

COMMON LANDS AND ECONOMIC DEVELOPMENT IN 19TH AND EARLY 20TH CENTURY SPAIN

Francisco J. Beltrán Tapia



Doctor of Philosophy in Economic and Social History

Trinity Term 2014

Nuffield College

University of Oxford

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SHORT ABSTRACT - 300 words

This dissertation contributes to the long-standing debate between those who argue that the enclosure of the commons was as a precondition to foster economic growth and those who defend common property regimes can be efficient and sustainable. Exploiting historical evidence from 19th century and early 20th century Spain, this research shows that the persistence of the commons in some Spanish regions was not detrimental to economic development, at least relative to the institutional arrangements they were replaced with. On the contrary, during the early stages of modern economic growth, the communal regime not only did not limit agricultural productivity growth, but indeed constituted a crucial part of the functioning of the rural economics in a number of ways. On the one hand, these collective resources complemented rural incomes and, subsequently, sustained households' consumption capacity. The reduction in life expectancy and heights in the provinces where privatisation was more intense, as well as the negative effect on literacy levels, strongly supports that the privatisation of the commons deteriorated the living standards of a relatively large part of the population. On the other hand, the communal regime also significantly contributed to financing the municipal budget. Deprived from this important source of revenue, local councils became unable to adequately fund local public goods and ended up increasing local taxes. Lastly, the social networks developed around the use and management of these collective resources facilitated the diffusion of information and the building of mutual knowledge and trust, thus constituting a vital ingredient of the social glue that hold these rural communities together. All things considered, the persistence of the commons in some regions provided peasants with cooperation mechanisms different from the market and made the transition to modern economic growth more socially sustainable.

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EXTENDED ABSTRACT – 2,500 words

Traditional historiography has positively regarded the privatization of the communal regime as a precondition to foster economic growth^a. This line of enquiry argues that private property rights are required in order to trigger investment and innovation and also, that common property regimes lead to overexploitation of the resources. The negative image surrounding the communal regime was most influentially put forward by Garret Hardin's portrayal of the 'tragedy of the commons'^b. However, starting in the 1980s, a growing literature examining historical and contemporary commons has shown that common property regimes can be efficient and sustainable, thus casting doubt in the previous interpretations and revaluating the role that common resources had for the local communities that managed them^c. According to these authors, what is essential is not whether property rights are private, public or communal but whether they are properly defined and enforced.

This dissertation contributes to this long-standing debate by exploiting historical evidence drawn from 19th century and early 20th century Spain. Common lands were a key component in the organic-based Spanish preindustrial economy. In 1860, they represented above one fourth of the total Spanish territory, a figure which should have been much higher at the end of the 18th century. The commons not only provided pasture, wood, fertilizer and fuel, among other different goods, but also allowed for the possibility of temporary cropping, thus playing a fundamental role in the workings of

^a J.D. Chambers and G.E. Mingay, *The agricultural revolution, 1750-1880* (London, 1966); D.C. North and R.P. Thomas, 'The first economic revolution', *Economic History Review*, 30 (1978).

^b G. Hardin, 'The tragedy of the commons', *Science*, 162 (1968).

^c R. Allen, 'The efficiency and distributional consequences of eighteenth century enclosures', *The Economic Journal*, 92 (1982); C.F. Runge, 'Common property and collective action in economic development', *World Development*, 14 (1986); E. Ostrom, *Governing the commons. The evolution of institutions for collective action* (Cambridge, 1990).

the rural communities. These communal resources were actually a crucial element of a system in which agricultural activity was completely integrated with cattle breeding and forestry. Importantly, the communal regime in Spain involved two main types of access to the land: a direct but regulated access for all members of the community (*comunales*) or a temporary cession of user-rights to particular individuals in exchange for a monetary income (*propios*). The latter, the commons which were rented out to individuals, did actually constitute an important source of revenue for municipalities.

The transformations caused by the transition to capitalism, and the emergence of a new liberal state, however, triggered their gradual dismantling throughout the 19th and early 20th centuries. Fuelled by ideological and fiscal pressures, the magnitude of this process was enormous: around 20 per cent of the total land ended up privatised during this period. What makes the Spanish case especially interesting is that, despite following a similar path to other European countries, the importance of the privatization process was geographically diverse. While some regions completely dismantled the communal regime, others managed to preserve a large stock of common lands, thus turning the Spanish experience into an ideal case study on which to base this research. Although explaining the reasons behind the privatisation process and its regionally uneven outcome, together with its consequences on the agricultural sector and the local communities, has produced an enormous literature, previous research on this topic has made little use of quantitative techniques, which has made an overall assessment of the process difficult^d.

This dissertation is a first step to fill this gap in the literature. Combining primary and secondary sources, I have collected a quantitative and a qualitative panel data set at the provincial level at three different time-periods (1860, 1900 and 1930). The information gathered has allowed me to carry out a comparative study of the historical data at the provincial level using econometric techniques with the aim of analysing the forces behind the privatisation of the communal regime and how this process affected economic development. Although it is true that using the province as a unit of analysis may conceal some of the variation within provinces, this strategy has allowed me to be able to examine the impact of privatisation on different economic and social dimensions and to take into consideration a large number of other variables which

^d For recent summaries, see I. Iriarte, 'Common lands in Spain, 1800-1995: Persistence, change and adaptation', *Rural History*, 13 (2002); X.L. Balboa, 'La historia de los montes públicos españoles (1812-1936): Un balance y algunas propuestas', *Historia Agraria*, 18 (1999); J.I. Jiménez Blanco, 'El monte: Una atalaya de la Historia', *Historia Agraria*, 26 (2002).

account for other important developments that were taking place at the same time. The period under analysis is indeed one characterised by fundamental transformations. Apart from urbanisation and industrialisation, the Spanish economy and society certainly underwent profound changes such as growing demographic pressures, improvements in agricultural productivity or the gradual increase of market integration, to name only a few.

The first chapter examines the diverse persistence of the communal regime and the reasons behind the dissimilar paths followed by the different regions. The initial research that examined the destiny of common lands in Spain attributed a leading role in their dismantling to the legislation introduced by the central government throughout this period^e. The rising liberal state, striving for its consolidation, would be the driving force of the process and the key to an understanding of its scope. However, without denying the boost it gave to the process, a reform imposed from the centre does not explain the diversity of regional outcomes. This first chapter thus tries to assess the relative contribution of different factors in shaping the privatisation process. The results of this analysis diminish the significance of market signals and show how the social and environmental conditions interacted to limit, or promote, the dismantling of the common lands. Apart from the greater need of resorting to the commons if agricultural production wanted to be increased in dry regions, the results stress that high levels of inequality in the access to land played a key role in promoting enclosure.

The rest of the dissertation examines how the persistence or the dismantling of collective resources shaped economic development by focusing on four different aspects: agricultural productivity, biological living standards, educational attainments and social capital. Firstly, in order to analyse the effect caused by the privatisation of communal resources on agricultural development, apart from having information on the stock of common lands and the agricultural output at the provincial level, I have gathered data on the different inputs affecting the level of agricultural output in 1900 and 1930. This includes information on agricultural labour force, diverse types of land and capital. The latter of these inputs refers to livestock and modern inputs such as artificial fertilisers, modern ploughs, threshing machines and tractors. By considering the commons as another productive factor, this chapter assesses their effect on

^e Sanz Fernández, 'La historia contemporánea'; J.I. Jiménez Blanco, 'Los montes de propiedad pública, 1833-1936', in F. Comín and P. Martín Aceña (eds.), *Historia de la empresa pública en España* (Madrid, 1991).

agricultural productivity. Given their role as provider of pasture, the link between common lands and livestock is also included in the analysis. Focusing on cross-regional differences during the period between 1900 and 1930 assures that the potential ultimate effect of the developments taking place throughout the 19th century is taken into account. This approach also enables the possibility of contrasting the role of the surviving commons in a dynamic period characterised by the increasing diffusion of modern agricultural inputs. The results show that, on average, the different stock of common lands did not explain the differences on the levels of agricultural output per worker between provinces. Even though privatisation fostered output per worker by bringing more land into cultivation, the role of the commons as provider of pasture and fertilising materials counteracted that effect, especially in humid regions.

Given that the dismantling of common lands was a measure that ‘touched almost every aspect of social and economic life’^f, the impact of privatisation on economic development is not only examined in terms of agricultural efficiency, but also regarding its effects on a wider array of economic outcomes. On the one hand, as mentioned above, the commons constituted a source of complementary income for rural households. Apart from wood, fuel or other products, the commons provided pasture to support livestock and offered the possibility of temporary cropping. These services, especially important for the bottom part of the income distribution, were not subject to market mechanisms, so quantifying their effect in terms of wages or income per capita becomes a hazardous task. Instead, the potential impact of these collective resources on standards of living is measured using life expectancy and heights. The empirical analysis not only shows that commons were at least as beneficial as private lands before 1860, but also that the persistence of these collective resources from then onwards was related to higher life expectancy and heights, particularly during the second half of the 19th century. Biological human welfare also seems to have been negatively influenced by the progressively decreasing role that local communities played on the management of these resources, thus supporting the claims defended by Elinor Ostrom^g.

On the other hand, during the 19th century, municipalities were responsible for the provision of elementary education and their financial capacity was crucial when it came to fund schooling expenditures. Spain experienced a delayed and geographically

^f Tortella, *The development*, p. 51.

^g Ostrom, *Governing the commons*.

uneven spread of literacy, resulting in very poor average levels of human capital^h. The monetary income derived from the cession of user-rights on the commons actually constituted a fundamental component of the municipal budget. Given that municipalities were responsible for the provision of elementary education, their financial capacity was crucial in the funding of schooling expenditures. Chapter four thus tests whether enclosure affected the evolution of human capital. Framed within the transition from restricted to universal literacy, common lands appear to have positively contributed to achieving significantly higher levels of both schooling expenditure and literacy rates. The exercise carried out shows that these collective resources, by supporting both municipal and households' incomes, sustained both the local supply of education and the demand for it, although their influence decreased over time.

Lastly, the dismantling of collective practices attacked the social fabric that knitted the community together by negatively affecting the possibility of resorting to cooperation mechanisms different from the market. The link between the institutions formed around the use and management of collective resources and social capital is explored in chapter five. Common lands, and also irrigation communities, provided dense networks of continuous social interactions that facilitated the diffusion of information and the building of mutual knowledge and trust, thus potentially favouring cooperative behaviour. The emergence of agricultural cooperatives in early 20th century Spain is used in this last chapter as the testing ground for this hypothesis. The results show that a higher stock of collectively-managed resources in 1900, employed as a proxy for social capital, is positively associated with the fraction of the rural population involved in agricultural cooperatives in the 1920s.

Contrary to what contemporary liberal thinkers and those who drank from those sources later on defended, my research shows that the dismantling of collective practices in 19th century Spain had unintended consequences for economic development. Not only did the privatisation of common lands not significantly foster agricultural productivity, but also this process did negatively affect other dimensions of these rural societies. Most research on the effect of institutional change usually focuses on a particular aspect of the institution in question. However, any particular institution

^h C.E. Núñez, *La fuente de la riqueza. Educación y desarrollo económico en la España contemporánea* (Madrid, 1992).

plays different roles and these activities are usually not separableⁱ. Crucially, this study illustrates that, if the overall economic and social efficiency of a certain institutional change is to be addressed, all the dimensions affected by that process need to be analysed.

This research also highlights that the effect of the privatization of common lands on economic development is not as linear as traditional historiography had suggested. Instead, its impact would depend on the context and the timing in which it is applied^j. On the one hand, the economic, social and environmental framework of each rural society determines the benefits and the costs of these changes, so it becomes a key factor to understand their impact. In this regard, the social and institutional context becomes especially important because it influences who benefits from these transformations. Where large landowners prevailed, privatisation was more intense and it was carried out at the expense of the lower ranks of the rural population, whose living standards deteriorated.

On the other hand, the timing of the process is also of considerable importance because of two main reasons. First of all, the potential benefits of the privatisation may not be fully achieved unless society has reached a determined level of development. A modernising agriculture requires not only financial resources, but also sufficient economic incentives to carry out those investments. Even in the case that private property rights provided better incentives, the low levels of income per capita, together with the unequal land property structure characteristic of 19th century Spain, may have prevented that enclosure led to a more widespread adoption of modern agricultural techniques. Secondly, the negative effects of the dismantling of the communal regime can only be limited if either a wide array of market opportunities exists or a new set of institutions is built to substitute the functions that the commons fulfilled for the local community. Urbanisation and industrialisation only began to generate significant non-agricultural employment opportunities from the late 19th century onwards and, unlike the Poor Laws in Britain, no compensation measures for landless peasants were deployed despite the privatisation of common lands. On the contrary, while state intervention in public health or primary schooling only slowly started during the first decades of the 20th century, privatisation imposed a terrible shock on local institutions,

ⁱ S. Ogilvie, “‘Whatever is, is right’? Economic institutions in pre-industrial Europe’, *Economic History Review*, 60 (2007), p. 668.

^j H.-J. Chang, ‘Institutions and economic development: Theory, policy and history’, *Journal of Institutional Economics*, 7 (2011).

which became incapable of providing basic public services and were also forced to increase the tax burden. In this regard, this research shows that the positive effect of the surviving common lands on biological living standards and educational attainments is especially strong during the second half of the 19th century and becomes smaller during the early 20th century as the public sector began to intervene in those spheres. The evidence presented therefore shows that the choice followed by liberal governments of speeding up the transition to capitalism by urging the privatisation of common lands, irrespective of the particular context, was mistaken.

ACKNOWLEDGMENTS

Thinking about how this dissertation came to life is realising that all this effort could not have been possible without the help of an extensive network of colleagues and the caring support of family and friends.

This catalogue of recognitions should start from the very beginning when, while working as a teacher of (A-level) Economics in Valderrobres, a beautiful small village in north-eastern Spain, I embarked in the graduate program in Economics at the University of Zaragoza. Encountering the energy, dedication and enthusiasm of the Economic History Department there constituted a crucial turning-point in my subsequent academic career. Among them, I feel deeply grateful to Domingo Gallego, Vicente Pinilla and Iñaki Iriarte for their invaluable advice and long-standing support throughout these years. I am especially indebted to Domingo for suggesting the Spanish enclosures as a potentially interesting topic which, although it had been thoroughly examined, it still had, in his opinion, some room for research. Our extensive discussions on these and other issues have crucially shaped my work. I would like to extend my gratitude to Mikeas Lana, from the Public University of Navarra who, as in the traditional fairy-tale structure, joined these three original helpers in making my transition to academic life easier and exciting.

My academic career, and my life for that matter, greatly changed when I was able to continue my graduate training at the University of Oxford. The social and economic history tribe at the University of Oxford and the vibrant community at Nuffield College have influenced my work in a number of ways. I have been incredibly fortunate to be part of such a challenging and, at the same time, supportive crowd. Among them, special mention to Arthur Downing, Rui Esteves, James Fenske, July Marfany, Kevin O'Rourke and Florian Ploeckl. Eric Schneider, who was the first person to warmly welcome me here, has been a great friend and a huge help throughout the sometimes tortuous paraphernalia of Oxford academic life. Our long conversations around a few pints definitely served to wash away some of our daily worries. I would also like to specially thank Jane Humphries and Deborah Oxley. I feel very honoured to have counted on their support. And my deepest gratitude to Bob Allen for believing in me and for his continuing support and guidance during all this time. I have been extremely privileged to have Bob as my supervisor and Oxford is not the same luminous place since he is not around.

I also gratefully acknowledge financial support from the Economic and Social Research Council and Nuffield College. The Economic History Association and the Spanish Ministry of Science and Education (Projects HAR2012-30732 and ECO2012-33286) has also allowed me to present my research in different venues. My work has greatly benefited from comments received at different conferences, seminars and workshops, so I would like to express my gratitude to all the colleagues I have been fortunate to cross paths with in those events. Among them, I am particularly indebted to Tine de Moor and Samuel Garrido who have shaped my work in a number of different ways.

Fortunately, there is life beyond the Nuffield walls. Going back and forth to Spain to spend time with my family and friends, or being visited by them, has kept me mentally (and physically) healthy. My huge gratitude to my dear friends Ángel, David, Óscar and Luis for always being there and for making me smile every time: you are amazing. Ana Belén also deserves a special mention for being so strong, active and affectionate. And a big hug to Isaac: it has been, my friend, a challenging but rewarding journey since we first met in the Highlands. I still remember those days. I wish you and Paula all the best.

And life is so beautiful thanks to Libe, the love of my life and closest friend. She changed my life from the moment we first met and her love and contestation has never stop inspiring and *affecting* me. Life has treated us well but the best is still to come.

None of this would have been possible without my family. I dedicate this dissertation to them. To Carlos, my brother, for his affection and for his willpower and great capacity for self-improvement, which do not cease to amaze me. To my parents, for showing me with their daily example the value of effort and perseverance and the importance of always doing things right (or, at least, trying). Thank you for your unconditional love and support. I love you so much.

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INTRODUCTION

‘Oh! –he replied raising both arms simultaneously–, that, my friend, is this village’s greatest wealth! That’s the *Common Field* ... It belongs to each and every one of the neighbours’¹.

In *Peñas Arriba* (1895), the celebrated 19th century novel by José María Pereda, the character of Don Celso, a relatively prosperous farmer of a small village in North-Western Spain, invites his nephew, Marcelo, who has spent most of his life in Madrid, to pay him a visit and get to know the place of origin of his ancestors. Without direct descendants and feeling that his days in this world were coming to an end, he secretly hopes that, after spending some time in the community, his nephew will accept to become his heir and take over his estates. In the passage above, Don Celso, from the balcony of his house, offers his just-arrived nephew a panoramic view of the countryside surrounding the village, while casually explaining him the functioning of the local economy. Pereda’s appraisal of the commons above continues by describing how the common meadow was collectively harvested in August and, then, equally distributed among the neighbours in a sort of celebratory ritual. This event is described in more detail at the end of the novel where men and women alike gather together to work in a merry atmosphere². Despite the idealised description, this image conveys the importance that the local community attached to the commons not only in purely economic terms but also as the center of socialisation³.

This passage also reflects the distance between the liberal ideology dominating the commanding heights of the 19th century Spanish economy and the wisdom of

¹ J. M. Pereda, *Peñas Arriba* (Madrid, [1895] 1999), p. 170 (my emphasis).

² Ibid, pp. 546-547.

³ The positive view of the commons and its important role within the community is also tied to the structure of the novel itself, since the description of the commons takes place at the beginning of the novel, when the still immature young nephew arrives to the village, and the actual harvest of the common meadow takes place in the last chapter when all the intricacies of the plot has been resolved and a now mature character decides to permanently stay in the village and take over his uncle’s patrimony.

popular knowledge. Despite numerous warnings arising from every corner of the Iberian Peninsula, the dismantling of the communal regime was seen as the panacea which would unleash extraordinary productive forces in the countryside, as well as solve, as a byproduct, the financial difficulties of the Treasury. Gaspar Melchor de Jovellanos, the prestigious agricultural reformer of the last third of the 18th century, rhetorically wonders in his well-known *Informe sobre el Expediente de Ley Agraria*: ‘What a spring of wealth will this decision alone not open, if subdued to the private property such vast and fecund territories, the action of the individual interest was then exercised [...]?’⁴. The belief that the communal regime was an archaic and inefficient institution was not exclusive to Spanish elites but was shared all across Europe. Jovellanos was actually advocating to mimic what was happening in Britain via the Parliamentary Enclosures and what was about to happen elsewhere in continental Europe⁵. Arthur Young, for instance, the influential English agronomist, was eagerly championing the advantages of enclosure roughly during the same period⁶. Jovellanos’ vision though was not implemented immediately. Almost one hundred years later, in 1872, the Spanish Ministry of Development, bitterly complained that the communal regime still constituted a harmful tradition that hampered the realisation of the nation’s full economic capacity⁷. The weakness of the Spanish liberal party and the conflicts presiding over most of the first half of the 19th century prevented the privatization of

⁴ G.M. de Jovellanos, *Informe de la Sociedad Económica de Madrid al Real y Supremo Consejo de Castilla en el Expediente de Ley Agraria* (Madrid, 1795), p. 21.

⁵ R. Robledo, *Economistas y reformadores españoles: La cuestión agraria, 1760-1935* (Madrid, 1993), pp. 30, 58; M.-D. Demélas and N. Vivier, *Les propriétés collectives face aux attaques libérales, 1750-1914: Europe occidentale et Amérique latine* (Rennes, 2003).

⁶ R. Allen, ‘The efficiency and distributional consequences of eighteenth century enclosures’, *The Economic Journal*, 92 (1982); R. Allen and C. O’Grada, ‘On the road again with Arthur Young: English, Irish, and French agriculture during the industrial revolution’, *Journal of Economic History*, 48 (1988), p. 97. For a detailed account of the pro-enclosure atmosphere in 18th century Britain, see L. Enrle, *English farming. Past and present* (London, 1961), pp. 150-161, 197-206, 249.

⁷ J. Sanz Fernández, ‘La historia contemporánea de los montes públicos españoles, 1812-1930. Notas y reflexiones (I)’, in R. Garrabou and J. Sanz Fernández (eds.), *Historia agraria de la España contemporánea*, vol. 2 (Barcelona, 1985), p. 218.

the commons from materializing earlier. However, as soon as the liberal government felt itself secured in office, the *General Disentailment Act* (1855) was quickly passed forcing local councils to sell their commons through public auctions. Policy and ideology went closely hand in hand⁸. Echoing liberal advocates all over the continent, Fermín Caballero, a prominent agricultural reformer writing at the height of the privatization process, regards the commons as ‘the worst agricultural illness, the cancer corroding its heart’⁹.

Hence, it is no wonder that, given this inheritance, traditional historiography has positively regarded the privatization of the communal regime as a precondition to foster economic growth¹⁰. This line of enquiry argues that private property rights are required in order to trigger investment and innovation and also, that common property regimes lead to overexploitation of the resources. The negative image surrounding the communal regime was most influentially put forward by Garret Hardin’s portrayal of the ‘tragedy of the commons’¹¹. According to him, ‘individuals locked into the logic of the commons are free only to bring on universal ruin’¹². However, starting in the 1980s, a growing literature examining historical and contemporary commons has shown that common property regimes can be efficient and sustainable, thus casting doubt in the previous interpretations and revaluating the role that common resources had for the local communities that managed them¹³. For these authors, what is essential is not

⁸ See Robledo, *Economistas*, pp. 65-63.

⁹ F. Caballero, *Fomento de la población rural. Memoria premiada por la Academia de Ciencias morales y políticas en el concurso de 1862* (Madrid, 1864), p. 121.

¹⁰ See J.D. Chambers and G.E. Mingay, *The agricultural revolution, 1750-1880* (London, 1966); D.C. North and R.P. Thomas, ‘The first economic revolution’, *Economic History Review*, 30 (1978). For the Spanish case, see R. Herr, ‘El significado de la desamortización en España’, *Moneda y Crédito*, 131 (1974). Allen devotes the term ‘agrarian fundamentalism’ to the proponents of this view, who also defend the efficiency of large-scale farms. See R. Allen, *Enclosure and the Yeoman* (Oxford, 1992), p. 2.

¹¹ G. Hardin, ‘The tragedy of the commons’, *Science*, 162 (1968).

¹² *Ibid.*, p. 1248.

¹³ Allen, ‘The efficiency’; C.F. Runge, ‘Common property and collective action in economic development’, *World Development*, 14 (1986); E. Ostrom, *Governing the commons. The evolution of institutions for collective action* (Cambridge, 1990); D. Feeny et al., ‘The tragedy of the commons: Twenty-two years later’, *Human Ecology*, 18 (1990); Allen, *Enclosure* (Oxford, 1992); D.W. Bromely et

whether property rights are private, public or communal but whether they are properly defined and enforced¹⁴.

The transition to modern economic growth nonetheless remains one of the most researched and controversial fields in economic history. In particular, the explanation that linked the enclosure of the commons with the British agricultural revolution has been confronted by Robert Allen's work, which defends that not only the agricultural revolution was already on its way long before the Parliamentary enclosures, but also that agricultural productivity growth had also taken place on open fields¹⁵. Although agricultural productivity has been the main yardstick against which the privatization of the commons has been evaluated, the distributional consequences of this process have also been considered¹⁶. The lower rural classes, disposed of their customary rights on the commons, suffered a decline in living standards and, unable to make a living in the countryside, were forced to join the urban labour force. However, in the light of the recent reassessment of the effect of enclosures on agricultural productivity mentioned

al. (eds.), *Making the commons work: Theory, practice and policy* (San Francisco, 1992); R. Wade, *Village Republics: Economic conditions for collective action in South India* (San Francisco, 1994); G. Clark, 'Commons sense: Common property rights, efficiency, and institutional change', *Journal of Economic History*, 48 (1998); J.L. van Zanden, 'The paradox of the marks. The exploitation of commons in the eastern Netherlands, 1250-1850', *Agricultural History Review*, 47 (1999); M. de Moor et al., *The management of common land in north west Europe, ca. 1500-1850* (Brepols, 2002); M. Turner et al., 'Agricultural sustainability and open-field farming in England, c.1650-1830', *International Journal of Agricultural Sustainability*, 1 (2003); M. de Moor, 'Avoiding tragedies: A Flemish common and its commoners under the pressure of social and economic change during the eighteenth century', *Economic History Review*, 62 (2009). Particular references for the Spanish case are profusely given throughout the text.

¹⁴ For recent developments within this line of enquire, see E. Ostrom, *Understanding institutional diversity* (Princeton, 2005); her Nobel Prize Lecture: E. Ostrom, 'Beyond markets and states: Polycentric governance of complex economic systems', *American Economic Review*, 100 (2010); or D.H. Cole and E. Ostrom, 'The variety of property systems and rights in natural resources', in D.H. Cole and E. Ostrom (eds.), *Property in land and other resources* (Cambridge, MA, 2011).

¹⁵ R. Allen, *Enclosure*; 'Tracking the agricultural revolution', *Economic History Review*, 52 (1999); 'Community and market in England: Open fields and enclosures revisited', in M. Aoki and Y. Hayami (eds.), *Communities and markets in economic development* (Oxford, 2001); 'Progress and poverty in early modern Europe', *Economic History Review*, 56 (2003).

¹⁶ J.L. Hammond and B. Hammond, *The village labourer, 1760-1832* (London, 1911); J. Humphries, 'Enclosures, common rights, and women: The proletarianisation of families in the late eighteenth and early nineteenth centuries', *Journal of Economic History*, 50 (1990); J.M. Neeson, *Commoners: Common right, enclosure and social change in England, 1700-1820* (Cambridge, 1993).

above, the traditional view regarding the existence of a trade-off between equity and efficiency might have been misplaced.

This long-standing debate has been mostly fed by assessments of the British experience. Displacing the lens of the economic historian to other areas is especially relevant because, as mentioned above, the ‘successful’ English example was followed by agricultural reformers all across continental Europe¹⁷. This dissertation thus contributes to the reassessment of this issue by exploiting historical evidence drawn from 19th century and early 20th century Spain. Common lands were a key component in the organic-based Spanish preindustrial economy¹⁸. In 1860, they represented above one fourth of the total Spanish territory, a figure which should have been much higher at the end of the 18th century¹⁹. The commons not only provided pasture, wood, fertilizer and fuel, among other different goods, but also allowed for the possibility of temporary cropping, thus playing a fundamental role in the workings of the rural communities. These communal resources were actually a crucial element of a system in which agricultural activity was completely integrated with cattle breeding and forestry. Importantly, the communal regime in Spain involved two main types of access to the land: a direct but regulated access for all members of the community (*comunales*) or a temporary cession of user-rights to particular individuals in exchange for a monetary income (*propios*). The latter, the commons which were rented out to individuals, did actually constitute an important source of revenue for municipalities.

The transformations caused by the transition to capitalism, and the emergence of a new liberal state, however, triggered their gradual dismantling throughout the 19th and early 20th centuries. Fuelled by ideological and fiscal pressures, the magnitude of this

¹⁷ G. Clark, ‘Commons sense’, *Journal of Economic History*, 48 (1998), p. 74; Demélas and Vivier, *Les propriétés collectives*.

¹⁸ I. Iriarte, ‘Common lands in Spain, 1800-1995: Persistence, change and adaptation’, *Rural History*, 13 (2002).

¹⁹ G. Rueda Herranz, *La desamortización en España: Un balance, 1766-1924* (Madrid, 1997).

process was enormous: around 20 per cent of the total land ended up privatised during this period²⁰. What makes the Spanish case especially interesting is that, despite following a similar path to other European countries, including England with their well-known enclosures, the importance of the privatization process was geographically diverse. While some regions completely dismantled the communal regime, others managed to preserve a large stock of common lands²¹, thus turning the Spanish experience into an ideal case study on which to base this research. No doubt this process has also been a contested topic in the Spanish historiography. Explaining the reasons behind the privatisation process and its regionally uneven outcome, together with its consequences on the agricultural sector and the local communities, has produced an enormous literature²². This doctoral thesis could not have been carried out, not even being conceived, without the vast amount of information gathered by generations of historians and the richness of the interpretations of the enclosing process that have been produced as a result. Previous research on this topic however has made little use of quantitative techniques, which has made an overall assessment of the process difficult²³.

This dissertation is a first step to fill this gap in the literature. Combining primary and secondary sources, I have collected a quantitative and a qualitative panel data set at the provincial level at three different time-periods (1860, 1900 and 1930). The information gathered has allowed me to carry out a comparative study of the historical data at the provincial level using econometric techniques with the aim of analysing the

²⁰ Rueda Herranz, *La desamortización*.

²¹ Grupo de Estudios de Historia Rural, 'Más allá de la "propiedad perfecta". El proceso de privatización de los montes públicos españoles (1859-1926)', *Noticiario de Historia Agraria*, 8 (1994).

²² For recent summaries, see I. Iriarte, 'Common lands'. X.L. Balboa, 'La historia de los montes públicos españoles (1812-1936): Un balance y algunas propuestas', *Historia Agraria*, 18 (1999); J.I. Jiménez Blanco, 'El monte: Una atalaya de la Historia', *Historia Agraria*, 26 (2002).

²³ To my knowledge, the only work applying econometric techniques to the study of Spanish commons is A.M. Linares, 'The privatization of communal lands in Spain (1750-1925): An econometric revision of the neo-malthusian theory', *Documentos de Trabajo AEHE 0403* (2004).

forces behind the privatisation of the communal regime and how this process affected economic development. Although it is true that using the province as a unit of analysis may conceal some of the variation within provinces, this strategy has allowed me to be able to examine the impact of privatisation on different economic and social dimensions and to take into consideration a large number of other variables which account for other important developments that were taking place at the same time. The period under analysis is indeed one characterised by fundamental transformations. Apart from urbanisation and industrialisation, the Spanish economy and society certainly underwent profound changes such as growing demographic pressures, improvements in agricultural productivity or the gradual increase of market integration, to name only a few²⁴.

Before continuing, it is likewise crucial to clarify that common land is generally defined as a resource that is collectively owned by the constituents of a particular local authority or council. However, this concept, and the reality that it describes, suffered a deep transformation during the period analysed in this dissertation. The substitution of the council by the municipality as the basis of local power from the end of the 18th century, together with the attack of the liberal state against the legal authority of neighbours to be able to collectively own a resource outside the municipal administration, led to a process in which the ownership of common lands was assimilated by municipalities. As a result, the commons became public lands belonging to the villages through their municipalities²⁵. The modern concept of *monte público*

²⁴ For a detailed overview of the period under study, see G. Tortella, *The development of modern Spain. An economic history of the nineteenth and twentieth centuries* (Cambridge, MA, 2000); J. Simpson, *Spanish agriculture: The long siesta, 1765-1965* (Cambridge, 1995); N. Sánchez-Albornoz (ed.), *The economic modernization of Spain, 1830-1930* (New York, 1987).

²⁵ For a review of this evolution, see GEHR, 'Más allá'; Balboa, 'La historia'. A perspective of what, respectively, happened in Galicia and Navarra can be found in A. Artiaga and X.L. Balboa, 'La individualización de la propiedad colectiva: Aproximación e interpretación del proceso en los montes vecinales de Galicia', *Agricultura y Sociedad*, 65 (1992) and J.M. Lana, 'From equilibrium to equity.

(public upland) actually originated in 1812 to refer to the land that belonged to the state, municipalities and other public institutions and was established to explicitly distinguish it from privately-owned land²⁶. This new legal entity was thus replacing the commons but it hardly changed the way they were managed. Although the concept of public land served to designate all those spaces that were not privately owned, whether owned by the municipalities, the State, or other public institutions, an overwhelming majority were municipally-owned. In 1859, 93 per cent of the public land belonged to municipalities. In addition, the commons owned by the State were, in practical terms, managed by the local councils²⁷. The economic and social functionality of the lands owned by the State made them certainly similar to the lands owned by municipalities and they are here considered as equivalents²⁸. There also existed another kind of property entitlement, from which Galicia constituted the most significant case, which further complicates the situation, since most of their commons went on being considered private but collectively owned²⁹. Given the hybrid nature that characterised the concept of the ‘commons’ in 19th century Spain, this dissertation, following the tradition in the Spanish historiography, identifies common lands as those lands that were collectively managed at the local level, in spite of being legally owned by the state, the municipalities or the village neighbours themselves³⁰. The different chapters, however, acknowledge these peculiarities and take them into account in the analysis.

The survival of the commons in the Ebro Basin: Navarra from the 15th to the 20th centuries’, *International Journal of the Commons*, 2 (2008).

²⁶ Balboa, ‘La historia’, p. 97, Iriarte, ‘Common lands’, p. 35.

²⁷ I. Iriarte, ‘La pervivencia de bienes comunales y la teoría de los derechos de propiedad. Algunas reflexiones desde el caso Navarro, 1855-1935’, *Historia Agraria*, 15 (1998), p. 122.

²⁸ Balboa, ‘La historia’, p. 107.

²⁹ See Artiaga and Balboa, ‘La individualización’; Balboa, ‘La historia’.

³⁰ In spite of the potential confusion regarding the real owners of the resources, it is considered that the main aim of this dissertation is to study the capacity of the local communities to preserve these resources for their own interests and their subsequent economic and social impact. We thus refer to those lands that, being owned either by the State, the municipalities or the neighbours themselves, affected the welfare of the local communities and were managed, to a greater or lesser extent, by them. See A.M. Bernal, ‘La tierra comunal en Andalucía durante la Edad Moderna’, *Studia Historica. Historia Moderna*, 16 (1997); Iriarte, ‘Common lands’; Gómez Urdañez, ‘Doctrinas y realidades’; Serrano, ‘La defensa del

The first chapter examines the diverse persistence of the communal regime and the reasons behind the dissimilar paths followed by the different regions. The initial research that examined the destiny of common lands in Spain attributed a leading role in their dismantling to the legislation introduced by the central government throughout this period³¹. The rising liberal state, striving for its consolidation, would be the driving force of the process and the key to an understanding of its scope. However, without denying the boost it gave to the process, a reform imposed from the centre does not explain the diversity of regional outcomes. This first chapter thus tries to assess the relative contribution of different factors in shaping the privatisation process. The results of this analysis diminish the significance of market signals and show how the social and environmental conditions interacted to limit, or promote, the dismantling of the common lands. Apart from the greater need of resorting to the commons if agricultural production wanted to be increased in dry regions, the results stress that high levels of inequality in the access to land played a key role in promoting enclosure.

The rest of the dissertation examines how the persistence or the dismantling of collective resources shaped economic development by focusing on four different aspects: agricultural productivity, biological living standards, educational attainments and social capital. Firstly, in order to analyse the effect caused by the privatisation of communal resources on agricultural development, apart from having information on the stock of common lands and the agricultural output at the provincial level, I have gathered data on the different inputs affecting the level of agricultural output in 1900 and 1930. This includes information on agricultural labour force, diverse types of land

comunal'; D. Gallego, *Más allá de la economía de mercado: Los condicionantes históricos del desarrollo económico* (Madrid, 2007). Bernal, referring to the period from the 16th to the 18th century states that, despite all the legal confusion, common lands were basically a category of public lands although belonging to municipalities (*concejos*) and stresses that their most important feature is that they were collectively-used by neighbours. See Bernal, 'La tierra comunal', p. 104.

³¹ Sanz Fernández, 'La historia contemporánea'; J.I. Jiménez Blanco, 'Los montes de propiedad pública, 1833-1936', in F. Comín and P. Martín Aceña (eds.), *Historia de la empresa pública en España* (Madrid, 1991).

and capital. The latter of these inputs refers to livestock and modern inputs such as artificial fertilisers, modern ploughs, threshing machines and tractors. By considering the commons as another productive factor, this chapter assesses their effect on agricultural productivity. Given their role as provider of pasture, the link between common lands and livestock is also included in the analysis. Focusing on cross-regional differences during the period between 1900 and 1930 assures that the potential ultimate effect of the developments taking place throughout the 19th century is taken into account. This approach also enables the possibility of contrasting the role of the surviving commons in a dynamic period characterised by the increasing diffusion of modern agricultural inputs. The results show that, on average, the different stock of common lands did not explain the differences on the levels of agricultural output per worker between provinces. Even though privatisation fostered output per worker by bringing more land into cultivation, the role of the commons as provider of pasture and fertilising materials counteracted that effect, especially in humid regions.

Given that the dismantling of common lands was a measure that ‘touched almost every aspect of social and economic life’³², the impact of privatisation on economic development is not only examined in terms of agricultural efficiency, but also regarding its effects on a wider array of economic outcomes. On the one hand, as mentioned above, the commons constituted a source of complementary income for rural households. They provided pasture to support livestock, wood, or fuel, among other products, as well as offering the possibility of temporary cropping. These services, especially important for the bottom part of the income distribution, were not subject to market mechanisms, so quantifying their effect in terms of wages or income per capita becomes a hazardous task. Instead, the potential impact of these collective resources on

³² Tortella, *The development*, p. 51.

standards of living is measured using life expectancy and heights. The empirical analysis not only shows that commons were at least as beneficial as private lands before 1860, but also that the persistence of these collective resources from then onwards was related to higher life expectancy and heights, particularly during the second half of the 19th century. Biological human welfare also seems to have been negatively influenced by the progressively decreasing role that local communities played on the management of these resources, thus supporting the claims defended by Elinor Ostrom³³.

On the other hand, during the 19th century, municipalities were responsible for the provision of elementary education and their financial capacity was crucial when it came to fund schooling expenditures. Spain experienced a delayed and geographically uneven spread of literacy, resulting in very poor average levels of human capital³⁴. The monetary income derived from the cession of user-rights on the commons actually constituted a fundamental component of the municipal budget. Given that municipalities were responsible for the provision of elementary education, their financial capacity was crucial in the funding of schooling expenditures. Chapter four thus tests whether enclosure affected the evolution of human capital. Framed within the transition from restricted to universal literacy, common lands appear to have positively contributed to achieving significantly higher levels of both schooling expenditure and literacy rates. The exercise carried out shows that these collective resources, by supporting both municipal and households' incomes, sustained both the local supply of education and the demand for it, although their influence decreased over time.

Lastly, the dismantling of collective practices attacked the social fabric that knitted the community together by negatively affecting the possibility of resorting to

³³ Ostrom, *Governing the commons*.

³⁴ C.E. Núñez, *La fuente de la riqueza. Educación y desarrollo económico en la España contemporánea* (Madrid, 1992).

cooperation mechanisms different from the market³⁵. The link between the institutions formed around the use and management of collective resources and social capital is explored in chapter five. Common lands, and also irrigation communities, provided dense networks of continuous social interactions that facilitated the diffusion of information and the building of mutual knowledge and trust, thus potentially favouring cooperative behaviour. The emergence of agricultural cooperatives in early 20th century Spain is used in this last chapter as the testing ground for this hypothesis. The results show that higher stock of collectively-managed resources in 1900, employed as a proxy for social capital, is positively associated with the fraction of the rural population involved in agricultural cooperatives in the 1920s.

