Economies of scale and obstacles to land reform, Andalusia 1931-36.

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Although total factor productivity is often very similar in areas of both large and small farms, they utilise factor inputs in very different proportions. Small farms can achieve high levels of output by working the land intensely using large quantities of family labour, but modest inputs of capital. By contrast large farms tend to utilise labour and land extensively, and production is more intensive in the capital (and sometimes technology). As a result, crop yields per hectare often decline as farm size increases, and on large farms rotations will be longer, and farmers are attracted to a product-mix which avoids the use of large quantities of labour, especially if labour has to be closely monitored. The incentives facing large farmers therefore systematically differ from those facing small farms.[2] The major economic justifications for land reform arises not so much that large farms are inefficient, but rather that in low income economies large estates save on the one factor that is available in large quantities and cheap (labour), but utilise more intensively another factor that is scarce (capital).

A successful land reform is likely to require a shift from extensive to more intensive crop rotations, and a crop mix that uses labour intensively, and that can be easily provided by the family. In the context of Andalusia and Extremadura in the 1930s this might involve a switch out of cereals, which required relatively small amounts of labour, to either vines or olives (in the *secano*), or irrigation (Table 1). Yet the experience in many countries shows that the simple 'reparto' of land has never been by itself enough, as a successful land reform also requires the removal of landlord and urban biases in government policies. These will include research (especially in biological, yield-raising technologies) and market price intervention for the type of crops grown on small (as oppose to large) farms, extension polices, the development of public irrigations systems, credit policies directed specifically to small farms, and institutional policies that encourage the organisations of small producers (farmers' associations, cooperatives and rural labour unions). Although large landowners usually enjoy exceptional political power in poor countries, this declines as economic development takes place, such as occurred in Britain after 1846.[3] In this case small growers often suffer not just from a 'landlord bias' in policies, but also from an 'urban bias'. Prices of basic foods are kept artificially low, and public sector investment in

[2] Cline and Berry (1979, p.7, 14). Griffin, Rahman Khan & Ickowitz, (2002, pp.286).

[3] Indeed, in some instances large landowners have been shown to positively discourage state investment in their areas of influence. See, for example, Alston y Ferrie (1993).

infrastructure and human capital (education, research, health), is directed towards urban rather than rural areas. A 'successful redistributive land reform requires the simultaneous elimination of both landlord bias and urban bias'.[4]

TABLE 1.

LABOUR USE IN ANDALUCIA AND EXTREMADURA, 1920.

Crops and rotations	Labour employed (number of days per year).	Output per day, in pesetas.	Hectares required to produce a net income of 5000 pesetas.
Extensive cereal rotations			
Rozas	8.8	11.1	
Cuarto	12.5	12.8	125,0
Tercio	17.5	12.9	66,7
Rotations of average intensity			
Año y vez -cereales	25.0	14.0	28,6
Olives (normal)	31.2	11.2	14,3
Vines (normal)	43.8	11.3	10,1
Intensive cropping			
Olives (intensive)	62.5	11.2	7,1
Vines (intensive)	237.5	6.3	3,3
Irrigation (normal)	175.0	12.0	2,4
Highly intensive rotations			
Irrigation (intensive)	375.0	10.7	1,25

Source: Carrión (1932: 1977, pp.324, 341-2). See Simpson (1995, p.235).

The political problem with land reform in Spain during the Second Republic has been neatly summarised by Malefakis, who notes that a slow reform, in which landowners were fully compensated, ran the risk of widespread opposition from the landless. By contrast, a rapid reform in which the legal niceties concerning property rights were overlooked, risked fierce opposition from landowners.[5] The governments of the Second Republic managed to alienate both groups, and the quantity of land redistributed was relatively small, at least prior to February 1936. In this paper we argue there was an additional problem which has not been fully considered by historians, namely the difficulties associated with converting an efficient, but extensive farming system, that had developed over centuries, into an intensive farming system

[4] Griffin, Rahman Khan & Ickowitz (2002, pp.284-5).
[5] Malefakis (1970). In this paper we do not consider the important question of labour and labour markets. For our comments on these, see Carmona and Simpson (2003, pp.97-115).

which would allow the landless labourers settled on small farms to be economically viable.[6] The paper comprises three sections. In the first we look at the nature of the latifundio, and in particular why labour was undersupplied and farms remained large, even when rented. The second section looks at the implications of converting a highly specialised agriculture based on cereals (and livestock) into another, more suitable for family farms. Finally, in the last section we consider the difficulties in removing the 'urban bias' in a society where the farm sector was becoming increasing less important.

