Chapter 2
The food price dilemma and strategies to solve it in relation to World War II

2.1. THE ECONOMICS OF THE FOOD PRICE DILEMMA

While the Franco regime was in many ways unique, it did not exist in a vacuum[1]. Widespread state control of the economy was prominent in the industrialised world in the 1930s and 1940s, either out of a perceived exceptional necessity in peculiar situations, or as a goal in itself. One reason behind increasing state intervention was the desire to secure a supply of basic foodstuffs in a wartime situation. This became clear during the course of the First World War. On several occasions, the absence of adequate supply due to declining national output and loss of imports had demoralising effects on troops and civilians, with subsequent risks of military inefficiency and/or social upheavals on the home front[2]. This lesson was learnt, although to varying degrees, by democracies and dictatorships alike in the 1930s and the 1940s and control measures were widely used in belligerent and neutral countries before, during and after World War II[3].

The interruption of international trade that accompanied the two World Wars of the 20th century often made a greater reliance on domestic food

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1 This special nature of the regime includes its origin in a Civil War in the context of the pre-World War II struggle between fascism and democracy, as well as its longevity. The last point led it to adopt different attitudes to, for example, economic policy.

2 See Offer (1989) for this aspect of World War I.

3 Some examples of this are treated in Section 2.2.

production and/or a shift in output composition necessary. In this situation, governments often faced what has been called the "food price dilemma" – i.e. how to keep farm prices high and food prices low[4]. On the one hand, it would be deemed necessary to protect the consumers from rising food prices due to a decline in supply. On the other hand, it would be desirable to increase the prices received by farmers, to expand domestic production in order to compensate for decreases in imports of foodstuffs and/or inputs.

The analysis of the economic and social effects of different approaches to the food price dilemma can best be understood when seen as a deviation from a situation with a competitive market with perfect information and no state intervention. In such circumstances and seen from the point of view of economic efficiency, the correct level of prices in a given country should adjust to the border price criterion. That is:

> In such a world, any deviation of the domestic price from the international border price of a commodity, as either an import or export, reduces total economic welfare in the country because of dead-weight efficiency[5] losses in production and consumption[6].

However, a government might dislike the consequences of following the border price criterion. Contemporary examples are the agrarian policies of the European Union and the United States, where the desire to secure food supplies and political pressures to maintain farm incomes have led to a system of guaranteed minimum prices. The effect of such a policy is income transfer from consumers to producers, a dead-weight efficiency loss in the economy and an over-production that has to be stored[7].

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4 The formulation is from Timmer, Falcon and Pearson (1983), pp. 224-225.

5 Dead-weight efficiency loss occurs when a reallocation of resources in an economy leads to a situation where "[…] somebody's welfare is reduced because of the misallocation of resources […] but no one else benefits from this particular loss". Timmer (1986), p. 45. Consequently, a dead-weight efficiency loss reduces the aggregate welfare of society.

6 Timmer (1986), p. 13. Still, if the government want to encourage production by promising farmers that they will receive the expected border price, there can be substantial methodological problems of establishing how to calculate this. Timmer (1986), pp 73-100. However, the examination of how to set farm prices according to border price is omitted from the following analysis, because the international market for basic staples was very limited in the 1940s.

7 For overall details of the US system, see Gardner (1992), pp. 85-88.

The border price criterion can also be irrelevant if there is no international market for a given commodity. In such a situation, the domestic price will be determined by supply and demand in the internal market. Wartime restrictions of international trade can further decrease availability of a commodity if these also affect inputs for the production[8].

The combination of insufficient domestic production and a limit on imports due to external circumstances can lead to a sharp increase in prices if no substitute products are available. If the commodity is also a basic staple, the result can be a social market failure, i.e. unacceptable social consequences for part of the population[9]. Whether or not a social market failure occurs will depend on several factors, such as the price elasticity of supply and the time gap between the introduction of higher prices and the subsequent increase in production. Except in cases of a high price elasticity of supply and sufficient buffer stocks, the government might find itself in the food price dilemma. If this is the case, the outcome in the 20th century has often been price intervention, including some sort of protection for the consumers.

In analytical terms the effects of a restriction on imports due to wartime conditions equal the imposition of a quantity quota on imports. To analyse how this works, it is first necessary to discuss briefly the price elasticity of supply in the agrarian sector and both the size of this elasticity as well as the question of whether it is positive or negative are widely debated in the historiography[10]. However, the following four conclusions appear to be generally agreed upon. First, a positive price elasticity of supply appears to be the norm, although it can be negative in specific circumstances[11]. Second, the short-run price elasticity of aggregate supply is smaller than the long-run elasticity. Third, the price elasticity of supply of single crops is

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8 Specifically in relation to agrarian production, major wars in the 20th century have led to a decrease in international trade with artificial fertilisers due to the use of nitrogen in explosives.

9 Middleton (1996), p. 54.

10 An outline of the development of the main points of the discussion can be found in Askari and Cummings (1976), Chhibber (1989), Griliches (1960), Peterson (1979) and Schiff and Montenegro (1997).

11 It has been argued that close to subsistence small-scale farmers in sub-Saharan Africa would react to increasing farm gate prices by selling less in the market but consuming more in the household. This will improve the living standard in the household and uphold monetary income. Platteau (1990), pp. 300-303.

higher than the aggregate supply elasticity and finally, non-price factors have to be taken into consideration, especially in less developed countries[12]. For the moment, we shall therefore assume that the price elasticity of supply in Spain in the 1940s was positive and symmetrical.

Standard economics then state that for a commodity with a positive price elasticity of supply and a negative price elasticity of demand, equilibrium in the market will occur at the point E where quantity Q_d obtains price P_d[13]. With international trade and world market prices P_w below the domestic equilibrium price P_d, imports will take place at P_w in the quantity $Q_2–Q_1$[14]. If government action or war restrict imports to the amount $Q_4–Q_3$, the supply curve will shift to the right to S' by this magnitude and a new equilibrium will occur at P_q. The quantity consumed will be Q_4, which is less than the amount that was consumed before import restriction Q_2, and the price will be P_q, which is more than the world market price before import restriction P_w. This means that after the introduction of trade restrictions, consumers will consume less at a higher unit price and domestic producers will produce more at a higher unit price.

This new equilibrium can lead to socially unacceptable consequences for a government, if, for example, the new equilibrium price makes it impossible or difficult for part of the population to buy the commodity. This can be a problem if it is an important dietary ingredient with no obvious substitute. This problem can be aggravated further in the short-term, given that it might take some time before the producers can supply the amount required for the new equilibrium to be established, due to the growth cycle of the crop. In these circumstances, a government might intervene in the price setting and/or the distribution of the commodity but before analysing the available possibilities, we will first have a look at another context where state intervention is likely.

Price intervention, which regulates consumer prices, might also happen if a regime decides upon a course of forced industrialisation. Here it might

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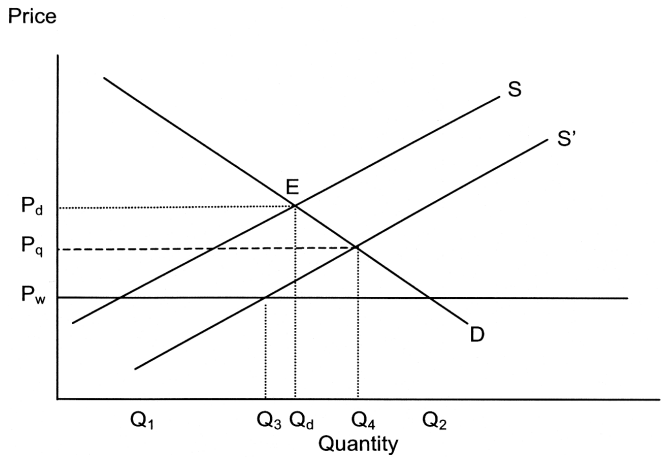
12 See footnote 10, p. 55.

13 Note that in Spain in the years immediately before the Civil War, the market for a basic staple like wheat was characterised by equilibrium between domestic demand and supply. This was the outcome of a protective trade policy, while exports were not possible because Spanish producers were not competitive in the international market.

14 World prices are defined as border prices c.i.f.

DIAGRAM 2.1. THE EFFECTS ON SUPPLY AND DEMAND OF AN IMPORT QUOTA OR A REDUCTION IN IMPORTS CAUSED BY INTERNATIONAL RESTRICTIONS



SOURCE: The figure and the description are standard textbook material on the consequences of import quotas, normally in the context of protective trade policies. See for example Boyes and Melwin (1996), pp. 984-986.

find it appropriate to squeeze agrarian output prices, to make it possible to lower costs in the industrial sector. This took place in Spain in the 1940s, where the policy was reinforced by strict state controls of wages at a level that in real terms was substantially lower than before the Civil War. More recently this phenomenon can also be found in less-developed countries[15]. This type of policy has often been based on the following four assumptions:

1) that aggregate agricultural production is not very responsive to price changes,
2) that the chief beneficiaries of higher prices would be the larger-size farmers,
3) that higher food and other agricultural-related prices such as clothing would most adversely affect low-income consumers, and

[15] See Krueger (1992) for a summary of discriminatory policies against the agrarian sector in the less developed countries.

4) that manufacturing provides a more rapid means of growth and that achieving that growth depends upon large transfers of income (profits) and foreign exchange from agriculture to manufacturing[16].

Price discrimination against agriculture can take a number of forms, ranging from indirect measures such as exchange rate manipulation, selective tariffs, tax levels, and so forth, to direct measures in the form of price fixing by the state.

It has been argued in the historiography that the main reason for the low level of agrarian output in Spain in 1940s was state discrimination against the agrarian sector. This was done by setting compulsory farm gate prices below the equilibrium price[17]. Leaving aside for the moment the question whether this interpretation is correct, the argument is as follows. In Spain before the Civil War, the market for basic staples was characterised by equilibrium between domestic supply and domestic demand with the price P_d being set by the market (Diagram 2.2). However, after the war the government fixed the price P_f at a level that was below the equilibrium, with the consequence that consumers increased demand to Q_2 and producers restricted output to Q_1. In the absence of imports this led to unsatisfied demand and it was required to introduce a quantitative rationing of consumption.

Returning to the analysis of import restriction, a government that wants to protect consumers against the price increase connected with the decline in imports by fixing prices for example at the level P_w, will face the situation described in Diagram 2.2. If this happens, producers will react by maintaining output at the same level as before the reduction in imports. Consequently, aggregate supply will be even further restricted, while at the same time demand will be maintained at the level corresponding to the price P_w. In Diagram 2.1, this will lead to a supply shortage of Q_2–Q_3, equalling the decline in imports. The result will be excess demand.

In this situation, the distribution of the available produce can take place in two different ways. One possibility is that the state establishes a rationing scheme, which limits the amount that can be purchased by each consumer but entitles all consumers to a minimum amount of the commodity at state

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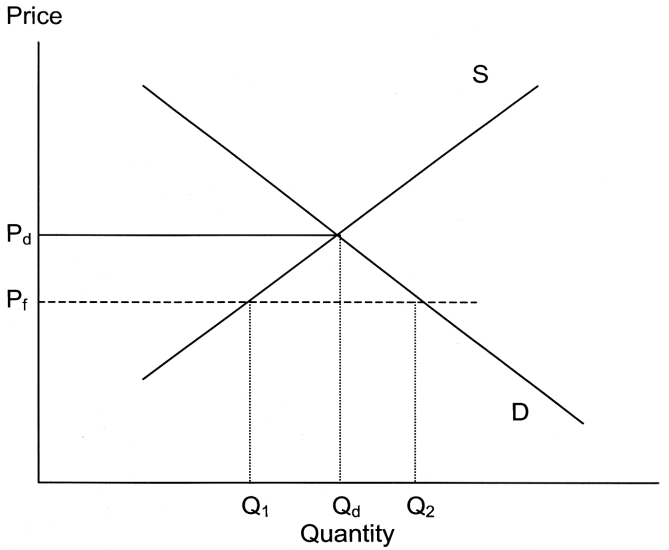
16 Brown (1978), p. 84.
17 See Section 1.2.

DIAGRAM 2.2. THE EFFECTS OF STATE FIXED PRICES BELOW THE EQUILIBRIUM PRICE



SOURCE: Dell (1994), pp.18-19.

fixed prices. The alternative to administrative rationing is a "First come, first served" scheme where consumers receive produce according to, for example, the time spent queuing or privileged access to information about where and when the goods can be purchased.

In a situation with excess demand, it is possible that some consumers will be willing to pay more than the official price and that some producers will break the law and sell at this price. Whether this will take place depends on a number of factors. These includes the efficiency of the control system, the nature of the goods, the degree to which both consumers and producers are willing to take risks, the moral assessment in society of breaking the law, and so on. The markets where illegal transactions take place at higher than official prices are normally referred to as "black markets".

The economic consequences of price-fixing and a black market can vary widely according to the specific government action, market conditions and the type of produce under consideration The following description is therefore restricted to conditions often found in markets for basic foodstuffs.

First, that there are numerous consumers and producers, which means that total state control over the market is unlikely. Despite the fact that the state cannot control all trade, it will still find it necessary to have a system of punishment to maintain supplies in the legal market. The large number of producers and consumers also means that each of them only produces/consumes a small fraction of total output, which leads to them being defined as price takers. A third factor to take into account is that demand for basic foodstuffs is often price inelastic, since daily intake of the produce is required for survival.

Price-fixing by the state is then often found in one of the two following forms. It can either be decided that all transactions taking place at prices higher than the official price are illegal. Alternatively, trading at higher than official prices can be declared legal if the producer has sold a certain amount of output beforehand at the official price. The free market in the last system is normally referred to as a "parallel market", in contrast to a black market, which is illegal trade at non-fixed prices.

In practice it is possible to combine various sorts of price-fixing with different types of penalty systems and the economic effects of state intervention vary to some degree according to the chosen combination. Dell has also shown that different price control systems lead to distinctly different output levels. Returning to Diagram 2.2, the situation is that the state has fixed the price at P_f below the free market equilibrium price P_d but the state is not able to control the market completely. This leads to part of output being sold at a higher price than P_f and in analytical terms this can take two forms, which are not mutually exclusive, though. The first possibility is that black market supply is the result of an increase in output beyond Q_1, while the second is that only the quantity Q_1 is produced but a part of this is sold in the black market. The last phenomenon is often described as "diversion" or "leakage". The possible situation where only Q_1 is produced but part of it is sold in the black market is a special case. Under normal circumstances, it would be optimal to produce more in this situation and reach a new equilibrium. Yet external restrictions on inputs might hinder this and, as we shall see later, the lack of mules – and hence cultivated land – and fertilisers were external constraints in Spanish agriculture in the 1940s and early 1950s. Another special case is that of olive oils where the production cycle is very long, given that it takes at least 15 years from planting trees until they start producing. Even though olive farmers would react to the price incentives from the black market, there

will be a significant delay before a new equilibrium can be reached and black market supply will take the form of diversion.