Contrary to what contemporary liberal thinkers and those who drank from those sources later on defended, my research shows that the dismantling of collective practices in 19th century Spain had unintended consequences for economic development. Not only did the privatisation of common lands not significantly foster agricultural productivity, but also did this process negatively affect other dimensions of these rural societies: it reduced the standard of living of a significant share of the population, deteriorated the finances of local councils and attacked the social ties that held the community together. Most research on the effect of institutional change usually focuses on a particular aspect of the institution in question. However, any particular institution plays different roles and these activities are usually not separable³⁶. Crucially, this study illustrates that, if the overall economic and social efficiency of a certain institutional change is to be addressed, all the dimensions affected by that process need to be analysed.

³⁵ D. Gallego, *Más allá de la economía de mercado: Los condicionantes históricos del desarrollo económico* (Madrid, 2007).

³⁶ S. Ogilvie, “‘Whatever is, is right’? Economic institutions in pre-industrial Europe”, *Economic History Review*, 60 (2007), p. 668.

This research also highlights that the effect of the privatization of common lands on economic development is not as linear as traditional historiography had suggested. Instead, its impact would depend on the context and the timing in which it is applied³⁷. On the one hand, the economic, social and environmental framework of each rural society determines the benefits and the costs of these changes, so it becomes a key factor to understand their impact. In this regard, the social and institutional context becomes especially important because it influences who benefits from these transformations. Where large landowners prevailed, privatisation was more intense and it was carried out at the expense of the lower ranks of the rural population, whose living standards deteriorated.

On the other hand, the timing of the process is also of considerable importance because of two main reasons. First of all, the potential benefits of the privatisation may not be fully achieved unless society has reached a determined level of development. A modernising agriculture requires not only financial resources, but also sufficient economic incentives to carry out those investments. Even in the case that private property rights provided better incentives, the low levels of income per capita, together with the unequal land property structure characteristic of 19th century Spain, may have prevented that enclosure led to a more widespread adoption of modern agricultural techniques. Secondly, the negative effects of the dismantling of the communal regime can only be limited if either a wide array of market opportunities exists or a new set of institutions is built to substitute the functions that the commons fulfilled for the local community. Urbanisation and industrialisation only began to generate significant non-agricultural employment opportunities from the late 19th century onwards and, unlike the Poor Laws in Britain, no compensation measures for landless peasants were

³⁷ H.-J. Chang, 'Institutions and economic development: Theory, policy and history', *Journal of Institutional Economics*, 7 (2011).

deployed despite the privatisation of common lands³⁸. On the contrary, while state intervention in public health or primary schooling only slowly started during the first decades of the 20th century, privatisation imposed a terrible shock on local institutions, which became incapable of providing basic public services and were also forced to increase the tax burden. In this regard, this research shows that the positive effect of the surviving common lands on biological living standards and educational attainments is especially strong during the second half of the 19th century and becomes smaller during the early 20th century as the public sector began to intervene in those spheres. The evidence presented therefore shows that the choice followed by liberal governments of speeding up the transition to capitalism by urging the privatisation of common lands, irrespective of the particular context, was mistaken.

³⁸ For the inability of cities and industrializing areas to attract rural workers in larger numbers, see J. Silvestre, 'Internal migrations in Spain, 1877-1930', *European Review of Economic History*, 9 (2005). For the financial difficulties of the liberal state and its lack of concern on poor relief, see C. García and F. Comín, 'Reforma liberal, centralismo y haciendas municipales en el siglo XIX', *Hacienda Pública Española*, 133 (1995); F. Comín, *Historia de la Hacienda Pública, vol. II, España, 1808-1995* (Barcelona, 1996).

Chapter 1

SOCIAL AND ENVIRONMENTAL FILTERS TO MARKET INCENTIVES: COMMON LAND PERSISTENCE IN 19TH CENTURY SPAIN³⁹

Abstract: The regional diversity of communal persistence in 19th century Spain has been well documented by historiography. Although the explanation of this divergence has been attributed to the social and environmental context, together with the prevailing market incentives that characterized the different rural societies of this period, there has been no clear assessment of the role played by each. Through a comparative study of the historical data at the provincial level, this paper analyzes the relative contribution of these elements to that divergence. The results diminish the significance of market signals and show how the social and environmental conditions interacted to limit, or promote, the dismantling of the common lands. Apart from the greater need of resorting to the commons when agricultural production wanted to be increased in dry regions, this article highlights the role of unequal levels of access to land in promoting enclosure. The Spanish case illustrates the limitations of the theories that predict the inevitable drift towards individual property rights.

1.1 Introduction

The economic literature addressing the dissolution of the communal regime relies on the argument that, as land becomes scarce, private property rights will be increasingly more efficient⁴⁰. Population growth and/or growing commercialization of agriculture increase the pressure over the resource and force local communities either to regulate user-rights more tightly or to divide it and establish individual property rights. Communal or collective management involves transaction costs, such as

³⁹ A version of this chapter has been published in the *Journal of Agrarian Change* (2015).

⁴⁰ J.-M. Baland and J.-P. Platteau, 'Division of the commons: a partial assessment of the new institutional economics of land rights', *American Journal of Agricultural Economics*, 80 (1998). These ideas were originally developed by proponents of the New Institutional Economics. See, for instance, H. Demsetz, 'Toward a theory of property rights', *American Economic Review*, 57 (1967); A. Alchian and H. Demsetz, 'The property rights paradigm', *Journal of Economic History*, 33 (1973); and North and Thomas, 'The first economic revolution', *Economic History Review*, 30 (1978).

negotiating an agreement and monitoring and enforcing such agreements⁴¹, which can be avoided by private ownership, so this latter institutional arrangement will often be preferred. However, two considerations may offset these costs. Firstly, private property rights also suffer from transaction costs: negotiating, defining, and enforcing private property rights, which tend to be higher the larger the physical resource. In this sense, Runge forcibly defends that ‘the social overhead required by assigned, defined and transferable private property rights and the capacity to support this superstructure through legal fees and taxes often goes unrecognized’ and ‘may be prohibitively costly compared to customary arrangements’⁴². Secondly, common property resources also enjoy some advantages themselves in terms of economies of scale and risk-insurance mechanisms. In this regard, while collective herding reduces supervision costs, common property regimes provide insurance mechanisms, thus protecting farmers against spatial variations in yields. Likewise, since these institutions guarantee certain level of access to these resources, equity considerations may play in favour of communal regimes⁴³. In any case, the property rights theory predicts that, unless the dismantling of the communal regime remains too costly, as increasing competition over the available land raises its value, the gains from privatization will eventually overcome the potential advantages of collective agreements. This process consequently translates into a growing demand for a redefinition of property rights.

These considerations have been extensively applied to the analysis of historical commons, especially in the British case. Even though the commons may have been an efficient institution in a distant past when land was abundant, the intensification of economic pressures inevitably led to its substitution for ‘modern’ property rights, or in

⁴¹ These transaction costs are likely to be higher in larger and/or more heterogenous groups. See Baland and Platteau, ‘Division of the commons’, p. 645.

⁴² C.F. Runge, ‘Common property and collective action in economic development’, *World Development*, 4 (1986), pp. 624-625.

⁴³ Idem.

other words, the individual private property. Boserup argues that, by increasing land values, population growth and agricultural intensification promote the redefinition of property rights⁴⁴. Likewise, in the absence of insurance markets, the open field system was relatively efficient because, although hindering efficiency due to higher transport and transactions costs, scattered landholdings provided a risk-insurance mechanism for farmers⁴⁵. However, this institution would be no longer necessary as modern markets for savings and insurance developed. This strand of thought is complemented by the idea that communal property rights encouraged over-exploitation, prevented individual entrepreneurship and impeded the diffusion of agricultural improvements⁴⁶. The drive towards more efficient institutional arrangements in the form of enclosures would have therefore laid the foundations for agricultural development.

However, recent research has re-evaluated the role of the commons in pre-industrial societies. On the one hand, open fields were not that inefficient with respect to enclosed fields in terms of agricultural productivity⁴⁷. On the other hand, the communal regime offered economies of scale, lower transaction costs and risk-insurance mechanisms⁴⁸. Importantly, this research shows that common lands were not the open access resources depicted as Hardin⁴⁹, but were tightly regulated. While a body of informal and formal rules (bylaws) established access rights and a system of graduated fines, formal and informal monitoring and enforcement mechanisms secured

⁴⁴ See E. Boserup, *The conditions of agricultural growth: The economics of agrarian change under population pressure* (New York, 1965).

⁴⁵ D. McCloskey, 'The persistence of English common fields', in E.L. Jones and W. Parker (eds.), *European peasants and their markets: Essays in agrarian economic history* (Princeton, 1975); D. McCloskey, 'The prudent peasant: New findings on open fields', *Journal of Economic History*, 51 (1991).

⁴⁶ J.D. Chambers and G.E. Mingay, *The agricultural revolution, 1750-1880* (London, 1966); D. McCloskey, 'The economics of enclosure: A market analysis', in E.L. Jones and W. Parker (eds.), *European peasants and their markets: Essays in agrarian economic history* (Princeton, 1975).

⁴⁷ R. Allen, *Enclosure and the Yeoman* (Oxford, 1992); G. Clark, 'Commons sense: Common property rights, efficiency, and institutional change', *Journal of Economic History*, 58 (1998).

⁴⁸ M. de Moor, 'Avoiding tragedies: A Flemish common and its commoners under the pressure of social and economic change during the eighteenth century', *Economic History Review*, 62 (2009).

⁴⁹ Hardin, 'The tragedy of the commons'.

the proper functioning of the system. The role of the commons in mitigating inequality has been seen as another advantage in order to explain why this institutional arrangement persisted in spite of its supposed inefficiency⁵⁰. In addition, although it is true that some spontaneous waves of enclosure took place, both in the British Isles and the Continent, the privatization of the commons was always decisively sponsored by the state through the enactment of different forms of enclosure acts or compulsory sales⁵¹. In this sense, state intervention, generally responding to the wishes of the landowner elites who controlled Parliaments, has been seen as a way to redistribute income from the poor to the richer classes⁵². Moreover, despite the efforts of the emergent liberal states to dismantle the communal regime, large tracts of common lands survived.

This chapter attempts to revisit these issues by analysing the factors behind the dissimilar persistence of the communal regime in Spain. Since common lands constituted a source, among other different goods and services, of pasture, wood, fertilizer and fuel, together with the possibility of temporary cropping, they were a key component in the organic-based Spanish preindustrial economy⁵³. These communal resources were indeed a crucial element of a system in which agricultural activity was completely integrated with cattle breeding and forestry⁵⁴. The commons contributed to

⁵⁰ J. Humphries, 'Enclosures, common rights, and women. The proletarianisation of families in the late eighteenth and early nineteenth centuries', *Journal of Economic History*, 50 (1990); J.M. Neeson, *Commoners: Common right, enclosure and social change in England, 1700-1820* (Cambridge, 1993). Clark, 'Commons sense', p. 75.

⁵¹ G. Clark and A. Clark, 'Common rights to land in England, 1475-1839', *Journal of Economic History*, 61 (2001); Van Zanden, 'The paradox'; M.-D. Demélas and N. Vivier, *Les propriétés collectives face aux attaques libérales, 1750-1914: Europa occidentale et Amérique latine* (Rennes, 2003).

⁵² Allen, *Enclosure*. See also R. Allen, 'Community and market in England: Open fields and enclosures revisited', in M. Aoki and Y. Hayami (eds.), *Communities and markets in economic development* (Oxford, 2001).

⁵³ I. Iriarte, 'Common lands in Spain, 1800-1995: Persistence, change and adaptation', *Rural History*, 13 (2002). X.L. Balboa, 'La historia de los montes públicos españoles (1812-1936): Un balance y algunas propuestas', *Historia Agraria*, 18 (1999); J.I. Jiménez Blanco, 'El monte: Una atalaya de la Historia', *Historia Agraria*, 26 (2002).

⁵⁴ E.A. Wrigley, *Continuity, chance and change: The character of the industrial revolution in England* (Cambridge, 1988).

supporting livestock which, in turn, provided fertiliser and workforce and subsequently influenced agricultural productivity, a virtuous circle that contemporaries themselves very well knew⁵⁵. Although the rural societies were not characterized by an equitable access to resources, the collectively-used land provided certain mechanisms of social cohesion that preserved the continuity of the system. Therefore, the existence of common lands was a way of guaranteeing the accumulation process of the upper classes, while simultaneously allowing the less favoured sectors of the population to obtain supplementary rents that were needed for their own reproduction. In addition, the commons played a fundamental role in the finances of local institutions.

However, the transformations brought about by the transition to capitalism that European economies experienced threatened the kind of property and management that these collective lands had been developing throughout the centuries, upsetting the traditional balance which characterized these economies. The communal regime in Spain was not immune to these trends and suffered, from the end of the 18th century, a transformation process that affected both its property regime and the way these resources had been traditionally used. On the one hand, local communities had to adapt to growing population pressures and the increasing role that markets were beginning to play. On the other hand, the establishment and consolidation of the new liberal state involved an attempt to not only accelerate the process by trying to privatize communal resources, but also to exert influence over the management of those lands that remained under the control of the rural community through an increasing interventionism. Both processes led to the dismantling of the communal regime, thus deeply transforming the Spanish economic landscape. Interestingly, neither the

⁵⁵ J. del Moral Ruíz, *La agricultura española a mediados del siglo XIX (1850-70): Resultados de una encuesta agraria de la época* (Madrid, 1979); A. Artiaga and X.L. Balboa, 'La individualización de la propiedad colectiva: Aproximación e interpretación del proceso en los montes vecinales de Galicia', *Agricultura y Sociedad*, 65 (1992), p. 103; G. Gómez Urdañez, 'Doctrinas y realidades. Los frenos a la liberalización de la propiedad en España, 1835-1855', *Historia Agraria*, 27 (2002), p. 158

pressures created by the market, nor those generated by the state, were completely successful and the outcome of the privatization process was quite different, both in pace and intensity, depending on the geographic area⁵⁶.

The initial research that examined the destiny of common lands in Spain attributed a leading role in their dismantling to the type of legislation introduced by the central government throughout this period⁵⁷. The rising liberal state, striving for its consolidation, would be the driving force of the process and the key to an understanding of its scope. However, without denying the boost it gave to the process, a reform imposed from the centre does not explain the diversity of regional outcomes. In fact, the role played by liberal policy during the first half of the 19th century was restricted, since it limited itself to establishing the legal framework that allowed municipalities to freely dispose of their patrimony. It was not until the decade of the 1850s, when privatization was already quite advanced in certain areas, that the liberal state became actively involved in the process. The diversity observed in different areas of the country thus indicates the presence of local elements that conditioned the outcome of this policy. Although the explanation of this diversity has been attributed to the social and environmental context, together with the prevailing market incentives that characterized the different rural societies of this period, there has been no clear assessment of the role played by each of these factors⁵⁸.

⁵⁶ Grupo de Estudios de Historia Rural (GEHR thereafter), 'Más allá de la "propiedad perfecta". El proceso de privatización de los montes públicos españoles (1859-1926)', *Noticiario de Historia Agraria*, 8 (1994); GEHR, 'Diversidad dentro de un orden. Privatización, producción forestal y represión en los montes públicos españoles, 1859-1926', *Historia Agraria*, 18 (1999).

⁵⁷ Sanz Fernández, 'La historia contemporánea de los montes públicos españoles, 1812-1930. Notas y reflexiones (I)'; Jiménez Blanco, 'Los montes de propiedad pública'.

⁵⁸ GEHR, 'Más allá de la "propiedad perfecta"'; Balboa, 'La historia de los montes públicos españoles'; Jiménez Blanco, 'El monte'; Iriarte, 'Common lands in Spain'.

Through a comparative study of the historical data at the provincial level, and building on previous innovative work by Linares⁵⁹, this chapter analyzes the relative contribution of these factors to the different levels of persistence of common land in 19th century Spain⁶⁰. These diverse elements constituted a complex web of reciprocal influences, where the joint interaction between social and environmental conditions prevailed over market pressures in shaping the privatization process. Apart from the greater need of resorting to the commons if agricultural production was to be increased in dry regions, the results stress that high levels of inequality in the access to land played a key role in promoting enclosure. Local communities were thus able to retain control over the property and management of collective resources to a greater or lesser extent, depending on the social and environmental context in which they were immersed, hence casting doubts about the ‘inevitability’ of the spontaneous emergence of private property rights.

1.2 Enclosing the commons

As commented in the introductory chapter, the communal regime in Spain involved two main types of access to the land: a direct but regulated access for all members of the community (*comunales*) or a temporary cession of user-rights to particular individuals in exchange for a monetary income (*propios*), which constituted an important source of revenue for municipalities. The importance of the commons in the reproduction and development of rural communities in pre-industrial Spain, and their capacity for adaptation and innovation, has already been examined by extensive

⁵⁹ A.M. Linares, ‘The privatization of communal lands in Spain (1750-1925): An econometric revision of the neo-malthusian theory’, *Documentos de trabajo Asociación Española de Historia Económica*, 403.

⁶⁰ Although the dismantling of the common lands also implies the privatization of their uses, my aim here is to focus on the redefinition of property rights.

research⁶¹. Although limited attempts were made trying to distribute private user-rights over the commons during the 1760s and 1770s, the assault on these collective resources did not politically crystallise until the 19th century⁶². Its motivation was not only driven by ideological considerations, the establishment of the ‘perfect property’ and market mechanisms in rural areas as synonyms of greater social efficiency, but also by the fiscal problems of both the municipalities and the Crown⁶³. Likewise, concerns about rapid population growth justified the promotion of arable land at the expense of the commons.

The legislation which followed the liberal Constitution of 1812 allowed municipalities to sell their commons, legal dispositions which, after the successive absolutist restoration periods, were re-established first briefly in 1820-23 and definitely

⁶¹ I. Iriarte, ‘La pervivencia de bienes comunales y la teoría de los derechos de propiedad. Algunas reflexiones desde el caso navarro, 1855-1935’, *Historia Agraria*, 15 (1998); J.R. Moreno, ‘El régimen comunal y la reproducción de la comunidad campesina en las sierras de La Rioja (siglos XVIII-XIX)’, *Historia Agraria*, 15 (1998); Balboa, ‘La historia de los montes públicos españoles’; A.M. Linares, ‘Estado, comunidad y mercado en los montes municipales extremeños (1855-1924)’, *Revista de Historia Económica*, 19 (2001); Jiménez Blanco, ‘El monte’; J.A. Serrano, ‘La defensa del comunal y de los usos colectivos, León (1800-1936): ¿Una “economía moral”?’, *Historia Agraria*, 37 (2005); J.M. Lana, ‘From equilibrium to equity. The survival of the commons in the Ebro Basin: Navarra from the 15th to the 20th centuries’, *International Journal of the Commons*, 2 (2008).

⁶² It is worth mentioning that the private appropriation of the commons is not a new phenomenon of the 19th century but can be traced back to the Modern Period, being this process especially intense in some areas of Andalusia, Catalonia and Madrid. See B. Yun Casalilla, *Sobre la transición al capitalismo en Castilla: Economía y sociedad en Tierra de Campos, 1500-1830* (Valladolid, 1987); F. Sánchez Salazar, *Extensión de cultivos en España en el siglo XVIII* (Madrid, 1988); A. Cabral, *Propiedad comunal y reparto de tierras en Cádiz: siglos XV-XIX* (Cádiz, 1995); A.M. Bernal, ‘La tierra communal en Andalucía durante la Edad Moderna’, *Studia Historica. Historia Moderna*, 16 (1997); R. Congost, ‘Comunales sin historia. La Catalunya de los masos o los problemas de una historia sin comunales’, in S. de Dios et al. (eds.), *Historia de la propiedad en España. Bienes comunales, pasado y presente* (Salamanca, 2002); J.R. Moreno, ‘La lógica del comunal en Castilla en la Edad Moderna: Avances y retrocesos de la propiedad común’, in S. de Dios et al. (eds.), *Historia de la propiedad en España. Bienes comunales, pasado y presente* (Salamanca, 2002); F. Esteve and J. Hernando, ‘Régimen comunal y economía moral en el Antiguo Régimen. La lenta transformación de los derechos de propiedad en Madrid, siglos XV-XVIII’, in R. Congost and J.M. Lana (eds.), *Campos cerrados, debates abiertos. Análisis histórico y propiedad de la tierra en Europa, siglos XVI-XIX* (Pamplona, 2007).

⁶³ For detailed summaries of the process during the 19th century, see Sanz Fernández, ‘La historia contemporánea’; A. García Sanz, ‘Introducción’, in A. García Sanz and R. Garrabou (eds.), *Historia agraria de la España contemporánea, vol. 1* (Barcelona, 1985); A. López Estudillo, ‘Los montes públicos y las diversas vías de su privatización en el siglo XIX’, *Agricultura y Sociedad*, 65 (1992); Balboa, ‘La historia de los montes públicos españoles’; Jiménez Blanco, ‘El monte’; Gómez Urdañez, ‘Doctrinas y realidades’; Iriarte, ‘Common lands’ (2002). For a review of the policies carried out in the 1760s-1770s, see A. Nieto, ‘Desamortización ilustrada y desamortización liberal de la propiedad agraria’, in S. de Dios et al. (eds.), *Historia de la propiedad en España. Bienes comunales, pasado y presente* (Salamanca, 2002), pp. 276-279.

in 1834. Despite its apparent opposite political view, this legislation was also applied during absolutist periods⁶⁴. The liberal reforms during this initial period also actively encouraged the distribution of common lands to labourers and small landholders, together with former soldiers who fought supporting the revolution⁶⁵. In an epoch highly marked by social and political instability, one of their aims was to gain support for the liberal revolution⁶⁶. This instability itself, characterized by wars, revolutions and counterrevolutions, also facilitated the illegal appropriation of collective resources⁶⁷. In any case, during this first period, municipal councils not only controlled who enjoyed user-rights over the commons, but also who benefited from the occasional sales and distributions⁶⁸.

The triumph of the liberal vision ultimately took place in 1855 when Pascual Madoz issued the *General Disentailment Act*, forcing municipalities to sell their lands through public auctions. According to the legal text, 20 per cent of the sale value would directly go to the state while the remaining 80 per cent would belong to the municipalities but transformed in perpetual and inalienable public debt yielding a 3 per cent annual return⁶⁹. However, although these rents were intended to compensate municipalities for the loss of these resources, the debt quickly depreciated and the payments were not often honoured. In any case, the decades of the 1860s and 1870s witnessed how large tracts of land became privatized at an unprecedented pace. The rhythm of sales slowed down from then onwards, partly in response to the end-of-the-

⁶⁴ M. Fernández Paradas, 'Los repartos de tierras municipales en Andalucía (1767-1854). Nuevas evidencias', *Historia Agraria*, 34 (2004), p. 48.

⁶⁵ García Sanz, 'Introducción', pp. 22-27; J.I. Jiménez Blanco, *Privatización y apropiación de tierras municipales en la Baja Andalucía: Jerez de la Frontera, 1750-1995* (Jerez de la Frontera, 1996).

⁶⁶ Gómez Urdañez, 'Doctrinas y realidades', p. 140.

⁶⁷ Iriarte, 'Common lands', p. 22.

⁶⁸ Jiménez Blanco, 'El monte', p. 149.

⁶⁹ J. Del Moral Ruiz, *Hacienda central y haciendas locales en España, 1845-1900* (Madrid, 1984), pp. 105-106; García Sanz 'Introducción', p. 28. Besides the *Disentailment Act* itself, other state interventions during this period were the creation of the Land Registry Office, the establishment of a registry of ownership (*catastro*) and the appointment of the Civil Guard, an already existent militarized police body, to watch over rural property. See Iriarte, 'La pervivencia de bienes comunales', p. 126.

century agricultural crises and partly because the best commons had already been sold⁷⁰.

However, even then, the legal text of the 1855 Act left the door open to municipalities to apply for exceptions to the general rule⁷¹. Although the law mainly aimed to privatize only those commons enjoyed privately, the distinction between different types of commons was blurred and, therefore, local councils had to demonstrate that the commons they wished to except from the sales were enjoyed collectively⁷². The requested criteria to be declared exempted was also particularly restrictive and the final resolution was in the hands of the provincial Treasury agencies (*Delegaciones Provinciales de Hacienda*), which had a vested interest in the fiscal aspect of privatization⁷³. Furthermore, for environmental reasons, the law also exempted from sale some woodlands which were considered to fulfill an ecological protective function: plots, larger than 100 hectares, which were dominated by pine, oak or beech trees⁷⁴. Both concessions were actually the result of the previous Parliamentary debates which showed numerous concerns about how a strict privatization would attack legitimate interests and distort the normal functioning of the rural communities in crucial ways⁷⁵. Other contemporary warnings can be found in the

⁷⁰ J. Sanz Fernández, 'La historia contemporánea de los montes públicos españoles, 1812-1930. Notas y reflexiones (II)', in R. Garrabou and J. Sanz Fernández (eds.), *Historia agraria de la España contemporánea*, vol. 3 (Barcelona, 1986), pp. 164-164; J. de la Torre and J.M. Lana, 'El asalto a los bienes comunales. Cambio económico y conflictos sociales en Navarra, 1808-1936', *Historia Social*, 37 (2000), p. 82; Linares, 'Estado, comunidad y mercado', p. 40; Iriarte, 'Common lands', p. 22.

⁷¹ Jiménez Blanco, 'El monte', p. 153.

⁷² A. Nieto, *Bienes comunales* (Madrid, 1964), p. 234; López Estudillo, 'Los montes públicos', pp. 81-82; Moreno, 'La lógica del comunal', pp. 147-150.

⁷³ GEHR, 'Más allá de la "propiedad perfecta"', p. 435. The processing of these files and its final resolution was extremely slow and it has not been possible to track the fraction of the commons which survived thanks to these applications. See GEHR, *Estadísticas históricas de la producción agrarian española, 1859-1935* (Madrid, 1991), p. 70.

⁷⁴ An initially more ambitious environmental criterion, involving around 2.5 million hectares more, was dismissed, mainly for fiscal considerations. See Sanz Fernández, 'La historia contemporánea', pp. 209-216. In 1896, a more rational Woodland Classification protected uplands taking into account their potential forestry and environmental externalities, the so-called *montes de utilidad pública*. See Jiménez Blanco, 'El monte', p. 154.

⁷⁵ Simón Segura, *La desamortización*; Gómez Urdañez, 'Doctrinas y realidades'.

1840's Report from the *Sociedad de Amigos del País* or the 1851's Questionnaire where almost every village which answered it stood against disentanglement⁷⁶.

The importance of the privatization process was nonetheless immense. Apart from sales and distributions carried out by legal means, illegal usurpations and appropriations also occurred⁷⁷. All together, more than 10 million hectares, around 20 per cent of the total national area, changed hands between 1770 and 1930⁷⁸. Several authors have stressed the importance of the sales and private appropriations carried out during the first half of the 19th century⁷⁹. According to Rueda Herranz, while around 6.7 million hectares became private between 1855 and 1924, the 'silent' disentanglement witnessed the private appropriation of around 5.3 million hectares⁸⁰. Furthermore, not only the amount of land privatized was extremely significant, but also of superior quality, thus enhancing the importance of that period⁸¹.

Interestingly, the outcome of the process was geographically uneven. The dismantling of the commons was especially intense in some areas of southern and central Spain (see Figure 1)⁸². As explained above, it seems that the liberal state,

⁷⁶ See García Sanz, 'Introducción', p. 28; Sanz Fernández, 'La historia contemporánea', p. 206; J. del Moral Ruíz, *La agricultura española a mediados del siglos XIX (1850-70): Resultados de una encuesta agraria de la época* (Madrid, 1979); F. Sánchez Salazar, 'La desamortización civil en la sierra riojana: las respuestas de los municipios al interrogatorio de 1851', *Agricultura y Sociedad*, 76 (1995); Gómez Urdañez, 'Doctrinas y realidades'.

⁷⁷ López Estudillo, 'Los montes públicos', pp. 83-90; Balboa, 'La historia de los montes públicos', p. 111; Jiménez Blanco, 'El monte', pp. 148-149.

⁷⁸ G. Rueda Herranz, *La desamortización en España: Un balance, 1766-1924* (Madrid, 1997).

⁷⁹ I. Iriarte, 'Una aproximación histórica a las formas de privatización de los montes públicos en Navarra', *Agricultura y Sociedad*, 65 (1992); Cabral, *Propiedad comunales*; Jiménez Blanco, *Privatización y apropiación de tierras municipales*; J.M. Lana, 'Commons for sale. Economic and institutional change in nineteenth century northern Spain', *Documentos de trabajo Asociación Española de Historia Económica*, 604 (2006).

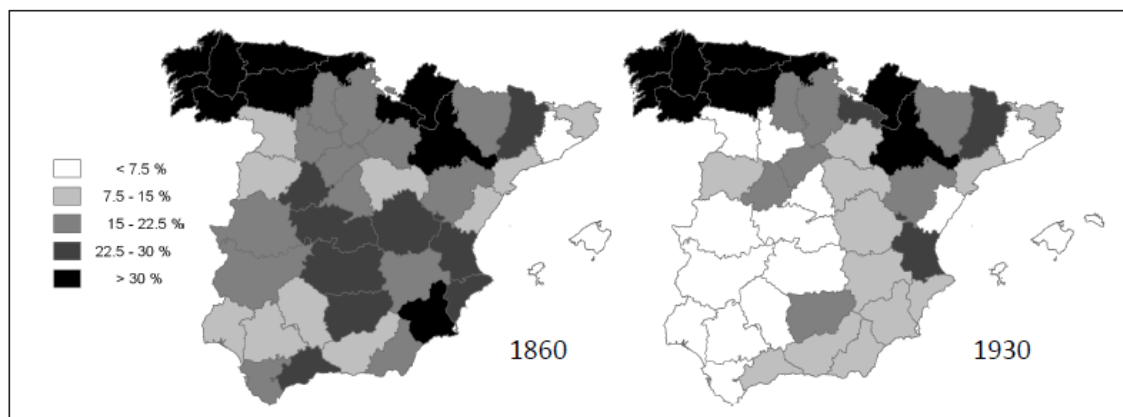
⁸⁰ Rueda Herranz, *La desamortización*, p. 61.

⁸¹ Cabral, *Propiedades comunales*; Lana, 'Commons for sale'.

⁸² The regional picture was definitely more complex. See GEHR, 'Más allá de la "propiedad perfecta"', for a more detailed description by region. Although the dismantling of the commons also implied the privatization of user-rights, the aim of this chapter is to focus on the redefinition of property rights. See M. González de Molina and A. Ortega Santos, 'Bienes comunales y conflictos por los recursos en las sociedades rurales, siglos XIX y XX', *Historia Social*, 38 (2000). For the sources employed to build the map, see Artiaga and Balboa, 'La individualización de la propiedad colectiva'; GEHR, 'Más allá'; and Gallego, *Más allá de la economía de mercado*. As explained in the introduction, given the hybrid nature that characterized the concept of the 'commons' in 19th century Spain, common lands are identified as

instead of forcing an homogenous policy, restrained its ambitions and adapted the legislation to the local demands for privatization, which in turn depended on the economic, social and environmental context of the local communities⁸³. Or, from a slightly different perspective, the liberal government only sanctioned what was already being arbitrarily implemented or imposed by the local elites⁸⁴. Not only did the liberal state give freedom to municipalities to control privatization during the first half of the 19th century, but also the legal text in 1855 was indeed clear on this issue: the sales would be carried out by putting the plots on public auction ‘as it was required by the potential buyers’⁸⁵. It is true nonetheless, as it is shown later, that the *Disentailment Act* of 1855 dramatically altered how the privatization was being carried out⁸⁶. Therefore, if the tempo of enclosure was ultimately left to the demands of local communities, analysing why the success of privatization was so geographically uneven allows for a deeper understanding of the driving forces behind this process.

FIG. 1. COMMON LAND PERSISTENCE IN SPAIN, 1860-1930 (percentage of the total area)



Source: See text. No data for the three provinces in the Basque Country is available.

those lands that were collectively managed at the local level in spite of being legally owned by the state, the municipalities or the village neighbours themselves. Thus, rather than using the data offered by the GEHR for the availability of common lands in Galicia, this dissertation employs the data provided by Gallego, based on the estimates made by Artiaga and Balboa, that takes into account not only public lands, but also those collectively-owned. Unfortunately, no data for the three provinces in the Basque Country is available.

⁸³ GEHR, ‘Más allá de la “propiedad perfecta”’, p. 132; Iriarte, ‘Common lands’, p. 23.

⁸⁴ Congost, ‘Comunales sin historia’, p. 327.

⁸⁵ My translation. Quoted in Iriarte, ‘La pervivencia de bienes comunales’, p. 126.

⁸⁶ Jiménez Blanco, ‘El monte’, p. 150.

1.3 Social and environmental filters to market incentives

Considering the diversity of the privatization outcome, it is clear that not every region responded equally to the guidelines drawn up by the central government. Rural societies had a significant response capability to direct the process, which led to either reinforcement or dilution of the liberal aims, depending on the context in which they were implemented. But, if this was the case, which were the conditions that led some villages to get rid of their commons, while other managed to preserve them? And to what extent did these conditions matter? Although the different economic, social and environmental factors involved formed a complex web of reciprocal influences, for the sake of clarity, they are analysed separately.

Firstly, reflecting Boserupian-like concerns and the predictions of the theory of property rights, the importance of demographic pressures and market incentives in the dismantling of the commons occupies a central place in Spanish historiography⁸⁷. A growing population and a slow but gradual economic growth increased the demand for agricultural products and raw materials such as timber, resin, cork and esparto grass during the period under analysis. At the same time, the influence of market mechanisms was also expanding in the rural areas. In general, it is argued that the connection to national and international agrarian markets encouraged farmers to increase their production capacity by resorting, among other things, to the ploughing up of common lands. These processes reinforced each other and were reflected in increasing land prices and rents, thus translating into what has been referred to as *land hunger*. However, the longing to get access to land by small farmers and labourers should not be confused with the motivations behind large landowners to consolidate and expand their holdings. Moreover, land was not only a purely economic asset but a status good,

⁸⁷ Sanz Fernández, 'La historia contemporánea'; R. Herr, *Rural change and royal finances in Spain at the end of the old regime* (Berkeley, 1988); GEHR, 'Más allá de la "propiedad perfecta"'; Iriarte, 'Common lands'.

since it conveyed prestige and position in society⁸⁸. Furthermore, purchasing land was seen as a safe investment, especially in the context of an underdeveloped modern financial system⁸⁹. The liberal state actually reinforced that role establishing property as the basic category to be a citizen and to be able to participate in elections. Interestingly, Clark finds that the perception of land as a status good increased during the 19th century in England as well⁹⁰.

Secondly, the literature has also analyzed this issue as the clash between two institutions. Gallego, for instance, opposes the existence of two social classes that asymmetrically interacted within the heart of the local communities: the agrarian elites and the peasant families⁹¹. The liberal state, on the one hand, would try to speed up the transition to capitalism through the privatization of the commons. The local communities, on the other hand, would try to adapt to the new situation, either by defending their collective assets or taking an active part in their dismantling. Rural societies were embodied by different social groups and by the municipalities that represented them politically. These local communities did not constitute a homogenous body, but had their own contradictions, generally derived from the conflict between a landowner elite, frequently allied with the liberal state, and the peasant population, the latter with very limited political power, but with some degree of room to manoeuvre. Although the allocation of the user-rights on the commons benefited the upper classes to a greater extent, the entire community profited from them. In fact, the commons fulfilled an important social function, since the less- favoured groups obtained supplementary rents that secured their reproduction. In this sense, the protests against

⁸⁸ A.M. Bernal, *Economía e historia de los latifundios* (Madrid, 1988), p. 236.

⁸⁹ E. Sagner, 'Estímulos y obstáculos al avance de la propiedad campesina (El Baix Empordà, 1860-1940)', *Revista de Historia Económica*, 3 (1998), pp. 692-693.

⁹⁰ G. Clark, 'Land hunger: Land as a commodity and as a status good, England 1500-1910', *Explorations in Economic History*, 35 (1998).

⁹¹ Gallego, *Más allá de la economía de mercado*. See also Iriarte, 'La pervivencia de bienes comunales', p. 132.

the selling of collective property had a fundamental prominence throughout the whole period⁹². Since this opposition was widespread in the country, and those individuals with lesser resources had less possibility of benefiting from the privatization process, the problem lies in explaining why landowner elites in certain areas shared this interest and did not take advantage of the potential sales or appropriate the commons through other means.

The existence of relatively cohesive societies stands as the main candidate to play the role of promoting the persistence of the collective lands, since it would facilitate the participation of all members of the rural society in the management and use of collective resources, including their defence against privatization⁹³. Local communities developed varied strategies in order to preserve their commons. Up to 1855, municipalities maintained legal authority over their patrimony. After the *Disentailment Act*, villages had the possibility of taking legal action to exclude those lands that were being enjoyed collectively from the general disentailment. At times, municipalities also either concealed estates, provided wrong information or refused to respond to the requests of the central government⁹⁴. On the other hand, legal channels were also employed to denounce illegal ploughings or appropriations or even to invalidate the sales⁹⁵. Likewise, in several cases, peasant groups collectively bid in the auctions or arranged the repurchasing of the commons, an adaptive strategy seeking to maintain the status quo⁹⁶. The neighbours themselves also acted to hinder the exercise of property rights that had been purchased by outsiders, which also served to discourage future purchases. It is worth noting that the peasant population could have also been in favour

⁹² González de Molina and Ortega Santos, 'Bienes comunes y conflictos'.

⁹³ Iriarte, 'La pervivencia de bienes comunales'; Moreno, 'El regimen comunal'; Lana, 'From equilibrium to equity'.

⁹⁴ Jiménez Blanco, 'El monte'.

⁹⁵ De la Torre and Lana, 'El asalto a los bienes comunales'.

⁹⁶ Balboa, 'La historia de los montes públicos'.

of privatization if this meant the distribution of the land⁹⁷. However, redistributions did often not imply privatization, but a mere allocation of the commons between neighbours without transferring property rights⁹⁸. Interestingly, demands reclaiming the commons back to the local communities were a central element of the peasants' organisations during the II Republic in the 1930s⁹⁹.

It has been argued that social cohesion against the privatisation of the commons was stronger in areas with dispersed settlements, fewer social imbalances and a generalised collective use of the commons¹⁰⁰. These features enhanced the social functionality of the commons and the incentives to protect an asset which was greatly valued by the whole community. Specifically, those rural societies where small landholdings and a lesser inequality prevailed were more successful in limiting privatization than those characterized by a strong presence of large landowners and more widespread social inequalities¹⁰¹. These circumstances gave rise to the formation of a broad consensus against privatization, since the commons simultaneously allowed for maintaining the accumulation systems of the elites, and for securing the reproduction of the peasant holdings. On the contrary, the existence of more unequal populations made control over the commons through a political negotiation (in a broad sense) difficult for the landowner elites, who promoted privatization in order to secure their privileged access to these resources¹⁰². In areas where economic and political imbalances were more acute, small farmers and labourers increased the pressure to redistribute collective lands. Although landowner elites may not have been necessarily

⁹⁷ Cabral, 'Propiedad comunal'.

⁹⁸ Sanz Fernández, 'La historia contemporánea', p. 196.

⁹⁹ R. Robledo, 'Política y reforma agraria: de la Restauración a la II República (1868/74-1939)', in A. García Sanz and J. Sanz Fernández (eds.), *Reformas y políticas agrarias en la Historia de España* (Madrid, 1966), pp. 289-302.

¹⁰⁰ Iriarte, 'La pervivencia de bienes comunales'; Moreno, 'El regimen comunal'; Lana, 'From equilibrium to equity'.

¹⁰¹ Balboa, 'La historia de los montes públicos españoles'.

¹⁰² Iriarte, 'La pervivencia de bienes comunales', pp. 131-132; Jiménez Blanco, 'El monte', p. 151.

in favour of privatization, they may have preferred that solution as the best choice to maintain their privileged access to those resources.

