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THE DYNAMICS OF INTERNATIONAL TRADE IN CEREALS, 1900-1938¹

Gema Aparicio * and Vicente Pinilla**

* Independent Scholar (Fort Wayne, Indiana, U.S.A.)

Contacto: aparicio4@gmail.com

** Universidad de Zaragoza and Instituto Agroalimentario de Aragón

Contacto: vpinilla@unizar.es

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Resumen

El objetivo de este trabajo es analizar la dinámica del comercio internacional de cereales en el primer tercio del siglo XX. Para ello se estudiará su evolución a lo largo de ese periodo, comparándola también con la del comercio del conjunto de productos agrarios y alimentos. Además, se examinará la composición por productos de este comercio. Para el trigo, maíz y arroz se estudiará el funcionamiento de sus mercados, con especial atención a los flujos de importación y exportación entre consumidores y productores. Para comprender mejor el funcionamiento del mercado de estos productos, se examinará la evolución de su oferta, demanda y precios.

Palabras clave: Comercio internacional agroalimentario, Comercio de cereales, Gran Depresión.

Abstract:

The aim of this paper is to analyse the dynamics of international trade in cereals in the first third of the twentieth century. To this end we will study its evolution over this period, comparing it also with the general trade of food and agricultural products. In addition, we will examine the structure of this trade. For wheat, maize and rice we will examine the operation of their respective markets, with special attention to the import and export flows between consumers and producers. To better understand the functioning of the market for these products, we will examine the changes in supply, demand and prices.

Key words: International agrifood trade, Grain trade, Great Depression

JEL Codes: F14, N50, N70, N76, Q17

1. Introduction

International trade expanded in the long XIX century (that is, up to and including the First World War). The reasons for this growth are clear, although there exists an interesting debate on the importance of each of them: incomes rose, the cost of maritime and overland transport fell and a general trend towards free trade took place (Findlay and O'Rourke, 2007; Jacks, 2006). Moreover, a highly stable international monetary system, based on the gold standard and which gradually included more and more countries, also favoured the integration of the international goods markets (Estevadeordal et al., 2003). The upsurge in trade, together with mass transoceanic migrations of workers and movements of capitals, were the essential components of the first globalizing wave (O'Rourke and Williamson, 1999).

Agricultural and food products were a key component of the increase in international trade, approximately half of which consisted of food products and agricultural commodities (Lewis, 1981). Moreover, inter-industrial trade (i.e. between manufactures and primary goods) is fundamental to the explanation of international exchanges of goods. The increasing integration of markets also had a significant impact on agriculture (Pinilla and Ayuda, 2010). Thus, the agricultural depression widespread at the end of the XIX century was a direct outcome of intensifying competition, in European markets, between continental farmers and those from other countries, mainly the Americas and the eastern fringes of Europe, where huge tracts of new land were being brought into cultivation (Tracy, 1964; O'Rourke, 1997).

The agricultural trade trend between 1900 and 1913 prolonged the growth witnessed in the nineteenth century, which then fell sharply during the First World War, to then recover and expand rapidly until the crash of 1929, when it initially dipped and then stagnated. Overall, between 1903 and 1938, agricultural trade grew at an annual growth rate of 1.4%, considerably less than the rate of 3.7% achieved in the second half of the XIX century. The sharp slowdown in the growth of trade in this period is the result of an external political shock (World War I) and of the economic shock resulting from the crisis that began in 1929, which deeply affected international trade. Until 1913 the volume of international trade in agricultural raw materials and food grew at an annual rate of 3.3%,

very similar to that of the preceding decades. During the war years trade volume experienced a negative annual growth rate of 10.9%. Trade plunged during these years, since Europe (the principal importer of agricultural products in this period) was the region most affected by the war. The period between the end of the First World War and the beginning of the Depression was marked by a rapid recovery in the volume of international trade. By 1925 agricultural trade had recovered to 1913 levels, and between 1921 and 1929 the world volume of agrifood exports grew at an annual rate of 7%. Economic crisis, and the spread of protectionism worldwide, caused international trade to fall. From 1929 to 1934 the volume of international trade in agricultural products diminished by 13% in absolute terms, although a slight recovery in the latter years of the decade resulted in an annual negative growth rate of 1.2% for the 1930s as a whole².

Given this background, the aim of this paper is to analyse the dynamics of international trade in cereals in the first third of the twentieth century. To this end we will study its evolution over this period, comparing it also with the general trade of food and agricultural products. In addition, we will examine the structure of this trade. For wheat, maize and rice we will examine the operation of their respective markets, with special attention to the import and export flows between consumers and producers. To better understand the functioning of the market for these products, we will examine the changes in supply, demand and prices.

The study first analyses international cereal trade as a whole, to then examine its principal products, especially wheat, to which we shall dedicate a large part of this study, maize and rice.

2. International trade in cereals

2.1. The evolution of world trade in cereals

In the first third of the XX century cereals represented a very important, although declining, part of the international trade in agricultural products, oscillating between 20.6% in 1909-13 and 14.7% in 1934-38 (Table 1).

²All the data and calculations of this introduction for agricultural international trade are from Aparicio et al. (2009).

Table 1: International imports of agricultural and food products and cereals (at 1925 prices, in thousands of U.S. dollars)

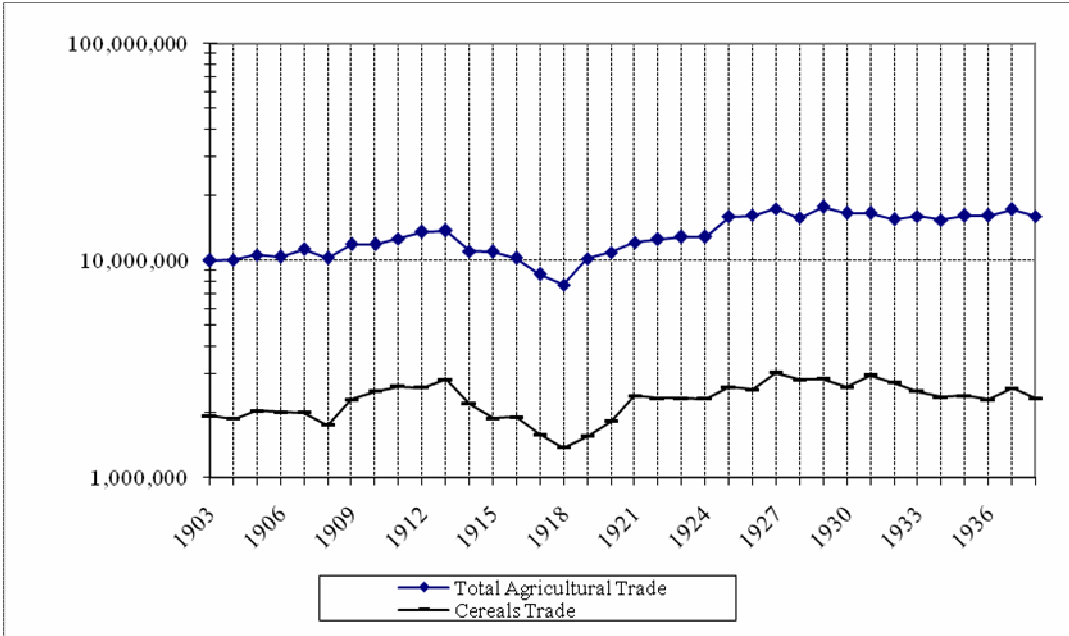
	1909-13	1924-28	1928-32	1934-38
1. Cereals	2,565,501	2,761,312	2,880,691	2,384,736
2. Agricultural and food products	12,434,144	16,231,905	17,263,358	16,194,206
% 1/2	20.6	17.0	16.7	14.7

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

This importance reflects their role as a principal source of energy in human foodstuffs in those years. By 1928, cereals provided over 50 per cent of the calories in the diet of the majority of countries, except in the United States where they accounted for approximately 30 per cent. The cereals trade displayed a clear rising tendency until 1914, falling significantly during the war years (Figure 1). The prewar level was not reached until 1927. The principal difference between the evolution of their trade and that of agricultural products as a whole is that in the case of cereals, this was the maximum achieved in the entire period, while for all agricultural products the volume of exchanges continued to increase until 1929. From that moment on, the volume of total agricultural trade decreased without again reaching this level of exchanges, although it approached that level from 1933-34 onwards. By contrast, the cereals trade showed no sign of recovery following its decrease after the crash of 1929.

