Why was protection to agriculture so high during the interwar years? The costs of grain policies in four European countries

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PRELIMINARY DRAFT

Abstract

Existing literature on the causes of agricultural protection unsatisfactorily explains why protection to grain farmers substantially increased during the Great Depression. Following the Gardner´s (1987) idea that governments tend to assist commodities with low supply or demand elasticity, this paper calculates the welfare costs of protection to wheat during the 1920s and the Great Depression. Estimations based on a single-market, single-product model point out that the costs of protection maintained relatively low in France during the 1930s (less than 0.2 per cent of the GDP), but sharply increased in Spain and, especially, in Germany and Italy. In Germany, protection to wheat farmers caused a loss of 2-3 per cent of GDP and 1.3 and 1.7 per cent in Italy, while this figures reached to 0.1-1 per cent in Spain. Although further research has to be done on the indirect effects of these policies, these estimations suggest that governments protected farmers during the 1930s despite the high costs of this policy.

Introduction

Existing literature on the causes of agricultural protection have unsatisfactorily explained why protection to grain farmers substantially increased during the Great Depression. Empirical analysis including both developed and developing countries have demonstrated that protection to farmers is inversely related to the number of farmers and the size of agriculture in the GDP (Lindert 1991; Honma and Hayami 1986a; 1986b). During the interwar years, agricultural production value accounted for one quarter of GDP in Spain and France in 1930-1939, for a third in Italy and for 15 per cent in Germany. Despite the agricultural sector in these countries was still large, high rates

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2 Sources for calculations are the following. Agriculture gross value added was taken from Toutain (1997) and the Annuaire Statistique for France, Hoffmann (1965) and the Statistisches Jahrbuch for Germany.
of protection to farm products were achieved and intervention into the grain markets was substantial. Protectionism agrarian policies have been fully used by developed countries since the late nineteenth century and protection to agriculture maintained very high, especially in the 1930s, despite economic theory has especially emphasized that free trade promotes economic growth and an efficient use of resources. Policies to protect farmers were believed to waste resources by encouraging production in higher-cost lands by marginal farmers. The inefficient use of land, machinery and fertilizers rise production costs and induce farmers to increase output, causing overproduction. Despite the negative economic consequences and the trade distortions arising from these policies, advanced European countries and the United States were reluctant to reduce the levels of protection to their farmers. Protectionism agricultural policies persisted over time and intervention into agricultural markets even intensified after World War II.

Why have these policies remained? Large-scale intervention in agricultural markets has been justified by the collective action of lobby groups (Olson 1965, 1985; Tracy 1989; Andreosso-O’Callaghan 2003; Federico 2005a). In the 1930s, however, farmers’ population accounted for 37 per cent of total active population in France, 29 per cent in Germany, 50 per cent in Italy and 54 per cent in Spain. Anderson and Hayami (1986), on the contrary, suggested that in fact the levels of protection to farmers are directly determined by the comparative advantage of a country’s agriculture. Some countries adopted support policies for farmers earlier and reached the highest levels of support in the second half of the twentieth century because of their disadvantage in agriculture (e.g.). Increasing protection was justified because farmers are more vulnerable to market fluctuations, as agricultural production is inelastic and prices fall sharply during an economic crisis (Hathaway 1963). Indeed, the rising gap between farm and non-farm

Prados (2003) for Spain, and for Italy from Istituto… (1986). GDP in current prices was taken from Mitchell (2003) in all cases, except for Spain’s GDP, which is from Prados (2003).


4 Agriculture was excluded from the GATT negotiations before the 1980s. While successive rounds have reduced the nominal rate of protection of manufacturing from 30 percent to 3 percent between 1950 and 2005, the level of protection for agriculture has remained very high, with a rate today of 30 percent. Sumner and Tangermann (2002: 2002-2005); OECD (2002a: 38-39); McCalla (1969); Houck (1979: 866); Anderson and Martin (2006).

5 Fernández (2009).

6 Olson (1965, 1985) and Becker (1983) pointed out that the declining size of agriculture facilitates the collective action of farmers as it reduces organization costs and prevents “free-riding.”

7 Calculated from data on Mitchell (2003)
incomes resulting from rapid structural change and economic growth is also considered as a main determinant explaining rising protection. Since World War I some governments sought to protect commodities considered as strategic. Thus, the grain policies followed during the 1920s by some Italy or Germany were seeking to isolate domestic markets and to increase domestic production, eliminating foreign dependence on food.

This paper tries to find an alternative explanation for the agricultural policies in developed countries looking at the cost of protection. Are the costs of protection relatively low as compared with the short-term benefits that governments can obtain? In an empirical study about the U.S. commodity programs, Gardner (1987) found that the social costs (or welfare effects) are important determinants of agricultural policies. Policies are more costly whether the elasticity of supply is high and the elasticity of demand low; on the contrary, an inelastic supply and demand decreases the cost of protection. Thus, Gardner (1987) ’s empirical results show that low supply elasticity or low demand elasticity is associated with higher protection in the United States.

