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Artículo

The end of the wheat problem? The functioning and evolution of the world wheat market, 1939-2010

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ABSTRACT

The outlook for the world wheat economy immediately before the Second World War was not very encouraging. Trade and prices had plummeted during the 1930s and many interventionist measures had been undertaken worldwide in order to deal with the so called "wheat problem". However, the world wheat trade in 2010 was almost ten times greater than it was in the postwar years and the signs of market disintegration had disappeared. This paper analyses the reasons behind the extraordinary expansion of the world wheat trade between 1939 and 2010, explores the main changes in the distribution of wheat exchanges and offers an informed explanation of those transformations. The discussion focuses on supply and demand variables, including institutional variables such as national agricultural policies, international agreements and the changing international context.

¿El fin del problema del trigo? Funcionamiento y evolución del mercado internacional de trigo, 1939-2010

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RESUMEN

Las perspectivas para el comercio internacional de trigo en los años inmediatamente anteriores a la Segunda Guerra Mundial eran poco halagüeñas. En los años treinta el comercio y los precios se habían desplomado y numerosos países habían implementado medidas para hacer frente al llamado «problema triguero». Sin embargo, en 2010 el comercio internacional de trigo era casi diez veces mayor que tras la Segunda Guerra Mundial y las señales de desintegración en el mercado habían desaparecido. Este artículo analiza las razones que explican la extraordinaria expansión del comercio de trigo entre 1939 y 2010, explora los principales cambios en la distribución de los flujos comerciales y ofrece una explicación a esas transformaciones. La discusión se centra en variables institucionales como las políticas agrarias, el efecto de los acuerdos internacionales y la influencia del cambiante contexto histórico internacional.

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1. Introduction

The outlook for the world wheat economy immediately before the Second World War was not very encouraging. World wheat markets experienced serious trouble in the thirties: total wheat trade fell by almost one third between 1925 and 1938 and wheat prices also plummeted during that period (Aparicio and Pinilla, 2015). In fact, wheat prices fell by roughly two thirds, reaching its lowest level in 1932, a collapse that was largely caused by the growth of worldwide supply in excess of demand (Malembaum, 1953). Plummeting income, balance of payment crises, shortages of payment methods, and the dismemberment of the traditional channels of trade that occurred during the Great Depression help to explain the collapse in world wheat markets. A wide range of protectionist measures were implemented worldwide in order to deal with this situation, which some authors referred to as the "wheat problem" (de Hevesy, 1940). However, there is every indication that protectionist measures contributed more to aggravating the problem than to alleviating it (*ibid.*, p. 3). In fact, the idea that the principal culprit of the "wheat problem" was to be found in protectionism was widely advocated (de Hevesy, 1940; Malembaum, 1953; Tracy, 1964). In view of the continued importance of protectionist measures, we will refer to the "wheat problem" as a long-lasting situation characterised by (1) the general perception that state intervention was necessary to ensure farmers' income and the good functioning of wheat markets and (2) the realisation that interventionist measures not only did not contribute to alleviating the causes that justified their existence, but in many cases aggravated the situation.

Considering that the second half of the 20th century was undoubtedly characterised by widespread protectionism on wheat markets, it is perhaps surprising that the world wheat trade in 2010 was almost ten times greater than it was in the postwar years and the signs of market disintegration had disappeared. This paper analyses the reasons behind the extraordinary expansion of the world wheat trade between 1939 and 2010, explores the main changes in the distribution of wheat exchanges and offers an informed explanation of those transformations. The expansion of wheat trade over the period studied suggests that a way out of the dismemberment of the world wheat trade was found after the Second World War, and it is the purpose of this work to shed light on that process. To this end, the paper is structured as follows. Section 2 serves as a starting point and describes the problems of the international wheat market in the years before World War Two (WWII). This is followed by an overview of the main trends in wheat trade up to 2010, which includes series of imports and exports —both absolute, *per capita* and percentage shares— for particular categories of countries. Following Malembaum (1953), countries have been grouped according to their relative position in the international wheat markets during the interwar period. This will serve to assess the evolution of these country groups during the 20th century with respect to what we have considered the starting point. The series have been constructed on the basis of the information contained in FAO Production and Trade Yearbooks (1948-61), the *Annuaire International de Statistique Agricole* (Institut International d'Agriculture, 1941-1946), the *FAOSTAT Statistical Database* (FAO, 2018), the *World Development Indicators Database* (World Bank, 2018), the *World Population Prospects* by the United Nations (2018) and the International Historical Statistics by Mitchell (2013). As shall be seen, there was a major reconfiguration of the world wheat market over the period studied, with increasing amounts of wheat leaving Europe for Asia and Africa. The following section (section 4) makes use of a theoretical model to identify the main reasons behind these changes. After a short section on the main reasons that have inspired agricultural policy in industrialized countries, section 4.3 discusses the main variables that have affected supply and demand for wheat in different countries, with a particular focus on major institutional developments such as international agreements and the evolution of national and international policies. A major conclusion is that the "wheat problem" has not yet been given a definitive solution even though wheat trade has grown considerably.

2. The "wheat problem" prior to World War II

Widespread agricultural protectionism in the 1930s was accompanied by a spectacular shrinking of the world wheat trade. As mentioned before, this collapse can be explained by the growth of worldwide wheat supply in excess of demand. Wheat production overseas was strongly encouraged by the demand for wheat from the belligerents of the First World War and it proved too difficult for overseas countries to reduce their wheat acreage once the European agricultural systems had recovered (Malembaum, 1953). Meanwhile, world wheat consumption remained stagnant or even fell slightly due to slow demographic growth in Europe and a tendency towards a greater variety in the diet of the industrialized countries. Eager to dispose of their surplus wheat, exporting countries threw it on the market at almost any price and interventionist measures were widely undertaken in order to protect farmers from low prices (de Hevesy, 1940, p. 3). The largest importers (Germany, France, Italy) strengthened their interventionist measures from 1932 onwards, resulting in an increasing degree of self-sufficiency. Free trade advocates, such as Great Britain and Denmark, also resorted to protectionism to achieve higher levels of national wheat production, and exporting countries soon relied on trade-distortive policies in order to give their wheat a competitive edge in world markets. Protection schemes encouraged the downward trend of wheat prices: "subsidized farming fosters excess production, excess production necessitates subsidized exports, and subsidized exports must always exert a depressing effect on the world price, which, in its turn, is detrimental to the farming interests" (*ibid.*, p. 12).

Importantly, excess wheat supplies in exporting countries coexisted with another implacable reality: the unfulfilled needs of millions of hungry people in many parts of the world. However, a transfer of wheat surpluses "would have involved a basic shift in the pattern of consumption in the underdeveloped areas" (Malembaum, 1953, p. 213). Malembaum argued that wheat surpluses reflected economic overproduction rather than underconsumption because there was no real demand for wheat from the undernourished areas that the market itself did not fill. Yet it was clear to everyone that there was a fundamental imbalance in wheat

markets, and that "it might seem untimely to talk of surpluses when shortages were lasting so long, and paradoxical to call them surpluses when hundreds of people still lacked many of the basic necessities of life" (FAO, 1947). In fact, this imbalance coexisted with a general concern that, on a global scale, the output of food grains could not keep pace with world population growth. Many political decisions during WWII were inspired by that kind of Malthusian fear (Collingham, 2011). For instance, food played a crucial role in driving both Germany and Japan into conflict, since both countries were afraid that their agricultural systems would not be able to produce enough food to feed the cities (id.). Yet, the War caused 20 million deaths directly attributable to starvation, malnutrition, and its associated diseases.