The fall in international exchanges of goods due to the crisis of 1929 was principally due to the depth of the depression, the dismemberment of the traditional channels of trade, the expansion of protectionism and the increase in the importance of bilateral agreements as a way of settling trade movements (Findlay and O'Rourke, 2007). The shortage of payment methods also had repercussions on the decrease in international exchanges and explains in part the proliferation of bilateral agreements (Eichengreen, 1996). Neither must it be forgotten that in the selection of trade partners, political harmony began to be important, as a consequence of the increasing tensions among European countries and the formation of trade blocs. In the case of cereals, moreover, a greater consumption of national cereals and an increased usage of natural pastures to feed livestock, in place of imported cereals, were also important.

Figure 1: International imports of cereals and agricultural and food products (at 1925 prices, in thousands of US dollars) (logarithmic scale)



Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

To explain the loss of importance of cereals within total agricultural trade, the increasing number and volume of agricultural products participating in international exchanges must be borne in mind. Furthermore, of great importance was the depressive effect exercised by the protectionist policies implemented in the principal countries importing cereals, following the First World War, and in particular from 1932 on. Another factor to be remembered was the slow growth in the demand for these products, because demographic growth in Europe slowed from the 1920s on. In addition, there can be observed a tendency towards a greater variety in the diet of the industrialized countries as per capita income rose, that is to say, as revenue rose the demand for cereals fell and that for fruit and meat increased. The demand for cereals had a negative income elasticity³.

³ Numerous studies undertaken in the 1940s and 1950s showed that in the developed countries their demand elasticity with regard to income was systematically negative. For a summary of these studies, see Malembaum (1953), pp. 68-76.

Within cereals as a whole, wheat was without a doubt the most important, followed by rice, maize and barley (table 2). The relative weight of wheat only fell in the 1930s, while the relative importance of rice and maize increased continuously, although these last two cereals were far distanced from wheat with regard to their importance. Also of note was the sharp fall in the importance of barley following the war, due to the sharp fall in Russian exports, which accounted for over 67% of worldwide exports in 1909-13. The fall in the exchanges of rye was the consequence in the weakening of its demand, as the consumption of rye bread was replaced by wheat bread in the majority of countries which were important consumers of the latter cereal. With regard to oats, these lost importance as a consequence of the mechanisation of agriculture, with the replacement of horses by tractors in agricultural labour (Grigg, 1992; Federico, 2005).

Table 2: Relative weight of trade of cereals (percentages)

	1909-13	1924-28	1928-32	1934-38
Wheat	52.2	56.7	55.9	48.6
Rye	4.9	3.6	2.7	2.3
Barley	10.5	5.5	5.9	5.2
Oats	5.2	2.5	2.1	1.5
Maize	11.8	13.0	14.4	18.3
Rice	15.4	18.7	19.0	24.1
Cereals	100.0	100.0	100.0	100.0

Wheat flour and rye are included in their respective products

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

If we examine the evolution in absolute terms of trade in the distinct cereals, it was rice which most increased, tripling its exchanges from the beginning of the century until the end of the 1930s (Table 3). At the opposite extreme were oats. In general, the volume of exchanges of all cereals increased until the First World War. During the war, there took place a fall in the exchanges of all cereals, one much more pronounced in the case of barley and oats than in the others. Possibly, this sharp fall in the volume of international trade in rye and oats was due to the geographical localization of exchanges. In both cases, three significant importers, Germany, Austria and Belgium, ceased purchasing (at least through official channels) possibly as a result of the Allied blockade (Offer, 1989). Another important importer of rye and oats, the Netherlands, reduced its imports of rye from an average of 5.7 million quintals in the period 1909-13 to an average of 245,000 quintals

between 1915 and 1919, and of rye from an average of 8 million quintal in 1909-13 to an average of 846,000 quintals in 1915-19, due to its difficulties in achieving supplies because of the Allied blockade of the continent. The lowest fall in trade volume as a result of the war was the case of rice (a mere 12 per cent), while the cereal whose international trade was most affected was barley, with a fall of 80.3 per cent. Cereals as a whole experienced a fall of 35 per cent as a result of the war. Following the conflict, wheat, rye, barley and oats reached their maximum level of exchanges in the period 1925-29. International trade in wheat fell in the following years. By contrast, international exchanges of rye, barley and oats continued to fall until the end of the period. Maize reached its maximum volume of trade in 1930-34, exchanges falling in the late 1930s. Only rice experienced continuous growth in its trade volume throughout the first third of the XX century.

Table 3: Evolution of trade of cereals (index numbers, 100 = 1903-1907)

	Wheat	Rye	Barley	Oats	Maize	Rice	Total Cereals
1903-04	96	109	98	84	93	99	96
1905-09	102	92	104	107	95	118	102
1910-14	121	126	125	134	109	217	130
1915-19	90	29	25	80	55	191	84
1920-24	125	89	47	60	103	177	114
1925-29	144	90	79	68	133	269	141
1930-34	129	75	77	54	147	278	134
1935-38	105	54	61	37	165	306	122

Wheat flour and rye flour are included in their respective products

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

The degree of trading in the distinct cereals did not reach in any case 20 per cent of production (Table 4). This indicates that the majority of production was consumed in the country in which it was produced. However, in some countries strongly oriented to foreign markets, such as Canada, Argentina and Australia, the percentage of wheat production traded exceeded on average 50 per cent of their production. Wheat was the most traded cereal, although this diminished in the late 1930s, due to the difficulties of importing it. With regard to barley, there took place an important fall following the war, as Russian exports practically disappeared. Only maize increased its trading throughout the period.

One of the causes of this increase was the tendency to substitute other cereals destined to livestock feed by maize and the need to import animal feed when certain European countries protected livestock production. With regard to rice, the absence of data from China, the principal producer and consumer country of rice in the world, overestimates its trade.

Table 4: Percentage of internationally traded grain production

	1909-13	1924-28	1928-32	1934-38
Wheat	18.9	19.3	18.4	b) 12.9
Rye	5.4	4.1	3.2	c) 3.1
Barley	15.6	9.2	9.0	c) 1.5
Oats	4.9	2.5	2.2	d) 1.6
Maize	7.2	7.5	8.5	d) 9.7
Rice	a) 9.7	8.7	e) 8.8	e) 9.1

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

a) Average production 1909-12. b) Without data for the Soviet Union in 1938. c) Without data for the Soviet Union in 1936-37 and 1938. d) Without data for the Soviet Union in 1936, 1937 and 1938. e) Without data for China.

2.2. The geography of international trade in cereals

Europe was the geographical area *par excellence* in the import of cereals. Prior to the war, European imports accounted for over 80 per cent of the total. This percentage fell over time, and by 1934-38 was only 63 per cent (Table 5). Among the factors responsible for this loss of relative importance were the protectionist policies which became generalized following the First World War and, to a lesser degree, the slowing down of population growth, the diversification of European diets as per capita incomes increased and the increasing importance of other geographical areas as significant importers of cereals. Here should be underlined the increasing importance of Asian countries as consumers of cereals, due to the increasingly important trade in rice in Asia, although they also increased their consumption of other types of cereals, due to population and income growth.

Table 5: Regional composition of imports of cereals (world imports at 1925 prices in thousands of US dollars)

	1909-13	1924-28	1928-32	1934-38
Europe	2,121,108	1,979,371	1,990,825	1,502,985
North & C. America	68,580	121,988	114,732	180,522
South America	57,884	94,857	95,998	90,028
Asia	253,561	477,590	585,412	528,045
Africa	80,185	73,804	84,106	71,723
Oceania	5,299	13,703	9,618	11,433
Total	2,565,501	2,761,312	2,880,691	2,384,736
%	1909-1913	1924-1928	1928-1932	1934-1938
Europe	82.7	71.7	69.1	63.0
North & C. America	2.7	4.4	4.0	7.6
South America	2.3	3.4	3.3	3.8
Asia	9.9	17.3	20.3	22.1
Africa	3.1	2.7	2.9	3.0
Oceania	0.2	0.5	0.3	0.5
Total	100.0	100.0	100.00	100.0

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

With regard to exports, their origin was much more diversified (table 6). Prior to the First World War, Europe was not only the principal importing region, but also supplied nearly 50 per cent of exports. However, following the war, this situation changed. Europe was overtaken by the countries of the American and Asian continents (especially due to the withdrawal of the Soviet Union from among the exporting countries leading the international grain trade). The South American or Asian countries gradually consolidated themselves as the most important exporters, thanks to a certain specialisation in the most dynamic cereals: maize and rice.