By looking at the consequences of these policies, this paper tried to answer to the question of why these protectionism policies in agriculture persisted. The paper focuses on the examination of the effects in welfare of policies adopted to protect grain producers during the interwar years in three highly protectionist countries (Spain, Italy and Germany) and a moderately protectionist country (France). The reminder of this paper is arranged as follows. After this introduction, section 2 explores major changes in the grain international markets during the 1920s and looks at policies adopted by governments to protect the grain sector in the selected countries. The effect of Great Depression on the grains markets and policies are explored in section 3. Section 4 presents the methodology to measure the welfare loses of these policies with a straightforward single-market, single-product model and presents the results. Section 5 presents conclusions and some ideas for further research.

The market of grains during the 1920s: from decline...

Following the methodology of Anderson et al. (2008), the intensity of protection to wheat producers has been measured by the nominal rate of protection defined as the

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8 Economic growth, relatively inelastic demand and rising productivity cause the so-called farm problem, or the sharp drop in relative incomes received by farmers (Schultz 1945).
percentage difference between the market price received by producers and the world price of a given commodity. Producer prices are used as an indicator of domestic prices for wheat when available and wholesale prices otherwise. Import prices are used as a proxy of world wheat prices and have been calculated as the ratio of import values over the import quantities using information gathered from national trade statistics. Figure 1 presents the results. The nominal rate shows that levels of protection increased during the 1920s, although only reached levels of 1914 by 1929-1930 (except for the case of Spain). After 1930 the gap between domestic and foreign prices substantially rose, although in a lesser extent in France (figure 1).

Important changes had been occurring in the international market for wheat since the late nineteenth century. Both exports and imports were highly concentrated in a few countries. The Western settlement countries (United States, Canada, Australia and Argentina), which had emerged as main producers and exporters of wheat in the last third of the nineteenth century, were responsible for more than 80 per cent of all exports by 1900 (table 1). Meanwhile, Western Europe accounting for more than 80 per cent of world imports, with Great Britain being responsible for 40 per cent of all purchases (table 2). As shown in figure 2, following the rising trend in the last third of the nineteenth century, world exports of wheat almost doubled in the period 1900-1929. World wheat output had also substantially risen in the first decades of the twentieth century. This increase had been the result of an expansion of the area cultivated, which rose by 14 per cent between 1909-13 and 1930 and an increase in yields that resulted from the technological advances and the use of chemical fertilizers.\(^9\) Moreover, the use of tractors in overseas countries, also contributed to this increase because it allowed reducing the quantity of land devoted to feed grains and fodder expanding the area under wheat.\(^10\) World production capacity was increased even more during the War as a response of the expanding demand and rising prices.\(^11\) As a consequence, the global wheat sector began to show an imbalance tendency and rising surplus after the mid-1920s and again after 1929 (figure 3), resulting in a decline in the price of wheat in the exporting countries (figure 4).\(^12\)

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\(^9\) Figures on area planted are calculated from Lamor (1931: 21)

\(^10\) Malenbaum (1953: vii); De Hevesy (1934: 1-2); See also Binet (1939: 97)

\(^11\) Temin (1994); Federico (2005)

\(^12\) Malenbaum (1953: vii)
European countries reintroduced tariffs on wheat from the early 1920s, after being suspended during World War I. First country was France that re-established tariffs in 1919. In 1921 Spain approved a restricted commercial policy prohibiting wheat imports in 1921. In 1922-1930, imports were only authorised when domestic prices were situated below a maximum. Other European countries only reinstated tariffs after 1925. In Germany, the limitations imposed in the tariff policy by the Treaty of Versailles, which had obliged Germany to establish the more favoured nation clause and prohibited to raise tariffs above the pre-war years. Until 1925, German wheat prices maintained at levels similar to those in the international market until 1925, but then they were raised 25 percent above international prices. In response to the agrarian crisis caused by the slump in the international price of wheat, the rising burden of debts and growing production costs, protection of farmers not only focused in this country on border policies but also on direct support to farmers. Assistance started in 1922 with the *Osthilfe* (Relief for the East), a plan that reduced taxes, interest rates and transport costs, and provided farmers with low rate credits. In addition, in 1928 the government approved a credit of 100 million marks to convert credits and to reduce interest rates. Thus, German producers obtained direct aids from the Government before the Great Depression. In Italy, deterioration of the balance-of-payments and an inflated lira led Mussolini to launch the *Battaglia del Grano* in July 1925 in an attempt to diminish dependence from foreign supplies, which accounted for over a quarter of total imports.

The pre-war duty was reintroduced and the government launched an intensive propaganda and financial assistance to producers to increase the use of new machinery, higher productive seeds and chemical fertilizers.