To a certain extent the Second World War contributed to alleviate the problem of surpluses in exporting countries. Global wheat production dropped significantly in the war years because the agricultural systems of chief producing countries such as the USSR were devastated by the military conflict. Moreover, the new activities associated with the War necessitated higher caloric intakes, and this pushed up global wheat demand. However, the total wheat trade did not rise but dropped significantly over the war period: warfare threw the global food trade into disarray, and for many countries wheat imports disappeared or were dramatically reduced. The Allied Governments "had to switch quickly from the Depression mentality of trying to persuade farmers to grow less in order to reduce food surpluses, to encouraging farmers to cultivate every inch of their land and to grow crops with the highest ratio of nutritional return for the effort expended" (*ibid.*, p. 66). On the other hand, the Second World War caused America to lose a large chunk of its export markets, and the United States Department of Agriculture (USDA) warned that they would be burdened with yet more unwanted food unless some way of selling food abroad was found. The reality of surpluses alongside needs became apparent at the end of WWII and stood as the cornerstone of the post war international wheat organization.

3. The evolution of the world wheat trade, 1939-2010

Total wheat trade

Total wheat trade has increased tenfold since the end of WWII and, in per capita terms, wheat trade in 2010 was roughly 3 times what it was in 1945 (figure 1). In addition, wheat exchanges have grown more than wheat production over this period: while wheat trade in 2010 accounted for more than 20% of total production, wheat exchanges represented approximately 15% of production in the postwar years (figure 2). Of course, the spectacular growth of international wheat markets must be put into context, because other agricultural and industrial areas grew even more significantly. A new international economic order arose after 1945, providing a stable environment in which unprecedented rates of economic growth were attained (Serrano and Pinilla, 2010). Although trade in foodstuffs expanded less rapidly than trade in industrial products, its growth was greater than that of production. The case of wheat is particularly interesting due to its problematic situation before WWII.

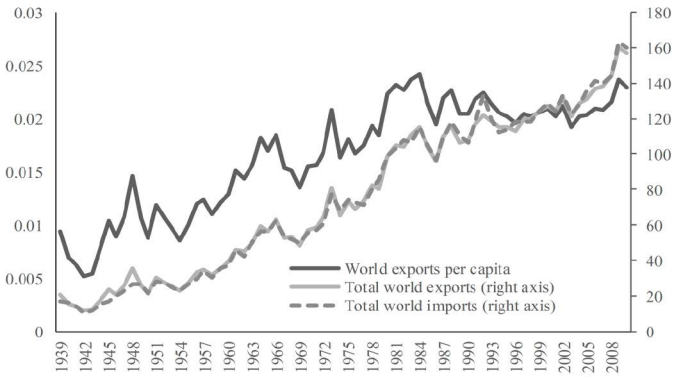


Figure 1. World wheat trade (tonnes) and world wheat trade per capita (tonnes/population), 1939-2010.

Sources: FAO Production and Trade Yearbooks (1948-61); Institut International d'Agriculture, *Annuaire Internationale de Statistique Agricole 1941-42 à 1945-46*, Volume II (1947); FAOSTAT Statistical Database. Note: although world exports are theoretically equal to world imports, there are small data discrepancies.

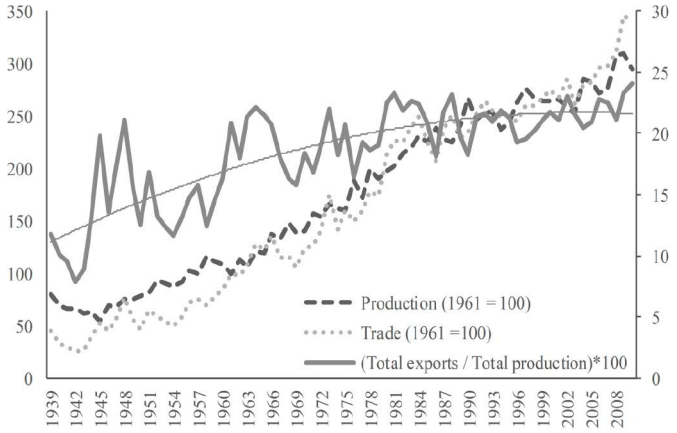


Figure 2. World wheat production and trade, 1939-2010 (1961=100).

Sources: FAO Production and Trade Yearbooks (1948-61); Institut International d'Agriculture, *Annuaire Internationale de Statistique Agricole 1941-42 à 1945-46*, Volume II (1947); FAOSTAT Statistical Database.

Wheat trade flows by country groups

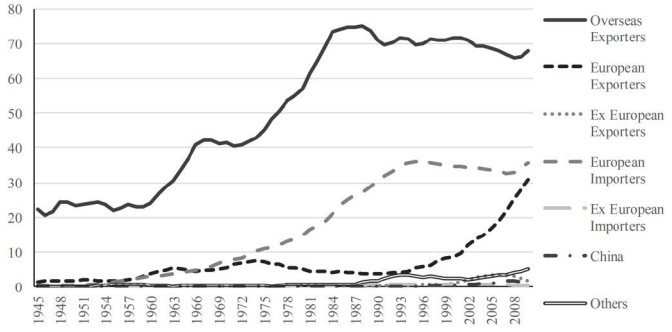
Malembaum (1953) grouped wheat-producing countries according to their regular position in the net balance of international wheat trade in the interwar period. He distinguished between the *overseas exporters* (USA, Canada, Argentina and Australia, accounting for roughly 80 per cent of all net exports of wheat), the *European exporters* (USSR, Hungary, Bulgaria, Romania, Poland, Yugoslavia,), the *ex-European exporters*[1] (Algeria, India, Morocco, Tunis, Chile, Uruguay), the *European importers* (British Isles, France, Italy, Germany, Spain, Austria, Czechoslovakia, Belgium, Finland, Denmark, Ireland Greece, Netherlands, Norway, Sweden and Switzerland, accounting for roughly 70% of all world imports), and the *ex-European importers* (Japan, Korea, Egypt, South Africa, New Zealand). China and

[1] The term "ex – European" stands for extra-European (i.e. non-European countries).

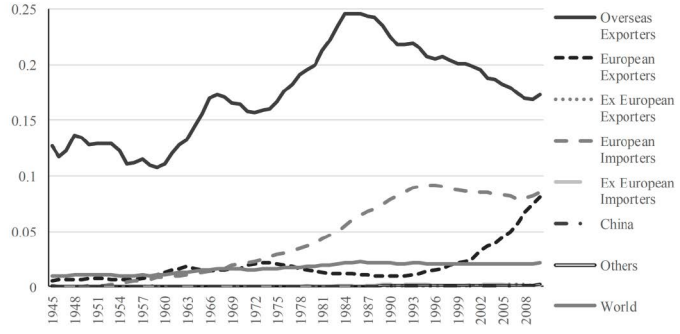
Manchuria were not included in his analysis due to the lack of reliable data. Our study will make use of Malembaum's taxonomy but will include China separately due to its special relevance. It will also include an additional group of 94 countries that were not incorporated in Malembaum's work (see table A.1, in the appendix). This will be useful for comparing changes with respect to the pre-war situation[2]. Besides, our analysis will be expanded with a continental grouping (see table A.2 and figures A.1 and A.2), which may be more convenient in order to frame trade flows geographically.