Lastly, the greater or lesser interest in dismantling the communal system was influenced by the environmental context and the potential productivity of the collective lands themselves. From this perspective, the natural environment conditioned the kind of rural organisation that was being developed in each area, together with the function that the commons played in it, thus affecting the incentives in favour, or against, their dismantling. On the one hand, in those areas with more favourable characteristics for farming ploughing the commons was easier¹⁰³. In this sense, a rougher and steeper relief complicates the definition and enforcement of private property rights. According to Iriarte, the redefinition of property rights over the land in areas where livestock and forestry predominate over cultivation is not considered to be essential¹⁰⁴. The privatization of forests and pastures would have also involved enormous exclusion costs arising from the great technical difficulty of enclosing them, and the problems derived from monitoring these spaces. Poor geographical conditions also slow down market exchanges, due to difficult and expensive communications, and prevent the expansion of arable land¹⁰⁵. In this regard, although the GEHR downplays the significance of the growth of arable land in explaining the process, other authors stress that the first use for the privatized land was to put it under the plough¹⁰⁶. Arable land actually increased by more than five million hectares, around 10 per cent of the total

¹⁰³ Iriarte, 'Una aproximación histórica'; Iriarte, 'La pervivencia de bienes comunales'.

¹⁰⁴ Ibid, p. 131.

¹⁰⁵ A harsh weather also reduces the yields obtained from these areas.

¹⁰⁶ GEHR, 'Más allá de la "propiedad perfecta"', p. 113; Sanz Fernández, 'La historia contemporánea de los montes públicos españoles, 1812-1930. Notas y reflexiones (II)', p. 163; González de Molina y Ortega Santos, 'Bienes comunes y conflictos'. Arable land increased by more than five million hectares, around 10 per cent of the total country area, from 1860 to 1926 (Garrahou and Sanz Fernández 1985, 114). In the southern half of the country, the flat lands of the Ebro valley, the Castilian plateau, and the Mediterranean strip running from Castellón to Murcia, the privatization process went hand-in-hand with the increase of land surface assigned to agricultural use (GEHR 1994). There is evidence however that, at least in some areas, the expansion of arable land was also carried out under the communal regime (Iriarte 1998, 135; Linares 2001, 43; Serrano 2005, 445).

country area, from 1860 to 1926¹⁰⁷. In the southern half of the country, the flat lands of the Ebro valley, the Castilian plateau, and the Mediterranean strip running from Castellón to Murcia, the privatization process went hand-in-hand with the increase of land surface assigned to agricultural use¹⁰⁸. There is evidence however that, at least in some areas, the expansion of arable land was also carried out under the communal regime¹⁰⁹.

On the other hand, the possibility to extend the arable land was also strongly determined by the soil and climate conditions that each area enjoyed. The most important ecological limit of the Iberian Peninsula was water, since water (or the lack of it) constituted the primary restraint on Spanish agricultural yields, especially in the dry areas, i.e. most of the country¹¹⁰. The availability of nutrients is determined by the humidity regime and the edafoclimatic characteristics of the territory thus put a limit on agrarian productivity. Given growing demand, if production needed to be increased, the only available choice was to expand arable land¹¹¹. However, the lack of rainfall not only reduced agricultural yields but also biomass production in general. The lower production of natural pastures limited the territorial capacity to support livestock that could provide fertiliser and workforce, which in turn influenced the level of crop yields. The need to expand arable land was lower in humid Spain, where, without this restraint, production could be increased through a more intensive use of the territory. Given their

¹⁰⁷ R. Garrabou and J. Sanz Fernández, 'Introducción', in R. Garrabou and J. Sanz Fernández (eds.), *Historia agraria de la España contemporánea*, vol. 2 (Barcelona, 1985), p. 114.

¹⁰⁸ GEHR, 'Más allá de la "propiedad perfecta"'.

¹⁰⁹ Iriarte, 'La pervivencia de bienes comunales', p. 135; Linares, 'Estado, comunidad y mercado', p. 43; Serrano, 'La defensa del comunal', p. 445.

¹¹⁰ M. González de Molina, 'Condicionantes ambientales del crecimiento agrario español (siglos XIX y XX)', in J. Pujol et al. (eds.), *El pozo de todos los males. Sobre el atraso en la agricultura española contemporánea* (Barcelona, 2001).

¹¹¹ The limits of the irrigation technology available in this period did not allow its widespread use. Although various methods of increasing agricultural production were tried anyway, the results could not be so different, given the environmental conditions. See González de Molina, 'Condicionantes ambientales', for a description of the strategies that were carried out and their limits. In his opinion, the expansion of arable land devoted to cereal farming was perhaps the only alternative to meet the growing demand.

crucial role as provider of pasture and fertilisers¹¹², the value of the commons in humid regions would thus be superior due to the larger volume of biomass that could be obtained from them, so generating a virtuous circle between agricultural productivity and the availability of common lands. The possibility of improving agricultural yields through this positive link reinforced the already superior agricultural productivity of humid Spain and limited even more the need to increase production through the expansion of arable land. The greater yields achieved by the commons in these regions would serve to enhance the interest in their preservation since reducing their availability would decrease agricultural yields. Therefore, the persistence of collective lands in humid Spain would be partly caused by the greater capacity of its agriculture to increase production, without resorting to the expansion of arable land, and by the function that the commons themselves fulfilled to support these high agricultural yields. The diverse levels of success of the privatization process would consequently have part of their roots in the differing needs of arable lands to increase production for the market, needs that would be determined by the environmental conditions of each area. It should be noted that the productive orientation of dry Spain was not exclusively based on cereal crops, but also on stockbreeding, vineyards and olive groves. However, the important issue here is that all of these crops were produced on un-irrigated land cultivated through extensive systems¹¹³. In fact, the cattle breeding interests from the interior of the Peninsula also took part in the privatization of the commons, which led to the formation of large extensive exploitations.

¹¹² Multiple warnings arose throughout the 19th century pointing out to the damage that an excessive reduction of the commons would cause to agrarian productivity, such as lower agricultural yields and the impossibility of properly maintaining livestock. See Moral Ruíz, *La agricultura española*; Artiaga and Balboa 'La individualización de la propiedad colectiva', p. 103; Gómez Urdañez, 'Doctrinas y realidades', p. 158. In this regard, there is evidence that the intensification of the privatization process during the decades of 1850 and 1860 led to the reduction of livestock, since the lower availability of common lands made their support difficult. See González de Molina, 'Condicionantes ambientales'.

¹¹³ D. Gallego, 'Sociedad, naturaleza y mercado: Análisis regional de los condicionantes de la producción agraria española (1800-1936)', *Historia Agraria*, 24 (2001), p. 46.

1.4 Empirical exercise

The arguments outlined above regarding the diverse regional persistence of common lands in Spain are tested employing the following model relating the importance of the commons to the different economic, social and environmental factors at play:

$$Commons_i = \beta_0 + \beta_1 Demand_i + \beta_2 Social_i + \beta_3 Environment_i + \beta_4 NW_i + u_i$$

While the stock of common lands in each province is measured as a fraction over the total provincial area, the importance of economic incentives is tested by using different proxies. On the one hand, population density and urbanization rates consider demographic pressures and the importance of market-oriented incentives and the demands arising from economic development. While population figures are divided by the total provincial area, urbanization is measured by the proportion of population living in cities bigger than 5,000 inhabitants¹¹⁴. On the other hand, a dummy for coastal provinces and the distance to big cities are also included to further test the importance of market incentives¹¹⁵. Likewise, in order to avoid multicollinearity problems, the variables accounting for economic incentives are also collapsed into one single variable using the market potential per capita. This indicator, recently developed by Martínez-Galarraga, captures the importance of market incentives by adding up the economic size of the province itself and that of other provinces and overseas market weighted by

¹¹⁴ Figures for these variables are found in R. Nicolau, 'Población, salud y actividad', in A. Carreras and X. Tafunell (eds.), *Estadísticas Históricas de España, siglos XIX y XX* (Bilbao, 2005); Instituto Nacional de Estadística, *Anuario Estadístico de España, 2000* (Madrid, 2001); X. Tafunell, 'Urbanización y vivienda', in A. Carreras and X. Tafunell (eds.), *Estadísticas Históricas de España, siglos XIX y XX* (Bilbao, 2005).

¹¹⁵ Distance to big cities is computed as the minimum geographical distance from the provincial capital to Madrid or Barcelona.

a decreasing function of distance and transport costs¹¹⁶. According to the theory of property rights, stronger market incentives should be negatively correlated with the stock of common lands.

However, since the social and environmental context may have qualified the market pressures to redefine the existing institutional arrangement, different proxies accounting for these factors are included in the model. On the one hand, the social framework is characterised by inequality levels measured by the fraction of landowners over the agricultural active population¹¹⁷. Furthermore, in order to consider the potential influence of large landowners, a proxy assessing the average size of plots is also calculated by dividing agricultural land between landowners and then included as an interaction term¹¹⁸. Likewise, the population settlement pattern and the importance of collective uses on the commons are also incorporated into the analysis. While the settlement pattern refers to the number of settlements per 100 km², the importance of collective user-rights is measured by the fraction of total uses which were being enjoyed collectively¹¹⁹.

On the other hand, environmental features are proxied using humidity and ruggedness indexes, as well as the interaction between orography and altitude to further distinguish the effects of a steep relief and extreme weather. Following Simpson, the humidity index divides annual rainfall by temperature using long-term series data from

¹¹⁶ J. Martínez-Galarraga, 'The determinants of industrial location in Spain, 1856-1929', *Explorations in Economic History*, 49 (2012), pp. 262-264.

¹¹⁷ This information is found in Dirección General del Instituto Geográfico y Estadístico, *Censo de la población de España, 1860* (Madrid, 1863).

¹¹⁸ Agricultural land taken from GEHR, 'Más allá de la "propiedad perfecta"'.
¹¹⁹ The data for these variables is taken from Comisión de Estadística General del Reino, *Anuario Estadístico de España, 1859-1860* (Madrid, 1860); Instituto Nacional de Estadística, *Anuario Estadístico de España, 2000*; GEHR, *Estadísticas históricas*. Regarding the importance of collective user-rights, the average between 1860 and 1870 is used to avoid unexplained short-run variations.

Goerlich¹²⁰. The ruggedness index quantifies terrain irregularity by comparing the altitude between neighbouring cells using GIS¹²¹. Lastly, altitude is measured as the fraction of provincial land over 1,000 metres¹²². According to the arguments outlined in the previous section, these variables are expected to be positively related with the stock of common lands.

Lastly, provinces in North-Western Spain constitute a special case. Before the advent of the liberal state, most commons there did not officially belong to the municipalities but to the neighbours themselves¹²³. It has been argued that, despite the central government's efforts to municipalize these resources, their special legal status further complicated privatization. A dummy variable for these provinces will be included in the analysis to test its potential effect on the privatization process and to further check the robustness of my results. These provinces include Asturias, Cantabria, León and the four Galician provinces. Summary statistics of the variables employed are reported in table A.1 in Appendix A.

Given the different legislation under which privatization was implemented, the empirical analysis is carried out separately for the two periods divided by the *Disentailment Act*. While prior to 1855, municipalities controlled who benefited from the process, the new legislation established that sales would be the result of public auctions, which were more likely to end up in the hands of the richer classes. In addition, plots were not parcelled up and payments were required in cash, thus preventing small farmers from participating in the bids¹²⁴. Likewise, the use of public auctions also facilitated the participation of foreigners in the sales. There is indeed

¹²⁰ J. Simpson, *Spanish agriculture: The long siesta, 1765-1965* (Cambridge, 1995), p. 41; F.J. Goerlich, 'Datos climáticos históricos para las regiones españolas (CRU TS 2.1)', *Documentos de Trabajo Fundación BBVA*, 9 (2010).

¹²¹ F.J. Goerlich and I. Cantarino, 'Rugosidad del terreno: Una característica del paisaje poco estudiada', *Documentos de Trabajo Fundación BBVA*, 10 (2010).

¹²² Instituto Nacional de Estadística, *Anuario Estadístico de España, 2000*.

¹²³ Balboa, 'La historia de los montes públicos españoles'; Jiménez Blanco, 'El monte'.

¹²⁴ García Sanz, 'Introducción', p. 28; Jiménez Blanco, 'El monte', p. 150.

evidence that, while sales and distributions carried out during the first half of the 19th century often benefited small and middle-sized farmers, the subsequent dismantling of the commons mostly favoured large landowners¹²⁵. The first set of regressions in Table 1.1 thus refers to the first period, the so-called ‘silent disentailment’. The dependent variable is the stock of common lands in 1860 and all explanatory variables also refer to the year 1860. The results in column (1) to (3) seem to give certain support to the theory of property rights. Although population density and urbanisation rates are not statistically significant, coastal provinces and/or those closer to big cities showed lower levels of common land persistence in 1860.

In contrast, it seems that the social framework did not play a significant role explaining regional differences before that date. As mentioned above, the way privatization was carried out before the *General Disentailment Act* of 1855 left the process under the control of the local communities themselves and there is evidence that the appropriation of the commons not only benefited large landowners, but also small and middle-sized farms¹²⁶.

Therefore, since all social groups may have profited from participating in the process but the regional outcome was so different, other elements were mediating their involvement. It is also important to stress that the first half of the 19th century was a turbulent period, characterized by continuous political conflicts which negatively affected municipal finances. The Napoleonic invasion of 1808, and the subsequent Peninsular War, was followed by revolutions and counter-revolutions, as well as by an external military intervention in 1823 and a civil war between 1833 and 1839. Local authorities saw privatization as a potential solution to their financial troubles, what

¹²⁵ Ibid, pp. 149-150.

¹²⁶ Cabral, *Propiedad communal*; Jiménez Blanco, *Privatización y apropiación de tierras municipales*.

increased the pressure on the commons independently of their social composition¹²⁷. Political instability also favoured illegal appropriations¹²⁸.

TABLE 1.1 COMMON LAND PERSISTENCE IN 1860

	Dependent variable: Stock of common lands (%)		
	(1)	(2)	(3)
Population Density	0.05 (0.20)	0.05 (0.20)	0.06 (0.15)
Urbanization	-0.17 (0.18)	-0.17 (0.18)	-0.17 (0.16)
d_coast	-8.82 (6.41)	-8.25 (7.26)	-12.34* (6.43)
Distance to Mad/Bcn	0.02** (0.01)	0.02** (0.01)	0.01 (0.01)
Landowners	-15.10 (27.65)	-14.37 (29.39)	-11.97 (27.42)
Landowners*Plot Size		0.28 (1.27)	0.16 (1.21)
Settlement Pattern	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Collective user-rights	-7.48 (11.26)	-7.39 (11.27)	-4.65 (10.62)
Humidity	6.26*** (2.04)	6.32*** (2.18)	1.51 (2.83)
Ruggedness	0.14 (0.19)	0.16 (0.21)	0.24 (0.21)
Ruggedness*Altitude	-0.01 (0.00)	-0.01 (0.00)	-0.01 (0.00)
d_North-Western			25.95** (10.47)
Observations	46	46	46
R-squared	0.56	0.56	0.63

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. OLS estimators. All explanatory variables refer to 1860. For simplicity, the intercept is not reported.

Interestingly, environmental features did play an important role. The humidity index is shown to be strongly associated with common land persistence, which supports the idea that either the need to resort to the commons to expand arable land or to use them as a basis for intensification was conditioned by the different climates present in

¹²⁷ Lana, 'From equilibrium to equity', p. 176.

¹²⁸ Iriarte, 'Common lands', p. 22.

the Peninsula. Surprisingly, the ruggedness index does not show a significant effect on this outcome. However, we should be aware that sometimes, and this is certainly one of them, this kind of regional analysis can present certain problems, arising from the fact that regional averages may conceal internal geographic differences that, in turn, may produce diverse degrees of privatization. Regional studies have clearly shown that privatization was more intense in the plains than in mountainous areas, mostly reflecting lower enclosing costs and larger agricultural potential. Iriarte shows, for the Navarran case, that the valley in the south experienced a much greater dismantling of their commons than did the upland areas of the north¹²⁹. In the Ebro valley, the mountainous areas retained a great part of their common lands, while sales in the flood plain were intense¹³⁰. The same is apparent in the case of Castile and León or Valencia, where most remaining common lands were in the hilly areas surrounding the plateau or in the mountainous areas of the interior respectively¹³¹.

The inclusion of the dummy for the North-Western provinces in column (3) does not greatly change the results just outlined. Holding everything else fixed, these provinces nonetheless enjoyed higher degrees of common land persistence, what points to the importance of the institutional design behind this type of commons in facilitating their survival. It should also be noted that, although humidity loses its significance, this is likely to be due to the high correlation between North-Western provinces and rainfall levels, so distinguishing between climate and legal status becomes elusive.

However, the OLS estimates may not only suffer from the possibility that an unobserved factor is correlated with the stock of common lands and any of the explanatory variables, but also from simultaneity or reverse causality, thus potentially

¹²⁹ Iriarte, 'La pervivencia de bienes comunales'.

¹³⁰ Moreno, 'El regimen comunal'.

¹³¹ GEHR, 'Más allá de la "propiedad perfecta"'; C. Montiel Molina, 'Titularidad y régimen de aprovechamiento de los montes catalogados en la Comunidad Valenciana', *Agricultura y Sociedad*, 65 (1992).

biasing these results. In this sense, if the existence of market incentives may favour the privatization of common lands, their dismantling, in turn, made the penetration of market mechanisms easier. As well as the marketing of the land factor itself, the process forced peasants to resort to the market to acquire the products that they previously obtained from the commons and this, in turn, pushed them to sell their workforce or a greater part of their productions to get enough resources to participate in the market¹³². Furthermore, given the increasing role of the land as mortgage security, the market for credit would also enjoy a boost that, in turn, would accelerate the transmission of land¹³³. A similar endogenous logic can be applied to population density if the privatization of the commons somewhat facilitated population growth.

Likewise, and although this argument may be more valid for privatization taken place under the *General Disentailment Act*, a widespread argument is that the appropriation of communal resources may have increased inequality through the property concentration that sales used to entail. In Extremadura, Castilla-La Mancha and Western Andalucía, the privatization of common lands was one of the keys of the property accumulation carried out by the local privileged classes¹³⁴. Similarly, more than 91 per cent of the surface area sold in Navarra from 1826 to 1860 ended up in the hands of well-off landowners, which gives an idea of how the privatization process could increase the level of social imbalances, thus reducing the social cohesion needed for the defence of the commons¹³⁵. It is true, however, that there is some evidence

¹³² GEHR, 'Diversidad dentro de un orden', pp. 130-131.

¹³³ I. Iriarte and J.M. Lana, 'Concurrencia y jerarquización de derechos de apropiación sobre los recursos: Bienes comunales en Navarra, siglos XVIII-XX', in R. Congost and J.M. Lana (eds.), *Campos cerrados, debates abiertos. Análisis histórico y propiedad de la tierra en Europa, siglos XVI-XIX* (Pamplona, 2007), p. 227.

¹³⁴ GEHR, 'Más allá de la "propiedad perfecta"', p. 120.

¹³⁵ Lana, 'Commons for sale', p. 19.

showing that the dismantling of the commons during the first half of the 19th century also benefited small and medium-sized farmers¹³⁶.

In order to try to overcome these problems, an instrumental variable approach is carried out exploiting different geographical sources of exogenous variation in the variables at play. On the one hand, as explained above, the different proxies used to account for economic incentives are collapsed into one single variable. The present-day size of the Spanish provinces was determined in 1833 when a new political organisation was designed¹³⁷. Apart from historical considerations, the size of the Spanish provinces was determined by taking into account their economic potentialities. Those provinces with worse geo-climatic conditions were compensated with a larger dimension, thus making province geographical area a potential instrument for market potential¹³⁸. On the other hand, access to land is instrumented using the population settlement pattern¹³⁹. Interestingly when working at the provincial level, instrumenting by the suitability for growing wheat, or cereals in general, as suggested by Easterly based on the arguments made by Engerman and Sokoloff, does not work¹⁴⁰. In fact, the correlation goes the other way around because, in Spain, growing cereals is often related to large extensive latifundia¹⁴¹. A different instrument is proposed here based on the settlement pattern which emerged from the *Reconquista*. Mostly taking place from the 11th to the 15th century, the *Reconquista* slowly expanded the Christian frontier and

¹³⁶ Cabral, *Propiedad communal*; Jiménez Blanco, *Privatización y apropiación de tierras municipales*.

¹³⁷ R. Dobado, 'Geografía y desigualdad económica y demográfica de las provincias españolas (siglos XIX y XX)', *Investigaciones de Historia Económica*, 5 (2006), p. 154.

¹³⁸ See also Martínez-Galarraga et al., 'Agglomeration and labour productivity in Spain over the long term', *Cliometrica*, 2 (2008), p. 208; which have employed this strategy to instrument for regional industrial employment density.

¹³⁹ Note that this variable was not significant in the previous regressions, so it can be removed from the model and employed as an instrument.

¹⁴⁰ W. Easterly, 'Inequality does cause underdevelopment: Insights from a new instrument', *Journal of Development Economics*, 84 (2007); S.L. Engerman and K.L. Sokoloff, 'Factor endowments, institutions, and differential paths of growth among new world economies', in S. Haber (ed.), *How Latin America fell behind* (Stanford, 1997).

¹⁴¹ Gallego, 'Sociedad, naturaleza y mercado'.

was accompanied by the colonisation of the occupied Iberian territory¹⁴². The origin of the extremely large estates existent in the South half of the country can be partly traced back to the quick settlement process originated with the *Reconquista*¹⁴³. In order to reward the nobility or the urban elites who had participated in taking over the Muslim Kingdoms and to commit them to the defence of the expanding border, large tracts of land were allocated to their members¹⁴⁴. Given the large stock of available land, the new settlements were located relatively far from each other, what greatly contrasts with the dispersed settlement pattern existing in Northern Spain where land was more equally distributed¹⁴⁵. Even the fundamental differences in property structures between Western and Eastern Andalusia clearly reflected different patterns of population settlement¹⁴⁶. The existence of large unpopulated areas also facilitated subsequent processes of land accumulation by these elites either through the purchase of Crown lands when Royal finances were in need or, more importantly, through illegal usurpations¹⁴⁷.

Reflecting geographical features and accidents in history, both instruments are plausibly exogenous and they show a significant relationship with the instrumented variables in the first stage. The approach followed here relies on the assumption that the instruments employed only affected the stock of common lands through its influence on economic incentives and land access. The results of collapsing market incentives into

¹⁴² J.F. O'Callaghan, *Reconquest and Crusade in Medieval Spain* (Philadelphia, 2003).

¹⁴³ M. Artola et al., *El latifundio. Propiedad y explotación, s. XVIII-XX* (Madrid, 1978), pp. 87-91; J.M. Mínguez, *Al-Andalus: Musulmanes y cristianos, siglos XIII-XIII* (Barcelona, 1989), pp. 193; T.F. Ruiz, *Historia Social de España, 1400-1600* (Barcelona, 2002), p. 26; I. Álvarez Borge, *La Plena Edad Media. Siglos XII-XIII* (Madrid, 2003), p. 352.

¹⁴⁴ The Catholic Church and different Religious Orders also greatly benefited from the expanding border. See E. Manzano Moreno, 'Épocas medievales', in J. Fontana and R. Villares (eds.), *Historia de España, vol. 2* (Madrid, 2010), pp. 484-485).

¹⁴⁵ M. González Jiménez, 'Repartimientos andaluces del siglo XIII. Perspectiva de conjunto y problemas', in CSIC (ed.), *De Al-Andalus a la sociedad feudal: Los repartimientos bajomedievales* (Madrid, 1987), p. 107; R. Domínguez, *La riqueza de las regiones: Las desigualdades económicas regionales en España, 1700-2000* (Madrid, 2002), p. 23.

¹⁴⁶ Artola et al., *El latifundio*, p. 88.

¹⁴⁷ Ibid, pp. 89-91; A.M. Bernal, *Economía e historia de los latifundios* (Madrid, 1988), pp. 27-30.

one single variable and the instrumental variable approach, reported in table 1.2, confirm the importance of the humidity index and the special characteristics of North-Western provinces but override that of market incentives.

TABLE 1.2 COMMON LAND PERSISTENCE IN 1860. IV ESTIMATES

	Dependent variable: Stock of common lands (%)			
	OLS		IV	
	(1)	(2)	(3)	(4)
Market Potential	-3.10 (3.73)	-4.47 (2.75)	-8.53 (8.43)	-7.72 (7.99)
Landowners	-11.45 (18.80)	1.64 (17.69)	-54.90 (44.94)	-10.89 (32.89)
Landowners*Plot Size	0.23 (0.95)	0.47 (0.82)	-0.07 (1.00)	0.32 (0.86)
Collective user-rights	-6.71 (10.40)	-5.49 (9.69)	-9.60 (10.41)	-7.57 (7.99)
Humidity	6.64*** (1.47)	2.54 (2.47)	6.97*** (1.65)	2.70 (2.39)
Ruggedness	0.10 (0.22)	0.13 (0.21)	0.02 (0.26)	0.12 (0.21)
Ruggedness*Altitude	-0.00* (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
d_North-Western		25.57** (12.09)		25.31** (11.17)
Observations	44	44	44	44
R-squared	0.49	0.58	0.43	0.57

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All explanatory variables refer to 1860. For simplicity, the intercept is not reported.

As previously mentioned, the *Disentailment Act* of 1855 meant an inflexion point in the privatization process. Not only did the liberal state force municipalities to put their lands on sale, but also those transactions had to be carried out through public auctions. However, some commons were also exempted from the sales due to ecological concerns, so, apart from the economic, social and environmental factors under analysis, the importance of those exemptions is also included in the model to

assess whether the liberal state partly contributed to the persistence of the commons¹⁴⁸. Also, given the already unequal stock of common lands that existed at this date, the stock of these collective resources and its interaction with the importance of collective user-rights is considered. The dependent variable is now the stock of common lands, as a fraction of the total provincial land, which ended up privatized between 1860 and 1930. In order to test for the structural reasons behind privatization, all explanatory variables refer to 1860. This specification also allows avoiding reverse causality problems. Table 1.3 reports the outcome of this empirical exercise.

These results are mostly confirmed in table 1.4, which collapses market incentives into one single variable and includes the same instrumental variable approach employed above to overcome the omitted variable problem. Again, while market incentives show a weak, or even negative, relationship with privatization, the importance of environmental features in driving the process is confirmed in all specifications. The dismantling of the commons was weaker in humid regions and in mountainous areas. This result confirms previous interpretations which have pointed out that the persistence of common lands in some Spanish regions was not due to economic backwardness but to the flexibility they provided to the agricultural system¹⁴⁹.

¹⁴⁸ The information about the importance of those commons exempted for environmentally-minded reasons is taken from Dirección General de Estadística, *Anuario Estadístico de España, 1866-1867* (Madrid, 1870).

¹⁴⁹ Iriarte, 'La pervivencia de bienes comunales'; Balboa, 'La historia de los montes públicos españoles'; Serrano, 'La defensa del comunal'; Lana, 'From equilibrium to equity'.

TABLE 1.3 PRIVATIZATION OF COMMON LANDS, 1860-1930

	Dependent variable: Common lands privatized (%)		
	(1)	(2)	(3)
Population Density	0.08 (0.06)	0.08 (0.07)	0.08 (0.07)
Urbanization	-0.07 (0.09)	-0.05 (0.09)	-0.05 (0.09)
d_coast	-4.63* (2.31)	-3.00 (2.58)	-2.48 (2.74)
Distance to Mad/Bcn	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Landowners	-11.25 (9.41)	-9.99 (8.10)	-10.03 (8.24)
Landowners*Plot Size		0.82* (0.42)	0.83* (0.42)
Settlement Pattern	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Collective user-rights	0.05 (0.12)	0.05 (0.13)	0.05 (0.13)
Humidity	-2.99*** (0.51)	-2.91*** (0.62)	-2.58*** (0.79)
Ruggedness	0.05 (0.07)	0.12 (0.08)	0.11 (0.09)
Ruggedness*Altitude	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)
Excmpted CL	2.72 (9.54)	-5.09 (11.62)	-5.19 (12.10)
Common Lands	0.35*** (0.12)	0.36*** (0.11)	0.37*** (0.13)
d_North-Western			-2.38 (3.58)
Observations	46	46	46
R-squared	0.76	0.79	0.79

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. OLS estimators. All explanatory variables refer to 1860. For simplicity, the intercept is not reported.

Interestingly, the degree of land concentration now shows a statistically significant relationship with the intensity of privatization. In those regions where access to land was less widespread and large landowners predominated, the private appropriation of the commons prevailed. The *General Disentailment Act* of 1855 fundamentally changed the rules through which privatization was being carried out,

mostly providing the well-off with a mechanism which gave them a significant advantage for privately appropriating the collective resources. Where a more unequal access to land prevailed, small farmers and labourers pushed to equally redistribute the commons. Although landowner elites may not have been necessarily in favour of privatization, they may have preferred that solution as the best choice to maintain their privileged access to those resources¹⁵⁰. In contrast, in those rural societies where small landholdings and a lesser inequality was the norm, a broad consensus against privatization arose since the commons simultaneously allowed for maintaining the accumulation systems of the elites, and for securing the reproduction of the peasant holdings¹⁵¹. Therefore, it was not land hunger, but land greed, which partly drove the dismantling of the commons in Spain. Although this effect is slightly reduced when the IV approach is conducted, this is likely due to the increased standard errors resulting from the IV procedure itself. Furthermore, performing a Hausman test actually shows that differences in the OLS and IV estimates are not systematic, so the OLS estimators would be preferred. The role of the landowner elites in fostering privatization for their own sake has indeed been widely recognised by the literature¹⁵².

It should also be noted that, although undoubtedly the governmental decision of exempting some commons for ecological reasons put a limit on the privatization process, this policy does not contribute to explaining the different regional trends. Although this variable shows the expected sign, it is not statistically significant. The ecological criteria defining which commons were exempted is correlated with the humidity and ruggedness indexes, so its lack of significance may be due to

¹⁵⁰ Jiménez Blanco, 'El monte', p. 151.

¹⁵¹ Balboa, 'La historia de los montes públicos españoles'.

¹⁵² GEHR, 'Más allá de la "propiedad perfecta"'; Balboa, 'La historia de los montes públicos españoles'; Linares, 'Estado, comunidad y mercado'; Iriarte, 'Common lands'.

multicollinearity¹⁵³. However, its large standard errors make this highly unlikely. Not only were the ambitious initial criteria greatly reduced for fiscal considerations, but applying the legislation was either extremely difficult due to the lack of personnel or was plagued with arbitrariness and irregularities¹⁵⁴. In this sense, referring to Jérez de la Frontera, a municipality in southern Spain, Jiménez Blanco argues that exemptions there were more the result of chance, arbitrariness and political influence than of the legislation itself¹⁵⁵. There is also evidence showing that, forced by fiscal needs, there were uplands which ended up being privatized even though they had been legally declared exempted, either for environmental reason or for being subject to collective uses¹⁵⁶. Therefore, many common lands which had been technically exempted ended up privatized.

Lastly, although showing the expected sign, the dummy for the North-Western provinces is now statistically insignificant, what suggests that the context in which the commons were immersed mattered more than their particular legal status. This outcome can also be the result of the legal changes imposed by the liberal state and, by which, municipalities substituted the neighbours as the recipients of the officially sanctioned authority regarding the management of the commons.

¹⁵³ See also Linares, 'The privatisation of communal lands'.

¹⁵⁴ Montiel Molina, 'Titularidad y régimen de aprovechamiento', p. 391; Jiménez Blanco, *Privatización y apropiación*, p. 254.

¹⁵⁵ Ibid.

¹⁵⁶ López Estudillo, 'Los montes públicos', pp. 79-81; Linares, 'Estado, comunidad y mercado', pp. 31-32.

TABLE 1.4 PRIVATIZATION OF COMMON LANDS, 1860-1930. IV ESTIMATES

	Dependent variable: Common lands privatized (%)			
	OLS		IV	
	(1)	(2)	(3)	(4)
Market Potential	-0.70 (1.42)	-0.45 (1.57)	-3.86* (2.12)	-3.79* (2.15)
Landowners	-8.87* (4.39)	-9.91** (4.76)	-21.18 (13.76)	-23.48 (14.83)
Landowners*Plot Size	0.93** (0.42)	0.91** (0.42)	0.70* (0.42)	0.68* (0.41)
Collective user-rights	0.04 (0.14)	0.05 (0.15)	-0.03 (0.13)	-0.02 (0.14)
Humidity	-2.63*** (0.49)	-2.39*** (0.61)	-2.32*** (0.52)	-2.12*** (0.69)
Ruggedness	0.11 (0.07)	0.11 (0.08)	0.09 (0.08)	0.08 (0.08)
Ruggedness*Altitude	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)
Excmpted CL	-7.36 (11.47)	-7.74 (11.95)	-2.66 (10.42)	-2.81 (10.66)
Common Lands	0.37*** (0.13)	0.38*** (0.14)	0.39*** (0.12)	0.39*** (0.13)
d_North-Western		-2.37 (3.96)		-1.86 (3.71)
Observations	44	44	44	44
R-squared	0.76	0.77	0.71	0.71

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All explanatory variables refer to 1860. For simplicity, the intercept is not reported.

1.5 Concluding remarks

As Runge puts it, the persistence of traditional institutions should not be simply explained as the manifestation of ‘backwardness’ or ‘irrationality’, but as collective arrangements well adapted to the physical and social environment in which they were immersed¹⁵⁷. The explanation of such a complex phenomenon as the one analysed here cannot be reduced to a single factor, nor can it rely on a number of individual elements isolated from each other. Nonetheless, rather than ascribing purely market incentives to

¹⁵⁷ Runge, ‘Common property’, p. 632.

this process, as predicted by the theory of property rights, this paper attributes a greater explanatory power to the interaction between the social and environmental conditions that shaped local communities, which were capable, under certain circumstances, of partially offsetting the pressures coming from the market and the state. Without denying their role as the backbone of the privatization process, market incentives were increasing everywhere and do not appear to be important enough in explaining the dissimilar regional trajectories. The variety of common land persistence throughout the 19th century was determined by a multiplicity of social and environmental conditions, within which a range of economic and political pressures were operating.

The need to extend arable land was strongly influenced by the climate restraints that each area enjoyed, forcing farmers to resort to an extensive exploitation of the land in order to increase production in those areas where edafoclimatic conditions limited agricultural yields. This strategy, in addition, produced more profits in flat areas than in mountainous areas due to the inherent difficulties that the ploughing of arable land entailed. The functionality of the commons was superior in humid areas given that these areas exploited them intensively through a growing integration between agriculture, stockbreeding and forestry, which allowed for the increase of agricultural production without resorting to the dismantling of the commons. By determining the productive orientation and the productivity of agriculture, and of the commons themselves, environmental conditions influenced the need to resort to the commons, either to expand arable land or to practice intensive cultivation, thus becoming a key factor in explaining the privatization process.

The attempt of the liberal state to speed up the process by forcing municipalities to sell their commons and institutionalising public auctions as the allocation mechanism, actually prevented the bottom part of the population from participating in

the sales and facilitated the private appropriation of those resources by landowner elites. During the precedent period, not only large landowners, but also small and middle size farmers took part on sales, distributions, and even illegal appropriations. In fact, the level of inequality does not explain regional differences, which were mostly the result of environmental constraints and the pressure of market incentives. Besides, although the distribution of user-rights on the commons was relatively unequal, reflecting the social structure itself, some sort of political negotiation at the local level aimed to secure social cohesion which limited the extent of unequal appropriation. The *General Disentailment Act* disrupted this equilibrium and triggered off two different responses depending on the existing institutional context. Where access to the land was relatively balanced, societies were more homogenous which, despite the changes in legislation, contributed to generating sufficient general consent to continue defending an asset greatly valued by the different groups within the community. However, where large economic and political inequalities prevailed, control over the commons through a political negotiation became difficult for the landowner elites. In this context, landowning elites opted to promote privatization in order to secure their privileged access to these resources, a strategy facilitated for the changes in the rules introduced by the state.

Although a model as described might miss the richness of detail inherent in such a complex phenomenon, it could perhaps serve as a template for future research to test its validity in the multiple circumstances that shaped the historical trajectory of the common lands. The results of this paper should nonetheless be tested further. Not only is the sample size used relatively small, but using provincial averages may conceal important internal differences that may have influenced the analysis. The outcome of the privatization process actually presented remarkable differences within the same

province, so a finer-grained analysis, going down to more disaggregated levels, to the county or municipal level, should clarify the previous results. Likewise, the availability of more complete data, especially regarding the stock of common lands that existed at the end of the 18th century would help to improve the model sketched here.

Chapter 2

‘GOTHS AND VANDALS’ OR ‘CIVILISED FARMERS?’

COMMON LANDS AND AGRICULTURAL PRODUCTIVITY

IN EARLY 20TH CENTURY SPAIN¹⁵⁸

Abstract: By analysing the different factors affecting labour agricultural productivity in early 20th century Spain, this chapter shows that common lands were not detrimental to agricultural development. Even though privatisation fostered output per worker by bringing more land into cultivation, the role of the commons as provider of pasture and fertilising materials counteracted that effect, especially in humid regions. The supposed advantages of dismantling the communal regime are thus not supported by the data.

2.1 Introduction

The privatisation of common lands has traditionally been considered a precondition to foster agricultural productivity and economic growth. Liberal thinkers and agrarian reformers, such as Arthur Young, eagerly advocated for the privatisation of the commons on the theoretical grounds of facilitating the adoption of more advanced farming methods and thus raising efficiency¹⁵⁹. Even though concerns about the subsequent deprivation of the peasantry, exemplified by the work of the Hammonds (1911), loomed in the public minds, several authors in the 1960s and 1970s supported the liberal views and the inevitability of the privatisation process¹⁶⁰. According to these

¹⁵⁸ A version of this chapter has been accepted for publication in *Social Science History* (forthcoming).

¹⁵⁹ For a critical overview of Young's writings, see R.C. Allen, 'The efficiency and distributional consequences of eighteenth century enclosures', *The Economic Journal*, 92 (1982); and R.C. Allen and C. O'Grada, 'On the road again with Arthur Young: English, Irish, and French agriculture during the Industrial Revolution', *Journal of Economic History*, 48 (1988).

¹⁶⁰ J.L. Hammond and B. Hammond, *The village labourer, 1760-1832* (London, 1911); J.D. Chambers and G.E. Mingay, *The agricultural revolution, 1750-1880* (London, 1966); D.N. McCloskey, 'The economics of enclosure: A market analysis', in W.N. Parker and E.L. Jones (eds), *European peasants and their markets. Essays in Agrarian Economic History* (Princeton, 1975). For a recent reaffirmation of this view, see M. Overton, 'Re-establishing the English Agricultural Revolution', *Agricultural History Review*, 44 (1996), pp. 18-20. Regarding the inevitability of enclosure, it has been argued that, although hindering efficiency due to higher transport and transactions costs, the open field system was relatively efficient during the Middle Ages because, in the absence of insurance markets, scattered landholdings provided a risk-insurance mechanism for farmers. However, this institution would be no longer necessary

critics, apart from preventing individual entrepreneurship and encouraging over-exploitation, the ambiguity of the implied ownership rights and the need to reach consensus impeded the diffusion of agricultural improvements¹⁶¹.

However, recent research has started to deconstruct the negative image surrounding the communal regime. According to this view, common property regimes do not need to be inefficient and/or unsustainable and, therefore, the persistence of common lands can be compatible with economic development. In this sense, while British agricultural productivity stagnated during the golden era of the enclosure movement, significant growth had already taken place before that period and improvements in farming methods had been actually implemented in open fields¹⁶². Likewise, the longstanding belief that rents increased after privatisation is not accounted for by growing productivity, but mostly by inflation and by lands being freed from tithe, not to mention a significant redistribution of the existing agricultural income from tenants to landowners¹⁶³. Recent research on continental commons has also contributed to this positive reassessment of the role of the commons¹⁶⁴. Similarly, McKean shows that, in Japan, common meadows and forests were also efficiently

as modern markets for savings and insurance developed. See McCloskey, 'The economics of enclosure'; 'The prudent peasant: New findings on open fields', *Journal of Economic History*, 51 (1991).