In 1927, tariff levels in all countries were lower than in the pre-war years (table 5). However, only in France domestic prices of wheat and other cereals maintained at levels close to those in the international market. In the other countries, nominal rates increased substantially but they never returned to the peak in 1913. Despite this relatively

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13 Tracy (1982: 128); for the tariff policy in Continental Europe in the 1920s, see Tracy (1982: 128) and Liepmann (1938).
14 Montojo (1945: 33, 38); Palafox (1991: 240); Hermida Revillas (1996: 53, 57); in the following years Spain only imported wheat in 1928, 1929 and 1932.
15 Lorenz (1941: 61-62; 65-84; 87-88).
16 Cohen (1979: 72-73); Schmidt (1936: 646). In order to intensify cultivation a number of subsidies were granted to producers, including reduction on gasoline price used in farm machinery and on railroad freight rates for chemical fertilizers, support for farm machinery industry, aids for the distribution of seeds, construction of silos and machinery and financial assistance to education and research, Schmidt (1936: 647-648).
moderate protection, production of wheat expanded in Italy, Germany and Spain (table 6), following the general movement of the production of wheat in Continental Europe that showed an upward trend after World War I. However, despite the increased European output of wheat and increasing barriers to imports, imports from Europe were maintained in levels similar to those in the prewar period, as shown in table 2.\textsuperscript{17} 

... to collapse: Intervention into the grain markets during the 1930s

Stocks of surplus wheat increased substantially in the 1930s. According to Malenbaum (1953: 5-6), world surplus doubled from an annual average of 19 million tons, or 25 per cent of world demand, in 1924-29 to almost 33 million tons, nearly 40 per cent of world consumption, in 1933 and 1934.\textsuperscript{18} Exporting countries considered that policies to restricted imports and encouraged national production in Europe had been an important factor contributing to this imbalance in the world market for wheat, especially after late-1929 when protection policies intensified.\textsuperscript{19} In fact, by the late 1930s imports from Europe had reduced by a third.\textsuperscript{20} Most of the reduced demand came from Continental Europe. Italian imports fell by nearly 80 percent between 1923-1928 and 1932-1937 as a result of the increasing domestic production and yields.\textsuperscript{21} The drop of German imports was also substantial. The support of domestic production resulted in a fall of imports that accounted for 90 percent in 1932-1937. On the contrary, Great Britain, the main wheat importer, reduced only slightly its imports.\textsuperscript{22}

Beside the expansion of world output and higher barriers to trade, Russian wheat trade contributed to aggravate the situation of the world market for grains. After having disappeared from the world market in 1914, exports of wheat from Russia substantially increased in only a few months.\textsuperscript{23} In 1930-1931, aiming at financing its machinery

\textsuperscript{17} De Hevesy (1934: 2).
\textsuperscript{18} See also figure 2.
\textsuperscript{19} Foreign Agriculture (1939), no. 1: 12.
\textsuperscript{20} Net imports from Western Europe declined from 15.8 million tons in the 1920s to 9.8 in the late 1930s, according to Foreign Agriculture (1939), no. 1: 5.
\textsuperscript{21} Between 1926 and 1936, Italian wheat area rose by 5 per cent, while increasing yields allowed production to increase by 25 per cent, in Foreign Agriculture (1939), no. 1: 7-8.
\textsuperscript{22} British imports remained free of duties until 1932, when a tariff of 6 cents per bushel was established. Nevertheless, this tariff hardly had any effect on consumption and it was suspended after a commercial treaty with the United States. According to Foreign Agriculture, difficulties to expand imports from Britain came from the Wheat Marketing Act of 1932 that established a guaranteed price for a share of national output, resulting in domestic production increasing from 1.3 million tons in 1927-1931 to 1.7 in 1933-1937. This explains therefore a slight decline of British imports, Foreign Agriculture (1939), no. 1: 6-7.
\textsuperscript{23} Binet (1939: 97).
imports, Russia exported at inferior prices 80 per cent more wheat than in the prewar period.  

The fall in import demand from Europe and the Russian cheap grains resulted in a severe fall of the wheat prices in the exporting countries beginning in 1929 (figure 4). In Continental Europe, governments intensified their policies to isolate domestic market from international tendencies. World depression encouraged in these countries to follow policies to reduce dependence on foreign grains (especially wheat).  

Protection was intensified firstly with the rise of tariffs. Later milling quotas were generalized and import monopolies were established in some countries, as in Italy since 1935 (see table 5 on different policies adopted by European countries). According to Foreign Agriculture, measures to protect farmers resulted from three main causes. With prices declining in the international markets, Governments sought to maintain farmers’ incomes in an attempt to retain a large share of rural population engaged in agriculture. Countries also attempted to cut imports in order to improve their balance of payments when exports were reducing. Finally, some countries tried to foster national production following military and strategic motivations.