In the immediate postwar years, North America alone accounted for roughly 80% of total word wheat exports. In fact, there were no significant exporters other than the United States, Canada, Australia, and Argentina, which together accounted for more than 90% of total exports. As may be observed in figure 3, the amount of wheat exported by the group of *Overseas Exporters* grew at historically unprecedented rates over the period 1945-1980 and then leveled off. Although this growth was very impressive, even in per capita terms, the importance of the *Overseas Exporters* in total wheat trade gradually diminished as European exports soared. The upward trend in European wheat exports began in the mid-1950s and continued for the next 60 years. Some countries belonging to the group of the traditional *European Importers* soon became crucial exporters –France being by far the most significant among them– and many former USSR republics also emerged as significant exporters in the 1990s.

(a) Total wheat exports (tonnes), by Malembaum's groups



(b) Wheat exports per capita (tonnes/population), by Malembaum's groups



(c) Wheat export shares (% of total exports), by Malembaum's groups

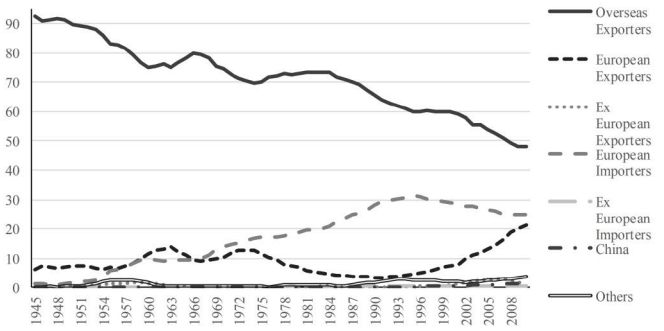


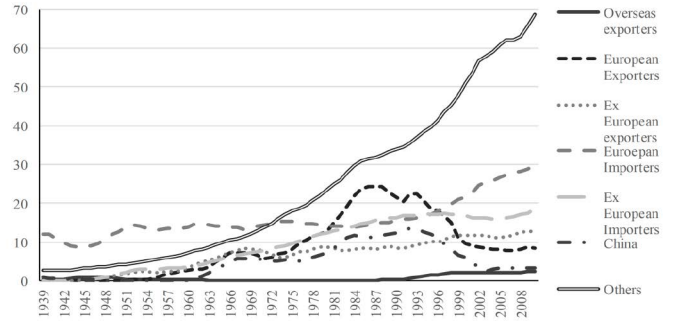
Figure 3. Wheat exports by Malembaum's groups, 1939-2010[3]

With regard to wheat imports (figure 4), Europe accounted for more than 70 % of them in the aftermath of WWII (see also figure A.2 in the appendix). On average, the volume of European imports followed an upward trend over the period 1945-2010 and it grew even more than the European population. Yet, it is possible to distinguish different trends among European territories: while some countries belonging to the *European Importers* group, such as France, Germany, and the United Kingdom, have managed to diminish wheat imports (or even to become significant net exporters), other countries, such as Italy and Spain are now major importers. As the main representative of the *European Exporters* group, the USSR also became a net importer from the mid-1970s to the mid-1990s. Yet, despite the overall growing volume of European wheat imports, its share in total world imports fell significantly throughout the whole period. The data show the emergence of a vast new market for wheat exports after World War II in developing countries. Asian countries began to import significant amounts of wheat in the immediate postwar years and by the 1960s its volume of imports had become as important as that of their European counterparts. African countries began to import wheat in large amounts later, but their imports now are roughly 20 times greater than they were in the 1960s and more than 30 times greater than in the immediate postwar years. In per capita terms, South American and African wheat imports have come to be almost as important as those of Europe. If we consider Malembaum's classification, the group of countries not included in his work – mostly African or Asian countries, which had no relevance at all in pre-war wheat markets – have come to be the recipients of roughly half of total world wheat exports.

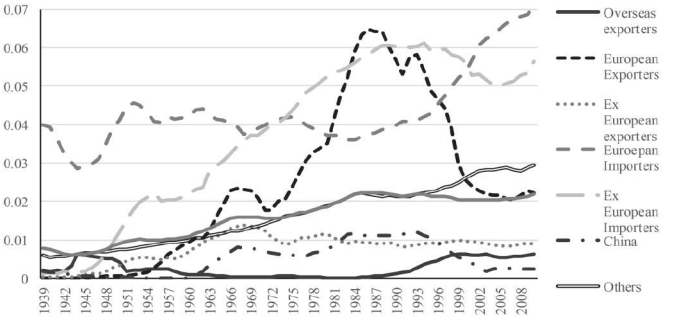
[2] This classification has also been used for the study of wheat consumption trends over the second half of the 20th century in González-Esteban (2017a).

[3] Figures 3, 4, 5, 7, A.1, A.2 and A.3 have been constructed from the same sources: FAO Production and Trade Yearbooks (1948-61); Institut International d'Agriculture, *Annuaire Internationale de Statistique Agricole 1941-42 à 1945-46*, Volume II (1947); FAO, *FAOSTAT Statistical Database* (2018); World Bank, *World Development Indicators Database* (2018); United Nations, *World Population Prospects* (2018); B. Mitchell and Palgrave Macmillan (firm), *International Historical Statistics* (2013).

(a) Total wheat imports (tonnes), by Malembaum's groups



(b) Wheat imports per capita (tonnes/population), by Malembaum's groups



(c) Wheat import shares (% of total exports), by Malembaum's groups

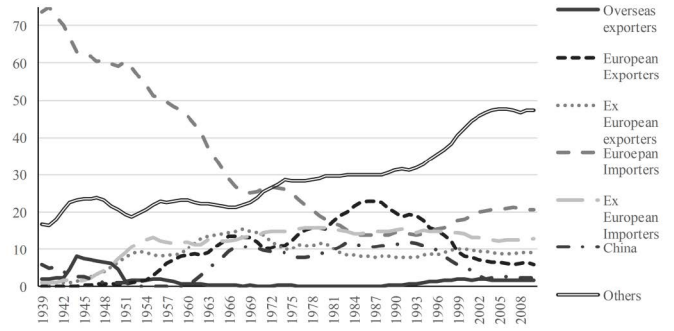
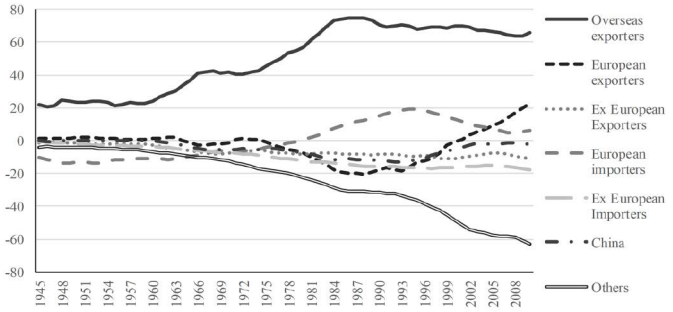