Table 6: Regional composition of exports of cereals (world exports at 1925 prices in thousands of US dollars)

	1909-13	1924-28	1928-32	1934-38
Europe	1,160,701	354,611	454,548	345,008
North & C. America	379,967	946,735	746,004	444,615
South America	307,638	507,960	577,425	513,653
Asia	360,321	393,308	416,088	480,936
Africa	33,112	56,908	79,703	74,069
Oceania	84,449	152,275	186,193	171,863
Total	2,326,187	2,411,797	2,459,960	2,030,145
%	1909-1913	1924-1928	1928-1932	1934-1938
Europe	49.9	14.7	18.5	17.0
North & C. America	16.3	39.3	30.3	21.9
South America	13.2	21.1	23.5	25.3
Asia	15.5	16.3	16.9	23.7
Africa	1.4	2.4	3.2	3.6
Oceania	3.6	6.3	7.6	8.5
Total	100.0	100.0	100.0	100.0

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

3. World trade in wheat

3.1. The evolution of world trade in wheat

From the onset of the first wave of globalisation, wheat was one of the key products in international trade. It has been common to signal the abolition of the Corn Laws in Great Britain in 1846 as one of the decisive factors in the process of liberalisation which took place (Sharp, 2009). Progress in market integration in that century has been estimated using precisely prices of wheat, which was a product strongly representative of international trade (Jacks, 2005 and 2006; Federico and Pearsson, 2007; Sharp and Weisdorf, 2013).

The European demand for wheat, and especially British demand, was the decisive factor in the growth of its trade in the XIX century. The problems of the end of the century, and particularly the competition which for European farmers meant the increasing arrival of wheat from the East (the Russian Empire) and from the West (above all the United States), marked the functioning of its market. The maintenance of free trade policies in countries such as Great Britain, the Low Countries and Denmark was the exception rather than the

rule. The large continental countries, such as Germany, France, Italy or Spain, imposed protectionist barriers which gave a certain margin to their farmers to compete with foreign production, on the condition that they modernize their farms, introducing innovations such as chemical fertilizers or machinery (O'Rourke, 1997; Gallego, 2003; Clar and Pinilla, 2009, Vivier, 2009; Grant, 2009). These protectionist restrictions were combined with population increase and a continuous rise in per capita income, which meant that some countries continued to substitute cereals such as rye by wheat, as this was preferred when the population had higher incomes. Production increased appreciably from the crisis at the end of the century (56% between 1885-89 and 1909-14), especially among the largest exporters which more than doubled it, while among the European importers it increased slightly (17%), as a consequence of small increases in the large continental countries (Malenbaum, 1953).

Figure 2: International trade in wheat and other cereals (at 1925 prices, in thousands of US dollars)



Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938), Wheat flour is included

From 1900, exchanges increased until the First World War, descended sharply during the conflict and recovered from 1918 on. The annual rate of growth from 1903 until 1913 was 3.2 per cent annually. Following the conflict, this was 5.9 per cent from 1918 until 1931 and -5.6 per cent between 1931 and 1938 (Figure 2).

Until the First World War trade in wheat was characterised by the stability of demand emanating from the European free trade countries, while that proceeding from the protectionist countries was highly irregular. The war and the decline of European production, as well as the end of Russian exports, stimulated a greater growth of production in overseas countries, which increased their production very significantly (by 46%) between 1914 and 1925, while in the rest of the world rates of increase were in general negative. Exports from those countries also increased significantly.

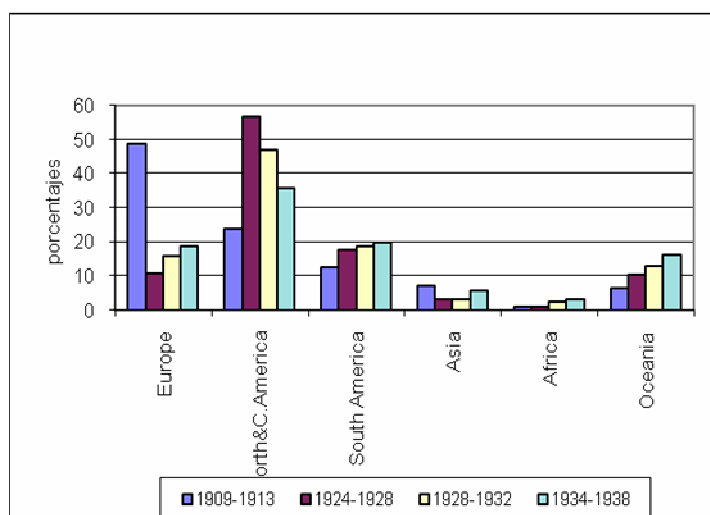
In the decade of 1920 the market began to display unequivocal signs of saturation. During the 1930s worldwide exports of wheat and flour decreased. This fall was approximately 65 million quintals between 1928-32 and 1934-38. The principal explanation is to be found in the increasing self-sufficiency of the principal wheat consumers, as the result of the increase in protectionist measures. From 1929 on, the traditionally protectionist countries increased their tariffs on wheat imports, and in 1932, adopted additional measures to reinforce their protectionist policies (Bacon and Schloemer, 1940: 40-43). In this latter year, even Great Britain abandoned its free trade policy and adopted some type of protective measures. The International Institute of Agriculture estimated that the need for wheat imports from the principal importers fell from an average of 800 million bushels in 1926-27 to 1931-32 to approximately 550 million bushels in 1937-38. In the first third of the XX century as a whole, practically the totality of growth in the wheat trade was due to an increase in non-European imports, since the quantities imported by the European countries were stagnant until 1929 and then fell sharply. This decrease was 33 per cent between 1924-28 and 1934-38.

3.2. World exporters and importers of wheat

At the start of the XX century, European exports accounted for almost fifty per cent of total trade in wheat and flour (figure 3). Yet the war had a decisive impact. The

destruction of European harvests and the subsequent increase in the European demand for food encouraged productive regions from other continents to increase their production. Once the war had ended, the decline of exports from Russia and the Danube countries meant an extreme concentration of such exports in the United States and the countries of recent European colonisation (Canada, Argentina and Australia), which represented an extremely high proportion, oscillating between 50% and 80%. Trade, which until 1914 was largely intra-European (50% of exchanges), became mainly intercontinental.

Figure 3: Composition of wheat exports by continent (%)



Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

Wheat flour is included

The withdrawal of Russia (20.5% of world exports in 1909-13) and of the countries situated in the Danube basin (Hungary, Rumania, the former Yugoslavia and Bulgaria) (14.6%) was largely the consequence of profound socioeconomic changes (table 7). Following the war, and due in part to the agrarian reform which took place in the majority of them, they decreased their exports, which proceeded in their majority from large estates. The reform meant that large properties were divided among small farmers, such that per capita income increased (Taylor, 1928). This increased income signified in some cases a

greater consumption of wheat in the interior of these countries, and in others, a diversion towards other types of crops in response to changes in relative prices or in demand (Imperial Economic Committee, 1932 a). The result in both cases was a fall in the wheat surpluses available for export. Furthermore, it must be taken into account that as the result of the peace agreements, the European political map changed, dislocating the economic relationships existing before the war.