1. Latifundios and the organisation of large estates in Andalusia

Farm property in Andalusia, whether it was land or livestock, was concentrated in the hands of a few large owners. Although perhaps two-thirds of the land in Bética (provinces of Córdoba, Sevilla, Huelva, Jaén and Cádiz) was cultivated directly by owners (explotación directa) by the late 1920s, land that was rented was traditionally done so in large units.[7] In this section we shall argue that the historical evolution of the latifundio produced an organisational structure which made it difficult to reform. This problem was further compounded by the predominance of extensive cereals and livestock production, a fact that would require radical changes if sufficient employment was to be created (Section 2). Land reform was unlikely to have proved a success, even if the social and political background had been more favourable (Section 3).

TABLE 2
Distribution of land by size of holding, 1930

	Average size of holdings	Small holdings (less than 10 hectares)		Medium holdings (10 to 100 hectares)		Large holdings (more than 100 hects)	
		Total no holdings (000s)	Total area (000s of hectares)	Total no holdings (000s)	Total area (000s of hectares)	Total no holdings (000s)	Total area (000s of hectares)
SPAIN	0.65 hectares	53.548	11.954	439	10.675	49	12.277
North	0.43 hectares	26.982	7.217	104	2.581	8	1.764
Centre	1.10 hectares	6.240	3.691	58	1.544	6	1.687
South	3.97 hectares	3.776	4.323	111	3.067	22	8.120

Calculated from Malefakis (1970), Appendix C.

Table 2 illustrates, very roughly, the concentration in land ownership in Spain. Naturally there were significant variations, even within regions of latifundios. For

[6] Efficient in terms of total factor productivity and private, rather than social returns.
[7] Calculated from Ministerio de Hacienda (1931).

example, in Bética over 57 per cent of the land was found on farms of more than 100 hectares, 46 per cent of land was on holdings of more than 250 hectares, and 31 per cent of land on holdings over 500 hectares.[8] However, and as Malefakis has argued, not only do these figures underestimate the degree of concentration, but latifundios were just as likely to be found on the fertile land of the Campiña as they were on the poorer soils. For example, farms of over 250 hectares occupied 69 per cent of the land in the municipalities of Almodóvar del Rio, 56 per cent in Ecija and 73 per cent in Jerez.[9] In Western Andalusia, less than 1% of holdings accounted for 57% of area and 43% of taxable income in 1930. In the mid-nineteenth century, the country's 55 highest taxpayers paid 41 per cent of the total on properties in Bética, a figure that increases to 51 if Extremadura is also included.[10] All the important aristocratic houses owned extensive estates in the south and, although their importance declined over time, undercultivation was considered to be made worse because many owners were absentee, and leased their land.

TABLE 3.
Concentration of cattle ownership in Southern Spain, 1865

	30-50	%	50-100	%	> 100	%
Cádiz	266	12.7	175	12.4	202	27.1
Córdoba	244	11.7	277	19.7	88	11.8
Huelva	75	3.6	46	3.3	38	5.1
Sevilla	284	13.6	270	19.2	175	23.5
Bética	869	41.5	768	54.6	503	67.5
Badajoz	143	6.8	153	10.9	66	8.9
Cáceres	160	7.6	96	6.8	21	2.8
Extremadura	303	14.5	249	17.7	87	11.7
Total	**1172**	**56.0**	**1017**	**72.3**	**590**	**79.2**
Spain	2092	100.0	1407	100.0	745	100.0

Sources: Junta General de Estadística, 1868, p.205

There were also extremes in the ownership of livestock. In 1865, although Andalusia had only 11.2 per cent of the nation's cattle, it had 61 per cent of all animals found in herds of over 30 animals, a figure that increases to over 85 per cent if Malefakis's definition of Southern Spain is used (Table 3). Half the country's herds of