As a whole, duty rates were in 1931 about 5-6 times higher than in 1913 in France and Germany and 2-3 times in Italy and Spain (table 6). In France and Germany, the tariff rise was possible because Governments were authorised to autonomously change duty rates without consulting to Parliament. These prerogatives were used in Germany to fix a highly prohibitive tariff on wheat. During the 1930s, Spain, Germany and Italy showed higher rates of protection (figure 1). The Germany’s rate of assistance for wheat was raised to 85 percent in the 1930s. In Spain, the price gap rose to 106 percent in 1930-1935. The nominal rate of assistance to wheat in Italy reached an average of 100 in the 1930s. In contrast, in France wheat prices were raised 32 percent above the import price (table 4). Producers in Europe realized very soon that tariffs were

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24 In 1913, Russian exports accounted for a quarter of world market (table 1); see also Lorenz (1941: 63).
25 Wheat Studies (1932), no. 4: 265
26 Malenbaum (1953: 12-13)
27 Foreign Agriculture (1939), no. 1: 12.
28 For France, see Lamor (1931: 95); Binet (1939: 108); Ménasseyre (1934: 38); Foreign Agriculture (1938), no. 1: 32; For Germany, see Wheat Studies (1936), no. 3: 83; In Italy, the increase of the tariff on wheat occurred in 1928 (from 7.5 to 11 lire), 1929 (to 14 lire), 1930 (to 16 lire) and 1931 (to 19); see Hazan (1933: 498); Schmidt (1936: 648). In 1935, Italian wheat imports were restricted under a system of quota control; Duty on wheat was reduced after 1936, but quota control significantly reduced foreign supplies, Foreign Agriculture (1939), no. 1: 40; Schmidt (1936: 648).
29 Wheat Studies (1936), no. 3: 83. For France, see Liepmann (1938: 67); Ménasseyre (1934: 37)
ineffective to prevent imports not only because increasing stocks in world markets obliged exporting countries to sell at any price, but also because home production were unable to substitute some grades of wheat, especially hard Canadian grades, to be used to produce light breads. In fact, millers preferred overseas hard grains to be used in the production of light bread, despite they were more expensive. In order to prevent these imports, import licenses and compulsory milling regulations were introduced in France, Italy and Germany.\(^{30}\) A milling quota was established in France in the late-1929 and initially required that a minimum percentage of 97 per cent of domestic wheat be mixed with foreign grains in the milling of flour.\(^{31}\) Similar percentages were established in Germany (97 per cent) and in Italy (95 per cent).\(^{32}\) In addition to milling quotas, the international financial crisis since the summer of 1931 has given new impetus in the adoption of import quotas and import licensing systems.\(^{33}\)

Milling quotas, and even the import licences of Italy, were very effective in cutting imports, but unsuccessful to maintain prices above world prices because of large production (in France and its colonies) and the decreasing consumption.\(^{34}\) Thus, governments, especially authoritarian regimes like Spain, Germany and Italy, approved measures to control grains. Spain continued with its prohibition to import wheat. Germany increased protection to farmers through minimum prices and compulsory storage of surplus wheat by millers.\(^{35}\) Intervention into the wheat market increased with the German national-socialist government, which aimed at reaching food self-sufficiency and guaranteeing fair prices to producers.\(^{36}\) In the late 1934, the Battle of Production (Erzeugungsschlacht) was initiated. Minimum prices were transformed in fixed prices and the government created import monopolies that controlled both the quantity and prices and provided importers with foreign exchange and clearing licences and established import taxes in order to balance foreign and domestic prices. Deliveries from producers to millers were subject to quotas and producers were guaranteed fixed

\(^{30}\) Binet (1939: 108); Ménasseyre (1934: 53-54).

\(^{31}\) This quota was reduced to 90 and 75 per cent in 1930 and 1931 in response to poor harvests, see Lamor (1931: 96-99), Binet (1939: 108), Ménasseyre (1934: 40). In addition to the restriction of wheat imports introduced in 1929, after 1931 France applied a quota system to the imports of livestock, meat, butter, cheese and sugar; Liepmann (1938: 68).

\(^{32}\) Foreign Agriculture (1938), no. 1: 17; For Italy, see Cohen (1979: 73); Schmidt (1936: 648); Liepmann (1938: 672)

\(^{33}\) Edminster et al. (1932: 2).

\(^{34}\) Foreign Agriculture (1938), no. 1: 33.

\(^{35}\) Lorenz (1941: 94), Wheat Studies (1936), no. 3: 84-85.

\(^{36}\) Foreign Agriculture (1938), no. 1: 18.
prices for a certain quantity. The Government created a monopoly for importing and established import taxes.\(^\text{37}\) In an attempt to eliminate excess in production, a compulsory cartel of millers was created. Each miller was assigned with an annual quota of production and their sales were controlled by a wheat producers association.\(^\text{38}\)