Figure 4. Wheat imports by Malembaum's groups, 1939-2010

Figure 5 puts together the evolution of wheat imports and exports by illustrating trends in net exports between 1945 and 2010. It confirms the fact that world wheat trade over the studied period not only grew significantly but also changed dramatically. While the countries belonging to the overseas exporters group have kept their position as major wheat exporters throughout the whole period, other significant exporters have made an appearance. Importantly, the group of traditional European importers managed to gradually reduce their notable dependence on international wheat markets and not only ceased to be a crucial importing group in the 1970s, but became a significant export force in the 1980s. France has always been by far the most prominent exporter among this group of countries, but even the United Kingdom –the most significant importing country in the 19th Century– consolidated its position as a net exporter of wheat in the 1980s. The traditional European Exporters –most noticeably certain countries belonging to the former USSR– also regained the status of net exporters in the 1990s, after decades of importing large amounts of wheat. With regard to the import side, a huge market for wheat has emerged in developing countries. The group of countries not considered by Malembaum –because of their lack of importance in international wheat markets before WWII– have come to be the most significant importing group. While their overall per-capita imports have always been less important than those of the traditional Ex-European importers (Egypt, Japan, South Africa…), the rapid population growth experienced in these countries has allowed them to absorb an increasing amount of wheat coming from the wealthier exporting countries. Overall, the clearest trend over the studied period is that more and more wheat has gone from Europe to Africa and Asia.

(a) Net exports (tonnes), by Malembaum's groups



(b) Per capita net exports (tonnes / population), by Malembaum's groups

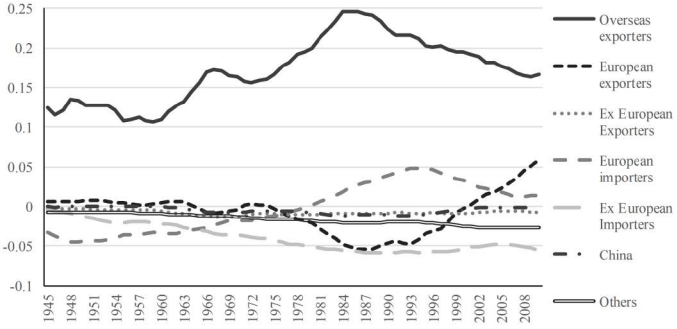


Figure 5. Net exports of wheat by Malembaum's groups, 1939-2010

4. The determinants of world wheat trade

This section will analyse the main drivers of the trends in the international wheat market described above. First, a simple theoretical model is proposed, which will serve to frame the discussion. This will be followed by a detailed analysis of the main trends by country groups, focusing mainly on national policies and the international context.

A theoretical model

Figure 6 proposes a theoretical model that serves the purpose of placing in a broad context some of the elements that will be discussed in the next section: policies, prices, institutions, agreements and the international context. The model aims to be a schematic simplification of an extraordinarily complex reality and for that reason it does not include every potential explanatory variable of the wheat trade, nor all possible relationships between the incorporated variables. It will allow us to put together the main factors affecting wheat production and consumption in both importing and exporting countries, and thus to construct a global explanation of the major wheat trade flows over the second half of the 20th Century. The model attempts to bring together multiple fields of discussion: the effect of national policies on prices or preferences, the role of technology and geography, the impact of the international context... With regard to the demand side, the model is inspired by that proposed by Byerlee (1987) for wheat imports in low-income countries. However, our model integrates the supply side with the demand side and offers a framework that is valid for both exporting and importing countries. In our theoretical model, net exports in one country are broadly considered as the difference between wheat production and wheat consumption in that country. It follows that trade occurs when production in a given country is not enough to cover its domestic consumption and when there are other countries in which production exceeds their current consumption requirements.

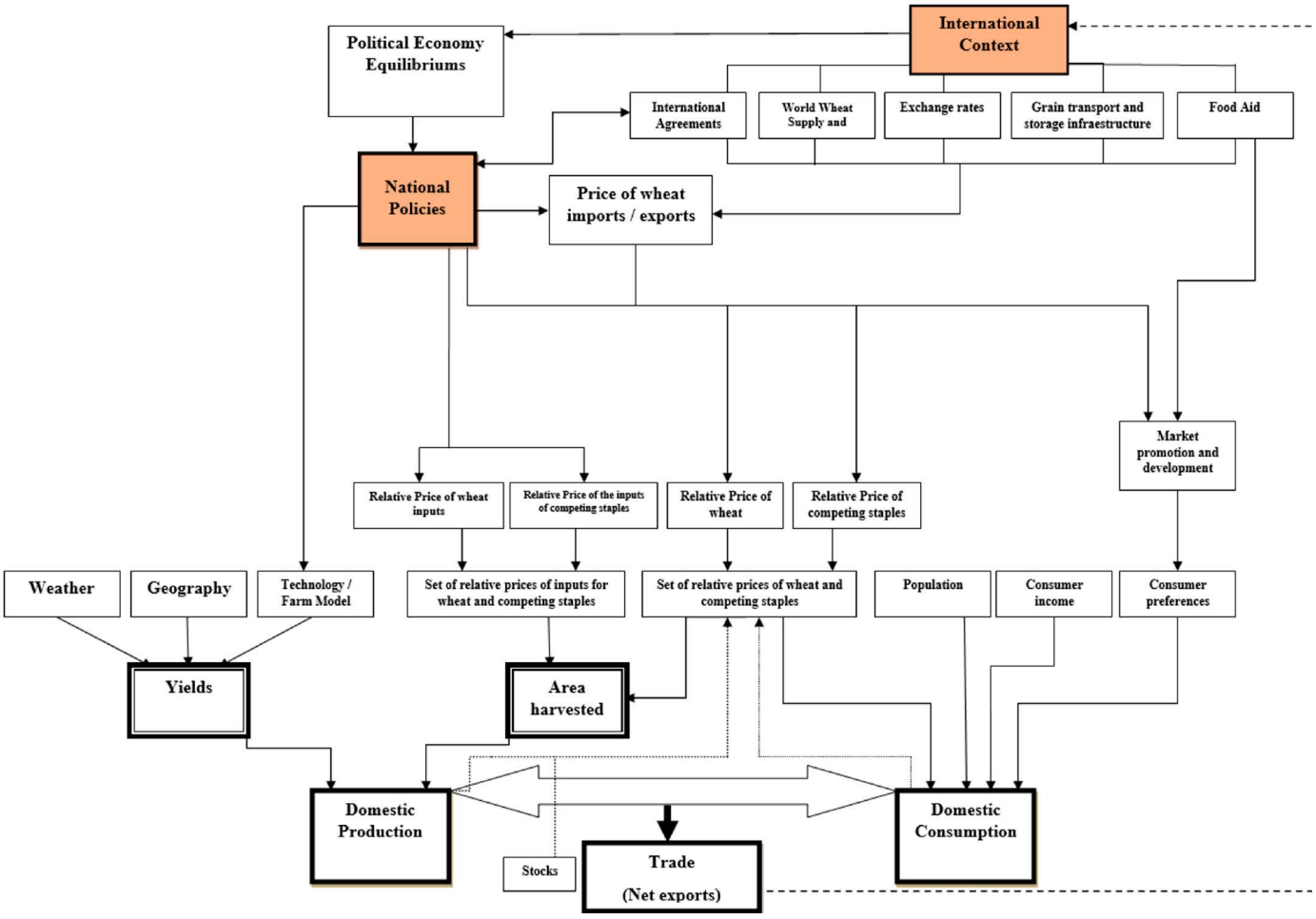


Figure 6. A theoretical model: major determinants of wheat production, consumption and trade.
Source: author's elaboration.