¹⁶¹ Individual private rights also permit using land as collateral when accessing the credit market. On this issue, see G. Federico, *Feeding the world* (Princeton, 2005), p. 120. The supposed over-exploitation of these resources, known as the 'tragedy of the commons', was influentially put forward by Garret Hardin. See Hardin, 'The tragedy'.

¹⁶² Allen, *Enclosure*; 'Tracking the Agricultural Revolution', *Economic History Review*, 52 (1999); 'Community and market'.

¹⁶³ Allen, *Enclosure*; G. Clark, 'Commons sense: Common property rights, efficiency, and institutional change', *Journal of Economic History*, 48 (1998). Instead of focusing on efficiency, other scholars, in the spirit of the Hammonds' pioneering contribution, have stressed the negative impact that the loss of common rights had on the living standards of the lower rural classes. See Humphries, 'Enclosures'; Neeson, *Commoners*; E.S. Tan, 'The bull is half the herd: Property rights and enclosures in England, 1750-1850', *Explorations in Economic History*, 39 (2002). These claims, nonetheless, have also been contested. See Shaw-Taylor, 'Parliamentary enclosure'; Clark and Clark, 'Common rights'.

¹⁶⁴ N. Vivier, *Propriété collective et identité communale. Les Biens Communaux en France, 1750-1914* (Paris, 1998); T. de Moor et al. (eds.), *The management of common land in North West Europe, ca. 1500-1850* (Brepols, 2002); T. de Moor, 'Avoiding tragedies: A Flemish common and its commoners under the pressure of social and economic change during the eighteenth century', *Economic History Review*, 62 (2009).

managed by rural villages for centuries¹⁶⁵. It should be stressed that a crucial factor behind these finding is that, contrary to previous belief, the commons were not open-access resources, but were conscientiously regulated by the village community¹⁶⁶. Access limits were widespread, both in terms of who was entitled to use the commons and what (and how much) could be extracted from them. Assemblies of users, by-laws, courts and self-monitoring mechanisms, were set up accordingly to securing the proper management of the system. Even though the view that enclosure did not foster economic growth has almost become the new paradigm¹⁶⁷, the lack of agreement between historians, especially focusing on the British case, still prevents making a definitive assessment of this issue.

This paper seeks to contribute to this debate by analysing the effect that the privatisation of common lands had on labour agricultural productivity in 19th and early 20th century Spain. Displacing the lens of the economic historian to other areas is especially relevant because the ‘successful’ English example was followed by agricultural reformers all across continental Europe¹⁶⁸. In this sense, by providing pasture, wood, fertilizer and fuel, together with the possibility of temporary cropping, common lands were a key component in the organic-based Spanish preindustrial economy¹⁶⁹. These communal resources were actually a crucial element of an organic system in which agricultural activity was completely integrated with cattle breeding and forestry. However, the strong liberal bias towards the supposed benefits of enclosure, exemplified by the well-known Young’s words comparing ‘the Goths and

¹⁶⁵ M.A. McKean, ‘Management of traditional common lands (Iriaichi) in Japan’, in National Research Council (ed.), *Proceedings of the Conference on Common Property Resource Management* (Washington, 1986).

¹⁶⁶ Allen, ‘Community and market’, p. 4; De Moor, ‘Avoiding tragedies’, pp. 4-10.

¹⁶⁷ Allen, ‘Progress and poverty’.

¹⁶⁸ Clark, ‘Commons sense’, p. 74; Demélas and Vivier, *Les propriétés collectives*.

¹⁶⁹ Iriarte, ‘Common lands’. Pasture seems to be, nonetheless, the most important use on the commons. See GEHR, ‘Diversidad dentro de un orden’; ‘Política forestal y producción’.

Vandals of open fields’ with ‘the civilization of enclosures’¹⁷⁰, was widely echoed by Spanish liberalism. The Ministry of Development in 1872, for instance, regarded the communal regime as a harmful remnant of a primitive rural culture which had to be replaced by individual property rights if economic progress wanted to be unleashed¹⁷¹. The transformations resulting from the emergence of the new liberal state, together with increasing market pressures, triggered the gradual dismantling of common lands throughout the 19th and early 20th centuries. Despite numerous warnings arising from the local rural communities, the liberal state actively promoted this process, particularly by passing the so-called *General Disentailment Act* in 1855¹⁷². Interestingly, not only the intensity of the privatization process was geographically diverse, as the previous chapter illustrates, but also the agricultural performance of each region did vary across Spain¹⁷³.

In order to analyse the distinctive effect of privatisation on agricultural productivity, this chapter exploits a data set at the provincial level at 1900 and 1930. Apart from quantifying the stock of common lands and agricultural productivity, it draws on data on the different inputs affecting the level of agricultural output. This includes information on agricultural labour force, diverse types of land and capital,

¹⁷⁰ Quoted in Allen and O’Grada, ‘On the road again’, p. 97.

¹⁷¹ Quoted in Sanz Fernández, ‘La historia contemporánea de los montes públicos españoles, 1812-1930. Notas y reflexiones (II)’, p. 165. Similar statements by prominent liberal figures can be found all over the 19th century. See, for instance, Moreno, ‘El régimen comunal’, p. 102; Gómez Urdañez, ‘Doctrinas y realidades’.

¹⁷² Examples of the contemporary opposition to the liberal policies can also be found in Simón Segura, *La desamortización*; C. Montiel Molina, ‘Titularidad y régimen de aprovechamiento de los montes catalogados en la Comunidad Valenciana’, *Agricultura y Sociedad*, 65 (1992); A.M. Linares, ‘De la apropiación del usufructo a la privatización de la superficie. Las tierras concejiles en la Baja Extremadura (1750-1850)’, *Noticiario de Historia Agraria*, 9 (1995); ‘Estado, comunidad y mercado’; F. Sánchez Salazar, ‘La desamortización civil en la sierra riojana: Las respuestas de los municipios al interrogatorio de 1851’, *Agricultura y Sociedad*, 76 (1995); González de Molina and Ortega Santos, ‘Bienes comunes y conflictos’; Gómez Urdañez, ‘Doctrinas y realidades’; Serrano, ‘La defensa del comunal; and Lana, ‘From equilibrium’.

¹⁷³ For a detailed account of this process and an analysis of the factors behind the diverse regional persistence of the communal regime in Spain, see Sanz Fernández, ‘La historia contemporánea de los montes públicos españoles, 1812-1930. Notas y reflexiones (I)’, GEHR, ‘Más allá de la “propiedad perfecta”’; Balboa, ‘La historia’; Jiménez Blanco, ‘El monte’; and Iriarte, ‘Common lands’.

both in terms of livestock and of modern inputs such as artificial fertilisers and modern ploughs, threshing machines and tractors. By considering the commons as another productive factor, this paper aims to assess their effect on agricultural productivity. Given their role as provider of pasture, the link between common lands and livestock is also included in the analysis. The results show that, on average, the different stock of common lands did not explain the differences on the levels of output per worker between provinces. Even though privatisation fostered labour productivity by bringing more land into cultivation, the role of the commons as provider of pasture and fertilizing materials counteracted that effect, especially in humid regions. The supposed advantages of dismantling the communal regime are thus not supported by the data, so liberal thinkers either were simply wrong or, given who mostly benefited from the sales, were seeking to promote vested interests.

2.2 Common lands, agrarian reform and agricultural modernisation in Spain

Sharing the same enlightened spirit prevalent in Europe, Spain also bred its own Arthur Youngs. Gaspar Melchor de Jovellanos was actually the leading figure when advocating the need for agricultural reforms in the last third of the 18th century¹⁷⁴. Interestingly, Jovellanos himself also intensely travelled across Spanish regions and the information gathered, together with his impressions, which he kept in a diary, served as a source of material for his subsequent writings¹⁷⁵. Although it is unclear whether Jovellanos got to directly know Young's work, he shared both the physiocrats' idea about the important role of agriculture and Smith's view on the role of economic

¹⁷⁴ Sánchez Salazar, *Extensión de cultivos*, p. 429; R. Robledo, *Economistas y reformadores españoles: La cuestión agraria, 1760-1935* (Madrid, 1993).

¹⁷⁵ J.M. Caso González, 'Los caminos de Jovellanos', in E. Fuentes Quintana (dir.), *Economía y economistas españoles*, vol. 3 (Barcelona, 2000).

freedom¹⁷⁶. However, the discussion of foreign ideas, including those of Young's, was a major activity in the *Sociedades del Amigos del País* (*Societies for Friends of the Country*), economic societies which sprang up all over Spain during the second half of the 18th century in an attempt to find solutions to the nation's economic problems¹⁷⁷. In any case, Young's work and that of other English liberals praising the benefits of enclosure became, directly or indirectly, increasingly influential among Spanish liberals from the late 18th century onwards¹⁷⁸. The journal *Semanario de Agricultura y Artes*, for instance, which ran from 1797 to 1808, published translations of Young's work¹⁷⁹. In this sense, after having read Young's writing, Canga Arguelles, a prominent liberal figure who wrote the preamble to the Constitution of 1812, wondered at the ability of the English farmer to increase yields¹⁸⁰.

Jovellanos' ideas, as reflected in the *Informe sobre el Expediente de Ley Agraria*, included the superiority of private property over other property regimes and, accordingly, the application of market mechanisms for the land factor or, in his own words, 'the suppression of the obstacles which prevent the free action of the individual interest'¹⁸¹. Although some timid attempts were made trying to distribute private user-rights over the commons during the 1760s and 1770s, his political stance only gradually crystallised throughout the 19th century, driven not only by market pressures and ideological considerations, but also by the fiscal problems of both the Crown and

¹⁷⁶ M. Grice-Hutchinson, *Economic thought in Spain: Selected essays of Marjorie Grice-Hutchinson* (Aldershot, 1993), p. 140.

¹⁷⁷ Ibid, p. 64.

¹⁷⁸ S. Almenar, 'El desarrollo del pensamiento económico clásico en España', in E. Fuentes Quintana (dir.), *Economía y economistas españoles, vol. 4* (Barcelona, 2000); R. Sidney Smith, 'El pensamiento económico inglés en España (1766-1848)', in E. Fuentes Quintana (dir.), *Economía y economistas españoles, vol. 4* (Barcelona, 2000). For the reception of English liberalism in Spain, see the different contributions in E. Fuentes Quintana (dir.), *Economía y economistas españoles* (Barcelona, 2000).

¹⁷⁹ Almenar, 'El desarrollo', p. 19.

¹⁸⁰ Sidney Smith, 'El pensamiento económico', p. 320.

¹⁸¹ G.M. de Jovenallos, *Informe de la Sociedad Económica de esta Corte al Real y Supremo Consejo de Castilla en el Expediente de Ley Agraria* (Madrid, 1795), p. 10. My translation.

municipalities¹⁸². This period certainly witnessed a massive privatisation process: around 10 million hectares changed hands between 1770 and 1930¹⁸³. The privatisation of property rights was also paralleled by a privatisation of the user-rights over the remaining commons. The success of the privatisation process was geographically uneven¹⁸⁴. The dismantling of the communal regime was particularly intense in some areas of the central and the southern half of the country, while common land persistence was especially high in North-western Spain¹⁸⁵.

The reasons behind this diverse outcome have been analysed in the previous chapter. What it is interesting to stress now is that the literature on the Spanish case, while regretting the potentially negative effects on the living standards of the rural poor, has mainly agreed with contemporary commentators about the necessity of removing old barriers for land to become a perfectly marketed commodity¹⁸⁶. The usual argument is that these reforms, although probably not able to significantly change farming methods and raise productivity, would have helped agriculture to feed a doubling population and meet an increasing international demand for Mediterranean products such as wine or olive oil. In this view, the negative consequences of enclosure on the bottom part of the population were viewed as the price to help bringing about the market mechanisms required for a better allocation of resources. However, the

¹⁸² For detailed summaries of the process during the 19th century, see Sanz Fernández, 'La historia contemporánea'; García Sanz, 'Introducción'; López Estudillo, 'Los montes públicos'; Balboa, 'La historia de los montes públicos'; Jiménez Blanco, 'El monte'; Gómez Urdañez, 'Doctrinas y realidades'; and Iriarte, 'Common lands'. For a review of the policies carried out in the 1760s-1770s, see A. Nieto, 'Desamortización ilustrada y desamortización liberal de la propiedad agraria', in S. de Dios et al. (eds.), *Historia de la propiedad en España. Bienes comunales, pasado y presente* (Salamanca, 2002), pp. 276-279.

¹⁸³ Rueda Herranz, *La desamortización*.

¹⁸⁴ GEHR, 'Más allá de la "propiedad perfecta"'.

¹⁸⁵ The regional picture was definitely more complex. See *ibid.* for a more detailed description by region.

¹⁸⁶ Herr, 'El significado'; García Sanz, 'Introducción'; R. Herr, *Rural change and royal finances in Spain at the end of the old regime* (Berkeley, 1988); J. Simpson, *Spanish agriculture. The long siesta, 1765-1965* (Cambridge, 1995).

appropriateness of having the commons dismantled has been subjected to mounting criticism.

Broadly speaking, the interpretation of this Spanish historical episode has followed a similar evolution as the one on the English enclosures. While contemporaneous agrarian reformists and liberal elites encouraged privatisation, this stance was strongly resisted in other spheres. This criticism peaked at the end of the 19th century and first decades of the 20th century coinciding with the end of the process and the realization of its poor results¹⁸⁷. Although heavily influenced by this school of thought, the first wave of professional historians, instead of reevaluating the role of the commons, negatively stressed the way the disentanglement was carried out, which was seen as a lost opportunity to promote a more equal access to land¹⁸⁸. A different view nonetheless emerged from the 1970s onwards. Perhaps influenced by Anglo-American historians and social scientists, the focus shifted to the potential positive effects of private property and market mechanisms¹⁸⁹. However, as pointed in the text, a new wave of researchers has reevaluated the contribution of the commons by considering its central role for the sustainability of the whole agrarian system.

By providing pasture and fertilising materials, as well as constituting a reserve of arable land, the commons were a key element within the agrarian sector, which can only be properly understood as an integrated system where arable, pasture and forest land complemented one another¹⁹⁰. Commons in Spain not only indirectly provided

¹⁸⁷ J. Costa, *Colectivismo agrario en España* (Madrid, 1898); P. Carrión, *Los latifundios en España: Su importancia, origen, consecuencias y solución* (Madrid, 1932).

¹⁸⁸ E.E. Malefakis, *Agrarian reform and peasant revolution in Spain. Origins of the Civil War* (New Haven, 1970); F. Simón Segura, *La desamortización española en el siglo XIX* (Madrid, 1973); F. Tomás y Valiente, 'El proceso de desamortización de la tierra en España', *Agricultura y Sociedad*, 7 (1978).

¹⁸⁹ R. Herr, 'El significado de la desamortización en España', *Moneda y Crédito*, 131 (1974); Herr, *Rural change*; García Sanz, 'Introducción'; J. Simpson, *Spanish agriculture*.

¹⁹⁰ González de Molina, 'Condicionantes ambientales'; Iriarte, 'Common lands'; Balboa, 'La historia de los montes públicos'; J.R. Moreno, 'La lógica del comunal en Castilla en la edad moderna: Avances y retrocesos de la propiedad común', in S. de Dios et al. (eds), *Historia de la Propiedad en España. Bienes comunales, pasado y presente* (Salamanca, 2002); Linare, 'Comunidad, estado y mercado'; Jiménez

manure by feeding livestock, but also by supplying organic fertilizers obtained from the decomposition of different varieties of fern, which was a fundamental element of the Atlantic areas¹⁹¹. This agrarian system was not only integrated through space but also through the different seasons¹⁹². Importantly, commons were not, as often wrongly assumed, an open-access resource, but were subject to tight formal and informal regulations and enforcement mechanisms, thus ensuring that user-rights were appropriately enjoyed¹⁹³. Furthermore, the expansion of arable land itself is likely to have quickly run into diminishing returns as marginal lands were put under the plough.

Some studies have especially stressed how the liberal reforms, by favouring arable land and reducing pasture land, may have negatively affected livestock numbers¹⁹⁴. The importance of the commons for maintaining livestock was well-known by contemporaries. During the 19th century, multiple warnings were raised over the damage that an excessive reduction of the commons would cause on the possibility of keeping adequate numbers of livestock and on agricultural yields¹⁹⁵. An official report about the province of Teruel in mid-19th century is highly eloquent: ‘every first-quality land is already under cultivation; [...] and even some plots which should only be

Blanco, ‘El monte’; Serrano, ‘La defensa del comunal’; Lana, ‘From equilibrium’. This line of research is heavily influenced by E.A. Wrigley, *Continuity, chance and change. The character of the industrial revolution in England* (Cambridge, 1988).

¹⁹¹ X. Balboa and L. Fernández Prieto, ‘Evolución de las formas de fertilización en la agricultura atlántica entre los siglos XIX y XX. Del toxo a los fosfatos’, in R. Garrabou and J.M. Naredo (eds.), *La fertilización en los sistemas agrarios. Una perspectiva histórica* (Madrid, 1996); Moreno, ‘La lógica del comunal’, p. 159; L. Fernández Prieto and D. Soto Hernández, ‘El Atlántico no es el Mediterráneo. El cambio agrario al otro extremo de la Península Ibérica: El mismo estado, otros paisajes, ¿los mismos campesinos?’ in R. Garrabou y R. Robledo (eds.), *Sombras del progreso. Las huellas de la historia agraria* (Barcelona, 2010), p. 244.

¹⁹² For a thorough description of how this integrated agrarian system worked, see Linares, ‘Estado, comunidad y mercado’, p. 24.

¹⁹³ Moreno, ‘El régimen comunal’; Iriarte, ‘La pervivencia’; Serrano, ‘La defensa del comunal’; Lana, ‘From equilibrium’.

¹⁹⁴ GEHR, ‘Contribución al análisis histórico de la ganadería española, 1865-1929 (II)’, *Agricultura y Sociedad*, 10 (1979); R. Garrabou and J. Sanz Fernández, ‘Introducción’, in R. Garrabou and J. Sanz Fernández (eds.), *Historia agraria de la España contemporánea, vol. 2* (Barcelona, 1985); M. González de Molina and Y. Pouliquen, ‘De la agricultura orgánica tradicional a la agricultura industrial: ¿Una necesidad ecológica? Santa Fe, 1750-1904’, in R. Garrabou and J.M. Naredo (eds.), *La fertilización en los sistemas agrarios. Una perspectiva histórica* (Madrid, 1996).

¹⁹⁵ Artiaga and Balboa, ‘La individualización’, p. 103.

employed as pasture or waste land have unfortunately been ploughed and now they are useless for either of them'¹⁹⁶. The opposition to the sales was indeed widespread in the responses given by municipalities to the Questionnaire sent by the Parliament in 1851 regarding this issue¹⁹⁷. Those answers stressed the crucial functions fulfilled by the commons mentioned above but especially pointed to the common fear that privatization, and subsequent ploughing up of new land, would break down the mixed husbandry and forestry equilibrium, thus reducing the availability of manure and subsequently agricultural yields. The same idea can be found in the writings of prominent Spanish economists and social reformers in the early 20th century such as Joaquin Costa or Flores de Lemus¹⁹⁸. Although it seems that livestock density maintained its importance between mid- 18th and mid- 19th century¹⁹⁹, the ploughing of new arable land between 1860 and 1880, coinciding thus with the peak of the privatisation process, may have reached a threshold which made the preservation of livestock numbers impossible. However, this relationship remains unclear because the reduction in pasture could have been counterbalanced by an expansion of fodder crops and by an expanding demand for animal energy²⁰⁰. In this sense, the maintenance of the livestock density between 1750 and 1865 would have been compatible with the expansion of arable land due to simultaneous changes in the relative composition of the herd between different species. This process was reflected in the expansion of animals employed in agricultural tasks, especially mules which were particularly well adapted

¹⁹⁶ Quoted in Moral Ruiz, *La agricultura española*, p. 35. My translation.

¹⁹⁷ Ibid; Sánchez Salazar, 'La desamortización civil'; Gómez Urdañez, 'Doctrinas y realidades'.

¹⁹⁸ J. Costa, *Política hidráulica. Misión social de los riegos en España* (Madrid, 1911); A. Flores de Lemus, 'Sobre una dirección fundamental de la producción rural española', *Moneda y Crédito*, 36 (1951), first published in 1926.

¹⁹⁹ J. García Sanz, 'La ganadería española entre 1750 y 1865: Los efectos de la reforma agraria liberal', *Agricultura y Sociedad*, 72 (1994), pp. 91-92.

²⁰⁰ García Sanz, 'Introducción', p. 37.

to work in the semi-arid conditions that characterise most of Spain²⁰¹. Fuelled by an increasing demand for working animals, meat, and dairy products, livestock numbers recovered previous figures during the first decades of the 20th century, which also led to an expansion of fodder crops²⁰².

To sum up, in order to fully examine the effect of privatisation in Spanish agriculture, this paper proposes to examine three different potential channels: firstly, the hypothesis that the commons, as defended by many liberal thinkers, were directly harmful to agricultural productivity; secondly, the possibility that, by expanding the area under cultivation, privatisation positively contributed to a rise in productivity; thirdly, the indirect link through which, by supporting livestock density, these collective resources may have sustained agricultural development.

2.3 Methodology

2.3.1 Common lands and agricultural productivity

The effect of the persistence of common lands on agricultural productivity can be assessed by framing it within the context of agricultural modernisation. Despite being traditionally considered as a failure due to its inability to fulfil the functions forcefully put forward by Johnston and Mellor²⁰³, Spanish agriculture nonetheless underwent significant transformations from 1860 onwards²⁰⁴. Not only arable land increased

²⁰¹ Garrabou and Sanz Fernández, 'Introducción', p. 121; García Sanz, 'La ganadería', pp. 91-95. While oxen and mules gained relative importance, sheep became less and less important over time. The evolution of pigs was different since, although it suffered significantly during the second half of the 19th century, its growth afterwards was extremely fast. See GEHR, 'Contribución al análisis histórico de la ganadería española, 1865-1929 (II)', pp. 155-156.

²⁰² GEHR, 'Contribución al análisis histórico de la ganadería española, 1865-1929 (I)', *Agricultura y Sociedad*, 8 (1978); GEHR, 'Contribución al análisis histórico de la ganadería española, 1865-1929 (II)'.

²⁰³ J. Nadal, 'The failure of the Industrial Revolution in Spain, 1830-1914', in C.M. Cipolla (ed.), *The Fontana Economic History of Europe*, vol. 4, 2 (Glasgow, 1973); Tortella, 'Agriculture'; For the functions which agriculture should fulfil to contribute to the process of economic development, see B.G. Johnston and J.W. Mellor, 'The role of agriculture in economic development.' *American Economic Review* 87 (1961).

²⁰⁴ L. Prados de la Escosura, *De imperio a nación: Crecimiento económico en España, 1780-1930* (Madrid, 1988); D. Gallego, 'Transformaciones técnicas de la agricultura española en el primer tercio del

considerably, but the crop-mix evolved towards more market-oriented products. Likewise, artificial fertilisers and modern machinery were increasingly applied, especially during the first decades of the 20th century²⁰⁵. Other improvements were the expansion of irrigation and the reduction of fallow. The geographical distribution of these transformations was nonetheless extremely varied²⁰⁶. The transformation of the organic agriculture from the last years of the 19th century especially affected the irrigated lands of the Mediterranean periphery and the Ebro valley and the dry-farmed cereal crops of this last region and the north of Castile, together with the presence of big threshing machines in the large exploitations of Cádiz and Seville. As for the rest of Spain, the agrarian sector went on as in the 19th century, increasing their productions and transforming their methods basically leaning on the typical methods of an organic agriculture²⁰⁷. Agricultural productivity therefore evolved differently depending on the region analysed.

By considering the commons as another productive factor, this paper assesses their distinctive effect on agricultural productivity. The employment of partial productivity measures has been criticised on the grounds that, apart from responding to diverse environmental contexts, different productivity levels may not be the result of technical change or improved efficiency, but the outcome of employing more of other inputs. As Federico points out, if blessed by a rich endowment of land, output per worker can be relatively high in backward economies or, alternatively, yields per hectare can be higher in densely populated countries which are able to work the land

siglo XX', in R. Garrabou et al. (eds.), *Historia agraria de la España contemporánea*, vol. 3 (Barcelona, 1986); D. Gallego, 'Pautas regionales de cambio técnico en el sector agrario español', *Cuadernos Aragoneses de Economía*, 3 (1993); Simpson, *Spanish agriculture*; J. Pujol et al., *El pozo de todos los males. Sobre el atraso en la agricultura española contemporánea* (Barcelona, 2001); J. Carmona and J. Simpson, *El laberinto de la agricultura española. Instituciones, contratos y organización entre 1850 y 1936* (Zaragoza, 2003).

²⁰⁵ Gallego, 'Transformaciones técnicas'.

²⁰⁶ Gallego, 'Pautas regionales de cambio técnico'. Simpson, *Spanish agriculture*.

²⁰⁷ D. Gallego, 'Sociedad, naturaleza y mercado: Análisis regional de los condicionantes de la producción agraria española (1800-1936)', *Historia Agraria*, 24 (2001), p. 43.

more intensively²⁰⁸. The model developed here takes into account the relative contribution of different inputs and therefore attempts to avoid that problem. In order to do so, a detailed panel data set on the different inputs involved in the agricultural production process is gathered at the provincial level in two different periods (1900 and 1930) and contrasted with information on agricultural productivity²⁰⁹. Focusing on cross-regional differences during the period between 1900 and 1930 assures that the potential ultimate effect of the developments taking place throughout the 19th century is taken into account. This approach also enables the possibility of contrasting the role of the surviving commons in a dynamic period characterised by the increasing diffusion of modern agricultural inputs. The sources and methodology employed to compile the data, as well as summary statistics of all the variables and the data itself, are presented in Appendix B.

Drawing on previous literature based on the Cobb-Douglas production function²¹⁰, an empirical exercise is thus carried out to uncover the causes behind different levels of labour productivity by estimating a model which attempts to explain variation in productivity across regions and over time:

$$\ln(Y)_{it} = \beta_0 + \sum \beta_j \ln(X_j)_{it} + \sum \delta_{ki} + \alpha_t + u_{it}$$

where Y refers to agricultural productivity measured by output per worker. Given that the levels of output depend on the crop mix, the whole agricultural sector has been

²⁰⁸ Federico, *Feeding the world*, p. 69.

²⁰⁹ Unfortunately, no information on agricultural production is available for 1860.

²¹⁰ Y. Hayami and V.W. Ruttan, *Agricultural development. An international perspective* (Baltimore, 1985); B.J. Craig et al., 'International productivity patterns: Accounting for input quality, infrastructure and research', *American Journal of Agricultural Economics*, 79 (1997). This model has been more recently applied to labour productivity differentials across Europe from 1950 to 2000. See M. Martin-Retortillo and V. Pinilla, 'Why did agricultural labour productivity did not converge in Europe from 1950 to 2005?', *European Historical Economics Society Working Paper*, 25 (2012).

considered when accounting for the numerator²¹¹. This choice is also forced by the impossibility of distinguishing between the fraction of the labour force devoted to either farming, cattle breeding or forestry. Likewise, even though the commons were primarily used as a source of pasture, some of them were allocated for cultivation among neighbours but the available information cannot discriminate between them.

The right-hand side of the equation contains the set of input factors, X_j , potentially contributing to agricultural productivity divided by the size of the agricultural labour force measured by the economically active male agricultural population²¹². On the one hand, three different types of land are considered: arable land, common land and other types of land comprising pastures, meadows and uplands²¹³. Regarding the arable land and given the importance of considering differences on the quality of different land types²¹⁴, the fraction of land left fallow, as well as the fraction of irrigated land, is included in the analysis as interaction terms. On the other hand, the stock of capital is split up between livestock, measured in live

²¹¹ In this sense, Kander and Warde (2011, 10) consider that narrowing agricultural practice down to the arable sector prevents a proper assessment of relative agricultural performance because it produces biases towards the practices of any of the regions involved in the comparison.

²¹² The lack of consistency between censuses regarding female working population advises to rely only on male workers, a usual procedure both in Spanish and international historical literature. See J.L. Van Zanden, 'The first green revolution: The growth of production and productivity in European agriculture, 1870-1914', *Economic History Review*, 44 (1991); P. O'Brien and L. Prados de la Escosura, 'Agricultural productivity and European industrialisation, 1890-1980', *Economic History Review*, 45 (1992); Erdozain and Mikalerena, 'Las cifras de activos agrarios'; Nicolau, 'Población'; Prados de la Escosura, 'Inequality'. In any case, employing the total agricultural labour force instead does not change the results of the analysis. Consistency between censuses also recommends using data of 1877 instead of 1860. It seems nonetheless that the population distribution did not change much between 1860 and 1877, while there was enough variation between 1877 and 1900. Ideally, the labour input should be converted into hours actually worked in agriculture but it has not been possible to establish regional differences in working intensity. However, this approach has the advantage of allowing labour productivity to be lower where underemployment was an important issue.

²¹³ The communal regime in Spain involved two main types of access to the land: a direct but regulated access for all members of the community (*comunales*) or a temporary cession of user-rights to particular individuals in exchange for a monetary income (*propios*). The privatisation process not only affected their property rights but also the way these resources were used and, consequently, the proportion of private user-rights over the remaining commons grew over time. See GEHR, 'Diversidad dentro de un orden'. In order to take this distinction into account, adding an interaction term between the stock of common lands and the importance of collective user-rights was considered but, since this variable always turned out to be statistically insignificant and did not affect the outcome of the analysis, it has been removed for the reported results.

²¹⁴ Craig et al., 'International productivity patterns', p. 1069.

weights, and modern inputs. The latter separately include both artificial fertilisers, measured in equivalent nutrient units of nitrogen, phosphorous and potash, and modern machinery, which accounts for the use of modern ploughs, threshing machines and tractors²¹⁵. Lastly, the error term, u_{it} , represents random disturbances that are uncorrelated with the other variables.

However, inputs' choice and agricultural productivity may depend on external factors, such as the constraints imposed by the economic, social or environmental context where farmers are immersed²¹⁶. In order to deal with this source of endogeneity and given the wide geographical and climatic differences that characterise the diverse Spanish areas, a set of time-invariant environmental and geographical controls, δ_k , will be included in the specification. These variables include average monthly rainfall and its interaction with the coefficient of variation of monthly rainfall, average temperature, altitude, a ruggedness index, the pattern of population settlement, distance to big cities and a dummy for those provinces with access to the sea²¹⁷. Likewise, a dummy for the year 1930, α_t , is also considered in order to account for technological progress or increasing market integration.

Furthermore, in order to account for other potential influences coming from outside the agricultural sector, an augmented model will be considered by expanding

²¹⁵ The series for modern ploughs, thresher machines and tractors are collapsed together under the category of modern machinery by employing average prices provided by J.I. Martínez Ruíz, *Trilladoras y tractores: Energía, tecnología e industria en la mecanización de la agricultura española, 1862-1967* (Sevilla, 2000), pp. 90, 144. Although this category omits other type of farm equipment and therefore is a crude indicator of total capital, it can be safely assumed that it is an adequate proxy for the use of modern machinery. Given that the numbers in 1900 require taking some arbitrary decisions, robustness checks using different figures were employed and the results remained unaltered.

²¹⁶ The importance of 'state' variables, defined as 'constraints, incentives, available technology, physical environment and political environment', in empirical research dealing with agricultural productivity is analysed in Y. Mundlak, 'Production and supply', in B. Gardner and G. Rausser (eds.), *Handbook of Agricultural Economics*, vol. 1 (Amsterdam, 2001), p. 20.

²¹⁷ Rainfall, rainfall variation and temperature account for climatic factors affecting yields. Terrain ruggedness not only influences agricultural productivity by determining the arability of land, but also transportation costs. The altitude variable complements terrain ruggedness in these two aspects and adds the potential for extreme weather. The population settlement pattern may have an effect on the ability to effectively work distant plots. Coastal provinces and distance to big cities, namely Madrid, Barcelona and Bilbao, are intended to complement the urbanisation variable when accounting for access to markets.

the set of X_j . On the one hand, Schultz forcibly contends that, by facilitating the acquisition of useful knowledge, higher educational levels enhance agricultural productivity²¹⁸. The stock of human capital, proxied by literacy rates, is thus included in the model. On the other hand, the existence of market incentives is usually seen as a major factor behind variations in land and labour productivity²¹⁹. Demand from the non-agricultural sector both increases the incentives to raise productivity and facilitates the reallocation of surplus labour. Likewise, the industrial sector provides artificial fertilisers and modern machinery, thus easing the constraints imposed by the inelastic supply of internally-generated inputs²²⁰. The urbanisation rate is employed in order to account for the new opportunities created by economic development. Lastly, there is a wide literature debating how both different levels of access to land and farm size may affect agricultural efficiency²²¹. Inequality in access to the land, and indirectly farm size, is thus accounted as the fraction of landowners over active agricultural population²²².

The previous specification may nonetheless suffer from reverse causality problems, potentially biasing the estimated coefficients. Firstly, although what it is being tested here is the effect of common lands on agricultural productivity, it is plausible that, in those areas with better agricultural potential, privatisation pressures were more intense²²³. Secondly, as well as the non-agricultural sector may foster agricultural development, growth in agricultural productivity may increase the demand

²¹⁸ Schultz, *Transforming traditional agriculture*.

²¹⁹ Hayami and Ruttan, *Agricultural development*.

²²⁰ An advanced industrial economy may also contribute to agricultural growth by supporting effective transportation and communication systems and by fostering agricultural research. See Hayami and Ruttan, *Agricultural development*, p. 132.

²²¹ K. Deininger and G. Feder, 'Land institutions and land markets', in B. Gardner and G. Rausser (eds.), *Handbook of Agricultural Economics*, vol. 1 (Amsterdam, 2001); R. Eastwood et al., 'Farm size', in P. Pingali and R. Evenson (eds.), *Handbook of Agricultural Economics*, vol. 4 (Amsterdam, 2010).

²²² Data on land ownership is only available for 1860 and 1920. Therefore, linear interpolation is employed to estimate that figure for 1900 and, for 1930, the data on 1920 is used.

²²³ Allen, *Enclosure and the Yeoman*; Clark, 'Commons sense'.

for industrial products and release labour force for other sectors²²⁴. Thirdly, it may be the case that higher levels of educational attainments foster output per hectare and per worker but a more advanced agricultural economy may also facilitate both the supply and the demand for human capital²²⁵. Lastly, similar arguments can be made regarding the relationship between inequality and agricultural productivity. In order to address these concerns, a two-stage instrumental variable approach, where the previous variables are considered as potentially endogenous and instrumented by their lagged values in 1860 and 1900 respectively, will be implemented.

3. 2. Common lands and livestock

According to the arguments outlined in section 2, the commons played an essential role as providers of pasture, so that link should be analysed in order to fully assess the influence of common lands on output per worker. The contribution of the stock of common lands to support livestock is assessed by estimating the following model²²⁶:

$$\ln(Y)_{it} = \beta_0 + \beta_1 \ln(X)_{it} + \sum \theta_j \ln(Z_j)_{it} + \sum \delta_{ki} + \alpha_t + u_{it}$$

While Y is the importance of livestock measured in live weight and X the stock of common lands²²⁷, Z_j refers to other potential determinants of livestock numbers as discussed by the literature. Apart from the commons, pastures, meadows and forests owned privately were used to support livestock, so a proxy accounting for this variable

²²⁴ B.G. Johnston and J.W. Mellor, 'The role of agriculture in economic development', *American Economic Review*, 87 (1961); C.P. Timmer, 'Agriculture and economic development', in B. Gardner and G. Rausser (eds.), *Handbook of Agricultural Economics*, vol. 2 (Amsterdam, 2002); D. Gollin, 'Agricultural productivity and economic growth', in P. Pingali and R. Evenson (eds.), *Handbook of Agricultural Economics*, vol. 4 (Amsterdam, 2010).

²²⁵ W.E. Huffman, 'Human capital. Education and agriculture', in B. Gardner and G. Rausser (eds.), *Handbook of Agricultural Economics*, vol. 2 (Amsterdam, 2001), p. 374.

²²⁶ Data sources and how the different variables are constructed are explained in Appendix A.

²²⁷ The importance of collective user-rights on the common was also considered but, since it was insignificant in all specification, it was dropped from the model.

is considered. The role of the arable land is however more complex. Although the expansion of cropland may have reduced the stock of spontaneous pastures, it may also have contributed to feeding livestock by producing fodder. Likewise, the proper cultivation of arable land also demanded draught energy, which in turn increased the demand for working animals, especially in a period when tractors were still rare artifacts²²⁸. However, some crops, such as vines or olive trees, made little use of animal power²²⁹, so a distinction between the arable land which was employed in these cultivations should be made²³⁰. Furthermore, it is important to note that customary practices allowed livestock to be fed in the area of arable which was left as fallow. However, Federico argues that fallow produced only a meager pasture, so any substitute would be welcome, providing that the nutrients extracted from the soil by farming could be reintegrated²³¹. The diffusion of new rotations first and of chemical fertilizers later would ease these constraints. In this sense, although the coexistence of organic and modern modes of productions has been widely found in the literature, the diffusion of chemical fertilizers, thresher machines and tractors, by making manure and animal draft energy less necessary, may have reduced the demand for livestock²³². In order to control for these hypotheses, proxies accounting for these potential determinants of livestock density are included.

²²⁸ Martínez Ruiz, *Trilladoras y tractores*. In 1932, only an average of one tractor for every 5,128 hectares was available. See *Ibid*, p. 132.

²²⁹ A. Kander and P. Warde, 'Energy availability from livestock and agricultural productivity in Europe, 1815-1913: A new comparison', *Economic History Review*, 64 (2011), pp. 4-5. It is true, however, that in areas where vines and/or olive trees were relatively abundant, the animal energy applied to these crops could be a significant part of the total draft energy. For instance, in the provinces of Badajoz, Cáceres and Huelva, these two crops accounted for 22, 14 and 18 per cent, respectively, of all work carried by yuntas (teams of draft animals). See Instituto de Reforma Agraria (1934).

²³⁰ A series accounting for the importance of vines and olive trees have been assembled using data from GEHR (1991).

²³¹ Federico, *Feeding the world*, p. 88.

²³² M.T. Knibbe, 'Feed, fertilizer, and agricultural productivity in the Netherlands, 1880-1930', *Agricultural History*, 74 (2000); A.L. Olmstead and P. Rhode, 'Reshaping the landscape: The impact and diffusion of the tractor in American agriculture: 1910-1960', *Journal of Economic History*, 61 (2001).

As in the previous exercise, the potential effect of technological progress or increasing market integration, as well as climatic and geographical differences, is accounted by considering a time dummy for 1930 (α_t) and a set of time-invariant provincial characteristics (δ_k)²³³. Likewise, an augmented model is preferred again because livestock numbers could have also been influenced by other factors than those purely input-related. The pull of urban markets, for instance, may increase incentives not only to raise agricultural productivity by employing more animals in agricultural tasks, but also to directly increase the production of meat and dairy products²³⁴. Moreover, commercial networks facilitate the purchase of fodder, easing land, either arable or pasture land, from the constraint to feed animals. These trends will be proxy by urbanisation rates²³⁵. Arguments similar to those already made in the previous empirical exercise also justify considering literacy rates and levels of access to land when explaining livestock numbers. Lastly, in order to avoid endogeneity and further test the robustness of this analysis, an instrumental variable approach will be implemented using the lagged values of these three variables, together with that of the commons themselves, as instruments.

2.4 Results

Table 2.1 reports the results from estimating the equation explained above²³⁶.