Table 7: Wheat production by the leading exporters

	1909-13	1924-28	1928-32	1934-38
CANADA				
% world production	5.22	9.76	8.83	5.39
% world exports	11.44	35.15	31.67	28.13
Exports/production (%)	45.83	72.72	66.89	67.78
ARGENTINA				
% world production	3.89	5.75	5.17	4.75
% world exports	12.04	16.82	18.56	19.48
Exports/production (%)	64.63	59.06	66.94	53.26
AUSTRALIA				
% world production	2.39	3.32	3.88	3.16
% world exports	6.26	10.46	12.92	16.3
Exports/production (%)	54.61	63.68	62.04	66.92
UNITED STATES				
% world production	18.26	19.1	18.56	14.78
% world exports	12.52	21.36	14.84	7.35
Exports/production (%)	14.33	22.59	14.91	6.45
DANUBIAN COUNT.				
% world production	8.32	6.63	6.92	6.79
% world exports	14.56	4.23	5.43	7.73
Exports/production (%)	36.56	12.88	14.65	14.79
RUSSIA				
% world production	20.03	17.49	17.12	25.82
% world exports	20.47	2.13	4.84	3.05
Exports/production (%)	21.35	2.46	5.28	1.54

Source: Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938). Wheat flour is included. * Danube countries: Hungary, Romania, Bulgaria and Serbia or Yugoslavia. Changes in borders have not been taken into account.

In Russia, following the war and with the coming of the Revolution, a series of changes occurred which meant that exports were nil or insignificant, until by the year 1930 the figure of 100 million bushels was exceeded. According to the experts of the Imperial Economic Committee, the absence of Russian wheat exports between 1920 and 1930 was due not so much to poor harvests (although in fact there were bad harvests in 1922, 1923

and 1924) or the division of large estates (from where the majority of wheat destined for export during the prewar years came) among small peasants and their subsequent collectivization, but instead to a greater internal consumption of wheat, as a result of both demographic increase and a rise in per capita consumption, and in part to the resistance of small farmers to produce a surplus for export, given the scanty rewards they were offered by the state (Imperial Economic Committee, 1932 b: 85).

Table 8: World imports of wheat and flour (Thousands of quintals)

	1909-13	1924-28	1928-32	1934-38
Europe	172,556	179,393	174,082	120,003
North & C. America	3,601	9,653	9,638	12,103
South America	6,997	11,443	12,031	11,545
Asia	5,329	18,314	28,506	18,279
Africa	5,184	6,817	7,998	5,151
Oceania	179	992	631	761
Total	193,846	226,612	232,886	167,842

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

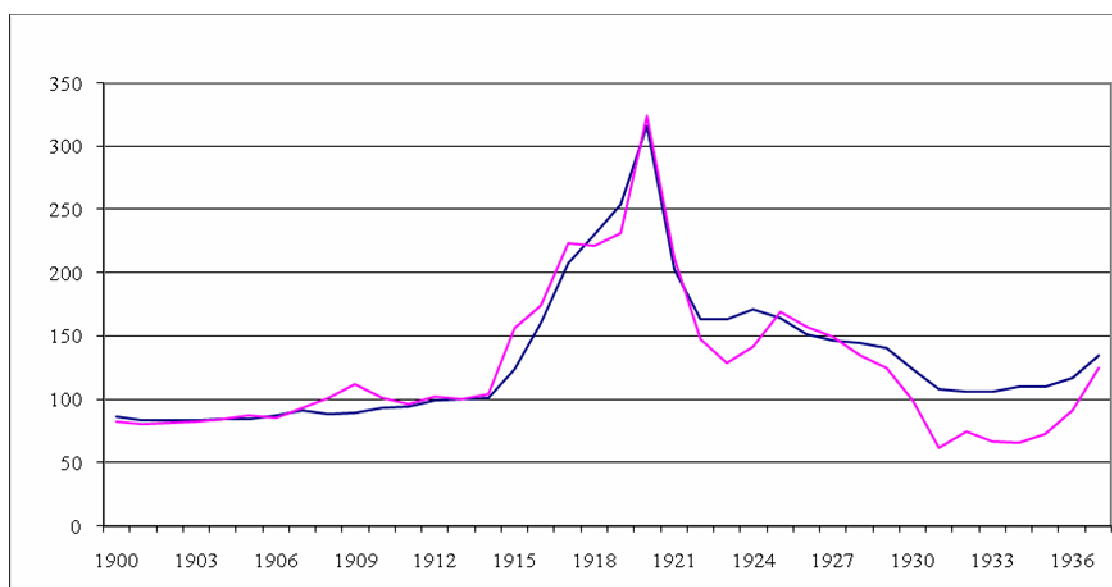
Imports of wheat and wheat flour were clearly dominated by the European continent. Europe imported between 70% and 90% of all wheat traded (table 8). However, its importance declined as the period advanced, while the relative weight of the remaining continents increased as importers of wheat. The growth of Asian imports is notable, rising from 2.8% in the period 1909-13 to 10.9% in the 1930s. By volume, Asian imports of wheat rose from 5,328,740 quintals in 1909-13 to 18,279,200 quintals in 1934-38, a rise of 243%. This was probably due to the growth of personal income (especially in Japan), which as we have seen produced a growth in the demand for wheat for the production of bread to substitute other cereals, and to the sharp growth in population in many zones. As well as in India, rice and wheat behaved as substitute foods, their demand depending on their relative prices (Lathan and Neal, 1883). Thus, rapid population growth in China made it necessary to increase wheat imports to feed it. Such imports rose from only approximately 4% of total Asian imports of wheat until 1928, to 51.2% in 1928-32 and 40.9% in 1934-38. Furthermore, India moved from being an important exporter of wheat prior to the First World War to a net importer in many years after the war. The principal reasons for this were the fall in its average production of wheat in the periods 1924-28 and 1928-32 and the

lack of incentives to export, due to the rapid growth of population and the low international prices of wheat from the end of the 1920s on.

3.3. The working of the international wheat market

As already seen, at the end of the 1920s tensions began to appear in the international wheat market. The volume of trade continued to increase until it reached a maximum in 1929, although in the European continent it had already begun to decline. This problematic situation was clearly reflected in wheat prices, which displayed a slight decreasing trend from 1925 onwards. From 1929 prices fell drastically (figure 4).

Figure 4. Evolution of wheat prices and the wholesale price index in Britain (100 = 1913)



Blue= Wholesale price index
Pink= Wheat prices

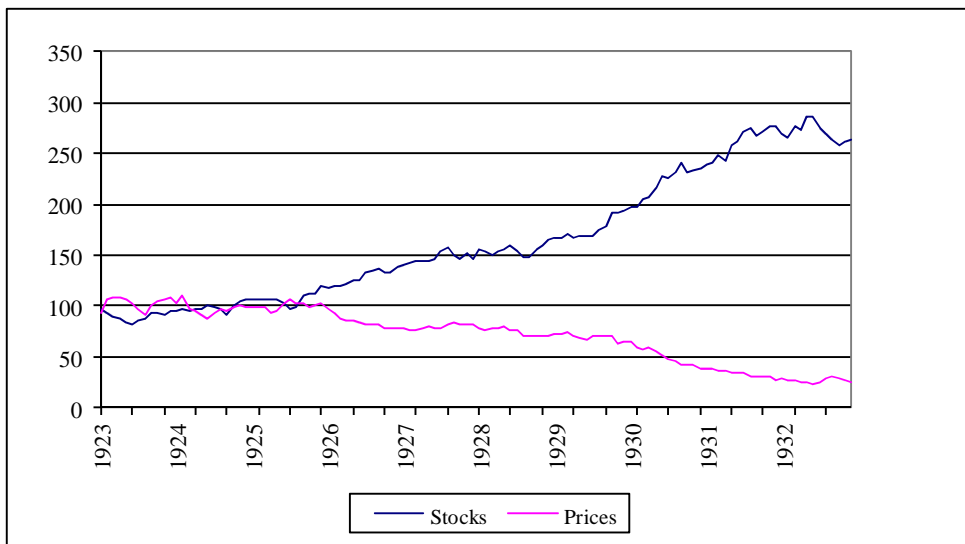
Source: Wheat: C.I.F. unit values from The Annual Statement of the Trade of the U.K. with foreign countries and British countries. Wholesale price index: Mitchell (1992), p. 739.

Even more interesting is the comparison of wheat prices with those in the rest of the economy. If we compare them with a wholesale price index for Great Britain, we can approximate their evolution in real terms. Figure 5 shows that until approximately 1921,

wheat prices evolved in consonance with those in the rest of the economy, meaning that the purchasing power of wheat producers did not change significantly. From then on, two periods can be observed, the first between 1922 and 1924 and the second from 1928 until the end of the period, in which the price of wheat fell by more than the wholesale price index. Between 1926 and 1934 wheat prices deflated by the wholesale price index fell by approximately 43%. This continuous decline in prices from the mid-1920s until the mid-1930s was known at that time as “the wheat problem”.

