from USD 30 to USD 175/t based on FOB price)	Russia	Export Ban
		Ukraine	Export Quota (3 million mt)
2009		2009	
Argentina	Export Tax (10%)	Argentina	Export Tax and exports with license requirement
China	Export Tax (lowered to 3% then to 0%); Export License	China	Export Tax (3% then to 0%); Export License
Egypt	Export Tax (300 Egyptian pounds/ton) converted to Export Ban , converted to Export Tax (2000 Egyptian pounds/ton)		
India	Export Ban (with exceptions for country specific quotas which for some countries would be revoked if minimum export price exceeds USD 1200/t)	India	Export Ban replaced by Quota (900,000 tons and additional 300,000 tons allocated to 3 firms)
Indonesia	Export License		
Viet Nam	Minimum export price (USD 350/t on 25% broken rice)		
2010		2010	
Argentina	Export Tax (10%)	Argentina	Export Tax
China	Export License	China	Export License
Egypt	Export Quota (100,000 mt first part of year plus 128,000 second half) Export Ban (second half of year)	Egypt	Special Export Procedure
Indonesia	Export License	India	Export Ban
India	Export Ban (with exceptions for country specific quotas)	Pakistan	Export Quota (1 million mt)
Viet Nam	Minimum Export Price (300 USD to 540 USD per ton depending on variety)	Russia	Export Ban
		Ukraine	Export Quota (500,000 mt)
2011		2011	
Argentina	Export Tax (10%)	Argentina	Export Quota (1 million mt), Export Tax
China	Export License	China	Export License
		Former Yugoslav Republic of Macedonia	Export Ban
Egypt	Export Ban	Republic of Moldova	Export Ban
Myanmar	Export Ban	Moldova	Export Ban
		Russia	Export Ban
		Ukraine	Export Quota (1 million mt), switched to Export Tax (9% but not less than EUR 17/mt)

Interventions in the wheat export markets expanded somewhat in 2008 with eight countries implementing various export restrictive measures. India continued banning wheat exports joined by Kazakhstan, Pakistan and Russia. Argentina changed its export tax to a variable rate that varied based on formulas provided by the government. This was later revised to a fixed rate of 23% or 28% depending on the variety. An export quota of 4.4 million tons was also fixed. China set an export tax of 20% while the Kyrgyz Republic, albeit a net wheat importer, set an export tax of local currency (soms) 15/kg and Ukraine continued its export quota.

Fewer countries intervened in the wheat market in 2009. Argentina continued taxing wheat exports as did China. In China's case, the export tax was lowered to 3% and subsequently eliminated but began an export license scheme. India continued banning exports with exceptions, under quotas, to specific destinations.

In 2010, more countries once again became interventionist in their wheat export market. Argentina continued taxing wheat exports and China continued the export license scheme while wheat exports from India and Russia were banned. Pakistan allowed exports under a 1 million ton quota ceiling while Ukraine's export quota was set at 500 000 tons

Wheat exports were banned in 2011 by three countries; the Former Yugoslav Republic of Macedonia, the Republic of Moldova and Russia. Although the first two countries are relatively minor players in the world wheat market, Russia is not. Additionally, China continued its export license requirements and Argentina continued taxing wheat exports and set an export quota of 1 million tons. Ukraine also fixed an export quota of 1 million tons but this was later converted into an export tax of 9% BNL EUR 17/ton. Table 3 summarises the timeline of export measures in the various wheat export markets for the 2007 to 2011 period.

Maize

Compared to the rice and wheat markets, fewer countries intervened in the world maize market in most years. In 2007 Argentina was the only country in the database with export measures. Argentina taxed maize exports at a 20% rate which was raised to 25%, and an export ban eventually followed.

Three countries; Argentina, China and India intervened in their maize export markets in 2008. Argentina imposed an export tax of 20%; China imposed an export tax of 5% but this was eventually eliminated, while India banned all maize exports. In 2009, Argentina applied an export tax and required exporters to obtain an export license. China also imposed export license requirements.

In the year 2010, there was again an increase in the number of countries taking export restrictive measures in their maize markets. Argentina continued taxing exports, along with the Kyrgyz Republic which taxed its exports at its local currency soms 5/kg. China continued its export license scheme while Russia banned all exports and Ukraine restricted exports to a quota of 2 million tons.

Argentina's export tax on maize continued in 2011 as did Russia's export ban and China's export license system. Ukraine initially set an export quota of 3 million tons which was later increased to 5 million tons. Table 4 summarises the timeline and export measures taken by the various countries in the 2007 to 2011 period.

Table 4. Timeline of export measures on maize and other coarse grain markets for selected countries 2007-2011

Maize		Other Coarse Grains	
2007		2007	
Argentina	Export Quota, Export Tax (20% raised to 25%) Export Ban	Argentina	Export Tax (20% on various coarse grains)
		Russia	Export Tax (30% on barley)
2008		2008	
Argentina	Export Tax (variable rate, switched to 25%, lowered to 20%)	Argentina	Export Tax (20% on various coarse grains)
China	Export Tax (5%, then to 0%)	China	Export Tax (20% on rye, barley buckwheat and oats); (5% on grain sorghum, millet and others)
India	Export Ban	Russia	Export Tax (30% but not less than EUR 70/mt, on barley)
2009		2009	
Argentina	Export Tax, Export License Requirement	Argentina	Export Tax (20% on various coarse grains)
China	Export License Requirement	China	Export Tax (eliminated)
2010		2010	
Argentina	Export Tax	Argentina	Export Tax (20% on various coarse grains)
China	Export License	Kazakhstan	Export Ban (buckwheat)
Kyrgyz Republic	Export Tax (local currency 5/kg)	Russia	Export Ban (barley and rye)
Russia	Export Ban		Export Quota (barley 200,000 mt; buckwheat 1,000 mt; rye 1,000 mt)
Ukraine	Export Quota (2 million mt)	Ukraine	
2011		2011	
Argentina	Export Tax	Argentina	Export Tax (20% on various coarse grains)
China	Export License	Russia	Export Ban (barley and rye)
Russia	Export Ban		Export Quota (barley 200,000 mt; buckwheat 1,000 mt; rye 1,000 mt)
Ukraine	Export Quota (3 million raised to 5 million mt)	Ukraine	Export Quota (eliminated on barley) converted to Export Tax (14% but not less than EUR 23/mt)

Other coarse grains

This is a grouping of different coarse grains including barley, buckwheat, millet, oats, rye and sorghum. And, as indicated above, the category encompasses a larger number of varieties as government export policies tend to be defined at very detailed level. In 2007, two countries intervened in their export markets. Argentina applied a 20% export tax on various coarse grains, while Russia imposed a 30% export tax on barley.

For 2008, Argentina and Russia continued their export taxes. In Argentina's case the rate of 20% remained as in 2007 while in the case of Russia, the 30% export tax on barley was retained conditional that a minimum export tax of EUR 70/ton. China was the third country to impose export restrictive measures this year, imposing a 20% export tax on barley, buckwheat, oats and rye and a 5% tax on exports of sorghum, millet and other coarse grains not elsewhere specified.

In 2009, China eliminated the export taxes on coarse grains from 2008, but Argentina's export taxes, as is the government policy, remained. While exports were relatively unhindered in 2009, 2010 ushered increased interventions by several governments. In addition to Argentina's continued taxing exports of various coarse grains, Kazakhstan banned exports of buckwheat, Russia banned exports of barley and rye while Ukraine imposed an export quota on barley of 200 000 tons, and on buckwheat and rye of 1 000 tons each.

Argentina's export taxes and Russia's export ban on barley and rye continued in 2011, while Ukraine continued the 200 000 ton export quota on barley and 1 000 tons each for buckwheat and rye. Subsequently, the barley quota was replaced by an export tax of 14%

BNL EUR 23/t. Table 4 summarises the timeline and export measures taken by the various countries in the 2007 to 2011 period.

Soybeans

Governments also intervened in the soybean export markets although not in the numbers seen in the rice or wheat markets. Only two countries - Argentina and one other (usually different) country interfered. Argentina was the only country to intervene in the soybean export market in 2007. Argentina's export tax of 24% was increased twice - to 28% and again to 32%. Subsequently, the export tax was replaced by an export ban which in turn was replaced again by an export tax, all in the same year.

In 2008, Argentina switched to a variable export tax which was subsequently replaced by a fix rate of 35%. China, although a large net importer, also intervened in 2008, imposing an export tax of 5%. These policies for these two countries continued in 2009, but in China's case, the 5% export tax was eventually eliminated.

Argentina continued to tax exports of soybeans in 2010 and 2011. In 2010, Kazakhstan banned its exports while in 2011 Russia imposed an export tax of 20% BNL EUR 35/ton. Table 5 summarises the timeline and export measures taken by the various countries in the 2007 to 2011 period.

Other oilseeds

This is a grouping of oilseeds other than soybeans and includes cottonseed, linseed, mustard seed, rapeseed and sunflower seed. As a reminder, the category encompasses a larger number of varieties as government export policies tend to be defined at very detailed level. As in the soybeans case, fewer governments interfered in the export market of these commodities.

In 2007, only Argentina intervened, imposing an export tax of 24% on linseed and sunflower seed and 10% on exports of rapeseed and other oilseeds. The 24% tax on linseed and sunflower seed was raised to 32% during the course of the year. The linseed rate at 24% and the rapeseed and other oilseed rate of 10% remained in force in 2008. The tax on sunflower seeds however was changed into a variable tax which was later replaced by a fixed rate of 32%. Exports of sunflower seeds in 2008 also faced an export tax by the Kyrgyz Republic of some 20/kg.

Only Argentina applied export measures in 2009 maintaining export taxes on the various products which continued into 2010 and 2011. In 2010, Belarus banned exports of rapeseed while Kazakhstan banned exports of cottonseed, sunflower seed and other oilseeds not elsewhere specified. In 2011, Belarus export ban on rapeseed continued and it added linseed to the export ban while Russia placed an export tax of 20% BNL EUR 35/ton on rapeseed and sunflower seed and 10% BNL EUR 25/ton on mustard seed. Table 5 summarises the timeline and export measures taken by the various countries in the 2007 to 2011 period.

Table 5. Timeline of export measures on soybeans and other oilseed markets for selected countries 2007-2011

Soybeans		Other Oilseeds	
	2007		2007
Argentina	Export Tax (24% increased to 28%, increased to 35%; converted to Export Ban converted to, Export Tax)	Argentina	Export Tax (linseed 24%; sunflowerseed 24% raised to 32%; rapeseed and other oilseeds 10%)
	2008		2008
Argentina	Export Tax (variable rate switched to 35%)	Argentina	Export Tax (linseed 24%; sunflowerseed variable rate converted to 32%; rapeseed and other oilseeds 10%)
China	Export Tax (5%)	Kyrgyz Republic	Export Tax (sunflower seeds local currency 20/kg)
	2009		2009
Argentina	Export Tax	Argentina	Export Tax
China	Export Tax (5% then eliminated)		
	2010		2010
Argentina	Export Tax	Argentina	Export Tax
Kazakhstan	Ban	Belarus	Export Ban (rapeseed)
		Kazakhstan	Export Ban (sunflowerseed cottonseed and others not elsewhere specified)
	2011		2011
Argentina	Export Tax	Argentina	Export Tax
		Belarus	Export Ban (linseed and rapeseed)
Russia	Export Tax (20% but not less than EUR 35/mt)	Russia	Export Tax (rapeseed and sunflowerseed, 20% but not less than EUR 35/mt, mustardseed 10% but not less than EUR 25/mt)

Vegetable oils

This is an aggregation of several different vegetable oils including cottonseed oil, linseed oil, maize oil, rapeseed oil, soybean oil, sunflower seed oil, groundnut oil coconut oil, palm kernel oil, palm oil, sesame oil and others. As a reminder, the category encompasses a larger number of varieties as government export policies tend to be defined at very detailed level.

In 2007, Argentina imposed an export tax of 24% which was later increased to 32% on soybean oil, while the export tax on sunflower seed oil and cottonseed oil at initially 20% was subsequently raised to 30%. Exports of linseed oil, maize oil and other oils not elsewhere specified were taxed by Argentina at 10%. The export taxes on the oils listed were replaced by a ban, with the ban also encompassing exports of groundnut oil. The ban was eventually revoked before the end of 2007. China decreased the tax rebate on the exports of most vegetable oils to 5% while Pakistan banned exports of vegetable ghee and cooking oil. Exports of sesame oil and groundnut oil from Myanmar are solely exportable by the State Owned Economic Enterprise. Exports of both of these products continued to be banned in 2007.

Two countries, India, and Kyrgyz Republic joined Argentina, Myanmar and Pakistan in applying export restrictive measures in 2008. For Argentina, the export taxes on soybean oil, sunflower seed oil and maize oil were initially converted into variable rates which were eventually replaced by fixed rates of 32% on soybean oil, 30% on sunflower seed oil, and 20% on maize oil. The Kyrgyz Republic set a rate of soms 100/kg on exports of sunflower seed oil and cottonseed oil. Pakistan continued its ban on exports of vegetable ghee and cooking oil. India also banned exports of several vegetable oils including soybean oil, groundnut oil, olive oil, palm oil, sunflower seed oil, cottonseed oil, coconut oil, palm kernel oil, rapeseed oil, linseed oil, maize oil, sesame oil, and others and Myanmar continued to ban groundnut oil and sesame oil exports.

Table 6. Timeline of export measures on vegetable oil markets for selected countries 2007-2011

Vegetable Oils	
2007	
Argentina	Export Tax (soybean oil, 24% raised to 32%, sunflowerseed oil and cottonseed oil, 20% raised to 30% linseed oil, maize oil, and other oils not elsewhere specified 10%) Export Tax converted to Export Ban on all above plus groundnut oil Export Ban lifted
China	Rebate on Export Taxes 5%
Myanmar	Export Ban (groundnut oil sesame oil)
Pakistan	Export Ban (vegetable ghee and cooking oil)
2008	
Argentina	Export Tax (variable rate on soybean oil switched to 32%; variable rate on sunflowerseed oil switched to 30% variable export tax on maize oil switched to 15%)
India	Export Ban (soybean oil, groundnut oil, olive oil, palm oil, sunflowerseed oil, cottonseed oil, coconut oil, palm kernel oil, rapeseed oil, linseed oil, maize oil, sesame oil, and others)
Kyrgyz Republic	Export Tax (sunflowerseed oil and cottonseed oil, local currency 100/kg)
Myanmar	Export Ban (groundnut oil sesame oil)
Pakistan	Export Ban vegetable ghee and cooking oil
2009	
Argentina	Export Tax
India	Export Ban (soybean oil, groundnut oil, olive oil, palm oil, sunflowerseed oil, cottonseed oil, coconut oil, palm kernel oil, rapeseed oil, linseed oil, maize oil)
Indonesia	Export Tax (variable rate on palm oil from 0% to 25% and on palm kernel oil from 0% to 23% depending on reference price)
Myanmar	Export Ban (groundnut oil sesame oil)
Pakistan	Export Ban (removed)
2010	
Argentina	Export Tax
Belarus	Export Ban (rapeseed oil)
India	Export Ban (soybean oil, groundnut oil, olive oil, palm oil, sunflowerseed oil, cottonseed oil, coconut oil, palm kernel oil, rapeseed oil, linseed oil, maize oil) Export Ban (removed)
Indonesia	Export Tax (variable rate on palm oil and on palm kernel oil from 0% to 25% depending on reference price)
Kazakhstan	Export Ban (Soybean oil, sunflower seed oil, cottonseed oil, rapeseed oil, and linseed oil)
Myanmar	Export Ban (groundnut oil sesame oil)
2011	
Argentina	Export Tax
Belarus	Export Ban (rapeseed oil)
Indonesia	Export Tax (variable rate on palm oil from 0% to 13% and on palm kernel oil from 0% to 10% depending on reference price)
Kazakhstan	Export Ban (Soybean oil, sunflower seed oil, cottonseed oil, rapeseed oil, and linseed oil, then lifted)
Myanmar	Export Ban (groundnut oil sesame oil)

From 2009 to 2011, Argentina's export taxes on the various vegetable oils remained unchanged as did Myanmar's export ban on groundnut oil and sesame oil. In 2009, India continued its export ban but in Pakistan's case, the ban was removed. Indonesia applied variable export taxes on vegetable oils (palm and palm kernel). In the case of palm oil, the rate ranged from 0% to 25% and on palm kernel oil it ranged from 0% to 23% depending on the reference price. India continued the export ban on the various vegetable oils in early 2010 (eventually the ban was lifted later in the year), while Belarus banned exports of rapeseed oil and Kazakhstan banned exports of soybean, sunflower seed, cottonseed rapeseed, and linseed oils. Indonesia continued the variable export tax on palm oil and palm kernel oil.

For 2011, Belarus continued to ban rapeseed oil exports as did Kazakhstan. But, in Kazakhstan's case, the ban was eventually removed. Indonesia continued the variable export tax on palm oil and palm kernel oil, but the rate was lowered ranging from 0% to 13% on palm oil and from 0% to 10% on palm kernel oil depending on the reference price. Table 6 summarises the timeline and export measures taken by the various countries in the 2007 to 2011 period.

Market developments

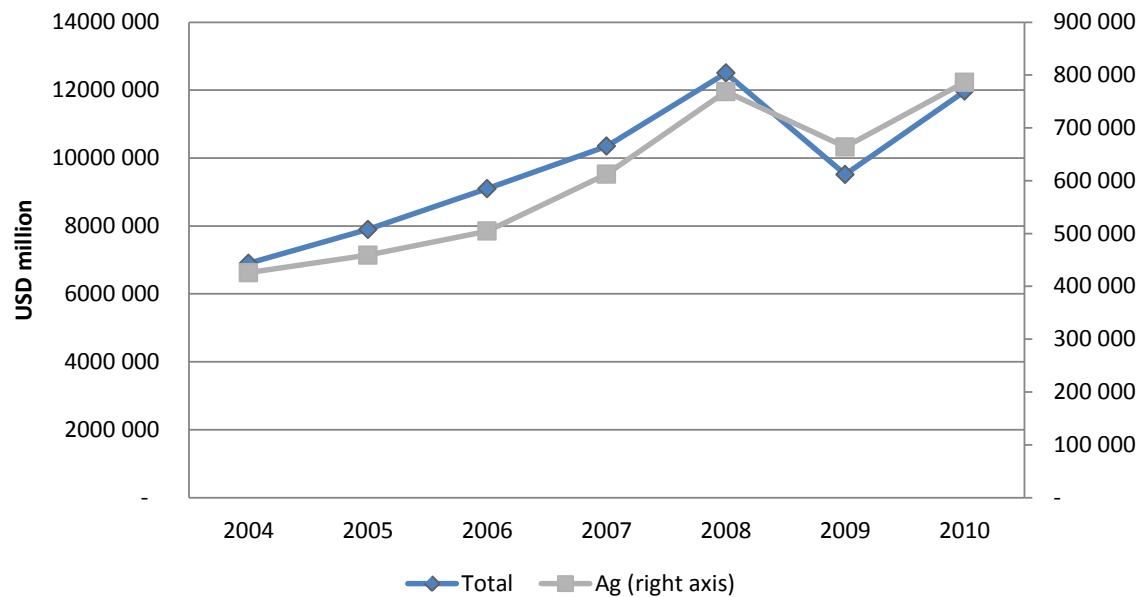
Overall trade

The inventory of the export measures that restrict exports occurred during the period of the financial crisis and the subsequent “great recession” which affected the overall economies of most nations. In addition to the policies captured in the inventory, several agricultural markets were negatively affected by several weather related incidences during the period such as draughts or floods in major producing regions that affected production. What were the resulting effects on trade?

From 2004 to 2008, total merchandise trade increased more than 80% from USD 6.9 trillion to USD 12.5 trillion.⁷ The onset of the financial crisis and subsequent recession in most developed economies resulted in almost a USD 3 trillion drop in trade (-24%) in 2009. Although merchandise trade rebounded in 2010, the level was still below the 2008 level (Figure 1).