As may be observed in figure 6, wheat trade in a given country depends on many factors. Some of these have been analysed in recent work on the evolution of the international wheat market in the period under study: González-Esteban, (2017b) analyses the variables that have influenced the evolution of national consumption and González-Esteban (2021) discusses the role of geography, distance, demographic variables and income growth. This paper will build on that work to explain the trends in wheat trade discussed in the previous section, but will focus on interpreting those trends in the light of key agricultural policy developments. As shall be explained, government intervention in wheat markets has been a world-

wide phenomenon, because multiple objectives of economic policy can be pursued through wheat policies. Given the considerable weight of the wheat sector within the agricultural systems of most developed countries, and considering the growing importance of wheat in the basic diet of developing countries, this should come as no surprise. The next section will show that the objectives of government intervention in exporting countries have been very different from those of importing countries, and the choice of instruments have also varied greatly over time.

A note on wheat policies

As the theoretical model in figure 6 illustrates, wheat trade flows depend on factors unrelated to agricultural policies — such as geography— or very indirectly related to them, such as population and income trends. However, the same graph also shows how the international context and agricultural policies can condition the evolution of wheat trade through their impact on variables such as technology and prices. In order to analyse the evolution of wheat trade in the period under study, it is therefore important to understand the motives behind the agricultural policies of the countries involved in this market, and to do so we must go back to the interwar period. It is not possible to talk about industrialized countries' agricultural policies in the postwar years, and over the 1950s, without referring to the *farm-adjustment problem* or *farm-income problem*. In fact, the "wheat problem" of the 1930s was only an early and certainly virulent manifestation of a much wider problem, namely the task of adapting basic agricultural supplies to demand, while ensuring the farmers a "fair" income (Tracy, 1964)[4]. In the United States, the approval of the Agricultural Adjustment Act (AAA) by president Franklin D. Roosevelt in 1933 was intended to raise the purchasing power of wheat and other basic foodstuffs while tackling the problem of overproduction, and it has often been said that this marked the beginning of the end for *laissez faire* in world agriculture (González-Esteban *et al.*, 2016). As mentioned before, the Second World War alleviated the problem of agricultural overproduction for a while, but wheat surpluses in the United States reappeared soon after the end of the conflict. In Europe, the wartime years were characterized by growing concerns about the availability of food supplies, and strong state intervention in agriculture was maintained in the postwar years with the aim of achieving self-sufficiency (Federico, 2005). However, no European government liberalized its domestic agricultural markets once food shortages disappeared, thus revealing that one of the main drivers of agricultural policy had been tackling the farm-income problem (Tracy, 1964). Wheat policies in exporting countries have certainly been conditioned by this issue throughout the 20th Century, though the design and execution of those policies may have also served other interests, such as increasing export earnings and guaranteeing price stability. Most OECD wheat exporters, such as the United States and the European Union (EU), have consistently supported domestic wheat production through the institution of price support policies (Mitchell and Mielke, 2005). For instance, a U.S. Department of Agriculture study found that «producer subsidies were used in all wheat exporting countries with the exception of Argentina» (Shalaby *et al.*, 1988). These policies were relatively successful in bolstering farmer's income, but failed in the objective of reducing wheat surpluses[5]. In fact, price supports stimulated production by artificially raising the prices received by farmers, thus aggravating the problem of surpluses (Tracy, 1964). Of course, the international wheat trade became increasingly distorted as a result. First, price support schemes were required by the implementation of import and tariff barriers, because the cheaper foreign wheat in the domestic market would otherwise erode domestic prices (Hathaway, 1987). It has often been claimed that the General Agreement on Tariffs and Trade (GATT), signed in 1947, allowed protectionism in agriculture because it was specifically designed to permit the functioning of the agricultural support programs then in existence in industrialized countries, and particularly in the United States (González-Esteban *et al.*, 2016; Rausser, 1995). Second, export subsidies were soon required in exporting countries in order to get rid of the accumulating wheat surpluses. Wheat export subsidies have been widely used to reduce stocks, raise farm income, increase foreign exchange holdings, and maintain or increase market shares. Export subsidies for wheat have been a «perennially important issue in international agricultural trade»: they have harmed competing exporters by forcing them to accept lower prices for their wheat, and they have been expensive both for governments and taxpayers (Mitchell and Mielke, 2005; O'Connor, 1982; Wilson *et al.*, 1999). In addition, since surplus disposal schemes have been reduced over periods of relative wheat shortages, export subsidies have contributed to global price volatility (Mitchell and Mielke, 2005). The importance of the North American aid diminished when international wheat prices skyrocketed in the 1970s, but wheat surpluses soon reappeared and aid schemes gave way to a fierce battle over subsidized commercial sales between the main exporting countries (Friedmann, 1993). Given the overall harmful effects of these practices, «for wheat, negotiated reductions in export subsidies were perhaps the most important outcome of the Uruguay Round of Agreements Act», when high-income countries agreed to reduce the value of their wheat export subsidies by 36 per cent by 2000 (Wilson *et al.*, 1999, p. 3). It has also been argued, however, that the progressive shift from price supports and export subsidies to decoupled payments has not altered the protectionist nature of agricultural policies in industrialised countries (Koning, 2017) nor has it reversed the trends in international wheat trade that began in the 1950s (González-Esteban, 2018). We will look at this in more detail in the next section.

[4] At least since the 1930s, productivity in agriculture has tended to grow more slowly than in other sectors of the economy in most countries of the world (González-Esteban and Botella, 2022). This has been due to certain characteristics of the agricultural sector that have been extraordinarily durable over time, and that have to do with technology, price formation, the distinctive characteristics of the labour market and the particular nature of agricultural supply and demand (Prebisch, 1950; Singer, 1950; Grilli and Yang, 1988; Koning, 2002; Yamada and Yoon, 2014; González-Esteban and Botella, 2022). Agricultural protectionism has been the completely uniform response to the political tensions associated to the resulting agricultural income gap, which has been a generalized reality over time and across countries (Timmer, 2013).

[5] The success in terms of improving agricultural income was only relative, since the distribution of aid in policies such as the CAP was profoundly uneven (Collantes, 2020).