Attempts to achieve self-sufficiency also intensified in Italy after 1931. The incapacity of tariffs and import quotas to encourage a rise in production resulted in the government restricting imports through a system of import licences.\(^\text{39}\) In France, in an attempt to reduce the effects of surplus production in prices, government established export subsidies and a system of public storage of excess production (April 1930).\(^\text{40}\) More than three million quintals were storage with public financing. An abundant production in 1930 of over 90 million quintals led to a new decrease in prices and resulted in the French government’ decision to prohibit milling with foreign grains and purchased part of the wheat harvest in 1932 in order to prevent a fall in prices.\(^\text{41}\) That year, the government started to purchase part of the wheat harvest in 1932 in order to prevent a fall in prices. At the beginning of 1933, farmers’ demonstrations intensified in Paris.\(^\text{42}\) Distress among grain producers continued thereafter. The Office National Interprofessionnel du Blé was created in 1936 to intervene into the grain markets, which controlled prices and the production and marketing of wheat. This office also had a monopolistic control of foreign trade and was allowed to restrict imports and subsidize exports.\(^\text{43}\) Protection to wheat was extended to feed grains and other products during the Great Depression. Maize achieved greater protection in Spain, Italy and France.\(^\text{44}\) Germany increased its tariffs on barley in 1929-1930, which resulted in a rate of assistance substantially high (152 percent) as compared to that of wheat.

Many contemporaries saw protectionist measures established in European countries, especially milling quotas and import restrictions through monopolies, as the main causes of the sharp fall in wheat prices, encouraging exporting countries to increasingly

\(^{37}\) Lorenz (1941: 94, 111); Wheat Studies (1936), no. 3: 86; Foreign Agriculture (1938), no. 1: 18-21. For the agricultural policy during the Third Reich, see Bertrand (1937).

\(^{38}\) Wheat Studies (1936), no. 3: 85.

\(^{39}\) Foreign Agriculture (1939), no. 1: 42-43.


\(^{41}\) Binet (1939: 108; 111).

\(^{42}\) Ménasseyre (1934: 63-69).

\(^{43}\) Tracy (1989: 120-125); McCalla (1969: 334-335); Foreign Agriculture (1939), no. 2: 73; Ménasseyre (1934: 63-69).

\(^{44}\) Fernández (2009)
intervene into domestic markets. Shortages in storage capacity and needs to obtain foreign exchanges obliged to Argentine and Australia to adopt policies to expand exports. In Argentine, the Government created the *Grain Regulating Board* to purchase at a fixed price a share of output to sell it in the international market. Canada and the United States created agencies to regulate markets through storage of surplus output. As a consequence of the international falling demand, Canadian stocks doubled in a short period and amounted to an annual average of 5.8 million bushels in 1933-35. In an attempt to solve the crisis, the Canadian wheat Pools received credit to storage surplus wheat beginning in 1929 and the Government purchased stocks in the Winnipeg markets. This policy was changed in 1935 with the creation of the Canadian *Wheat Board* and the introduction of measures to encourage exports. In United States, a policy of surplus storage was pursued through the Grain Stabilization Corporation. With the approval of the Agricultural Adjustment Act of 1933, wheat policy aimed at balancing supply and demand through payments directed to encourage producers to reduce the area planted. Loans from the Commodity Credit Corporation and marketing operations of the Surplus Marketing Administration intended to raise domestic prices. Only in 1939 the United States established measures to encourage exports. Because of declining prices and expanding stocks, a number of international conference were celebrated aiming at taking measures to expand world consumption of wheat and to diminish output. This international collective action had been initiated during World War I as a consequence of the problems to supply urban centers with grains and the low stocks of wheat caused by the war. In 1916 France, Italy and the United Kingdom established a *Wheat Executive*. This agency aimed at increasing wheat output, organizing production and controlling prices. The United States joined this organization in 1917. A total of 20 international conferences were celebrated until 1933, most of them (16 conferences) between 1930 and early 1931. However, this international collective action failed in their attempt to regulate the world market for wheat.

**Welfare cost: a single-market single-product model**

This paper tries to quantify the losses that resulted from agrarian policies. In this section the cost of the policies on wheat is the deadweight loss associated with an increase of

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45 *Wheat Studies* (1932), no. 4: 265; Malenbaum (1953: 12-13); *Foreign Agriculture* (1939), no. 1: 12.
46 Malenbaum (1953: 12-13).
48 Five of them were organized by the League of Nations, *Wheat Studies* (1931: no. 9: 440)
domestic prices over the world price. A single-market, single-product model is initially followed to calculate the cost of protection to wheat producers. Following Corden (1957), Harberger (1959) and Johnson (1960), the welfare effects of protection can be measured by the Marshallian triangles representing the change in the consumers’ and producers’ surplus.

Both triangles can be expressed as,

\[
NSL_p = \frac{1}{2} (t_p)^2 \varepsilon V_p \quad [1]
\]

\[
NSL_c = \frac{1}{2} (t_c)^2 \eta V_c \quad [2]
\]

where NSL\textsubscript{p} and NSL\textsubscript{c} are the net social loss of producers and consumers, respectively; t\textsubscript{p} is the proportion of the gap between the domestic and the international price in the production price; \varepsilon and \eta are the price elasticity of supply and demand, respectively; \(V_p\) is the value of production at production prices; \(V_c\) is the value of production at consumption prices. These social costs functions imply that losses are proportional to demand and supply elasticities, \varepsilon and \eta, i.e. protecting goods with lower \varepsilon and \eta is cheaper; however, the social costs augment in proportion to the square of protection.\textsuperscript{49} The net social loss is the sum of NSL\textsubscript{p} and NSL\textsubscript{c}.