The general economic conditions seem to have impacted the agricultural sector in a similar vein as total agricultural trade followed a similar trend. Between 2004 and 2007, total agricultural (as defined in the WTO) exports expanded by 80% from USD 426 billion to USD 768 billion (Figure 1). Agricultural trade seems to have been more resilient to the financial crisis. Although exports also fell in 2009, the magnitude was less severe, with a 13% drop in trade to USD 664 billion. Furthermore, the rebound in agricultural trade in 2010 was more robust, increasing 18% resulting in exports of USD 786 billion, USD 20 billion greater than in 2008.

Figure 1. Total merchandise and agricultural trade 2004 -2010



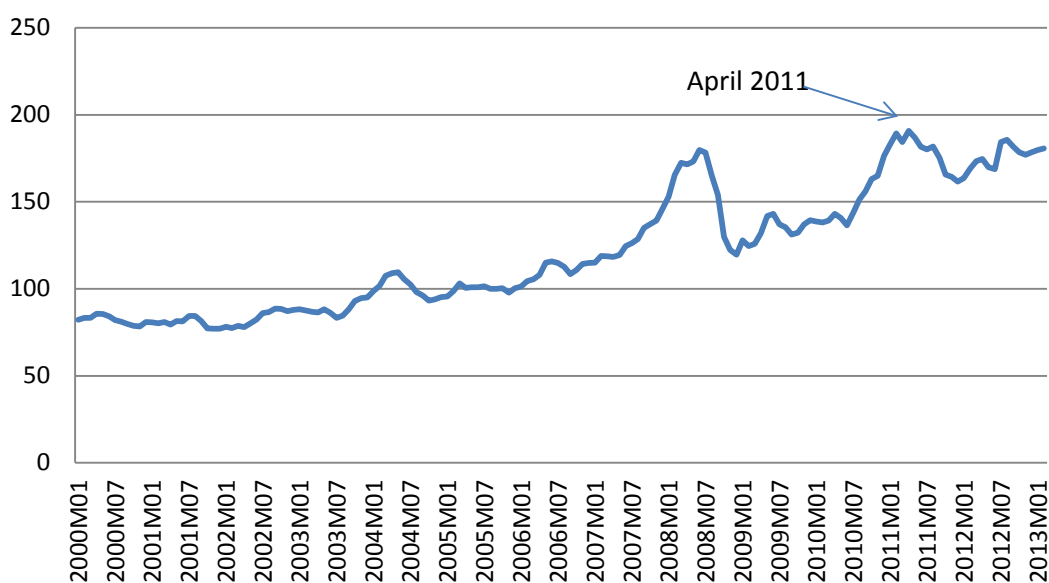
7. Trade data excludes intra EU trade.

Agricultural markets

World indicative price of selected products

Figure 1 provides a broad overview of developments in agricultural trade immediately before and during the period when various countries intervened in export markets. Another broad overview is provided by developments in food prices. Prices in agricultural markets, as in other commodities, have gyrated greatly since the mid 2000s. Food prices as revealed in the IMF's food price index, after remaining flat during the early 2000's started rising in 2004 slowly at first, but then climbed quickly from the end of 2005 reaching a peak on June 2008. After a few months respite, prices began to climb again in 2009 reaching a new peak in April 2011 before once again retreating somewhat (Figure 2).

Figure 2. Monthly Food price index January 2000 to July 2012

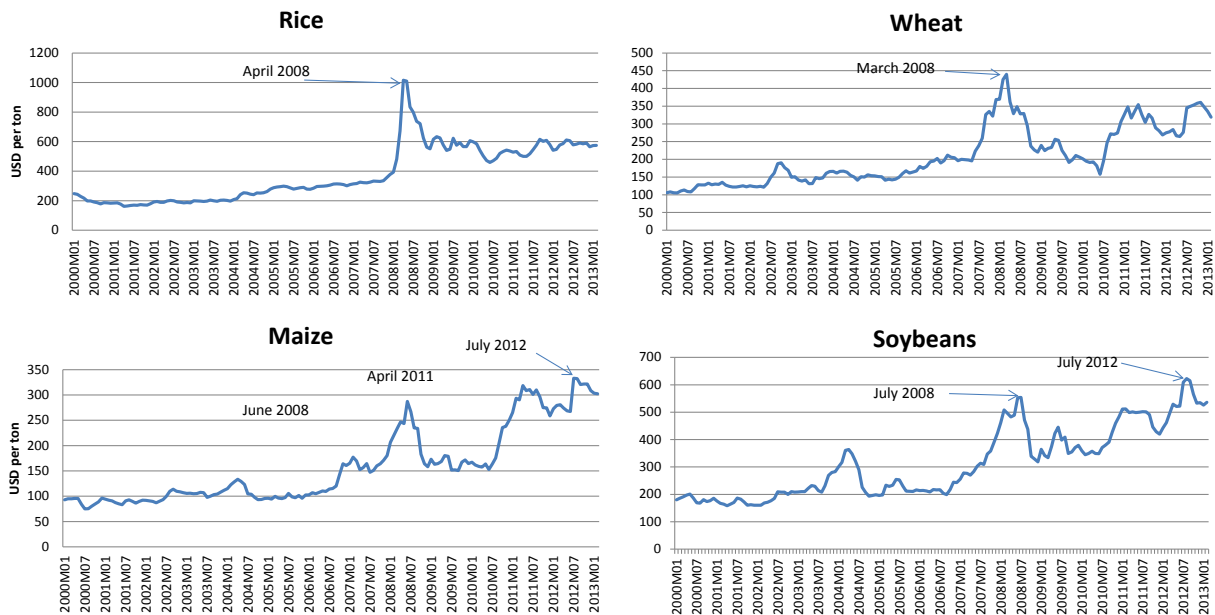


Source: IMF Primary Commodity Prices.

Export measures, as indicated above, have been applied by a variety of countries on a number of agricultural products potentially impacting food price developments. But, as suggested, major grains (rice, wheat, maize) and oilseeds (soybeans, sunflower seeds) and vegetable oils (soybean, palm, sunflower) are the products for which many of the countries applied various export restraining measures. These are also products that provide most of the calories to people in developing countries either directly or indirectly via feed to livestock. These are also among the more traded agricultural products in value and in the number of countries importing those products and they are also of interest to the Agricultural Market Information System (AMIS). Hence market developments discussion below is restricted to these products.

Monthly world prices for several commodities of interest since 2000 are shown in Figure 3. Rice, wheat, maize and soybean prices peaked in spring/summer of 2008. For rice and wheat, prices have since subsided. In contrast, the maize price peaked again in April 2011 and yet again in July 2012. Soybean prices also reached a new high in July 2012. The high price levels for maize and soybeans which have subsided since their 2012 peak, by most accounts, reflected the severe draught in the US during the spring/summer.

Figure 3. International rice, wheat, maize and soybean prices: January 2000 to July 2012

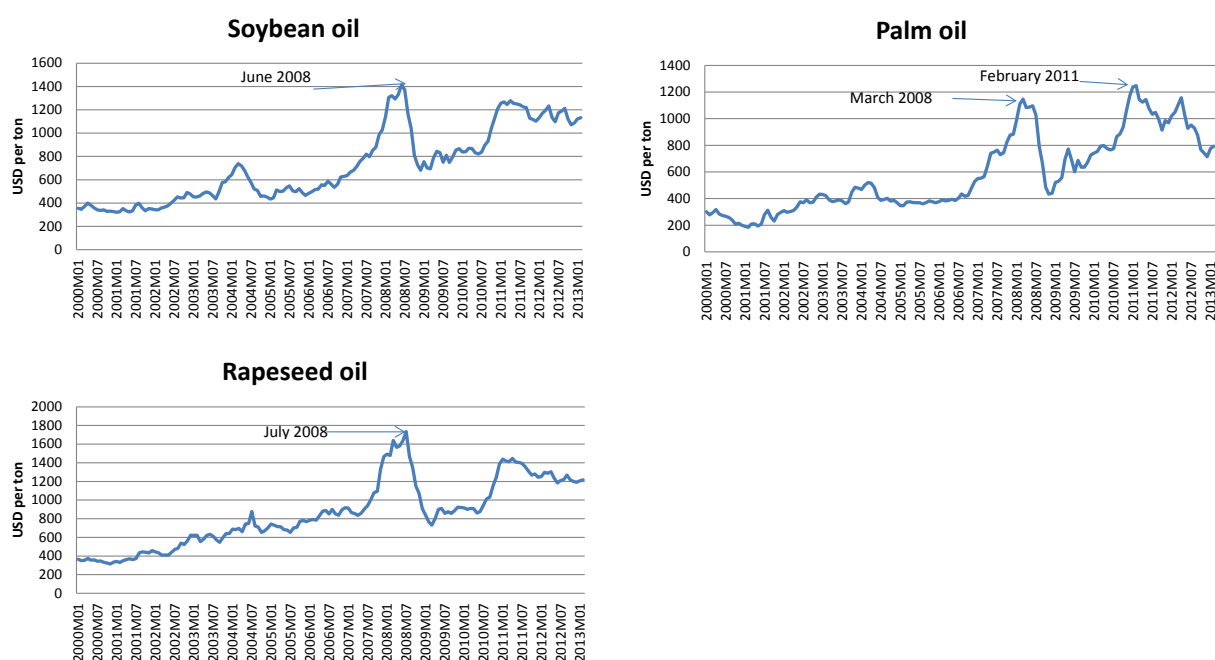


Source: IMF Primary Commodity Prices.

The run-up in prices from the beginning of 2007 was dramatic. The price for rice, wheat and soybeans more than doubled during this period and within a few months of each other, each commodity reached record highs. Wheat was the first commodity to reach record highs (in nominal terms) in March 2008 followed by rice which reached its record high in April 2008, while soybeans reached its record high (at the time) in July 2008. Prices for rice and wheat retreated since their historic highs, but have settled at higher plateau relative to the price level prior to the price run-up. The rise in the maize price was less dramatic reaching what was at the time a record high in June 2008, but its price continued increasing reaching new heights. And, as evidenced in Figure 3, prices not only exhibited an upward trend during this period, they were relatively volatile with large monthly price swings. For example, between March and April 2008, the rice price jumped almost 51%, only to retreat by 17% between May and June 2008. During the course of 2008, the rice price jumped from USD 393/ton in January to USD 1015/ton in April down to USD 551/ton in December. A contributing factor to the falling price in the rice market was the Japanese government's announcement that it would release rice from its stocks. The rapid price rises during 2007-08 was fuelled in part by the news that some developing countries - so as to slow the rise in domestic prices - were suspending their grain exports.

Vegetable oil prices followed similar price pattern as the crops shown above. Soybean oil and rapeseed oil prices respectively, reached new highs in June and July 2008 (Figure 4). Since, their prices have retreated but at a higher plateau than their pre-2007 levels. In the case of palm oil, its price also reached what was a new high in March 2008, but after a steep decline in the later part of 2008, its price began to climb again, reaching a new high in February 2011, after which they again subsided but at higher plateau.

Figure 4. International soybean oil, rapeseed oil and palm oil prices: January 2000 to July 2012



Source: IMF Primary Commodity Prices.

Many factors have been proposed for the jump in international prices during the 2007-2008 period (see for example McCalla (2009) and Trostle 2008), including export restrictions and other policy responses by various governments. According to most experts, export restrictions caused severe disruptions and collapse in confidence on international markets (FAO, OECD, et al 2011, Dollive 2008, Mitra and Josling 2009).

The first wave of rising prices saw social unrest in several countries (Trostle, 2008). Governments responded by instituting policies to insulate their consumers from rising food prices directly. The OECD surveyed the policy responses by ten developing or emerging economies for two basic commodities that provide the bulk of calories to their population (wheat and rice) (Jones and Kwiecinski, 2010) and carried out scenario analysis to assess impacts of three specific policy interventions - export taxes, consumption subsidies, and public stockholding (Thompson and Tallard, 2010). The first study found that Argentina, China, India, Indonesia, Russia, and Viet Nam introduced or increased export taxes or reduced export incentives while Ukraine imposed export quotas to limit the rise in food prices. Thompson and Tallard (2010) for the same set of countries using the Aglink-Cosimo model examined three scenarios including each country imposing an export tax to prevent a surge in domestic prices. They found that while such a policy can have a large effect in constraining the increase of domestic consumer prices, it typically has a smaller effect on quantities consumed.

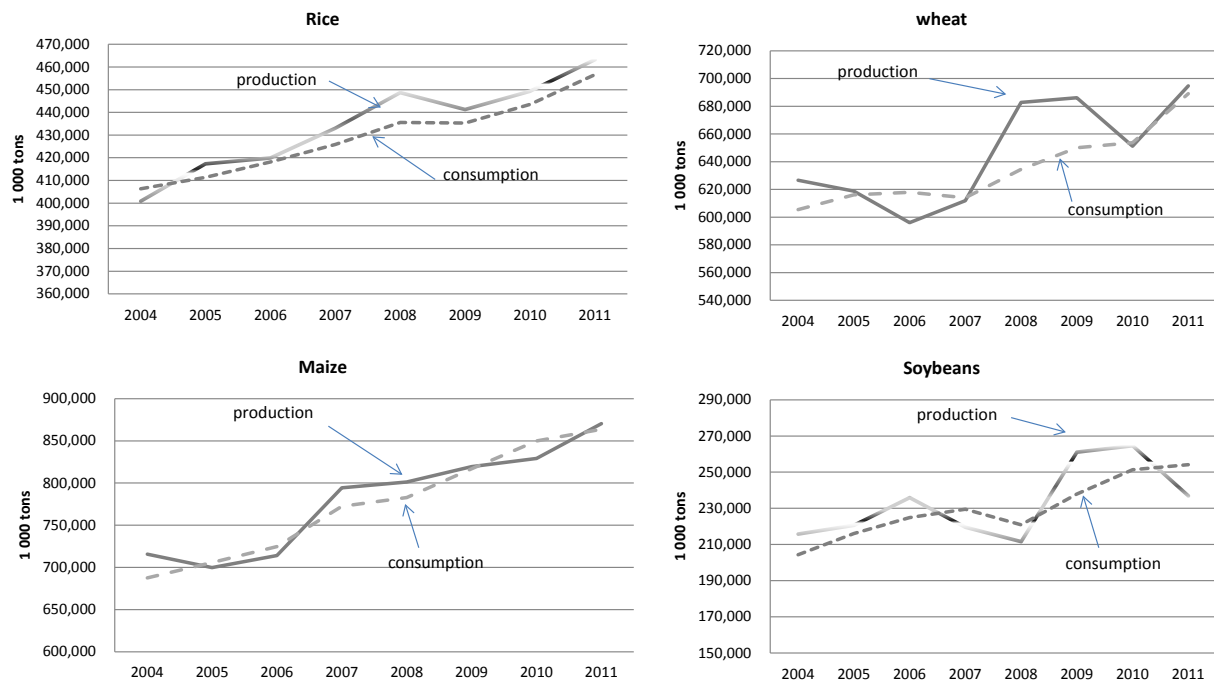
A variety of reasons, as mentioned above, motivate countries to impose export restrictions, including food security concerns, reduce inflation in food prices during periods of rising international prices, or to promote downstream industries through lower input prices. But, sudden export restrictions evidently can contribute to spikes in international food prices. They thus add to the cost of supply or demand shocks to food buyers in the rest of the world. Typically they are also not in the economic interests of the countries imposing them, as there are almost always more-efficient ways to achieve the stated objectives of the restriction. Moreover, they are of concern to all trading nations because they reduce the stability and

predictability of trade opportunities. Hopefully, the inventory, through the information provided on export measures by significant exporters, will enable researchers to shed light on the topic.

World production and consumption

Prices are a reflection of demand and supply. What has been the evolution of production and consumption of the selected commodities during the period? Worldwide, both total production and consumption of each commodity increased. For the selected crops, production, especially for wheat exhibited greater variability than consumption (Figure 5). On the global scale, production mostly kept pace with consumption exceeding consumption in most years suggesting ample supplies. During the 2004-11 period, rice consumption exceeded production only in 2004 with production greater than consumption in each of the following years. Consumption exceeded production suggesting upward price pressure in 2007 and 2008 in the soybean market, in 2006, 2007 and 2010 in the wheat market and in 2005, 2006, 2010 and 2011 in the maize market. The maize and wheat markets were simultaneously under upward price pressure with demand exceeding production in 2006 and again in 2010. Although production exceeded consumption in most years, Figure 5 illustrates that in most years, the markets were relatively tight.

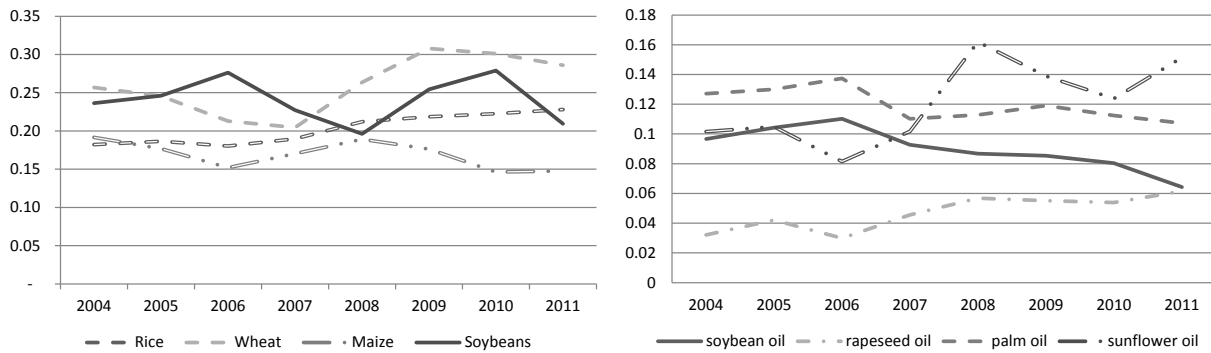
Figure 5. Total production and consumption of selected crops: 2004-2011



Source: USDA, FAS, PS&D.

At this level of aggregation, differences between production and consumption (including trade) get reflected into changes in inventories with stock build-up when production exceeds consumption and stock draw-down when the reverse occurs. Stockholding during the period was variable for each crop. Compared to average ending stocks in 2004 to 2006, rice and wheat, stock holding mostly expanded with ending stocks in 2011 above 2004-2006 average levels. That was not the case for maize and soybeans. The variability of stockholding is reflected in the stocks to use ratio which is mostly higher for wheat and rice but not for maize and soybeans (Figure 6).

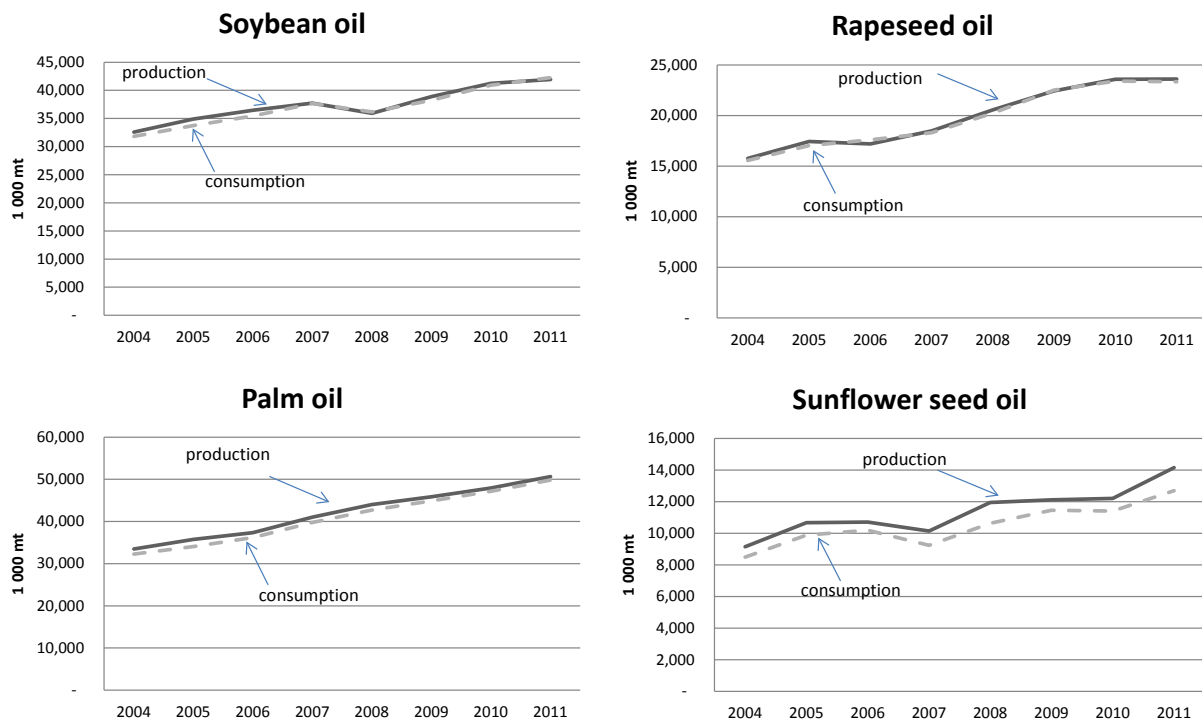
Figure 6. Stocks to use ratio for selected commodities: 2004-2011



Source: USDA, FAS, PS&D.