[8] Carrión (1932, pp.54-5)
[9] For the underestimation of farm size, see especially Malefakis (1970, chapter 1).
[10] Congost (1983, pp.289).

more than 100 animals were found in Cádiz and Sevilla alone. Many of the large livestock owners were also tenants of large estates (cortijos). Although off-farm sales of livestock produce was important in the poorer northern areas of Andalusia and the rich pastures in Cádiz, on the extensive cereal land most cattle were kept primarily as work animals. Thus some 60 % of Cordoba's cattle were work animals in 1891, and the figure reached 90% in the campiña where the latifundios predominated.[11] One sample of large tenants who lived in the municipality of Cordoba, one of the largest in Spain, cultivated on average 430 hectares each with the help of 68 animals in 1860 (Table 4). In fact many of these tenants cultivated more than one farm (cortijo), which suggests that scale was even greater than is indicated in the table. There are no figures on livestock composition, but the isolated figures suggest that apart from oxen for the plough teams, a number of cows were kept for breeding, horses for the threshing, pigs, sheep and donkeys.[12]

Table 4.
Herd size and farm size in Cordoba municipality, 1860

	hectares	cattle head	hectares/cattle
total 39 farmers	17157	2644	
average per farmer	439.9	67.8	6.5
standard deviation	203.9	33.3	1.8

Source: Mata, 1987, pp.92-3

Oxen were the chosen work animal on the large estates even in the 1930s, and would be substituted directly by tractors.[13] The usual explanation for the persistence of oxen until so late is that the deep soils of the campiña required at least four oxen to plough them, and that the harvest stubble and natural pastures produced on the fallow kept feeding costs low.[14] Mules by contrast, which was the work animal most widely used in dry-farming in the rest of Spain, were the preferred work animal for the small tenants close to the towns or in the olive groves. [15]The extension of crop cultivation and, in particular, the planting of olives encouraged the spread of the mule, so that if they

[11] Lopez Ontiveros (1974, p.313).
[12] Bernal (1988); Lopez Ontiveros (1974, pp.309-10)
[13] Mata Olmo (1987)
[14] Drain (1977).
[15] López Ontiveros (1974, p.313).

provided about a third of work animals in 1865 and 1891, the figure had increased to about two thirds by 1933.[16]

In general terms large owners were free to choose contracts to work the land that would maximise returns. Economies of scale existed in farm management, as large tenants were more solvent, had capital to invest and owned more livestock. They also found it easier to sell in distant markets. Small farmers, by contrast, are more competitive when there are significant problems of moral hazard and monitoring of labour, or, as one commentator nothed, when there is a need for labour 'of a special quality and an individualised nature'.[17] As we shall see, this implied that small farms were more likely to be competitive when crops required individual attention, such as vines or market gardening, or with farm animals, and in particular in dairying. When tasks were more mechanical in nature, such as ploughing, sowing or harvesting cereals, then the large farmers suffered less from agency problems than with other tasks in the use of wage labour. In addition, and, of special relevance for our period, some of these routine tasks began to become mechanised which allowed the large farmers to benefit not just from their better access to capital, but also from enjoying sufficient scale to make the machines profitable.

The preference for large tenants in southern Spain was originally because of the lower transaction costs associated with renting land in large, rather than small properties. Bernal, for example, notes that the Duque de Osuna had a total of 677 latifundios distributed in 14 municipalities in Bética in the mid-nineteenth century.[18] Large, absentee landowners such as the Duke of Osuna had difficulties in creating efficient administrative systems of their properties, and therefore preferred to reduce the number of tenants that they had dealings with. Large landowners in Britain also preferred large tenants, at least prior to the late nineteenth century.[19] Tenants had to be wealthy to be able to both rent the large farms and have sufficient animals to stock them. However their size helped them in capital markets, and they were able to offer guarantees to landowners which small tenants were unable to. However, when times were especially difficult, such as at the end of the eighteenth century or the end of the nineteenth century, the large tenants sometimes had difficulties paying the rent and demanded reductions, which suggests that smaller tenants would have had even greater

[16] Simpson (1987, p.282). The figures refer to Córdoba and Sevilla. Zapata (1986).
[17] Levy (1911, p.181).
[18] Bernal (1988, p.119)
[19] Carmona (1995 and 2001) and Robledo and Casado (2004).

difficulties paying, and the large landowners to manage their properties.[20] One of the problems for the large landowners was to find tenants who were solvent, which explains the attraction in reducing transaction costs by simply renewing contracts and reducing rents.[21] The persistence of these problems perhaps indicated that the number of large tenants were inferior to the number of farms.