The problematic situation of the wheat market was also reflected in a progressive increase in unsold wheat stocks. The same occurred with other agricultural products. From mid-1925 on, the progressive accumulation of stocks of the principal foodstuffs caused a fall in their international prices (Figure 5). Hevesy (1940: 207) stated that the stocks accumulated in these years were unsaleable, since not even the wheat which was offered to merely cover transport costs found any purchasers.

Figure 5: Price indices and stocks of major food products (base 1923-25 = 100)



Source: Timoshenko (1933: 122).

The simple fact of accumulating stocks was a motive for price instability. Agents in the market were concerned by the fact of not knowing the exact quantity accumulated or the moment at which it would be placed on the market. Another of the consequences of accumulated stocks was that there did not occur the adjustments in the cultivated land area which a free market situation would have demanded. (Imperial Economic Committee, 1932 b: 81).

The problem of the increasing accumulation of stocks began to be important following the great wheat harvest of 1928 (Liverpool Corn Trade Association, 1953: 42) (Table 9). Thus, the margins between available wheat supply and total utilization (including all the uses of wheat), plus the normal reserves, were increasingly greater, reflected in an increase of stocks (Table 9). In this way, the decreasing trend of wheat prices corresponded with a significant increase in stocks from approximately 1922. Meanwhile, production continued to grow, reaching a maximum in 1929.

Table 9. World wheat supply and approximate total use (millions of quintals)

Year	Available supply a)				Total use plus normal reserves		
	Stocks July	Harvests exc-Russia exc-China	Russian exports	Total	Total use b)	Normal reserves c)	Total
1921-22	130	845	...	974	836	122	958
1922-23	138	859	...	997	872	125	997
1923-24	125	947	6	1,079	922	128	1,050
1924-25	157	839	...	996	882	131	1,013
1925-26	114	901	7	1,023	892	133	1,025
1926-27	131	917	13	1,062	920	136	1,056
1927-28	142	978	2	1,122	961	139	1,100
1928-29	161	1,064	...	1,225	991	142	1,133
1929-30	234	931	3	1,167	947	144	1,091
1930-31	220	1,003	30	1,254	1,008	147	1,155
1931-32	246	d) 986	d) 22	d) 1,254	d) 1,012	150	d) 1,162

Source: Davis (1932): 422.

a) Wheat Studies, VIII, 177, 182, 190, 401, with a slight revision of the latest data. 1 bushel of weight = 0.27216 quintals) Subtracting the estimated stocks of the coming year from total supply. c) Rough approximation. In the article cited, normal reserves are calculated as 450 million bushels for the year 1921-22 and increase by 10 million bushels each year. d) Preliminary

The problem of wheat was a problem of imbalance between supply and demand, which led to an excessive supply of wheat at international level pushing prices down. This

problem appeared from the First World War on, since in the prewar period wheat supply and demand increased at approximately the same rhythm, meaning the market situation was one of equilibrium. Specifically, Paul de Hevesy (1940) stated that the problem of overproduction was important between 1926 and 1934.

In the case of wheat, the most important factor in the determination of its international prices throughout the period under study was the supply available in the market (Timoshenko, 1928). This depended not only on the harvest which had recently been gathered, but also on the stocks accumulated from previous years and the forecasts made regarding the quality of the following harvest. Apart from these factors, the poor international economic situation during the 1930s depressed wheat prices and limited the growth of international demand. With regard to demand, this was fairly stable, being modified very slowly with population growth, and thus did not affect the annual variations in international prices. Nevertheless, demand factors can be important in the determination of the trend in international prices in the long term. In general, annual price movements represented changes in the supply-demand relationship. The most important factors in this relationship were: expectations regarding the following harvest, the quantity of accumulated stocks, the prices of other cereals and the prices of other foodstuffs (e.g. meat and potatoes).

In summary, it can be stated that the principal causes of the problem of wheat were: the implementation of protectionist measures in the second half of the 1920s and their strengthening from 1932 onwards in the largest importers (Germany, France and Italy), which also stimulated the national production of wheat with the objective of self-sufficiency, and in addition the implementation of this type of policy in the until then free trade countries (Great Britain, The Netherlands and Denmark); the emergence of Russia as an important exporter, for the first time since the First World War, in the years 1930-31 (Davis, 1932: 431); and finally and most importantly, the increasing disequilibrium between worldwide wheat supply and demand, due principally to the increase in worldwide production available for export, while consumption remained stagnant or fell in the large consumer countries. The worldwide production of wheat increased greatly throughout the first third of the twentieth century (Table 10). This increase in the volume of production

had two causes: the increase in yields per hectare (intensive growth) and the rise in the number of hectares sown with wheat (extensive growth).

The continuous growth in the worldwide production of wheat was possible due to technological innovation. The technological advances which permitted greater production of wheat were, principally: research into new species of seeds which were adapted perfectly to each type of soil and climatology, the increasingly generalized of fertilizers and the introduction of machinery (Olmstead and Rhode, 2008). In overseas countries, like Australia or Canada, technical advances were aimed at increasing production per worker. The introduction of capital-intensive and labour-saving technology in these countries reflected their endowment of productive factors. Labour power was scarce and land was fertile, virgin and abundant; consequently, labour costs were greater and land costs lower than in the European continent; overseas countries were interested in achieving very high productivity per worker. However, in Europe, much more densely populated, the objective was the opposite and technical advances were directed at increasing yields per hectare. (Pujol, 2011).

Table 10. Growth of world wheat production (1909-13 = 100)

1909-13	1924-28	1928-32	1934-38
100	111	120	130

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

The extensive increase in the production of wheat in overseas countries was linked principally to their colonisation and the great migration they attracted (Malenbaum, 1953: 128-129). A fundamental characteristic of the expansion of production in these countries was that once investment had been made in the ploughing of virgin lands for the cultivation of wheat, in response to the increase in demand or prices, it was very difficult to reduce the number of hectares as a consequence of poor market conditions. The initial costs faced by farmers were high and inflexible with regard to the variation in wheat prices, meaning that the majority of farmers were reticent to reduce the number of hectares cultivated once they had incurred the costs of placing them under production; instead, they hoped to recover their losses when the market situation improved. In addition, agricultural activity, in

general, included all the family, and thus the costs associated with the abandoning of such activity were much greater than if only one member of the family was involved. The reaction to a fall in prices, which reduced agricultural income and increased indebtedness in the sector, was precisely to produce still more, since farmers attempted to maintain gross income and reduce general expenditure, which increased the gravity of the situation. A reduction in prices therefore coexisted with increases in production. The technical advances which were intensified in this period also permitted an increase in productive capacity while reducing costs.

The return of the Soviet Union to the group of exporters at the end of the 1920s, although in quantities far lower than the prewar figures, doubtless led to a greater market saturation.

In the increase of production a decisive role was also played by the protectionist policies applied by the principal importing countries, thereby encouraging the increase in the number of cultivated hectares by maintaining prices high in this way, especially from 1929 on (Table 11). Hevesy (1940: 41-42) states that between 1924 and 1931, wheat prices in Liverpool fell by 52%, while in France, Germany and Italy they rose by 39%, 60% and 2% respectively. In these three countries the number of hectares dedicated to wheat rose between 1919-24 and 1929-34. The increase was approximately 46% in Germany, 6.4% in Italy and 3.3% in France. The increase in the land area cultivated with wheat continued uninterruptedly in Germany and Italy until the end of the 1930s.

While protectionist policies had been based between 1880 and 1929 on simple customs tariffs, from the latter year until 1934 supplementary measures were utilized to reinforce protection, such as the establishment of obligatory percentages for the quantity of national wheat which the flour produced in a certain country must have had or quotas on the importation of cereals from abroad; finally, until the start of the war there was complete state control of foreign trade and the wheat market. Even countries which had traditionally been free traders ended up by joining the protectionist camp. Not even the United Kingdom escaped.