The effects on total output of a black market differ according to whether diversion takes place or not. The simplest case is if there is no diversion. In this condition, all black market supply is the result of an increase in output above the level of Q_1. On the other hand if diversion is possible, a black market will lead to a decrease in the supply in the legal market[18]. Moreover, if diversion is possible, Dell has shown that a parallel market will increase output compared to a situation where no trade outside the regulated market is allowed[19].

This conclusion has a paradoxical consequence: if the goal is to raise output, it will be in the interests of the state to tolerate trade outside the regulated market if part of the supply is not the result of diversion. However, it is not likely that a government would be able to declare this in public, since it would undermine the authority of the state to encourage violation of its own price control system, potentially foster corruption (including among civil servants) and would further decrease market transparency.

A further problem for the political acceptance of a system which includes a parallel market is that although aggregate output might increase in comparison with a system without a parallel market, this is not necessarily visible. Given the illegal nature of the black market, it can be difficult to estimate changes in aggregate output and this estimate is further complicated in agriculture because climatic conditions cause annual variations in output, thus obscuring the picture. For the administrator of the control system, the visible point of comparison will be aggregate output before and after the introduction/removal of a parallel market. However, the correct point of comparison is between output after the introduction/removal of a parallel market and the same situation without this change in policy. This however is non-observable counterfactual.

In price-fixing, the changes in total welfare in society also vary according to the type of regulation and supply response and once again the existence of a parallel market turns out to be an advantage for society. On the one hand, it can be shown that a price-fixing system, which prohibits

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18 Dell (1994), p. 18.
19 Dell (1994), pp. 63-64 and 68-70.

all trade at non-official prices leads to a decrease in total welfare, when compared with a market without price-fixing, irrespective of the nature of the penalty system[20]. Nevertheless, the loss of welfare is less in a situation with a black market, as opposed to one where price-fixing is perfectly enforced[21]. On the other hand, a price-fixing system which allows trade at non-official prices in a parallel market does not necessarily lead to loss of welfare compared to a non-regulated market[22].

The absence of welfare loss in the last model requires a design of the price-fixing system that might be difficult in the agrarian sector. The first condition is that the state is able to calculate a compulsory quota that the producers have to sell at the official price, where the official price equals the marginal cost of the last produced unit in the quota. This condition is difficult to fulfil when there are many producers with different production functions. The second condition is that the costs for the farmers resulting from breaking the law have to be money transfers but may not include the use of real resources, which can lead to the production of other goods being prevented[23].

An alternative way of dealing with the food price dilemma is to try to keep producer prices high and food prices low at the same time, i.e. either a general consumer subsidy or a targeted consumer subsidy for the poorer part of the population.

A general consumer subsidy requires an intermediary – often in the form of a parastatal monopoly – which buys the produce from the farmers and sells it to the consumers at a loss, with the deficit being covered by the treasury. Such a system has the advantage of increasing output and supporting poor consumers at the same time. However, such a system also involves income transfers that are not easily observable since these will normally be hidden in the state budget. If the consequences for the consumers and producers are disaggregated between social groups, it further becomes clear that across-the-board subsidies lead to a socially regressive re-distribution of income from the poor to the rich in society. If the goods under consideration have a positive income elasticity of demand

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20 Dell (1994), pp. 68-69.
21 Dell (1994), p. 30.
22 Dell (1994), pp. 64-66.
23 Dell (1994), pp. 64-66.

and if there is no rationing of consumption, those who benefit most will be the large-scale farmers and the richer consumers.

A general consumer subsidy also carries the possibility of fraud and/or changes in consumption patterns. Fraud can take the form of producers selling to the state not only what they have produced on the farm but also an amount bought at subsidised prices from the state agency. The change in consumption pattern can arise if the commodity can be used both for human consumption and as fodder. Here the risk is that livestock farmers will buy the produce from the state and feed it to their animals, because the subsidy has made it cheaper than normal fodder[24].

An alternative to a general consumer subsidy is one targeted at the poorest part of the population, e.g. in the form of food coupons or other ways of establishing a dual price system. This is a measure that is socially more progressive and at the same time cheaper for the treasury. The other side of the coin is that targeted subsidies are more difficult to administer. The easiest solution is to subsidise a commodity which has a negative income elasticity of demand, or is only consumed by poor consumers but this may not always be possible[25].

Finally, the ultimate way of solving the problem of supply to avoid rationing and/or unsatisfied demand is to obtain a temporary or permanent shift of the supply curve to the right[26]. This can take various forms, such as a subsidy on inputs or capital goods in the agrarian sector, the promotion of technical changes which increase the productivity of land, capital or labour, or a change in conditions in related markets, such as husbandry. The increase in calorific output can in some cases take place at the cost of variety of diet if it includes shift in production patterns to fewer but high-calorific products.

To sum up, it can be said that the food price dilemma forces governments to choose between economic efficiency and social equality. Yet, even the most efficient ways of price-fixing are likely to reduce total output when dealing with agriculture or, in the case of partly or across-the-board subsidies, to require substantial financial outlays on behalf of

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24 Timmer (1986), pp. 108-111.

25 Timmer, Falcon and Pearson (1983), pp. 202-206. A variation of this strategy was carried out in Spain after 1949, as will be described in Chapter 3.

26 Note that this can be done with or without an across-the-board consumer subsidy being implemented at the same time.

the state. The existence of a black market might further undermine social coherence and/or the authority of the government. However, leaving a part of the population without access to daily foodstuffs or other basic commodities might be considered politically unacceptable and the economic losses and administrative problems can then be seen as necessary costs. The choice between economic efficiency and social equity can also be formulated as selecting between social market failure, as formulated by Stiglitz:

> For some type of public intervention, the full costs of government intervention, taking into account the inevitable public failures, may be less than the benefits arising from correcting (or improving upon) market failure[27].

and government failure, as formulated by North:

> Economists (such as Professor Stiglitz) ordinarily take for granted a state that has created a set of rules of the game that are broadly conducive to economic growth. But not only are such rules still the exception […] there is no guarantee that they will be perpetual even in the developed world […][28].

Given that governments might face financial, technical or political constraints to the scope of action that is open to them, it is usually possible to criticise the strategy of a given government for being less than perfect. Consequently, the analysis should also include the question of what the viable alternatives would have been. This discussion is crucial in the analysis of the situation in Spain in the 1940s and early 1950s. However, before returning to Spain in the following chapters, we shall first have a brief look at how other governments tried to solve the food price dilemma before, during and after World War II.

2.2. THE REGULATION OF PRODUCTION, DISTRIBUTION AND CONSUMPTION OF BASIC FOODSTUFFS DURING WORLD WAR II

During World War II there was widespread state intervention in the economy with the purpose of securing national food supply and ensuring that all members of the population were receiving minimum rations. The

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27 Stiglitz (1989), p. 56.
28 North (1989), p. 109.

present section shows that the systems of intervention were not the same in all countries, given differences in political regimes, the relation between natural endowments and population size, trade possibilities, and so forth. Consequently, the intended – and unintended – impact on output, supply, distribution and costs also varied from country to country. The next four sub-sections describe state intervention in the agrarian sector and its consequences in the United Kingdom, Germany and the USA before and during World War II, as well as in "Bizonia" after the end of the war[29].

2.2.1. From external dependency to improved nutritional standards: The case of the United Kingdom

In the context of securing food supply during World War II, the case of the United Kingdom is often regarded as relatively successful, particularly in the light of the external circumstances. In spite of the fact that the country was highly dependent on imports of food[30], few measures were taken to secure provisions before the outbreak of the war[31]. The supply situation was further complicated after the capitulation of France in 1940, which left the country dependent on a limited agricultural base and the hazards of transatlantic maritime transport of foodstuffs.

This led the government to adopt a policy that had three main objectives: a) to increase agrarian production, b) to avoid unacceptable inequality of consumption and c) to control inflationary pressures[32]. To fulfil these goals, the policy included incentives to increase calorific output, a rationing system and price controls for both producers and consumers.

The expansion of calorific output was stimulated through disincentives for most animal production as well as incentives for increasing vegetal production. These measures were relatively successful and led to a substantial increase in the amount of land under cultivation and total output of calories. The outcome was an improvement in the nutritional

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29 "Bizonia" is an often-used name for the Anglo-American occupation zones in Germany after 1945.

30 In the 1930s, some two thirds of the consumed calories were imported and for a basic staple like wheat, almost 90 percent of consumption was accounted for in this way. Olson (1963), p. 117.

31 Olson (1963), pp. 43-44. A contemporary author went as far as to say that it was not until 1941 that agrarian policy worked well. Murphy (1943), pp. 266-267.

32 Nash (1951), p. 200.

standards of large parts of the British working class during the war[33]. As far as the distribution of production was concerned, rationing was gradually introduced. Here it is notable that consumption of some basic staples, including bread, remained unrationed during the war[34]. Finally, an across-the-board consumer subsidy for basic foodstuffs was introduced step by step. The procedure was that the state borrowed the money to pay for the difference between what the farmers received and what the consumer paid. This was done to maintain social stability as well as to stimulate domestic production of foodstuffs without risking inflationary pressures due to wage demands. However, the control of inflation was not as successful as intended and the consumer subsidy turned out to be quite expensive for the state[35]. Further, price fixing turned out to be problematic according to one of the participants in the planning of price controls:

> From what has already been said as to the circumstances in which the successive price decisions were made during the war, it will be clear that the individual price changes cannot be expected to fall into a completely logical pattern. Each set of decisions was to some extent a compromise, a result of conflicting influences. Thus we cannot take the individual price changes as conforming in any consistent fashion to official estimates of change in costs of production, or to cost changes modified by appropriate "incentives" for different producers[36].

Although parts of the price policy were introduced on an ad hoc basis, the general results went in the desired direction. On the supply side, calorific output increased by 91 percent, the production of proteins grew by 106 percent and inflationary pressures eased[37]. However, success had been obtained at the cost of a significant increase in state expenditure and imports from the US continued to be necessary[38].

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33 Olson (1963), pp. 120-130.

34 Murphy (1943), pp. 270-273. Note, however, that bread was rationed in the UK after 1946. Farquharson (1985b), p. 120.

35 See Nash (1951), pp. 206-236 for details of the price control system and the gradual introduction of its different elements.

36 Nash (1951), pp. 214-215.

37 Olson (1963), p. 125.

38 Hirsch (1943), pp. 230-231 and Puhle (1985), p. 165.

2.2.2. State control and exploitation through conquest: The case of Nazi Germany

The lesson from World War I of the importance of food supply was maybe most acutely learnt by the Nazi regime in Germany. The result was that during a good part of the war there appears to have been a reasonable supply of food to the German population but this was partly obtained at the cost of the population in occupied countries.

Already from the 1930s, agrarian policy and part of trade policy were directed at securing wartime supplies and technically, this strategy to some degree resembled that of the British government. The policy included compulsory organisation of the farmers in the *Reichsnährstand,* the introduction of total state control over agrarian output, trade agreements with countries in Eastern Europe[39], rationing, price controls and an increase of calorific output through changes in the composition of output[40]. However, on top of that, the plan for securing food supplies included occupied Eastern Europe being the granary for a German controlled continent. This last point, including the atrocities committed against the population of the occupied countries as well as the occupation by German citizens of the homes and land of those killed or deported, was a singular strategy amongst the belligerent countries in Europe[41].

The outcome of this policy is difficult to assess exactly due to lack of statistics but it appears that with its perverted logic, it managed to secure reasonable provisions for the German population until approximately 1943. However, from that date output declined at an accelerating rate due to a lack of fertilisers, farm machinery and labour[42]. The policy appears to have been more successful in Germany than in occupied Eastern Europe. First, because the war was fought outside Germany during most of the period. Second, because shifting war fortunes left few years to "normalise" the situation in the occupied countries. Further, the singular Nazi conception of "normalising" the situation in Eastern Europe included plundering as well as deporting and killing the local population which would not promote agrarian output.

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39 Lehmann (1985), pp. 29-31 and Overy (1994), pp. 21-22.
40 Puhle (1985), pp. 40, 46.
41 For the situation in Czechoslovakia and Poland, see Prucha (1985) and Luczak (1985).
42 Lehmann (1985), pp. 36, 40-42.

2.2.3. From peacetime depression to wartime boom in the US

The negative effects of the depression in the 1930s led to state intervention in the agrarian sector as a part of the New Deal programme. The main goal was to secure farmers' income through state guaranteed minimum prices and upper limits on areas under cultivation. This policy led to surplus output and there were significant buffer-stocks at the outbreak of World War II[43]. The outbreak of World War II led to an increase in domestic demand and demand from the United Kingdom, as well as a decline in imports. In these circumstances, the government tried to increase output but also to keep consumer prices low to avoid inflationary pressures. To obtain this double goal, price subsidies were introduced for consumers, in the same way as in the United Kingdom. Farm prices were then calculated on the basis of the relative prices of agrarian and industrial goods[44].

Price controls were not confined to the agrarian sector but covered large parts of the economy. In total there were more than 600 rent and price regulations during World War II, covering more than 8,000,000 articles. After the end of the war, Galbraith maintained that widespread price control had only been introduced when no other alternatives appeared viable. But the regulation "made no pretence to deal with particular disequilibria; it undertook, quite unequivocally, to fix prices *qua* prices"[45]. However, the official prices were not always respected. The violations of regulation included upgrading, falsification of records, cash at the side payment, payments for non-delivered goods, tie-in sales, quantity/quality deterioration, falsification of coupons, selling of rationed commodities without coupon-payment, and so on[46].

The ability of the agrarian sector to satisfy not only an increase in domestic demand but also to deliver exports to allied countries indicates that the outcome of the policy was output growth. This was mainly obtained through an increase in the areas under cultivation, more intensive use of fertilisers, improvement in seed quality and acceleration of the mechanisation process[47]. However, this happened against a background of substantial buffer stocks at

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43 Hirsch (1943), pp. 229-230.
44 Hirsch (1943), pp. 232-242.
45 Galbraith (1980), p. 4.
46 Clinard (1952), pp. 10, 16-21.
47 Puhle (1985), pp. 165, 172-173.

the outbreak of the war and the under utilisation of land and capital that was the norm in the sector in the 1930s. Both these factors were an advantage in the process of responding to the increase in demand after 1939.

2.2.4. The industry versus agriculture dilemma: The case of Bizonia 1945-49

After the end of World War II, *Bizonia,* i.e. the Anglo-American occupation zones in Germany, was not able to produce sufficient foodstuffs to maintain an acceptable level of nutrition for the population. So the rationing introduced during the war continued after 1945 and the area was heavily dependent on imports from the United States[48]. The British and American administrators in *Bizonia* adopted the strategy of shifting from husbandry to vegetal production but with less success than in the UK during the war. The move was resisted by farmers who refused to slaughter more animals after the Nazi regime had already pursued a policy of limiting animal production[49].

During the last years of the war, the shortage of fertilisers was a major problem for the agrarian sector and this problem persisted after 1945. The simultaneous lack of agrarian and industrial output gave rise to a vicious circle of food-coal-food shortages. Lack of food meant that the labour force in the German mines produced less coal due to low calorific intake and time spent searching for food rather than working. With energy being a very important input in the production of farm machinery and artificial fertilisers, output of these commodities was below the desired level and so it was difficult to raise agrarian output[50].