Production and consumption of each of the selected vegetable oils also expanded during the period (Figure 7). These markets indicate that conditions were tight with relatively small difference between production and consumption, with production exceeding consumption in most years.

Figure 7. Total production and consumption of selected vegetable oils: 2004-2011



Source: USDA, FAS, PS&D.

Excess production relative to consumption, in most years, resulted in greater rapeseed, sunflower seed and palm oil ending stocks. Soybean oil ending stocks however, after peaking in 2006, fell in subsequent years. Given lower stocks and higher consumption, soybean oil stocks to use ratio declined, as did palm oil, even while ending stocks grew during the period. For rapeseed and sunflower seed oil, stock holding expanded faster than consumption leading to rising stocks to use ratio (Figure 6).

Production of each crop, probably reflecting natural resource endowments, is highly concentrated. For example, the top ten rice or maize producing countries provide about 85% to 86% of world’s total while the ten leading wheat producers account for about 83% of the total. Soybean production is the most concentrated of the four crops with the top ten producers providing almost 98% of the total. Countries in the inventory, Argentina, China, Kazakhstan, India, Pakistan, Russia, Ukraine and Viet Nam are among the leading producers of one or more of these crops.

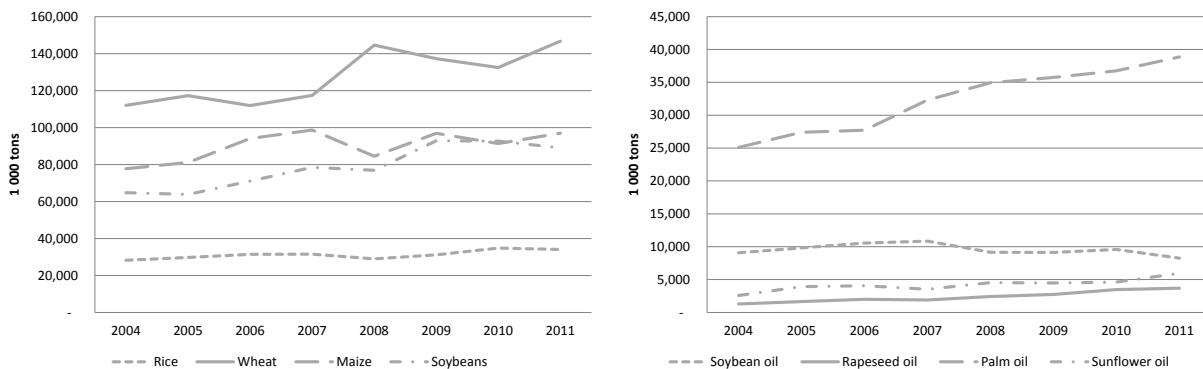
Vegetable oil production is also heavily concentrated with the ten leading producers providing about 93% of world supply of soybean and sunflower seed oil. Production of rapeseed and palm oil is even more concentrated with the leading ten producers supplying at least 96% of world’s total. Among the leading ten producers of one or more of these products are Argentina, China, India, Indonesia, Pakistan, Russia and Ukraine.

Total exports of selected products

What were the trade developments during this time? To provide an overview of the state in world markets, data on total exports are presented. In order to abstract from price developments, total exports of each of the selected products are initially provided in physical units. Rice is the least traded of the four crops averaging about 31 million tons a year during this time and wheat is the most traded with an average of more than 125 million tons. Most of the rice is consumed where it is produced and during the eight-year period, on average, 7% of production was traded. At the other end of the spectrum, about 35% of soybean production was traded each year.

Exports during this time have an upward trend (Figure 8). But in 2008, the year when several countries applied measures in their respective export markets of various products, exports of soybeans were more than 2% below their 2007 level rice exports were almost 9% below their 2007 level while maize exports were more than 14% below the 2007 level. Exports of wheat followed a somewhat different pattern reaching a peak in 2008. Since then, wheat exports have fallen although still higher than pre-2008 levels.

Figure 8. Exports of selected products in physical units: 2004-2011



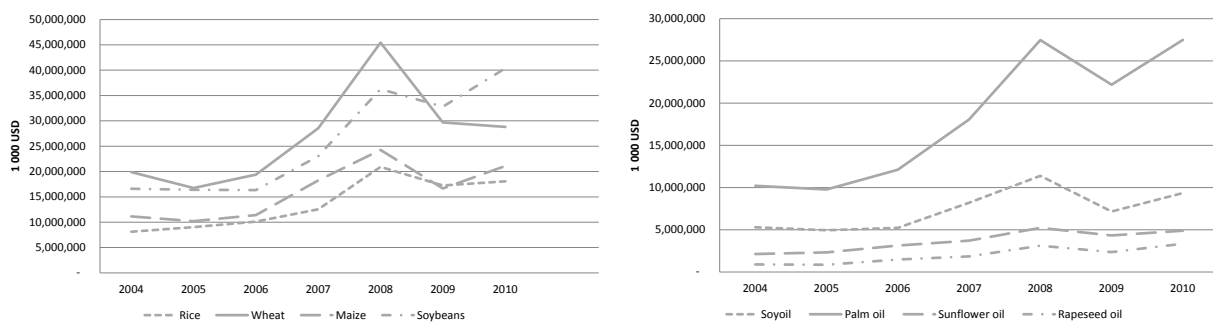
Source: USDA, FAS, PS&D.

In the vegetable oils markets, exports of palm oil are an order of magnitude greater than exports of the other vegetable oils. As illustrated in Figure 8, the volume of exports expanded during the period except for soybean oil which declined somewhat starting in 2008. Not only is palm oil trade greater than the other vegetable oils in absolute terms, it is also the oil mostly consumed in a country other than where it was produced, with about 75% of production crossing international borders to reach its consumers. Consumption of the other vegetable oils occurs mostly domestically but at varying degrees with rapeseed oil the least traded.

However, the share of rapeseed production that's exported has increased substantially during the period, doubling from 8% in 2004 to 16% in 2011. The share of sunflower oil production traded has also increased somewhat while that of soybean oil has declined with more of the production remaining in the domestic market.

Does the inclusion of prices, the value partners place on the varieties exported, alter the trade patterns? Using the BACI data⁸ (Gaulier and Zagnago 2010) which is bilateral trade data detailed at the HS6 digit level and focusing on the total value of trade for the selected commodities one observes that among the crops, wheat trade is not as dominant as suggested by trade in the physical units, nor is rice trade as lowly as suggested. Figure 9 illustrates that soybeans rather than maize is the second most valuable traded commodity and in 2009 surpassed wheat to become the most valuable of the four crops (compare Figure 9 to Figure 8). Thus, for the selected crops, trade in value terms reveals a somewhat different pattern compared to trade measured in physical units. For example, in 2008, rice, maize and soybean trade in physical quantities was below the 2007 level whereas in value terms, reflecting the higher prices, the value of exports reached new high for each commodity. In contrast, exports in physical units increased for each of the three commodities in 2009, but the value of those exports fell as prices declined in that year. Note however, that the export pattern exhibited by each of the selected crops tracks closely total agricultural exports (Figure 3) suggesting that in addition to commodity specific events, general conditions are also important drivers.

Figure 9. Value of exports of selected products: 2004-2010



Source: Author's calculations from BACI (International Database at the Product Level).

For the selected vegetable oils, the value of their exports tracks their respective export volumes with palm oil, by far; the most valuable exported vegetable oil. Note that even though export volumes were generally higher in 2009 compared to 2008, the value of those exports fell tracking the overall fall in the value of all agricultural and merchandise trade for that year.

8. BACI data start with UN COMTRADE data and treats them to reduce inconsistencies.

The data in physical units indicate that exports are even more concentrated than production with a handful of countries dominating exports. For example, the leading 10 rice exporting countries shipped more than 90% each year. Among the countries in the inventory with export interventions in the rice market, India, Pakistan and Viet Nam are consistently among the ten leading exporting countries. China was in that group until falling out in 2010 and 2011 while Argentina dropped out of the top ten exporting countries in 2007 to 2009 and rejoined again in 2010. Egypt was in this category from 2004 to 2007 and again in 2009 while Myanmar was among the ten leading exporters in 2007 to 2008 and again in 2010 to 2011.

The international wheat market is also dominated by relatively few countries. The leading ten (in volume terms) wheat exporting countries supplied about 94% of world's wheat exports during this time. Among the countries in the inventory with export measures in the wheat market in any year during the period, Argentina's, Kazakhstan's and Russia's exports rank among the leading ten exporting countries each year while Ukraine's exports were sufficient to rank among this group except in 2007. India's exports were sufficiently high to belong to this group only in 2004 while China's wheat exports placed China among the leaders from 2005 to 2007, and Pakistan's export volumes were sufficient to rank among the top ten countries in 2007 and 2008.

The top ten maize exporting countries dominate the world market, shipping, depending on the year, 95% to 97% (in physical units) of the total maize moving internationally. Argentina and Ukraine were among the leaders each year and India joined the group for one year only (2005) and Russia entered the ranks in 2008 and again in 2011. China was among the leaders through 2007 but since has not exported sufficient volumes to rank among the ten leading exporters. Since 2006, China's maize exports have plummeted. Ukraine's exports exhibited an increasing trend during the period while Argentina's exports increased substantially after 2008.

As was the case for soybean production where it was dominated by the ten largest producing countries, soybean exports are dominated by the ten largest exporting countries providing essentially 100% of exported volume. Importantly, the top four to five exporters provide more than 95% of the international supply. A country can be among the leading ten exporting countries with a market share less than one-tenth percent. Of the countries in the inventory taking export measures in the soybean market, Argentina, China and Ukraine are among the ten leading soybean exporting countries, but other than Argentina, they are not significant exporters. Combined, the exports from China and Ukraine often provide less than 1% of world total.

Vegetable oil exports are perhaps even more concentrated than the selected crops. In any year, the leading ten exporters of each of the selected vegetable oils exported at least 95% of world volume. Of the countries in the inventory with any export measure during the period, Argentina was the leading exporter of soybean oil in each year with more than half of all exports. Rapeseed oil exports are dominated by a single country, Canada, supplying more than 60% of traded volume in any year. Among countries in the inventory, Belarus' export volume each year resulted in placement among the top ten exporters, providing about 1% of world total in any year, while India exported sufficient volume in 2009 and 2010 to place among the leaders, while supplying less than 1% of world total. Ukraine and Argentina top the list of top ten exporters of sunflower seed oil, together providing more than 60% of world's total in any year. Other than Argentina, none of the leading exporters are in the inventory of countries taking export measures. Exports of palm oil are dominated by two countries; Indonesia and Malaysia, together supplying more than 80% of traded volume in any year. Indonesia is the only country among the leading exporters that intervened in the palm oil export market.

On the import side, the data suggest that the markets are less concentrated as importers are more numerous with smaller shares. Although from different data, the bilateral trade data from BACI was used by Liapis (2012) to calculate the Herfindahl index to measure market concentration of exporters or importers of various products. The results indicated that export markets are more concentrated than import markets. The implication is that many more countries rely on world markets for their imports compared to the number of exporters supplying their needs. Disruptions in the export supply from any provider have the potential to adversely affect a large number of importers. This is more so when, as indicated above, several exporters intervened in the same year.

Although discussed in more detail below, the data presented above suggest that in most cases, the total volume exported did not shrink during the periods of export intervention. Most of these markets are dominated by few major suppliers many of whom did not restrict their exports. Furthermore, of the countries in the inventory taking measures in specific markets, their interventions did not sufficiently restrict their exports relative to total traded volumes and they remained among the leading ten exporting countries. It may still be the case however, that specific importers may have been adversely affected if their traditional supplier restricts access to their market.

Collective production and export share of countries with export measures

The data thus far presented an overall picture of developments in world markets and this may mask some important information for individual countries. What can be said about specific effects for the countries applying export measures on specific commodities during the relevant period? Since in each year, several countries applied export measures on the same commodity, it may be more informative to focus on the combined effects of their policies on their exports, while taking into account their domestic supply and by inference potential export supply (Annex II reports developments for individual countries in selected markets).

Table 7 reports for the selected commodities, the number of countries taking export measures in a year the number of actions taken collectively (each action is counted whether it is more or less liberalising), the average share of production (exports) during the three year period prior to the time most countries began their interventions (2004-2006) and the average share of those same countries in the year they intervened. A three year average is chosen to represent the pre-intervention base production and exports to reduce climatic and other particularities of any one year.

For example, for the year 2008, eight countries took 149 actions in their respective rice export market. On average, production by those eight countries in the base (2004 to 2006) accounted for 71% of total production, and the share of rice production in 2008 for those 8 countries was also 71%. Table 7 also shows that exports from the eight countries averaged 52% of total trade in the base and it was 48% of total trade in 2008. It appears therefore that in 2008, these eight countries maintained their share of world production relative to the base but even though total rice exports were below the base, exports from the eight countries in 2008 fell even more leading to a four percentage point reduction in their export share.

Similarly, eight countries also intervened in their wheat market, taking 34 actions. In 2008, these 8 countries accounted for 48% of world's total wheat production, compared to 46% average share in the base. But, even with the interventions in their respective export market, the eight countries provided 33% of total exports in 2008, a three percentage point increase relative to their share in the base. Recall from Figure 8 that total wheat exports were higher in 2008. The higher share indicates that exports from the eight countries that imposed export measures expanded more than exports from other countries.

Table 7. Number of countries, actions and collective share of production and exports

2007						
	Number of countries	Number of varieties/actions	Average share of production 2004-2006	Share of production 2007	Average share of exports 2004-2006	Share of exports 2007
rice	3	44	0.27	0.28	0.34	0.31
wheat	5	39	0.28	0.29	0.24	0.24
maize	1	6	0.03	0.03	0.16	0.15
other grains	2	11	0.09	0.08	0.18	0.18
soybeans	1	5	0.19	0.21	0.13	0.18
other oilseeds	1	13	0.05	0.07	0.03	0.03
vegetable oils	3	88	0.29	0.29	0.44	0.43
2008						
	Number of countries	Number of varieties/actions	Average share of production 2004-2006	Share of production 2007	Average share of exports 2004-2006	Share of exports 2007
rice	8	149	0.71	0.71	0.52	0.48
wheat	8	34	0.46	0.48	0.30	0.33
maize	3	15	0.25	0.28	0.23	0.16
other grains	3	20	0.12	0.12	0.26	0.31
soybeans	2	9	0.26	0.22	0.14	0.08
other oilseeds	2	5	0.13	0.07	0.05	0.03
vegetable oils	4	100	0.28	0.10	0.41	0.42
2009						
	Number of countries	Number of varieties/actions	Average share of production 2004-2006	Share of production 2007	Average share of exports 2004-2006	Share of exports 2007
rice	5	66	0.54	0.52	0.25	0.13
wheat	3	21	0.3	0.34	0.12	0.05
maize	1	1	0.03	0.03	0.16	0.17
other grains	2	19	0.05	0.05	0.19	0.21
soybeans	2	5	0.26	0.27	0.14	0.14
other oilseeds	1	4	0.05	0.04	0.03	0.03
vegetable oils	3	40	0.11	0.10	0.14	0.09
2010						
	Number of countries	Number of varieties/actions	Average share of production 2004-2006	Share of production 2007	Average share of exports 2004-2006	Share of exports 2007
rice*	6	74	0.28	0.28	0.38	0.31
wheat	7	19	0.29	0.3	0.24	0.17
maize	4	7	0.04	0.05	0.18	0.21
other grains	4	14	0.14	0.12	0.37	0.34
soybeans	2	2	0.19	0.19	0.13	0.1
other oilseeds	3	9	0.04	0.05	0.01	0.03
vegetable oils	5	59	0.27	0.30	0.41	0.40
2011						
	Number of countries	Number of varieties/actions	Average share of production 2004-2006	Share of production 2007	Average share of exports 2004-2006	Share of exports 2007
rice*	3	8	0.04	0.04	0.05	0.05
wheat	6	10	0.13	0.15	0.22	0.31
maize	3	5	0.04	0.06	0.18	0.3
other grains	3	15	0.14	0.16	0.37	0.5
soybeans	2	3	0.19	0.19	0.13	0.1
other oilseeds	4	18	0.09	0.1	0.04	0.03
vegetable oils	4	51	0.22	0.27	0.41	0.4

Each hs code counts as an action and each time an action is taken is counted whether more or less restrictive. In the case of Argentina assume tax continues if no other information is given (although not included in the database).

* Information for rice in 2010 and 2011 excludes China since effects of export license not clear.

In any year, average share of production or exports for 2004-2006 refers to countries with policies in that year. Data for other oilseeds include cottonseed, rapeseed, sunflower seed and palm kernel depending on the country and year.

Data for vegetable oils include soybean oil, rapeseed oil, sunflower seed oil, coconut oil, palm kernel oil, palm oil, cottonseed oil depending on the country and year.

Data is not available for all relevant commodities for all countries.

This is not the case for 2009, however. Production of the four countries⁹ that took 66 measures in their rice export market averaged 54% of world total in the base. In 2009, production share of these four countries fell slightly to 52% of world total. Their exports however were substantially lower in 2009 compared to their base average, falling some 12 percentage points from 25% of world total exports in the base to 13% in 2009. In contrast, total rice exports were higher (Figure 8). Given the small decline in relative production and the relatively large fall in export share, a casual inference is that the export measures may have contributed to the lower export share for these countries.

The wheat market was similarly affected in 2009. The three countries with export measures in 2009 had a 30% share of world wheat production, the same as in the base. In contrast, their share of the export market was 8 percentage points lower to 4% of the export market in 2009. As indicated in Figure 8, total wheat exports in 2009 were greater than in the base. Lower export share by the three countries with export measures even with stable share of world wheat production, implies that production shortfall may not have contributed to lower exports, rather, export measures may have played a role.

It seems that in the rice and wheat markets, the countries applying export measures in 2008 and 2009 were collectively large producers and traders during the pre-intervention period. But it is not clear what impact their actions had on their exports. In three of the four cases presented above, export share fell relative to the base, but in the other case, export share rose while production shares either increased or remained the same. Similarly, it is difficult to generalise on the effects of the interventions to other years or products given the data. Table 7 illustrates that in some years and for some products, the countries intervening in their export markets, collectively, produced a relatively large share of world total and provided a large share of world's exports. In other years or for other commodities, the intervening countries collectively were relatively small producers and traders. During the five years from 2007 to 2011, countries with any kind of export measure on the selected products depicted in Table 7 experienced production declines in the year in which they took the action of at least one percentage point compared to the 2004 to 2006 average production a total of eight times. In five of those eight times, their export share was lower in the year the action was taken compared to their 2004-06 average. In two cases, the export share was the same in both periods and in the other, export share expanded somewhat. In 17 cases, average production of the countries taking action in that year was at least one percentage point above their 2004-06 average. In seven of those cases, however, even with higher production, their share of exports in the year was below their 2004-2006 average. In two cases, the export share was the same, with the remaining eight cases showing export share above the 2004-2006 average. Annex II provides a more detailed description of developments in individual countries.

In general, it is difficult to assert with any certainty that export restrictive measures by the countries in the inventory lowered exports of the selected crops. Assuming that their 2004 to 2006 average market share is representative of their market share absent export restrictions, Table 7 indicates that collective export shares in any year were either higher, lower or the same as the average during 2004-2006 and the resulting export shares seem independent from whether the collective production of the countries imposing restrictions were lower, higher or the same as the representative years. A possible exception is the world rice market where data in Table 7 and Annex II suggest a possible link between export restrictions and export volumes. This is examined in more detail below.