Table 11. Import duties on wheat, 1926-1936 (in gold francs per quintal)

	1926	1928	1930	1931	1932	1933	1934	1935	1936
Austria	0.26	0.26	2.1	2.1	10.5	9.62	16.8	16.8	16.8
Belgium	0	0	0	* 0	* 0	* 0	* 0	*1.45	*1.04
Denmark	0	0	0	0	0	0	* 0	* 0	*0.31
France	2.68	7.11	10.15	16.24	16.24 _o	16.24 _o	16.24 _o	16.24	16.24
Germany	4.32	6.17	8.03	° 3.89	13.81	13.89	13.89	*4.32	*4.32
Ireland	0	0	0	0	0	0	* 0	* 0	*0.74
Italy	7.5	7.5	14	16.5	19.65	19.95	20.47	19.78	*18.4
Netherlands	0	0	0	0	0	0	*3.12	*3.12	*4.17
Norway	* 0	* 0	* 0	* 0	* 0	* 0	* 0	* 0	* 0
Sweden	5.14	5.14	5.14	5.14	*3.62	*3.51	*3.15	*2.88	*2.9
Switzerland	*0.6	*0.6	*0.6	*0.6	*0.6	*0.6	*0.6	*0.6	*0.6
Tchecoslovaquie	1.93	4.61	4.61	*8.45	*8.45	*8.45	*11.5	*9.6	*9.6
U.K.	0	0	0	0	0	0.8	0.76	0.7	0.7
U.S.A.	5.71	5.71	5.71	8	8	8	5.03	4.76	4.72

Source Hevesy (1940), p. 762.

° Indicates that imports against payment of the given import duty are subject to special conditions

* indicates that all imports are under special control (quota, licence system, monopoly, etc.)

Gold franc is the pre-devaluation Swiss franc. After devaluation (26 September 1936) however, original prices have been converted into U.S. dollars and multiplied by 3.061, which can be considered as the rate of exchange between the dollar and the former gold franc.

The Great Depression was also an indirect factor of great importance in maintaining low wheat prices. For Davis (1932), the worsening of the international economic situation negatively affected the course of trade exchanges, restricting foreign credit (which on other occasions had facilitated the increase of imports) and increasing restrictions on trade. Consequently, the poor economic situation in diverse countries reduced the demand for wheat in the European countries. The situation of increasing protectionism and the lack of confidence in political relations led to the following in many cases of agricultural policies of self-sufficiency, which had as a result the increase in the number of hectares cultivated and the extension of cultivation to lands of poorer quality, due to new seeds and technical advances (Hevesy, 1940). On the demand side, there was a tendency in the principal consumer countries to a decrease in the consumption of cereals as per capita income increased. Consequently, despite demand increasing with demographic growth, the fact that

demand per capita tended to fall resulted in very slow growth of worldwide demand. Thus, according to the calculations of Malenbaum (1953: 244-245), per capita consumption fell significantly in overseas exporting countries and very slightly for European importers. In addition, the International Institute of Agriculture calculated in 1931 a slight decrease in per capita consumption in Europe and one considerably higher in the United States. This, added to the gentle growth in population, meant very small increases in consumption in absolute terms between the years prior to the war and 1930 (Société des Nations, 1931:28). The crisis of 1929 was not the cause of consumption per capita of wheat in 1929-34 being lower than that of 1924-29. Instead, falling income in the industrialised countries meant little change in a pattern of consumption taking place in a diet still basically composed of cereals towards a much more diversified one.

In short, in our opinion the problem of wheat was a result of the growth of worldwide supply in excess of that of demand. The origin of this disequilibrium between supply and demand was to be found in the increase in production by overseas countries, encouraged by the extraordinary demand for wheat proceeding from the countries directly involved in the First World War, during the years of conflict and during the post-war epoch, until the recovery of their harvests. Once European production had recovered, worldwide supply outstripped the needs of consumption, meaning that international prices tended to fall. It is from that moment on when the activity of governments, in both the exporting countries and the principal importers, accentuated the problem of oversupply. As we have seen, in all cases (with the exception of Great Britain until 1932) governments implemented agricultural and trade policies which protected wheat farmers from the low international prices prevailing. Thus, not only did worldwide production not fall, but instead continued to increase in many cases. The slow growth of demand, as a consequence of the improvement of per capita income in the most developed countries, contributed to creating an unfavourable backdrop.

3.4. International attempts to solve the problem of wheat: the failure of the London Conference

The problem of low wheat prices affected more those countries for which this product represented an important percentage of the total value of their exports. In the period between 1926 and 1930, the percentage which the value of the exports of wheat and wheat flour represented in total exports was 31% for Canada, 27% for Argentina, 17% for Australia, 8% for the Soviet Union and only 5% for the United States (I.E.C., 1932: 11). However, all these countries had reduced their dependence on wheat around the mid-1930s. Thus, between 1932 and 1936, these percentages were 22.5% for Canada, 17.3% for Argentina, 14.8% for Australia, 6.7% for the Soviet Union and 1.2% for the United States. (Imperial Economic Committee, 1939: 43). As a result, countries such as Canada, Argentina and Australia suffered much more deeply the economic consequences of the fall in wheat prices than countries such as the United States or the Soviet Union. This fact probably explains the different behaviour of the first three countries on the one hand and that of the United States on the other. Thus, when international wheat prices were very low, the United States was capable of reducing its volume of exports, accumulating stocks or establishing export quotas, while the other three large overseas exporters further increased their exports in an attempt to recover part of the export revenue which they lost as the consequence of low prices.

In the international sphere, there were various attempts to solve the problems of falling wheat prices through the holding of numerous international conferences. Specifically, in the years 1930-31, 16 international conferences were held with this objective. Both partial conferences (of countries which shared common private interests) and those which included all the countries involved in the problem, were no more than successive attempts to clarify the problem and propose solutions, whose implementation was not successful.

Among the distinct solutions proposed, that of creating a system of export quotas among the exporting countries, producing a cartel of the international marketing of wheat, was that which achieved the greatest number of supporters. This proposal was taken to the

London Conference, the most important of all, held from 18-23 May 1931 to give concrete form to the details of a law to be ratified by the principal exporting countries.

Before its holding the exporting European countries met to propose the signing of an agreement between importing and exporting countries to give preferential treatment to exports of wheat from Europe, without applying the clause of most favoured nation to the remaining exporting countries. Some European importers, such as Germany and Czechoslovakia, supported the proposal, as they saw such an agreement as a solution to exchange manufactures for wheat, but others opposed it, such as Great Britain, which already had agreements with the Commonwealth countries. When this proposal was presented to the League of Nations, this organisation could not support it, since one of its missions was to reduce the restrictions on international trade. As was logical, neither were the overseas exporting countries in agreement with the measure. The European exporting countries did not consider themselves responsible for the overproduction of wheat. By the end of the 1920s their production of wheat was lower than that prior to the First World War, and thus the problem was approached as a problem of low prices and not as one of imbalance between supply and demand. Furthermore, they believed they had a “historic right” to receive preference for their exports in comparison to those from overseas countries and to be awarded a quota equal to the quantity of exports in the prewar period (Taylor, 1931: 450). This meant that only did they see no obligation to reduce the number of hectares of wheat, but instead in some cases the possibility of increasing them was considered. Nevertheless, these countries believed that without the collaboration of all the exporting countries, it would be impossible to reach the objective of raising international wheat prices. Consequently, the idea of an intra-European system of preferences was abandoned and the creation of a system of quotas in the international sphere was proposed.

Thus, the London Conference hosted the 11 most important exporting countries, with the intention of reaching an agreement upon the quotas which would be assigned to each country, the subsidies foreseen for the accumulation of stocks, the method of sanctioning those countries which did not respect the agreement, etc. The 11 countries participating in this conference were Argentina, Australia, Bulgaria, Canada, Hungary, India, Poland, the Soviet Union, Rumania, Yugoslavia and the United States.