Trade explanation

In section 3 we presented an overview of the main world trade trends in wheat by continents and by Malembaum's groups of countries. This allowed us to identify some of the main processes that have taken place in the world wheat market over the last 65 years, namely (1) the European Importers' transition from being the most significant importer group to standing as a crucial net exporter, (2) the prevalence of the Overseas Exporters as key wheat-exporting nations, even while their share of global wheat exports has diminished greatly, (3) the critical role of the Ex-European Exporters (most notably the USSR) as wheat importers in the 1970s and 1980s, and their re-emergence as key wheat exporters after the 1990s, (4) the spectacular growth of wheat imports in the group of Ex-European importers and in the group of "others" throughout the whole period. The continental analysis showed that Europe as a whole (including the countries belonging to the former USSR) ceased to be a net importer of wheat in the 1990s and consolidated as a major net exporter in the 2000s. North America has remained as the most significant exporter, and Oceania (Australia) has progressively improved its trade balance in wheat throughout the whole period. The relative weight of South America in total wheat trade has barely changed over this 65-year period. On the other hand, Africa and Asia have been the recipients of rapidly growing amounts of wheat. The purpose of this section is to provide a synthetic institutional explanation of those transformations.

One of the most significant changes that have taken place in the world wheat market over the last 70 years has been the (1) transition of some countries belonging to the traditional European Importers –i.e. the United Kingdom and France– from being crucial net importers to acting as major exporters. While this group of countries accounted for roughly 75% of total world imports in 1939, their joint share was only 20% in 2010. Moreover, the European Importers' share in total world wheat exports came to be around 30% in the peak years of the 1990s. At the end of the Second World War, the situation in the group of traditional European Importers was one of acute shortages of food. All European governments had intervened significantly in their own agricultural sectors during the war years, and widespread intervention was maintained with the aim of achieving self-sufficiency once the conflict was over. In the postwar years, these countries received vast amounts of food aid through the Marshall Plan of European Reconstruction and soon, food shortages disappeared. However, as mentioned before, price supports for wheat were maintained, even when short supplies were no longer a problem, thus revealing that the main driver of agricultural policy was the political willingness to provide income support to farmers. Since that moment, the history of wheat among the European importers has been one of supply outstripping demand. The growth of *per capita* wheat production from the 1950s to the 2000s was indeed outstanding, and it can only be explained by the spectacular improvement in land productivity. Production subsidies were consolidated under the CAP, and guaranteed high prices for wheat –together with credit facilities and public investment– motivated the widespread adoption of new production techniques based on labour-saving machinery and the massive utilization of pesticides and fertilizers. However, the rapid growth of wheat production was not accompanied by a similar increase in wheat demand. Most countries belonging to the European Importers group had attained significant levels of income *per capita* by the 1960s, and the commonly low –or even negative– income-elasticity of demand for wheat products at high income levels meant that the possibilities of increasing *per capita* demand were certainly limited. In fact, increasing wheat utilization *per capita* in the 1970s, 1980s, and 1990s had much to do with the growing use of wheat as feed (which in turn was directly related to the distortion of relative prices under the CAP)[6]. Since population growth has been low throughout the whole period, and wheat utilization *per capita* has grown at much lower rates than production, European importers have tended to produce much more wheat than they have consumed. And, since domestic prices for wheat have usually been set above world prices, export subsidies and various surplus disposal schemes have been needed in order to get rid of excess production. Most of these countries have made commitments to reduce specific supports to wheat growers and eliminate export subsidies under the URAA, yet they have found alternative ways to maintain protection and keep wheat flowing from their ports. It must be said, however, that the countries belonging to this group stand out for having extremely high per capita wheat production and consumption rates (González-Esteban, 2017b, 2017a). Thus, as figure 7 shows, although this group of countries has flooded international markets with wheat, in fact the wheat they export represents a relatively small percentage of their production.

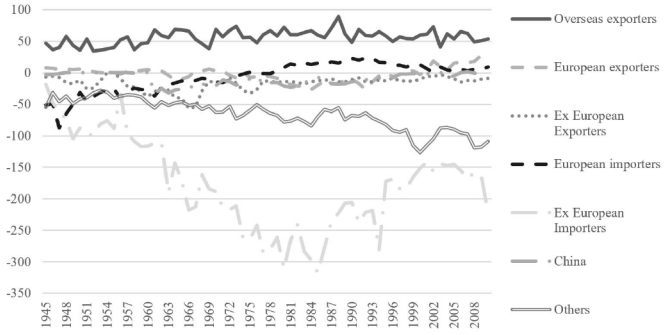


Figure 7. Net wheat exports as a percentage of national production, tonnes, 2010.

Source: author's elaboration. See footnote 3 for data sources.

The (2) Overseas Exporters group accounted for roughly 90% of total world wheat exports in 1945. Although their relative importance in the international export market for wheat gradually diminished over the following 65 years –in 2010, their share of total exports was only 50%– these countries have managed to maintain their position as the most prominent wheat exporters throughout the whole period. The United States and Canada were pioneers in struggling with the farm-income problem prior to WWII, and their agricultural policies in postwar years were indeed motivated by a desire to give farmers a "fair" income. The GATT, signed in

[6] See González-Esteban (2017a)

1947, was specifically designed to permit the domestic farm programs then in existence in the United States (which required tariffs and other measures of protection to function). Several schemes for limiting domestic output were implemented, with the aim of preventing wheat prices from falling more, but the problem of overproduction persisted and new ways of surplus disposal had to be found. Public Law 480 was approved by the U.S. congress in 1954, and it institutionalized a way of getting rid of wheat surpluses by shipping them to developing countries at subsidized prices. Since the United States and Canada overwhelmingly dominated the international wheat market in the 1950s and 1960s, they were able to coordinate price policies and tried to prevent other countries from growing more wheat. This was partly achieved through the eight International Wheat Agreements signed between 1945 and 1971 (Callear and Blandford, 1981). Yet despite all this, and even while Australian and Argentinian wheat exports were also gradually increasing, the Overseas Exporters' share of total world exports fell steadily. In fact, the relative weight of the Overseas Exporters in the wheat export market further accelerated its downward trend from the 1980s onwards. This was, of course, related to supply trends in those countries: while overall world wheat production continued its upward trend between 1980 and 2010, production in the Overseas Exporters leveled off and remained fairly steady over this period. The stagnation of production was one consequence of the evolution of yields and area harvested. First, probably due to climate and soil conditions, wheat yields in the Overseas Exporters group remained much lower than those in certain European countries, such as France, Germany, and the United Kingdom. Second, the area harvested in the United States and Canada followed a downward trend from 1980 to 2010, due to the implementation of wheat-land diversion programs and the progressive abandonment of direct supports to wheat growers. This process was, in turn, related to the loss of the European market for wheat due to the successful establishment of the CAP: US-EEC negotiations in the 1960s ended up with North American soybeans being exempted from EEC import duties in exchange for European protection against wheat. In any case, the percentage of wheat that these countries have exported in relation to their production has remained relatively stable and has even increased over the period (see figure 7). The countries belonging to this group are undoubtedly those which, for reasons related to comparative advantage, specialised in producing for export. With regard to Argentina, its agricultural policies have probably been the most prominent exception among wheat exporters throughout the whole period, since wheat exports have usually been taxed rather than subsidized.