This vicious circle gives a clear example of the food-price dilemma which was difficult to break in the specific circumstances of post-war Germany. It was politically unacceptable to increase rations for the German population beyond the level found in the allied countries and paying higher prices to the farmers would jeopardise the situation for the population until agrarian output increased. At the same time, low official prices paid to the farmers would lead to a decline in output, or a larger share of produce being sold on the black market[51].

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48 Farquharson (1985b), pp. 161-175.
49 Farquharson (1985a), p. 57.
50 Farquharson (1985b), pp. 120-133.
51 Farquharson (1985b), pp. 216-217.

The vicious circle was only broken with the aid of the Marshall plan which allowed food imports from the United States to enter *Bizonia* in the winter of 1948/49. The increase in rations led to a decline in black market prices and more German produced food being sold through legal channels. Finally, the improvement in the nutritional status of the workers in the mines led to an increase in coal output and subsequently industrial output, including inputs and capital goods for the agrarian sector[52].

2.3. SUMMARY AND PERSPECTIVES FOR THE ANALYSIS OF THE SITUATION IN SPAIN IN THE 1940s AND EARLY 1950s

Economic theory suggests that price-fixing and rationing in the agrarian sector will reduce total welfare in a society when compared to a situation without these measures. In spite of this, price-fixing in agriculture has been widely used in the 20th century, for example to counter a perceived risk of social market failure or to foster industrial growth. These two approaches reflect different attitudes towards price-fixing. It can either be seen as a temporary exception from the normal course of economic policy or as a desired procedure.

The experiences from World War II show that the contrast between the two approaches can be partly obscured in times of large-scale war. In such cases, increased levels of state intervention have often been seen as inevitable. Thus divergent opinions on price-fixing mainly show up as different degrees of interference in the economy. The second part of the chapter showed this as the opposition between the German organisation of the economy on the one hand and the approach taken by the United Kingdom and the United States on the other. When the experiences from these three countries are compared to the Spanish economic policy in the 1940s and early 1950s, it is clear that politically, the course taken in Spain had more in common with German economic policy than with that of the United Kingdom and the United States[53]. Both Spain and Germany favoured widespread state control with the economy with the purpose of obtaining national self-sufficiency in key war-related sectors including

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52 Farquharson (1985b), pp. 218-219.

53 See Section 1.2 for a brief overview of the general economic policy of the Franco regime in the 1940s and early 1950s.

agriculture. Even under the assumption that World War II had not broken out in 1939, it is likely that the Franco regime would have pursued a policy of extended state intervention in the economy in the 1940s. On the other hand, the experience from other European countries suggests that most types of regime governing Spain in the 1940s would have resorted to state intervention in the economy to alleviate problems of supply.

We have found that the situation faced by the governments in the 1940s can be seen as an example of the "food price dilemma", i.e. how to keep producer prices high to encourage production and at the same time keep consumer prices low to secure supply for all. The first part of this chapter suggested that there was no cost-free solution to the dilemma, while the second part demonstrated some of the conditions that eased the way out of the dilemma. The favourable conditions included a surplus capacity in agriculture, as well as a domestic industrial sector that could compensate for declining imports of inputs for the agrarian sector. Further, it appears that high-productivity agriculture tends to adapt more easily than low-productivity agriculture to requirements of change in production patterns[54].

All in all, the theory presented in this chapter makes it possible to evaluate the agrarian policy of the Franco regime within the context of the food price dilemma. This will be possible both as an assessment of the policy that was carried out and as a discussion of the alternatives open to the government. This analysis will cover both the questions of how to raise output and of how to make an adequate distribution of the supply that was to hand. At the same time, the description of the various solutions to the food price dilemma tried in other countries serves as a point of comparison for the advantages and disadvantages of Spanish agriculture to respond to agrarian policy. The two first points to be dealt with are the questions of whether wheat output could have been increased significantly in the 1940s if the regime had opted for another policy and whether the rationing system for wheat and bread could have been optimised.

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[54] Milward (1985), pp. 13-14.

Chapter 3
The importance of producer prices, chemical fertilisers and draught animals on post-war wheat output

3.1. INTRODUCTION

In the historiography, much focus has been on wheat when analysing the consequences of the agrarian policy of the Franco regime[1]. This is not surprising since wheat was the most extensive crop, bread was an important part of the diet of the Spanish population and because the black market for wheat was the largest in the sector in terms of value. Further, due to a combined decline in cultivated area and average yields, output in the 1940s and the first half of the 1950s was significantly smaller than before the Civil War, as can be seen in Diagram 3.1.

Traditionally, wheat output levels in the 1940s have been interpreted in three different ways.

The first interpretation is that output declined due to a movement along the supply curve due to declining prices. The widely accepted works of Barciela are representative of the first argument[2]. According to this line of reasoning, the prices set by the state led to a substitution of other crops for wheat, as well as less intense wheat cultivation[3]. Finally, this interpretation

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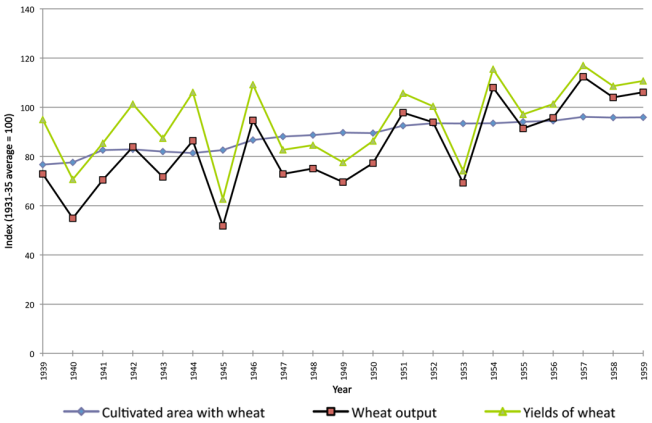
1 See Section 1.2.

2 See Barciela (1981a), Barciela (1981b), Barciela (1986b), Barciela and García González (1983) and Barciela and López Ortiz (2003).

3 Barciela (1986b), pp. 391-393.

DIAGRAM 3.1. INDEX OF THE DEVELOPMENT OF OUTPUT, YIELDS AND CULTIVATED AREA WITH WHEAT IN SPAIN, 1939-59



SOURCES: Carreras (ed.) (1986), Ministerio de Agricultura: *Anuario Estadístico de las Producciones Agrícolas* (1931-35).

states that the supply problem was only solved in the early 1950s when prices paid to farmers by the state were increased and the market for agrarian products was deregulated[4].

The second interpretation states that the movement along the supply curve was to some degree counteracted by a shift of the supply curve to the right. This viewpoint was made by Leal *et al.* and later maintained by Abad and Naredo, who observed that although the official prices paid to farmers in real terms were lower in the 1940s than in the 1930s, this coincided with an increase in the relative price of output to labour[5]. According to Abad and Naredo, capital accumulation in the agrarian sector in Spain is somewhat atypical, given that this was not the result of an increase in productivity but a decline in wages and the existence of a black market[6].

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4 Barciela (1986b), p. 416.

5 Leal *et al.* (1985), pp. 44-46 and 64 and Abad and Naredo (1998), p. 251. According to this last article, salaries constituted 78 percent of the value of inputs in the agrarian sector in 1942/43 and 61 percent in 1949/50, clearly indicating the importance of the price/salary ratio for the profitability of the sector.

6 Abad and Naredo (1998), p. 253.

Finally, Simpson has suggested that the decline in output was the result of a shift of the supply curve to the left. He pointed to the possibility that it was the lack of fertilisers and draught animals that was behind the decrease rather than the level of official prices[7].

The main problem to be addressed in this chapter is which of these three interpretations is more accurate, alone or seen as simultaneous changes. This issue is important because it is fundamental to an understanding of the agrarian policy of the Franco regime in the 1940s and thus for the evaluation of the general political economics of the period. Further, it will serve as a background for Chapter 5, which deals with wheat growing farmers in the province of Cuenca. The joint conclusions from these two chapters make it possible to discuss whether the economic policy of the Franco regime had special consequences for small-scale wheat growing farmers compared to the rest of the agrarian sector.

3.2. ABSOLUTE AND RELATIVE WHEAT PRICES RECEIVED BY FARMERS AND THEIR EFFECT ON OUTPUT LEVELS BETWEEN 1939 AND 1953

3.2.1. The increase in wheat prices in absolute terms in the 1940s when black market earnings are included

From Section 2.1 we know that in a situation with state-fixed prices, the existence of a black market could in certain circumstances increase output. The principal condition that had to be fulfilled was that at least a part the produce sold in the black market was not the result of "diversion"[8]. It is therefore significant that in the early 1960s, the SNT estimated that for the 1939-49 harvests 55.7 percent of the marketable production of wheat was sold in the black market[9]. It might have been the case that black market sales immediately after the end of the Civil War were mainly the result of diversion. However, the relative size of the black market makes it likely that from the early 1940s, it was clear to farmers that earnings from this source could be included in planning production. Consequently, official prices paid

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7 Simpson (1995), p. 247.
8 See Section 2.1 for the concept of diversion.
9 Servicio Nacional del Trigo (1963), Table C.-9-1.

to farmers might not have been that important for the level of output. This is supported by the fact that when rationing was abolished in 1952, official prices in real terms were some of the lowest since the end of the war.

If black market earnings were to work as an incentive to increase production, the gains from this source had to be worth the risk of being caught. The fact that such a high proportion of the harvest found its way to the black market indicates that the deterrent effect of the control system was limited. As mentioned in Section 1.2, a special court called the *Fiscalía de Tasas* was created in 1941 to deal with cases of black market activity. In an earlier work based on the archive of the *Fiscalía Provincial de Tasas* in Teruel, I reached the conclusion that the activities of the *Fiscalía de Tasas* were rather limited compared to the size of the black market and consequently that the risk of being caught in black market trading was not very large[10].

In theory it could be the case that the limited activity of the *Fiscalía de Tasas* was the result of a situation in which very heavy fines and other sorts of punishment had a strongly deterrent effect even though the probability of being caught was small. Yet, the relative size of the black market makes this an unlikely interpretation of the situation. That the deterrent effect was limited is supported by the fact that even though farmers were normally fined if they owed more than 1,000 kg of their quota[11], examples can be found of people selling nothing to the SNT despite the fact that their production quotas sometimes reached 50,000 to 60,000 kg[12].

It was moreover a peculiarity of the daily operation of the control system that it appears to have been characterised by a high degree of corruption and politically-based discretion as to who should be punished. There are several examples of this.

In a study covering several locations in Andalucía Del Arco Blanco found that the political ideology and the social status of the accused defendant played a predominant role when judging cases of black market

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10 Christiansen (2005).

11 Although non-fulfilment of the compulsory production quota is no proof of black market activity in itself, the sources suggest that there probably was a high coincidence between the two phenomena.

12 Servicio Nacional del Trigo: *Resumen de agricultores deudores de cupos forzosos de trigo para la campaña 1950/51.*

trading[13]. Similarly, farmers owing less than 1,000 kg were in general fined in a discretionary way. These would be based on a joint evaluation by the local SNT office and the Ministry of Agriculture in Madrid. Judging from the correspondence between the local SNT offices and Madrid, it is clear that the purpose of fining some of the farmers owing less than 1,000 kg was to inflict exemplary punishment where they saw fit[14].

Inefficient control of production had the consequence that the official price did not equal the average price received by the farmers. It is therefore crucial to determine what prices farmers received for their produce to accurately gauge the importance of the price policy on output. Unfortunately, almost all information on black market prices deals with consumer prices and not those received by farmers. However, based on oral and personal evidence, Barciela and García González judged that setting the black market price of wheat received by farmers at 250 percent of the official price was a conservative estimate for the 1939-53 period as a whole[15]. Applying this factor to the share of output that the SNT estimated was sold in the black market, Barciela and García González calculated average nominal prices received by farmers (Column 3 in Table 3.1)[16]. Moreover, Pujol Andreu has provided annual average farm prices for wheat, barley, rye and oats for a Catalan farmer (Column 4 in Table 3.1). The constant increase in nominal prices in Columns 3 and 4 is not that telling for the economic situation of the farmers, given that Spain in the 1940s was characterised by high levels of inflation[17].

In Columns 5, 6 and 7 in Table 3.1 nominal prices in pesetas have been converted to real prices in 1958 pesetas using Prados de la Escosura's price

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13 Del Arco Blanco (2007), pp. 342-370.

14 This is for example explicitly stated in letters from the Provincial Delegates of SNT in Palencia and Málaga to the SNT office in Madrid, both from May 30th 1951. Servicio Nacional del Trigo: *Resumen de agricultores deudores de cupos forzosos de trigo para la campaña 1950/51*. However, even this did not always take place, given that at least in one year in Cuenca, the Civil Governor of the province cancelled the fines imposed on the farmers for not fulfilling their production quota. Christiansen (1999), pp. 234-235.

15 García González worked for the SNT in the 1940s.

16 In Barciela and García González (1983) the total price received by the farmers does not include earnings from black market sales in 1939 and 1940. Since the authors do not argue that the situation was different in these two years, the figures for these two years have been recalculated according to the method for the rest of the years.

17 See Section 1.1.

TABLE 3.1. OFFICIAL WHEAT PRICE, ESTIMATED AVERAGE PRICE, INDEX OF OFFICIAL PRICE AND INDEX OF ESTIMATED AVERAGE PRICE RECEIVED BY FARMERS PER 100 KG WHEAT

Years	1	2	3	4	5
	Official price paid to farmers[1] (Current ESP)	Amount of output sold in the black market (Percent)	Barciela and García González estimate of average prices received by farmers (Curent ESP)	Prices received by catalan farmer according to data from Pujol Andreu (Current ESP)	Official prices paid to farmers (Constant 1958 ESP)[2]
1931	47	—	47	49	513
1932	47	—	47	44	517
1933	47	—	47	55	574
1934	49	—	49	51	556
1935	47	—	47	47	563
1936	N/A	N/A	N/A	N/A	N/A
1937	51	—	51	N/A	515
1938	63	—	63	N/A	549
1939	67	28	94	64	495
1940	85	31	124	100	490
1941	87	28	123	200	406
1942	96	38	151	250	375
1943	127	34	192	289	480
1944	163	34	246	398	529
1945	181	29	259	630	556
1946	177	31	260	575	444
1947	192	36	295	843	458
1948	252	37	392	935	574
1949	252	33	367	1000	514
1950	252	21	331	704	453
1951	290	18	369	424	497
1952	376	24	511	425	662
1953	401	9	456	418	685

1 Official prices are national averages, except 1937 and 1938 where they are average prices in the part of Spain controlled by the rebels.

2 Constant prices were obtained by deflating current prices by "price index in agriculture, forestry and fishing" from Prados de la Escosura (1995).

SOURCES: Barciela and García González (1983), p. 94, Ministerio de Agricultura: *Anuario Estadístico de las Producciones Agrícolas (1931-35),* Pujol Andreu (1985), p. 237.