From among them, it is logical that those proposing the measure, that is to say the European countries with the exception of the Soviet Union, supported it. What appears less logical was that Argentina, Australia and Canada accepted the measure “in principle”. With regard to Argentina and Australia, the reason why they supported the measure, in the opinion of Taylor (1931), was because they thought that prices would be better maintained if only part of their production, and not all, was traded on the free market. In the case of Canada, it appears that its representatives at the conference believed that as Canadian wheat was of good quality and was necessary in mixtures to obtain the best wheat for bread, the quotas it would obtain would be satisfactory. The United States was the only country which from the start opposed the quota system. This country saw clearly that the problem of wheat was a problem of overproduction and not of low prices, and that the only solution to raise prices was to reduce the number of hectares cultivated in the international sphere, thereby reducing total supply. Its scanty dependence on wheat exports permitted it a more objective analysis of the situation. As we have seen, the European exporting countries were not disposed to reduce the number of hectares cultivated. Lastly, Canada, Australia and Argentina, despite admitting that the land area dedicated to wheat had increased greatly since 1914, without taking into account their needs for internal consumption, saw no path to reduce the number of hectares cultivated with wheat, and further alleged that the extension of wheat cultivation had been performed to colonise new lands, that production was highly mechanised and was obtained at very low cost, and thus urged countries with high production costs to reduce their cultivated land area. In addition, it was very important to be able to maintain revenue from wheat exports. Given this, and due to the lack of agreement, the London Conference closed without having reached any decision with regard to solving the problem of wheat.

4. International trade in maize

Although the worldwide production of wheat and maize was quite similar, the volume of international trade in maize was only 40% of that of wheat. The principal reason was that in the United States, the principal producer, the greater part of harvests was destined to internal consumption (80% to cattle feed).

The volume of international trade in maize increased throughout 1900 and 1938 by 44.3%, which is equivalent to an annual growth rate of 1.5%. It increased uninterruptedly until the First World War. During the war years, exchanges fell by more than 50 percentage points, which indicates a fall proportionately greater than that of cereals as a whole. However, following the war, trade in maize evolved more dynamically than overall trade in all cereals, even increasing during the years of the Great Depression (Table 3).

In distinction to what occurred with other cereals, the consumption of maize, above all as livestock feed, increased throughout the period. Thus, while international exchanges of other feed cereals, such as barley or oats, diminished, the international trade in maize increased. As maize was principally used for animal feed, its worldwide demand depended on its relative price in comparison to feed cereals and other products which were also used to feed livestock. The relative price of maize fell following the First World War with regard to other cereals and livestock feed, which doubtless favoured its demand (Imperial Economic Committee, 1934: 40).

Table 12. Regional distribution of maize imports (thousands of quintals and percentages)

	1909-13	1924-28	1928-32	1934-38	%	1909-13	1924-28	1928-32	1934-8
Europe	64,482	77,198	91,028	86,393		91.9	92.5	94.8	85.3
North & Central America	4,898	4,963	3,743	11,538		7.0	5.9	3.9	11.4
South America	131	224	94	60		0.2	0.3	0.1	0.1
Asia	27	278	673	2,293		0.0	0.3	0.70	2.3
Africa	493	567	444	906		0.7	0.7	0.46	0.9
Oceania	123	243	52	53		0.2	0.3	0.05	0.1
Total	70,154	83,473	96,035	101,242		100.0	100.0	100.0	100.0

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

With regard to imports, Europe was by far the principal purchasing region (Table 12). The relative importance of European imports increased uninterruptedly until the beginning of the 1930s, from 91.9% of total worldwide imports prior to the war to 94.8% in the years 1928-32. In the second half of the 1930s, European imports were equivalent to

85.3% of the worldwide total and the imports of North and Central America had risen from 3.9% of the worldwide total in 1928-32 to 11.4% at the end of the 1930s. The fall in European importance after 1932 was probably due to the increase in protectionist measures in Europe and to the increase in the production of maize in European countries by some 28 million quintals. Similarly, the growth in the imports by North and Central America in the second half of the 1930s was possibly due to the fall in production and the increase in internal consumption, above all in the United States, which multiplied its imports of maize by 47 between 1928-32 and 1934-38. The principal importing country within the European continent was Great Britain, including Ireland; its imports constituted between 22 and 38 per cent of European imports. Following Great Britain and Ireland, Germany, The Netherlands, Belgium and France were the most significant importers.

Table 13. Regional distribution of maize exports (thousands of quintals and percentages)

	1909-13	1924-28	1928-32	1934-38	%	1909-13	1924-28	1928-32	1934-38
Europe	28,968	17,854	16,0145	13,221		40.1	20.9	16.6	13.0
North & Central America	11,051	4,929	4,055	8,482		15.3	5.8	4.21	8.3
South America	29,460	54,332	66,078	65,740		40.7	63.6	68.5	64.7
Asia	1,414	2,268	3,665	7,606		2.0	2.7	3.8	7.5
Africa	1,406	5,951	6,584	6,618		1.9	7.0	6.8	6.5
Oceania	8	159	25	15		0.0	0.2	0.0	0.0
Total	72,307	85,493	96,422	101,683		100.0	100.0	100.0	100.0

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

At the head of maize-exporting regions was South America (Table 13). Prior to the First World War, this region shared leadership with Europe, since it constituted 40.7% of worldwide exports and Europe 40%. The countries of North and Central America were also very important exporters before the war, constituting 15.3% of the world total.

Following the war, South America affirmed its leadership of the maize-exporting regions, while the relative importance of Europe and Central America fell. This was due in part to the increase in the land area cultivated with maize in Argentina from 1925 onwards and to the growth of production. In turn, the internal consumption of maize in Argentina

was very small, due to the low population density per unit of land area, and to the existence of abundant natural pastures for the feeding of livestock (Pinilla and Aparicio, 2015). Thus, in the period 1924-28 and during the greater part of the 1930s, over 80% of the maize which participated in international trade came from Argentina and the countries of the Danube basin. According to data from the International Institute of Agriculture, Argentinean exports of maize constituted 40.6% of total worldwide exports in 1909-13, 63.5% in 1924-28, 68.4 % in 1928-32 and 64.2% in 1934-38.

5. International trade in rice

Until the early decades of the XIX century, the United States was the principal exporter of rice. Subsequently, the South-East Asian countries moved to the head of exporters (Coclanis, 1993 and 1995). The cause of the decline of the United States in favour of other producing regions is to be found in the interior of the United States as much as in events in the rest of the world. On the one hand, the land suitable for this type of crop was limited and that which was already under cultivation was losing part of its richness. On the other, other more dynamic crops, such as cotton and tobacco, competed for the capital and land available. Furthermore, the Civil War, the abolition of slavery and the destruction of harvests due to the war contributed to its decline. In addition, American rice had to face increasing competition from other zones, among them Italy, Brazil, Bengal, Java and, shortly afterwards, Burma, Thailand and Indochina. The ascent to the leadership of rice exporters of the countries of South East Asia was produced as the result of their excellent price competitiveness. Both land and labour were much cheaper than in the American continent or in Europe. Often, the labour power of the economic unit was not remunerated. There also existed much fertile land, unused and suitable for the cultivation of rice. Furthermore, in distinction to what occurred in the cases of cotton or tobacco, Asian productivity in the production of rice was not characterized by being lower than in other regions of the globe. Elsewhere, the military and economic control exercised by the European countries in the region determined a large part of the productive and commercial decisions, facilitating in addition the capital necessary for the commercialisation of rice.

The response of some Western producers to the considerable international supply from South-West Asia was the establishment of tariffs to protect national production. Thus, in the XIX century, the United States, Brazil and Italy, for example, raised their tariffs on rice imports.

In the first third of the XX century the international trade in rice evolved much more dynamically than exchanges of wheat and of cereals in general. In contrast to events with other cereals (except maize), the long-term tendency of this trade increased until the end of the period analysed. This was due, probably, to the lesser importance of Europe as an importer in the international rice trade. This can be observed by the lower fall in the exchanges of rice during the First World War. Additionally, the growth of rice exchanges during the 1930s was achieved as it was possible to find markets to replace Europe.

Table 14. Regional distribution of rice imports (thousands of quintals and percentages)

	1909-13	1924-28	1928-32	1934-38	%	1909-13	1924-28	1928-32	1934-38
Europe	18,680	14,098	13,910	16,039		33.1	19.2	17.8	19.6
North & Central America	2,554	4,157	4,040	4,350		4.5	5.7	5.2	5.3
South America	1,1845	2,038	1,732	1,357		2.1	2.8	2.2	1.7
Asia	30,804	49,658	54,790	55,348		54.6	67.5	70.1	67.6
Africa	2,783	2,926	3,068	4,019		4.9	3.9	3.9	4.9
Oceania	398	693	672	777		0.7	0.9	0.9	1.0
Total	56,405	73,570	78,212	81,889		100.0	100.0	100.0	100.0

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

Before War World I there already existed a complex international network of trade in rice and an integrated international market in rice. Burma, Thailand and French Indo-China were the main exporters (Latham and Neal, 1983). Most of these exports were directed to other Asian regions, China and Japan being important importing countries (Brandt, 1985 and 1993).