The (3) role of the European Exporters in the international wheat trade is particularly interesting, for two reasons. First, because most of the countries belonging to this group were centrally planned economies for most of the studied period; and second, because they were significant net importers of wheat for roughly two decades (from the early 1970s to the mid-1990s) but in recent times they have returned to their traditional position as major exporters. Their changing role in the world wheat market has been, of course, deeply influenced by government policies that have affected both supply and demand trends. The agricultural sector in the Soviet Union was completely devastated during the Second World War, and the government tried to increase wheat production as rapidly as possible in the immediate postwar years. This was achieved through the Virgin Lands Campaign, which expanded wheat cultivation to 40 million hectares of marginal land (Burkitbayeva and Kerr, 2013; González-Esteban, 2021, 2017b). The growth of wheat production in the 1950s and 1960s was indeed remarkable, yet it was based on area increases rather than on enhanced land productivity. Distorted peasant incentives due to collectivized agriculture also limited the improvement in yields. Meanwhile, demand for wheat was also rapidly increasing as a result of the growing use of wheat as feed and the rising meat consumption of Soviet citizens. This meant that, by the early 1970s, Soviet self-sufficiency in wheat could no longer be maintained. The so-called Great Grain Robbery –massive purchases of subsidized wheat from North American grain companies in 1972– marked the beginning of roughly two decades in which the USSR acted as a major net importer in the world wheat market. The situation would only be reversed when the whole centrally planned system of the USSR collapsed in the early 1990s. The re-emergence of the European Exporters as significant net exporters of wheat over the 2000s was strongly related to supply and demand trends from the 1990s onwards, and particularly with the declining use of wheat as feed that occurred as a result of the transition to free-market capitalism: the extraordinary protections that had been granted to the livestock sector under the Soviet regime were removed during the transition, and rising meat imports meant that much lower amounts of wheat were required for feedstock (Götz *et al.*, 2013).

Finally, the flip side of the spectacular export growth discussed above is (4) the magnificent growth of wheat imports in the group of Ex-European importers and in the group of "others" throughout the whole period. As the theoretical model illustrates, this phenomenon has to do with both supply and demand reasons. Several studies have looked at this phenomenon from the point of view of consumption growth in these countries, which was closely related to population and income growth (González-Esteban, 2021, 2017b). On the supply side, it is important to note that many of the countries belonging to this group are located in regions where wheat cultivation is very difficult or virtually impossible[7]. As figure 8 shows, there is a relationship between the most produced cereal in each country and the latitude in which it is located.

[7] Although we are considering wheat as a homogeneous product, hundreds of different varieties of wheat are produced around the world based on characteristics of local climate

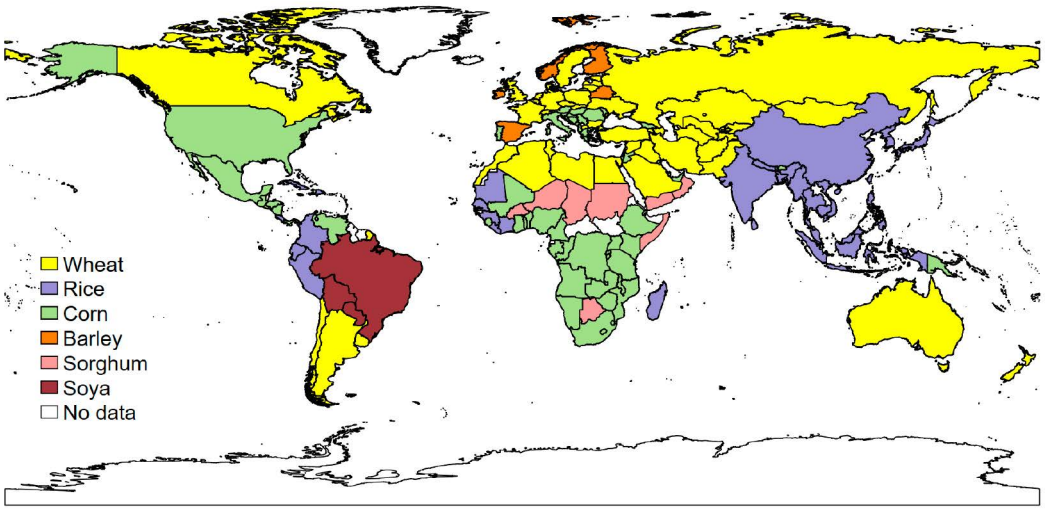


Figure 8. Most produced cereal* in 2010, by country.
Source: author's elaboration from FAOSTAT Statistical Database. * Including soya.

Against this background, in this paper we are particularly interested in the institutional factors that have contributed to the growth of wheat imports in importing countries, which are many and very heterogeneous. First, the above analysis has suggested that import growth is related to the policies of exporting countries. On the other hand, the policies of wheat importing countries have varied greatly. One reason for this is that they have depended on many factors, such as income levels, population growth, political stability, political economy equilibriums within the country, the international credit situation, and foreign exchange restrictions (Shalaby *et al.*, 1988, p. 25). In general, wheat-importing countries have always been concerned about the lack of assured access to wheat export markets over periods of shortages and high prices. There have been, however, different approaches to tackle the problem of food security. On the one hand, (1) many countries, particularly in Asia, have long intervened strongly in grain markets (Chabot and Dorosh, 2007; Tyagi, 1990). Government intervention has taken many forms: subsidies, price guarantees, trade restrictions, credit facilities, domestic purchases, and sales of wheat stocks (Timmer, 1989). While in centrally planned economies, those instruments served rigid long-term goals, in market economies they were usually the result of more decentralized decisions. Part of the rationale for these interventionist policies has been, however, «a deep mistrust of private traders and private markets, deemed to work against the best interests of consumers and producers» (Chabot and Dorosh, 2007, p. 335). For instance, wheat production has been significantly subsidized in importing countries such as Japan, Pakistan, India and China (Jabara, 1981; Rozelle and Huang, 1998; Srinivasan and Jha, 2001). Of course, domestic wheat markets in those countries required substantial protectionist measures that isolated them from international markets. On the other hand (2), there was a large group of developing countries whose governments followed industry-driven development strategies and adopted policies with an anti-agricultural bias (Anderson *et al.*, 2013; GATT, 1958; Krueger *et al.*, 1988). Most South American and African countries welcomed subsidized foreign wheat while discouraging local wheat production. The key idea, inspired in the law of comparative advantage proposed by Ricardo, was to maintain a low level of urban wages by virtue of low food prices, and thereby «to maintain a high level of profits of factory owners for reinvestments and to enhance economic growth» (Son, 1986, p.2). Yet somehow, surprisingly, many of these governments also put the emphasis on increased food production and self-sufficiency –which was clearly at odds with the anti-agricultural bias– so ambiguous policy settings often arose in those countries (FAO, 2000). The overall trend in most wheat importing countries –and particularly in those whose governments supported heavily its local wheat sector over the 1950s, 1960s, and 1970s– has been one of deregulation and liberalization from the 1980s (Rozelle and Huang, 1998; Srinivasan and Jha, 2001). In addition, the anti-agricultural bias in most African and South American countries began to lose importance in the 1980s, so it may seem that there has been a convergence process in the policies of wheat importing countries (Anderson *et al.*, 2013). There have been, however, significant exceptions to those overall trends. For instance, certain high-income countries such as Japan –which is one of the largest wheat-importing countries– have not reduced import controls or meaningfully reduced producer support so far (Mitchell and Mielke, 2005). India and other significant developing countries began to cautiously liberalize wheat trade in the 1980s and 1990s, but have now expressed opposition to further reform under the WTO, «arguing that developing countries have not gained from the Uruguay Round and that the URAA deals only with issues of importance to developed countries» (Young, 2000, p. 19). It can surely be said that wheat policies in importing countries have been the subject of severe controversy throughout the last 70 years. In fact, the history of wheat policies in deficit countries could easily be taken as an example of the very different perspectives that have coexisted on the purpose of ensuring adequate availability of food and household food security in importing countries (González-Esteban, 2014). Moreover, considerably less agreement has existed on how the food security aim can be balanced with other goals, such as maintaining farm income or achieving economic development (O'Connor, 1982).