6	7	8	9	10
Barciela and García González estimate of average prices received by farmers (Constant ESP 1958)[2]	Prices received by catalan farmer according to data from Pujol Andreu (Constant ESP 1958)[2]	Index of official price received by farmer in constant 1958 pesetas (1931-35 Av.=100)	Index of column 6 (1931-35 Av.=100)	Index of column 7 (1931-35 Av.=100)
513	537	94	94	95
517	489	95	95	86
574	677	105	105	119
556	574	102	102	101
563	558	103	103	98
N/A	N/A	N/A	N/A	N/A
515	N/A	94	94	N/A
549	N/A	101	101	N/A
702	476	91	129	84
717	579	90	132	102
577	939	75	106	166
589	975	69	108	172
724	1089	88	133	192
799	1292	97	147	228
797	1940	102	146	342
650	1438	81	119	254
703	2008	84	129	354
892	2127	105	164	375
749	2040	94	137	360
596	1268	83	109	224
631	725	91	116	128
900	748	121	165	132
778	714	126	143	126

deflator for "agriculture, forestry and fishing"[18], which reflects that farmers mainly spent their income on products from within the primary sector, rather than industrial products or service goods[19]. Although the chosen deflator might be too narrow to capture the development of all prices paid by farmers, it still appears to be more accurate than a GDP deflator[20].

It is now possible to assess the development of average wheat prices received by farmers. Columns 8, 9 and 10 in Table 3.1 clearly indicate that the average wheat price received by farmers during the post-war years was probably higher than the pre-war average when black market earnings are included and when prices are calculated in real terms.

However, probably neither of the figures in Table 3.1 give a precise measure of the exact level of prices received by the farmers. Concerning the estimate based on Barciela and García González, the problems are the uniform black market premium and the difficulty in determining the overall size of the black market. Concerning the figures from the Catalan farmer, Pujol Andreu indicates that black market earnings for this farmer might have been higher than the national average for two reasons. First, because even in normal years Catalonia was unable to produced sufficient wheat to cover regional needs. Hence in a period of scarcity, black market demand might have been higher than the national average, leading to higher prices. Second, the farmer in question rented out his land and received payment in kind from tenants. According to Pujol Andreu, these were both factors

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18 Prados de la Escosura (1995), vol. 2, pp. 131-134. The deflator is also used to convert nominal prices to real prices in Chapters 4, 5, 6 and 7. Barciela and García González used a GDP deflator, with 1915 as its base year, for the conversion of nominal prices into real prices. However, it has been preferred to use Prados de la Escosura's price deflator because the base year is 1958, which is closer than 1915 to the period that is dealt with in the analysis.

19 The first inquiry into household expenditure patterns in Spain was made between March 1964 and March 1965. At this time farm households spent on average 55 percent of their income on foodstuffs, 15 percent on clothes and shoes, 6 percent on rent, 8 percent on household equipment and 5 percent on holidays and miscellaneous. Instituto Nacional de Estadística: *Anuario estadístico de España* (1966). It can be assumed that an even higher proportion of income was spent on foodstuffs in the 1940s, where the average economic situation was far worse than in the 1960s.

20 Moreover, using the GDP-deflator from Prados de la Escosura has the consequence that official prices in real terms were higher than the pre-war average in most of the 1939-53 period, which is a highly unlikely interpretation.

that made it easier to sell a larger than normal amount of the harvest in the black market[21].

The correct interpretation of Table 3.1 would therefore be that it clearly indicates that average post-war prices were higher in real terms than the pre-war level and three factors indicate that the average price was probably higher than indicated by the estimate from Barciela and García González. The first is these authors maintain that the applied black market price is only a conservative estimate. Second, the calculation does not take into account that a part of what is registered in the statistics as farmers' self-consumption could also have been traded in the black market. Third, Barciela and García González ignored the existence of a more diversified official market in 1950 and 1951 where part of production fetched a higher price than indicated in the table[22]. All in all, it is therefore questionable whether the level of wheat output was principally determined by official prices.

Finally, it is important that the solution to the bread supply problem did not happen alongside an increase in the official price of wheat. Bread rationing was abolished in the spring of 1952, it being a product of the 1951 harvest. Table 3.1, Column 5 shows that in real terms the official price known to the farmers at the time of sowing[23] was the second smallest since 1939. In addition, Table 3.1 demonstrates that in real terms, the official price received for the 1951 harvest was almost exactly the same as the average official price between 1939 and 1950. These two findings mean that at the time of sowing, the incentive from official prices to increase planned output in 1951 was smaller than in almost every year in the 1940s. At the same time, the encouragement from the official prices to sell on the official market rather than on the black market was similar to the average situation in the 1940s.

The findings of this section seriously question the interpretation that the level of official prices paid to the farmers determined the level of wheat output. The two main points in the critique are: that the average prices received by the farmers in absolute terms were higher after the war than in the 1930s when black market earnings are included and that the abolition of the rationing system happened at a time of low official prices.

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21 Pujol Andreu (1985), p. 244.

22 The conditions in the official market in 1950-51 are described in Section 3.6.

23 I.e. the official price of the 1950 harvest.

3.2.2. Limited substitution of other crops and other types of agrarian land use for wheat in the post-war years

Diagram 3.1 demonstrates that the post-war decline in wheat output was the combined result of a smaller cultivated area and lower yields than in the 1930s. In theory, this trend in cultivation could be the outcome of changing relative prices, which made it more attractive to plant other crops than wheat or to use the land for animal husbandry.

It is difficult accurately to measure changes in relative prices between wheat and other crops as there are insufficient data on black market prices and the relative size of the black market for crops other than wheat. Thus, we can only observe the changes in the allocation of land to different crops without knowing the accompanying shifts in relative prices. Since wheat was by far the most widespread crop, only the following crops could act as substitutes on any significant scale: barley, rye, oats, maize, chickpeas, broad beans, green beans, carob beans, vetch and potatoes. Table 3.2 shows that before the war, the total area under these 10 crops was slightly larger than the area given over to wheat. For a period after the war, it appears that the cultivation of wheat lost its attractiveness for farmers. Until 1946 the relative size of the area under wheat compared to the other 10 crops was smaller than the pre-war average. Nevertheless, this temporary decline in the share of land used for wheat was not the principal factor behind the absolute decrease in the area cultivated. In fact, the fact that the total post-war cultivated area was significantly below the pre-war average was almost doubly significant[24].

Table 3.2 shows further that after 1941, the post-war cultivated area remained stable at around 90 percent of the pre-war average. This implies that the shift in land use for annual crops did not lead to a change in the total area used for the crops between the early 1940s and the late 1950s. An expansion of wheat output through an increase in the cultivated area would only have been possible at the expense of other annual crops. The

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[24] The relative importance of the two factors can be calculated by constructing the following two counterfactuals. The first is to apply the share of land used for wheat between 1939 and 1946 to the pre-war total cultivated area. This would have resulted in a 306,000 ha decrease in the average area cultivated with wheat between 1939 and 1946. The other counterfactual is to apply the pre-war share of land used for wheat to the total cultivated area between 1939 and 1946. This would have resulted in a 571,000 ha decrease in the average area under wheat between 1939 and 1946.

TABLE 3.2. THE DEVELOPMENT OF THE AREA CULTIVATED WITH THE MOST WIDESPREAD ANNUAL CROPS IN SPAIN, 1931-59

Year	Area cultivated with wheat	Area cultivated with other 10 annual crops[1]	Area cultivated with 11 main annual crops	Index of area of 11 main annual crops	Area under wheat as % of 11 crop total
	(ha 1,000)	(ha 1,000)	(ha 1,000)	(1931-35 average = 100)	(%)
1931-35	4,557	5,073	9,630	100	47.3
1939	3,496	4,229	7,725	80	45.3
1940	3,535	4,652	8,187	85	43.2
1941	3,762	4,882	8,644	90	43.5
1942	3,776	5,039	8,815	92	42.8
1943	3,736	4,978	8,714	90	42.9
1944	3,711	4,800	8,511	88	43.6
1945	3,766	4,618	8,384	87	44.9
1946	3,950	4,465	8,415	87	46.9
1947	4,017	4,395	8,412	87	47.8
1948	4,041	4,405	8,446	88	47.8
1949	4,086	4,451	8,537	89	47.9
1950	4,080	4,451	8,531	89	47.8
1951	4,214	4,447	8,661	90	48.7
1952	4,262	4,368	8,630	90	49.4
1953	4,256	4,356	8,612	89	49.4
1954	4,260	4,417	8,677	90	49.1
1955	4,288	4,282	8,570	89	50.0
1956	4,305	4,351	8,656	90	49.7
1957	4,378	4,258	8,636	90	50.7
1958	4,365	4,250	8,615	89	50.7
1959	4,368	4,158	8,526	89	51.2

1 Barley, rye, oats, maize, chickpeas, broad beans, green beans, carob beans, vetch and potatoes.

SOURCES: Instituto Nacional de Estadística: *Anuario estadístico de España* (1943) and Ministerio de Agricultura: *Anuario Estadístico de las Producciones Agrícolas* (1931-60).

stability of the total cultivated area for the whole of the 1941-59 period is also interesting in relation to Barciela's interpretation of agrarian policy. He stated that the recovery in agrarian output that occurred in the early 1950s was the result of higher official prices and deregulation of the market. These measures then led to an increase in the area under wheat and

more intensive use of fertilisers[25]. It is especially noteworthy that Barciela maintains that the deregulation of the market for foodstuffs led to a general increase in the area under cultivation. A conclusion he reaches on the basis of trends for wheat, barley, rye, oats and maize only[26], and as Table 3.2 demonstrates, the picture changes when more crops are included in the analysis. So this hypothesis must at least be questioned as the supposed incentive to increase output did not manifest itself in a larger area under cultivation with the main annual crops[27].

The stability of the area cultivated with the main annual crops after 1941 at about 90 percent of the pre-war average could be the result of a relative expansion of animal husbandry. Cattle and sheep were the two species that could compete with annual crops for the same land. Table 3.3 shows that there were some 10-15 percent fewer animals older than one year in the 1940s than before the war for cattle, while the number of sheep increased by some 20 percent in the same period[28]. When calculated on

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25 See Section 3.1 for an outline of Barciela's argument.

26 Barciela (1986b), pp. 420-421.

27 As explained in Appendix 1, the statistics for the production and cultivated area of wheat, barley, rye and oats between 1939 and 1949 were upwardly adjusted by the Ministry of Agriculture in the early 1950s. The lack of corrections for the other annual crops opens the possibility that there was also an underestimation of the area under cultivation. This means that if the data for the total cultivated area in Table 3.2 are inaccurate, the bias is against our hypothesis that the level of official prices was not the main cause for the post-war decline in production.

28 Some confusion is possible about the number of animals in 1933 when compared to the 1940s. In the 1933 data, the total number of animals is divided in "adult animals" and "young animals" (*terneros/terneras*), while in 1940 the division is between "adult animals", "young animals" and "animals younger than 1 year" (*crías*). In subsequent overviews of the development of the number of animals, the 1933 data has then been understood to include "animals younger than 1 year", but this appears to be a mistake. In 1940 883,943 animals younger than 1 year plus 1,030,453 "young animals" were registered, while in 1933 only 964,931 "young animals" were registered. Further, there were 2,171,459 cows in 1933 but only 1,722,945 in 1940. It does not seem likely that a smaller number of cows in 1940 had produced twice the number of animals younger than three years than in 1933. An alternative source gives the number of some 4,215,000 cattle for 1935, in comparison with the 1933 data of 3,568,325. The difference is close to the number of animals that were registered in 1940 as "Animals younger than 1 year". We have therefore interpreted the 1933 data as being without "animals younger than 1 year". For the post-1940 data, the "Animals younger than 1 year" are not included in the original statistics. See Ministerio de Agricultura: "Tres

the basis of the combined live weight of the two species, the two opposing tendencies cancel each other out (Table 3.3).

TABLE 3.3. NUMBER OF CATTLE AND SHEEP AND ACCUMULATED LIVING WEIGHT OF THE TWO SPECIES IN SPAIN, 1933-55

Year	Cattle older than 1 year	Index of number of animals (1933 = 100)	Adult sheep	Index of number of animals (1933 = 100)	Live weight[1] (kg)	Index of live weight (1933 = 100)
1933	3,568,625	100	13,618,645	100	2,108,382,250	100
1940	3,013,428	84	16,715,567	123	2,041,149,550	97
1942	3,294,000	92	16,539,110	121	2,144,555,500	102
1948	3,300,180	92	15,921,303	117	2,116,137,150	100
1950	3,092,491	87	16,341,821	120	2,054,087,450	97
1955	2,742,037	77	15,933,140	117	1,893,471,800	90

1 Calculation based on cattle weighing 400 kg and sheep weighing 50 kg.
SOURCES: Instituto Nacional de Estadística: *Anuario estadístico de España* (1943, 1944-45, 1950, 1953, 1958) and Ministerio de Agricultura: "Tres estudios económicos".

The difference in the development of the number of animals in the two cases reflects different market conditions for some of the products obtained from these species. The combination of the post-war decline in the production of fodder crops[29], with the lower level of living standards for both urban and rural population, was probably detrimental to most animal production in the 1940s[30]. This is supported by the data in Diagram 3.2. Meat output from slaughterhouses in provincial capitals was 55 percent

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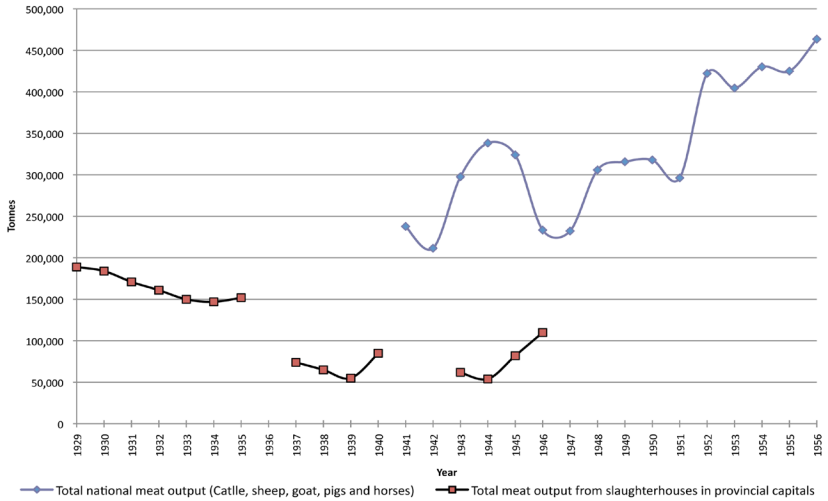
estudios económicos", pp. 52-53, 75-80 and Instituto Nacional de Estadística: *Anuario estadístico de España* (1943), pp. 480-483, for the original statistics. See the 1958 edition of the *Anuario estadístico de España*, p. 185 for the 1935 data, as well as for an example of the interpretation that the 1933 data includes the "animals younger than 1 year". Note that 69 percent of the decline in the number of cattle between 1948 and 1955 recorded in Table 3.3 was found in only five provinces in the north-east of Spain: La Coruña, Lugo, Orense, Oviedo and Pontevedra. This might either be due to special circumstances at the local level and/or changes in the methodology or the quality of the statistics. We will not pursue the matter further since wheat was not very widespread in these provinces and because 1955 is after the period with the most intensive state control of wheat production.