The demand elasticity has been estimated for the three countries by demand equation \[3\]

\[
Q_i^\text{wheat} = D_i (P_1^\text{wheat}, \ldots, P_n^\text{wheat}, Z_i), \quad i = 1, n, \quad [3]
\]

where \(Q_i\) is the quantity, \(P_n\) the price and \(Z_i\) the instrumental variables. Nominal rate of protection is used as the \(Z\) variable for Italy, obtaining a coefficient of 0.53 in the IV regression, which coincided with price elasticity of wheat supply given by Iñiguez \textit{et al.} (1978) for Spain (table 7). No conclusive results have been found for France using the NRA as the instrument variable, so that the price of barley as the \(Z\) variable.

Estimations for France show a negative coefficient for wheat price. Similar problems have been found for Germany. Thus, for the cases of France and Germany, both the result for Italy and the figure of 0.42 given by Bale and Lutz (1981) have been used in the calculations. On the other hand, due to the lack of wholesale prices in all countries,

\[\text{Winters (1987: 11).}\]
price elasticity of demand have been taken from Bale and Lutz (1981) for France, Italy and Germany, and from Prados (1989) for Spain (table 8).

Estimations of the equation [1], measured as percentages of total value of wheat production, is presented in figure 5.\(^{50}\) Gains of wheat producers from protection policies substantially increased during the Great Depression in Italy, Germany and Spain, especially in the early 1930s. During the 1920s, gains accounted an average of 1 per cent of the value of production in France, and 6-7 per cent in Spain, Italy and Germany. As accounted by the estimations base on a single-market, single-product model, during the 1930s, this figure reached to a minimum of 43, 20 and 31 per cent in Spain, Germany and Italy, respectively.

After estimating the NSL\(_c\) in equation [2], results of the total cost of protection to wheat producers were presented in table 9, as a percentage of GDP.\(^{51}\) Estimations suggested that during the 1920s the cost of protection was relatively low in France and Italy (less than 0.1 per cent of the GDP, while in Spain and Germany costs accounted for a maximum of 0.52 and 0.63 in Spain and Germany, respectively. The costs of protection maintained relatively low in France during the Great Depression (less than 0.2 per cent of the GDP), but sharply increased in Spain and, especially, in Italy and Germany.

Protection to wheat farmers caused a loss of 2-3 per cent of GDP in Germany and 1.3 and 1.7 per cent in Italy, while this figure reached to 0.1-1 per cent in Spain.

**Conclusions**

Protection to wheat farmers substantially rose in the 1930s through increased duties and milling quotas that obliged to use a certain percentage of domestic grains in the production of flour. Some countries also established import monopolies and guaranteed minimum prices to producers. This empirical evidence contracts with the hypothesis that protection is higher in countries with a small agriculture sector because the share of the rural sector in European economies and the size of agriculture in GDP were still large during this period. Following the Gardner’s (1987) idea that governments tend to assist commodities with low supply or demand elasticity, this paper calculates the welfare costs of protection to wheat producers during the 1920s and the Great

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\(^{50}\) Output and GDP in current prices for all the three countries have been obtained in *Annuaire International de la France* and Mitchell (2005), respectively.

\(^{51}\) Both \(t\) and \(V\) have been calculated taken producer prices.
Depression, in an attempt to contrast the hypothesis that protection was raised because costs were relatively low as compared with the short-term benefits that governments could obtain. The paper focuses on the wheat sector and on three highly protectionist countries (Spain, Italy and Germany) and a moderately protectionist country (France). A single-country, single-product model have been used to calculate the gains of wheat producers from protection and the net loss generated by the agricultural policies in the 1920s and 1930s. Results show that gains of producers substantially increased during the Great Depression in Italy, Germany and Spain, especially in the early 1930s. During the 1920s, gains accounted for an average of 1 per cent of the value of production in France, and 6-7 per cent in Spain, Italy and Germany. During the 1930s, these gains accounted for a minimum of 43, 20 and 31 per cent in Spain, Germany and Italy, respectively. Estimations also suggest that the costs of protection maintained relatively low in France during the Great Depression (less than 0.2 per cent of the GDP), but sharply increased in Spain and, especially, in Italy and Germany. Thus, protection to wheat farmers caused a loss of 2-3 per cent of GDP in Germany and 1.3 and 1.7 per cent in Italy, while this figure reached to 0.1-1 per cent in Spain.