While column (1) shows the estimated coefficients of the baseline specification

²³³ These are the same as in the previous empirical exercise. Climatic conditions, together with geographical features conditioning market access, clearly influenced livestock densities in Spain. On this issue, see Simpson, *Spanish agriculture*, p. 103; Gallego, ‘Sociedad, naturaleza y mercado’; and González de Molina, ‘Condicionantes ambientales’.

²³⁴ GEHR, ‘Contribución al análisis histórico de la ganadería española, 1865-1929 (II)’; Van Zanden, ‘The first green revolution’.

²³⁵ Note that the possibility of accessing other markets is also controlled by including distance to big cities and the coastal dummy in the set of controls referred to above.

²³⁶ Apart from pooled OLS, a random-effects model was estimated but the coefficients hardly changed. Likewise, a fixed-effects model was also considered. The estimated effect of the commons on agricultural productivity was even higher and highly significant (0.16**). I have nonetheless preferred to report the pooled OLS model. The privatisation process took mainly place before 1900, so the variation

accounting for the different inputs affecting labour agricultural productivity, columns (2) and (3) add the state variables and the climate and geographical controls, respectively. The model employed accounts for 85 per cent of the variation in productivity, what suggests that it fits remarkably well the subject under study. The two-stage IV approach, reported in columns (4) to (6), mostly confirms the results obtained using OLS. Contrary to the liberal ideology, the commons did not seem to have been directly detrimental to labour productivity. The coefficients are always positive but hardly statistically significant, although it should be noted that, when the effect of the state variables is controlled for, their positive impact becomes significant. The comparison with the estimated effect of pastures and forests held under private property, which is always negative, is also revealing. Columns (3) and (6) highlight that the supposed negative link between the commons and efficiency was perhaps better reflecting the environmental conditions in which these resources were immersed than their actual productivity. Once climate or geographical variables are taken into account, the commons actually seem to have a positive influence on the agricultural sector. Given that the direct effect of livestock on agricultural productivity is already accounted for the specification, this positive impact of the commons is explained, as argued in section 2, by their role as provider of organic fertiliser based on different types of fern, especially in humid Spain²³⁷.

between 1900 and 1930 is relatively small. However, a fixed-effects model only considers variation within provinces and hence disregards the variation across provinces. Including the control variables explained in the previous section allows for mitigating the concerns coming from potential omitted variable bias, while still taking advantage of the cross-sectional variation in the data. In addition, the reported results provide the more conservative evaluation of the positive contribution of the commons. The full specification is reported in Table B.4 in Appendix B.

²³⁷ Including the part of the agrarian output corresponding to forestry as a regressor does not significantly change the results obtained above.

TABLE 2.1 COMMONS AND AGRICULTURAL PRODUCTIVITY, 1900-1930

	Dependent variable: Agrarian output / Active agricultural population					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	0.02 (0.03)	0.03 (0.04)	0.07* (0.04)	0.02 (0.04)	0.03 (0.04)	0.09* (0.05)
Other inputs	Yes	Yes	Yes	Yes	Yes	Yes
State variables	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	89	89	89	89	89	89
R-squared	0.75	0.76	0.85	0.75	0.76	0.85

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. A time dummy for 1930 is included in all specifications. Other inputs refer to arable land, including its interaction with the fraction left fallow and irrigated; pastures, meadows and forests; livestock; chemical fertilisers; and modern machinery. All input variables are computed in relation to the labour force and expressed in natural logs. State variables refer to urbanisation, literacy and access to land. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its coefficient of variation, ruggedness, altitude, population settlement pattern, distance to Madrid or Barcelona and a coastal dummy. See Table B.4. in Appendix B for the full specification.

It is true nonetheless that one of the declared aims of the disentailment was to put more land under the plough²³⁸. The estimated coefficient on arable land is positive and significant and, therefore, by converting pasture and scrubland into cultivated land, privatisation may have indirectly favoured agricultural productivity²³⁹. Table 2.2 shows the results of regressing the fraction of land that became private on the fraction of land that was turned into crop land. Although the privatisation process appears to have contributed to expanding arable land, the strength of that relationship is not that clear. Both variables show a weak positive relationship between 1860 and 1900 but the link between them completely disappears between 1900 and 1930. There is indeed evidence that the persistence of common lands, at least in some regions, was compatible with the expansion of arable land and increasing yields even in the first decades of the 20th

²³⁸ As seen in the previous chapter, apart from the need to expand arable land in dry region in order to meet the increasing demand for agricultural products, an unequal distribution of access to land was also a factor behind the massive dismantling of the communal regime in the more unequal regions. Large landowners actually promoted privatisation in those areas because those resources were likely to end up in their hands.

²³⁹ However, there are no reasons why the expansion of arable land could not have equally taking place under a communal regime.

century, a period witnessing a significant modernisation process²⁴⁰. Studying Navarre, Iriarte shows that 40 per cent of the ploughing of new land between 1850 and 1935 was carried out in common lands which had been leased out²⁴¹. In any case, given that the estimated coefficient of arable land on output per worker is 0.30, assuming that 34 per cent of the commons which were privatised helped feeding the expansion of crop land during the second half of the 19th century implies that, by potentially encouraging the expansion of land under cultivation, a one per cent decrease in the stock of common lands would have increased labour productivity by 0.102 per cent²⁴². However, it should be noted that part of that land was kept fallow and, given that these lands show a negative relationship with output per worker, that figure should be adjusted. On average, in 1900, 36.5 per cent of the arable land was left uncultivated in order to replenish soil nutrients. Therefore, the final opportunity cost of maintaining the commons derived from its potential benefit if put into tillage would be 0.071 per cent²⁴³. When this figure is compared with the 0.09 per cent effect of common lands on output per worker, the supposed advantage of expanding arable land resorting to the commons becomes negligible or even negative²⁴⁴. Furthermore, these estimates are based on the period ranging from 1900 to 1930, when the increasing availability of chemical fertilisers made the expansion of crop land on marginal lands potentially more productive. This possibility was seriously limited during the second half of the 19th century when extensification quickly ran into diminishing returns²⁴⁵.

²⁴⁰ Iriarte, 'La pervivencia', p. 135; Balboa, 'La historia de los montes', p. 113; Linares. 'Estado, comunidad y mercado', p. 43; Serrano, 'La defensa del comunal', p. 445; . The expansion of cropping on land held in common was also a widespread mechanism to cope with the increasing demand for land during the 18th century. See Sánchez Salazar, *Extensión de cultivos*.

²⁴¹ Iriarte, 'La persistencia', p. 128.

²⁴² Arable land expansion was subject to diminishing returns, so this figure should be taken as a maximum of the actual effect.

²⁴³ The estimated coefficient on the land left fallow is -0.26.

²⁴⁴ It should also be taken into account that the relationship between privatisation and the expansion of crop land was also very weak statistically speaking.

²⁴⁵ González de Molina, 'Condicionantes ambientales', p. 69.

TABLE 2.2 ENCLOSURE AND ARABLE LAND EXPANSION, 1860-1930

	Dependent variable: Expansion of arable land (% of total land)	
	1860-1900	1900-1930
Privatisation of the commons (% of total land)	0.34* (0.20)	0.16 (0.54)
Observations	46	46
R-squared	0.06	0.00

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. For simplicity, the intercept is not reported.

However, according to the arguments outlined in section 2, the commons played an essential role as providers of pasture. Given that the previous analysis shows that livestock density was significantly associated with higher levels of agricultural productivity, the link between those collective resources and livestock numbers should be explored in order to fully assess the role of common lands on agricultural development. Table 2.3 reports the estimation of the model presented in section 2.3.2 which, taking into account other potential determinants of livestock density, confirms the importance of the stock of common lands in supporting livestock. The estimated coefficient, computed based on information of the early 20th century, should be taken as a minimum. It is likely that, during the second half of the 19th century, the role of the commons was even more important given the lack of alternatives to organic manure and animal draught energy.

TABLE 2.3 COMMONS AND LIVESTOCK, 1900-1930

	Dependent variable: Livestock (live weight)					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	0.18*** (0.05)	0.24*** (0.06)	0.20** (0.09)	0.23*** (0.05)	0.28*** (0.06)	0.24*** (0.09)
Other variables	Yes	Yes	Yes	Yes	Yes	Yes
State variables	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	89	89	89	89	89	89
R-squared	0.56	0.59	0.72	0.55	0.59	0.69

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. A time dummy for 1930 is included in all specifications. Other variables refer to other potential determinants of livestock numbers: pastures, meadows and forests; arable land, including its interaction with the fraction left fallow and the fraction devoted to vines and olive trees; chemical fertilisers; and modern machinery. All these variables, including the commons, are expressed in natural logs. State variables refer to urbanisation, literacy and access to land. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its standard deviation, ruggedness, altitude, population settlement pattern, distance to Madrid or Barcelona and a coastal dummy. See Table B.5 in Appendix B for the full specification.

Therefore, if this indirect effect is taken into account, the positive assessment of the role of the commons on sustaining agricultural productivity becomes stronger. Given that a one per cent increase in the stock of the commons is associated with a 0.24 per cent increase in livestock numbers, and that the estimated effect of livestock on output per worker was 0.31, the indirect effect of the commons on agricultural productivity would be 0.074. Table 2.4 summarizes the overall influence of the commons on agricultural productivity. These figures should not be understood literally but as an educated guide about the processes at play. In any case, since the two first effects somewhat counterbalanced each other (both in economic and statistical sense), the net effect of the stock of common lands on output per worker remains positive and significant. According to these estimates, the attack on the commons, which mostly took place during the second half of the 19th century, and by which 33.5 per cent of these resources became private (7.7 per cent of the total land), reduced Spanish labour

productivity a minimum of 2.3 per cent, a negligible amount but also very far from the advocated potential benefits it was supposed to bring about.

TABLE 2.4. COMMON LANDS AND LABOUR PRODUCTIVITY, 1900-1930

	Direct effect	Crop land potential	Sustaining livestock	Net effect
Estimated effect	0.09*	-0.07*	0.07***	0.09***

*, **, or *** denotes significance at 10, 5 or 1 per cent level. These figures reflect the estimated effect (in percentage points) of a one per cent increase in the stock of common lands.

2.5 Common lands and agricultural development in arid or semi-arid Spain

Apart from the power of large landowners to promote the dismantling of the communal regime, the analysis of the factors explaining the dissimilar regional outcome of the privatisation process carried out in the previous chapter shows a higher degree of privatisation in dry regions. In contrast to the intensification process carried out in humid Spain, farmers in arid or semi-arid regions were likely to have been compelled to the extension of cultivated land if production wanted to be increased. The commons in both areas may have subsequently played different roles, so this section explores this possibility by replicating the previous empirical exercise but leaving aside those provinces that enjoyed an Atlantic climate²⁴⁶. The importance of aridity in constraining agricultural productivity has been widely acknowledged, yet cross-country comparative studies often tend to overlook climatic and geographical differences when accounting for the backwardness of Spanish agriculture²⁴⁷. The lack of water certainly constituted the primary restraint on agricultural yields in dry regions, which refers to most of the country. Therefore, and following the typology presented by Gallego, the

²⁴⁶ This exercise also serves as a robustness check of the previous results.

²⁴⁷ G. Tortella, 'Patterns of economic retardation and recovery in south-western Europe in the 19th and 20th centuries', *Economic History Review*, 47 (1994); Gallego, 'Sociedad, naturaleza y mercado'; González de Molina, 'Condicionantes ambientales'.

Atlantic provinces are dropped from the analysis²⁴⁸. The results of this exercise are reported in tables V to VIII.

TABLE 2.5. COMMONS AND AGRICULTURAL PRODUCTIVITY IN ARID SPAIN, 1900-1930

	Dependent variable: Agrarian output / Active male agricultural population					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	-0.04 (0.03)	-0.02 (0.03)	0.06 (0.04)	-0.05 (0.04)	-0.04 (0.03)	0.06 (0.05)
Other inputs	Yes	Yes	Yes	Yes	Yes	Yes
State variables	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	77	77	77	77	77	77
R-squared	0.80	0.81	0.87	0.79	0.81	0.86

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All input variables are divided between the active agricultural population and expressed in natural logs. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its standard deviation, ruggedness, altitude, population settlement pattern, distance to big cities and a coastal dummy. See Table B.6 in Appendix B for the full specification.

Although the results of assessing the relative importance of the different inputs on agricultural productivity remain relatively unchanged from what has been shown in the previous section, some differences are nonetheless significant. Comparing these results with those obtained with the whole sample of Spanish provinces thus unveils interesting conclusions. Firstly, the coefficient of the common lands in table 2.5 is never significant, which suggests that, due to their ability to support a higher volume of biomass, the commons were more productive in humid regions, especially regarding the possibility of providing fern-based fertilisers. In this regard, when a dummy for the Atlantic provinces is interacted with the common lands and added to the regression on the whole sample, its coefficient turns to be 0.29 and highly significant, while the general coefficient on the commons is positive but not statistically significant. This

²⁴⁸ Gallego, 'Sociedad, naturaleza y mercado'. The Atlantic regions include the four Galician provinces, Asturias, Cantabria and the three Basque provinces. See the map portraying the different climatic regions in M. Ninyerola et al., *Atlas climático digital de la Península Ibérica. Metodología y aplicaciones en bioclimatología y geobotánica* (Bellaterra, 2005).

result strongly confirms the importance of the commons in providing non-animal fertiliser in humid regions. Likewise, given that in non-humid regions privatisation was more intense and that the best commons were the first to be appropriated, the previous result may as well reflect that the remaining commons were less productive²⁴⁹. Secondly, the land-labour ratio now has a much larger impact on output per worker, illustrating the logic of extensification in dry areas. Therefore, the possibility of bringing land into cultivation at the expense of commons had a higher potential here²⁵⁰.

TABLE 2.6 ENCLOSURE AND ARABLE LAND EXPANSION IN ARID SPAIN, 1860-1930

	Dependent variable: Expansion of arable land (fraction of total land)	
	1860-1900	1900-1930
Privatisation of the commons (fraction of total land)	0.31 (0.20)	1.10* (0.63)
Observations	40	40
R-squared	0.06	0.08

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level.

Table 2.6 shows that the estimated relationship between the privatisation of the commons and the extension of crop land between 1860 and 1900 is not statistically significant at the 10 per cent level. However, its p-value is relatively low (0.123), which, given that the coefficient hardly changes with respect to the whole sample, is likely to be the result of the loss of degrees of freedom²⁵¹. Assuming the estimated coefficients would imply that one percentage increase in the stock of common lands entailed an opportunity cost, in terms of the efficiency loss derived of not having transformed those lands into arable lands, of 0.195 per cent. However, as in the

²⁴⁹ De la Torre and Lana, 'El asalto a los bienes comunales', p. 82.

²⁵⁰ On the contrary, if we just focused on the Atlantic provinces, the coefficient on arable land would be lower than the one estimated previously (0.30) because excluding those provinces raise the coefficient to 0.64, what implies that the humid regions are counterbalancing that effect leaving the estimated coefficient at 0.30.

²⁵¹ It should be noted that, although weakly significant, the coefficient for the period 1900-1930 makes little economic or historical sense due to the fact that the amount of land privatised is really small compared to the expansion of cultivated land. In any case, in order to assess the effect of privatisation, I focus on the second half of the 19th century, which is the period when most of the privatisation took place.

previous section, the negative effect of fallow should also be taken into account. On average, these provinces kept fallow 43.5 per cent of the cultivated area in 1900, a figure higher than the national average, what reflects the tougher constraints imposed by the lack of water. The adjusted impact would thus be 0.116 percentage points.

TABLE 2.7 COMMONS AND LIVESTOCK IN ARID SPAIN, 1900-1930

	Dependent variable: Livestock (live weight)					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	0.10* (0.05)	0.12* (0.06)	0.14 (0.09)	0.11** (0.06)	0.14** (0.07)	0.23** (0.09)
Other variables	Yes	Yes	Yes	Yes	Yes	Yes
State variables	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	77	77	77	77	77	77
R-squared	0.54	0.59	0.75	0.54	0.58	0.69

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All variables expressed in natural logs. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its coefficient of variation, ruggedness, altitude, population settlement pattern, distance to big cities and a coastal dummy. See Table B.7 in Appendix B for the full specification.

Lastly, table 2.7 confirms that the estimated effect of the commons on sustaining livestock remains virtually unchanged with respect to the estimation that also includes humid regions. Taking all these considerations together, the effect of common lands on labour productivity in dry regions turns out to be different from the impact estimated in the previous section. As shown in table 2.8, and assuming that no direct influence exists, the net effect of the stock of common lands on output per worker is now negative: a one percentage increase on the stock of common lands reduced output per worker by 0.06 per cent. However, compared to the catastrophic admonitions of liberal thinkers, the efficiency loss is almost negligible. During the second half of the 19th century, when most of the attack on the communal regime took place, an average of around 41.9 per cent of the commons was privatized in these provinces (around 8.1 per cent of the total land). Therefore, this process contributed to increasing Spanish

agricultural productivity by only 2.5 per cent²⁵². It should also be stressed that, given that the estimated elasticity of the extension of cultivated land on the dismantling of the commons was hardly significant, this figure should be taken as a maximum. Furthermore, as explained above, the growing accessibility of chemical fertilizers during the first decades of the 20th century made the expansion of crop land possible, while this strategy was much less productive during the second half of the 19th century, and especially so in the poor soils of dry Spain. The analysis carried out in this section also suggests that the diverse persistence of common lands, higher in humid areas and lower in arid or semi-arid regions, is partly explained by the different role that these collective resources played in these different contexts, thus suggesting that, given their respective constraints, farmers all over Spain behaved somewhat sensibly when deciding whether preserving the commons or not. This is not to deny, as shown in the previous chapter, that other factors were also affecting the privatisation process, especially the more unequal access to the land prevailing in Southern Spain.

TABLE 2.8 COMMON LANDS AND LABOUR PRODUCTIVITY IN ARID SPAIN, 1900-1930

	Direct effect	Crop land potential	Sustaining livestock	Net effect
Estimated effect	0.06	-0.12***	0.06**	-0.06***

*, **, or *** denotes significance at 10, 5 or 1 per cent level. These figures reflect the estimated effect (in percentage points) of a 1 per cent increase in the stock of common lands.

2.6 Conclusion

The macro evidence presented here shows that Spanish peasants were not those ‘Goth and Vandals’ subjected to an irrational communal culture as claimed by liberal advocates, but ‘civilised’ farmers who knew how to adapt their agricultural practices to the constraints imposed by the wider economic, social and environmental context.

²⁵² This figure is obviously based on the total average, so in provinces where privatisation was more intense, the estimated effect would be higher. However, even in Ciudad Real where 20.8 of the total provincial land ended up in private hands, the estimated effect would imply a 1.2 per cent increase in labour productivity, which is still a hardly significant figure given the amount of land transferred.

Common lands were a valuable resource because, apart from sustaining livestock density, they provided significant amount of fern-based organic manure, especially in humid Spain. Surely, putting more land under the plough at the expense of the commons increased the productivity of those spaces²⁵³, although this effect should have been even lower during the second half of the 19th century, where most of the attack on the common took place, due to the impossibility of supporting that extensification with chemical fertilisers. In any case, the net gains from privatisation were small or even negative depending on the region analysed. If we took into account the necessary costs of implementing the dismantling of the commons, especially high after 1855 when, by passing the so-called *General Disentailment Act*, the central state became involved in the process, those partial gains would become negligible or even negative. Among others, these costs include commissioning an inventory of these resources, surveying land values, organising auctions, fencing plots, establishing a body of public agronomists and a police civil guard, together with the subsequent legal disputes that the process involved²⁵⁴.

²⁵³ However, as pointed out before, there are no reasons why the expansion of arable land could not have equally taken place under a communal regime, as the successful cases of Navarre, León and Extremadura testify. See Iriarte, 'La pervivencia', p. 135; Balboa, 'La historia de los montes', p. 113; Linares. 'Estado, comunidad y mercado', p. 43; Serrano, 'La defensa del comunal', p. 445; J.A. Serrano, 'When the enemy is the state: Common lands management in northwest Spain (1850-1936)', *International Journal of the Commons*, 8 (2014), pp. 112-114.

²⁵⁴ For a detailed description of these costs, see Simón Segura, *La desamortización*; Balboa, 'La historia'; Jiménez Blanco, 'El monte'; Iriarte, 'La pervivencia'. Admittedly, by improving the public knowledge about Spanish natural resources and other potential positive externalities, all these expenses were not a complete waste of public resources.

Chapter 3

COMMONS AND THE STANDARD OF LIVING DEBATE IN SPAIN, 1860-1930²⁵⁵

Abstract: Biological living standards stagnated or even declined during the transition to modern economic growth. Although income per capita was increasing, other indicators, such as mortality rates or heights, portrayed a completely different image. This paper adds to the standard of living debate by analysing the potential effect of the privatisation of common lands. Focusing on the Spanish experience, this paper exploits geographical variation over time by collecting a panel dataset at the provincial level on three different periods: 1860, 1900 and 1930. The empirical analysis shows that the persistence of these collective resources is related with higher life expectancy and heights, particularly during the second half of the 19th century. Biological human welfare also seems to have been negatively influenced by the progressively decreasing role that local communities played on the management of these resources. The survival of common lands in some regions provided peasants with mechanisms different from the market, thus making the transition to a market economy more socially sustainable.

3.1 Introduction

The standard of living debate has revealed the deterioration in welfare suffered by many people in the transition from traditional to modern economies²⁵⁶. Although income per capita was increasing, other indicators, such as mortality rates, life expectancy or heights, puzzlingly portrayed an image of stagnating or deteriorating wellbeing in the early phases of modern economic growth, especially among the lower classes of the population. The development process, reflected in rapid industrialisation and urbanisation, generated negative externalities which, in an era where government

²⁵⁵ A version of this chapter has been published in *Cliometrica* (2015).

²⁵⁶ See R. Floud and R. Steckel (eds.), *Health and welfare during industrialisation* (Chicago, 1997); J. Komlos, 'Shrinking in a growing economy? The mystery of physical stature during the industrial revolution', *Journal of Economic History*, 58 (1998); R.A. Easterlin, 'How beificent is the market? A look at the modern history of mortality', *European Review of Economic History*, 3 (1999).

intervention was practically nonexistent, were overcome only slowly due to an increasing awareness on the role of the public sector in improving the health environment. Apart from assessing the direct impact of economic modernisation on human wellbeing, the literature has also stressed that health also influences economic development²⁵⁷.

This chapter adds to the standard of living debate by analysing the potential effect of the privatisation of common lands. Although highly controversial regarding its impact on the modernisation process itself, its contribution to human welfare has received much less attention. The arguments outlined by those authors who support that privatisation was required to sustain agricultural growth and the replica put forward by recent reassessments have been summarised in the previous chapters. It is true however that the debate has not only been led by efficiency considerations but also by its effect on inequality and poverty. In this regard and focusing on the British case, Allen shows that enclosures did not increase efficiency but caused a massive redistribution of income from peasants to large landowners²⁵⁸. Likewise, other authors emphasize that the enclosure movement prevented poor households from keeping livestock and other animals on the commons, thus eliminating an important source of complementary income and accelerating the proletarianisation of the agricultural labour²⁵⁹.

Drawing on the Spanish case as field laboratory, this chapter aims to shed additional light into this long-standing debate. The evolution of human wellbeing in Spain closely follows the wider international experience given that the development process carried out throughout the 19th century had ambiguous effects in the standard of

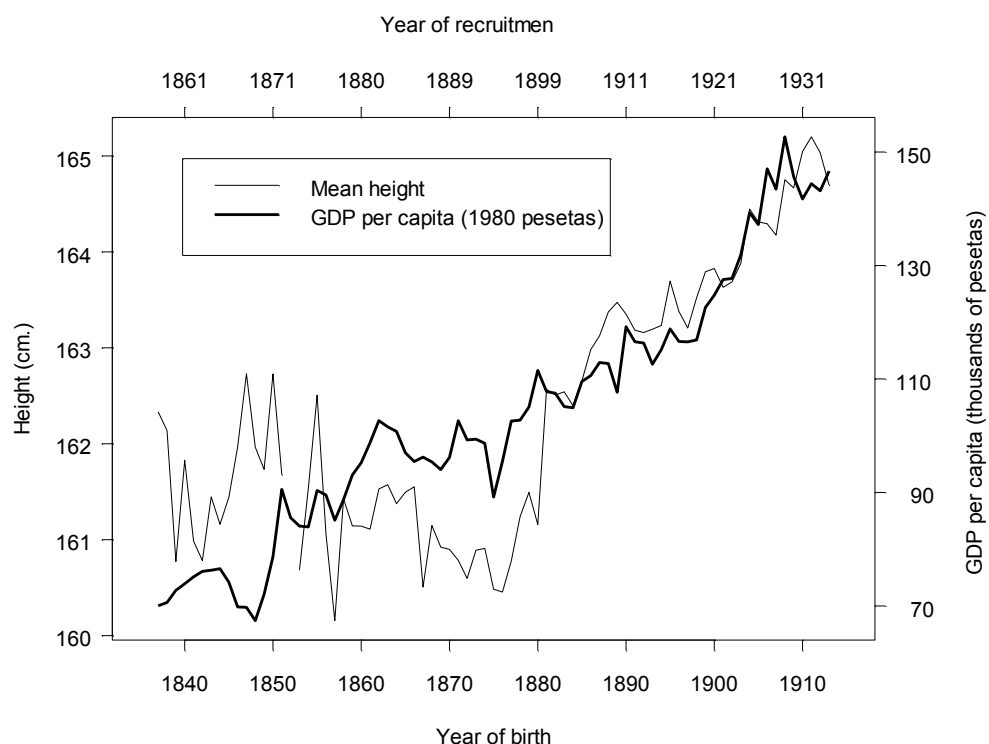
²⁵⁷ S. Arora, 'Health, human productivity, and long-term economic growth', *Journal of Economic History*, 61 (2001); R.W. Fogel, 'Health, nutrition, and economic development', *Economic Development and Cultural Change*, 52 (2004).

²⁵⁸ Allen, 'The efficiency'.

²⁵⁹ Humphries, 'Enclosures'; Neeson, *Commoners*. This view, nonetheless, has been contested. See Shaw-Taylor, 'Parliamentary enclosure'; Clark and Clark, 'Common rights'.

living of its population. As shown in Figure 2, in a context of steady economic growth, biological living standards stagnated or even declined between 1850 and 1880²⁶⁰. Worsening living conditions and increasing spread of diseases, in a context of insufficient diets due to low agricultural productivity, are seen as the main causes behind this process. These indicators reversed this negative trend from the late 19th century onwards, and particularly so during the first decades of the 20th century, in response to improvements in diets and general living conditions, thus strengthening the connection between incomes and biological living standards.

FIG. 2. HEIGHTS AND INCOME PER CAPITA IN SPAIN, 1860-1930



Source: Martínez Carrión and Pérez Castejón, 'On the heights of Spanish recruits'.

²⁶⁰ A. Gómez Mendoza and V. Pérez Moreda, 'Heights and welfare in Spain, 1900-1930', in J. Komlos (ed.), *The biological standard of living on three continents. Further explorations in anthropometric history* (Boulder, 1995); D. Reher et al., 'Assessing change in historical contexts: Childhood mortality patterns in Spain during the demographic transition', in C.A. Corsini and P.P. Viazzo (eds.), *The decline of infant and child mortality. The European experience, 1750-1990* (The Hague, 1996); J.M. Martínez Carrión and J.J. Pérez Castejón, 'Heights and standards of living in Spain, 1860-1969: Evidence from the Southeastern Region', in J. Komlos and G. Baten (eds.), *The biological standard of living in comparative perspective* (Stuttgart, 1998); F. Dopico and D. Reher, 'El declive de la mortalidad en España, 1860-1930' (Zaragoza, 1998); V. Pérez Moreda, 'Población y economía en las España de los siglos XIX y XX', in G. Anes (ed.), *Historia económica de España. Siglos XIX y XX* (Barcelona, 1999); J.M. Martínez Carrión and J.J. Pérez Castejón, 'On the heights of Spanish recruits during the early phases of modern economic growth', *Jahrbuch für Wirtschaftsgeschichte. Economic History Yearbook*, 15 (2000).

As previously explained, common lands were a key component in the organic-based Spanish preindustrial economy. Around one-fourth of the total land was managed by local communities in 1860, a figure that was much higher in some regions. Apart from providing pasture to support livestock, which in turn supplied agriculture with fertiliser and workforce, commons constituted a source of complementary income by providing animal proteins, wood, and fuel, among other products, including the possibility of temporary cropping. Likewise, common lands played a fundamental role in the finances of local institutions, which was particularly important given that municipalities were responsible for the provision of basic public services and establishing the level of local taxes. Crucially, the contribution of the commons to living standards, especially important for the bottom part of the income distribution, mostly escaped the market sphere, so quantifying their effect in terms of wages or income per capita becomes a hazardous task. Instead, the potential impact of the dismantling of the communal regime on standards of living is measured using life expectancy and heights.

In order to test the distinctive impact of common lands on biological standards of living, this chapter exploits geographical variation over time by employing a panel dataset at the provincial level on three different periods: 1860, 1900 and 1930. The empirical analysis not only shows that, relative to private lands, the commons were not detrimental to biological living standards before 1860, but also that the persistence of these collective resources was related to higher life expectancy at birth and heights, particularly during the second half of the 19th century. Biological human welfare also seems to have been negatively influenced by the progressively decreasing role that local communities played on the management of these resources, thus supporting the

claims defended by Ostrom²⁶¹. The rest of the chapter is organised as follows. The next section discusses the historical evidence regarding biological standards of living and the potential role that common lands played in this context. Section 3 describes the methodology employed to test the hypothesis outlined here whereas section 4 reports the results of the empirical analysis. Finally, the last section presents the conclusions.

3.2 Standards of living and common lands

Spanish biological standards of living were among the worst in the European continent throughout the 19th century. Mortality rates, for instance, especially infant and childhood mortality, were dramatically high²⁶². In a context of low agricultural productivity and inadequate transportation, these negative outcomes were the result of subsistence crises, chronic malnutrition and the effect of diseases and epidemics²⁶³. Moreover, although income per capita was growing steadily, at least from the middle of the 19th century, biological living standards, measured by mortality rates or heights, stagnated or, in some cases, declined between 1850 and 1880²⁶⁴. Regional and local studies in diverse areas of the Iberian Peninsula confirm these trends²⁶⁵. Recent research indeed shows that the evolution of height and levels of economic development in Spain was not correlated during the initial stages of modern economic growth but

²⁶¹ Ostrom, *Governing the commons*.

²⁶² Pérez Moreda, 'Población y economía', p. 10.

²⁶³ Tortella, *The development of modern Spain*, p. 33.

²⁶⁴ Reher et al., 'Assessing change'; J.M. Martínez Carrión, 'El nivel de vida en la España rural, siglos XVIII-XX. Nuevos enfoques, nuevos resultados', in J.M. Martínez Carrión (ed.), *El nivel de vida en la España rural, siglos XVIII-XX* (Salamanca, 2002).

²⁶⁵ J. Colomé, E. Saguier and E. Vicedo, 'Las condiciones de reproducción económica de las unidades familiares campesinas en Cataluña a mediados del siglo XIX', in J.M. Martínez Carrión (ed.), *El nivel de vida en la España rural, siglos XVIII-XX* (Salamanca, 2002); J. Moreno-Lázaro, 'El nivel de vida en la España atrasada entre 1800 y 1936: El caso de Palencia', *Investigaciones de Historia Económica*, 4 (2006); A.D. Cámara, 'Long-term trends in height in rural Eastern Andalucía (1750-1950)', *Historia Agraria*, 47 (2009); J.M. Ramón Muñoz, 'Bienestar biológico y crecimiento agrario en la Cataluña rural, 1840-1936', *Historia Agraria*, 47 (2009); H. García Montero, 'Antropometría y niveles de vida en el Madrid rural, 1837-1915', *Historia Agraria*, 47 (2009); R. Hernández García and J. Moreno Lázaro, 'El nivel de vida en el medio rural de Castilla y León, 1840-1970. Una constatación antropométrica', *Historia Agraria*, 47 (2009); J.M. Martínez Carrión and J. Puche Gil, 'Alfabetización, bienestar biológico y desigualdad: la Comunidad Valenciana, 1850-1970', *Historia Agraria*, 47 (2009).

became closely linked during the period between 1900 and 1920²⁶⁶. The decline in biological living standards during the middle decades of the 19th century in Spain, and its subsequent rapid improvement from the late 19th century, has been related to economic factors that affected real incomes and the effects of increasing market integration²⁶⁷. In the absence of adequate public sanitation, urbanisation and industrialisation processes also negatively affected living standards, although it seems that the low dynamism of Spanish cities cushioned their potentially negative impact on health²⁶⁸.

The pattern of biological welfare indicators was also geographically different, especially between Northern and Southern Spain. Quiroga analysed differences in heights between Spanish provinces in 1920 and concluded that variation reflected population pressure, income levels and economic structure²⁶⁹. However, income differences do not fully explain the regional differences in mortality rates during the second half of the 19th century. Climatic factors were also an important factor. Humid regions seem to have enjoyed an ecological advantage regarding the impact of digestive infectious diseases, which is one of the main factors behind the extremely high childhood mortality rates²⁷⁰. Coastal provinces are also seen as favouring heights²⁷¹. Likewise, social and institutional factors also mattered. Regions where land ownership was more evenly distributed have also been linked to better biological living

²⁶⁶ R. María Dolores and J.M. Martínez Carrión, 'The relationship between height and economic development in Spain, 1850-1958', *Economics and Human Biology*, 9 (2011), p. 34.

²⁶⁷ Martínez Carrión and Pérez Castejón, 'Heights and standards of living'; Martínez Carrión, 'El nivel de vida en la España rural'; Moreno Lázaro, 'El nivel de vida en la España atrasada'.

²⁶⁸ Pérez Moreda, 'Población y economía', p. 18; J.M. Martínez Carrión and J. Moreno Lázaro, 'Was there an urban height penalty in Spain, 1840-1913?', *Economics and Human Biology*, 5 (2007).

²⁶⁹ G. Quiroga, 'Height evolution in Spain, 1893-1954: An analysis by regions and professions', in J. Komlos and J. Baten (eds.), *Studies of biological standards of living in comparative perspective* (Stuttgart, 1998), p. 378. Note that, in Quiroga's econometric results, inequality in income distribution between professional groups showed the expected sign but was not significant, perhaps due to multicollinearity problems.

²⁷⁰ X. Cusó and R. Nicolau, 'La mortalidad antes de entrar en la vida activa en España: Comparaciones regionales e internacionales, 1860-1960', *Revista de Historia Económica*, 18 (2000), p. 529.

²⁷¹ Gómez-Mendoza and Pérez-Moreda, 'Heights and welfare', p. 85.

standards²⁷². Apart from its impact on productivity and income levels, education also influenced heights by facilitating improvements in hygiene and nutritional habits²⁷³. Lastly, a more dispersed population may have also reduced the diffusion of infectious diseases²⁷⁴.

However, the potential effect of the privatisation of common lands on biological standards of living has hardly been stressed, either in the longitudinal studies or in the cross-sectional analyses. Although abundant evidence connecting this process to the deterioration of living standards has been found in regional studies, this issue is rarely mentioned when making wider generalisations at the national level²⁷⁵. Similarly, few regional analyses explicitly link the liberal land reforms with declining biological living standards²⁷⁶. As mentioned above, recent research on the commons, mostly at the regional or local level, has strongly pointed out the negative economic and social consequences that the privatisation of common lands involved²⁷⁷. However, their conclusions have not yet found their way into the wider literature. This fact is surprising given that the disentailment process has been considered one of the most important events in Spanish economic history²⁷⁸.

By promoting individual property rights and land markets, the liberal reforms were expected to provide better incentives for investing in land, as well as allocating land to those farmers who will make a better use of these resources²⁷⁹. However,

²⁷² Martínez Carrión, 'El nivel de vida en la España rural', p. 37.

²⁷³ G. Quiroga, 'Literacy, education, and welfare in Spain (1893-1954)', *Paedagogica Historica*, 39 (2003), pp. 615-617.

²⁷⁴ Cusso and Nicolau, 'La mortalidad', p. 246.

²⁷⁵ For exceptions, see Martínez Carrión, 'El nivel de vida en la España rural'; Escudero and Simón, 'El bienestar en España: Una perspectiva de largo plazo (1850-1992)', *Revista de Historia Económica*, 3 (2003), p. 550; Gallego, *Más allá de la economía de mercado*.

²⁷⁶ For exceptions, see Cámara, 'Long-term trends in height'; Ramón Muñoz, 'Bienestar biológico'.

²⁷⁷ See, for instance, Iriarte, 'La pervivencia de bienes comunales'; Moreno, 'El régimen comunal'; Linares, 'Estado, comunidad y mercado'; Ortega Santos, *La tragedia de los cerramientos*; Serrano, 'La defensa del comunal'; Lana, 'From equilibrium to equity'.

²⁷⁸ Simón Segura, *La desamortización*, p. 293.

²⁷⁹ The possibility of using land as collateral in the credit market would reinforce these advantages (Deininger and Feder 2001, p. 299).

although the disentanglement brought into cultivation idle or underutilised land, thus increasing agricultural production, productivity remained low²⁸⁰. The loss of common lands may have negatively affected agricultural productivity because it meant a reduction of pastures and, subsequently, of livestock density, thus reducing the availability of manure and workforce²⁸¹. In the context of a traditional agriculture, these inputs were crucial and there is evidence that livestock density indeed declined throughout the 19th century²⁸². According to the previous chapter, even though privatisation fostered output per worker by bringing more land into cultivation, the role of the commons as provider of pasture and fertilising materials counteracted that effect.

Nevertheless, the privatisation process itself could have also negatively affected standards of living, especially for the poorer households, through different ways. On the one hand, collective lands constituted a fundamental source of complementary income by providing pasture, wood, fertiliser and fuel, together with the possibility of temporary cropping²⁸³. This mechanism was extremely important since commons contributed to achieve a minimum level of caloric intake and a higher level of animal protein consumption²⁸⁴. Meat, milk and egg consumption is positively related to health and stature²⁸⁵. The combined effect of the loss of common rights and the decline in livestock production are likely to have reduced the consumption of animal proteins per capita²⁸⁶. The widespread conflict and resistance that privatisation generated, especially among the least favoured groups, strongly points to the crucial role that commons played on securing the subsistence of rural households and the negative impact that

²⁸⁰ Simpson, *Spanish agriculture*; Clar and Pinilla, 'The contribution'.

²⁸¹ Moral Ruiz, *La agricultura*, p. 14.

²⁸² J. Simpson, 'La producción agraria y el consumo español en el siglo XIX', *Revista de Historia Económica*, 19 (1989).

²⁸³ Iriarte, 'Common lands'.

²⁸⁴ Jiménez Blanco, 'El monte', p. 146.

²⁸⁵ Cusso y Nicolau, 'La mortalidad', p. 245; Martínez Carrión and Puche Gil, 'Alfabetización', p. 177.

²⁸⁶ Martínez Carrión, 'El nivel de vida en la España rural', p. 37; Cámara, 'Long-term trends in height', pp. 59-60.

privatisation had on their living standards²⁸⁷. This behaviour was also reflected on the *Guardia Civil*'s reports of illegal uses on the remaining commons, especially wood and firewood theft and unauthorised pasturing, which were geographically concentrated in those regions where the dismantling of the communal regime had been more intense²⁸⁸.

On the other hand, the role that commons played in the finances of local institutions should also be stressed. The monetary income derived from the cession of use rights on the commons constituted a fundamental component of the municipal budget²⁸⁹. In 1858, common lands covered 32.4 per cent of the ordinary municipal budget²⁹⁰. Furthermore, the income arising from the renting of common lands did frequently not appear in the municipal budgets, so these figures would be a minimum approximation²⁹¹. In addition, commons were not only a source of revenues to municipalities but could be used as a guarantee when applying for credit²⁹². These figures, nonetheless, reflect the national average and hide the importance of the commons in those municipalities that had preserved them, especially in the rural areas. In the province of Seville, for instance, despite being one of the areas that most suffered privatization prior to the *Disentailment Act* of 1855, the income generated by the commons still provided the 100 per cent of the ordinary revenue in 66 per cent of the municipalities in 1849²⁹³. In the four municipalities studied by Iriarte in Navarra, the

²⁸⁷ F. Cobo, S. Cruz, and M.L. González de Molina, 'Privatización del monte y protesta social. Un aspecto desconocido del movimiento campesino andaluz (1836-1920)', *Revista de Estudios Regionales*, 32 (1992); De la Torre and Lana, 'El asalto a los bienes comunales'.