Where economies of scale were less important, such as in olive production, farm size was smaller, favouring the use of mules which were faster than oxen.[22] Olives require a light soil, which made this tree crop unsuitable for a large part of the Guadalquivir valley.[23]

Large landowners preferred to rent land in large units, a policy that was not necessarily inefficient if crops had low monitoring costs and if labourers access to common lands for seasonal employment. Extensive, as oppose to intensive livestock farming, did not require many workers.[24] Provincial agronomists at the end of the nineteenth century estimated that 7 men and 5 boys were sufficient to look after a hundred head of cattle; 30 mares; 200 sheep; 20 pigs and 20 donkeys. [25] It was not, however, an efficient system when product markets encouraged a more intensive use of the land, such as occurred in England from the 1870s or Andalusia in the 1930s. One possible solution was sub-leasing, which combined low transaction costs for landowners with the possibility of allowing small farmers access to the land. Yet, with the exception of the extensive *dehesas* in Extremadura, this was not widely carried out.

The latifundio in southern Spain developed over the centuries as a solution for landowning aristocracy to the demands for cereals and meat in a labour scarce economy. The enclosure of lands, as in England, started as early as the sixteenth century, with the appropriation of common lands (*tierras comunales* and *baldíos*), for extensive cereal / livestock farming.[26]

As in southern Italy or Eastern Europe, large areas of extensively cultivated land surrounded large urban settlements in Andalusia.[27] Municipalities in southern Spain were three times larger than the national average (54 km²), and five times those of

[20] López Estudillo, 2005, p.35
[21] Ibidem.
[22] Bernal (1988).
[23] Mata (1987); Lopez Ontiveros (1974).
[24] For Seville and Cádiz, López Martínez (2002, 194-5); for Cordoba, López Ontiveros (1974, 309-11).
[25] Avance (1891, pp. 330-3).
[26] López Martínez (2001, pp.17-19).
[27] Dovring (1956, p.??).

Castilla-León (33 km²).[28] Some townships in the rich, fertile plain (*Campiña*) were even larger, with more than 1000 km², of which most were cultivated.[29] These extensive townships provided another dimension to crop choice. In a municipality of 1000 km² (100,000 hectares) with the land distributed in a perfect circle around it, the average distance of a farm would be nine kilometres, and the furthest 18 kilometres. In reality, some land was as far away as 40 or 50 kilometres from the town, and the source of labour supply.[30] The large *cortijos* (permanent farms) were therefore scattered over the countryside, and housed the livestock and permanent labour. The large quantities of seasonal labour was provided from the distant towns or from outside the region. A relatively efficient system which had developed for extensive cereals / livestock, was difficult to adapt to intensive, small farm cultivation.

2. Latifundios and cereal cultivation, 1873-1931.

The impact of cheap New World cereals on European agriculture after 1870 varied significantly. At one extreme, falling prices led to the area of wheat in Great Britain declining by 42 per cent, from 1.35 million hectares in 1866/75, to 0.78 millions in 1938.[31] The switch into livestock and poultry was helped both by cheap, imported animal feed, and by the greater demand elasticities for these products amongst the increasingly wealthy urban consumers. Denmark followed a similar path, specialising for the British market. At the other extreme, levels of protection in Spain were sufficient to produce an increase in the area of cereals and legumes of 20 per cent or 1.56 million hectares, between 1886/90 and 1930/5.[32] High bread prices, relatively low wages and low levels of urbanisation all combined to limit the demand for livestock products and other farm products with a high elasticity of demand in Spain. In 1925/9, Spain was 96.9 per cent self-sufficient in bread grains, while in France the figure was 86.2 per cent, in Italy 74 per cent and in Great Britain 21 per cent.[33] In 1910 cereals and legumes contributed only 11 per cent of final agricultural output in the United Kingdom, 22 per cent in France, but 31 per cent in the case of Spain (Table 3).