9. Data for Indonesia are excluded because Indonesia is a large net rice importer and information indicating how or whether the licensing mechanism affected its exports is lacking.

Do export restrictions reduce exports?

The previous section and Annex II suggest that in addition to the export restrictive measures that affect export levels, there were concurrent changes in production and consumption as well as changes in ending stocks that confound the effects of the export measures on exports. Based on the information from Tables 3 and 4 the relationship between export restrictive measures and physical exports is estimated while controlling for a country's exportable surplus (production minus consumption) and ending stocks.

The three crops with relatively frequent interventions by countries in the inventory - rice, wheat and maize - are selected for this exercise for the period 2004-11. Export measures are represented by a zero-one dummy variable which takes on the value of one when a country imposed any of the export measures found in the database in that year for that crop and zero otherwise.¹⁰ The zero-one dummy to mark whether export restrictive measures were taken may be a crude indicator as it does not discriminate among the various instruments and it assumes that the measures were in place for the entire year. Given that production, consumption, stock and trade data are annual a more refined indicator was not possible. It is expected that exports increase with exportable surplus and decrease when export measures are used. Larger ending stocks are also expected to lower exports.

Table 8 reports the regression results based on observations from the countries in the inventory that applied at least one export restrictive measure at least one time during the period. The resulting number of observations reported in the table range from 48 for maize to 88 for wheat and is a reflection of the number of countries in the inventory with restrictive measures for that crop. Numbers in parenthesis below the estimated coefficients are robust standard errors. The explanatory power of the estimated equations is fairly strong, especially for maize exports, as evidenced by the adjusted R^2 . Reading across the first row, the results suggest that regardless of the crop exportable surplus is highly significant statistically and numerically. Having an additional 1 000 tons in exportable surplus, holding everything else constant, increases wheat exports by 622 tons, rice exports by 713 tons or maize exports by 857 tons. The estimated coefficients suggest that at the sample mean, a 10% increase in exportable surplus leads to a 4.8% increase in wheat exports, a 7.5% increase in rice exports and 8.8% increase in maize exports. The results also suggest that when controlling for exportable surplus and export restrictions, ending stock levels do not materially impact exports of any of the three crops. Furthermore, the export restrictive measures imposed on wheat and maize did not significantly reduce their exports when controlling the level of exportable surplus and ending stocks. But, export restrictions on rice significantly reduce exports. On average, rice exports are some 653 000 tons less when restrictions are imposed. This finding is consistent with the discussion above and in Annex II.

10. Except in cases where the only restriction is licensing and information on potential impact on exports is not evident. For those (few) cases, the policy indicator dummy takes on the value of zero.

Table 8. Effects of export measures on exports

	Rice	Wheat	Maize
Exportable surplus	0.713***	0.622***	0.857***
	-0.10	-0.06	-0.07
Ending stocks	-0.01	-0.04	-0.03
	-0.01	-0.03	-0.04
Export measures	-652.991**	164.73	-34.80
	-253.82	-599.81	-532.72
Constant	809.684***	1,997.901***	714.25
	-255.18	-336.87	-427.29
Adjusted R ²	0.75	0.73	0.82
Number of observations	64	88	48

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

The results from this exercise indicate that when controlling for exportable surplus and ending stocks, export restrictive measures did not significantly alter overall wheat or maize exports from the countries imposing those measures. This was not the case for the rice market however where the results suggest that overall exports from the countries imposing export measures was reduced. This finding supports conjectures made elsewhere in the report¹¹.

World unit values

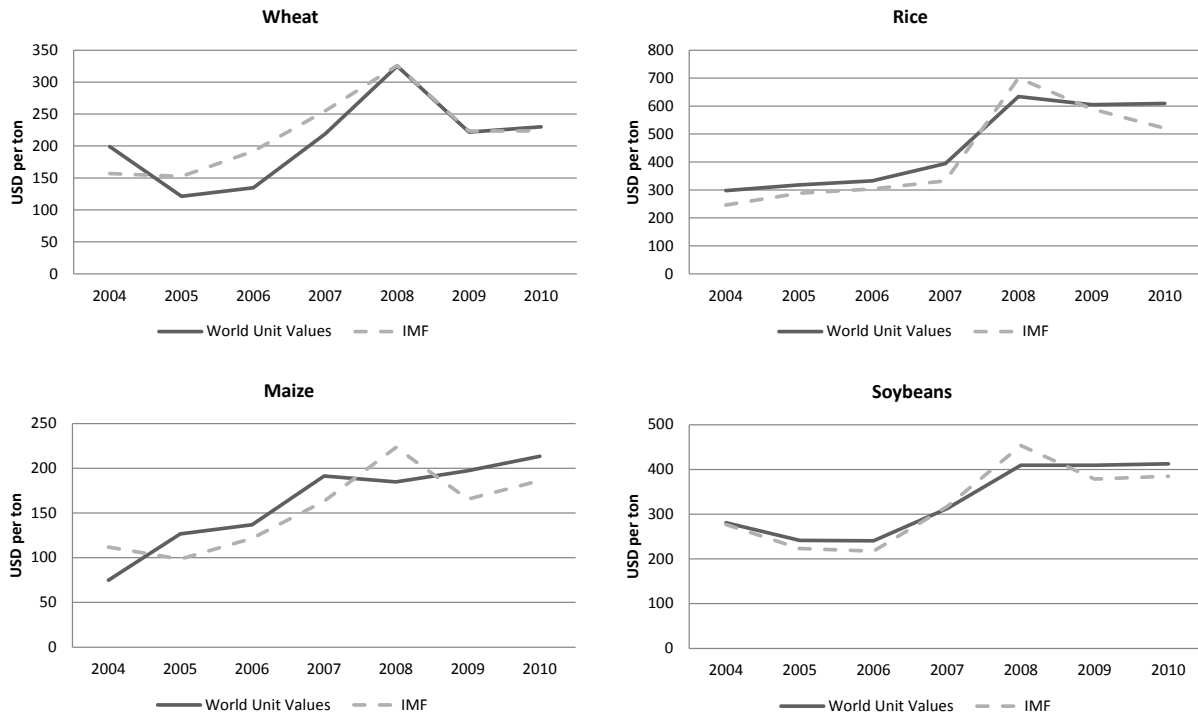
Above, data was presented on monthly world prices of selected commodities as one indicator of developments in world markets. Those prices are indicative of a specific variety in a given location. Although informative, they do not provide information on how different importers value the varieties of their various partners. As noted above, countries import many varieties from different origins and prices vary depending on source and variety as the unit values take into account the various varieties individual countries export to each of their partners reflecting the degree to which partners differentiate among the various suppliers. What is the average price that exporters receive for their goods and is there a discernible pattern before, during and after an exporter imposed export measures?

Using the BACI bilateral export data average unit values which are freight on board (fob) prices were calculated for each of the selected products representing world prices (from all origins to all destinations). These are compared to the respective world indicative price provided by the International Monetary Fund (IMF) for similarities or differences. Additionally, average unit values for each of the selected products in each relevant exporter are computed. How does the fob price of a country imposing an intervention in a crop in a given year compare to the average world fob value? Unfortunately, the unit values are based on annual trade data and thus miss the drastic changes in monthly prices seen above. But, they do reflect the average price developments during the year. In order to make the two price series comparable, an annual average is calculated from the IMF monthly data. Figure 10 provides the reader a sense of the similarities or differences between the world unit values

11. Results (not reported but available on request) based on observations from all exporting countries including those that never employed export restrictive measures indicate that export restrictive measures did not reduce overall exports of any of the three crops.

calculated from the bilateral trade data and the IMF world indicative price for the selected crops.

Figure 10. World unit values and world indicative price of selected crops



Source: Author's calculations from IMF and BACI.

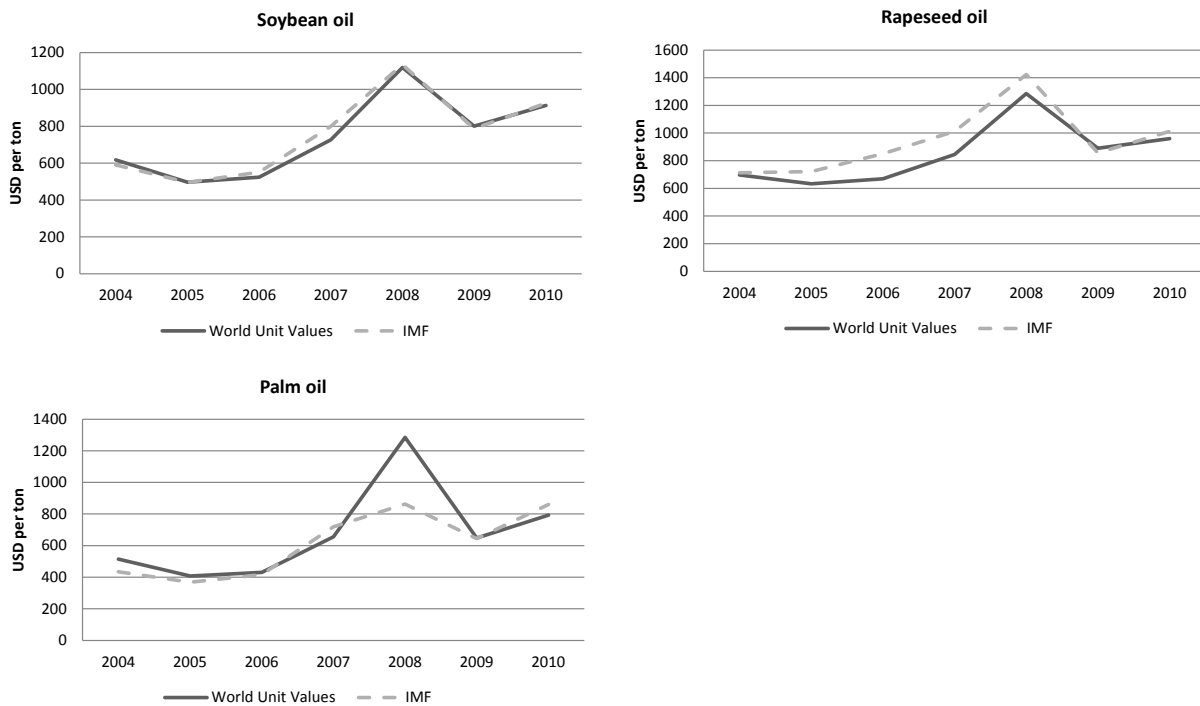
For the four crops, the magnitude of the price in any year, although not the same, are fairly close (except for the wheat price from 2005 to 2007), but more importantly, the pattern is the same, both prices rising or falling at the same time, except for maize price which diverges in 2008 and 2009.¹²

The magnitude of the two world prices of the selected vegetable oils also differ somewhat but as for crops, the two price series track each other pretty closely exhibiting rising, falling and peaking in the same year (Figure 11),¹³ thus indicating that world unit values are a reasonable proxy for the indicative IMF prices. The advantage is that they provide exporter specific information on the average price received on their exports to the various destinations.

12. The correlation coefficient between the two price series is .78 for maize, .87 for wheat, .96 for soybeans and .97 for rice.

13. The correlation coefficient between the two price series is .84 for palm oil, .94 for rapeseed oil and .99 for soybean oil.

Figure 11. World unit values and world indicative price of selected vegetable oils



Source: Author's calculations from IMF and BACI.

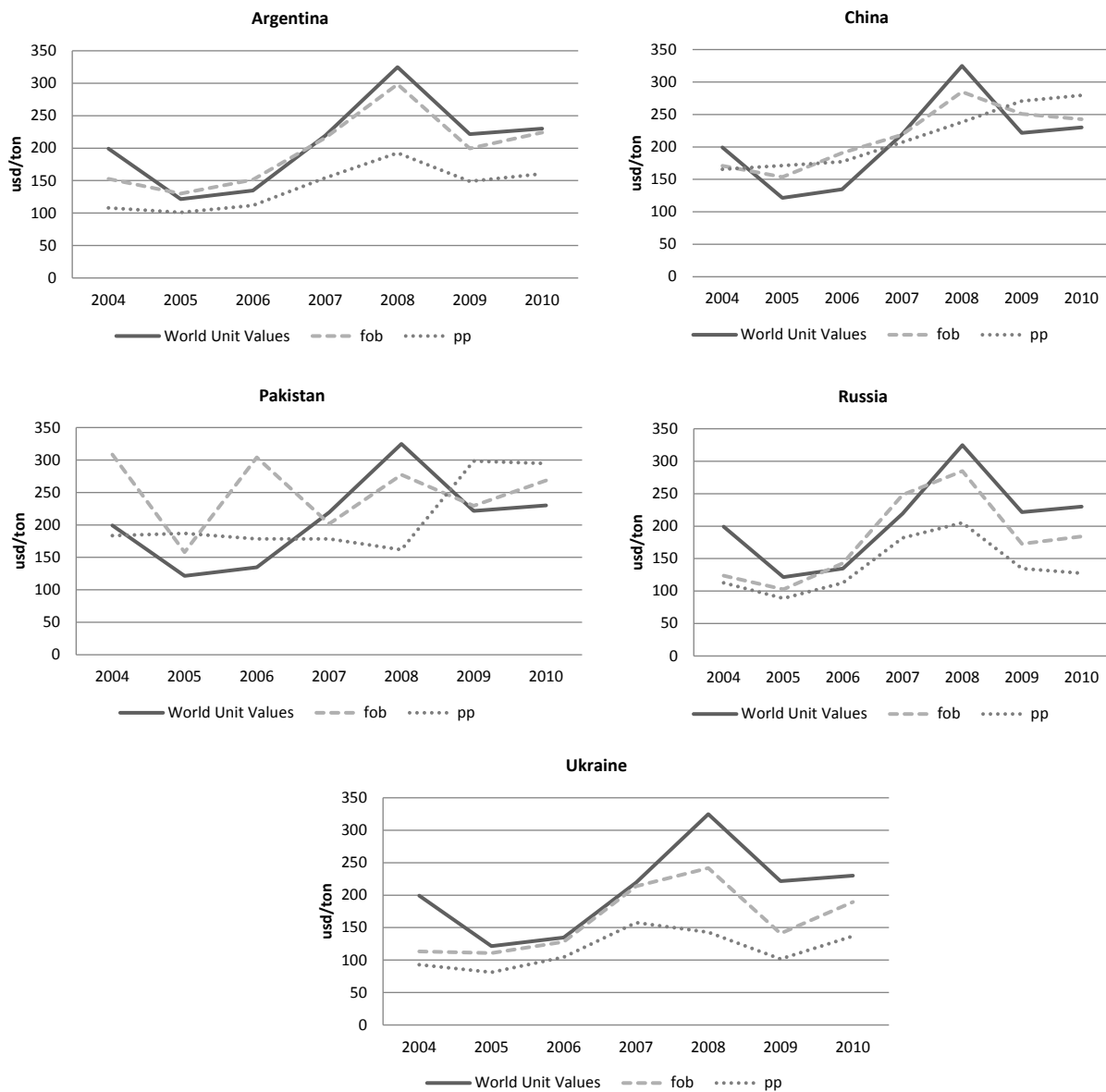
Country specific export and producer price of selected commodities.

First principles suggest that when “large” countries” relative to world markets restrict their exports world prices are higher than they would have been otherwise. When the intervention of choice is an export tax or a binding export quota which is equivalent to an export tax, a “large” exporter can benefit from improved terms of trade through higher prices. In the domestic market, prices should be lower than the world price, regardless of the size of the country imposing the restriction. Export bans on the other hand are efforts to isolate a market and delink it from developments in the world market.

In addition to calculating individual exporter unit price, producer price information from the FAO (when available) is used to provide information on producer price as well. Again, relying on first principles, the producer price should be lower than the export (fob) price since there’s transportation and other handling cost to get the product to the port and onboard the ship whereas the producer price is at the farm gate or point of initial sale. It is not clear *a priori* for any one country whether its export price should be above or below the world average as it depends on the demand for the exporter’s variety.

Wheat

How have the average fob and domestic prices of selected countries that imposed export measures compare to world average before during and after their actions? In the world wheat market, of the countries in the inventory that intervened in their wheat market at any time during the relevant period, Argentina, China, Pakistan, Russia and Ukraine were relatively large exporters during at least one of the relevant years. Focusing on the larger exporters reduces the possibility of small shipments biasing the calculated average fob price.

Figure 12. Average world fob price and fob and producer price of selected countries: Wheat 2004-2011

Source: IMF, BACI and FAO.

Except for the case of Ukraine where its fob price was consistently below the average world unit value, the fob price of the other countries varied from below to above the world's average depending on the year. In 2007, all countries other than Russia exhibited unit values below the world average. Russia's export price however for the following three years was at least 10% below the world's average. In 2008, the fob price of the relevant countries was anywhere from 8% below (Argentina), to 26% below (Ukraine) world average fob price.

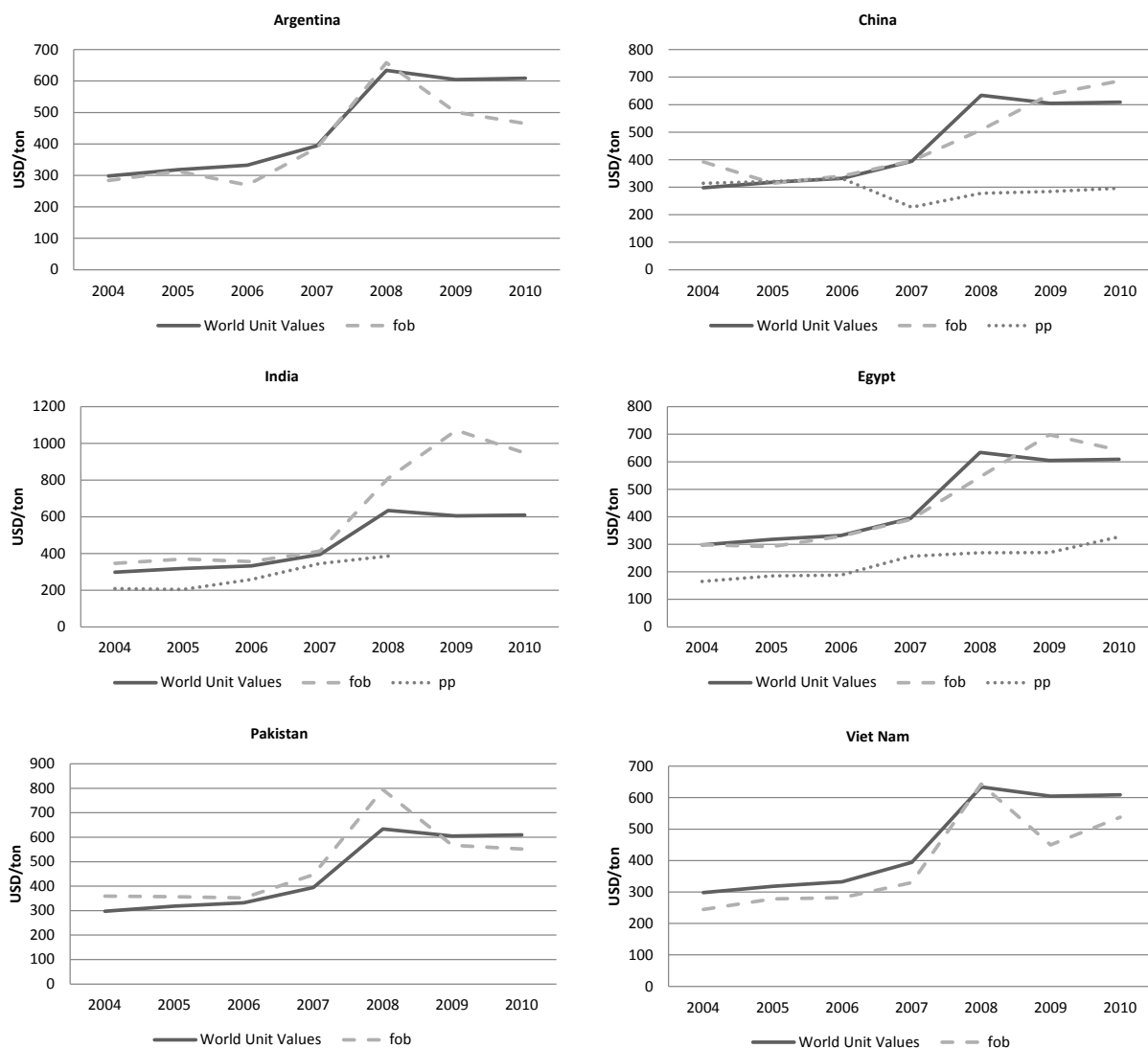
The wheat producer price in the selected markets was also variable. In the case of Argentina, Russia and Ukraine, the producer price is below their respective fob and world average fob price, as expected, and follows the same trend, rising and falling with the traded price. For China and Pakistan, this is not the case. The producer price is at times above the

traded price (suggesting exports are subsidised) and producer price seem divorced from developments in world markets (Figure 12).