²⁸⁸ GEHR, 'Diversidad dentro de un orden', pp. 150-152.

²⁸⁹ A.M. Bernal, 'Haciendas locales y tierras de propios: Funcionalidad económica de los patrimonios municipales (siglos XVI-XIX)', *Hacienda Pública Española*, 55 (1978); J. del Moral Ruiz, 'Desamortización y haciendas locales, 1820-1900', in M.P. Alonso et al. (eds.), *Desamortización y Hacienda Pública*, vol. 2 (Madrid, 1986); C. García and F. Comín, 'Reforma liberal, centralismo y haciendas municipales en el siglo XIX', *Hacienda Pública Española*, 133 (1995); I. Iriarte, 'Algunos modelos de explotación forestal: Ingresos de montes y haciendas municipales en el norte de Navarra (1867-1935)', in J.A. Sebastián and R. Iriarte (eds.), *Historia y economía del bosque en la Europa del sur, Siglos XVIII-XX* (Zaragoza, 2003).

²⁹⁰ García and Comín, 'Reforma liberal', p. 95.

²⁹¹ Moral Ruiz, 'Desamortización y haciendas locales', p. 746.

²⁹² Bernal, 'Haciendas locales', p. 307; Iriarte, 'Algunos modelos de explotación forestal', p. 245.

²⁹³ Bernal, 'Haciendas locales', p. 307.

importance of the commons in the local budget ranged from 20 to 59 per cent in the period 1926/35²⁹⁴. The privatisation of these collective resources meant that municipalities lost a crucial source of income. As seen in the first chapter, according to the legal text, 20 per cent of the sale value would directly go to the state, while the remaining 80 per cent would belong to the municipalities now transformed in perpetual and inalienable public debt yielding a 3 per cent annual return. Although these rents were intended to compensate municipalities for the loss of these resources, the debt quickly depreciated and the payments were not often honoured²⁹⁵. The provision of public goods and services, including schooling, medical care and poor relief, was thus clearly affected²⁹⁶. Likewise, in order to manage the loss of revenue from common lands along with increasing expenditures on these new public services, municipalities raised local taxes, especially affecting poorer households due to the regressive nature of a fiscal system mostly built around taxing consumption goods²⁹⁷. In this regard, the Treasury set the state's fiscal needs, which were then apportioned between regions and municipalities. If the municipal budget did not meet these requirements, local taxes had to be increased. This outcome was by no means unexpected for contemporaries. The parliamentary debates carried out between 1835 and 1855 about the convenience of privatising common lands reflect the concern that depriving local communities from these resources would necessarily force municipalities to increase local taxes, negatively affecting the lower classes²⁹⁸. Iriarte indeed shows that higher levels of

²⁹⁴ Iriarte, 'Algunos modelos de explotación forestal', p. 243.

²⁹⁵ J. Nadal, *El fracaso de la revolución industrial en España, 1814-1913* (Barcelona, 1975), p. 66-67; García Sanz, 'Introducción', p. 28.

²⁹⁶ Bernal, 'Haciendas locales'; Iriarte, 'Algunos modelos de explotación forestal'.

²⁹⁷ J. del Moral Ruiz, *Hacienda central y haciendas locales en España, 1845-1905* (Madrid, 1984), p. 150; García and Comín, 'Reforma liberal', p. 91; A.M. Linares, 'Tapando grietas: Hacienda local y reforma tributaria en Extremadura (1750-1936)', *Investigaciones de Historia Económica*, 5 (2006).

²⁹⁸ Gómez Urdañez, 'Doctrinas y realidades', p. 144. See also Simon Segura, *La desamortización*, pp. 170-171.

income coming from the commons were related to both a lower municipal fiscal burden on the neighbours and higher levels of social spending²⁹⁹.

Apart from the direct impact on human welfare that the possibility of resorting to the commons provided, other indirect mechanisms may have played a role as well. The way through which privatisation was implemented is likely to have increased, or at least consolidated, the concentration of landholding by an elite, thus contributing to social polarisation and the proletarianisation of agricultural labour, although this outcome may have depended on the previous structure of land ownership³⁰⁰. A more equal redistribution of land would have promoted a farmers' middle class with a higher consumption capacity³⁰¹. Likewise, land purchases may have diverted capital that would have otherwise been invested in modernising farms or in the industrial sector³⁰². Lastly, the communal management of these resources enhanced social cohesion and local cooperation³⁰³. In this sense, as developed in the last chapter, the social networks built around common lands facilitated the diffusion of information and the building of mutual knowledge and trust, thus promoting social capital.

To sum up, the dismantling of communal resources triggered off a chain of negative outcomes, likely having affected human welfare in rural areas. In this sense, privatisation processes often eliminate the institutions that support a market economy, especially in developing regions where market failures are widespread and the state is absent³⁰⁴.

²⁹⁹ Iriarte, 'Algunos modelos de explotación forestal', p. 250.

³⁰⁰ Rueda, *La desamortización en España*.

³⁰¹ J. Nadal, 'A century of industrialisation in Spain, 1830-1930', in N. Sánchez Albornoz (ed.), *The economic modernisation of Spain, 1830-1930* (New York, 1987), p. 63.

³⁰² Simón Segura, *La desamortización española*, p. 300.

³⁰³ Iriarte, 'La pervivencia de bienes comunales'; Gallego, *Más allá de la economía de mercado*.

³⁰⁴ C.P. Timmer, 'Agriculture and economic development', in B. Gardner and G. Rausser (eds.), *Handbook of Agricultural Economics* (Amsterdam, 2002), p. 1490.

3.3 Methodology and data

A panel data set at the provincial level has been collected at three different time periods (1860, 1900 and 1930) in order to analyse the impact of the privatisation of common lands on biological standards of living during the transition to modern economic growth in Spain. The use of life expectancy at birth and heights as indicators of human welfare has a well-established tradition within the literature³⁰⁵. These indicators are especially useful when studying developing countries where statistics about income or other economic indicators are often unreliable and/or large informal sectors are present. These biological measures capture net nutritional levels and health better than income measures since they not only account for the effect of diets, but also for the impact of the disease and working environment, including the effect of public sanitation and health systems. Period life expectancy at birth provides a measure of long-term population health by adding up the extent of disease-generated deaths. Adult heights, apart from genetic factors, reflect the cumulative net nutritional status from conception to maturity.

Data for these variables, originally generated from vital statistics and conscripts records, have been collected from different published sources³⁰⁶. A summary of that information is presented in table C.1 in Appendix C. While life expectancy is derived from vital statistics based on parish registers, stature information comes from military conscripts and refers to the year of measurement. It should be noted that the data on heights is not perfectly comparable between the three periods. Firstly, while data on

³⁰⁵ See Floud and Steckel (eds.), *Health and welfare during industrialization* (Chicago, 1997); Easterlin, 'How beneficent is the market?'; Arora, 'Health, human productivity'; Fogel, 'Health, nutrition'; R. Floud et al., *The changing body: health, nutrition, and human development in the western world since 1700* (Cambridge, 2011).

³⁰⁶ F. Dopico, 'Regional mortality tables for Spain in the 1860s', *Historical Methods*, 20 (1987); Dopico and Reher, *El declive de la mortalidad*; A. Gómez Mendoza and V. Pérez Moreda, 'Estatura y nivel de vida en la España del primer tercio del siglo XX', *Moneda y crédito*, 174 (1985); G. Quiroga, *Medidas antropométricas y condiciones de vida en la España del siglo XX* (Universidad Alcalá de Henares, 2002). I would like to thank the authors for kindly sharing their data.

1860 comes from the summary statistics provided by the Army, information on 1900 and 1930 comes from sampling individual recruitment files. In order to improve the accuracy of the stature estimates for the latter dates, the average of the periods 1896-1904 and 1926-1934 is employed for 1900 and 1930 respectively. Secondly, data in 1860 may be downwards biased because redemption via payment in cash was allowed. Another concern is that conscripts were measured at different ages: the age of recruitment was 20 years-old between 1859 and 1906, except for the period 1885-1899 during which conscripts were measured at age 19, and then increased to 21 years-old in 1907 onwards. However, these modifications in the recruitment age hardly changed the trend in heights³⁰⁷. Lastly, there is missing information on heights for some of the provinces, so the sample size is slightly smaller than for life expectancy. However, the potential bias in the sample of heights would only affect the empirical results if that bias was systematically related to the existing stock of common lands.

It is important to note that migration may have biased these indicators. Cusso and Nicolau argue that emigrating abroad implied a considerable investment and, therefore, healthier migrants, who have more opportunities abroad, will not appear in the statistics, thus downward biasing average height estimates in sending regions³⁰⁸. Conscript records in a high-migration area, such as Castile-Leon, show that 21 per cent of rural conscripts emigrated to America at the end of the 19th century and their average height was 1.9 cm higher than those who remained behind³⁰⁹. Low heights in Galicia could also be the result of extremely high desertion rates since around one third of the conscripts deserted³¹⁰. Internal migration may have also generated a selection bias³¹¹. In

³⁰⁷ Martínez Carrión and Moreno Lázaro, 'Was there an urban height penalty', p. 151.

³⁰⁸ Cusso and Nicolau, 'La mortalidad', p. 544.

³⁰⁹ Martínez Carrión and Moreno Lázaro, 'Was there an urban height penalty', p. 156.

³¹⁰ Cusso and Nicolau, 'La mortalidad', p. 544.

³¹¹ Hernández García and Moreno Lázaro, 'El nivel de vida en el medio rural', p. 159.

order to account for this bias, internal and international migration rates, measured as net migration flows, will be included in the analysis using data from Mikelarena³¹².

As in previous chapters, common lands are measured as the proportion of common lands over the total provincial area. As shown in figure 1, the stock of common lands already showed a wide regional variation in 1860. The privatisation that took place from that date onwards under the *General Disentailment Law* (1855), accentuated these differences, especially from 1860 to 1900. Sales were much less important during the first decades of the 20th century. However, the welfare of the rural communities was influenced not only by the availability of common lands, but also by the way these resources were managed³¹³. The communal regime in Spain involved two main types of access to the land: a direct but regulated access for all members of the community (*comunales*) or a temporary cession of user-rights to particular individuals in exchange for a monetary income (*propios*). The privatisation process affected both their property rights and the way these resources were used. The proportion of private user-rights over the remaining commons grew over time³¹⁴. To account for this distinction, common lands are also split up into two variables by taking into account the fraction of total user-rights which was being enjoyed privately or collectively³¹⁵.

³¹² F. Mikelarena, 'Los movimientos migratorios interprovinciales en España entre 1877 y 1900: Áreas de atracción, áreas de expulsión, periodización cronológica y cuencas migratorias', Cuadernos Aragoneses de Economía, 3 (1993). The available data does not perfectly fit the time periods employed here. The flows between 1878-1887, 1888-1920 (average of three different sub-periods) and 1921-1930 are employed to account for 1860, 1900 and 1930 respectively.

³¹³ Jiménez Blanco, 'El monte', p. 146.

³¹⁴ GEHR, 'Diversidad dentro de un orden', p. 136.

³¹⁵ GEHR, *Estadísticas históricas*. In order to avoid unexplained short-run variations in the data, the average proportion of collective practices over the periods 1861-70, 1903-13 and 1920-32 is used to account for the years 1860, 1900 and 1930 respectively. This data should be nonetheless taken with caution. On the one hand, in contrast to 1860, the data for the period 1900-1930 only applies to a restricted set of common lands, the so-called "montes de utilidad pública" (see GEHR, 'Política forestal'). On the other hand, the Disentailment Law itself introduced incentives for villages to misclassify those resources depending on their interests regarding privatization. The law forced municipalities to sell their commons with the exception of those which had been enjoyed collectively in the past. Villages could thus apply to except "comunales" from the sales. However, regardless of the actual use of the commons, municipalities cheated both ways depending on their interests either by

The panel data collected allows carrying out an econometric analysis to assess the distinctive impact of common lands on the standards of living according to the following specification:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \sum \gamma_k Z_{kit} + \delta_i + \alpha_t + u_{it}$$

where Y_{it} refers to either to life expectancy at birth or heights and X_{it} to the fraction of common lands over the total provincial area. A fixed-effects model controls for time invariant province-specific factors (δ_i), partly solving the omitted variable problem, which is so pervasive in cross-sectional analyses. This model also allows for the inclusion of time fixed effects (α_t) to account for both the process of economic development itself, together with the technological and institutional advances in relation to biological wellbeing which were implemented from the late 19th century onwards. These would include improved nutrition, better public and personal sanitation, decontamination of food and water, improved housing, or advances in medical technology, among others. In this regard, interacting the variable of interest with time-period dummies also permits to assess whether the effect of common lands varied over time as the Spanish economy developed.

The main potential concern here is the omitted variable bias arising from variation both across provinces and over time. Both common land privatisation and changing biological wellbeing could also be the result of another time-variant unobserved factor, thus affecting our estimates. Other processes were unfolding during this period which may be correlated with privatisation and human welfare. In order to overcome this problem, a host of controls which take into account other potential determinants of life expectancy and heights is included in the analysis (Z_{kit}). The potential effect of income per capita on biological living standards is considered by

pretending that commons had been used collectively in order to prevent sales or by pretending that they had been individualized in order to put them on the market.

using recently developed estimates of gross domestic product at the provincial level³¹⁶. Demographic pressures are proxied by population density³¹⁷. Urbanisation and industrialisation are measured as the proportion of population living in cities bigger than 5,000 inhabitants and the per capita gross value added by non-agricultural activities per capita³¹⁸. Structural change is measured by the proportion of the male active population working on agriculture³¹⁹. The effect of changes in land ownership, as a proxy of inequality, is assessed through the fraction of landowners over the agricultural active population³²⁰. Finally, literacy rates are also employed in order to account for the potential effect of education³²¹. Summary statistics of the variables employed are reported in table C.2 in Appendix C.

3.4 Results

Table 3.1 reports the results of fixed-effect regressions estimating the impact of the stock of common lands on either life expectancy at birth or heights. All regressions also include time dummies. Columns (1) and (5) present the baseline specification.

³¹⁶ J.R. Rosés et al., ‘The upswing of regional income inequality in Spain (1860-1930), *Explorations in Economic History*, 47 (2010). I am grateful to Julio Martínez-Galarraga for kindly sharing the data. Population figures are taken from Nicolau, ‘Población, salud y actividad’.

³¹⁷ Ibid; Instituto Nacional de Estadística, *Anuario Estadístico de España*, 2000.

³¹⁸ Tafunell, ‘Urbanización y vivienda’; Rosés et al., ‘The upswing of regional income inequality’.

³¹⁹ P. Erdozain and F. Mikelarena, ‘Las cifras de activos agrarios de los censos de población españoles del period 1877-1991. Un análisis crítico’, *Boletín de la Asociación de Demografía Histórica*, 17 (1999). The lack of consistency between censuses regarding female working population advices to rely only on male workers when accounting for the importance of agriculture, a usual procedure in Spanish historical literature. For this issue, see Erdozain and Mikalarena, ‘Las cifras de activos agrarios’; Nicolau, ‘Población y actividad’; Pérez Moreda, ‘Población y economía’; L Prados de la Escosura, ‘Inequality, poverty and the Kuznets curve in Spain, 1850-2000’, *European Review of Economic History*, 128 (2008). Consistency between censuses also recommends using data of 1877 instead of 1860. It seems nonetheless that the population distribution did not change much between 1860 and 1877, while there was enough variation between 1877 and 1900. Likewise, the strange figures found in some provinces in 1930 also recommend to employ an average between 1920, 1930 and 1940 to account for that date. On this issue, see also the comments of Erdozain and Mikalarena, ‘Las cifras de activos agrarios’, pp. 107-108.

³²⁰ Dirección General del Instituto Geográfico y Estadístico, *Censo de la población de España, 1860*; Dirección General del Instituto Geográfico y Estadístico, *Censo de la población de España, 1920*. Unfortunately, data on land ownership is only available for 1860 and 1920. Therefore, linear interpolation is employed to estimate that figure for 1900 and the data on 1920 is used for 1930.

³²¹ C.E. Núñez, *La fuente de la riqueza. Educación y desarrollo económico en la España contemporánea* (Madrid, 1992).

Columns (2) and (6) introduce the variable of interest interacted with time-period dummies to allow the effect of common lands to vary over time as the Spanish economy developed. In addition, internal and international migration rates are included in column (3) and (7) to account for their potential bias on the dependent variables. The remaining columns further test the robustness of the results by including the series of controls explained above, which take into account other potential determinants of human wellbeing³²².

TABLE 3.1 COMMONS AND BIOLOGICAL LIVING STANDARDS

	Dependent variable							
	Life expectancy at birth				Heights			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Common Lands	0.13* (0.08)	0.12* (0.07)	0.13* (0.07)	0.05 (0.05)	0.00 (0.05)	0.00 (0.04)	0.00 (0.04)	0.02 (0.05)
CL*d_1900		0.05* (0.03)	0.05* (0.03)	0.06** (0.03)		0.06*** (0.02)	0.06*** (0.02)	0.06*** (0.02)
CL*d_1930		-0.01 (0.03)	-0.01 (0.03)	-0.02 (0.04)		0.05*** (0.01)	0.05*** (0.01)	0.05* (0.02)
d_1900	6.29*** (0.80)	5.29*** (1.00)	5.05*** (1.09)	-0.23 (1.38)	0.72 (0.48)	-0.37 (0.66)	-0.36 (0.66)	-0.52 (1.13)
d_1930	21.56*** (0.81)	21.54*** (1.04)	21.29*** (1.16)	11.29*** (2.76)	2.95*** (0.49)	2.04*** (0.47)	2.04*** (0.50)	1.85 (2.18)
Migration	No	No	Yes	Yes	No	No	Yes	Yes
Controls	No	No	No	Yes	No	No	No	Yes
Observations	137	137	137	137	124	124	124	124
R-squared	0.96	0.96	0.96	0.97	0.56	0.62	0.62	0.66

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. 'CL*d_1900' and 'CL*d_1930' stand for the interaction of the variable of interest, common lands, with a time dummy for 1900 and 1930 respectively. All regressions include provincial fixed effects. For simplicity, the intercept is not reported. Migration refers to both internal and international migration rates. Controls include income per capita, population density, agricultural population, urbanisation, industrialisation, land ownership and literacy.

The results evidence that there was no influence, neither positive nor negative, of common lands on biological living standards before 1860. Relative to private lands,

³²² The coefficients of the migration variable are significant and have the expected negative sign: higher migration rates are related to lower life expectancy and heights, suggesting that migration is positively selected. Regarding the other control variables, the share of agricultural population and literacy rates have the expected positive sign, while the remaining controls turn out to be statistically insignificant.

common lands were not detrimental to life expectancy at birth or heights before that date, thus supporting the revisionist literature on this issue³²³. However, the estimated impact of common lands on biological living standards is shown to be positive and statistically significant after that date. The explanation behind this change can be related to the tighter control that local communities exerted over the sale of these resources before the *General Disentailment Act* in 1855. The role played by the central government during the first half of the 19th century limited itself to establishing the legal framework that allowed municipalities to freely dispose of their patrimony³²⁴. It has been argued that sales and distribution of common lands carried out during this period also often ended up benefiting small and middle-sized local farmers³²⁵. It is worth mentioning that, in the highly unstable first half of the 19th century, the liberal movement was well aware of the advantages of the civil disentailment to increase the number of land owners and thus widen the social support to the revolution against absolutism³²⁶. It was not until the *General Disentailment Act*, when privatisation was already quite advanced in certain areas, when the liberal state became actively involved in the process by forcing municipalities to sell their commons. Most land was then publicly auctioned to the highest bidder, thus benefiting the well-off that could bid on them³²⁷. Moreover, plots were not parcelled up and payments were required in cash, thus preventing small farmers from participating in the bids³²⁸. Likewise, the use of public auctions also facilitated that foreigners could participate in the sales. Sales were carried out through simultaneous public auctions both in Madrid and in the village

³²³ Allen, *Enclosure and the Yeoman*; Allen, *Progress and poverty*; Moor, 'Avoiding tragedies'.

³²⁴ Jiménez Blanco, 'El monte', Gómez Urdañez, 'Doctrinas y realidades'.

³²⁵ Jiménez Blanco, 'El monte', pp. 149-150.

³²⁶ Gómez Urdañez, 'Doctrinas y realidades', pp. 139-140.

³²⁷ G. Tortella, 'Agriculture: A slow-moving sector, 1830-1935', in N. Sánchez Albornoz (ed.), *The economic modernization of Spain, 1830-1930* (New York, 1987), p. 45.

³²⁸ García Sanz, 'Introducción', p. 28; Jiménez Blanco, 'El monte', p. 150.

where the plot was located³²⁹. As a result, local communities lost control over who gained from these land transfers, which allowed wealthy individuals, often coming from outside the community, to appropriate resources that were being more fairly distributed before.

To illustrate the impact of the privatisation on biological living standards, it should be noted that common lands went from representing around 25.6 per cent of the total Spanish area in 1860 to 17 per cent in 1900. The estimates obtained here imply that, on average, the privatisation process is associated with a reduction in life expectancy by around 0.5 years and stature by around 0.5 centimetres during that period. Although these may seem low values, it should be stressed that life expectancy at birth was only 29.8 years in 1860, increasing to 35 years in 1900, while heights only increased by 1.1 centimetres during this period. In Toledo, for an example where privatisation was more intense (21 per cent of the land became private between 1860 and 1900), the effect was much more dramatic. Life expectancy there would be reduced by around 1.3 years and heights stunted by 1.3 centimetres. These estimates, reflecting only the population average, should be also taken as a lower bound, especially in areas where access to resources was highly unequal, since the bottom-half of the distribution relied comparatively more on the commons to obtain a crucial complement for their incomes.

In relative terms, the impact of common lands on human wellbeing is much greater in the case of heights than in life expectancy. A one standard deviation decrease in the stock of common lands reduced stature by 0.3 standard deviations, while life expectancy decreased by 0.1 standard deviations. Likewise, while the effect on life expectancy had already disappeared in 1930, the positive influence of the commons on

³²⁹ Linares, 'Estado, comunidad y mercado', p. 26.

heights was still visible in the period prior to the Civil War. This situation is due to the different ways in which both common lands themselves and the evolution of the Spanish economy affected life expectancy and heights. It is likely that the nutritional complement which commons supplied, particularly in terms of animal proteins, had a larger and more persistent impact on heights than on life expectancy, whose determinants were more strongly influenced by the improvements in the disease environment. Although life expectancy and heights are related because both are influenced by the nutritional status and the disease environment, the relative impact of each of these elements on these different measures of health is likely to be different³³⁰. In this regard, advances in medical technologies, together with the increasing importance of the state in providing a healthier environment, made the contribution of the commons to life expectancy less and less necessary over time.

The coefficients of the time dummies illustrate that as the country developed, biological standards of living greatly improved, especially during the first decades of the 20th century. In this sense, it is especially interesting to discuss the relative impact of the modernisation process and the increasing role of the state by comparing the coefficients of the time-period fixed effects before and after including the host of controls in the model. In columns (3) and (7), the time dummies capture the combined impact of both processes, holding the influence of the commons fixed. The results show that even though life expectancy at birth increased throughout the whole period, the improvements were much larger during the first decades of the 20th century. While life expectancy increased by an average of around 5 years between 1860 and 1900, it grew by around 16.2 years between 1900 and 1930. Increases in heights, on the other hand, are only visible between 1900 and 1930. Columns (4) and (8) add the set of controls

³³⁰ For a discussion of these two indicators, see Arora, 'Health, human productivity', pp. 703-705.

reflecting the on-going modernisation process reflected in growing incomes and higher urbanisation or industrialisation levels, together with increasing literacy rates and other factors affecting living standards. Interestingly, the effect of the time dummy for 1900 on life expectancy is no longer significant which means that the weak advances prior to that date were not due to increasing public intervention but to better economic conditions. However, the coefficient in 1930 is not only highly statistically significant, but it also remains historically important after including controls, thus implying that the role of the state on augmenting life expectancy was crucial during the first decades of the 20th century. According to these estimates, the role of the state accounts for around 11.3 of the 21.3 years by which life expectancy increased between 1860 and 1930 (column 4). Given that the control variables account for all the 5.05 years of increase between 1860 and 1900 (column 3), it can be concluded that increasing government intervention accounts for more than two thirds of the improvements between 1900 and 1930.

This finding, consistent with other research³³¹, supports the idea that the first stages of economic modernisation were not so beneficial for human welfare, being only the active intervention of the state the key factor able to overcome the negative externalities arising from demographic pressures, urbanisation or industrialisation. Mostly available only from the beginning of the 20th century onwards, the new technologies of disease control, including efforts to educate the public on this matter, were not implemented by the market but by government action³³². On the other hand, given that the effect on heights of the time dummy in 1930 disappears when controls

³³¹ Floud and Steckel, *Health and welfare*; Dopico and Reher, *El declive de la mortalidad*; Komlos, *Shrinking in a growing economy*; S. Arora, 'Understanding aging during the epidemiologic transition', *Research in Economic History*, 29 (2013).

³³² Easterlin, 'How beneficent is the market?'; S. Arora, 'On epidemiologic and economic transitions: An historical view', in B. López Casanovas et al. (eds.), *Health and economic growth* (Cambridge, 2005).

are included, increasing statures, only visible after 1900, were not related to state intervention but to improved economic conditions. These diverse patterns point again to the different relative importance that the disease environment and diets had in influencing mortality rates and heights mentioned above. In this sense, significant improvements in Spanish diets, especially regarding the consumption of meat, milk and eggs, were only achieved during the first decades of the 20th century³³³.

Lastly, it is important to note that the welfare of these communities was not only influenced by the availability of common lands, but also by the way these collective resources were managed. As explained above, the communal regime in Spain involved two main types of user-rights: a direct but regulated access for all members of the community or a temporary cession of use rights to particular individuals in exchange for a monetary income. Table 3.2 reports the estimates when common lands are split up into two types depending on whether they were being exploited collectively or privately. While column (1) and (4) report the baseline specification, columns (2) and (5) introduce the variables of interest interacted with time-period dummies to allow the effect of common lands to vary over time and the remaining columns add the set of controls which account for other potential determinants of human well-being.

These estimates confirm the previous findings and clarify the picture portrayed above regarding the redefinition of property rights. On average, it was those user-rights enjoyed collectively, not the user-rights rented out to individuals, the ones which positively affected life expectancy at birth and heights, thus stressing the importance of common rights in complementing households' incomes. Again, while no relationship is found between the different types of user-rights and living standards before 1860, the persistence of collective practices over the remaining common lands after that date is

³³³ Simpson, *Spanish agriculture*, pp. 180-181.

shown to be positively related with life expectancy and heights. Interestingly, prior to that date, local communities independently managed these resources, thus benefiting their own neighbours when deciding both the forms of use and who enjoyed access to them.

TABLE 3.2. TYPES OF COMMONS AND BIOLOGICAL LIVING STANDARDS

	Dependent variable					
	Life expectancy at birth			Heights		
	(1)	(2)	(3)	(4)	(5)	(6)
Collectively-used Common Lands	0.01 (0.04)	0.01 (0.04)	-0.05 (0.04)	-0.02 (0.03)	0.01 (0.02)	0.00 (0.02)
Coll. CL *d_1900		0.09*** (0.03)	0.07** (0.03)		0.07*** (0.02)	0.08*** (0.02)
Coll. CL *d_1930		-0.01 (0.04)	-0.04 (0.05)		0.08*** (0.02)	0.09** (0.04)
Privately-used Common Lands	0.10* (0.06)	0.18** (0.08)	0.10 (0.07)	-0.03 (0.05)	0.04 (0.05)	0.06 (0.05)
Priv. CL *d_1900		-0.12 (0.10)	-0.11 (0.09)		-0.05 (0.08)	-0.05 (0.08)
Priv. CL *d_1930		0.01 (0.10)	-0.00 (0.09)		-0.02 (0.05)	-0.01 (0.06)
d_1900	5.18*** (0.72)	5.09*** (1.14)	-0.15 (1.37)	0.60 (0.41)	0.26 (0.68)	-0.27 (1.13)
d_1930	20.17*** (0.75)	20.21*** (1.11)	8.94*** (2.44)	2.82*** (0.37)	2.38*** (0.46)	1.73 (2.22)
Migration	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	137	137	137	124	124	124
R-squared	0.96	0.96	0.97	0.56	0.64	0.68

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. 'Coll. CL' and 'Priv. CL' refer to the variables of interest, the fraction of collectively- or privately-used common lands, when interacted with time dummies for 1900 and 1930. All regressions include provincial fixed effects. For simplicity, the intercept is not reported. Migration refers to both internal and international migration rates. Controls include income per capita, population density, agricultural population, urbanisation, industrialisation, access to land and literacy.

However, from the *Ley de Montes (Uplands Act)* of 1863 onwards, both the central government and the market began to actively influence the administration of

these resources³³⁴. Private-use rights over the remaining commons not only progressively grew in importance, but also were increasingly subject to external regulations designed by forestry engineers and granted through public auctions. As a result, local communities partly lost control over the management of the commons and the progressive dismantling of collective-use rights increasingly involved the presence of powerful individuals or private firms that monopolised access to these resources. In this context, the commons whose user-rights remained collective became crucial to sustain biological living standards, especially for the lower rural classes.

3.5 Conclusion

Common lands played a crucial role in the functioning of rural communities in Spain. They constituted a source, among other different goods and services, of pasture, wood, fertilizer and fuel, together with the possibility of temporary cropping. The commons were indeed a crucial element of a system in which agricultural activity was completely integrated with cattle breeding and forestry. They also represented a critical asset for the local municipalities given that they were an important source of revenue. Although privatisation *per se* may have not been negative for economic growth, the way the liberal land reform was carried out in Spain, regarding both its distributional impact and its timing, had negative consequences for the standard of living of a large part of the population.

On the one hand, both the redefinition of property and user rights carried out between 1860 and 1900 mostly benefited a small elite, thus preventing an important part of the population from enjoying the benefits that commons used to provide. In this sense, undermined by the penetration of market incentives and the increasing

³³⁴ Jiménez Blanco, 'El monte', p. 155; Balboa, 'La historia de los montes públicos', p. 119; Iriarte, 'Common lands', p. 25.

intervention of the central government, local communities lost control over both the sales themselves and the management of the remaining commons. This process had a negative influence over how these resources were exploited and who enjoyed access to them, thus supporting Ostrom's thesis about the efficiency of the local management of collective resources³³⁵. It is regrettable that the political heirs of the liberal Constitution of 1812 did not observe its preamble which stressed the risks of privatising communal lands and advocated the respect of local autonomy when managing those resources: 'the very neighbours of the villages are the only people who know best how to promote their own interests and there is nobody better than them to adopt the appropriate measures'³³⁶.

On the other hand, the timing of enclosure was inadequate. The weak manufacturing and urban sectors characteristics of mid-19th century Spain were unable to provide sufficient incentives to modernise the agricultural sector³³⁷. The potential benefits of the privatization may have thus gone missing. Similarly, a dynamic non-agricultural sector, able to provide a wide range of employment opportunities, would have been able to partly reduce the negative effects of the dismantling of the communal regime. Alternatively, a new set of institutions which would have substituted the functions that the commons fulfilled in the local community could have had a similar positive effect. However, no compensation measures were deployed. On the contrary, while state intervention in public health only slowly began to influence living standards during the first decades of the 20th century, privatisation imposed a terrible shock on local institutions, which became both incapable of providing basic public services and were forced to increase the tax burden.

³³⁵ Ostrom, *Governing the commons*.

³³⁶ My translation. Quoted in Gómez Urdañez, 'Doctrinas y realidades', p. 139.

³³⁷ Pinilla, 'Sobre la agricultura'.

In conclusion, standards of living depended on the whole array of possibilities that peasant families could rely on. The persistence of collective resources in some provinces provided peasants with mechanisms different from the market and made the transition to a market economy more socially sustainable, an outcome completely different from what happened in some areas of central and southern Spain where the dismantling of the communal regime was more intense. This view is not only compatible with the idea that the privatisation of common property was not a vital component of the agricultural revolution, but also points to the negative consequences of this process for the standards of living of rural populations.

Chapter 4

ENCLOSING LITERACY? COMMON LANDS AND HUMAN CAPITAL IN SPAIN, 1860-1930³³⁸

Abstract: The slow growth of the stock of human capital in Spain has been related to weak levels of economic development and a low commitment of Spanish institutions to primary education. This paper adds to these explanations by showing that common lands positively contributed to achieving significantly higher levels of both schooling expenditure and literacy rates. By supporting both municipal and households' incomes, these collective resources sustained not only the local supply of education, but also the demand for it, although their influence decreased over time. Likewise, either low levels of economic development prevented human capital from growing endogenously or demand factors were not as important as previously argued. Lastly, even though the active intervention of the central government was crucial to promote education, its effort was not enough and human capital in Spain lagged behind other European countries in the early stages of economic development.

4.1 Introduction

The transition from restricted to universal literacy in Europe took place during the 19th century, thus coinciding with fundamental economic and political transformations. Together with other backward economies, Spain experienced a delayed and geographically uneven spread of literacy, resulting in very poor average levels of human capital³³⁹. While literacy was almost universal in Britain and France, at least one third of the Spanish population was still illiterate in 1930³⁴⁰. Although growing, Spanish educational attainments, measured by average years of schooling, were hardly sixty per cent of the British levels for the cohorts born between 1886 and 1936³⁴¹.

³³⁸ A version of this chapter has been published in the *Journal of Institutional Economics* (2013).

³³⁹ Núñez, *La fuente de la riqueza*.

³⁴⁰ G. Tortella, 'Patterns of economic retardation and recovery in south-western Europe in the 19th and 20th centuries', *Economic History Review*, 47 (1994).

³⁴¹ C.E. Núñez, 'Within the European periphery: Education and labour mobility in 20th century Spain', *Paedagogica Historica*, 39 (2003), p. 624.

Spanish public expenditure and enrolment rates in primary schooling were also significantly lower than in other European countries³⁴². Likewise, internal regional differences on literacy rates, already high in 1860, also widened during the second half of the 19th century and the first decades of the 20th century³⁴³.

The stock of human capital has been extensively associated with different factors affecting long-term economic development. Higher educational levels positively affect workers' productivity and wages and facilitate the adoption of technological and organisational innovations³⁴⁴. Primary schooling has also shown to be positively related with geographical and occupational mobility, thus promoting the reallocation of labour³⁴⁵. In addition, increased human capital influences household fertility behaviour, facilitating the demographic transition³⁴⁶. In general, education improves the ability of individuals to acquire information and to adapt to, and benefit from, the new opportunities arising from an increasingly fast-changing environment, typical of the modernisation process³⁴⁷.

Unveiling therefore the causes behind the dissimilar trajectories on the transition from restricted to universal literacy becomes crucial. Studying the historical experience of European countries from the middle of the 19th century onwards, Sandberg argues that a relatively high level of human capital was a pre-condition for modern economic

³⁴² C.E. Núñez, 'Sobre la escasez de capital social fijo y humano en la España contemporánea', in J. Morilla et al. (eds.), *Homenaje a Gabriel Tortella. Las claves del desarrollo económico y social* (Madrid, 2010).

³⁴³ Núñez, *La fuente de la riqueza*.

³⁴⁴ T.W. Schultz, *The economic value of education* (New York, 1963); R.A. Easterlin, 'Why isn't the whole world developed?', *Journal of Economic History*, 41 (1981).

³⁴⁵ S. Nicholas and P.R. Shergold, 'Intercounty labour mobility during the industrial revolution: Evidence from Australian transportation records', *Oxford Economic Papers*, 39 (1987); B. Sánchez-Albornoz, 'Those who left and those who stayed behind: Explaining emigration from the regions of Spain, 1880-1914', *Journal of Economic History*, 60 (2000).

³⁴⁶ G.S. Becker et al., 'Human capital, fertility, and economic growth', *Journal of Political Economy*, 98 (1990).

³⁴⁷ M.J. Bowman, 'Education and economic growth: An overview', in T. King (ed.), *Education and income* (Washington, 1980); C.E. Núñez, 'Schooling, literacy and modernization: A historian's approach', *Paedagogica Historica*, 39 (2003).

growth³⁴⁸. Lindert also shares this view and links high schooling rates with democratic institutions³⁴⁹. Recent empirical analysis, focusing on cross-country comparisons during the second half of the 20th century, shows that the impact of human capital, particularly primary schooling, is relevant for economic growth³⁵⁰. Deficient levels of schooling actually seem to have prevented Spain from achieving higher economic growth rates before the Civil War³⁵¹. It is therefore important to understand why Spain was a laggard in terms of educational attainments.

Broadly speaking, the slow growth of the stock of human capital during the early stages of economic modernisation in Spain has been associated with weak levels of economic development, together with a low commitment of Spanish institutions to primary education³⁵². This chapter adds to these explanations by analysing the links between the existence of common lands and the provision of education in the early stages of economic development in Spain. Some authors have actually pointed out the role of the commons in contributing to financing the local supply of primary schooling³⁵³. Given the different regional paths, the privatisation of these collective resources throughout the 19th and early 20th century provides an excellent case study to test these arguments. In order to assess the distinctive impact of common lands on human capital, this paper exploits geographical variation over time by collecting a

³⁴⁸ L.G. Sandberg, 'Ignorance, poverty and economic backwardness in the early stages of European industrialisation: Variations on Alexander Gerschenkron's grand theme', *Journal of European Economic History*, 11 (1982). Lindert (2003) also shares this view and links high schooling rates with democratic institutions. Recent empirical analysis, focusing on cross-country comparisons during the second half of the 20th century, also shows that the impact of human capital, particularly primary schooling, is relevant for economic growth (Sala-i-Martin *et al.*, 2004).

³⁴⁹ P.H. Lindert, 'Voice and growth: Was Churchill right?', *Journal of Economic History*, 63 (2003).

³⁵⁰ X. Sala-i-Martin *et al.*, 'Determinants of long-term growth: A Bayesian Averaging of Classical Estimates (BACE) Approach', *American Economic Review*, 94 (2004).

³⁵¹ Tortella, 'Patterns of economic retardation'; K. O'Rourke and J.G. Williamson, 'Around the European periphery, 1870-1913: Globalisation, schooling and growth', *European Review of Economic History*, 1 (1997). For an extensive analysis of the contribution of education to economic development in Spain, see Núñez, 'La fuente de la riqueza; Núñez, 'Within the European periphery'.

³⁵² *Ibid.*

³⁵³ C.E. Núñez, 'El gasto público en educación entre 1860 y 1935', *Hacienda Pública Española*, 1 (1991); García and Comín, 'Reforma liberal'; Iriarte, 'Algunos modelos'; Linares, 'Tapando grietas'.

panel dataset at the provincial level on three different periods: 1860, 1900 and 1930. Three main conclusions emerge from the empirical analysis. Firstly, common lands positively contributed to achieving significantly higher levels of both schooling expenditure and literacy rates. By supporting both municipal and households' incomes, these collective resources sustained not only the local supply of education, but also the demand for it, although their influence decreased over time. Secondly, either low levels of economic development during this period prevented human capital from growing endogenously or demand factors were not as important as previously argued. Lastly, although the active intervention of the central government was crucial to promote education, its effort was not enough and human capital in Spain lagged behind most European countries. The rest of the chapter is organised as follows. Section 2 reviews the elements behind the historical transition from restricted to universal literacy. Next section discusses the potential role that common lands played in this context. While section 4 describes the methodology employed to test the hypothesis outlined here, section 5 reports the results of the empirical analysis. Finally, the last section presents the conclusions.