[28] The average size of townships in Cordoba was 183 km², in Cadiz 174 km², in Seville 138 km² or in Ciudad Real, 205 km². Carrión (1932, pp.305-7).
[29] Carrión (1932, p.312). Some 70 per cent of the Campiña cordobesa was cultivated in 1970 according to López Ontiveros (1974, p.229).
[30] Average area form López Ontiveros (1974, p.399).
[31] Ministry of Agriculture, Fisheries and Food (1968, p.34).
[32] GEHR (1983, p.318).
[33] International Institute of Agriculture, various years.

Table 5

Composition of agricultural final agricultural output in 1910

	France	Germany	Italy	Spain	U.K.
Cereals, pulses and hay	23.0	18.9	22.2	34.7	15.0
Veg and raw materials	8.2	12.8	13.0	15.7	9.6
Fruits, olive oil & wine	24.4	2.7	36.2	19.8	2.4
Livestock products	44.4	65.3	28.3	30.2	71.9
Others	0.0	0.3	0.0	0.1	1.1
Total	100	100	99.5	100	100

Source: O'Brien and Prados de la Escosura (1992, Table 3).

Composition of agricultural final agricultural output in Spain by region in 1910

	Cereals	Vines & olives	Other crops	Livestock products	Hectares per male worker
North	16.8	2.6	26.7	53.9	3.4
Interior	41.0	13.2	23.7	22.2	10.8
Andalusia	28.4	27.5	23.6	20.5	5.7
Mediterranean	15.5	17.3	48.5	18.7	4.1
Spain	28.0	14.3	31.0	26.7	7.1

Source: Simpson (1995, table 2.4).

The level of cereal protection, and consequently the relative importance of these crops, was highly relevant to the question of whether land reform was likely to be a success or not. In the first instance, labour requirements with cereals were relatively small (Table 1). Thus in Andalusia and Extremadura, the annual employment in cereals in most cases varied between 17.5 and 25 days a year (*al tercio* and *año y vez*), compared to 33 or 44 days in extensive olive cultivation and viticulture.[34] A second, and related factor, was that mechanisation and labour- saving technologies could be

[34] In all cases, small farms are likely to have used more labour than on larger farms.

relatively easily applied to cereals. Binswanger groups farm operations according to their relative intensity with which they require *power* (or energy) relative to the *control* functions of human mind, or as we have noted in section one, labour *quality*.[35] Activities such as threshing or milling required considerably quantities of power, but limited control, and this made them relatively easy to mechanise. Land preparation, especially for primary tillage, also required large amounts of energy, which could be met by the use of tractors. By the 1930s, a relatively high degree of mechanisation was possible with cereals, but the opportunities were much less with most other crops. Cereal harvesting was labour and energy intensive, but with fruits, vegetables, olives or vines, the possible damages to the crop were much greater and it was necessary to select the ripe fruit individually.

The relative ease of mechanising with cereals allowed an increase in the scale of production from the second half of the nineteenth century. In the United States, with the exception of California, cereals were predominantly produced on family farms.[36] The high cost of labour encouraged mechanisation, and with it a growth in scale. Paul David has argued that the diffusion of the reapers from the 1850s encouraged a growth in farm size. Further technological change encouraged further increases. For example in Kansas, which moved from the sixth leading producer in 1889 to become the largest in 1919, average farm size increase from 155 to 283 acres between 1880 and 1930.[37] In the major wheat –exporting areas of countries such as the United States, Canada, Argentina and Australia, the average size of farms on the eve of the First World War was almost 100 hectares.[38] These were obviously considerably larger than those found in Castilla-León, where José Cascón noted at this time the typical farmer had about 30 hectares, of which only half were sown each year.[39] By contrast, it is likely in Andalusia that an important area of cereal cultivation was carried out on farms at least as large as those found in exporting countries.