Rice

Unlike the wheat market, none of the selected rice exporters have export prices that are consistently below the world average. In contrast, India for all years and Pakistan except for the last two years, had export prices greater than the world's average. India average rice export price in 2009 was almost 80% above the world's average while it was 56% above in 2010.

Figure 13. Average world fob price and fob and producer price of selected countries: Rice 2004-2011



Source: IMF, BACI and FAO.

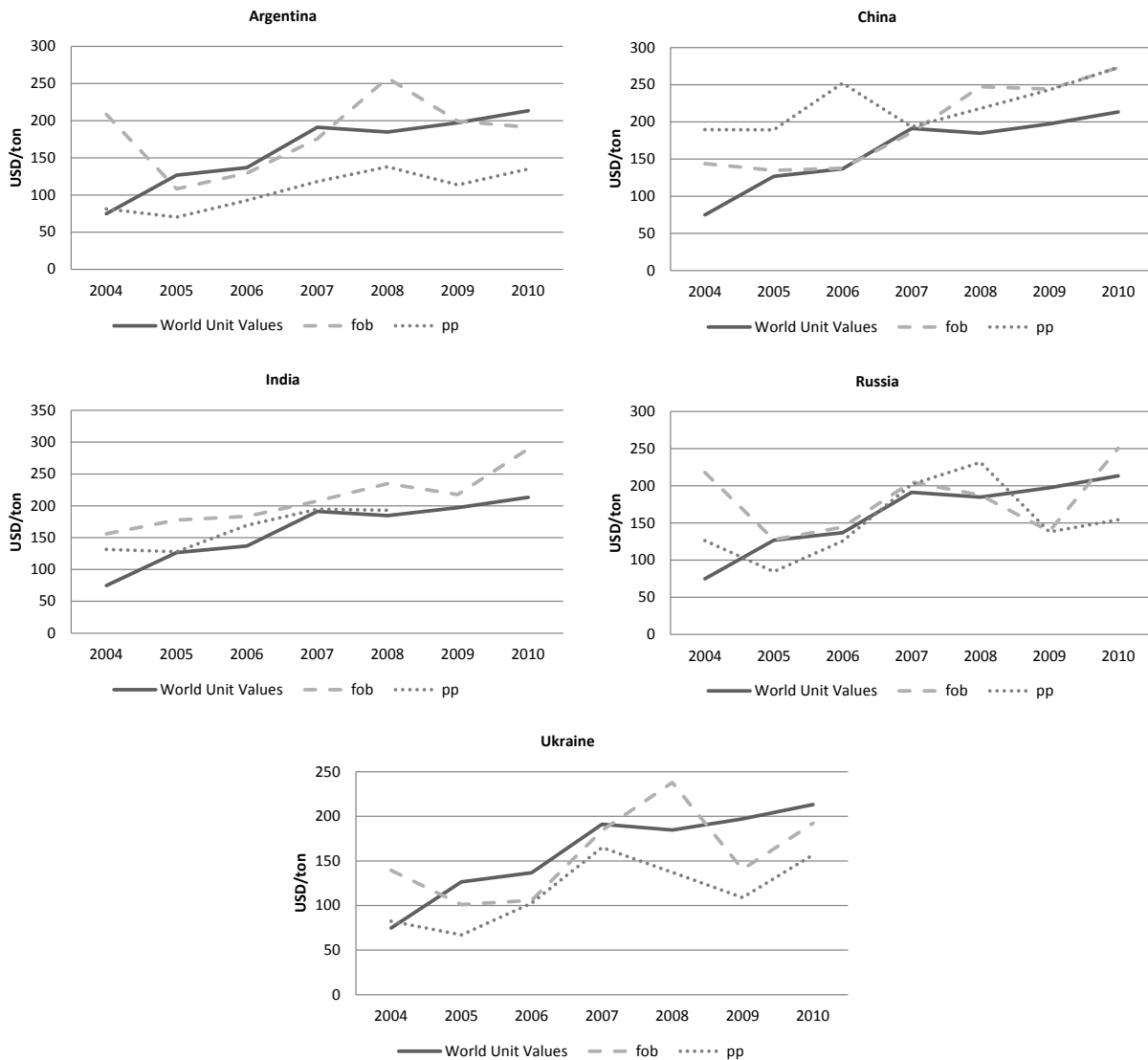
The FAO's producer price is for paddy rice which is not strictly comparable to the export price, and does not report producer price for Argentina, Pakistan and Viet Nam and only to 2008 for India. Although not comparable, it is still informative to examine the relationship between the producer and export prices. For China, Egypt and India, the data indicate that the

producer price is below the export price in each case and does not necessarily move with the export price (Figure 13).

Maize

In the maize market in 2004 (before most export interventions) and again in 2008 (during interventions), the export price of each of the selected countries was above the world's average price. India's export price persisted above the world average price for the duration of the time period examined, while China's export price was below the world average price only in 2007 and Russia's only in 2009.

Figure 14. Average world fob price and fob and producer price of selected countries: Maize 2004-2011



Source: IMF, BACI and FAO.

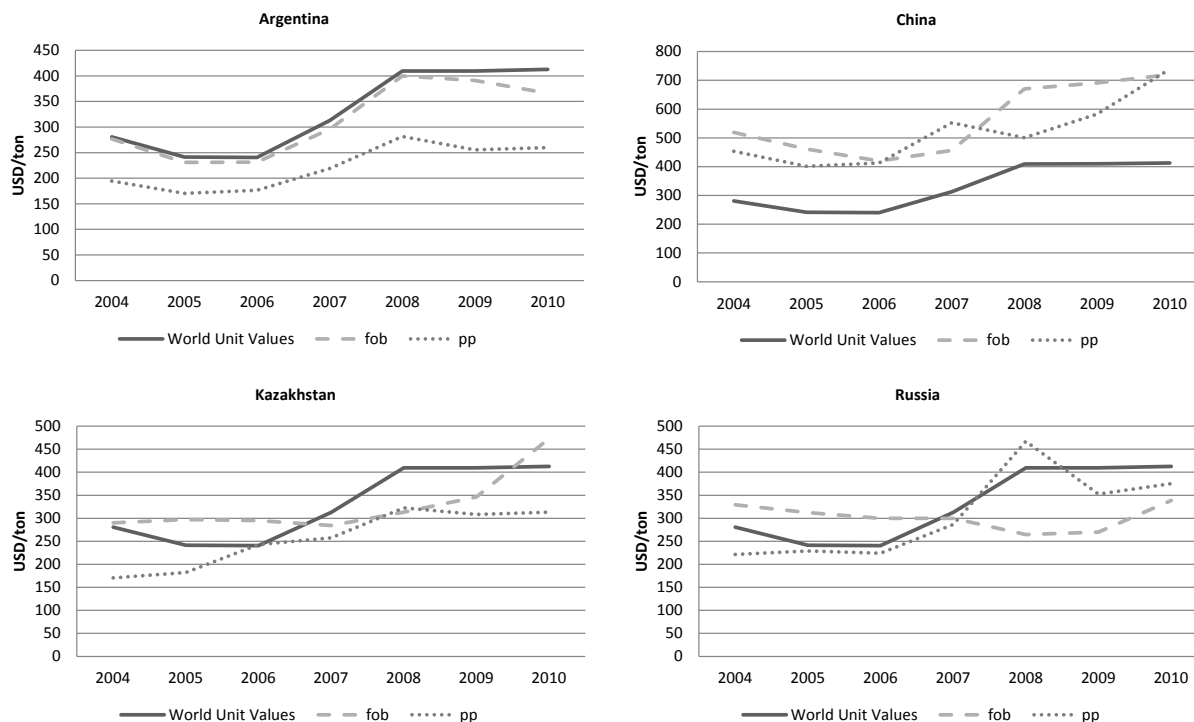
The maize producer price in Argentina and Ukraine is, as expected, below the world average and the respective country's export price and seem linked to the international price. In India, the producer price is only available until 2008 and while it is less than its export price, it is above the world average price. The producer price in Russia is about the same as its export price in 2007 and 2009 while above it in 2008. China's producer price is above the world's average unit value each year, and it is greater than its own export price up to 2007. In the last two years, China's producer price is about the same as the export price (Figure 14).

Soybeans

Of the countries with export measures in the soybean market, only Argentina is a large exporter. Russia and especially China are large net importers of soybeans while there are no trade data for Kazakhstan in the PS&D database. The bilateral trade data suggest that each of these three countries exported soybeans during the relevant period, but in none of the years, did their combine exports represent more than 1% of world's total exported value, mostly from China.

Nonetheless, their respective prices are reproduced in Figure 15. Not surprising, as a major supplier, Argentina's export price closely mimics the world price. The producer price, as expected seems linked to and is below the export price. The producer price in Kazakhstan is also below the average world export price, and in most years, below its own export price while the price relationship is more variable in Russia. In the case of China, both its export price and producer price are above the world average price, substantially so in some years.

Figure 15. Average world fob price and fob and producer price of selected countries: Soybeans, 2004-2011



Source: IMF, BACI and FAO.

Vegetable oils

Of the countries that applied at least one export measure in the selected vegetable oils, in at least one year, only Argentina in the soybean oil and sunflower seed oil markets, Belarus, in the rapeseed oil market and Indonesia in the palm oil market are substantial exporters. Furthermore, of the relevant vegetable oils the FAO reports producer price for palm oil. Only Indonesia is relevant and the information from the FAO is only to 2007. Given Argentina's and Indonesia's role in the soybean oil and palm oil markets respectively, it is not surprising that their export price is very close to and mimics the average world price.

The price information above suggests that casual inference between export measures taken and export or domestic prices are difficult to make. Clearly there were dramatic increases in monthly prices during the period which coincided with several countries announcing restriction on their exports. Undoubtedly, such announcements affected the psychology of the markets creating panic and uncertainty.

Effects of export restrictive measures on importers

The database contains information, at the HS6 digit level, for each exporter, the top five destinations (when relevant) and each partner's share. Here, the focus is on the effects at a more aggregate product level while restricting the discussion to the three crops, maize, rice and wheat. Previously, the effects of export restrictions on export volumes from countries imposing restrictions were examined. Here the effects of the restrictions on bilateral trade are examined.

Between 2004 and 2010, the average country that imported wheat sourced its supply from seven different providers; the average rice importing country used 13 different partners in any year for its supply while the average maize importing country relied on eight exporters for its supply. There was a great deal of variation in the number of suppliers to a specific destination, ranging from only one supplier providing all of a country's needs to a maximum of 27 different wheat suppliers to one destination, 36 different suppliers providing the maize import needs for one country while 57 different sources supplied rice to one importer.

Did *ad hoc* export restrictive measure reduce the number of exporting countries participating in international markets of each of the three crops? Alternatively, did *ad hoc* export restrictive measures entice importers to hedge by expanding the number of trading partners? To examine this question, the average number of trading partners per importer of each of the three crops pre- and post-2007 was computed and a Student t-test was run to test whether there was a statistically meaningful difference between them. In general, for each of the three crops, the average importing country was supplied by one more exporter during the period 2007 to 2010, compared to the period from 2004 to 2006. Except for the rice market however, the difference was not statistically significant at the 5% level.¹⁴ This result suggests that importers broadened their supply source to meet their import demand for rice. The fact that countries use various sources for their imports suggests a strategy of supply diversification to reduce disruptions from exogenous supply shocks. This finding, coupled with earlier result that rice exports were significantly lower when countries imposed export restrictive measures, indicates that the international rice market has been more severely impacted,

What about the volume of imports? Did the export restrictions reduce the import demand for any of the three crops? Here a simple import demand function is specified where the volume demanded by importing country *i* from exporting country *j* (where *j* encompasses all

14. The computed t-statistic that the two means are equal is 4.48, 1.90 and 1.42 for rice, wheat and maize respectively.

exporters and not only those with export restrictive measures) of product k (k = wheat, rice or maize) X_{ij}^k is a function of country i 's income, country j 's production of crop k , the bilateral unit value of exporter j to importer i in product k (UV_{ij}^k) as a proxy for price, time, and the usual trade resistance variables such as distance, whether or not a country is landlocked, whether or not partners share common border or common language etc. and a zero one dummy to reflect whether the exporting trade partner has implemented an export restrictive measure during the year. The results of the estimated equations (in log form) controlling for exporter fix effects¹⁵ are reported in Table 9.

The results suggest that import demand for rice and maize is positively related to income with a 10% rise in income resulting in a 1.5% increase in demand for rice and a 3.3% rise in demand for maize. Surprisingly, demand for wheat is not responsive to income perhaps because it is considered a staple and necessity by many low income importing countries. Controlling for unobserved exporter characteristics, increased rice or maize production does not seem to influence bilateral import demand. For wheat however, a 10% increase in wheat production in exporting countries, increases bilateral imports by 5%. The upward trend in trade illustrated previously is evidenced also in the upward trend in bilateral trade with the positive and significant estimated coefficient on the time variable with an elasticity of .3 to .4 depending on the crop. Holding everything else constant, export restrictive measures do not significantly reduce bilateral trade, but bilateral prices as one would expect, have a large and statistically significant negative effect on bilateral trade. A 10% increase in the bilateral rice price results in a 9.8% reduction in bilateral rice imports while a 10% rise in either the bilateral wheat or maize price leads to about an 11% decline in bilateral imports. The relatively high elasticity suggests that importing countries are able to substitute relatively easily among suppliers. This may also partly explain why export measures were not found to significantly influence bilateral import demand for these three crops.

The variables from a gravity type specification have a variable effect on bilateral trade depending on the crop. Transportation and other trade costs as proxied by distance impair bilateral trade. A 10% increase in distance between trading partners lowers bilateral maize trade by 8.2%, rice trade by 4.5% and wheat trade by 3.1%. Being landlocked and trying to import is also detrimental to bilateral trade as indicated by the relatively large and statistically significant estimated coefficient for each crop. Importing countries that are landlocked trade less; anywhere from 40% (maize), 50% (rice) or 54% (wheat), than other countries. Interestingly, sharing a border facilitates bilateral trade in rice with neighbouring countries trading some 126% more than others, but maize or wheat trade seems to be indifferent to whether or not countries share a border. Proxies for similarities among trading partners such as having a common official language or being in a colonial relationship have variable effects on the bilateral trade of each crop. Having a common language is not significant in the rice or maize trade but surprisingly, has a negative impact on the trade of wheat. Being a former colony has a positive and statistically significant effect on bilateral trade in rice, a negative and statistically significant effect on bilateral trade in wheat and no statistically significant effect on bilateral maize trade. Sharing the same colonizing country on the other hand does not have a statistically significant effect on bilateral wheat trade but does facilitate trade in rice and maize. Rice trade is some 56% more and maize trade is some 84% more among countries with the same former coloniser.

15. This is equivalent to specifying a dummy variable for each exporter to capture unobserved effects peculiar to each exporter.

Table 9. Estimated import demand for rice wheat and maize

Variables	Rice	Wheat	Maize
Log of importer income	0.152*** (0.048)	0.071 (0.064)	0.326*** (0.073)
log of production in exporting country	0.001 (0.165)	0.525*** (0.144)	0.335 (0.212)
log of unit value (USD/ton)	-0.981*** (0.127)	-1.090*** (0.151)	-1.147*** (0.128)
export restrictive measures (zero-one dummy)	0.066 (0.073)	0.118 (0.232)	0.146 (0.229)
log of time (2004=1, 2005=2 etc)	0.409*** (0.056)	0.270** (0.109)	0.352*** (0.077)
Log of distance (simple distance most populated cities KM)	-0.445*** (0.105)	-0.311* (0.159)	-0.820*** (0.155)
Is importer landlocked? (zero-one dummy; yes = 1)	-0.690*** (0.142)	-0.777*** (0.228)	-0.511** (0.222)
Do trading partners share a common border (zero-one; yes=1)	0.816*** (0.230)	-0.144 (0.251)	0.047 (0.181)
Do trading partners share a common official language (zero-one; yes=1)	0.103 (0.120)	-0.430** (0.212)	-0.351 (0.217)
Was either trade partner in colonial relationship? (zero-one; yes=1)	1.056*** (0.271)	-0.516** (0.256)	0.035 (0.207)
Did either partner share a common colonizer post 1945? (yes=1)	0.446** (0.189)	0.044 (0.481)	0.609** (0.275)
Constant	12.356*** (1.622)	10.882*** (2.202)	8.978*** (1.804)
Observations	9,045	4,430	6,026
Exporter fixed effects	Yes	Yes	Yes
Adjusted R-squared	0.139	0.114	0.286

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Summary

To summarise, the data collected for the inventory indicate that export restrictive measures are employed on a large variety of agricultural products, but among the most often targeted are the major grains such as wheat, rice and maize, along with major oilseeds such as soybeans and vegetable oils. These are also the products that are widely traded with many countries, including some of the least developed, which depend on foreign sources for their nutritional needs.

The measures that have been identified include export duties (either ad valorem or specific, including variable duties that change depending on specified conditions), minimum export prices, tax rebates on exported goods, export quotas, licensing requirements and outright export bans. These may not be an exhaustive list of instruments used in agriculture as not all countries with known export measures are included in the inventory. The most frequent used instrument by the countries in the inventory is export prohibitions followed by export duties. At times countries use a combination of these measures either concurrently or sequentially. When used sequentially, measures that were initially intended to last a relative short time become measures that can last longer than one year.

The inventory has data on the various export measures taken by the major actors in the various markets. The countries covered are: Argentina, Belarus, China, Egypt, Former Yugoslav Republic of Macedonia, India, Indonesia, Kazakhstan, Kyrgyz Republic, Moldova, Myanmar, Pakistan, Russia, Tajikistan, Ukraine and Viet Nam. Although data earlier than 2007 are included in the inventory for some countries, the majority of the information is for the years from 2007 to 2011 and for some countries, the information extends to 2012. Most of the countries in the inventory applied export measures on products for which they were net exporters but in some cases export measures were applied on products for which they were net importers.

The data reveal that some but not all countries notified their export intervention measures to the WTO as specified in Article 12 of the URAA. In some cases, interventions were temporary. GATT Article XI paragraph 2(a) permits export restrictions when they are temporary (without stipulating what this means) and are imposed to prevent or relieve critical shortages of foodstuffs. Nonetheless, the relevance of the notifications comes into question if they're submitted after the fact. Furthermore, when temporary measures are invoked frequently within short periods of time, they probably contribute to market instability.

Undoubtedly, export restrictions create uncertainty in the domestic and international markets for the commodities affected. These can influence supply decisions domestically and raise concerns about supplier reliability in import dependent countries that may last long beyond the duration of the policy.

The data indicate export supply for these products is very concentrated with only a handful of countries supplying most of the world's needs. On the import side, trade is less concentrated implying that many different countries depend on a few countries for their import needs. Export restrictions by even one of the major exporters may create havoc in international markets and this can be significantly magnified when several exporters intervene at the same time.

During the relevant time period, many agricultural markets were turbulent. Prices were relatively stable from 2000 to 2004 but since then they have increased substantially. Many peaked in April 2008 but after a period of modest declines, the food price index reached a new high in April 2011. Price developments for the four crops, (rice wheat, maize and soybeans) and the vegetable oils (soybean rapeseed and palm oil) exhibited similar characteristics, also peaking in 2008 (albeit in different months and the palm oil, maize and soybean price after declining, reached a new peak 2011 for palm oil and in 2012 for the other two). Although prices trended higher, they also oscillated potentially increasing uncertainty for buyers and sellers. The import bill for these commodities increased substantially as illustrated in Figure 9. Although rising prices was a boom for exporters, importing countries, especially the less developed countries that depend on world markets for their supplies were stressed.