4.2 The literacy transition: A supply- or demand-driven process?

Leaving aside North America, the transition from restricted to universal literacy first took place in North-Western Europe, hand-in-hand with the establishment of a system of formal schooling and growing economic development³⁵⁴. Spain, however, experienced a delayed and geographically uneven spread of literacy³⁵⁵. Although growing, Spanish educational attainments diverged from the levels achieved by the most developed nations during the second half of the 19th century and only began to

³⁵⁴ Easterlin, 'Why isn't the whole world developed?: Sandberg, 'Ignorance, poverty'; Núñez, 'Schooling, literacy'.

³⁵⁵ Núñez, *La fuente de la riqueza*; 'Within the European periphery'.

converge during the first decades of the 20th century. These improvements were also subject to frequent interruptions and setbacks, especially between 1870 and 1910³⁵⁶. Likewise, regional differences on literacy rates, already high in 1860, widened during the second half of the 19th century and the first decades of the 20th century (see figure 3)³⁵⁷. Even though educational attainments were improving everywhere, the early stages of economic modernization resulted in a huge educational gap between Northern and Southern Spain³⁵⁸.

The demand for education has been considered as a crucial element in the rise of human capital during this period. Only when the returns to education were large enough, were investments made to acquire it³⁵⁹. The rate of return to education, and thus the incentives to invest in it, depends on its potential benefits and actual costs. In this sense, apart from the direct costs of schooling, the opportunity cost of forgoing work is crucial in household behaviour. Literacy and primary schooling had a higher economic value for the average individual in more market-oriented economies and in the growing non-agricultural sector³⁶⁰. More developed societies also had more resources to invest in education.

³⁵⁶ Núñez, 'Sobre la escasez', p. 253.

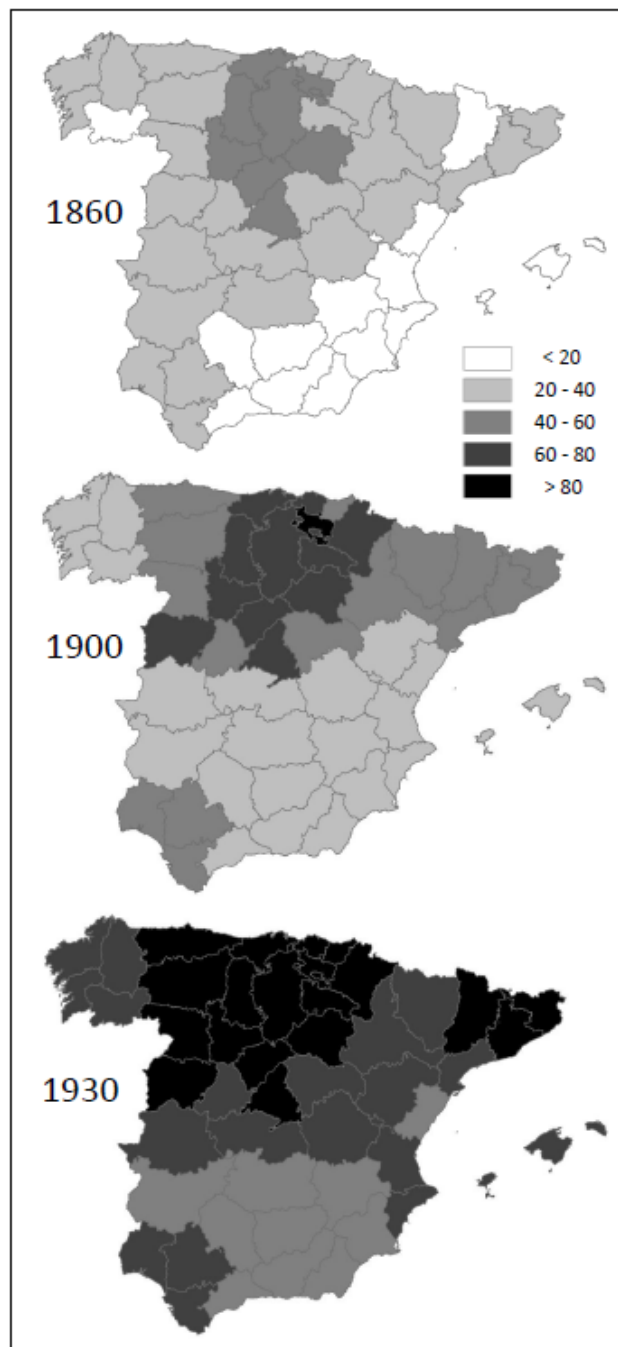
³⁵⁷ Figures taken from Núñez, *La fuente de la riqueza*.

³⁵⁸ The geography of the transition to universal literacy in Spain was obviously more complex. The Galician provinces in the North, for instance, did perform badly, while the Mediterranean coast was not as backward as the South. For a more detailed geographical picture, see Núñez, *La fuente de la riqueza*.

³⁵⁹ O. Galor and D.N. Weil, 'From Malthusian stagnation to modern growth', *American Economic Review*, 89 (1999); Núñez, 'Schooling, literacy'; J. Reis, 'Economic growth, human capital formation and consumption in Western Europe before 1800', in R. Allen et al. (eds.), *Living standards in the past: New perspectives on well-being in Asia and Europe* (Oxford, 2005).

³⁶⁰ Sandberg, 'Ignorance, poverty'; R.E. Lucas, *Lectures on economic growth* (Cambridge, MA, 2002).

FIG. 3 THE LITERACY TRANSITION IN SPAIN
(percentage of population literate)



Source: See text.

The relationship between industrialisation and literacy, however, is not so clear³⁶¹. Although some scholars argue that literacy was related to the British industrial revolution, other researchers have pointed out to stagnating, or even falling, literacy

³⁶¹ For an extended survey on the relationship between literacy and industrialisation or economic development in general, see Núñez, 'Schooling, literacy'.

rates during that period, especially in industrial areas³⁶². Not only was literacy perhaps not required for factory workers, but also industrialisation, by providing a wider array of working opportunities, may have increased the opportunity costs of investing in education³⁶³. In this regard, by promoting child labour, employment opportunities generated by industrialisation or growing cities may have affected human capital formation³⁶⁴. According to Galor, the acceleration of technological progress during the second phase of industrialisation gradually increased the relative importance of human capital³⁶⁵.

Likewise, an unequal access to land may have also influenced the demand for education. The existence of credit market imperfections disproportionately affects the lower classes' capacity to invest in human capital³⁶⁶. Moreover, while small and middle size farmers positively valued education, landless labourers, due to scanty economic prospects, did not see any economic advantage from investing in it³⁶⁷.

In addition, there is also evidence that child labour was widespread in the agricultural sector, what is likely to have also affected opportunity costs, preventing higher educational attainments in rural areas³⁶⁸. Since the decision to invest in education is generally taken by the parents, their educational levels, particularly those of the mothers, significantly influenced the demand for education for the next

³⁶² R.S. Schofield, 'Dimensions of illiteracy, 1750-1850', *Explorations in Economic History*, 10 (1973); D Mitch, *The rise in popular literacy in Victorian England. The influence of private choice and public policy* (Philadelphia, 1992).

³⁶³ Núñez, 'Schooling, literacy', pp. 547-548.

³⁶⁴ V. Pérez Moreda, 'El proceso de alfabetización y la formación de capital humano en España', *Papeles de Economía Española*, 73 (1997), p. 248.

³⁶⁵ O. Galor, *Unified growth theory* (Princeton, 2011).

³⁶⁶ O. Galor and J. Zeira, 'Income distribution and macroeconomics', *The Review of Economic Studies*, 60 (1993).

³⁶⁷ C.E. Núñez, 'A modern human capital stock. Spain in the 19th and 20th centuries', in M. Jerneck et al. (eds.), *Different paths to modernity. A Nordic and Spanish perspective* (Lund, 2005), p. 132.

³⁶⁸ J.M. Borras, 'El trabajo infantil en el mundo rural español, 1849-1936', in J.M. Martínez Carrión (ed.), *El nivel de vida en la España rural, siglos XVIII-XX* (Salamanca, 2002); C. Sarasúa, 'El acceso de niños y niñas a los recursos educativos en la España rural del siglo XIX', in J.M. Martínez Carrión (ed.), *El nivel de vida en la España rural, siglos XVIII-XX* (Salamanca, 2002)

generation³⁶⁹. Lastly, life expectancy, by determining the time-horizon of the investment, also affects the potential benefits that can be reaped off from investing in education³⁷⁰.

Although demand factors are crucial, the supply side, by affecting the costs of education, plays an important role in determining the levels of human capital³⁷¹. The public provision of free and compulsory primary schooling significantly reduced the direct cost of education, while at the same time it tried to prevent child labour. The first serious attempt to promote primary schooling in Spain was the *Moyano Act* in 1857³⁷². However, although it theoretically established compulsory education (and free for those who could not afford it), its enactment was not fully effective until the early 20th century. In this regard, recent research has shown that an unequal distribution of land property rights negatively influence human capital formation³⁷³. Landholding elites are likely to block the implementation of educational reforms in order to both preserve the power relations status quo and reduce the mobility of the rural labour force. Although the backwardness of the economy obviously limited the spending capacity during this period, the low levels of public expenditure on schooling evidenced the lack of commitment of Spanish government and local elites to primary education, partly explaining the deficient primary educational system³⁷⁴.

The finance of schooling was actually left to municipal councils and, therefore, their capacity to fund primary education became crucial. Núñez has shown that

³⁶⁹ Pérez Moreda, 'El proceso de alfabetización'.

³⁷⁰ Núñez, 'A modern human capital stock', p. 131; Galor, *Unified growth theory*, p. 52.

³⁷¹ Lindert, 'Voice and growth'; Núñez, 'Schooling, literacy'; Reis, 'Economic growth'.

³⁷² Núñez, *La fuente de la riqueza*, pp. 216-226. There were some short-lived and hardly effective precedents, such as the *Rivas* and *Pidal Plans* of 1836 and 1845 respectively. See *ibid*, pp. 208-229.

³⁷³ K. Deininger and L. Squire, 'New ways of looking at old issues: Inequality and growth', *Journal of Development Economics*, 57 (1998); S.L. Engerman and K.L. Sokoloff, 'History lessons: Institutions, factor endowments, and paths of development in the New World', *Journal of Economic Perspectives*, 14 (2000); O. Galor et al., 'Inequality in land ownership, the emergence of human capital promoting institutions and the Great Divergence', *Review of Economic Studies*, 76 (2009).

³⁷⁴ F. Comín, *Hacienda y economía en la España contemporánea, 1800-1936* (Madrid, 1988); Núñez, 'El gasto público en educación'; 'A modern human capital stock'.

schooling expenditures per capita were already geographically uneven in 1860 and these regional differences had increased in 1930³⁷⁵. A related problem was the low quality of school teaching. The ratio students per teacher worsened throughout the 19th century, probably up to around 1910³⁷⁶. The material conditions of the schools were deficient and teachers' low salaries and social status prevented attracting qualified and motivated professionals³⁷⁷. Although it soon became obvious that municipalities could not afford supporting a well-functioning primary education system, the central government was too slow to intervene: it was only in 1902 when, together with the creation of the Ministry of Public Instruction and Arts, it took care of the salaries of school teachers³⁷⁸. However, given that the central state limited itself to cover schooling expenditures, without readjusting the pre-existing disequilibria, the problems regarding the uneven regional distribution of schooling expenditures persisted well into the first decades of the 20th century. Furthermore, the problem with primary education was not only of lack of resources, but also of allocation between educational levels. Those regions where elites were powerful enough gave priority to secondary and university level expenditures, thus negatively affecting primary schooling³⁷⁹. A similar pattern can be found in Latin America and Colonial India³⁸⁰.

However, apart from government intervention, other elements should also be taken into account when explaining the supply of education. Although demographic growth in Spain was relatively slow, the proportion of schooling-age population was

³⁷⁵ Núñez, 'El gasto público en educación'.

³⁷⁶ Núñez, *La fuente de la riqueza*, p. 237.

³⁷⁷ Núñez, 'A modern human capital stock', p. 130.

³⁷⁸ Núñez, 'El gasto público en educación'.

³⁷⁹ Ibid.

³⁸⁰ E. Mariscal and K.L. Sokoloff, 'Schooling, suffrage, and the persistence of inequality in the Americas, 1800-1945', in S. Haber (ed.), *Political institutions and economic growth in Latin America. Essays in Policy, History and Political Economy* (Stanford, 2000); L. Chaudhary, 'Determinants of primary schooling in British India', *Journal of Economic History*, 69 (2009).

significantly larger than in other countries³⁸¹. This trend put an extra pressure on the Spanish educational system, making it more difficult to increase schooling expenditures per capita. It should be noted that, given that households' resources were limited, demographic pressures also affected the demand for education by limiting the possibility that every child enjoyed schooling³⁸². It may be the case, nonetheless, that the supply of education enjoyed increasing returns to scale, so the extra demographic burden may have been offset by the increasing productivity arising from size³⁸³. Likewise, although distance to the school is likely to have played a negative influence in areas with dispersed settlements, especially in the context of a steep orography, the one-teacher per village policy, related also to the role that the local parish had on imparting education, may have benefited small villages³⁸⁴. Lastly, inherited historical factors, such as somewhat different legal systems or cultural values, may have also played a role in the different regional paths followed by educational attainments in Spain during this period³⁸⁵.

4.3 Commons and human capital

The debate over the effect of the commons on economic development has mainly revolved around efficiency and/or equity considerations. Although the received wisdom actually attaches a trade-off between both goals, the previous chapters show that while efficiency was hardly affected, the bottom part of the population suffered disproportionately. However, the potential contribution of the commons to human capital has hardly been explored.

³⁸¹ Núñez, 'A modern human capital stock', p. 131.

³⁸² Pérez Moreda, 'El proceso de alfabetización', p. 246.

³⁸³ Ibid, p. 249.

³⁸⁴ Sarasúa, 'El acceso de niños y niñas', pp. 569-570; Pérez Moreda, 'El proceso de alfabetización', p. 249.

³⁸⁵ Pérez Moreda, 'El proceso de alfabetización'; D. Reher, 'La teoría del capital humano y las realidades de la historia', *Papeles de Economía Española*, 73 (1997).

As already explained, the communal regime in Spain involved two main types of access to the land: a direct but regulated access for all members of the community (*bienes comunales*) or a temporary cession of user-rights to particular individuals in exchange for a monetary income (*bienes de propios*). Apart from providing pasture to support livestock, which in turn supplied agriculture with fertiliser and workforce, these *comunales* constituted a source of complementary income by providing animal proteins, wood, and fuel, among other products, including the possibility of temporary cropping. The *bienes de propios*, on the other hand, played a fundamental role in the finances of local institutions, which was particularly important given that municipalities were responsible for the provision of basic public services.

During the 19th century, municipalities were indeed responsible for the provision of elementary education and their financial capacity was crucial when it came to funding schooling expenditures. Between 1858 and 1863, for instance, primary education absorbed around 15-20 per cent of the municipal expenditures³⁸⁶. It has been argued that both the backwardness of Spanish literacy and its uneven regional spread are partly explained by the fiscal problems of these local institutions³⁸⁷. The monetary income derived from the cession of user-rights on the commons actually constituted a fundamental component of the municipal budget³⁸⁸. In 1858, revenues obtained from the commons met 32.4% of the municipal budget³⁸⁹. It should be noted that these figures reflect the national average and therefore hide the importance of the commons in those municipalities that had preserved them, especially in the rural areas. In the province of Seville, for instance, despite being one of the areas that most suffered privatization prior to the *Disentailment Act* of 1855, the income generated by the

³⁸⁶ García and Comín, 'Reforma liberal', p. 93.

³⁸⁷ Núñez, 'El gasto público en educación'; García and Comín, 'Reforma liberal'.

³⁸⁸ Bernal, 'Haciendas locales'; García and Comín, 'Reforma liberal'; Iriarte, 'Algunos modelos de explotación forestal'; Linares, 'Tapando grietas'.

³⁸⁹ García and Comín, 'Reforma liberal', p. 95.

commons still provided the 100 per cent of the ordinary revenue in 66 per cent of the municipalities in 1849³⁹⁰. In the four municipalities studied by Iriarte in Navarre, the importance of the commons in the local budget still ranged from 20 to 59 per cent in the period 1926-1935³⁹¹. Furthermore, the income coming from the renting of common lands did frequently not appear in the municipal budgets, so these figures would be a minimum approximation³⁹². It should also be stressed that commons were not only a source of revenues to municipalities but could be used as a guarantee when applying for credit to finance the provision of public goods³⁹³. Common lands were indeed the source of the economic and political independence of municipalities against an increasingly active central government³⁹⁴.

The financial difficulties of municipalities during the 19th century are well known by the historiography³⁹⁵. The privatization of common lands meant a loss of assets that negatively influenced their economic viability and the possibility to meet the increase in expenditures required by the functions on education, among other basic public services, which they were suppose to carry out³⁹⁶. In Seville, for instance, the revenues generated by common lands were reduced by 70 per cent between 1821 and 1849, a situation that aggravated later as a result of the *General Disentailment Act* of 1855³⁹⁷. As explained in chapter 2, according to the legal text, 20 per cent of the value sales value would directly go to the state while the remaining 80 per cent would belong to the municipalities but transformed in perpetual and inalienable public debt yielding a 3 per cent annual return. However, although these rents were intended to compensate

³⁹⁰ Bernal, 'Haciendas locales', p. 307.

³⁹¹ Iriarte, 'Algunos modelos de explotación forestal', p. 243.

³⁹² Moral Ruiz, 'Desamortización y haciendas locales', p. 746.

³⁹³ Bernal, 'Haciendas locales'; Iriarte, 'Algunos modelos de explotación forestal';

³⁹⁴ García and Comín, 'Reforma liberal'; Jiménez Blanco, 'El monte'.

³⁹⁵ Moral Ruiz, 'Desamortización y haciendas locales'; García and Comín, 'Reforma liberal'.

³⁹⁶ Jiménez Blanco, 'El monte', p. 169; Iriarte, 'Algunos modelos de explotación forestal'; Linares, 'Tapando grietas'.

³⁹⁷ Bernal, 'Haciendas locales', p. 302.

municipalities for the loss of these resources, the debt quickly depreciated and the payments were not often honoured.

The income generated by the commons and the funds obtained with their guarantee financed the creation and maintenance of local public goods and the financial problems of municipalities thus negatively influenced the provision of local public goods, especially of education³⁹⁸. Most of the municipal budget on education was devoted to the payment of local teachers, which did not prevent their wages from being extremely low. In addition, delays in paying the wages of the local teachers were widespread. A high proportion of these teachers had no official certificates and a great deal of villages did not have an adequate building devoted to the school.

Although literacy improved in the whole country during the period analysed here, the gap between Northern and Southern Spain increased³⁹⁹. The provision of schooling, measured by the number of schools and teacher per population, and the public expenditures in education per capita, were indeed higher in the northern half of the Peninsula, which also coincided with the geography of common land persistence. The diverse survival of the commons may therefore partly contribute to explaining the dissimilar funding capacity of municipalities that led to a considerable regional variation in the provision of schooling⁴⁰⁰. In the province of Cádiz, for instance, most of the teachers' salaries came from revenues generated by the commons in 1840⁴⁰¹. Furthermore, municipalities frequently financed schooling directly through the commons by allocating a plot of land to the maintenance of the teacher or by providing

³⁹⁸ Iriarte, 'Algunos modelos de explotación forestal'; García and Comín, 'Reforma liberal'.

³⁹⁹ Núñez, *La fuente de la riqueza*.

⁴⁰⁰ Ibid; Sarasúa, 'El acceso de niños y niñas'; F. Collantes, 'Las disparidades educativas en la España rural contemporánea, 1860-2000: Un análisis comparado de las comarcas montañosas', *Revista de Demografía Histórica*, 22 (2004).

⁴⁰¹ Bernal, 'Haciendas locales', p. 303.

the building where lessons were given⁴⁰². Interestingly, in a comparative study of two European regions, Maynes shows that the absence of common lands made the expansion of schooling difficult in Vaucluse (France) because it had to be funded with regressive local taxes, while in Baden (Germany), the persistence of traditional ways of financing local schools based on payments in kind (housing, arable land...) allowed for a higher diffusion of elementary schools⁴⁰³.

However, apart from contributing to the supply of education by financing public services, the income generated by the commons allowed the reduction of the fiscal burden supported by the community⁴⁰⁴. The privatisation of these collective resources coincided with the increasing expenditures that municipalities had to face to provide new public services. These two combined factors not only influenced the provision of education and other public goods, such as medical care and poor relief, but also forced local institutions to increase taxes. Poorer households were especially affected by this process due to the regressive nature of a fiscal system built mostly around taxing consumption goods. In this regard, the Treasury set the state's fiscal needs, which were then apportioned between regions and municipalities⁴⁰⁵. If the municipal budget did not meet these requirements, local taxes had to be increased. The tax on consumption goods became the most important source of municipal revenue and was particularly hated and contested by the lower classes⁴⁰⁶. The negative effect of selling the commons on the finances of the local councils was by no means unexpected for the contemporaries. The parliamentary debates about the convenience of privatising

⁴⁰² Sarasúa, 'El acceso de niños y niñas', pp. 580-581.

⁴⁰³ M.J. Maynes, 'The virtues of archaism: The political economy of schooling in Europe, 1750-1850', *Comparative Studies in Society and History*, 21 (1979).

⁴⁰⁴ García and Comín, 'Reforma liberal'; Iriarte, 'Algunos modelos de explotación forestal'; Linares, 'Tapando grietas'.

⁴⁰⁵ For a detailed summary of the functioning of the liberal fiscal system during this period, see F. Comín and B. Yun Casalilla, 'Spain. From a composite monarchy to nation state, 1492-1914', in B. Yun Casalilla et al. (eds.), *The rise of fiscal states. A global history, 1500-1914* (Cambridge, 2012), pp. 258-259).

⁴⁰⁶ García and Comín, 'Reforma liberal', p. 100; Linares, 'Tapando grietas', p. 83.

common lands carried out between 1835 and 1855 reflect the concern that depriving local communities from these resources would necessarily force municipalities to increase local taxes⁴⁰⁷. Municipal budgetary problems also meant that local public goods, especially schooling, were sometimes funded through neighbours' extraordinary contributions⁴⁰⁸. In a study of four municipalities in Navarre, Iriarte shows that higher levels of income coming from the commons were related to both a lower municipal fiscal burden on the neighbours and higher levels of social spending⁴⁰⁹.

Likewise, the dismantling of common lands not only influenced the municipal financial capacity and the level of local taxes, but it also directly affected households' incomes. As explained above, common lands provided pasture, fertilised, wood, fuel, among other products, including the possibility of temporary cropping. The loss of these sources of complementary incomes, by reducing disposable income, increased the relative cost of education, thus reducing the demand for education, particularly for the less favoured groups. The widespread conflict and resistance that privatisation generated strongly points to the crucial role that commons played on securing the subsistence of rural households and the negative impact that privatisation had on their living standards⁴¹⁰.

Lastly, the privatisation of common lands could also have indirectly influenced human capital through its effect on inequality. The way through which privatisation was implemented is likely to have increased, or at least consolidated, the concentration of landholding by an elite, thus contributing to social polarisation and the proletarianisation of agricultural labour⁴¹¹. According to the arguments outlined in section 3, an unequal distribution of land property rights negatively affected human capital

⁴⁰⁷ Simón Segura, *La desamortización*, pp. 170-171; Gómez Urdañez, 'Doctrinas y realidades', p. 144.

⁴⁰⁸ Sarasúa, 'El acceso de niños y niñas', p. 581.

⁴⁰⁹ Iriarte, 'Algunos modelos de explotación forestal'.

⁴¹⁰ Cobo et al., 'Privatización del monte'; De la Torre and Lana, 'El asalto a los bienes comunales'.

⁴¹¹ Moral Ruiz, *La agricultura española*; Linares, 'Estado, comunidad y mercado'.

formation through both the supply and the demand for education. Not only did landless labourers not see any economic advantage from investing on it, but also landholding elites blocked the implementation of educational policies.

4.4 Methodology and data

In order to test the hypothesis outlined above regarding the distinctive impact of common lands on human capital in Spain, this paper exploits geographical variation over time by collecting a panel dataset at the provincial level on three different periods: 1860, 1900 and 1930. Literacy rates and school expenditures have been widely employed as indicators of educational attainments, especially in developing countries⁴¹². These indicators are particularly suitable for studying the evolution of education in the early stages of economic modernisation because most of the human capital embodied in the Spanish population during this period was due to elementary schooling⁴¹³. Data for these variables are taken from Núñez⁴¹⁴. Literacy refers to the fraction of population above 10 years old that was able to read and write while schooling expenditure refers to expenses in staff and material per capita. Although highly correlated, analysing both indicators is especially meaningful because the ability to read and write evaluates an educational output, while schooling expenditures measure an input. In addition, while literacy is a stock variable, schooling expenditure is a flow variable⁴¹⁵. In this sense, while literacy is the result of demand and supply

⁴¹² Núñez, 'Schooling, literacy'.

⁴¹³ Núñez, 'A modern human capital stock', p. 130.

⁴¹⁴ Núñez, 'El gasto public en educación'; *La fuente de la riqueza*. I would like to thank the author for kindly sharing her data.

⁴¹⁵ For a detailed discussion of the nature, advantages and shortcomings of historical human capital indicators, see Núñez, 'Schooling, literacy'.

factors, schooling expenditures mostly reflect supply considerations, which partly allow distinguishing the role that common lands played on these two different dimensions⁴¹⁶.

It is important to note that migration processes may have biased these indicators. The importance of internal migratory patterns increased from mid-19th century onwards and accelerated in the first decades of the 20th century⁴¹⁷. Although relatively low in international terms, emigration abroad followed a delayed but similar trend⁴¹⁸. Regional differences in migratory behaviour were large throughout this period. In this regard, higher literacy rates not only allow acquiring the necessary information about potential destinations, but also increase the potential returns of migrating⁴¹⁹. Regions with superior educational attainments actually enjoyed higher rates of both internal and international migration before the Civil War⁴²⁰. Drawing on military records, Quiroga finds that average literacy rates for internal emigrants between 1893 and 1899 were at least twenty-five per cent higher than for those who stayed in their province of origin⁴²¹. Therefore, the actual literacy rates would have been higher if migration had not taken place. The role of outmigration in schooling expenditures is, on the other hand, less clear. Although it reduces pressure on local resources, it also diminishes the potential to generate income given that the most skilled were those who often made the move. Similar arguments can be made about the receiving areas. However, the capacity of the existing urban educational system to meet a growing stock of potential students

⁴¹⁶ It should also be noted that literacy levels only reflect a component of education, the skills of reading and writing, while schooling expenditure serves as an indicator of the quality of schooling that goes beyond those particular skills.

⁴¹⁷ J. Silvestre, 'Internal migrations in Spain, 1877-1930', *European Review of Economic History*, 9 (2005).

⁴¹⁸ Sánchez Alonso, 'Those who left'.

⁴¹⁹ J.D. Gould, 'European intercontinental emigration: The role of "diffusion" and "feedback"', *Journal of European Economic History*, 9 (1980).

⁴²⁰ Sánchez Alonso, 'Those who left'; Núñez, 'Within the European periphery'; Collantes, 'Las disparidades educativas'. It should be noted, however, that Silvestre, using cross-section analysis at the provincial level, does not find that changes in literacy rates between 1900 and 1920 significantly affected internal migration in the 1920s. See Silvestre, 'Internal migrations'.

⁴²¹ G. Quiroga, 'Literacy, education and welfare in Spain (1893-1954)', *Paedagogica Historica*, 39 (2003), p. 600.

due to a high inflow of migrants could have been compromised⁴²². In order to account for this potential bias, both internal and international migration rates will be included in the analysis⁴²³.

As explained in previous chapters, the stock of common lands was already geographically diverse in 1860. The privatisation that took place from that date onwards under the *General Disentailment Act* accentuated these differences, especially from 1860 to 1900 when sales were widespread. Common lands are, as usual, measured as the proportion of common lands over the total provincial area. The Galician case is nonetheless problematic. Given their particular legal characteristics, a large part of the commons in this region did not belong to the municipalities but to the neighbours themselves⁴²⁴. In these areas, the body of neighbours formed a legal entity different from the municipality. Despite the central government's efforts to municipalize these resources, their management was in practice left in the hands of the neighbours. According to Balboa, the Galician municipalities did respect neighbours' autonomy and did not intervene in the management of the commons at all⁴²⁵. This means that these collective resources did not contribute to funding municipalities. In order to minimize this problem, only those Galician commons belonging to the municipalities will be considered in the analysis. Furthermore, in order to further test the robustness of the general results, the Galician provinces will also be excluded from the empirical analysis.

⁴²² Núñez, 'Schooling, literacy', pp. 547-548.

⁴²³ These figures have been taken from Mikelarena, 'Los movimientos migratorios'. Migration rates are measured as net migration flows. The available data does not perfectly fit the time periods employed here. The flows between 1878-1887, 1888-1920 (average of three different sub-periods) and 1921-1930 are employed to account for 1860, 1900 and 1930 respectively.

⁴²⁴ Artiaga and Balboa, 'La individualización de la propiedad colectiva'; Balboa, 'La historia de los montes'.

⁴²⁵ X. Balboa, 'Al margen de la ley: La defensa de los montes vecinales de Galicia (1848-1968)', in S. de Dios et al. (eds.), *Historia de la propiedad en España: Bienes comunales, pasado y presente* (Salamanca, 2002), p. 464.

The panel data collected allows carrying out an econometric analysis in order to assess the distinctive impact of common lands on education. A fixed-effects model accounts for unobserved time-invariant provincial heterogeneity, thus partly addressing the potential omitted variable problem. This specification also permits including time dummies to account for the evolution of the Spanish economy and the establishment of a mass public schooling system, which was mostly implemented from the early 20th century onwards⁴²⁶. Also, interacting the variable of interest with time-period dummies allows assessing whether the effect of the existence of common lands on human capital varied over time as the Spanish economy evolved.

The main potential concern here is the possibility that both the privatisation of common lands and the changing educational attainments were the result of another time-variant unobserved factor, thus affecting our estimates. Other processes were taking place around the same time which may be correlated with common land persistence and human capital indicators. As explained above, the actual educational levels are the result of a complex web of supply and demand factors. In order to overcome the omitted variable problem, a host of controls that take into account other potential determinants of human capital are included in the investigation. On the one hand, the demand for education is considered by employing different proxies of economic development. Income per capita is calculated from recent estimates of gross domestic product at the provincial level and population figures⁴²⁷. Urbanisation and industrialisation are measured as the proportion of population living in cities bigger than 5,000 inhabitants and the gross value added by non-agricultural activities per capita respectively⁴²⁸. The importance of the agricultural sector is proxied by the

⁴²⁶ As explained in Section 2, some advances were nonetheless carried out from the middle of the 19th century.

⁴²⁷ Rosés et al., 'The upswing of regional income inequality'; Nicolau, 'Población, salud y actividad'.

⁴²⁸ Tafunell, 'Urbanización y vivienda'; Rosés et al., 'The upswing of regional income inequality'.

proportion of the male active population working on agriculture (Erdozain and Mikalerena, 1999)⁴²⁹. The lack of consistency between censuses regarding female working population advises to rely only on male workers when accounting for the importance of agriculture, a usual procedure in Spanish historical literature⁴³⁰. Inequality in access to the land is measured through the fraction of landowners over active agricultural population⁴³¹. The importance of the parents, especially of the mothers, is taken into account by interacting the actual literacy rates with the inverse of the gender educational gap⁴³². In addition, given that the returns on education also depend on the time-horizon of the investment, life expectancy is also included in the model⁴³³. On the other hand, supply factors are also considered. In this regard, the impact of demographic pressures is proxied by population density⁴³⁴. The potential influence of the population settlement pattern is already accounted for by including provincial fixed-effects. Similarly, regional-specific factors arising from somewhat different legal systems or cultural values are also taken into account by this specification. Summary statistics of the dependent and independent variables are reported in Appendix D.

⁴²⁹ Erdozain and Mikalerena, ‘Las cifras de activos agrarios’.

⁴³⁰ Ibid; Nicolau, ‘Población, salud y actividad’; Prados de la Escosura, ‘Inequality, poverty’. Consistency between censuses also recommends using data of 1877 instead of 1860. It seems nonetheless that the population distribution did not change much between 1860 and 1877, while there was enough variation between 1877 and 1900. Likewise, the strange figures found in some provinces in 1930 also recommend to employ an average between 1920, 1930 and 1940 to account for that date. On this issue, see also the comments of Erdozain and Mikalerena, ‘Las cifras de activos agrarios’, p. 107.

⁴³¹ Dirección General del Instituto Geográfico y Estadístico, ‘Censo de la población de España, 1860’; ‘Censo de la población de España, 1920’. Data on land ownership is only available for 1860 and 1920. Therefore, linear interpolation is employed to estimate that figure for 1900 and, for 1930, the data on 1920 is used.

⁴³² Núñez, *La fuente de la riqueza*.

⁴³³ Dopico, ‘Regional mortality tables’; Dopico and Reher, ‘El declive de la mortalidad’.

⁴³⁴ Nicolau, ‘Población, salud y actividad’; Instituto Nacional de Estadística, ‘Anuario Estadístico de España, 2000’.

4.5 Results

Table 4.1 reports the results of the empirical analysis. All regressions include province fixed-effects and time dummies. Columns (1) and (5) present the baseline specification assessing the relationship between the persistence of common lands and human capital indicators. The remaining columns introduce the variable of interest interacted with time-period dummies to allow the effect of common lands to vary over time as the Spanish economy evolved. In addition, columns (3) and (7) introduce the controls explained above, thus taking into account other potential determinants of human capital. Lastly, given the conceptual ambiguity of the Galician commons, columns (4) and (8) further test the robustness of the results by excluding the Galician provinces from the empirical analysis. Since migration rates turned out to be statistically insignificant in all specifications and did not affect the outcome of the analysis, they have been removed from the reported results.

TABLE 4.1 COMMONS AND HUMAN CAPITAL

	Dependent variable							
	Literacy				Schooling expenditure			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Common Lands	0.35** (0.14)	0.33*** (0.12)	0.16** (0.07)	0.19*** (0.06)	0.05*** (0.01)	0.04*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
CL*d_1900		0.24*** (0.07)	0.15** (0.07)	0.16** (0.07)		0.00 (0.01)	-0.01** (0.01)	-0.01** (0.01)
CL*d_1930		0.25*** (0.08)	0.05 (0.07)	0.03 (0.07)		0.04*** (0.01)	0.01 (0.02)	0.00 (0.02)
d_1900	20.81*** (1.40)	17.22*** (1.71)	13.41*** (1.53)	14.08*** (1.55)	0.82*** (0.11)	0.78*** (0.12)	1.16*** (0.19)	1.27*** (0.24)
d_1930	48.76*** (1.33)	45.08*** (1.84)	32.94*** (3.24)	31.04*** (3.22)	2.22*** (0.21)	1.61*** (0.24)	2.34*** (0.52)	2.30*** (0.68)
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Observations	138	138	137	125	137	137	137	125
R-squared	0.97	0.97	0.98	0.98	0.75	0.80	0.87	0.87

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All regressions include provincial fixed effects. For simplicity, the intercept is not reported. Controls include income per capita, population density, agricultural population, urbanisation, industrialisation, access to land, parents' literacy and life expectancy.

The presence of common lands is shown to be positive and significantly related to both literacy rates and schooling expenditures per capita. These estimates are robust even when adding the series of controls explained above and the Galician provinces are excluded. The special characteristics of the Galician commons can actually be extended other North-Western provinces⁴³⁵. The empirical results nonetheless remain unchanged if, together with Galicia, the other North-Western provinces (Asturias, Cantabria and León) are excluded from the analysis. The impact of the persistence of common lands on human capital is relatively important in economic terms, although it decreases over time (see table 4.2). According to the estimates in columns (4) and (8), a one standard deviation in the stock of common lands in 1860 meant literacy and schooling expenditure to be an average of 2.5 percentage points and 0.39 pesetas per capita higher respectively. Given that the average level of literacy and schooling expenditure in 1860 were 27.7 percentage points and 1.14 pesetas per capita, these figures represent 9 and 34.2 per cent of those levels in that order. This result points to the important role these collective resources played in the funding of education at the municipal level in the period prior to 1860. As expected, the lower influence of the commons on literacy reflects the fact that, while schooling expenditure mostly reflects supply side considerations, literacy is the outcome of a wider set of supply and demand factors, thus leaving less room to the contribution of the commons.

TABLE 4.2. EVOLUTION OF THE ESTIMATED INFLUENCE OF COMMON LANDS

	Literacy		Schooling expenditure	
	Absolute	Relative	Absolute	Relative
1860	2.5 pp.	9.0%	0.39 ptas,	34.2%
1900	3.9 pp.	8.3%	0.22 ptas,	13.7%
1930	2.1 pp.	2.9%	0.34 ptas.	11.4%

Note: Literacy is measured in percentage points (pp.) and schooling expenditure per capita in pesetas (ptas.). The effect is computed using one standard deviation in the stock of common lands. These estimates only reflect the national average and therefore underestimate the influence of the commons in those areas that had preserved them.

⁴³⁵ Jiménez Blanco, 'El monte', p. 151.

The impact of the commons on these variables changed between 1860 and 1900, coinciding with the further privatisation of these resources under the *General Disentailment Act* which took place from 1855 onwards. In this sense, while the relationship between common lands and literacy levels grew even stronger, their effect on schooling expenditure was somewhat diminished. In this regard, one standard deviation in the stock of common lands now increased literacy and schooling expenditures by 3.9 percentage points and 0.22 pesetas per capita respectively. Taking into account that both indicators were growing between 1860 and 1900, the relative effect of the commons was now 8.3 and 13.7 per cent respectively.

Two factors explain the fact that, despite the estimated impact of the commons on the supply of schooling was significantly reduced, their effect on literacy levels actually increased. On the one hand, the privatisation process that took place during this period mostly affected those commons which were being rented privately —the so called *bienes de propios*—, which especially contributed to the municipal budget⁴³⁶. Likewise, although the *Uplands Act* of 1863 promoted the privatisation of user-rights over the remaining commons, which would have increased municipal revenues, its actual application was fairly limited before 1900⁴³⁷. Therefore, given the limitations on schooling expenditure, the privatisation process further constrained the transition to universal literacy by creating a bottleneck in the supply of schooling. There is evidence that the quality of education decreased during the second half of the 19th century as the number of teachers per pupil decreased⁴³⁸. On the other hand, the literature has stressed that the second half of the 19th century was a difficult period for the bottom half of the

⁴³⁶ Sanz Fernández, ‘La historia contemporánea’; Linares, ‘Estado, comunidad y mercado’.

⁴³⁷ GEHR, ‘Política forestal y producción de los montes públicos españoles. Una visión de conjunto, 1861-1933’, *Revista de Historia Económica*, 20 (2002), p. 518.

⁴³⁸ Núñez, *La fuente de la riqueza*, p. 237.

population⁴³⁹. The privatisation of common lands certainly made things worse. These collective resources became a crucial source of complementary incomes in those areas which were more successful in resisting privatisation pressures⁴⁴⁰. Therefore, by complementing households' incomes, commons distinctively contributed to sustaining the demand for education.

The influence of the commons on educational human capital continued evolving during the first decades of the 20th century. On the one hand, their absolute contribution to fund schooling expenditure recovered the levels of 1860. Together with a larger effort by municipal authorities to provide education during the 1920s, this is likely due to the greater importance that monetary revenues obtained from the commons gained during the first decades of the 20th century⁴⁴¹. Not only did private user-rights over the commons allocated through public auctions grow in importance but also the value of the production estimated by forest engineers in the plans came closer to the outcome that actually took place, which means that municipalities gradually learnt to manage the commons in more 'efficient' ways⁴⁴². On the other hand, their effect on literacy rates decreased from the previous period, reflecting the fact that the role of the commons in complementing households' incomes declined as the economy modernised. However, although still noticeable in absolute terms, given that the levels of both variables had increased over time, the relative effect of these collective resources on both literacy rates and schooling expenditure did not recover the levels achieved in previous periods. While one standard deviation in the stock of common lands was now related to higher levels of literacy and schooling expenditures by 2.15 percentage points and 0.34

⁴³⁹ Pérez Moreda, 'Población y economía'; Martínez Carrión, 'El nivel de vida'.