During the period of analysis, wheat was still a large sector of the economy in the four economies under study. The value of production of wheat accounted for 2 per cent of the GDP in Germany, and between 5 and 7 per cent in France, Italy and Spain. Thus, a single-market, single-product model dismisses the indirect effects of protection such as changes in total employment, in factor and other commodity prices or in the balance of trade. This implies that the cost of protection to farmers during the interwar years requires further research based in a multi-product model. Although further research has to be done on the indirect effects of these policies, estimations suggest that governments protected farmers during the 1930s despite the high costs of this policy.
References


Statistique Générale de la France (vva): *Annuaire Statistique*.


Appendix 1: Data sources

a) Nominal rate of assistance

Producer prices are used as an indicator of domestic prices when available and wholesale prices otherwise. Import prices are used as a proxy of world prices and have been calculated as the ratio of import values over the import using information gathered from national trade statistics.

- France: Domestic prices and foreign trade data were compiled from Annuaire statistique de la France.

- Germany: Import data are from Statistisches Jahrbuch für das Deutsche Reich and Statistisches Jahrbuch für die Bundesrepublik Deutschland. Domestic prices prior to 1958 were collected from Hoffmann (1965) when available and from the national statistics otherwise.

- Italy: Domestic prices and import values were taken from Istituto Centrale di Statistica (1958; 1986)

- Spain: Producer prices are taken from Anuario estadístico de España. Import statistics were obtained in Estadística del Comercio exterior de España.
### Table 1

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</tr>
<tr>
<td>1915-9</td>
<td>16</td>
<td>4</td>
<td>28</td>
<td>37</td>
<td>1</td>
</tr>
<tr>
<td>1920-4</td>
<td>14</td>
<td>9</td>
<td>25</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>1925-9</td>
<td>19</td>
<td>11</td>
<td>33</td>
<td>23</td>
<td>1</td>
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<tr>
<td>1930-4</td>
<td>20</td>
<td>18</td>
<td>31</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>1935-8</td>
<td>17</td>
<td>18</td>
<td>29</td>
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<td>3</td>
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</table>

Source: Own calculations from USDA’s Yearbook

### Table 2

<table>
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<th>1910</th>
<th>1915</th>
<th>1920</th>
<th>1925</th>
<th>1930</th>
<th>1935</th>
<th>1938</th>
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<tr>
<td>UK</td>
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<td>6.01</td>
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<td>2.04</td>
<td>0.93</td>
<td>1.22</td>
<td>1.31</td>
<td>1.12</td>
<td>1.17</td>
<td></td>
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<tr>
<td>Germany</td>
<td>1.33</td>
<td>2.31</td>
<td>2.37</td>
<td>0.68</td>
<td>2.07</td>
<td>0.84</td>
<td>0.11</td>
<td>1.01</td>
<td></td>
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<tr>
<td>Netherlands</td>
<td>1.20</td>
<td>1.91</td>
<td>2.20</td>
<td>0.79</td>
<td>0.54</td>
<td>0.84</td>
<td>1.01</td>
<td>0.57</td>
<td>0.79</td>
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<td>France</td>
<td>0.16</td>
<td>0.19</td>
<td>0.65</td>
<td>2.10</td>
<td>2.40</td>
<td>1.20</td>
<td>1.82</td>
<td>0.82</td>
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<tr>
<td>Italy</td>
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<td>1.22</td>
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<td>2.34</td>
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<td>Total</td>
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<td>17.31</td>
<td>18.13</td>
<td>13.91</td>
<td>17.36</td>
<td>20.38</td>
<td>19.62</td>
<td>12.71</td>
<td>14.67</td>
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</table>

Source: Own calculations from USDA’s Yearbook

### Table 3

<table>
<thead>
<tr>
<th></th>
<th>Great Britain</th>
<th>Germany</th>
<th>France</th>
<th>Spain</th>
<th>Italy</th>
<th>Major exporting countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1905-9</td>
<td>116</td>
<td>106</td>
<td>106</td>
<td>105</td>
<td>109</td>
<td>120</td>
</tr>
<tr>
<td>1910-14</td>
<td>117</td>
<td>119</td>
<td>93</td>
<td>110</td>
<td>113</td>
<td>135</td>
</tr>
<tr>
<td>1915-19</td>
<td>142</td>
<td>79</td>
<td>60</td>
<td>123</td>
<td>106</td>
<td>161</td>
</tr>
<tr>
<td>1920-24</td>
<td>121</td>
<td>71</td>
<td>84</td>
<td>122</td>
<td>112</td>
<td>175</td>
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<tr>
<td>1925-29</td>
<td>102</td>
<td>93</td>
<td>83</td>
<td>129</td>
<td>144</td>
<td>193</td>
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<tr>
<td>1930-34</td>
<td>101</td>
<td>132</td>
<td>94</td>
<td>139</td>
<td>155</td>
<td>175</td>
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<tr>
<td>1935-39</td>
<td>123</td>
<td>133</td>
<td>88</td>
<td>101</td>
<td>175</td>
<td>169</td>
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</tbody>
</table>

Source: Own calculations from Statistique Générale de la France (various years).
Table 4
Nominal rate of protection to wheat by countries, 1920-1980 (in percent)