29 Typical fodder crops were barley, oats and various leguminous plants.

30 Engel's Law states that in general there is a positive correlation between income and the demand for superior foodstuffs such as meat.

lower in the 1940s than between 1929 and 1935 and total meat production between 1950 and 1956 was 42 percent higher than in the 1941-49 period[31].

DIAGRAM 3.2. MEAT OUTPUT IN SPAIN, 1929-56



SOURCES: Instituto Nacional de Estadística: *Anuario estadístico de España* (1958), Mitchell (ed.) (1992).

Nevertheless, the economic conditions for sheep breeding appear to have improved after the war in spite of intervention by CGAT[32]. The improvement of the economic situation was due to declining imports of raw cotton and wool for the Spanish industry and increased exports of woollen cloths during World War II[33]. Although the number of sheep increased, this did not have a negative effect on the output of annual crops. Nineteen

31 Unfortunately, the data for the 1929-56 period are contained in two discontinued series but the picture still remains clear. Note that the retail price for meat was controlled by the CGAT in the 1940s but a black market also existed. Cámara Oficial de Comercio, Industria y Navegación de Bilbao: *Memoria Comercial* (1944-49).

32 Barona (1948), pp. 372-373. The official trade union repeatedly demanded a liberalisation of the market. Monter García (1949), p. 689 and p. 714.

33 Catalán (1995), pp. 175-179 and Instituto Nacional de Estadística: *Comercio exterior de España. Números índices (1901-1956)*, pp. 56-57.

provinces accounted for close to 70 percent of the total number of animals. In these areas, the correlation coefficient between the increase in sheep and the increase in area cultivated with annual crops between 1933 and 1950 is only –0.10[34].

In sum, the stable level of aggregate live weight of sheep and cattle and the limited inverse correlation between the increase in the number of sheep and the development of the area cultivated with annual crops, suggest that the post-war decline in wheat output was not the result of a competition for land from animal husbandry. On the other hand, the relative importance of husbandry increased due to the absolute decline in the land used for annual crops. Yet this was only significant if it would have been possible to use land liberated from husbandry for annual crops. This will be investigated in the next section.

3.3. THE POST CIVIL WAR DRAUGHT ANIMAL SITUATION

It has been argued that the total area cultivated with annual crops was virtually stable from 1941 to 1959 at a level that was approximately 10 percent below the pre-war level. Moreover, the analysis showed that this was not the result of an increase in the land used for animal husbandry, which makes it relevant to see if there were other factors that limited post-war land use. Given that the agrarian sector was largely non-mechanised sector, the draught animal situation is an obvious place to look for explanations.

The two main species used as draught animals were mules and cattle but rather than being substitutes, the two animals were to a certain degree complementary due to the variances in natural conditions and social organisation that characterised the agrarian sector[35]. The result was large regional variations in the relative share of cattle and mules, with cattle

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[34] The 19 provinces are those with more than 2 percent of national total of sheep in 1933, i.e. Ávila, Badajoz, Burgos, Cáceres, Ciudad Real, Córdoba, Cuenca, Guadalajara, Huesca, León, Navarra, Palencia, Salamanca, Soria, Teruel, Toledo, Valladolid, Zamora and Zaragoza. The picture is the same when using data for 1948 instead of 1950. Instituto Nacional de Estadística: *Anuario estadístico de España* (1950, 1952), Ministerio de Agricultura: *Anuario Estadístico de las Producciones Agrícolas* (1931-35, 1948, 1950) and Ministerio de Agricultura: *Resumen estadístico de las producciones agrícolas* (1950, 1950-1951).

[35] Ministerio de Agricultura: “Tres estudios económicos”, p. 57.

being less suited to the natural conditions and the social organisation in large parts of central and southern Spain[36]. Since this was the main area for cereal cultivation, production of these crops depended to a large degree on the available number of mules.

The Civil War led to a 10 percent decline in the number of animals and it was very difficult to recover to the pre-war figures in the 1940s[37]. The importance of the decline is indicated by the fact that the relative reduction in the cultivated area with the 11 main annual crops was also 10 percent (Table 3.2). Consequently, the ratio of mules per cultivated area with annual crops remained constant from the early 1930s to 1950.

Yet, in 1939 it did not appear to be a major problem to recover to the pre-war number of animals. With an increase in demand for mules, prices for fodder crops controlled and with less competition for land use, the breeders of mules should have been able to increase prices and reduce costs at the same time. In normal circumstances, this would increase mule output but three problems militated against this.

The first problem was structural and was related to the stock of animals in Spain. Production of mules requires an adequate stock of horses and donkeys and there was a shortage of horses since they were seldom used as draught animals in Spain. Consequently, the animals on hand did not have the required characteristics for being good breeding animals for mules and pre-war practice was to import young mules, mainly from France and the

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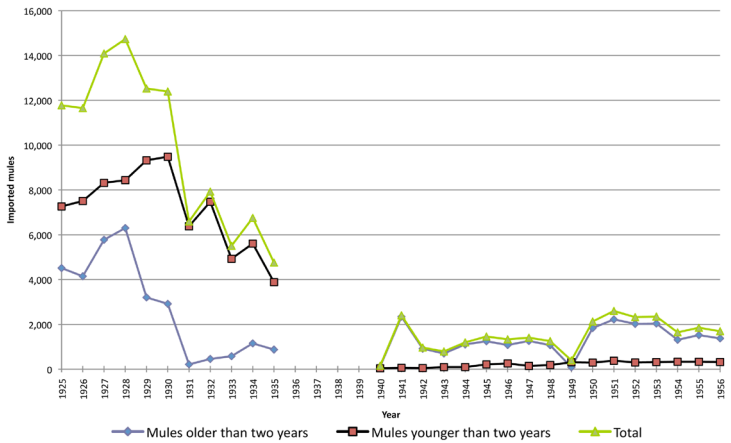
36 In general cattle were widespread in places where the natural conditions favoured animal husbandry and where the urban concentration was small, while mules dominated in areas with a harsh climate and a high urban concentration.The largest numbers of cattle were found along or close to the Atlantic coast, with 99 percent in Santander, 89 percent in the Basque Country, 87 percent in Galicia, 81 percent in León and 77 percent in Asturias. Mules dominated in the central and southern parts of the country, with 94 percent in Levante, 90 percent in Castilla la Nueva and Albacete, 89 percent in Aragón, 69 percent in Extremadura and 66 percent in Eastern Andalucía. See Ministerio de Agricultura: "Tres estudios económicos", p. 56 and p. 95. Since horses and donkeys were mainly used for riding and to carry loads, the Ministry of Agriculture did not consider them when analysing the relative numbers of draught animals in 1933.

37 In 1933 there were 1,019,756 mules older than three years, while the average for 1940, 1942, 1948 and 1950 was approximately 924,000. Ministerio de Agricultura: "Tres estudios económicos" and Instituto Nacional de Estadística: *Anuario Estadístico de España* (1943, 1944-45, 1952).

United States[38]. Recovery to the pre-war number of draught animals based on the existing stock of breeding animals in Spain was therefore not feasible.

The second problem, which originated in the international environment, was the eruption of World War II. Transatlantic trade was interrupted, while at the same time the war led to a sharp increase in the demand for draught animals for military use, especially for the German invasion of the Soviet Union in 1941. Hence, continued imports of draught animals to Spain, let alone in greater numbers than before the Civil War, was not possible. This is reflected in import data, which also reveal that imports had already declined in the early 1930s compared to the late 1920s (Diagram 3.3).

DIAGRAM 3.3. IMPORTS OF MULES TO SPAIN, 1925-56



SOURCES: Instituto Nacional de Estadística: *Comercio exterior de España. Números índices (1901-1956).*

The third factor was political in the form of the introduction of a price-cap for mules in 1942, which complicated the situation for the breeders[39].

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38 Crespo Serrano (1943), p. 43.

39 In October 1942 the official maximum price for a mule was set at 10,000 pesetas. This cap remained unchanged until May 1947, when it was raised to 15,000 pesetas. Consejo Económico Sindical de Cuenca: *Informe*, dated 22nd of May 1946, s.p. and Consejo Económico Sindical de Cuenca: *Situación actual de la agricultura*, dated 23rd of September 1947, s.p. It was the *Junta Superior de Precios* that decided to increase the price cap. Junta Superior de Precios: *Acta de la reunión celebrada el día 7-5-47*.

Given that the number of mules on a farm was relatively easy to check, price controls probably worked as a damper on production, even though there was also a black market in this commodity.

It is hard to argue that the Franco regime could have done much to correct the two first problems between 1939 and the end of the 1940s. This left the regime with the option of increasing national production through deregulation of prices and/or a technical program of improvement in the stock of animals. Even so, as late as in 1947 there was apparently still no initiative on the last point, despite the fact that this could apparently increase the number of surviving foals by 50 percent over a number of years[40].

It is clear that the price policy did not favour an increase in the stock of mules. However, given the other problems just described, it appears that the recovery to pre-war numbers of animals would always have been a lengthy process. Moreover, we have seen that the possibility of substituting mules for cattle was limited in the cereal sector. In this way, lack of mules became an important restriction on wheat output throughout the 1940s by moving the supply curve to the left and the government had only limited options in solving this problem.

3.4. CHANGES IN THE INTENSITY OF CULTIVATION

The development of the number of draught animals was not the only factor that affected wheat output in the post-war period. Two other factors have to be considered as well: the availability of fertilisers and the development of the relative price of wheat to labour.

3.4.1. The availability of chemical fertilisers in the 1940s

Table 3.4 shows that after the end of the Civil War, there was a sharp decrease in fertiliser usage per unit of cultivated land. The decrease in the usage of fertilisers along with their later revival around 1950 had an important influence on wheat output. This is reflected in that the correlation coefficient for the 1940-57 period between the five years moving average of the yields of wheat and the usage of nitrogen and phosphates is 0.85 and 0.77 respectively. However, the official price of wheat in the 1940s does not seem to have influenced the usage of fertilisers, as it increased before the official prices did.

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[40] Seculi Brillas (1947), pp. 158-162.

The development of the post-war fertiliser output was to a large degree beyond the control of the Franco regime. Before the war, the domestic industry was able to satisfy the demand for phosphate fertilisers. Nonetheless, according to Robles Teigeiro production fell after the war due to a combination of difficulties with the replacement of capital in industry and a 50 percent decline in the import of phosphate rock[41]. The result was that it took until 1952 to re-establish the 1935 level of output.

TABLE 3.4. INDEX OF THE USE OF FERTILISER IN SPAIN, 1940-57 (1931-35 average = 100)

Year	Nitrogen kg/ha – wheat, barley, rye and oats	Phosphate kg/ha – wheat, barley, rye and oats
1940	40	77
1941	36	71
1942	32	65
1943	34	30
1944	28	32
1945	20	62
1946	35	32
1947	40	41
1948	40	80
1949	54	93
1950	127	105
1951	105	114
1952	176	127
1953	160	137
1954	195	147
1955	269	166
1956	268	175
1957	239	195

SOURCES: Ministerio de Agricultura: *Anuario Estadístico de las Producciones Agrícolas* (1931-57) and Robles Teigeiro (1992), pp. 193 and 197.

[41] Robles Teigeiro (1992), pp. 195-196. Between 1931 and 1935, the average imports of phosphate rock were 534,255 tons per year. Yet, from 1940 to 1947, imports oscillated around 200,000 tons per year, until they sharply increased in 1948 to more than 400,000 tons and finally reached approximately 850,000 tons in 1956. Instituto Nacional de Estadística: *Comercio exterior de España. Números índices (1901-1956)*, p. 33.

The pre-war demand for nitrogenous fertilisers was almost entirely satisfied by imports. For military reasons, these were drastically reduced with the outbreak of World War II[42]. In the 1940s, establishing a state-controlled industry capable of producing nitrogenous fertilisers and explosives for military use was high on the agenda of the INI. Even so, the jealousy of the INI towards private enterprise worked as a constraint on output[43]. The availability of imports did not improve immediately with the end of World War II given that a world-wide shortage prompted the International Emergency Food Council to regulate the international trade in fertilisers until 1949[44]. In the meantime, Spain was allocated 25 percent of her necessities, while other countries with import needs were given 80 percent of their requirements[45]. Consequently, it seems unlikely that the majority of farmers in the 1940s even faced the possibility of considering whether the relative prices of artificial fertilisers and wheat made it attractive to increase their usage of the former.

While it might be argued that government action for increasing fertiliser output was sub-optimal from a technical point of view, there was hardly anything they could do about the international situation[46]. It is significant in relation to the timing of renewed growth in wheat output that usage of fertilisers already surpassed the pre-war level per hectare in 1949-50. This was before the market was deregulated and at a time when official prices for wheat were still in real terms below the pre-war average. Hence, official wheat prices do not appear to have determined the use of fertilisers for wheat cultivation in the 1940s.

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42 Between 1931 and 1935 the Spanish production of nitrogenous fertilisers was less than 5 percent of domestic usage. Gallego Martínez (1986), p. 222.

43 See Gómez Mendoza (1997) for the plans of the INI to create an industry capable of producing nitrogenous fertilisers and explosives.

44 See International Emergency Food Council (1947), pp. 52-61 for a short description of the reasons for the shortage of nitrogenous fertilisers.

45 Gómez Mendoza (1997), p. 25. The treatment of Spain was probably the result of its international isolation. The Spanish government asked for an import quota of 93,000 tonnes in 1946-47 and 126,000 tonnes in 1947-48 but received only 27,800 tonnes and 31,600 tonnes. International Emergency Food Council (1947), pp. 62-63.

46 An increase of production of nitrogenous fertilisers would have been economically sound in the short run in the 1940s. Yet, the Spanish industry had not been competitive in the international market in the 1920s and 1930s, which was the main reason for the limited production in this period.

The lower supply of fertilisers in the post-war years equalled a shift of the supply curve to the left but less fertiliser would also result in a steeper supply curve. In the short run, the easiest way for a farmer to react to changing prices would be to regulate the amount of fertilisers used on his land rather than to alter the amount of land under cultivation. The difference is that a change in the use of fertilisers can be made in infinitely small steps while it is more complicated to increase or decrease the cultivated area. When the capacity of the existing stock of animals to work is exhausted, an increase would require a larger number of draught animals. At least for small and medium-scale farmers, this would require a significant investment. Similarly, a decrease in the cultivated area would either mean using less than the full potential of the stock of draught animals or a reduction in their number. Consequently, farmers' overall options in responding to changes in prices would be more rigid after the decline in the availability of artificial fertilisers.