Total exports of each product trended upwards during the period. But, measured in physical units, rice, maize, soybeans and soybean oil exports dropped in 2008, while the drop in wheat occurred in 2009. The higher prices in 2008 resulted in export receipts that were considerably higher than previous years for all agricultural products including all the goods that are the focus of this report. It seems that at this level of aggregation, the inference that export measures contributed to, if not caused, the price spikes may be reasonable.

However, exports have rebounded since for all but soybean oil. Rising total exports in most years suggest that countries without export measures were able to compensate any potential shortfalls resulting from those measures minimising potential disruptions. However, it may still be the case that specific import markets had to scramble to find alternative suppliers increasing their costs and uncertainty.

These overall trends conceal developments for the countries that intervened in their export markets. Since for some products in several years, various countries applied export measures in the same year, production and export data were aggregated to explore whether it is possible to discern effect of the measures on their collective exports. From these data, it is difficult to discern a pattern between export measures and resulting export shares because changes in production confounded the effects.

Disaggregating further, exports, exportable surplus (production minus consumption) and ending stocks (all measured in physical units) for individual countries and markets were examined for potential insights into the relationship between export measures and exports. Again the data are inconclusive. For example, rice exports in Argentina and Viet Nam in 2008 were above 2007 levels despite the export measures. But, in China, Egypt and India, exports were below 2007 levels while basically flat in Pakistan. In China and Egypt, exportable surplus in 2008 was below 2007 suggesting tighter domestic market and less product available for export. In general, for most of the markets and countries examined, there is a strong positive correlation between exportable surplus and exports even with export measures in place. The relationship between exports and ending stocks is less clear, but in many cases exportable surplus is positively correlated with ending stocks suggesting, not surprisingly, that ending stocks expand with ample supplies. Correlation between exports and ending stocks is more problematic rendering assessment of whether export measures were used to replenish depleted stocks inconclusive.

The effects of export restrictions on importers were also examined using a reduced form bilateral import demand for wheat, rice or maize. The results suggest that bilateral trade was not significantly affected by the export restrictive measures.

Undoubtedly, unless the export measures are totally ineffective, they constrain exports at least for a time, and they affect perceptions of market reliability and stability. These likely contributed to market uncertainty possibly contributing to the volatility witnessed at the time. And, it may be one of the reasons that rice importing countries increased the number of partners from whom they source their import needs. The frequent changes to the measures and in their levels may have sparked panic buying to secure import needs compounding potential shortages in international markets possibly contributing to the large oscillations in monthly prices. The effect of interventions on market psychology is also a factor that should be considered in assessing their market impacts.

But when examined from somewhat longer perspective of a year, the annual data suggest that in most years, total trade expanded as exports from countries without restrictive measures made-up potential shortfalls. Additionally, because of the type of measure or its duration, exports from countries imposing measures sometimes continued flowing and in some cases, exports from those countries were above previous year's level. In other cases however, exports from countries applying export measures were substantially reduced relative to their level in the previous year. But, in some of the countries, when their exports were below previous levels, often it was also the case that the domestic markets were tight suggesting lower available export supply. Such confluences make it difficult to discern what the export level from the various countries would have been absent the export measures. Nonetheless, the results do suggest that in the rice market, the restrictive measures significantly lowered exports from the countries imposing the restrictions, but other suppliers must have filled the gap as imports were not substantially lower.

Export restrictive measures undoubtedly raised concerns among importers as to the reliability of their trade partners while identifying new trade partners raises import costs. Uncertainty about partner reliability may cause importers to contemplate pursuing costly policies toward self sufficiency and to raise border protection in pursuit of that goal. Furthermore, the analysis examined the effects of export restrictions on trade. The effects of

the policies on domestic markets was not investigated, therefore, it is not possible to ascertain whether or not the policies achieved their goals. Other OECD work suggests that results were mixed depending on the country, the crop and on the measure. But whether or not the goals were achieved, it is well known that policies targeted to the specific objective are more efficient than non-targeted policies such as border measures.

References

- Agricultural Market Information System (AMIS), (2012), “First Meeting of the Global Food Market Information Group: Abnormal Market Conditions and AMIS Indicators”, Rome, 9-10, February, 2012.
- Dollive, Kendall, (2008), “The Impact of Export Restraints on Rising Grain Prices”, U.S. International Trade Commission, Office of Economics Working Paper No. 2008-09-A, September.
- FAO, OECD, IFAD, IMF, UNCTAD, WFP the World Bank, the WTO, IFPRI, and the UN HLTF, (2011), “Price Volatility in Food and Agricultural Markets: Policy Responses”, May.
- Gaulier Guillaume and Soledad Zignago, (2010), “BACI International Trade Database at the Product Level: The 1994-2007 Version”. CEPII Working Paper 2010-23.
- Jones, Daryl, and Andrzej Kwiecinski (2010), “Policy Responses in Emerging Economies to International Agricultural Commodity Price Surges”, OECD, Food, Agriculture and Fisheries Working Papers, No. 34, OECD Publishing.
- Kim, Jeonghoi (2010), “Recent Trends in Export Restrictions”, OECD Trade Policy Working Paper No. 100, July.
- Liapis, Pete (2011), “Changing Patterns of Trade in Processed Agricultural Products”, OECD Food, Agriculture and Fisheries Working Papers, NO. 47, OECD Publishing. <http://dx.doi.org/10.1787/5k9fp3zdc1d0-en>.
- Liapis, Pete (2012), “Structural Changes in Commodity Markets: Have Agricultural Markets Become Thinner?”, OECD Food, Agriculture and Fisheries Working Papers, NO. 54, OECD Publishing. <http://dx.doi.org/10.1787/5kge3mq19s6d-en>.
- McCalla, Alex, F. (2009), “World Food Prices: Causes and Consequences”, Canadian Journal of Agricultural Economics, 57, pages 23-34.
- Mitra, Siddhartha and Tim Josling (2009), “Agricultural Export Restrictions: Welfare Implications and Trade Disciplines”, International Policy Council Position Paper, Agricultural and Rural Development Policy Series, January.
- Sharma, Ramesh (2011), “Food Export Restrictions: Review of the 2007-2010 Experience and Considerations for Disciplining Restrictive Measures”, FAO Commodity and Trade Policy Research Working Paper No. 32.
- Trostle, Ronald (2008), “Global Agricultural Supply and Demand: Factors Contributing to the Recent Increase in Food commodity Prices”, USDA, ERS, WRS-0801, July.
- Thompson Wyatt and Grégoire Tallard (2010), “Potential Market Effects of Selected Policy Options in Emerging Economies to Address Future Commodity Price Surges”, OECD Food, Agriculture and Fisheries Working Paper No. 35, OECD Publishing.

Annex I

Detailed Account of Export Restrictive Measures Taken by Selected Countries

Argentina

Argentina has a 5% export duty on all products (at the HS8 digit level) except as otherwise noted. In 2002, there were 580 agricultural products with differential export duties. Of these, 325 or 56% of the selected products faced an export duty of 10%, another 161 or 28% of selected products were exported duty free and the rest, (16% of the selected products) faced export duties of 20%. In 2005, Argentina increased the export duty on 34 products in its dairy sector to either 10% or 15% depending on the product. These were then lowered in 2006 back to 5% while the duty on two food preparation products was increased to 10%. In the last two months of 2006, Argentina also banned by closing the export registry, exports of maize except for exports of organic maize and maize exported in bags.

In 2007 as the agricultural markets started to heat up, Argentina's government became more interventionist in its export markets. A total of 462 lines in the inventory are used to describe changes to export duties across a whole gamut of agricultural products or the imposition and relaxation of quotas and export bans. Focusing on the products of interest, rice, wheat, maize other coarse grains, soybeans, other oilseeds and vegetable oils, Argentina imposed an export duty of 10% on rice in May which was not changed the rest of the year. In the maize market however, an export tax of 20% was imposed in May and then raised to 25% in November. Also in May, Argentina set a maize export quota of 3 million tons which was quickly filled. Consequently, the export registry was closed in June implying an export ban. Other coarse grains such as barley, rye, oats and sorghum faced a 20% export tax. In the soybean market, a 24% export duty in January was raised to 28% in May and raised again to 35% in November. Also in November, the export registry was closed banning exports which lasted one week when the registry was re-opened. Among other oilseeds, sunflower seeds were taxed initially at 24% which was later raised to 32%. Linseed exports were taxed at 24% while rapeseeds and other oilseeds were taxed at a 10% rate. Vegetable oils faced export taxes of various amounts depending on the vegetable oil. For example, soybean oil exports faced a 24% export tax initially but this was subsequently raised to 32%, while exports of sunflower oil and cottonseed oil were initially taxed 20% before the rate was increased to 30%. But exports of linseed oil and maize oil, among others, were taxed at a lower 10% rate. In the wheat market, an export ban was imposed in March except for 100 000 tons destination Brazil only. In May, two quotas were opened for 15 000 tons (organic wheat) and 10 000 tons for wheat exported in bags not greater than 50 kg. and there was a 24% export tax. In June, the export registry was once again closed banning exports. In November, the export tax on wheat was raised to 28% and the export registry was opened allowing exports with licenses and in December opened a new quota of 20 000 tons for wheat exported in bags not exceeding 50 kg. Also subject to export bans were various vegetable oils and grain products such as brans, sharps and other residues. Export tax rates above the normal 5% rate were applied to exports of various products. For example exports of live animals, planting material, cut flowers, dried beans, processed grains, tobacco, hides and skins, wool, and cotton (among others) were subject to a 10% tax rate. Various fresh or chilled meats were subject to a 15% rate while a 20% rate was applied to some processed grains and grain flour, groats and 24% rate was applied on soybean flour and meal, on some oilseed cakes and peanuts. This is not an exhaustive list of the 462 lines for 2007 but an illustration of the magnitude of the export tax and on the variety of agricultural products whose exports were affected.

Table A.I.1. Actions in selected markets taken by Argentina (2007-2011)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2007	maize	20% raised to 28%	Yes	Yes	Yes
	other coarse grains	20%	No	No	No
	rice	10%	No	No	No
	soybeans	24% raised to 28% raised again to 35%	No	Yes	Yes
	other oilseeds	10% to 32% depending on oilseed and time	No	No	No
	vegetable oils	10% to 32% depending on vegetable oil and time	No	Yes	No
	wheat	20% raised to 28%	Yes	Yes	Yes
2008	maize	variable rate changed to fix 25% reduced to 20%	No	No	Yes
	other coarse grains	no change	No	No	No
	rice	no change		No change	
	soybeans	variable rate changed to fix 35%	No	No	No
	other oilseeds	variable replaced by 32% on sunflower seeds, 10% to 24% on others, depending on oilseed	No	No	No
	vegetable oils	variable on soybean, sunflower and maize replaced by 32%, 30% and 15% respectively.	No	No	No
	wheat	variable rate changed to fix 28% reduce to 23%	Yes	No	Yes
2009	maize	no change	No	No	Yes
	other coarse grains	no change		No change	
	rice	no change		No change	
	soybeans	no change		No change	
	other oilseeds	no change		No change	
	vegetable oils	no change		No change	
	wheat	no change	No	No	Yes
2010	maize	no change	No	No	No
	other coarse grains	no change	No	No	No
	rice	no change	No	No	No
	soybeans	no change	No	No	No
	other oilseeds	no change	No	No	No
	vegetable oils	no change	No	No	No
2011	maize	no change	No	No	No
	other coarse grains	no change		No change	
	rice	no change		No change	
	soybeans	no change		No change	
	other oilseeds	no change		No change	
	vegetable oils	no change		No change	
	wheat	no change	Yes	No	No

In 2008, a total of 288 lines report information on actions taken by the Argentinean government in its export markets. Most of the lines (157) indicate that in December of 2008, export duties were reduced. Most of the products are fruits, nuts and vegetables, but duties on maize and wheat were also lowered in December to 20% and 23% respectively. For the products of interest, there were no changes to the export duty on rice. In February, the maize export registry was opened and maize exports were allowed via export licenses. Wheat exports were also allowed with the opening of an export quota of 4.4 million tons in January managed through licenses. In March, variable export duties were introduced for maize, soybeans and wheat. In July these were scraped and replaced with fixed rates of 25% on maize, 35% on soybeans and 28% on wheat. In March 2009, Argentina lowered the export duties on 35 dairy products to zero and at the end of September opened the export registry for wheat and maize continuing the export license system. In February 2011, Argentina established a quota of one million tons for wheat with protein content less than 9.5%. In May, the quota level remained the same but the quality standard was changed to wheat containing less than 10.5% protein. Table A.I.1 summarises the actions taken by Argentina in various products of interest. The most frequently cited rationale for the actions taken include: to ensure the normal and transparent functioning of the agricultural sector, to reduce domestic prices in the face of rising international prices, or price stabilisation, to adjust differential in cases of higher value added products and to guarantee supplies for the domestic market.

China

Information on China is from 2005 to 2011 containing 919 lines at the HS10 digit level. In 2005 China provided a 5% tax rebate on exports of several types of animal products, a temporary export ban on vegetable materials other than bamboos, and export quotas on liquorice roots and on saps and extracts of liquorice, all products that are not widely traded and a very small part of agricultural trade.

In 2007, China removed the tax rebate on exports of several types of live animals, animal products, bulbs, plants, cut-flowers, nuts and non-alcoholic beverages. There was a 5% tax rebate on exports of various vegetable oils and some other products. Export quotas of various volumes were imposed on liquorice roots and extracts along with export quotas of varying volumes on various live animals destined to either Hong Kong or Macau. Other than the changes to the tax rebate for vegetable oils, for the products listed in Table 3 to Table 6, information on any specific action was not found.

In 2008, 386 lines are used to indicate the actions taken by China in its agricultural export markets. Tax rebates were provided for exporting various essential oils while exports of various cereal products (flour, groats or meals for example) and some live animals necessitated an export license. Export duties of 20% were imposed on exports of wheat, barley rye, oats and buckwheat while the rate on maize, rice or soybeans was 5%. Higher export duty rates were imposed on exports of certain value added cereal products such as maize flour (10%), or wheat flour (25%) indicating a type of tariff escalation reversal. With tariff escalation, tariffs are higher on value added rather than the raw product to discourage imports of value added products and promote domestic production of those goods. China seems to want to accomplish the same thing by imposing higher export duties on value added products thereby discouraging exports of those goods increasing the supply available for the domestic market.

Also in 2008, China continued to regulate exports of liquorice roots and extracts, vegetable material other than bamboos and different live animals through export quotas of various volumes depending on the product. The live animal quotas were applicable for exports to Hong Kong and Macau. For some other live animals such as horses or pure-breeding bovine animals, exports were banned, as were exports of horsemeat, other animal products, certain types of live bulbs and plants, cut flowers, certain nuts, bottled water and

other non-alcoholic beverages. In total, exports were banned on 75 (50) individual products at the HS10 (HS6) digit level.

In 2009, China lowered its export duties on many products. Export duty on maize was eliminated while the rate on rice and wheat was lowered to 3% and the soybeans rate was held at the 5% level. However in July export duties on wheat, rice and soybeans were eliminated. Tax rebates ranging from 5% to 15% were provided mainly to exports of certain dairy products, preserved vegetables, coffee tea and certain condiments among others. In total, exports of 258 products at the HS10 digit level could profit from the rebate. Exports of liquorice and saps and extracts of liquorice continued to be regulated by export quotas. In 2009, China also introduced export license requirements for the exports of 116 products at the HS10 digit level, including wheat, rice and maize.

In 2010, tax rebates were eliminated on exports of five products (HS10 digit level) including corn starch. And, in addition to the export licensing requirements from 2009, the liquorice and liquorice saps and extracts quotas continued while export quotas were re-introduced for vegetable material other than bamboo. Export quotas of various volumes were also imposed on a variety of cereal products. One example is a 75 000 ton quota available for any or all of 13 products (HS10 digit level) such as corn flour, corn groats or corn meal, wheat flour, wheat groats or wheat meal and pellets of cereals. Exports of wheat, rice and maize continued to be governed by licensing requirements.

The export quotas from 2010 continued into 2011 but at different volumes. Additionally, export quotas were established for several different kinds of live animals destined for Hong Kong and Macau. Exports of wheat, rice and maize continued to require licenses.

When available, the rationale justifying the various intervention measures given include to support the export market, to preserve the environment and protect endanger species and to support the export development of the private sector. Table A.I. 2 summarises the actions taken by China in the export market of the products listed in Table 3 to Table 6. As indicated in the table, China introduced export duties on these products in 2008 along with licensing requirements. The export duties were eliminated by July 2009 but the licensing requirement continued. From the information in the database, it is not possible to assess whether this has impacted firms ability to export.

Table A.I.2. Actions in selected markets taken by China (2007-2011)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2007	maize	none found		none found	
	other coarse grains	none found		none found	
	rice	none found		none found	
	soybeans	none found		none found	
	other oilseeds	none found		none found	
	vegetable oils	none found		none found	
	wheat	none found		none found	
2008	maize	5%	No	No	No
	other coarse grains	20% on barley, buckwheat, rye, and oats; 5% on millet, sorghum and others	No	No	No
	rice	5%	No	No	No
	soybeans	5%	No	No	No
	other oilseeds	none found		none found	
	vegetable oils				
	wheat	20%	No	No	No
2009	maize	0%	No	No	Yes
	other coarse grains				
	rice	3% reduced to 0%	No	No	Yes
	soybeans	5% reduced to 0%	No	No	No
	other oilseeds	none found		none found	
	vegetable oils	none found		none found	
	wheat	3% reduced to 0%	No	No	Yes
2010	maize	no change	No	No	Yes
	other coarse grains	eliminated	No	No	No
	rice	no change	No	No	Yes
	soybeans	no change	No	No	No
	other oilseeds	none found		none found	
	vegetable oils	none found		none found	
	wheat	no change	No	No	Yes
2011	maize	no change	No	No	Yes
	other coarse grains	none found		none found	
	rice	no change	No	No	Yes
	soybeans	no change	No	No	No
	other oilseeds	none found		none found	
	vegetable oils	none found		none found	
	wheat	no change	No	No	Yes

India

Data for India in the inventory contain 434 lines from 2006 to 2010. The product specification ranges from HS2 to HS8 digits which are standardised to HS6 as for other countries in the database. In 2006 India banned exports of certain dairy products including skim milk, milk food for babies and whole milk. In total, exports of seven (three) dairy products at the HS8 (HS6) digits were banned.

In 2007, the export ban on the dairy products continued. However, in August 2007, India established several country-specific quotas for some of the dairy products. In February, India banned wheat exports and in October, the ban was expanded to wheat flour. In June of that year, exports of several varieties of dry beans (HS 0713) were also banned (except that exports to some countries were allowed up to a specified quota), followed by an export ban on rice in October. The rice ban however was not comprehensive and it was conditional. If the minimum export price (MEP) rose above USD 500 exports were allowed as were exports to Russia and the Maldives irrespective of the MEP. Additionally, three country-specific quotas were established; 50 000 tons for exports to Bangladesh 40 000 tons for Sierra Leon and 1 000 tons to Mauritius. Also in October, India restricted exports of onions (fresh, preserved or dried).

The export ban on most of the products that were banned in 2007 including on wheat and rice, continued into 2008 except for a few edible vegetable oils for which the ban was lifted in April. Additionally, maize exports were banned in July as were exports of many edible vegetable oils, including soybean and maize oil. The dry bean export ban contained an exception for exports to the Maldives and was conditional on a MEP of USD 1 200, above this level, the ban would be lifted. The rice ban was also not comprehensive as country-specific quotas were established for several countries. In addition to the three countries with export quotas in 2007, six new countries were allocated quotas in February of 2008. The nine export quotas for the nine countries totalled 300 000 tons. The ban on wheat flour also continued in 2008 but in February, two export quotas were opened for exports destined to the Maldives (22 100 tons) and Bangladesh (50 tons).