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920-24</td>
<td>2</td>
<td>-39</td>
<td>-23</td>
<td>35</td>
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<tr>
<td>1925-29</td>
<td>-2</td>
<td>24</td>
<td>17</td>
<td>64</td>
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<td>1930-39</td>
<td>32</td>
<td>85</td>
<td>100</td>
<td>50</td>
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</table>

Source: See appendix

Table 5
Main measures to protect wheat producers in importing and exporting countries

<table>
<thead>
<tr>
<th>Measures</th>
<th>France</th>
<th>Spain</th>
<th>Italy</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher tariffs</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Flexibility in tariff policy</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Subsidies to exports and Dumping</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import restrictions</td>
<td>Quotas</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Import Monopolies</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Import prohibitions</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currency Devaluation and clearing</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mill regulations</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Minimum Prices</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>Fixed Prices</td>
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<td>✓</td>
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<tr>
<td>Output restrictions</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output and Marketing Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt Moratorium or reconversion</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Tax, Interest rate reductions; cheap credit and subsidies to transportation</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assistance to co-operatives</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Source: Own elaboration; see text
Table 6
Duties on Wheat (in percentage of prices)

<table>
<thead>
<tr>
<th></th>
<th>1913</th>
<th>1927</th>
<th>1931</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>38</td>
<td>29</td>
<td>212</td>
</tr>
<tr>
<td>France</td>
<td>35</td>
<td>23</td>
<td>180</td>
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<tr>
<td>Italy</td>
<td>42</td>
<td>27</td>
<td>144</td>
</tr>
<tr>
<td>Sweden</td>
<td>9</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>Spain</td>
<td>29</td>
<td>20</td>
<td>71</td>
</tr>
</tbody>
</table>

Source: Liepmann (1938)

Table 7
Estimation of price-elasticity of supply:
Instrumental variables (2SLS) regression

<table>
<thead>
<tr>
<th></th>
<th>Dependent variable in logarithms: output of wheat (3 year-lagged)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Italy (1884-1940)</td>
</tr>
<tr>
<td>Wheat price (in logs)</td>
<td>.5279*** (.1262)</td>
</tr>
<tr>
<td>Constant</td>
<td>1.8763 (.4734)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.4064</td>
</tr>
<tr>
<td>Observations</td>
<td>57</td>
</tr>
<tr>
<td>Probability &gt; F</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

| Italy = Instrumented: Ln (P$^{wheat}$); Instruments: Ln (NRA$^{wheat}$) lagged 3 years |
| France A = Instrumented: Ln (P$^{wheat}$); Instruments: Ln (NRA$^{barley}$) lagged 3 years |
| France B = Instrumented: Ln (P$^{wheat}$); Instruments: Ln (P$^{barley}$) lagged 3 years |

Notes: Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.
Table 8
Supply and demand price-elasticities for wheat in three countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>0.53 / 0.42 (see text; Bale &amp; Lutz, 1981: 12)</td>
<td>-0.10 /-0.30 (Bale &amp; Lutz, 1981: 12)</td>
</tr>
<tr>
<td>Spain</td>
<td>0.53 (Iñiguez et al., 1978)</td>
<td>-0.3 /-0.5 (Prados, 1989)</td>
</tr>
<tr>
<td>Germany</td>
<td>0.53 / 0.42 (see text; Bale &amp; Lutz, 1981: 12)</td>
<td>-0.10 /-0.30 (Bale &amp; Lutz, 1981: 12)</td>
</tr>
<tr>
<td>Italy</td>
<td>0.5279 (estimated)</td>
<td>-0.10 /-0.30 (Bale &amp; Lutz, 1981: 12)</td>
</tr>
</tbody>
</table>

Sources are provided in parenthesis

Table 9
Cost of protection to wheat producers as a percentage of GDP, 1901-1939

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>Spain</th>
<th>Germany</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901-1909</td>
<td>0.03</td>
<td>0.06</td>
<td>0.01</td>
<td>0.05</td>
</tr>
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<td>0.02</td>
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</tr>
<tr>
<td>1920-1929</td>
<td>0.02</td>
<td>0.04</td>
<td>0.07</td>
<td>0.52</td>
</tr>
<tr>
<td>1930-1939</td>
<td>0.08</td>
<td>0.16</td>
<td>0.13</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Source: see text.
Figure 1
Nominal rate of protection to wheat in France, Italy, Germany, Spain, and the United States, 1870-1939 (7-year moving average)

Source: see Appendix 1.

Figure 2
World output and exports of wheat, 1900-1938

Sources: Own calculations from USDA (various years): Agricultural Statistics and USDA (various years): Yearbook
Figure 3
World end-year carry-over of wheat, 1922-1939

Source: Calculated from wheat prices and index of farm prices in Strauss and Bean (1940)

Figure 4
Price of wheat in the United States in constant dollars (1870 = 100)
Figure 5
Welfare gains of wheat producers from protection policies, as percentage of total value of production, 1901-1939 (5-year moving average)

Source: see text