3.4.2. The relative price of wheat to labour

Another factor that could be detrimental to wheat output was a decline in the employment of labour for post-emergent care of crops. Yet, this does not appear to have been economically attractive for small-scale farmers nor for large-scale farmers. For small-scale farmers tilling their own land, a reduction in working their land would only be desirable if alternative employment generated a growth in income. This was difficult to obtain because in most rural areas in Spain in the 1940s, alternative employment was scarce outside the harvest season. Small-scale farmers therefore had few ways of increasing total earnings other than the non-monetary expenditure of improving the yields on their own land through post-emergent tillage.

For the large-scale farmers, post-emergent tillage of crops involved the employment of wage labour. This makes it necessary to analyse the development of the relative price of wheat to labour. Here Table 3.5 shows that, even when using official prices, it is clear that the relative price of wheat to labour increased significantly after the war[47]. Moreover, in all

[47] Unfortunately, the base year for the two series is not the same but this does not change the fact that the relative price of wheat to labour increased after the war. First, we expect that the wages in 1936 were at least as high as in 1935, due to the result of the general elections in February 1936 when the Popular

aspects the agrarian labour policy of the dictatorship clearly favoured the interest of the employers, with the cancellation of the Republican labour legislation as well the suppression of all independent trade unions, which ensured strict control of the local labour market[48].

TABLE 3.5. THE DEVELOPMENT OF THE RELATIVE PRICE OF WHEAT TO LABOUR, 1936-53

Year	Index of real official wheat price paid to farmers (1935 price = 100)	Index of real wages in the agrarian sector (1936 salary = 100)	Index of relative price of wheat to labour (1935-36 = 100)
1940	87	82	106
1941	72	73	99
1942	67	72	92
1943	85	74	115
1944	94	73	129
1945	99	72	137
1946	79	63	125
1947	81	60	136
1948	102	56	182
1949	91	53	172
1950	81	56	144
1951	88	51	173
1952	118	52	226
1953	122	52	234

SOURCES: Martínez Alier (1968), p. 27, Tables 1.5 and 3.1.

The favourable post-war evolution of the relative price of wheat to labour corresponds to a shift of the supply curve to the right which, other things being equal, would act as an incentive for farmers to increase land under production. However, Section 3.3 demonstrated that the number of

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Front coalition won on a left wing program. Second, as the wheat prices used in Table 3.5 are official prices, they underestimate the wheat price received by the farmers. Both these factors further increase the relative price of wheat to labour in the 1940s.

48 See Ortega López (2007) for an overview of the legislation governing the labour market in the agrarian sector in the 1940s.

draught animals available limited the total amount of land that could be put under cultivation. Yet, landowners appear to have reacted to this incentive anyway, given that in the 1940s a large number of sharecroppers were evicted and relatively more land was cultivated directly by the owners. This indicates that wealthy land owners gained from the development of the ratio of received prices/salary and compensated for the limits on total cultivated area, by cultivating more land directly[49]. It is therefore not likely that wheat output declined in the 1940s because of a general reduction of labour inputs.

3.5. SOCIAL MARKET FAILURE IN THE MARKET FOR WHEAT AND BREAD, 1939-49

So far the analysis has shown that the post-war decline in wheat output was due to the lack of fertilisers and draught animals, which shifted the supply curve to the left as well as making it steeper. At the same time this movement of the supply curve was partly – but only partly – compensated by the development of the ratio received prices/salaries, which for farms using employed labour worked in the opposite direction, i.e. moved the supply curve to the right.

By examining some characteristics of the market for wheat and bread, it is argued that the absence of regulation of the market for bread would have led to an example of social market failure. The ramifications of this conclusion make it necessary to reconsider the agrarian policy of the Franco regime in the 1940s in the light of what was defined in Section 2.1 as the "food price dilemma".

The post-war decline in wheat output obviously affected consumption but this was probably not felt equally by different parts of the population. It is likely that farmers were better able to maintain their pre-war level of consumption than the urban population, who experienced a rather grim situation according to the analysis of calories supplied through the rationing system[50]. In the city of Bilbao, in the 1944-49 period, adult males in the

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49 See Section 1.2.4.

50 Leal *et al.* stated that the variation of the harvest mainly affected the size of the marketable surplus rather than the farmers' self-consumption. Leal *et al.* (1986), p. 35.

poorest part of the population received between 800 and 1,250 calories in their daily rations. The figures were slightly higher in the mining districts, where rations contained between 1,000 and 1,300 calories per day. In all cases it was only approximately half of the daily recommendation[51].

It is hardly surprising that between 1941 and 1949 black market prices for bread varied from 457 percent to 1,286 percent of the official price[52]. With these levels of consumption, demand for bread in the black market is likely to be inversely correlated with the amount of bread provided through the rationing system. This appears to have been the case since the correlation coefficient between the amount of wheat *per capita* sold through the rationing system and the marketable part of wheat production sold on the black market is –0.80[53]. From the farmers' point of view, this meant that black market demand was a function of the calorific value supplied through rations.

This left the state in a position where a decline in the share of wheat sold in the black market would require increased supplies through official channels. This could be obtained through either an increase in imports or an increase in the share bought from the farmers. Concerning the last point, the analysis has shown that lack of fertilisers and draught animals made it difficult to increase production between 1939 and 1949. The possibilities for the state to increase the relative share of wheat that went through the official channels were therefore limited. The two main tools at hand were increasing the prices paid to the farmers, either with or without redistributive taxation in favour of consumers, or applying more coercive power towards the agents in the black market. These two parts together constitute the food price dilemma described in Section 2.1.

An increase of the prices paid to the farmers would increase the supply through the rationing system but also the prices paid by the consumers.

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51 Cámara Oficial de Comercio, Industria y Navegación de Bilbao: *Memoria Comercial* (1944-49). The number of calories in the rations is an estimate, given that the calorific values are difficult to fix for some of the less important categories of food.

52 González Portilla and Garmendia (1988), pp. 33-34.

53 See Servicio Nacional del Trigo (1963), Tables C.-8-1 and C.-10-1 for the data on the size of the rations *per capita* and the relative size of the black market for wheat. Note that the amount of bread sold through the legal market was not only a function of the harvest but also of net imports and changes in stocks.

Further, it is to be expected that the high relative price in the black market would lead to an increase in official supply being relatively smaller than the increase in prices. Total wheat output would also grow since the relative price of wheat to other crops would increase but the growth would take place at the expense of other crops competing for the same land. This equals a shift of the supply curve to the left for the other crops and would result in an increase in prices before a new equilibrium between demand and supply was reached. Since a price increase was not possible in the official market, it would take place in the black market[54].

The net result would be a change in the distribution of income between consumers. Wheat consumers would experience an increase in official price, a growth in supply through the rationing system and a decrease in black market prices. The net result for the individual consumer depends on the share of consumption that comes from the rations. The larger the share coming from rations, i.e. the poorer the consumer, the more the increase in official prices would have been felt. As explained in Section 2.1, an increase in the prices paid to the farmers included the serious risk of deterioration in the living standards of the poorest part of the population. The establishment of equilibrium between supply and demand for wheat in the 1940s would therefore include the risk of unacceptable social consequences in the short run. At the same time, consumers of substitutional products, such as livestock farmers buying barley, would also be worse off if they bought part of their produce on the black market.

Yet, as mentioned in Section 2.1, the short run negative consequences for consumers of a price increase paid to the producers could be modified by introducing redistributive taxation, for examply by way of a general consumer subsidy, or in the form of a dual price system, such as by giving the poorest part of the population food coupons to cover basic necessities.

An alternative strategy for the state to obtain more supply through the rationing system would have been to strengthen the enforcement of its regulations. With the total number of producers and consumers in the millions, complete control of all commercial activity was not realistic. Even leaving this point aside, the application of more coercive power in a

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[54] The lack of fodder crops was a recurrent subject in contemporary discussions but the subject attracted less attention than the lack of crops for human consumption. Moreno Luque (1944).

situation without a parallel market would leave total output unchanged as described in Section 2.1. It can therefore be argued that neither increased control with the black market nor an increase in the official price of wheat would in itself have solved the overall supply problem.

3.6. THE CREATION OF A PARALLEL MARKET AS A SOLUTION TO THE FOOD PRICE DILEMMA

Although there was limited scope for increasing wheat output in the 1940s, it is clear that the distribution system could have been improved significantly. In Section 2.1 it was argued that in a situation of social market failure, it would be desirable from a social point of view to introduce a dual pricing policy. The purpose would have been to give the poorest consumers access to cheap foodstuffs without jeopardising total output through low producer prices. In Section 2.1 we also saw that if a parallel market existed alongside the black market, the result would be an increase in total output. A version of just such a dual pricing system was in fact introduced in Spain by way of a parallel market for wheat. Probably because of the political climate in the 1940s, the parallel market opened as late as 1950, although economic theory and contemporary evidence show that this was long overdue.

A closer look at the data for the relative size of the black market reveals the positive influence of the parallel market. The black market was significantly smaller in 1950 than between 1939 and 1949, in spite of the fact that the official price paid to farmers in real terms was 12 percent lower in 1950 than in 1949. Further, the absolute size of the two harvests was not that different[55]. The difference between the two years was the extension of a pre-existing minor parallel market for wheat. From 1948, wheat grown on land categorised as "improved land" could be sold legally at free prices to certain industries, as well as to some public and private institutions. In October 1949 it was decided to extend this parallel market from the 1950 harvest onwards:

> Una vez entregado el cupo forzoso de trigo, el agricultor podrá dedicar los remanentes para su venta con destino a la panificación a través del Servicio Nacional del Trigo, a los consumidores o colectivi-

[55] See Table 3.1 for the official price in the two years. In nominal terms, the official price was 252 pesetas per 100 kg in both years. In 1949, SNT controlled 725,110 tons of wheat out of a harvest of 3,035,000 tons, while in 1950 it controlled 1,289,015 tons out of a harvest of 3,374,000 tons. Barciela (1981b), p. 32.

> dades que así lo deseen. En tal caso, éstos quedarán transformados en reservistas, en la forma siguiente: El precio de estas ventas será de libre contratación entre ambas partes, pero el agricultor deberá entregar el trigo correspondiente al Servicio Nacional del Trigo, el que, a su vez y a través de los fabricantes, entregará la correspondiente harina al consumidor, previa entrega por parte de éste de los cupones de pan de su cartilla de racionamiento […] [56].

It was this extension that was behind the large increase in 1950 in the share of wheat that went through legal channels. This can be deduced from information provided by the SNT (Table 3.6).

Column 3 shows that farmers as a whole still did not fulfil their production quotas. Nevertheless, Column 6 demonstrates that those of them who had fulfilled their quota and therefore had the right to sell wheat in the parallel market as well, delivered a significantly larger "surplus production" than anticipated[57]. It took some months after the 1950 harvest before the market adjusted to the new conditions, with the result that the price in the parallel market of wheat remained higher than expected by the CGAT. In this space of time, farmers often declined to sell in the parallel market at the price they were offered but from December 1950, farmers started to sell bigger quantities in the parallel market causing prices to fall[58].

The establishment of a parallel market was an advantage to producers, consumers and administrators. For the producers the possibility of selling a part of their production at freely negotiated prices had the benefit of obtaining higher than official prices without the risks involved in dealing in the black market. For the consumers it was an improvement that the price of bread could be set relative to the individual opportunity cost of queuing in the rationing system. This was so because not all members of a family had to shift from receiving rations to being *reservists*. Within a family it was therefore possible to set the average price paid

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[56] "Once the farmer has sold the compulsory quota (to the SNT), he can then sell the rest for bread making to consumers or collectives who so wish through the SNT. In this case, the consumers are converted to *reservistas* in the following way: The price of the sales will be for free contraction among the participants, but the farmer has to hand in the corresponding part of wheat to the SNT, which then, through the manufacturers, delivers the corresponding flour to the consumer, after he has handed in his bread coupons from his ration book". Translation by the author. *Alimentación Nacional,* vol. 154, 25th of October, 1949, p. 2.

[57] See Section 1.2.2 for details on the intervention system.

[58] *Alimentación Nacional*, vol. 180-181, December 10th 1950, pp. 5 and 34.

TABLE 3.6. EXPECTED AND OBTAINED AMOUNT OF WHEAT BOUGHT AS PRODUCTION QUOTA AND SURPLUS PRODUCTION RESPECTIVELY IN 1950
The data describe the situation as of 15 January 1951

	1	2	3	4	5	6	7	8	9
Provinces	Production quotas (tonnes)	Fulfilled quota (tonnes)	Fulfilled quota as percent of production quota	Expected surplus output (tonnes)	Realised surplus output (tonnes)	Realised surplus output as percent of expected surplus output	Amount of wheat expected to be controlled by SNT (tonnes)	Amount of wheat actually controlled by SNT (tonnes)	("8"/"7")*100
Álava	10,000	9,790	98	4,250	4,010	94	14,250	13,800	97
Albacete	5,750	8,160	142	2,500	4,400	176	8,250	12,560	152
Alicante	1,580	1,820	115	670	470	70	2,250	2,290	102
Almería	1,470	1,690	115	630	310	49	2,100	2,000	95
Ávila	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Badajoz	62,830	58,820	94	26,920	45,400	169	89,750	104,220	116
Baleares	1,750	2,280	130	750	4,670	623	2,500	6,950	278
Barcelona	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Burgos	63,850	64,810	102	27,350	28,460	104	91,200	93,270	102
Cáceres	21,550	18,820	87	9,200	17,500	190	30,750	36,320	118
Cádiz	28,350	25,920	91	12,150	14,820	122	40,500	40,740	101
Castellón	3,430	3,670	107	1,470	2,290	156	4,900	5,960	122
Ciudad Real	12,450	10,860	87	5,300	9,700	183	17,750	20,560	116
Córdoba	26,000	24,700	95	11,400	37,110	326	37,400	61,810	165
Cuenca	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gerona	6,650	6,840	103	2,850	3,050	107	9,500	9,890	104
Granada	16,280	17,070	105	6,970	19,700	283	23,250	36,770	158
Guadalajara	19,250	17,650	92	8,650	18,600	215	27,900	36,250	130
Guipúzcoa	880	1,010	115	370	210	57	1,250	1,220	98
Huelva	7,000	4,960	71	3,000	1,300	43	10,000	6,260	63
Huesca	6,650	8,420	127	2,850	13,060	458	9,500	21,480	226

Jaén	5,600	5,270	94	2,400	5,980	249	8,000	11,250	141
La Coruña	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Las Palmas	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
León	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lleida	25,250	14,910	59	10,800	400	4	36,050	15,310	42
Logroño	12,150	11,190	92	5,120	3,920	77	17,270	15,110	87
Lugo	1,400	1,400	100	600	600	100	2,000	2,000	100
Madrid	3,500	6,170	176	1,500	5,970	398	5,000	12,140	243
Málaga	13,480	10,790	80	5,770	1,260	22	19,250	12,050	63
Murcia	4,200	4,490	107	1,800	1,880	104	6,000	6,370	106
Navarra	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orense	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oviedo	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Palencia	49,700	47,010	95	21,250	34,900	164	70,950	81,910	115
Pontevedra	140	140	100	60	60	100	200	200	100
Salamanca	38,250	33,460	87	16,350	18,960	116	54,600	52,420	96
Sta. C. de Tenerife	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Santander	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Segovia	14,900	16,530	111	6,400	15,790	247	21,300	32,320	152
Sevilla	54,250	48,950	90	23,250	29,430	127	77,500	78,380	101
Soria	14,000	15,130	108	6,000	23,490	392	20,000	38,620	193
Tarragona	3,430	570	17	1,470	230	16	4,900	800	16
Teruel	7,150	6,970	97	3,050	8,150	267	10,200	15,120	148
Toledo	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Valencia	5,670	5,800	102	3,420	2,520	74	9,090	8,320	92
Valladolid	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vizcaya	1,400	1,510	108	600	730	122	2,000	2,240	112
Zamora	20,300	12,220	60	8,700	8,860	102	29,000	21,080	73
Zaragoza	42,000	33,740	80	18,000	21,160	118	60,000	54,900	92
Total	612,491	563,542	92	263,824	409,355	155	876,317	972,898	111

SOURCES: Servicio Nacional del Trigo: *Resumen de agricultores deudores de cupos forzosos de trigo para la campaña 1950/51.*

for bread by letting some members buy their bread through the rationing system and letting others do so on the parallel market. Hence, the result was in fact a more flexible price system than a dual price system based for example on food coupons. Further, consumers would no longer pay the specific transaction costs inherent in the black market, and fewer people would have to be fed through the rationing system, so that the rations for those remaining could be increased. Finally, the control mechanism became easier for the administrators to handle since a significant part of the former black market had been legalised.