For the most part, the products whose exports were restricted in 2008 and the instruments used to restrict those exports did not change in 2009. The ban on exports of some dairy products continued as did the ban on dry or shelled beans (with some exceptions via quotas to specific destinations) and most edible vegetable oils. The export ban on rice also continued with exceptions. The ban was conditional on MEP of less than USD 1 200 and exports destined for the Maldives were excluded from the ban. Furthermore, country-specific quotas to Madagascar (50 000 tons), Comoros (25 000 tons), Mauritius (9 000 tons), Sierra Leon (40 000) and Bangladesh (151 010 tons) continued in 2009. The export ban on wheat flour continued as did the export ban on wheat during the first half of the year. In July, the wheat ban was converted to an export quota of 900 000 tons. In addition, three firms were allocated an additional 300 000 tons each.

The export ban on selected dairy products continued into 2010 as did the ban on dry or shelled beans (with some exceptions via quotas to specific destinations). The ban on rice exports also continued but without conditions or exceptions and wheat and wheat flour exports were also banned also without exceptions. When available, the rationale used to justify the restrictions imposed was that it was in the public's interest. Table A.I.3 summarises the actions taken by India in its export markets of selected products of interest.

Table A.I.3. Actions in selected markets taken by India (2007-2010)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2007	maize	No	No	No	No
	other coarse grains	No	No	No	No
	rice	No	Yes [*]	Yes ^{&}	?
	soybeans	No	No	No	No
	other oilseeds	No	No	No	No
	vegetable oils	No	No	No	No
	wheat	No	No	Yes	No
2008	maize	No	No	Yes	?
	other coarse grains	No	No	No	No
	rice	No	Yes [#]	Yes [^]	?
	soybeans	No	No	No	No
	other oilseeds	No	No	No	No
	vegetable oils	No	No	Yes	No
	wheat	No	No	Yes	No
2009	maize	No	No	No	No
	other coarse grains	No	No	No	No
	rice	No	Yes [%]	Yes ^{**}	?
	soybeans	No	No	No	No
	other oilseeds	No	No	No	No
	vegetable oils	No	No	Yes	No
	wheat	No	Yes	Yes	?
2010	maize	No	No	No	No
	other coarse grains	No	No	No	No
	rice	No	No	Yes	No
	soybeans	No	No	No	No
	other oilseeds	No	No	No	No
	vegetable oils	No	No	No	No
	wheat	No	No	Yes	No

^{*} 3 country specific quotas

[&] Excludes Russia and Maldives; Conditional on minimum export price USD 500

[#] 9 country specific quotas

[^] Excludes exports of a specific type of rice, excludes exports to Maldives, conditional on minimum export price of USD 1 200, allows exports to designated countries up to a specified quota

[%] 5 country specific quotas

^{**} Excludes exports to Maldives; Conditional on minimum export price USD 1 200

Indonesia

Information on Indonesia's export measures encompass the period from 2003 to 2012 and contain 259 lines. Here the focus is on the 2007 to 2012 period. Export goods are segregated into three categories by the government; goods whose exports are allowed unhindered, goods whose exports are restricted and goods whose exports are prohibited. In 2007, Indonesia required coffee and coffee extract exporters to register with the government. Anyone can apply to become a registered exporter, but the government reserves the right to decide which companies to approve. This can be an export restrictive measure, or not, depending upon how the government implements this measure. Export quotas were imposed on exports of rattans, certain live reptiles and some roots. Exporters of certain goods must obtain an export license in addition to registering. Goods requiring export license include various kinds of hides and skins, and live animals. Of the goods listed in Tables 3 to 6, exporters of palm oil and palm kernel oil need export licenses.

In addition to registering, coffee exporters needed to register and obtain export licenses to export in 2008, while exports of rattan were subject to a quota. Among the commodities of interest, rice exports needed a license. Many more products and varieties (68 lines) were subject to export measures in 2009. Rice exports continued needing a license and coffee exporters continued needing to register and obtain export license for their coffee exports, and they were joined by exporters of several varieties of ethyl alcohol. Furnishing material, basically various varieties of rattan seem to be important to the Indonesian government. Their exports at the beginning of 2009 were subject to an export tax which varied by variety (15% or 20%), then in July the tax was replaced by quotas that varied, again by variety, which in turn were replaced by an export ban. The ban was in turn replaced in December with export taxes that varied by variety. Exports of certain hides and skins were subject to a 25% export tax and palm nuts and kernels faced a 40% tax rate. Exports of vegetable oils (palm and palm kernel) were subject to a variable export tax with the rate depending upon the reference price.

The export tax on rattan along with the variable export tax (based on reference price) on palm oil and palm kernel oil, were maintained in 2010 (with different parameters than 2009). For 2011, Indonesia's export measures resulted in 62 lines of data. Exports of a variety of live animals and eggs and their products required licenses and exporters various coffee varieties registration and export licenses. Exports of palm oil and palm kernel oil were subject to variable export taxes with the rate again depending upon the reference price. In 2012, Indonesia re-introduced the ban on various varieties of rattan and in July, banned the exports of certain live animals. Table A.I. 4 summarises the actions taken by Indonesia in its export markets.

Table A.I.4. Actions in selected markets taken by Indonesia (2007--2012)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License	Registration to export required
2007	palm oil	No	No	No	Yes	Yes
	palm kernel oil	No	No	No	Yes	Yes
	hides and skins	No	No	Yes	Yes	No
	rattans	No	Yes	No	No	No
	coffee	No	No	No	Yes	No
2008	coffee	No	No	No	Yes	Yes
	rattans	No	Yes	No	No	No
2009	palm oil	0% to 25% ^{&}	No	No	No	No
	palm kernel oil	0% to 23% ^{&}	No	No	No	No
	palm nuts and kernel seeds	40%	No	No	No	No
	rice	No	No	No	Yes	No
	coffee	No	No	No	Yes	Yes
	rattans	15%, 20% depending on variety	Yes	Yes	No	No
	coffee	No	No	No	Yes	Yes
	hides and skins	25%	No	No	No	No
selected beverages	No	No	No	Yes	Yes	
2010	palm oil	0% to 25% ^{&}	No	No	No	No
	palm kernel oil	0% to 20% ^{&}	No	No	No	No
	cocoa beans	0% to 15% ^{&}	No	No	No	No
	palm nuts and kernel seeds	40%	No	No	No	No
	hides and skins	25%	No	No	No	No
	rattans	15%, 20% depending on variety	No	No	No	No
2011	palm oil	0% to 22.5% ^{&}	No	No	No	No
	palm kernel oil	0% to 10% ^{&}	No	No	No	No
	coffee	No	No	No	Yes	Yes
	palm nuts and kernel seeds	40%	No	No	No	No
2012	hides and skins	No	No	Yes	No	No
	rattans	No	No	Yes	No	No
	other oilseeds [*]	No	No	Yes	No	No

^{*} applied only to Illipi nuts

[&] Depends on reference price

Russia

Data for Russia are for the years 2007 to 2012 with 86 lines reporting the various export measures enacted by the government. Other than beverages, hides and skins and grain flour, groats, the measures have targeted the products listed in Tables 3-6. In October 2007, Russia imposed an export tax of 10% BNL EUR 22/t on wheat and 30% BNL EUR 70/t on barley. In December, the export tax on wheat was raised to 40% BNL EUR 105/t. The export tax on wheat and barley at the December 2007 rate continued into 2008. Information on export measures enacted in 2009 was not found, but in August 2010, Russia banned exports of wheat, maize, barley, rye, and grain flour, groats. The ban on exports of wheat, maize, barley and rye continued into 2011, ending in June of that year. Information for 2012 suggests that Russia applied export taxes on various oilseeds, including soybeans, beverages and hides and skins. The tax on some beverage exports was 6.5%, while various varieties of hides and skins were subject to EUR 500/t tax. The tax on soybeans exports was initially 20% BNL EUR 35/t

but in June it was lowered to 5% BNL EUR 8.5/t. These export taxes are scheduled to fall, some to 0% in gradual steps after one to five years depending on the variety, as part of Russia's accession agreement to the WTO. Table A.I.5 summarises the actions taken by Russia in its export markets.

Table A.I.5. Actions in selected markets taken by Russia (2007-2012)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2007	barley	30% but not less than EUR 70/MT	No	No	No
	wheat	10% but not less than EUR 22/MT, increased to 40% but not less than EUR 105/MT	No	No	No
2008	barley	30% but not less than EUR 70/MT	No	No	No
	wheat	40% but not less than EUR 105/MT	No	No	No
2010	maize	No	No	Yes	No
	barley	No	No	Yes	No
	rye	No	No	Yes	No
	wheat	No	No	Yes	No
2011	maize	No	No	Yes	No
	barley	No	No	Yes	No
	rye	No	No	Yes	No
	wheat	No	No	Yes	No
	soybeans	20% but not less than EUR 35/MT	No	No	No
	rapeseeds	20% but not less than EUR 35/MT	No	No	No
	sunflower seeds	20% but not less than EUR 30/MT	No	No	No
hides and skins	20% but not less than EUR 35/MT	No	No	No	
2012	soybeans	20% but not less than EUR 35/MT reduced to 5% but not less than EUR 8.5/MT	No	No	No
	rapeseeds	20% but not less than EUR 35/MT	No	No	No
	sunflower seeds	20% but not less than EUR 30/MT	No	No	No
	beverages	6.50%	No	No	No
	hides and skins	EUR 500/me	No	No	No

Viet Nam

The information for Viet Nam, as for Russia, is from official government sources supplemented with information from its WTO accession negotiations (Viet Nam joined the WTO on 11 January 2007) and from the FAO. The FAO information is at the product level and not at the HS system. The inventory contains 140 lines with information on different products and the various measures taken from 2002 to 2012. The product coverage includes different types of nuts, hides, live animals, coffee and tea. Among the products of interest, Viet Nam applied export measures on maize and rice.

In its WTO accession, Viet Nam reserved the right to use state trading in its rice markets (until 2011) and to have export taxes on certain products. In the agricultural domain, Viet Nam scheduled an export tax of 4% on fresh or dried cashew nuts and 10% on hides and skins of bovine and equine animals.

For the products listed in Tables 3-6, Viet Nam intervened in the maize market imposing an export tax ranging from 0% to 3% in 2005. Viet Nam was more interventionist in its rice market. In July 2007 rice exports were banned. In 2008, the ban was converted to an export quota of 4.5 million tons and MEP was established which varied by the type of rice. For 5% broken rice, the MEP was initially set at USD 385/ton which was increased to USD 800/ton in June. For rice between 10% and 25% broken, the MEP was set at USD 360/ton. In July of 2008, the quota was replaced by a variable export tax based on the freight on board (fob) price. The export tax varied between USD 30/ton for an fob price of USD 600 to a maximum of USD 175/ton when fob price exceeded USD 1 300/ton.

In April of 2009 Viet Nam reinstated the minimum export price regime, setting it at USD 350/ton for 25% broken rice. The MEP was lowered to USD 300/ton in July 2010, but increased again to USD 360/ton in August and increased yet again to USD 480/ton in October. The MEP on 5% broken rice was set at USD 395/ton in August and it was increased to USD 540 in October. Table A.I.6 summarises the actions in the rice export market taken by Viet Nam.

Table A.I. 6. Actions in the rice market taken by Viet Nam (2007-2010)

Year	Commodity	Export Duty	Export Quota	Export Ban	Minimum Export Price	State Trading
2007	rice	No	No	Yes	No	Yes
2008	rice	Variable	Yes	No	Yes	Yes
2009	rice	No	No	No	Yes	Yes
2010	rice	No	No	No	Yes	Yes

Ukraine

Ukraine joined the WTO on 16 May 2008. The information on Ukraine consists of 23 lines, is for 2006 to 2007 and 2010 to 2011 and is from notifications to the WTO under Article 12 and national sources.

In October, 2006, Ukraine introduced a 3 million ton quota on wheat exports with a May 2007 ending date. But it was re-introduced in July 2007 with a scheduled ending date of July 2008.

Based on its notifications to the WTO, in October, 2010, Ukraine imposed an export quota on wheat (500 000 tons), maize (2 million tons), barley (200 000 tons), rye (1 000 tons) and buckwheat (1 000 tons) administered by licenses. The wheat, barley, buckwheat and rye quotas were scheduled to expire in December 2010 while the maize quota was scheduled to

expire in May 2011. In 2011, the wheat quota was extended until March, but the value was doubled to 1 million tons. In May the wheat quota was replaced with an export tax of 9% BNL EUR 17/t. The export quotas on the other grains were also extended in 2011 at their 2010 levels. The barley quota however was converted to an export tax of 14% BNL EUR 23/t in May. For maize, the quota was raised to 3 million tons and then to 5 million tons. The rationale given for the intervention is to prevent critical shortages in the domestic market and for food security. Table A.I.7 summarises the actions taken by Ukraine in its grain export markets.

Table A.I.7. Actions in the maize and wheat markets taken by Ukraine (2006-2011)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2006	wheat	No	Yes	No	No
2007	wheat	No	Yes	No	No
2008	wheat	No	Yes	No	No
2010	maize	No	Yes	No	Yes
	barley	No	Yes	No	Yes
	rye	No	Yes	No	Yes
	wheat	No	Yes	No	Yes
2011	maize	No	Yes	No	Yes
	barley	14% but not less than EUR 23/MT			
	rye	No	Yes	No	Yes
	wheat	9% but not less than EUR 17/MT	Yes	No	Yes

Belarus

Information for Belarus is for 2010 and 2011 and indicates that exports of oilseeds and vegetable oils were banned. In October, 2010, exports of rapeseed, rapeseed oil and flax were banned with the ban scheduled to end in April 2011. The export ban on flax was ended in 2011, but the ban on rapeseed and rapeseed oil was extended twice, once to September 2011 and then to March 2012. In March 2011, linseed exports were also banned as were exports of margarine. For linseed exports, the ban was scheduled to terminate in September while for margarine the ban was to last until March, 2012. Table A.I.8 summarises the actions taken by Belarus.

Table A.I.8. Actions taken by Belarus (2010-2011)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2010	rapeseed	No	No	Yes	No
	rapeseed oil	No	No	Yes	No
	flax	No	No	Yes	No
2011	rapeseed	No	No	Yes	No
	rapeseed oil	No	No	Yes	No
	flax	No	No	Yes	No
	linseed	No	No	Yes	No

Kazakhstan

Information for Kazakhstan in the database is for 2008 and 2010. In April 2008, durum wheat exports were banned and the ban was scheduled to last until September. In 2010, Kazakhstan intervened to ban exports of several oilseeds (soybeans, sunflower seeds and cottonseeds) and vegetable oils (soybean oil, linseed oil, sunflower oil and rapeseed oil), along with buckwheat and grain flour, groats. In all cases, the ban was scheduled to expire in March 2011 (Table A.I.9).

Table A.I.9. Actions taken by Kazakhstan (2008 and 2010)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2008	wheat	No	No	Yes	No
2010	cotton seeds	No	No	Yes	No
	soybeans	No	No	Yes	No
	sunflower seeds	No	No	Yes	No
	soy oil	No	No	Yes	No
	rapeseed oil	No	No	Yes	No
	sunflower oil	No	No	Yes	No
	linseed oil	No	No	Yes	No

Egypt

In March, 2008, Egypt intervened in its rice export markets, initially imposing an export tax of Egyptian pound (EGP) 300/t on various rice varieties. In April, the tax was replaced by a ban that was scheduled to expire in October, but the ban was extended into April 2009. In July 2009, the ban was replaced by an export tax EGP 2 000/t which itself was replaced in October with a ban, scheduled to terminate October 2010. In January of 2010 however, Egypt opened an export quota (128 000 tons) followed by another quota of 100 000 tons in September. This was quickly followed by an export ban in the same month, scheduled to expire in October 2011. White sugar exports were added to the export ban in 2010. Also in 2010, a new regulation was instituted requiring wheat exports via a single port and export tax of EGP 300/t on bran and other residues and lucerne and other similar forage products. In 2011, the rice export ban continued and was prolonged to October 2012 while exports of hides and skins were also banned. Table A.I.10 shows the actions taken by Egypt.

Table A.I.10. Actions taken by Egypt (2008 - 2011)

Year	Commodity	Export Duty	Export Quota	Export Ban
2008	rice	300 lc/t		Yes
2009	rice	300 raised to 2000 lc/t	No	Yes
2010	rice	No	Yes	Yes
	sugar	No	No	Yes
2011	rice	No	No	Yes
	raw hides and skins	No	No	Yes

Pakistan

For Pakistan, data on export restrictive measures start in 1996 and from 2005 to 2011. Here the timeline presented is from 2006 to 2011. In 2006, Pakistan lowered its export tax on various pulses to 35% and introduced a 15% export tax on cane and beet sugar exports in May, scheduled to end in December 2007. In 2007, Pakistan banned exports on 32 agricultural varieties including various pulses, wheat flour, some alcoholic beverages and vegetable ghee and cooking oil. The ban on wheat flour was converted into a 35% export tax in December which was scheduled to last until September 2009. A quota was introduced on wheat exports, 500 000 tons in January, 300 000 tons in March and 500 000 tons in May. On the other hand, the sugar export tax was reduced to 0%.

In 2008, wheat exports were again banned in July along with exports of wheat flour. Sugar exports were once again restricted in July, with a ban rather than export tax as before. Also in 2008, rice exports were constrained by a minimum export price ranging from USD 750/t to USD 1500/t depending on the variety. In 2009, exports of various pulses were banned with the ban scheduled to last until December 2011. The wheat flour export tax was lowered to 0%, but exports of molasses faced a 15% export tax. In contrast, the export ban on vegetable ghee and cooking oil was removed. In 2010, wheat exports were constrained to a quota of 1 million tons, while exports of wheat flour were restricted to 200 000 tons. In 2011, Pakistan's intervention was limited to banning exports of various pulses, onions and sugar. Table A.I.11 shows the actions taken by Pakistan.

Table A.I.11. Actions taken by Pakistan (2006 - 2011)

Year	Commodity	Export Duty	Export Quota	Export Ban	Export License
2006	pulses	35%	No	No	No
	sugar	15%	No	No	No
2007	pulses	No	No	Yes	
	wheat	No	Yes	Yes	
	beverages	No	No	Yes	
2008	rice *	No	No	No	
	sugar	No	No	Yes	
	wheat	No	No	Yes	
2009	pulses	No	No	Yes	
2010	wheat	No	Yes	No	
2011	pulses	No	No	Yes	
	sugar	No	No	Yes	

* Rice in 2008 had a minimum export price between USD 700/MT and 1500/MT depending on variety.

Republic of the Union of Myanmar

All exports need to have an export license issued by the Ministry of Commerce, and all exporting firms need to register with the Directorate of Trade. All exporters have the right to export all commodities except for selected products that are prescribed to be solely exportable by the State owned Economic Enterprise. For agricultural commodities, the prescribed list contains rice and its products, white, red and brown sugar, groundnuts and groundnut oil, sesame seed and sesame oil, groundnut cake, sesame cake, gram whole and cotton.

During the 2007 to 2011 period, Myanmar temporarily banned rice exports in 2008 and again in 2011. Exports of cotton, groundnuts, groundnut cake, groundnut oil, sesame cake, sesame oil and sugar were banned continuously during this time.

Other countries

Of the remaining four countries, three - the Former Yugoslav Republic of Macedonia (FYROM), the Kyrgyz Republic and the Republic of Moldova — notified their export restriction measures to the WTO. For Tajikistan, the information is from official government sources. These countries are not very large producers or traders of the products of interest.

The Kyrgyz Republic notified to the WTO that in 2008 and 2010 export taxes were imposed on a variety of cereals and their products and oilseeds and their products. These were specific export duties expressed in local currency per unit of product. The rationale given was that there were critical shortages of the products in the domestic market and the low income level of the population. The FYROM notified that in 2011 it banned exports of wheat and wheat flour in order to avert serious shortages in the domestic market. The Republic of Moldova notified that in March of 2011, exports of wheat were banned but within the same month, the ban was removed. For Tajikistan, the information is only for 2011 and indicates that the government banned exports of various hides and skins along with wool exports.

Annex II.