It is not easy to explain the impressive import growth that has taken place in the group of ex-European importers and in the group of "others" because they encompass countries of a very heterogeneous nature. The group of ex-European countries –i.e. those that were already major importers in the interwar period such as Egypt, Japan, Korea and South Africa– has maintained relatively high levels of per capita wheat consumption while growing demographically (González-Esteban, 2017a). Since domestic production has not grown substantially, these

countries continue to be the largest wheat importers relative to their production (see figure 7). On the other hand, the group of "others" is composed of countries whose importance in the world wheat trade in 1945 was negligible. They neither consumed nor produced significant amounts of wheat at the end of WWII. However, their wheat imports multiplied by 20 over the following 65 years and, by 2010, they had come to absorb roughly half of total world wheat imports. This group of countries has played a key role in alleviating the "wheat problem" in exporting countries, since they have been the recipients of growing amounts of wheat coming from the overproducing developed regions. Wheat products were almost unknown in most of these countries in 1945, but a transformation of diets took place, slowly but steadily, and a significant shift towards wheat products occurred from the 1950s onwards[8]. Although *per capita* demand for wheat has not come to be as high as in Europe and North America, wheat has become a staple in the diet of many urban consumers of these countries, successfully displacing traditional local products in their food baskets. This was partly the result of the active promotional activities carried out by national and international agencies, such as the USDA and the FAO (Morgan, 1979), but it was also the consequence of other underlying processes, such as growing income, urban migration, and the rising opportunity cost of time. Importantly, despite the fact that growing wheat consumption *per capita* was a necessary condition of raising total demand in these countries, population growth has probably been the most important factor. Wheat production has grown significantly over the whole period, yet it has not kept pace with the spectacular rise in demand. This is directly related to two issues. First, most countries belonging to the group of "others" are located in areas not suitable for wheat production, and environmental and soil conditions have limited land productivity. And second, most of these countries applied anti-agricultural-biased policies in the 1950s and 1960s with the aim of fostering industrialization via cheap food imports and low food prices for urban workers. In most cases, this strategy revealed itself as ineffective, but also as extremely dangerous in terms of ensuring adequate food supplies to their population. Importantly, most of these countries are not only net importers of wheat, but also net importers of calories (González-Esteban, 2018). The wheat-price crisis from 1972 to 1975 raised serious concerns about food security in these countries, leading to a reduction of the anti-agricultural bias of their policies over the following decades. However, in spite of this, most countries belonging to the group of "others" became more dependent upon wheat imports from 1975. Their agricultural sector had been disregarded for many years, and the productivity gap that existed between wheat production in these countries and in the main exporting regions widened. In addition, the new consumption habits of their populations, including their growing preference for wheat products, showed no sign of slowing down.

5. Concluding remarks

The world wheat market showed evident signs of disintegration during the late 1920s and 1930s: trade and prices plummeted, and governments of both exporting and importing countries intervened worldwide in order to deal with the associated problems. This situation was referred to as the "wheat problem", and the writings of the time reveal that the outlook for the world wheat economy was very discouraging. However, the available data shows a dramatic increase in wheat trade over the following 70 years. A temporary solution to this issue was found –at least as far as market disintegration was concerned– via the attempt to put an end to a perturbing paradox: while wheat overproduction was an essential part of the problem in exporting/developed regions, millions of people remained hungry in the developing countries. Since the problem was, of course, that no effective demand for wheat existed in those countries –wheat products were virtually unknown and there were also institutional and income barriers preventing people who may have wanted to buy wheat from getting it– an institutional international effort was made in order to promote the transfer of wheat surpluses from overproducing regions to deprived countries. The reconstruction of the international wheat trade that is delineated in this paper clearly shows that that was indeed what happened between 1939 and 2010. It also shows, however, that wheat trade flows have been affected by a large number of economic and institutional variables, with those variables differing in time and space. Three general conclusions may be extracted from the discussion.

First, state policies have significantly affected the international distribution of wheat trade flows. Developing countries that have achieved a certain degree of self-sufficiency in wheat –i.e. China, India, Pakistan– have done so through extensive state intervention. Industrialized countries that have gone from being major wheat importers to being significant wheat exporters –i.e. France, the United Kingdom, Germany– have done so thanks to massive programs of governmental support and protectionist measures at the border. Traditional wheat exporters, such as the United States and Canada, have benefited from large export subsidies and other surplus-disposal schemes in order to dump their wheat abroad. On the other hand, most countries whose trade balance in wheat has deteriorated –Colombia, Ghana, Jordan, Kenya, Nigeria, Indonesia, among others– have systematically disregarded domestic wheat production and have not restricted wheat imports. It is not clear whether or not widespread state intervention in the wheat sector has restricted the total amount of wheat traded: while measures that directly discourage imports have imposed limits, policies directed towards promoting exports may have actually led to expansion. It is obvious, however, that these policies have been responsible for large losses, in terms of efficiency costs, at the aggregate level. The main problem is that the national rationales behind those policies have usually been entirely understandable.

The second conclusion is, in fact, directly related to those rationales: wheat policies –in both exporting and importing countries– have been an instrument to achieve different national goals. These objectives, ranging from raising farm income to attaining food self-sufficiency, have systematically overridden other considerations regarding international trade. Wheat trade policies have been an adjunct of domestic policies aimed at tackling unresolved domestic issues, and there are reasons to believe that many of the theoretical considerations and normative statements that have been made regarding state intervention in wheat markets have also been strongly influenced by those issues.

[8] This process has been analysed in González-Esteban (2017b).

A final corollary emerges from all the above. The "wheat problem" ceased to be an issue because wheat trade resumed its growth after WWII and the signs of market disintegration disappeared. However, while the wheat trade surely increased in the years that followed the end of the Second World War, the primary forces that initially motivated the "wheat problem" are still extant and have not been given a universally satisfactory solution. Real prices of wheat followed a marked downward trend over the studied period and, while it is true that income support for wheat growers in exporting countries is now commonly decoupled from production, the farm-income problem still strongly influences trade policy. There is no doubt that the structural change process has contributed to moderate the dimensions of this issue, but it is clear that the farm problem still overrides most other considerations regarding the design of wheat-trade policies in high-income exporting countries. On the other hand, recent experiences of wheat price-crisis have shown that no global solution has been provided on the issue of price volatility and its devastating effects on wheat importing countries. The collapse of the Doha Development Round in 2008 perfectly illustrates that no global consensus has been reached on the issue of how to balance wheat trade liberalization with domestic aims, such as increasing farm income or guaranteeing food security. International wheat flows, national wheat policies, and international negotiations over those policies are still subject to the old, unresolved questions.

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