Between 54.6% and 70% of worldwide imports of rice were destined to the Asian continent (table 14). The importance of Asia as an importing region increased throughout the period. After Asia, Europe was the principal destination of international rice exchanges. However, there can be observed a progressive fall in European imports of rice as the period advanced, until the early 1930s. This decrease occurred in a context of the growth of European production of rice and of tariff restrictions. During the 1930s, the decreasing trend of European rice imports halted due to the increase in French imports from its colonies in Asia. This was a French attempt to compensate for the fall in demand in the principal Asian import markets from 1930 on, which affected Vietnam and Thailand especially severely. Until the end of the XIX century Japan was a net exporter of rice, but from then on became an increasing net importer. From 1920 onwards, Japan initiated a policy of self-sufficiency in the provision of food and directed its demand for imports to its two colonies, Korea and Taiwan. From 1930, approximately, Japan was capable of supplying its population with its national production and with imports from these two countries. Prior to 1928, Japan needed to import great quantities of rice from outside the frontiers of its empire. These imports came principally from Thailand, Vietnam and Burma, and some rice was also imported from the United States (Wickizer and Bennett, 1941:91).

Before the First World War, imports from its colonies were approximately one third of total imports. In 1922-27 they were already 97% (Brandt, 1993: 274). The principal rice exporters did not only lose the Japanese market due to the high tariffs (approximately 40%) which rice had to pay on entering the country but, from approximately 1925, the demand for rice also fell in three significant importers, China, Indonesia and the Philippines.

The fall in Chinese imports was the most important (Table 15). Between 1921 and 1935, these were of the order of between 650,000 and 1,350,000 tons annually, but they fell to an average of between 300,000 and 400,000 tons between 1936-39. This fall in imports was in part due to the need for China to balance its payments, and on the other hand to policies of self-sufficiency in food. Burma was the exporting country least affected by the fall in demand in these Asian countries, since it was able to continue exporting to India, Ceylon (Sri Lanka), Malaysia and Europe. However, Thailand and Vietnam suffered more from the consequences of the fall in Asian demand, as they could only export to Malaysia

and the non-Asian markets, principally Europe. Thailand had an advantage in exporting to Malaysia and to non-European markets such as Cuba, while Vietnam, as part of the French empire, enjoyed the preference of certain European markets (Wickizer and Bennett, 1941:95).

Table 15. Principal importers of rice (thousands of quintals)

	1909-13	1924-28	1928-32	1934-38
Germany	4,169	4,078	3,479	2,295
France	2,588	2,414	3,021	6,571
Sri Lanka	3,859	4,672	4,888	5,344
China	3,040	9,465	9,261	6,259
Hong Kong	a) 7,821	5,091
Japan	4,756	16,138	14,970	18,983
Malaysia	1,807	7,414	7,514	7,205
Philippines	1,872	758	372	378
India	1,613	1,789	1,564	6,365
Indonesia	4,558	5,313	5,957	2,802

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

a) Average 1931-32.

The principal importers of rice in the 1930 were Japan, Malaysia, Sri Lanka, India and France. The first and last of these countries had preferential agreements with their respective colonies, meaning that the remaining exporters only had available important markets for their respective productions in Malaysia, Sri Lanka and India. According to Wickizer and Bennett (1941), the expansion of the imports of these countries was due as much to population growth as to the specialisation of domestic industries, which meant a fall in the relative importance of the domestic production of rice.

The growth of imports from these countries, plus the growth of the non-Asian countries, served to cover the fall in exports to Japan, China, Indonesia and the Philippines in the 1930s (Wickizer and Bennett, 1941: 97).

Table 16. Regional distribution of rice exports (thousands of quintals and percentages)

	1909-13	1924-28	1928-32	1934-38	%	1909-13	1924-28	1928-32	1934-38
Europe	7,167	5,978	4,943	3,728		12.2	8.0	6.3	4.5
N.& C. America	702	1,929	2,797	2,259		1.2	2.6	3.6	2.7
South America	84	193	657	879		0.1	0.3	0.8	1.1
Asia	50,152	65,229	69,562	74,719		85.7	87.9	88.3	90.1
Africa	345	815	763	1,200		0.6	1.1	0.9	1.5
Oceania	86	79	53	129		0.2	0.1	0.1	0.2
Total	58,536	74,223	78,775	82,914		100.0	100.0	100.0	100.0

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

As in the case of imports, the importance of the Asian continent as the origin of rice exports is striking. Thus, throughout the period, between 85.7 and 90.1% of world exports of rice came from Asian countries (table 15). Furthermore, the importance of this continent only increased over time, leading us to conclude that the international rice trade was almost exclusively located in Asia and that as purchasing power in the Asian countries increased so did the volume of rice exchanges. The Asian preponderance in rice exports was due as much to the geographical localisation of exchanges as to the comparative advantage with regard to production costs in the Asian countries. The cultivation of rice was labour-intensive and much cheaper in Asia than in the rest of the rice-producing continents, meaning that its exports were much more competitive in the international markets.

The importance of Europe as a rice-exporting region fell throughout the first third of the XX century. Thus, the annual rate of growth of European exports between 1909-13 and 1934-39 was -2.6% (table 17).

Table 17. Principal exporters of rice (thousands of quintals)

	1909-13	1924-28	1928-32	1934-38
Germany	1,799	1,659	850	274
Italy	673	1,955	1,819	1,477
France	360	628	765	239
Burma and India	24,352	22,783	22,069	20,052
Vietnam	8,958	13,928	12,005	14,140
Thailand	7,917	12,378	11,965	14,303
Korea	933	7,875	9,373	12,123
Taiwan	1,199	3,336	3,764	6,747
Hong Kong	n.a.	n.a.	a) 6,410	3,333

Source: Authors' elaboration, based on International Institute of Agriculture (1909-1938).

a) Average 1931-3.

Five countries exported 95 per cent of the rice which originated from monsoon Asia: Burma, Vietnam, Thailand, Korea and Taiwan. Italy and the United States were the only two non-Asian countries which were important rice exporters. In turn, Germany and France re-exported considerable quantities of rice after refining it. According to Wickizer and Bennett (1941), Burma was without a doubt the principal exporter of rice at the end of the 1930s, exporting an average of 3 million tons annually.

6. Concluding remarks

This study has analysed the worldwide trade in cereals in the first third of the XX century. These products were important not only to constitute the basis of nourishment of a large part of humankind (with wheat, maize and rice as key elements), but also to mean, consequently, a very significant part of trade in agricultural products and food in the world. However, their relative importance tended to diminish from the beginning of the century until the 1930s. This relative decline was due in part to the intensification of international economic relationships until 1929, which meant that more products and countries participated in world trade. It was also important that rising incomes in the more industrialised countries led to a diversification of their diets and a greater weight in them of products of higher income elasticity, such as meat, dairy products, oils or fruit and fresh vegetables.

Within cereals, wheat was by far the most important product, which was indubitably linked to the fact that in the largest food-importing region in the world, Great Britain and Western Europe, it was the principal dietary component and for that reason, from the mid-nineteenth century onwards, had developed an increasing international trade in a market which became profoundly integrated. By contrast, maize and rice, which initially had a fairly small weight in the cereals trade, displayed much more dynamic behaviour due to their use in Europe in animal feedstuffs in the case of maize and the extension of intra-Asian trade in the case of rice.

In the case of wheat Europe was the principal importing and exporting region prior to the First World War. Following this there came very important changes, with the rise of overseas exporters, which ended a clearly dominant position in the market, and with the sharp fall of intra-European trade. Finally, the wheat market was faced with enormous tensions from approximately 1928 on, which the crisis of 1929 and the collapse of the first globalisation complicated yet further. Excess supply in the market, as a consequence of the strong growth in production in overseas countries, affected international wheat prices. Obstacles to trade in the 1930s and the outbreak of protectionism in Europe accentuated the problem, yet further efforts to reach international agreements with the objective of stabilising the market were unsuccessful.

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