Production, Consumption and Trade Developments for Selected Commodities and Countries

In the main text, to reflect the fact that several countries took export measures in a given year and that the world market is influenced by the collective actions, the market information was aggregated and reported for the sum of the countries taking action in the specific year. This however, glosses over developments in individual countries taking the action. In this Annex, developments in production and consumption, summarised by exportable surplus (production minus consumption), exports and ending stocks, (all measured in physical units) are presented for each relevant country. Developments in ending stocks may either indicate that a country imposing export restrictions may be doing so in order to reduce stock depletion or to build-up depleted stocks suggesting concerns about future food security.

Figure 1, Annex II provides information on rice exports, exportable surplus and ending stocks for the major countries that applied export measures during the period. With the aid of the information in Table 3, the reader can visualise a country's rice exports during the time export measures were taken. For example, in 2008, Argentina, China and Egypt applied an export tax (and Egypt followed up with an export ban), while India had a conditional export ban, Pakistan had a minimum export price and Viet Nam had an export quota and a minimum export price later converted into a variable export tax.

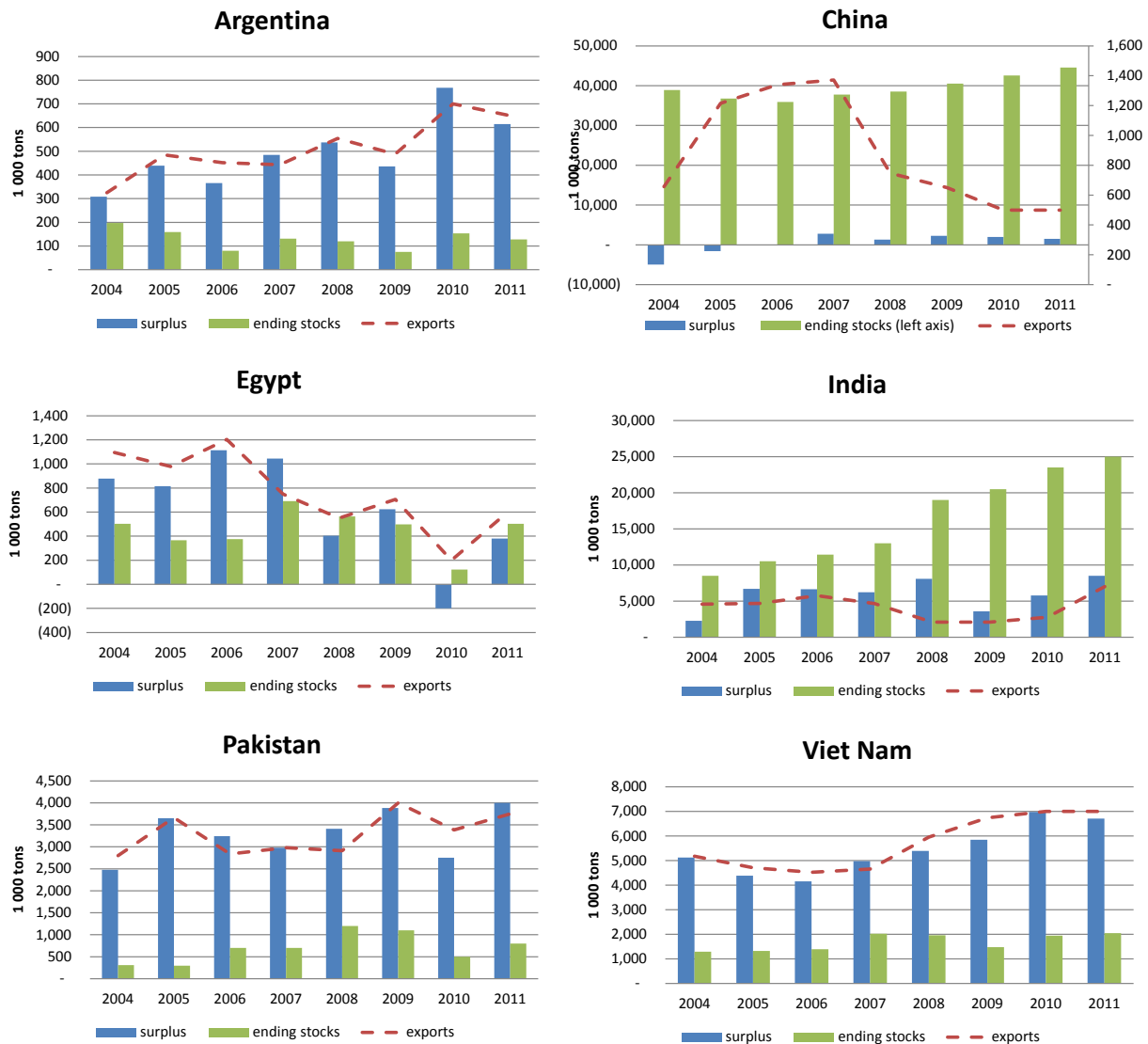
What was the effect on each country's rice exports? In the case of Argentina and Viet Nam, exports in 2008 were above 2007 level while Pakistan's exports in 2008 were basically the same as in 2007. Exports from the other countries on the other hand in 2008 were below 2007 levels. Can one infer therefore, that the export measures were responsible for the decline? Undoubtedly, they contributed but as shown in the figure, exportable surplus in China and Egypt also fell suggesting tighter domestic market and less product available for export. This may also have contributed to fewer exports. This confounding effect was absent in India's market suggesting that the selective ban and minimum export price resulted in lower exports.

As it seems from Figure II.A.1, in most of the countries, rice exports are closely correlated with exportable surplus, increasing with larger surpluses. In three countries, Argentina, Egypt and Viet Nam, the correlation coefficient is above .9, while it is .7 in Pakistan. In India's case, the correlation between exports and surplus is positive but less strong (.3). China's rice exports on the other hand seem to be totally delinked with its exportable surplus with a correlation coefficient -0.01.

The relationship between ending stocks and exports or exportable surplus is more problematic. For three countries, the correlation between exports and ending stocks is negative; Argentina (-0.16), India (-0.19), and highly negative in China (-0.84). In these three countries, lower exports imply stock build-up and vice versa. In Egypt (0.29), Pakistan (0.15) and Viet Nam (0.47), it is the opposite, with exports falling with stock depletion and vice versa. Exportable surplus in each country, and ending stocks are positively correlated with the

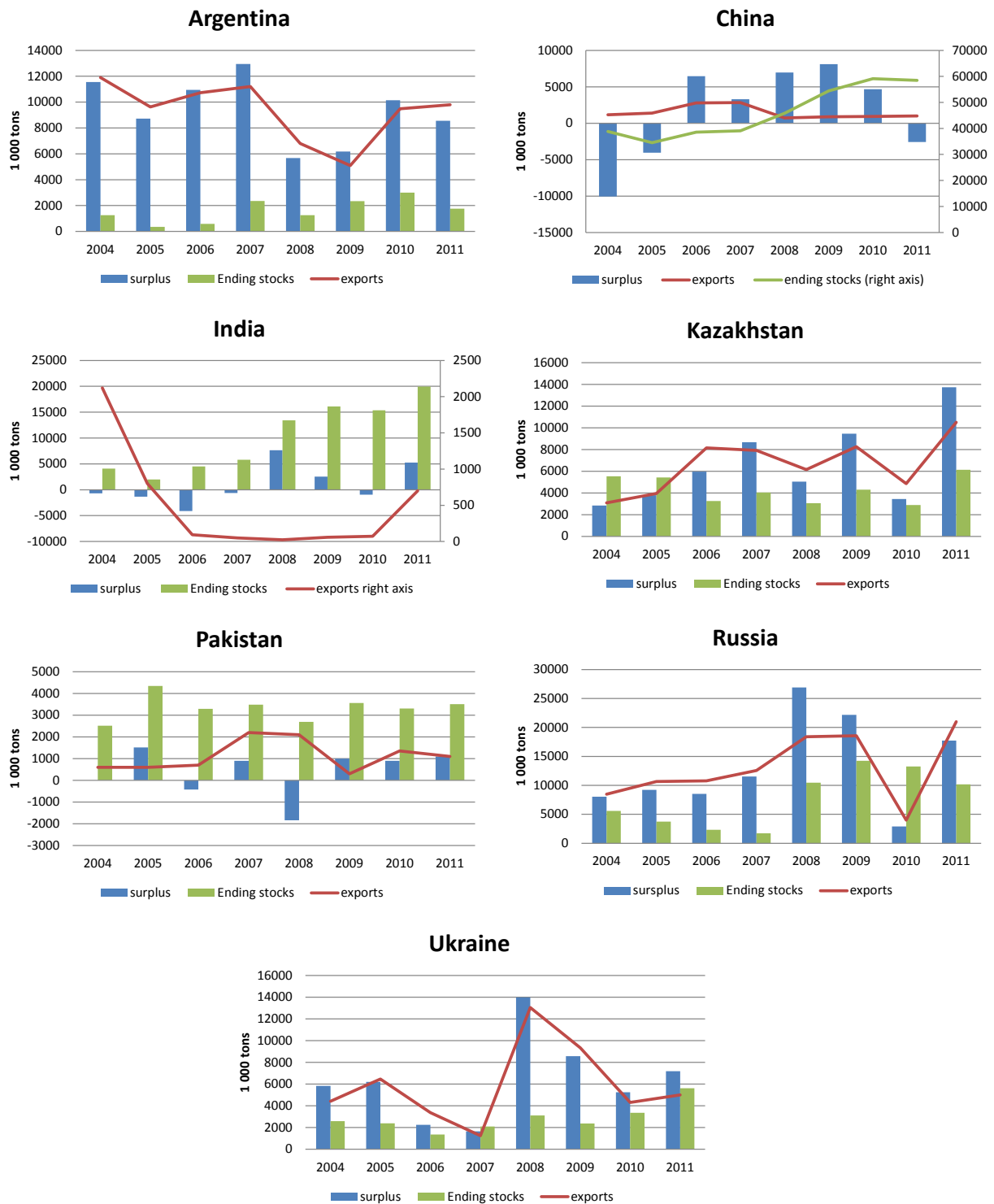
strength of the relationship varying by country. Argentina has the weakest correlation (0.03) and Viet Nam the largest (0.62). The fact that exportable surplus is positively correlated with exports and with ending stocks, is perhaps, not a surprise. This suggests that domestic consumption is paramount with exports and stocks secondary. This is also consistent with the fact that only a small share of world rice production is traded. As indicated in the main text however, overall rice exports from the countries using export restrictive measures were reduced.

Figure II.A. 1. Exportable surplus, exports and ending stocks selected countries in the inventory: Rice



For the wheat markets in four countries (Argentina, Kazakhstan, Russia and Ukraine), exportable surplus and exports are highly correlated with a coefficient not less than 0.9 for each country. There is also a positive albeit weak (0.13) relationship in China. For India and Pakistan, the correlation is negative, less so in India (-0.14) than Pakistan (-0.38). The relatively weak correlation between exportable surplus and exports for these countries may be a result of the negative exportable surplus in some years (Figure II.A.2).

Figure II.A. 2. Exportable surplus, exports and ending stocks selected countries in the inventory: wheat



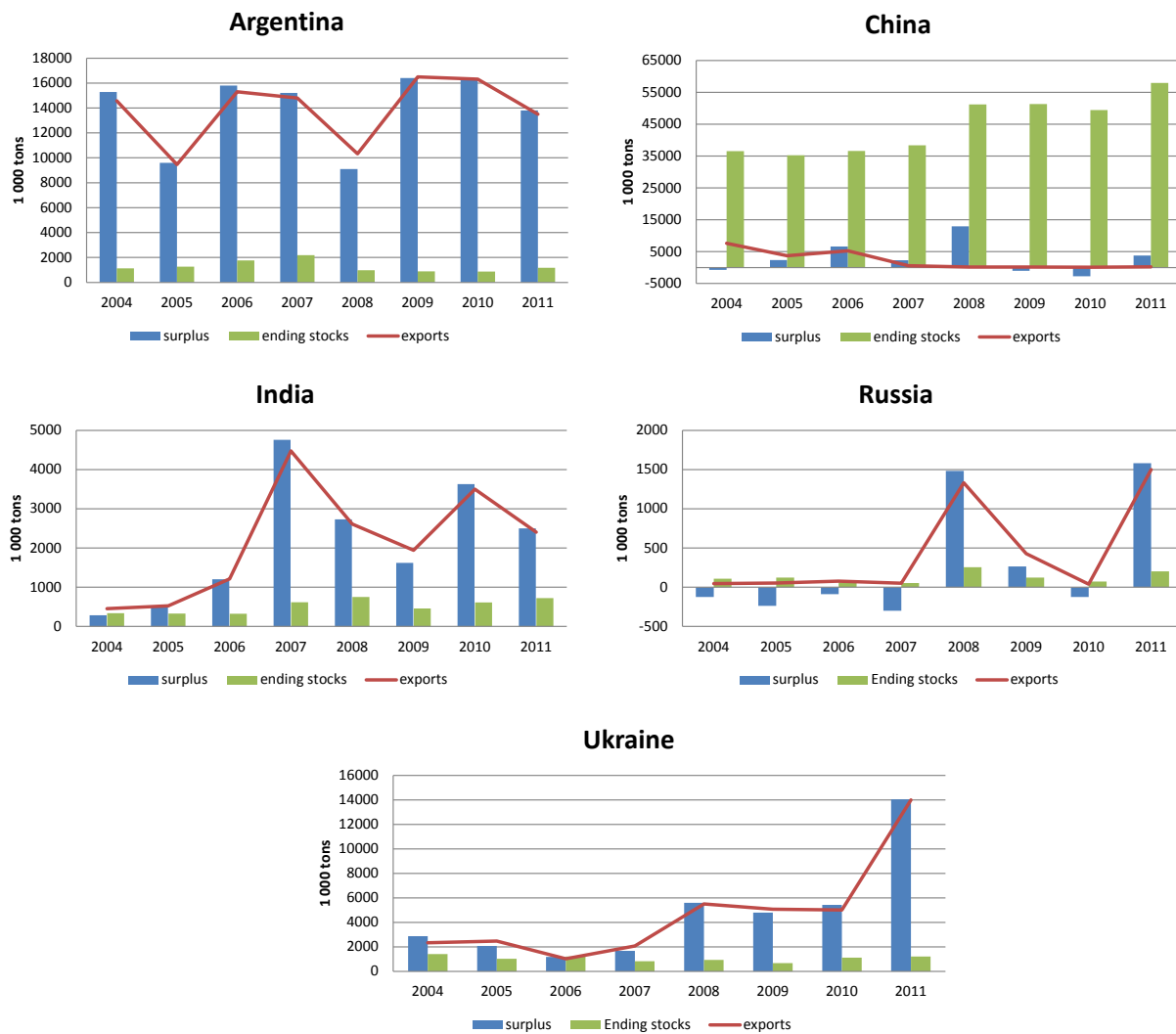
The correlation between exports and ending stocks depends on the country and seems weaker than the correlation between exports and exportable surplus. It is negative for Argentina, China, India and Pakistan, ranging in value from -0.22 in Argentina to -0.57 in China. The positive correlation between ending stocks and exports for the other countries is weaker in absolute value ranging from 0.04 in Kazakhstan to 0.27 for Russia. As was the case in the rice market, the correlation between ending stocks and exportable surplus is positive and relatively strong for Pakistan (0.75) and India (0.69) and weakest in Argentina (0.06). As reported in the main body of the report, the export restrictive measures by these countries did not significantly reduce their exports.

As indicated above, in any year, fewer countries intervened in their maize export markets. Nonetheless, information for five countries is used to illustrate developments in the maize markets although China's and Russia's exports are relatively minor. An examination of Figure II.A.3 suggests a strong correlation between exports and exportable surplus. The calculated correlation coefficient indicates a perfect correlation (value of 1) for India, Russia and Ukraine and almost perfect (0.98) for Argentina. This means that exports and exportable surplus move in lockstep with each other, higher exports are associated with higher exportable surplus. China's maize market seems the exception with a calculated correlation coefficient of -0.1. The figure suggests that for China, even with a tight domestic market (relatively small and at times negative exportable surplus), there's strong interest in stock accumulation. Overall, as reported in the main body of the report, export restrictive measures did not materially reduce maize exports from these countries.

China is also exceptional regarding the relationship between exports and ending stocks. In the other countries, the relationship is positive and for Russia (0.91) and India (0.75) rather strong. That is, even with higher exports, they also expand their ending stocks. China on the other hand, the relationship is negative and relatively strong (-0.75) indicating that higher ending stocks are associated with lower exports.

Regarding the relationship between exportable surplus and ending stocks, maize is like the other two grains with a positive relationship. Again, this is not surprising, when countries have relatively abundant supplies - relatively high exportable surplus - they export more and build up stocks. The strength of the relationship varies by country with Russia having the strongest relationship (0.92) followed by India (0.76). The relationship in the other countries is much weaker, ranging from 0.1 (China) to 0.15 (Argentina).

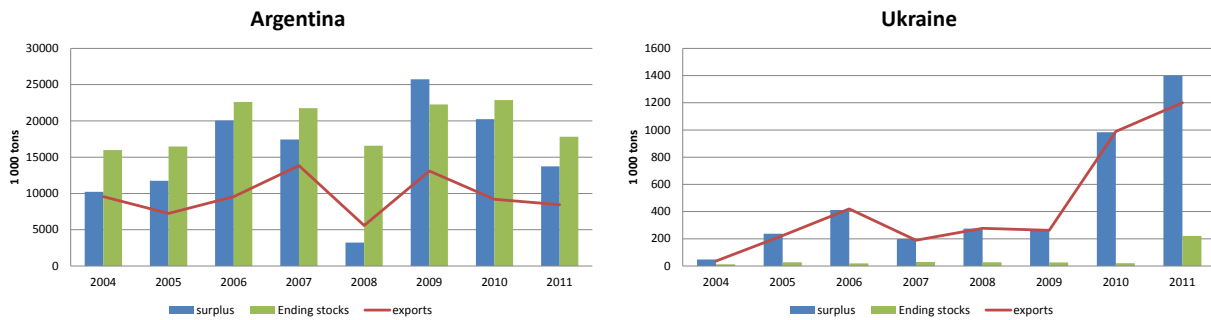
Figure II.A.3. Exportable surplus, exports and ending stocks selected countries in the inventory: Maize



The soybean market, like the maize market, did not have a large number of countries applying export measures, and in the case of Russia and especially China, their soybean market was in deficit each year with negative exportable surplus. The relevant countries therefore are Argentina and Ukraine since PS&D database does not report information on Kazakhstan.

It appears that the soybean market in Argentina and Ukraine, as in most of the other cases, exhibits a relatively strong positive relationship between exportable surplus and exports. For Ukraine, this is close to one while for Argentina the value is 0.75. When they have large exportable surpluses, they export more and vice versa (Figure II.A.4). The relationship between exports and ending stocks is also positive and rather strong with a correlation coefficient of 0.72 and 0.65 for Ukraine and Argentina respectively. These two countries not only tend to have higher exports when their markets are flush, they also expand their ending stocks. And as was the case in all the markets above, there is a positive and strong relationship between exportable surplus and ending stocks. Perhaps the countries are adding to their stocks in times of relative abundance in an effort to support producer prices and insure supply in case of future production shortfalls.

Figure II.A.4. Exportable surplus, exports and ending stocks selected countries in the inventory: Soybeans



Similar examination of other oilseeds, other coarse grains and vegetable oils is more problematic as various countries applied measures on different products, data for which is not readily available, or the export measures were applied by countries that are relatively small exporters or even net importers of the relevant product. For example, export measures were applied on soybean oil by Argentina, Belarus, India and Kazakhstan. Production, consumption or other data for Belarus and Kazakhstan are not available from the PS&D database. India although a relatively large producer, is even a larger consumer of soybean oil. India does not have an exportable surplus and exports therefore are miniscule, as India is a net importer. Argentina is the sole remaining country and the data indicate similar results as above. The correlation coefficient between Argentina's exportable surplus and exports is 0.98 and there's a strong positive correlation between exportable surplus and ending stocks. Similarly, Indonesia is the only country in the inventory that intervened in the palm oil market. Indonesia, depending on the year, is either the leading or second largest exporter of palm oil. Indonesia's exports during the period grew steadily even with the export measures. The correlation between exports and exportable surplus is close to perfect (0.98). It is not anticipated therefore than new insights would materialise by examining more markets, especially since data is sparse.