Overall, the parallel market worked as a consumer subsidy for that part of the population for whom the opportunity cost of queuing was the lowest. Producers paid for the subsidy since they were forced to sell part of their production to the SNT below market price. Given the advantages of the parallel market, the question arises why this was not introduced earlier. The answer has to be found in the culture of intervention which dominated the political system.

In 1946 the economic policy was dominated by a plan for a "campaign for the reduction of the costs of living". Consequently, the director of the CGAT, Rufino Beltrán, launched the idea at a meeting in the *Junta Superior de Precios* in September 1946 that it would be possible to solve the inflationary pressures by restoring relative prices to the situation in the 1931-35 period. The suggested procedure for reaching this goal consisted of finding the product among the basic necessities which had experienced the lowest increase in price since 1935. The 1946 prices of the other commodities should ideally be their 1935 prices multiplied by the same factor. The next step was to compare this "harmonious" price scale with the actual prices in 1946. A given price should then remain unchanged if it was lower than the calculated "harmonious price". On the other hand, in the cases where the prices were actually higher than on the list, the state should reduce the price to the desired level[59].

However, when the *Junta Superior de Precios* discussed the plan in the autumn of 1946, the idea of setting an equal relative price level for all products was partially abandoned. Instead it was agreed to temporarily

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[59] "The *Junta Superior de Precios*, considers that it is possible to gradually reach a harmonious level of prices for food products at a minimum level that is technically acceptable. However, the authorities should know that it is difficult to maintain this in practice without severe discipline". Translation by the author. Junta Superior de Precios: *Acta de la reunión celebrada el día 9-9-46* and *Acta de la reunión celebrada el día 16-9-46.*

permit higher levels for products in short supply[60]. A meeting held on October 31st produced an explanatory note about the plan, which said:

> La Junta Superior de Precios, que considera posible llegar paulatinamente a la proporcionalidad armónica de los precios en los productos alimenticios al mínimo nivel técnicamente aceptable, estima que debe hacer llegar a la Superioridad la dificultad de los mantenimientos prácticos sin una severa disciplina[61].

At least it can be said that this affirmation was more realistic than the general design of the plan.

Even in the *Junta Superior de Precios* there were voices that doubted the viability of the plan. Carlos Rein Segura, the Minister of Agriculture, presented a note at a meeting on October 4th where serious doubts were cast about the viability of the proposed procedure. The main objection was that the transferring of pre-war relative prices to a period of state-determined prices would ignore the changes in a number of factors that were important for production. As a result, the proposed reduction in prices would be very difficult to enforce in practice and only an initial minor reduction in prices could be the first step in a long-term project[62].

While the political agenda in 1946 excluded the introduction of a parallel market, its inauguration in 1950 also met with some resistance. The new measure was commented upon with considerable interest and a diversity of opinions even found their way into the strictly controlled press. They went from demands for further deregulation to calls for the reinstatement of the former system. From the discussion, it appears that the partial deregulation of the wheat market was disputed even in government circles[63].

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60 Junta Superior de Precios: *Acta de la reunión celebrada el día 4-10-46.*

61 "The *Junta Superior de Precios,* considers that it is possible to gradually reach a harmonious level of prices for food products at a minimum level that is technically acceptable. However, the authorities should know that it is difficult to maintain this in practice without severe discipline". Translation by the author. Junta Superior de Precios: *Acta de la reunión celebrada el día 4-10-46.*

62 Junta Superior de Precios: *Acta de la reunión celebrada el día 4-10-46* and Secretaría Técnica del Ministerio de Agricultura: *Informe.*

63 See for example *Alimentación Nacional,* vols. 157, 166, 169, 176, 177, 179, 182 – all from autumn/winter 1950 – for comments and references to opinions voiced in other newspapers.

On the one hand, Rein Segura – still the Minister of Agriculture – said in an interview in *Arriba* in March 1951 that the new measure had been a success in 1950, with even better results expected for the 1951 harvest[64]. Nevertheless, one month later *Alimentación Nacional* published a leading article defending the return to a higher degree of state intervention. It cited a recent speech by Franco where he said "intervention is the only defence for the poor"[65]. An article titled "The poor luck of the free markets" appeared in the same volume of the journal. At any rate, within a broader context of a gradual deregulation of the economy in the first half of the 1950s, the partial deregulation of the production, distribution and consumption of foodstuffs eventually got the upper hand.

3.7. THE SUPPLY RESPONSE TO OFFICIAL AND BLACK MARKET PRICES

So far it has been argued that the black market for wheat was not supplied exclusively by diversion and that the farmers planned production based on black market and official earnings rather than only official prices as has been argued earlier in the historical literature. In the present section we will analyse whether either of these arguments can be quantitatively supported by available statistics, on production, official prices and black market prices.

For questions of this type, the normal practice is to estimate the price elasticity of supply. Yet, as explained earlier the analysis of the situation in the 1940s and early 1950s is complicated by the fact that there was a large black market in the period. The Ministry of Agriculture corrected the official statistics for the 1939-48 period but the annual figures cannot be expected to be accurate[66]. Yet, it appears that the errors mainly affect output data and the estimate of farmers supply response has therefore to be based on data for the cultivated area. This procedure is not only convenient in these specific conditions, as it also has the advantage that it makes it possible to avoid "noise" in the results due to random climatic variations that affect output. This advantage is generally recognised in the economics literature and a well-established research trend uses cultivated area as a proxy for planned output[67].

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64 Reproduced in *Alimentación Nacional*, vol. 188 (25 March 1951).

65 *Alimentación Nacional*, vol. 190 (25 April 1951).

66 See Appendix 1, Section 1.3 for details.

67 Over the years, large numbers of researchers have considered price elasticity of supply in agriculture and the result has been a number of different estimate

The textbook definition of price elasticity of supply is that it measures the relative effect on output of a one-percent change in prices paid to producers. Hence, a standard way of testing farmers' supply response to prices is to see if the cultivated area with a given crop in the year "t" is a function of the expected price of wheat paid to the farmers. For the case we are looking at, the relevant equation would be:

(1) $CA_{w,\,t} = f\,(P_{w,\,t,*})$ [68]

where

$CA_{w,\,t}$ = the total area cultivated with wheat in year "t"

$P_{w,\,t,\,*}$ = the expected wheat price in year "t"

Yet, careful consideration should be given to the fact that there was a co-existence of an official market and a black market and that the total amount of cultivable land was in fixed supply due to the post-war lack of draught animals[69].

The co-existence of the black market and the official market has several implications for the analysis. First we note that the cultivated area with wheat $CA_{w,\,t}$ was composed of two parts: "$CA_{w,\,t\,(OM)}$", which produced for the official market and "$CA_{w,\,t\,(BM)}$", which produced for the black market, i.e.:

(2) $CA_{w,\,t} = CA_{w,\,t\,(OM)} + CA_{w,\,t\,(BM)}$

Second, the expected price of wheat is also composed of two parts, the expected price in the official market $p_{w,\,t,\,*(OM)}$ and the expected price in the black market $p_{w,\,t,*(BM)}$.

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techniques. Apparently the procedure selected has often been pragmatically based on the availability of data! Descriptions of different methodologies and a large number of results can be found in Askari and Cummings (1976), pp. 52-218.

68 As noted by Colman, the following estimates are strictly speaking not an analysis of the price elasticity of supply but of the price elasticity of output. Farmers will usually consume and/or stock part of output. This is therefore not the same as "supply", which is conventionally defined as the amount offered for sale in a market. Nevertheless, estimations of the price elasticity of "supply" in agriculture are mostly based on output data, as is also the case here. Colman (1983), pp. 201-202.

69 See Section 3.3.

Third, it seems likely that $CA_{w,\,t\,(OM)}$ and $CA_{w,\,t\,(BM)}$ are substitutes, in the sense that in case of a price increase in the official market, farmers will sell more wheat to the state monopoly and less in the black market. Hence, a likely scenario is that an increase in the official price might have an influence on $CA_{w,t(OM)}$ but the net effect on $CA_{w,t}$ might be small given that a part of the increase in $CA_{w,t(OM)}$ is off-set by a simultaneous change in $CA_{w,t(BM)}$. At the same time, if the increase in the supply in the official market for wheat is passed on to the consumers in the form of an increase in the supply of bread in the official market, this might lead to a decrease in the demand in the black market for bread and wheat, thereby reducing $P_{w,\,t,(BM)}$.

Consequently, to analyse the influence of changes in expected prices on total output, we should run the regression using both the expected price in the black market and in the official market as independent variables, i.e. equation (1) should be written as:

(3) $CA_{w,\,t} = g\,(P_{w,\,t,\,*(OM)},\ P_{w,\,t,\,*(BM)})$

Moreover, to go one step further in understanding price elasticity of supply, we should also decompose the effect of changes in $P_{w,\,t,\,*(OM)}$ and $P_{w,\,t,\,*(OM)}$ on each of the two components of $CA_{w,\,t,}$ i.e. estimate the following two equations:

(4) $CA_{w,\,t\,(OM)} = h\,(P_{w,\,t,\,*(OM)},\ P_{w,\,t,*\,(BM)})$
(5) $CA_{w,\,t\,(BM)} = i\,(P_{w,\,t,\,*(OM)},\ P_{w,\,t,\,*(BM)})$

To calculate own price elasticity of supply for wheat requires knowledge of farmers' price expectations. In the economics literature, a great deal of attention has been paid to the issue of how to solve this problem. Various models have been proposed based upon the assumption that farmers plan output on rational expectations about the price they will receive. Moreover, it is normally assumed that the expectations are the result of prices in earlier years, with the most recently received prices carrying the heaviest weight in the formation of expectations[70].

To calculate the price elasticity of supply, equations (3), (4) and (5) we should therefore run three OLS regressions, with $CA_{w,t}$, $CA_{w,t,(OM)}$ and $CA_{w,t(BM)}$ respectively as the dependent variables and $P_{w,t,\,*(OM)}$ and $P_{w,t,\,*(BM)}$ as the independent variables in all three equations. Moreover, to account for the fact

[70] Askari and Cummings (1976), pp. 25-51.

that farmers' price expectations might be formed over several years, prices with a one and two year timelag should be used for $P_{w,t,\ *(OM)}$ and $P_{w,t,\ *(BM)}$.

Doing this is, however, not feasible as few data exists on black market prices. As explained earlier, Barciela and García González estimated that the average black market prices received by the farmers were 250 percent of the official price[71]. Obviously a fixed ratio between the official price and the black market price cannot be used to estimate the price elasticity of supply and it has not been possible to find consistent black market farm gate prices.

Currently, the best available data is from Pujol Andreu who has published annual data on the average price received for wheat, barley, rye and oats by a big farmer in Catalonia[72]. The accounts of the farm do not state how large a proportion of total sales went to the black market and the official market respectively, so it is not possible to compute the black market farm gate price. Nevertheless, the data can be used for computing the price elasticity of supply for the entire cultivated area using the expected average price received by the farmer as the independent variable in the "normal" equation for this sort of analysis, i.e.:

(1) $CA_{w,\ t} = f\ (P_{w,\ t,*})$

The more detailed picture, which could be provided by equations (3), (4) and (5), is not available due to lack of data.

Prior to running the analysis, we still need to take into account that the total amount of cultivable land was in fixed supply due to the post-war lack of draught animals. This implies that the expansion or contraction of the area cultivated with wheat was probably not only the result of the development of the wheat prices but also of the prices of substitutional crops. The most likely substitutional crop for wheat in Spain in the 1940s appears to have been barley for the following three reasons. First, it was the second most extended crop in the period. Second, wheat and barley could be cultivated on the same land using the same tools. Finally, with the natural exception of seeds, the same inputs were used for the cultivation of the two crops. Farmers would therefore be able to switch between wheat

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71 This ratio was used earlier to discuss the average farm income level when black market earnings are included.

72 Pujol Andreu (1985), p. 237.

and barley year by year[73]. To test the price elasticity of supply for wheat, we should therefore also take the expected price of barley $P_{b,\,t,\,*}$ into account, i.e. modifying equation (1) into:

(6) $CA_{w,\,t} = j\,(P_{w,\,t,\,*}, P_{b,\,t,\,*})$

where

$P_{b,\,t,\,*}$ = the expected price of barley in year "t"

Here it is important that there also was an important black market for barley and consequently the considerations about the level of the expected wheat price are also valid for the expected price of barley. Hence, we will use the average farm gate barley prices provided by Pujol Andreu in the estimates.

Finally, we must take into consideration the fact that the 1940s and early 1950s were characterised by significant inflation. To account for this, the inflation level must enter the equation as well, as the relation between expected prices and cultivated area otherwise would be muddied by the nominal increase in prices. Consequently, the equation to be used for the calculation of the price elasticity of supply is:

(7) $CA_{w,\,t} = k\,(P_{w,\,t,\,*}, P_{b,\,t,\,*}, Inf_{t,\,*})$

where

$Inf_{t,\,*}$ = the expected inflation level for the year t.

The question of the possible influence of inflation on supply must be treated in two steps. First we need to analyse whether prices are homogeneous of degree zero, i.e. whether "money matters" in farmers decision on what to cultivate. To analyze this, a number of regressions[74] have been made with $CA_{w,\,t}$ as the dependent variable and the following independent variables: $P_{w,\,t,\,*}$, $P_{b,\,t,\,*}$ and $Inf_{t,\,*}$[75]. All three independent variables were introduced with one and two year lags with respect to the dependent variable.