The early appearance of labour saving technologies in Andalusia have been extensively documented by historians.[40] If cereal farmers in the region continued to use

[35] Binswanger (1984).
[36] California was the second largest producing state in 1889, but had dropped to 23 largest two decades later, as farmers switched into irrigated fruit and vegetables instead.
[37] United States Department of Agriculture (1932, pp.53 and 743).
[38] Figures are 85 hectares in the United States, 117 hectares in Canada, 102 hectares in Australia and 78 hectares in Argentina. Offer (1989, table 6.2).
[39] EPAPM (7 enero 1909, no.610, p.3).
[40] Bernal (1988 and 1998), Cabral Chamorro (2000), Martínez Ruiz (2000) and Simpson (1987 and 1995).

large quantities of manual labour in the half century prior to the Civil War, it was because labour was cheap. When wages started increasing, or labour militancy increased transaction costs, then farmers quickly looked to mechanise.[41] On international markets, irrigated wheat was unprofitable, and increases in productivity in the half century prior to the Second World War came not from new biological technologies and improved yields, but through *increasing* farm size and mechanisation.[42]

Table 4 below considers how decisions over protection would affect different farm sizes. Countries which protected cereal farmers found that there were few incentives to break up large farms (Andalusia), whereas in those which allowed free trade, cereal farmers had either to mechanise to remain competitive (and therefore often encouraging larger farms), or switch into other products, which in turn implied smaller farms. When the original farm size was already small, and protection was sufficient to encourage farmers to remain in cereals, then the incentive was to *increase* holdings to take advantage of the increasing choice of machinery (Castilla-Leon).[43] If there was free trade (or levels of protection not sufficiently high to allow small cereal farmers to compete), then these farmers would be forced to abandon cereals and switch into other crops, livestock or to abandon farming all together. Soil quality and climate, location, human capital and market outlets determined whether farmers switched into other products, or simply migrated to the cities.

Table 6.

ORIGINAL FARM SIZE	PROTECTION FOR CEREALS	INCENTIVES TO REDUCE FARM SIZE	POTENTIAL IMPACT ON LABOUR PRODUCTIVITY
Large	Yes	None	Limited
"	No (or limited)	Yes > labour intensive crops	Significant
"	"	No > mechanisation	Significant
Small	Yes	No	Limited
"	No (or limited)	Yes > labour intensive crops	?

[41] For changes in rural wages and the speed of mechanisation of the cereal harvest in Spain, see Simpson (1996).
[42] Malenbaum (1953),
[43] Castilla-León saw the area of cereal-legumes increase by 22% between 1902/12 and 1930/5, and the farm population decline by 35%.

	"	No > rural exodus	

There are no farm accounts available for this period, but the evidence suggests that cereals were especially profitable. Bernal has noted that tariffs were set at a level to protect the small farmer of the interior, and thereby allowing large profits in the south.[44] The relative importance of cereals (and legumes) in the latifundio provinces therefore fell only slightly, from 38 per cent to 33 per cent of the producción final agraria between 1910 and 1930, compared to the national decline from 34 to 28 per cent. In terms of work, employment opportunities in cereals and legumes in the provinces of Cádiz, Córdoba, Jaén and Sevilla, peaked at about 24.7 million days in 1898-1900, but were still 22.7 million in 1931-35, or almost 40 per cent of the demand in arable.[45] With the increase in real wages, especially in the 1930s, the benefits that large, compact farms enjoyed for mechanisation became increasingly apparent. The success of land reform in Andalusia therefore required not just a redistribution of land, but also a change in the nature of crops and livestock production. Yet the possibility of introducing changes in land use were likely to find important short-term difficulties, not just because of the nature of resources endowments but also because the organisational structure of farming. The need for rapid changes in agriculture, such as trying to adapt to the fall and changes in relative farm prices, such as experienced by British farmers after 1873, could produce a situation where an originally efficiently organised agriculture could quickly becomes inadequate. As Avner Offer has noted:

> The English farmer was shackled by his previous success, by past cycles of innovation, by enclosure and high farming which had formed his fields and farmsteads, which had raised his rents to their high levels. .. England in the 1880s was struck with an obsolete agriculture, inherited from a successful past. Landowners (like industrialists who followed the same path later) found it difficult to write off obsolete investments. At the same time, they were unwilling to make new ones. In any case, enterprise was required more than investment, and this was inhibited by the deadweight of land values.[46]

3. Conclusion

A redistribution of land was therefore only the first step. The new farmers needed equipment and farm buildings, and if they were to successfully work their land, many

[44] Bernal (1985).
[45] Simpson (1992).
[46] Offer (1991, pp. 119-20).

would have to leave the villages and establish new settlements on the land.[47] It is also clear that major changes in farm policies would have been required in Andalusia if landless labourers were going to be converted into successful small farmers. To realise the potential for increasing productivity on small farms, farmers had to make a series of investment decisions. First they had to chose a suitable product mix. This involved both selecting products that were suitable to their land (and levels of physical and human capital), but also one for which a suitable marketing structure was available. The early twentieth century witnessed the development of new technologies and institutions which allowed farmers to reduce production and marketing costs. New drainage and irrigation techniques changed land quality and, together with chemical fertilisers, provided much greater possibilities for farmers to change their product mixes and / or increase yields. Farmers needed to be literate, as the number of magazines and books devoted to practical farming topics was expanding rapidly. Finally, if the economies of scale on farms was limited, and therefore favoured as we have seen the small, family farm, there were increasing economies of scale to be found outside the farm. Buying and marketing co-operatives not only allowed small farmers to benefit from these economies, but they also allowed them to capture themselves the margins that were previously enjoyed by wholesalers.

Land reform in Andalusia faced three problems. First, and noted above, the heavy dependence on cereal rotations and large-scale extensive livestock, - measured by the area utilised, or the demand for labour, or their contribution to the agrarian final output - was an important obstacle to a successful reform. Rather than allowing for a greater use of labour, further mechanisation was likely to reduce its demand. A second problem was that many of the potential landless recipients of land had not been renting the land prior to its redistributed. In the five countries since the Second World War where the redistribution of land was 'perhaps the most comprehensive ever implemented', namely in Japan, Taiwan, South Korea, China and Vietnam, that had been a very high incidence of tenancy. In the case of the first three countries, the land reforms would give the tenants the possibility of purchasing their land at a very low, artificial price.[48] There were few problems for the farmers to adapt. By contrast in China and Vietnam, land initially was worked in collective farms, with a second land reform a

[47] In this respect, a communal organisation of property perhaps made more sense than a privately owned one.
[48] Griffin, Rahman Khan & Ickowitz (2002, pp.302-7).

couple of decades later allowing peasants to cultivate the land. Even in a period of low conflicts, and with a government sympathetic to the small farmer, the problems of converting Andalusia's latifundios into market orientated small farms would have been immense.

The final point relates to 'sympathetic' governments. In many countries where land reform has been deemed as being necessary, such as Spain in the early twentieth century, the owners of the large estates had a significant influence over government policies. Potential challenges to this influence could come from both small farmers, and also the non-farm sector. In Latin America, many of the attempts at land reform took place at the same time as governments were following import substituting industrialisation policies which discriminated against agriculture. The same was also probably true of Spain. In the case of irrigation, Carreras and Tafunell have noted:

> Los intereses de las compañías eléctricas, de los grandes propietarios – temerosos de la asociación de los pequeños cultivadores en comunidades de regantes – y la inclinación de los gobernantes por políticas industrialistas antes que agraristas, confluyeron en la promoción de embalses para producir energía eléctrica.[49]

Certainly, as studies by Bernal, Estudillo, Florencio, Montañes or Robledo, among others have shown, the debate over 'la crisis agraria' in Andalusia was not simple. A number of attempts were made to establish 'colonias', together with irrigation schemes and a diversification cultivation. Yet in general the results were not very successful, precisely because the latifundio's comparative advantage was with extensive cereals and livestock. The advent of the Second Republic in 1931, when a real political market for votes appeared, might have led to the government indulging and not penalising peasant producers, instead the fact that many small farmers fell threatened themselves by the 1932 law, helped the right to win the elections the following year.

[49] Carreras and Tafunell (2004, p.241)

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