The most consistent and statistical significant result were obtained using $P_{w,\,t,\,*}$ and $P_{b,\,t,\,*}$ with two year lags. Yet, $Inf_{t,\,*}$ was not statistically

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73 Introducing other variables than the own price of the crop is in line with standard agricultural economics. Such variables often includes the price of substitutional crops, the price of inputs if they differ between the crops or changes significantly over time, technological trends and so forth. See Askari and Cummings (1976), pp. 52-218. That wheat and barley are substitutional crops was also observed for the 1959-1985 period. See Astorquiza and Albisu (1993), p. 26.

74 The OLS regressions were inconclusive as to whether there was auro-correlation. The regressions were re-estimated using the Prais-Winstein procedure. All calculations were done using "gretl"-software.

75 The annual inflation was derived from the the price deflator for "agriculture, forestry and fishing" by Prados de la Escosura. See Section 3.2.1 for the choice of deflator.

significant irrespective of whether it was included with one or two year lags or both. Consequently, for the remaining part of the analysis, we assume that prices are homogeneous of degree zero.

With this in mind, the price elasticity of supply has then been estimated by computing regressions, with $CA_{w,t}$ as the dependent variable and $P_{w,\,t,\,*}$ and $P_{b,t,\,*}$ as the independent variables. Both independent variables were introduced with one and two year lags with respect to the dependent variable. Based on the assumption that prices are homogeneous of degree zero, the influence of inflation has been dealt with by transforming all nominal prices into real prices, using the price deflator for "agriculture, forestry and fishing" by Prados de la Escosura[76]. All data on cultivated area and prices have further been converted into natural logarithms to avoid the problem of units. This has the advantage that the price elasticity of supply is directly given by the coefficients of the variables[77].

$P_{w,\,t,\,*}$ and $P_{b,\,t,\,*}$ with a one year lag were not statistically significant when entered in the equation in real prices. The lack of statistical significance for one year lag is present both when using one year lag only and when both one year lag and two year lag are entered as independent variables. Consequently, the first estimate of the price elasticity of supply has $CA_{w,\,t}$ as the dependent variable and $P_{w,\,t,\,*}$ and $P_{b,\,t,\,*}$ with a two year lag as the independent variables. Data covers the period 1939-1955, i.e. the harvests from 1941 to 1955 due to the two year lag of the independent variables[78]. Both the OLS regression and the Prais-Winstein method were inconclusive with regards to auto-correlation, so the regression was re-estimated using the Cochrane-Orcutt method (Regression 1, Table 3.7).

The results show that the explanatory power of the model is rather high, that the coefficients of the variables have the expected sign and that the variables are statistically significant. Moreover, the test for autoregressive conditional heteroskedasticity shows that the model is homoskedastic and the test for normality shows that the errors are normally distributed. Yet, the price elasticity of supply for wheat and the cross price elasticity of barley is very low. Before we discuss this issue, we shall first consider whether the model can be better defined.

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76 See Section 3.2.1 for the choice of deflator.

77 Lim Lin Shu (1975), pp. 12-13.

78 Running the analysis on the 1939-1953 period only, provides almost the same results.

First, the size of the constant in comparison with the coefficient of the price elasticity of wheat and cross price elasticity of barley indicates that a large and rather stable independent variable might be missing from the equation. Hence, we will introduce the cultivated area with wheat with a one year lag as an independent variable to account for that changes in land use for widespread crops do not normally take place at a very fast rate, reflecting a partial adjustment process to changes in prices.

Second as described in Section 3.6, there was a partial deregulation of the market for wheat in 1950, which was followed by abolition of the rationing system in 1953. To account for these two changes, two dummy variables were introduced as independent variables, with the first covering the existence of the grey market in 1950-1952 and the second covering the free market from 1953 onwards and then an OLS regression was run based on the following equation:

(8) $CA_{w,\,t} = I\,(P_{w,\,t,\,*}, P_{b,\,t,\,*}, Inf_{t,\,*}, CA_{w,\,t-1}, DV_{1950\text{-}1952}, DV_{1953\text{-}1955})$

As was also the case in the first equation, expected prices were entered into the regression with a two year lag and all nominal prices were transformed into real prices, using the price deflator for "agriculture, forestry and fishing" by Prados de la Escosura[79]. All data on the cultivated area and prices were converted into natural logarithms to avoid the problem of units. The dummy variable $DV_{1950\text{-}1952}$ took the value 1 in 1950-1952 and 0 in the remaining years. The dummy variable $DV_{1953\text{-}1955}$ took the value 1 in 1953-1955 and 0 in the remaining years. Both variables entered the equation with a one year lag to account for the minimum time required between the change in conditions and the possibility of farmers to react with a change in supply. The result can be seen in the second part of Table 3.7 and once again we observe that the explanatory power of the model is rather high, that the coefficients of the variables have the expected sign and that the variables, including the dummy variables are statistically significant at the 1 percent level. The test for autoregressive conditional heteroskedasticity shows that the model is homoskedastic, the test for normality shows that the errors are normally distributed and the Durbin h-statistics rejects auto-correlation[80].

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79 See Section 3.2.1 for the choice of deflator.

80 All calculations were done using "gretl"-software.

It is noteworthy that the analysis indicates that the partial deregulation of the wheat market in 1950 as well as the further deregulation of the market in 1953 had a positive effect on the cultivated area with wheat. However, while the effect of the deregulation is as expected, the size of the coefficients of the dummy variables also indicates that a deregulation of the market in itself was insufficient to reach pre-war levels of production.

It is also important that once again the price elasticity of supply for wheat and the cross price elasticity of barley is unusually low. For both regressions this might be at least partially explained by the characteristics of the data used in the regressions, which means that the estimate of the coefficients is likely to be biased towards zero. First, Pujol Andreu states that the farmer in question probably was able to sell a larger amount of produce on the black market than the average farmer due to the size of his property and the fact that he received payment from his tenants in kind, which was then sold on the legal and the illegal markets. Second, Pujol Andreu also states that black market prices received by the farmer were probably higher than the average black market price due to the market conditions in Catalonia[81].

At a general level, the size and the sign of the price elasticity of supply has been widely debated in the economics literature but two arguments appear to be dominant[82]. First, the price elasticity of supply for single crops is higher than the aggregate supply elasticity. Second, the price elasticity of supply in most cases positively correlates with technological and economic development[83]. The first point is in line with the analysis earlier in this chapter, which said that any increase in wheat output in the 1940s could only happen at the expense of the output of other crops. With regards to the second point, we would expect that the general conditions in Spain in the 1940s and early 1950s would result in a lower price elasticity of supply than both before the war and after the analysed period. Other things being equal,

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81 Pujol Andreu (1985), p. 244.

82 The topic has attracted considerable interest over the years, which probably has to do with its implications for economic policy choice. An outline of the main points of discussion can be found in Askari and Cummings (1976), Chhibber (1989), Griliches (1960), Peterson (1979) and Schiff and Montenegro (1997).

83 See footnote 82. The introduction of highly specialised utilities for a specific crop would lead to a lower price elasticity of supply. Yet, in a largely unmechanised sector as that found in Spain in the 1940s, there is not a relevant objection.

TABLE 3.7. ESTIMATIONS OF THE PRICE ELASTICITY OF SUPPLY FOR WHEAT, 1939-85

Regression 1: Cochrane-Orcutt, using observations 1942-1955 (T = 14)
Dependent variable: CA_w

	Coefficient	Std. Error	t-ratio	p-value	
const	15.6729	0.127547	122.8799	<0.00001	***
$P_{w, t, *}$	0.0398777	0.0139436	2.8599	0.01552	**
$P_{b,t, *}$	−0.0684567	0.0171967	−3.9808	0.00216	***

Statistics based on the rho-differenced data:

Mean dependent variable	15.20837	S.D. dependent variable	0.053459
Sum squared residual	0.001253	S.E. of regression	0.010673
R-squared	0.969009	Adjusted R-squared	0.963374
F(2, 11)	7.926601	P-value(F)	0.007382
Rho	0.093701	Durbin-Watson	1.719837

* = Significant at the 10 percent level
** = Significant at the 5 percent level
*** = Significant at the 1 percent level

Test for ARCH of order 1:
Null hypothesis: no ARCH effect is present
Test statistic: LM = 0.513462
with p-value = P(Chi-Square(1) > 0.513462) = 0.473644

Test for normality of residual:
Null hypothesis: error is normally distributed
Test statistic: Chi-square(2) = 1.64432
with p-value = 0.439482

SOURCES: Instituto Nacional de Estadística: *Anuario estadístico de España* (1943), Ministerio de Agricultura: *Anuario Estadístico de las Producciones Agrícolas* (1939-1955) and Ministerio de Agricultura: *Resumen estadístico de las producciones agrícolas* (1950, 1950-1951).

Regression 2: OLS, using observations 1941-1955 (T = 15)
Dependent variable: $CA_{w,t}$

	Coefficient	Std. Error	t-ratio	p-value	
const	9.19377	1.37113	6.7053	0.00009	***
$P_{w,\,t,\,*}$	0.0535559	0.00949672	5.6394	0.00032	***
$P_{b,t,\,*}$	–0.0766171	0.0133146	–5.7544	0.00027	***
$DV_{1950\text{-}1952}$	0.0438741	0.00948786	4.6242	0.00125	***
$DV_{1953\text{-}1955}$	0.056243	0.0137533	4.0894	0.00272	***
$CA_{w,t\text{-}1}$	0.402997	0.0915648	4.4012	0.00172	***

Mean dependent variable	15.20384	S.D. dependent variable	0.054417
Sum squared residual	0.000733	S.E. of regression	0.009027
R-squared	0.982309	Adjusted R-squared	0.972480
F(5, 9)	99.94463	P-value(F)	1.32e-07
rho	–0.170991	Durbin's h	–0.681002

* = Significant at the 10 percent level
** = Significant at the 5 percent level
*** = Significant at the 1 percent level

Test for ARCH of order 1:
Null hypothesis: no ARCH effect is present
Test statistic: LM = 0.10062
with p-value = P(Chi-Square(1) > 0.10062) = 0.751087

Test for normality of residual:
Null hypothesis: error is normally distributed
Test statistic: Chi-square(2) = 2.37828
with p-value = 0.304483

we would expect that limited access to artificial fertilisers and the problems of renewing capital stock due to the general economic depression would reduce the ability of farmers to react to price incentives. Still, the estimated price elasticity of supply for wheat and the cross price elasticity for barley are indeed very low.

To get a possible point of comparison, various models were constructed to estimate the price elasticity of supply for wheat and the cross price elasticity for barley for the period 1920-1935. Yet, the estimations provide no statistically significant price elasticity of wheat or cross price elasticity of barley[84]. This result is at least questionable and it is possible that it is the result of deficient pre-war statistics.

All in all, it could be argued that the data on prices and cultivated area are too uncertain to make any use at all of the results. Hence, it is difficult to argue that the results by themselves prove that the post-war decline in output was not mainly the result of the level of official prices. However, if we give any credit to the estimations, they do support the argument forwarded in this chapter that the post-war decline in wheat output was mainly due to lack of fertilisers and draught animals. On the other hand, if we do not give any credit to the estimate, the argument about the importance of the lack of fertilisers and draught animals is at least not falsified.

Finally, it would have been relevant to estimate the supply function as well. Yet, the original figures on wheat production were officially recognised as untrustworthy due to the existence of the large black market. The figures for the period 1939-1948 were later revised but the corrections were the same in relative terms in six of the 10 years[85]. The calculation above of the price elasticity of supply already depends on more or less doubtful data with regard to the average price received by the farmers but we have assumed that data on the cultivated area are more or less correct due to the fact that the amount of land under cultivation could be visually observed by state officials. Estimating the supply function based doubtful data on prices received by farmers and flawed output data has been considered futile.

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84 The tested models all had the cultivated area with wheat as the dependent variable, while the independent variables were the expected price and the expected price of barley.

85 See Appendix 1, Section 1.3.

3.8. CONCLUSIONS

The main purpose of this chapter was to discuss whether there was a cause-and-effect relationship or a coincidence between, on the one hand, the level of the official prices paid to farmers and, on the other, the level of wheat output. The main conclusion is that neither quantitative nor qualitative data support this interpretation.

With respect to the quantitative data, it appears that farmers reacted to the average level of total prices, i.e. when legal prices and black market prices are both factored in. So from the point of view of wanting to expand production, the inefficiency of the control system can therefore be seen as a positive feature. The result is that the non-enforcement of the state's coercive powers increased output and market distortions at the same time, while more effective control would have led to a smaller black market and lower output. Yet, it is not certain that that the data on average prices used in the analysis are representative and the conclusion should only be considered as indicative. Further, the estimated price elasticities of supply are very likely to be biased towards zero.

With respect to the qualitative data, the analysis supported the conclusion that the lack of draught animals and chemical fertilisers were the main reasons for the post-war decline in output. Since these problems were virtually insoluble in the 1940s, neither higher official prices nor a deregulation of the market would have solved the supply shortage. A likely process would be that an increase in the official price would increase the amount of wheat sold through the legal system but would not affect total output, as the increase in amount of wheat sold legally might be offset against a similar decrease in the amount of wheat sold illegally. Yet, the poorest consumers would run the risk of ending up in a very precarious situation in the short run unless a subsidy for consumer prices was introduced. Total deregulation of the market would have left poor consumers even worse off, given that they would not even have been assured a minimum amount of foodstuffs through the rationing system. In both cases, the result would be a socially regressive redistribution of income in a situation where the living standards for the poorest part of the population were already problematic.

As pointed out in Section 2.2, the potential problems of a free market for basic foodstuffs in wartime were generally recognised by the

participants in World War II and the situation in Spain cannot be regarded as an exception[86]. However, the analysis in the present chapter also indicated that the intervention system in Spain in the 1940s left much to be desired. The extension of the parallel market in 1950, which introduced a multilayered price system based on the opportunity costs of queuing for the individual consumer, was a belated way of easing the problem of distribution of supply. Other possibilities would have been to introduce food coupons for the poorest part of the population, or an across-the-board consumer subsidy following the British model during World War II[87]. However, this last measure would have required a substantial outlay on behalf of the government. All models, i.e. parallel markets, food coupons and across the board subsidies, had their problems but all could have increased the legally consumed part of the production without an adverse effect on its size. This places a large portion of the blame on the regime. The interventionist culture in the 1940s was responsible for the late introduction of the indubitable advantages connected with the extension of the parallel market. In this light, the criticism found in much of the historiography stating that the agrarian policy was problematic turns out to be right but for the wrong reasons. While little could have been done to increase the size of the cake, its distribution was clearly deficient.

This overall argument is broadly in line with what has been suggested by Simpson[88], Leal *et al.*[89], and Abad and Naredo[90]. On the other hand, the conclusions are at odds with the interpretation forwarded by Barciela, who argued that the level of official prices paid to the farmers in the 1940s was the main reason for the post-war decline in output[91].

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86 This was also recognised by Barciela in Barciela (1998), pp. 83-90.

87 See Section 2.2.1 for the British experience with an across-the-board consumer subsidy.

88 Simpson (1995).

89 Leal *et al.* (1986).

90 Abad and Naredo (1998).

91 Barciela (1981a), Barciela (1981b), Barciela (1986b), Barciela and García González (1983) and Barciela and López Ortiz (2003).