⁴⁴⁰ Jiménez Blanco, 'El monte'; Iriarte, 'Common lands'.

⁴⁴¹ Núñez, *La fuente de la riqueza*, p. 307; GEHR, 'Política forestal y producción'; Iriarte, 'Algunos modelos de explotación forestal'.

⁴⁴² GEHR, 'Política forestal y producción'; Iriarte, 'Algunos modelos de explotación forestal'; Linares, 'Comunidad, estado y mercado'.

pesetas per capita respectively, their relative effect on the actual levels of these variables was 2.9 and 11.4 per cent respectively.. A more intensive process of economic development provided alternative, and more important, sources of income to both municipalities and households, which, together with the increasing intervention of the state in the supply of education, meant that common lands became relatively less and less important over time. In this regard, Iriarte shows that although the revenues coming from the commons increased during the first decades of the 20th century, their relative importance in relation to total revenues gradually decreased⁴⁴³.

4.6 The literacy transition: Economic modernisation or state intervention?

Interestingly, the results reported in table I also allow assessing the relative importance of these two processes, economic modernisation and state intervention, in the transition to universal literacy in Spain. The coefficients of the time-period fixed effects illustrate that as the country developed, both indicators of human capital greatly improved, especially during the first decades of the 20th century. If we compare the coefficients of the time dummies before and after including the host of controls, the distinctive impact of the modernisation process and the increasing role of the state can be distinguished. In columns (2) and (6), the time dummies capture the combined impact of both processes. Literacy rates increased throughout the whole period although the increase is almost two times larger between 1900 and 1930 than during the previous period. Schooling expenditures grew evenly during the whole period. Columns (3) and (7) add the set of controls reflecting the on-going modernisation process visible in growing incomes, urbanisation and industrialisation levels, together with other demographic and economic factors. The coefficient on the dummy variable

⁴⁴³ Iriarte, 'Algunos modelos de explotación forestal', p. 243. See also García and Comín, 'Reforma liberal', pp. 94-95; and Linares, 'Tapando grietas', p. 95.

now reflects the rise in literacy and schooling expenditure that is not explained by the model and can therefore be attributed to the efforts of the state to improve the provision of education. The comparison between these pairs of columns unveils interesting conclusions.

On the one hand, regarding literacy rates, the effect of the dummy for 1900 hardly changes when controls are included which means that economic modernisation barely had any effect on human capital, and that most of those 17 percentage points increase on literacy rates between 1860 and 1900 were due to state intervention. This situation changed during the first decades of the 20th century. Although the state was still responsible for a larger share of the now higher increases in literacy rates, economic modernisation began to play a significant role in pushing human capital forward⁴⁴⁴. On the other hand, although schooling expenditures per capita grew evenly during both periods, the results evidence that the process of structural change triggered off by economic modernisation had negative consequences on the supply of primary education. The coefficient of the time dummies increases significantly after including the set of controls, implying that the financial effort of municipalities and the state was partly offset by other negative processes at play. In this sense, accelerating population and urbanisation growth is likely to have put more pressure on the scarce resources available⁴⁴⁵.

These results therefore strongly confirm the crucial role of public institutions in providing education, especially in the first stages of economic development. It is worth noting that the contribution of the public sector to literacy rates and schooling

⁴⁴⁴ According to these estimates and holding the influence of the commons fixed, literacy rates increased by around 45.1 percentage points between 1860 and 1930. Given that a 17.2 point-increase did happen between 1860 and 1900, the actual increase between 1900 and 1930 was 27.9 percentage points. Applying the same logic to the coefficient on the time dummy after including controls means that the state is responsible for 19.5 percentage points of that increase (or 69.9 per cent), while the remaining 8.4 percentage points (or 30.1 per cent) are attributable to economic modernization.

⁴⁴⁵ Lindert, 'Voice and growth', p. 343; Núñez, 'Sobre la escasez de capital', p. 256.

expenditure remained roughly unchanged both between 1860 and 1900 and between 1900 and 1930. In absolute terms, while public institutions accounted for 13.4 and 19.5 percentage points of the rise in literacy rates during the periods 1860-1900 and 1900-1930 respectively, they contributed to the increase in schooling expenditures by 1.2 and 1.1 pesetas per capita during those periods. This points to the robustness of these results since the role of the state in providing education, at the local or national level, is reflected first on schooling expenditures, which is then translated into literacy rates, a measure that reflects the interaction of supply and demand factors. Although there is evidence of some improvements, the modernisation of the Spanish economy was not enough to foster an endogenous increase in human capital indicators. Economic development only translated into a noticeable increase in literacy rates from 1900 onwards and, even then, its contribution was significantly lower than that of the public sector. Therefore, either demand forces were too weak or their role in promoting educational human capital was not as important as it has been suggested.

However, given the low levels of human capital in Spain relative to neighbouring countries⁴⁴⁶, it can be argued that the public effort was not enough either. Likewise, given that the contribution of the public sector to both literacy levels and school expenditure is similar throughout the whole period, it seems that the Law of 1902, by which the central government took care of teachers' salaries, thus releasing municipalities from that responsibility, did not significantly succeed in promoting human capital indicators. In this sense, Núñez argues that the centralisation of schooling expenditure was not able to alter previous trends because it limited itself to meeting the pre-existing budget without either improving it or adjusting its uneven regional distribution⁴⁴⁷. Schooling expenditures did actually stagnate between 1902 and

⁴⁴⁶ Tortella, 'Patterns of economic retardation'.

⁴⁴⁷ Núñez, 'El gasto publico en educación', p. 145.

1915⁴⁴⁸. According to this author, an oversized secondary and tertiary educational sector, mostly benefiting the sons of the elites, prevented more public resources to be devoted to schooling. In this sense, while there was a wide gap between Spain and other European countries in terms of investment on primary schooling, the difference is hardly significant in secondary education and even positive at the university level⁴⁴⁹. The distribution of public expenditures among the different educational levels was thus not only unequal, but also inefficient given the importance of primary schooling for economic growth in developing countries⁴⁵⁰.

Several authors have pointed to the lack of interest of the elites to educate the masses, reflecting the high degree of inequality in the Spanish economic and political arena⁴⁵¹. In this regard, Easterlin claims that a decisive commitment to mass education only happens when ‘a major shift in political power and associated ideology in a direction conducive to greater upward mobility for a wider segment of population’ has taken place⁴⁵². Similarly, Acemoglu and Robinson (2000) link the extension of voting rights to the spread of educational policies⁴⁵³. Despite the establishment of universal male suffrage in 1890, that shift does not seem to have occurred in Spain or was only slowly coming about due to the unequal distribution of wealth and the shortcomings of the political regime. Political and economic elites firmly controlled the Spanish political system by widespread vote buying, coercion and mass fraud, together with promises of individual or collective favours, although these practices weakened over

⁴⁴⁸ Núñez, *La fuente de la riqueza*, p. 303.

⁴⁴⁹ Núñez, ‘Sobre la escasez de capital’, pp. 247-252.

⁴⁵⁰ Ibid, pp. 261-264.

⁴⁵¹ Núñez, *La fuente de la riqueza*; Pérez Moreda, ‘El proceso de alfabetización’; Reher, ‘La teoría del capital humano’.

⁴⁵² Easterlin, ‘Why isn’t the whole world developed?’, p. 14.

⁴⁵³ D. Acemoglu and J.A. Robinson, ‘Why did the West extend the franchise? Democracy, inequality and growth in historical perspective’, *Quarterly Journal of Economics*, 115 (2000).

time, especially after the turn of the century⁴⁵⁴. Lindert's arguments regarding the importance of the degree of political participation in determining the patterns of the provision of public goods are especially relevant here⁴⁵⁵. Powerful elites indeed tend to block the implementation of institutions promoting human capital⁴⁵⁶. Although it is true that relevant steps were taken, the Spanish political system, kidnapped by oligarchic interests and restricted political representation, somewhat precluded higher levels of human capital formation. As shown here, the privatization of common lands from 1860 onwards, which principally benefited the well-off and their negative effects on the supply and demand for education highlights only another way through which an unbalanced political system hindered economic development.

4.7 Conclusion

Common lands played a crucial role in the functioning of the rural communities in pre-industrial Spain. They complemented households' incomes by providing pasture, fertilizer, wood, and fuel, among other different goods and services, as well as offering the possibility of temporary cropping. The commons were also a critical asset for the local municipal councils given that they constituted an important source of revenue. Although less important over time, these functions contributed to sustaining both the demand and the supply of education during the early stages of economic development when neither the slow rates of structural change were able to maintain an endogenous increase of human capital, nor the intervention of the state was decisive enough to bring Spanish educational attainments in line with other European countries.

⁴⁵⁴ J. Moreno Luzón, 'Political clientelism, elites, and caciquismo in Restoration Spain (1875-1923)', *European History Quarterly*, 37 (2007); M. Curto Grau et al., 'Pork-barrel politics in semi-democracies: The Spanish "Parliamentary Roads"', *Journal of Economic History*, 72 (2012).

⁴⁵⁵ P.H. Lindert, 'The rise of social spending, 1880-1930', *Explorations in Economic History*, 31 (1994); P.H. Lindert, 'What limits social spending?', *Explorations in Economic History*, 33 (1996).

⁴⁵⁶ Mariscal and Sokoloff, 'Schooling, suffrage'; Lindert, 'Voice and growth'; Easterly, 'Inequality does cause underdevelopment'.

The historical experience of the developed countries should serve to prevent the repetition of the same mistakes in the developing world today. As mentioned above, the historical revision of the modernisation process in Europe has shown that the privatisation of common lands was not, as long-term believed, a pre-condition for promoting economic growth. Enclosures in Britain did not increase agricultural productivity but redistributed income from peasants to large landlords, thus contributing to the pauperisation of an important part of the population. A well-functioning primary education system is essential for sustained economic growth but the diffusion of higher levels of human capital in many parts of the world is still a formidable endeavour⁴⁵⁷. Given the crucial role of local institutions in providing schooling during the 19th century and the, although threatened, still large stock of common and public resources managed at the local level in developing countries⁴⁵⁸, exploring the links and potentialities between them and the supply and demand for education at the local level may prove a beneficial agenda for the years to come.

⁴⁵⁷ Easterlin, 'Why isn't the whole world developed?'; C. Colclough and K.M. Lewin, *Educating all the children. Strategies for primary schooling in the South* (Oxford, 1993).

⁴⁵⁸ Lindert, 'Voice and growth', p. 333; E. Ostrom, 'Beyond markets and states: Polycentric governance of complex economic systems', *American Economic Review*, 100 (2010).

Chapter 5

COMMONS, SOCIAL CAPITAL AND THE EMERGENCE OF AGRICULTURAL COOPERATIVES IN EARLY 20TH CENTURY SPAIN⁴⁵⁹

Abstract: The emergence of Spanish agricultural cooperatives from the end of the 19th century was a narrative of uneven regional development. It has been argued that the cooperative movement developed in areas where small and middle-sized farms were relatively important. This paper seeks to complement this explanation by analysing the role played by the pre-existing stock of social capital. The prior importance of institutions built around the use and management of collective resources is explored as an alternative proxy for social capital in pre-industrial economies. The results show that the social networks built around common lands and irrigation communities were a key element, together with relatively high levels of human capital and the existence of a wide layer of middle size farms, in facilitating the emergence of the cooperative movement in rural areas.

5.1 Introduction

The agricultural cooperative movement emerged and spread throughout Europe in response to the increasingly competitive global environment that followed the agricultural crisis of the late 19th century⁴⁶⁰. More integrated markets resulting from the combined effect of new technologies and expanding markets, led farmers to adapt to the new prevailing economic conditions. The significance of the cooperative movement and the benefits it brought to the rural sphere is beyond doubt, to the point that its implications to the social fabric of the rural world have been compared to those brought about by railways⁴⁶¹. The advantages of cooperation for small farmers are varied but basically consist of the combination of the benefits of family farming with the

⁴⁵⁹ A version of this chapter was published in the *European Review of Economic History* (2012).

⁴⁶⁰ G. Federico, *Feeding the world. An economic history of agriculture, 1800-2000* (Princeton, 2005), pp. 168-170.

⁴⁶¹ M. Augé Laribé, *La révolution agricole* (Paris, 1955); quoted in A.R.H. Baker, *Fraternity among the French peasantry: Sociability and voluntary associations in the Loire Valley, 1815-1914* (Cambridge, 1999), p. 240.

economies of scale of acting together⁴⁶². Cooperatives facilitated mutual assistance, the acquisition of cheaper inputs, machinery and credit, the diffusion of information about new technology and methods, the building of processing facilities, and the increase of farmers' marketing power. Cooperation also helped farmers to overcome the problems of asymmetric information and locked-in between agricultural processors and their suppliers⁴⁶³. However, despite these advantages, the diffusion of cooperatives was unequal both between countries and within them⁴⁶⁴.

The Spanish experience fits particularly well into the international pattern since the emergence of the agricultural associations offering cooperative services from the end of the 19th century was a narrative of uneven regional development, where the general failure was punctuated by the successful story of some regions⁴⁶⁵. The main activities of the Spanish cooperatives were the purchase of agricultural inputs (mainly chemical fertilisers and machinery) and consumer products and the diffusion of information about technologies and methods⁴⁶⁶. Processing, commercial and credit activities remained relatively rare, although their importance grew over time, especially

⁴⁶² Federico, *Feeding the world*, p. 133.

⁴⁶³ I. Henriksen, 'Avoiding lock-in: Cooperative creameries in Denmark, 1882-1903', *European Review of Economic History*, 3 (1999).

⁴⁶⁴ Federico, *Feeding the world*, pp. 168-172. See also D. Taylor, 'The English dairy industry, 1860-1930', *Economic History Review*, 29 (1976); C. O'Grada, 'The beginnings of the Irish creamery system, 1880-1914', *Economic History Review*, 30 (1977); J.L. Van Zanden, 'The first green revolution', *Economic History Review*, 44 (1991), pp. 22-23; T.W. Guinnane, 'A failed institutional transplant: Raiffeisen's credit cooperatives in Ireland, 1894-1914', *Explorations in Economic History*, 31 (1994); F. Galassi, 'Coordination and monitoring in lending co-operatives: The Italian *Casse Rurali*', in P.L. Cottrell and J. Reis (eds.), *Finance and the making of the modern capitalist world* (London, 1998); Baker, *Fraternity among the French peasantry*; Henriksen, 'Avoiding lock-in'; J. Simpson, 'Cooperation and cooperatives in Southern European wine production', *Advances in Agricultural Economic History*, 1 (2000); K.H. O'Rourke, 'Culture, conflict and cooperation: Irish dairying before the Great War', *The Economic Journal*, 117 (2007); and P. Van der Hallen, 'The transaction cost approach and the performance of the Belgian dairy co-operatives before 1940', *Working Paper Social and Cooperative Entrepreneurship, SCE-09.02* (2009).

⁴⁶⁵ P. Carasa Soto, 'El crédito agrario en España durante la Restauración. Entre la usura y el control social', in B. Yun Casalilla (coord.), *Estudios sobre capitalismo agrario, crédito e industria en Castilla, Siglos XIX y XX* (Salamanca, 1991); S. Garrido, 'El cooperativismo agrario español del primer tercio del siglo XX', *Revista de Historia Económica*, 13 (1995); S. Garrido, 'Why did most cooperatives fail? Spanish agricultural cooperation in the early twentieth century', *Rural History*, 18 (2007).

⁴⁶⁶ *Ibid.*

after World War I. Agricultural associations also facilitated the articulation of farmers' interests and acted as pressure groups to obtain advantages from the state⁴⁶⁷.

Although the first cooperatives were established in the late 19th century, the Spanish cooperative movement did not take off until the beginning of the 20th century when the Agrarian Syndicate Law of 1906 triggered the formation of new cooperatives by providing tax exemptions. The cooperative movement also received the support of other external agents, especially from the Catholic Church⁴⁶⁸. However, the state was not able to support their operations and a great deal of cooperatives was doomed to disappear. Without the leading role of the state, the farmers' lack of capital, the difficulties of obtaining long-term credit, and the weak support from wealthy landowners prevented a stronger cooperative movement⁴⁶⁹. The percentage of members belonging to agricultural associations, around 12 per cent of the total agrarian population by 1924, was indeed low by international standards⁴⁷⁰. However, a closer examination reveals a more complex picture since some areas, especially in northern and eastern Spain, definitely stand out in terms of members enrolled (Figure 4)⁴⁷¹.

⁴⁶⁷ G. Sanz Lafuente, 'La Asociación de Labradores de Zaragoza (1900-1930)', *Historia Agraria*, 25 (2001); J. Planas, 'Cooperativismo y difusión del cambio técnico en la agricultura. La contribución de las cámaras agrícolas (Cataluña, 1890-1930)', *Historia Agraria*, 30 (2003).

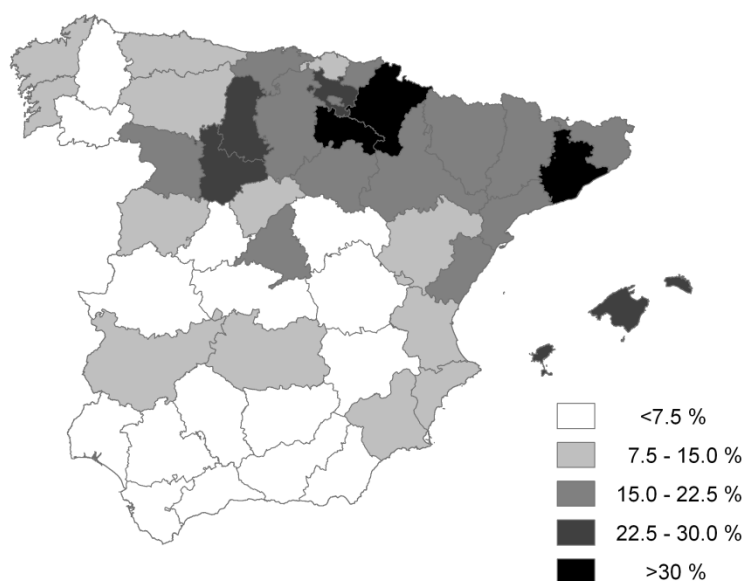
⁴⁶⁸ J.J. Castillo, *Propietarios muy pobres: Sobre la subordinación política del pequeño campesino en España. La Confederación Nacional Católica Agraria, 1917-1942* (Madrid, 1979); E. Majuelo and A. Pascual, *Del catolicismo agrario al cooperativismo empresarial. Setenta y cinco años de las cooperativas navarras, 1910-1985* (Madrid, 1991); Carasa Soto, 'El crédito agrario'.

⁴⁶⁹ A.P. Martínez Soto, 'El cooperativismo de crédito en España, 1890-1934: Modelos, sistemas de gestión y balance de actuación', *Historia Agraria*, 30 (2003), p. 141; Garrido, 'Why did most cooperatives fail?', pp. 185-189; Simpson, 'Cooperation and cooperatives', p. 115; J. Carmona and J. Simpson, *El laberinto de la agricultura española: Instituciones, contratos y organización entre 1850 y 1936* (Zaragoza, 2003), p. 246.

⁴⁷⁰ Garrido, 'Why did most cooperatives fail?'.

⁴⁷¹ Figures taken from Jefatura Superior de Estadística, *Anuario Estadístico de España, 1924-25* (Madrid, 1926); Dirección General del Instituto Geográfico y Estadístico, *Censo de la población de España, 1920* (Madrid, 1922).

FIG. 4. AGRICULTURAL COOPERATIVES IN SPAIN, 1923
(members over agrarian population)



Sources: See text.

The propensity to cooperate has been related to the prevalence of small and medium-size farms, high levels of human capital, relatively low distances to markets and the specialization in products that could be commercialized in national or international markets⁴⁷². The support of the state, by allowing freedom of association and facilitating subsidies, has also been considered an important but not sufficient condition for the emergence of cooperatives⁴⁷³. The existence of booming markets is not enough either, as the English dairy industry illustrates⁴⁷⁴. In the Spanish case, it has been argued that, despite the failure of the central government to promote this kind of agrarian organization, the cooperative movement developed in those areas where a

⁴⁷² Henriksen, 'Avoiding lock-in'; I. Henriksen and K.H. O'Rourke, 'Incentives, technology and the shift to year-round dairying in late nineteenth-century Denmark', *Economic History Review*, 58 (2005); K.H. O'Rourke, 'Culture, politics and innovation: Evidence from the creameries', *CEPR Discussion Paper Series*, 3235 (2002); O'Rourke, 'Culture, conflict and cooperation'.

⁴⁷³ Henriksen, 'Avoiding lock-in'.

⁴⁷⁴ Taylor, 'The English dairy industry'.

relatively significant group of small and middle-sized farms was present, providing the size of their plots was large enough to secure their financial operations⁴⁷⁵.

Some authors have also emphasized the importance of trust to promote participation among peasants. The successful Danish example was based on high levels of social cohesion arising from a homogeneous population and an existing peasant value system that encouraged self-reliance and self-help within the group⁴⁷⁶. In Ireland, on the contrary, the influence of social and political conflict encouraged distrust and impeded the diffusion of cooperatives⁴⁷⁷. Similarly, it has been argued that agrarian associations in France were built on a 'spirit of association', while the lack of mutual trust has been pointed as a potential cause behind the failure of credit cooperatives in Southern Italy and dairy cooperatives in Belgium⁴⁷⁸. According to O'Rourke, 'there are qualitative grounds to believe that trust was indeed a factor involved in the decision to set up a cooperative ... since, after all, it implied that one farmer's income depended on how well and honestly his neighbours did their work'⁴⁷⁹.

Following this approach, this paper seeks to complement traditional explanations by including the pre-existing stock of social capital as a crucial variable to understand why some areas were able to generate a more vibrant cooperative movement than others. The main hypothesis here is that the social networks and the personal links built around the use and management of collective resources, such as common lands and irrigation communities, were crucial elements in facilitating the emergence of the cooperative movement in rural areas. Through a comparative study of the historical

⁴⁷⁵ Garrido, 'Why did most cooperatives fail?'.

⁴⁷⁶ C.P. Kindleberger, 'Group behaviour and international trade', *Journal of Political Economy*, 59 (1951), p. 45; Henriksen, 'Avoiding lock-in', p. 60; G.L. Svendsen and G.T. Svendsen, *The creation and destruction of social capital: Entrepreneurship, cooperative movements and institutions* (Cheltenham, 2004), p. 176.

⁴⁷⁷ O'Rourke, 'Culture, conflict and cooperation'.

⁴⁷⁸ Baker, Fraternity among the French peasantry; Galassi, 'Coordination and monitoring'; Van der Hallen, 'The transaction cost approach'.

⁴⁷⁹ O'Rourke, 'Culture, conflict and cooperation', p. 1360.

data at the provincial level, this analysis intends to unveil whether, and under which conditions, the social networks formed around the use and management of common resources might have promoted the constitution of agricultural associations in early 20th century Spain. The rest of the chapter is organised as follows. The next section discusses the theoretical and historical background that supports the hypothesis that the social capital promoted by common lands and irrigation communities may have contributed to the emergence of cooperatives. Section 3 describes the methodology employed to test that hypothesis and section 4 reports the results of the empirical analysis. The last section presents the conclusions.

5.2 Commons and Social Capital

Building on the seminal works by Robert Putnam and James S. Coleman⁴⁸⁰, a growing literature has employed the concept of social capital to account for successful collective action and diverse economic and political performance⁴⁸¹. Social networks, values and norms facilitate mutual cooperation by fostering predictable behaviour, mutual obligation and trust among individuals and groups. In other words, social capital reduces the transaction costs of collective action and limits free-riding by facilitating decision making, mobilization and management of resources, communication and coordination, monitoring and enforcement and conflict resolutions.

⁴⁸⁰ J.S. Coleman, 'Social capital in the creation of human capital', *American Journal of Sociology*, 94 (1988); J.S. Coleman, *Foundations of Social Theory* (Cambridge, MA, 1990); R. Putnam (with R. Leonardi and R. Nanetti), *Making democracy work: Civic traditions in Modern Italy* (Princeton, 1993).

⁴⁸¹ See, among others, R. La Porta et al., 'Trust in large organizations', *American Economic Review. Papers and Proceedings*, 87 (1997); S. Knack and P. Keefer, 'Does social capital have an economic payoff? A cross-country investigation', *Quarterly Journal of Economics*, 112 (1997); M. Wolcock, 'Social capital and economic development', *Theory and Society*, 27 (1998); P.J. Zak and S. Knack, 'Trust and growth', *The Economic Journal*, 111 (2001); R.I. Rotberg, 'Social capital and political culture in Africa, America, Australasia and Europe', in R.I. Rotberg (ed.), *Patterns of Social Capital: Stability and change in historical perspective* (Cambridge, 2001); A. Krishna and N. Uphoff, 'Mapping and measuring social capital through assessment of collective action to conserve and develop watersheds in Rajasthan', in C. Grootaert and T.V. Bastelaer (eds.), *The role of social capital in economic development* (Cambridge, 2002); S. Knack, 'Social capital and the quality of government: Evidence from the States', *American Journal of Political Science*, 46 (2002); and E. Ostrom and T.K. Ahn, 'Introduction', in E. Ostrom and T.K. Ahn (eds.), *Foundations of Social Capital* (Cheltenham, 2003).

The concept of social capital has nonetheless been open to criticism for its ambiguity, for the unclear direction of causation, and for the difficulties in measuring it⁴⁸². Different proxies, such as voluntary associations, voter turnout and surveys' responses, among others, have been used with uneven fortune to assess the level of 'civicness' within particular societies. These problems are especially acute when analyzing historical social capital.

This paper explores an alternative proxy for social capital in pre-industrial economies by focusing on the prior importance of institutions built around the use and management of collective resources. The selection of the proxy variable is inspired by the specific vehicle through which social capital is acquired, namely the existence of networks that allow for social interaction⁴⁸³. Putnam regards craft guilds as incubators of social capital since they promoted horizontal reciprocal trust⁴⁸⁴. Similarly, formal institutions, regardless of whether participation in them was voluntary or obligatory, formed the basis of rural social capital in later medieval and early modern English villages⁴⁸⁵. These institutions allowed "the creation of personal networks based upon respect, trust and shared experience that comprised people beyond their own families, immediate neighbours, and personal friends"⁴⁸⁶. Likewise, Svendsen and Svendsen trace back the stock of social capital using agricultural cooperatives from the mid-19th century in Denmark and Poland, while stressing the role of the commons as alternative potential indicators of the presence of social capital⁴⁸⁷.

⁴⁸² J. Sobel, 'Can we trust social capital?', *Journal of Economic Literature*, 40 (2002). For a concise summary of these issues, see also Wolcock, 'Social capital'.

⁴⁸³ C. Grootaert and T.V. Bastelaer, 'Introduction and overview', in C. Grootaert and T.V. Bastelaer (eds.), *The role of social capital in economic development* (Cambridge, 2002), p. 5.

⁴⁸⁴ Putnam, *Making democracy work*.

⁴⁸⁵ McIntosh, 'The diversity of social capital'.

⁴⁸⁶ Ibid, p. 128.

⁴⁸⁷ G.L. Svendsen and G.T. Svendsen, 'Measuring social capital: The Danish co-operative dairy movement', *Sociologia Ruralis*, 40 (2000).

The distinction between ‘structural’ and ‘cognitive’ social capital can be helpfully applied here⁴⁸⁸. Structural social capital, on the one hand, refers to objective, tangible elements such as local institutions, organizations and social networks, which are usually set up for economic, social or political considerations. Alongside these more formal organizations, informal networks of friendship, neighbourliness and assistance operate, thus reinforcing the social interactions promoted by them⁴⁸⁹. These informal networks should not be ignored since the social interactions and the benefits they generated were especially important among less favoured groups and developing countries⁴⁹⁰. On the other hand, ‘the ability to transpose social capital cultivated at the individual level to larger projects of collective action is limited by the available organizations’⁴⁹¹. Therefore, common lands and irrigation communities may play the role of those ‘available organizations’ that channel social energies. Cognitive social capital, on the other hand, involves more abstract manifestations such as trust, norms and values. However, both types of social capital, structural and cognitive, reinforce each other, especially through a process of long-term co-evolution based on frequent personal interactions⁴⁹². Social capital would thus be generated in the course of continuing and successful cooperation. Therefore, the long-term history of society determines the stock of social capital available, thus conditioning future collective action and particularly the emergence of agrarian cooperatives.

The existing common lands and irrigation communities at the beginning of the 20th century in Spain, understood as ‘structural’ social capital, fit into the theoretical

⁴⁸⁸ Krishna and Uphoff, ‘Mapping and measuring’.

⁴⁸⁹ McIntosh, ‘The diversity of social capital’, p. 121; E.S. Clemens, ‘Securing political returns to social capital: Women’s associations in the United States, 1880s-1920s’, in R.I. Rotberg (ed.), *Patterns of social capital: Stability and change in historical perspective* (Cambridge, 2001), p. 249.

⁴⁹⁰ McIntosh, ‘The diversity of social capital’, p. 152; Krishna and Uphoff, ‘Mapping and measuring’, p. 104.

⁴⁹¹ Clemens, ‘Securing political returns’, p. 250.

⁴⁹² P. Collier, ‘Social capital and poverty: A microeconomic perspective’, in C. Grootaert and T.V. Bastelaer (eds.), *The role of social capital in economic development* (Cambridge, 2002), p. 19.

model described above since they provide dense networks of continuous social interactions and fertile soil for the development of values and social norms. The structured social interaction formed around the use and management of these collective resources was the outcome of a centuries-long development, resulting in longstanding traditions of local cooperation. Irrigation communities, predominantly located on the Mediterranean coast and in some interior provinces, went at least back to medieval ages and the same holds true for the remaining common lands in most of the country although their origins remain unclear⁴⁹³. The social interactions built around these institutions induced mutual awareness and control, favouring cooperative behaviour by facilitating compliance and, in the long run, impregnating social values and norms of behaviour that were transmitted across generations⁴⁹⁴. The use and management of these resources implied consensus, together with monitoring and enforcement mechanisms that facilitated carrying out what had been agreed. Information flowed easily through the channels provided by these institutions and formal and reputation mechanisms encouraged honest behaviour.

Water, on the one hand, has always been a crucial production factor in agrarian societies since its availability not only increases agricultural productivity, but also the security of crops. Irrigation communities managed water resources by constructing, maintaining and expanding the physical system, allocating water to the users, and

⁴⁹³ T.F. Glick, *Irrigation and society in Medieval Valencia* (Cambridge, 1970); M.T. Pérez Picazo and G. Lemeunier, 'Los regadíos murcianos del feudalismo al capitalismo', in M.T. Pérez Picazo and G. Lemeunier (eds.), *Agua y modo de producción* (Barcelona, 1990); G. Pérez Sarrión, 'Regadíos, política hidráulica y cambio social en Aragón, siglos XV-XVIII', in M.T. Pérez Picazo and G. Lemeunier (eds.), *Agua y modo de producción* (Barcelona, 1990); G. Pérez Sarrión, 'Historia política en el regadío. A modo de presentación', in C. Laliena (coord.), *Agua y progreso social: Siete estudios sobre el regadío en Huesca, siglos XII-XX* (Huesca, 1994); Sanz Fernández, 'La historia contemporánea'; GEHR, 'Más allá de la "propiedad perfecta"'; Jiménez Blanco, *Privatización y apropiación*.

⁴⁹⁴ Gallego, *Más allá de la economía de Mercado*, pp. 54-63. This author argues that these social values and norms promoted the sense of belonging to the community. Social interaction in the long run not only generated social values, but also tended to materialise in organisations and networks that formalised the cooperation processes, usually increasing their effectiveness.

resolving potential conflicts⁴⁹⁵. These functions were achieved through regular meetings and a body of formal and informal norms and rules that regulated individual behaviour. A system of fines, together with a body of official guards and mutual informal self-monitoring, ensured compliance and prevented dishonest behaviour by individual users (wasting water, irrigating out of turn, failing to clean the secondary canals, or flooding neighbours' fields, among others). Irrigation communities faced the disequilibrium between increasing water demand and the limited water availability by expanding and improving the physical system and the efficiency of the distribution and allocation mechanisms. Furthermore, these institutions provided distributing methods to face water scarcity in times of drought or organize collective work to clean the main canals.

Common lands, on the other hand, also played a crucial role in the organisation of production in organic economies since they were a source of pastures, fuel and wood, together with temporary arable land, to members of the community⁴⁹⁶. The communal regime in Spain implied two main types of access to the land: a direct but regulated access for all the members of the community or a temporary cession of use rights to particular individuals in exchange for a monetary income. The regulation underwent by the local communities, represented by local councils or municipalities, constituted the central element on the use of the commons by regulating the access to these resources, the enforcement of rules and the resolution of any conflict that might arise. Informal norms, reputation mechanisms and peer-monitoring were also widespread⁴⁹⁷. Their social functionality, which allowed for the capital accumulation of the elites while

⁴⁹⁵ Ostrom, *Governing the commons*, pp. 69-81; S. Garrido, 'Las instituciones de riego en la España del este. Una reflexión a la luz de la obra de Elinor Ostrom', *Historia Agraria*, 53 (2011).

⁴⁹⁶ Iriarte, 'Common lands'.

⁴⁹⁷ Moreno, 'El régimen comunal'.

securing the reproduction of the less favoured groups, legitimated the system⁴⁹⁸. In this sense, common lands contributed to prevent increasing differentiation and potential social disintegration, which favoured social cohesion. Significantly, the existence of the commons also facilitated the development of reciprocity or mutual aid mechanisms, based on the expectations about future interactions that their collective use implied⁴⁹⁹.

The extraordinary resilience of communal practices in Spain suggests that cooperative behaviour was strong within those communities⁵⁰⁰. Their long-lasting success rested on their ability to solve the free-rider problem through a set of formal and informal rules operated at the local level and congruent with the social and environmental context in which they operated. This is not to suggest that these communities were free from conflict but instead that they developed internal mechanisms to manage it⁵⁰¹. The degree of autonomy, internal democracy and equity enjoyed by the users should not be exaggerated either. Both systems, common lands and irrigation communities, reproduced the existing economic and social inequality that characterised the society in which they were immersed, but nonetheless, these systems allowed for the reproduction of the less favoured groups and were flexible enough to adapt to changing circumstances⁵⁰². It has indeed been argued that these institutions

⁴⁹⁸ Iriarte, 'Common lands', p. 20.

⁴⁹⁹ Iriarte, 'La pervivencia de bienes comunales', p. 125.

⁵⁰⁰ Ostrom, *Governing the commons*.

⁵⁰¹ For internal differentiation and conflicts around irrigation institutions, see T. Peris, 'La conflictividad hidráulica en el País Valenciano entre los siglos XIII y XVIII', *Áreas*, 17 (1997); E. Mateu and S. Calatayud, 'Control del agua y conflictividad social en la expansión del regadío: La Acequia Real del Júcar', *Áreas*, 17 (1997); M.T. Pérez Picazo, 'Gestión del agua y conflictividad en el sureste de España, siglos XIX y XX', in P. Arrojo (ed.), *El agua a debate desde la Universidad. Hacia una nueva cultura del agua* (Zaragoza, 1999); and Garrido, 'Las instituciones de riego'. For the case of common lands, see Moreno, 'El régimen comunal'; Balboa, 'La historia de los montes'; Jiménez Blanco, 'El monte'. Conflict around the commons became especially high when they were subject to privatization attempts. The level of conflict and social cohesion was of course influenced by the existing inequality within the local community itself. For this issue, see Gallego, *Más allá de la economía de mercado*.

⁵⁰² R. Herin, 'Agua, espacio y modos de producción en el Mediterráneo', in M.T. Pérez Picazo and G. Lemeunier (eds.), *Agua y modo de producción* (Barcelona, 1990); S. Calatayud, 'El regadío ante la expansión agraria valenciana: Cambios en el uso y control del agua (1800-1910)', *Agricultura y Sociedad*, 67 (1993); S. Calatayud, 'Cambios institucionales en el regadío valenciano, 1830-1866', *Ayer*, 69 (2008); Iriarte, 'Common lands'; Lana, 'From equilibrium to equity'.

were part of a wider ‘moral economy’ where, despite the dominance of the elite, the interests of the less favoured groups were preserved⁵⁰³. Potential conflicts were kept within certain limits because these systems would have been doomed to fail without the consensus and cooperation of the peasants⁵⁰⁴. A culture of compliance to the norms emerged based on formal and informal rules, peer-monitoring, reputation mechanisms and successful cooperation. The benefits of cooperation, in turn, contributed to maintaining social cohesion in the long run⁵⁰⁵. It should also be stressed that the activities of these institutions trespassed their own boundaries and were enmeshed in the culture of the local communities, in the form of everyday practices or popular traditions and festivities⁵⁰⁶. Therefore, this kind of self-governing institutions tended to be efficient and sustainable ‘because of the social capital in the form of effective working rules those systems are more likely to develop and preserve, the networks that the participants have created, and the norms they have adopted’⁵⁰⁷.

However, the transition to capitalism and the establishment of the liberal state brought about changes in the way these resources were used and managed. In this sense, either their privatization or their appropriation and regulation by central authorities tends to eliminate the social networks, values and norms built around communal property arrangements⁵⁰⁸. Irrigation communities, on the one hand, underwent a formal reorganization which favoured users’ associations against other

⁵⁰³ Moreno, ‘El régimen comunal’, H.R. Oliva, ‘Gestión del agua, economía agraria y relaciones de poder en Tierra de Campos a fines del medievo’, *Historia Agraria*, 30 (2003); Serrano, ‘La defensa del comunal’; M. Ferri, ‘Reorganización de los regadíos valencianos en el siglo XIX: Las ordenanzas liberales de la provincia de Valencia (1835-1850)’, *Áreas*, 17 (1997); Calatayud, ‘Cambios institucionales’.

⁵⁰⁴ C. Laliena, ‘Los regadíos medievales en Huesca. Agua y desarrollo social, siglos XII-XV’, in C. Laliena (coord.), *Agua y progreso social: Siete estudios sobre el regadío en Huesca, siglos XII-XX* (Huesca, 1994); Garrido, ‘Las instituciones de riego’; Moreno, ‘El régimen comunal’; Lana, ‘Commons for sale’.

⁵⁰⁵ Gallego, *Más allá de la economía de mercado*, p. 44.

⁵⁰⁶ Pérez Sarrión, ‘Historia política’, p. 15; Serrano, ‘La defensa del comunal’, pp. 437-438.

⁵⁰⁷ Ostrom and Ahn, ‘Introduction’, xxiii.

⁵⁰⁸ J.M. Baland and J.-P. Platteau, *Halting degradation of natural resources: Is there a role for rural communities?* (Oxford, 1996).

kind of institutions such as municipal councils and *Heredamientos*⁵⁰⁹. The regulations included in the *ordenanzas* (bylaws) were nonetheless preserved and adapted to meet new constraints. It has been argued that these changes reinforced the position of the large landowners within these organizations but an unequal structure was already present in the traditional regime and the liberal state only confirmed those trends⁵¹⁰. Furthermore, the number of users and the land irrigated by canals and *acequias* (secondary canals) expanded during the 19th century and early 20th century in some areas, which reinforced the importance that these institutions had for local communities and agricultural development⁵¹¹.

Common lands, on the other hand, suffered an intense attack from the end of the 18th century onwards that led to a massive privatization, either of their property rights, or the way in which these resources had been traditionally used⁵¹². The outcome of this process, however, widely varied by region⁵¹³. The diverse persistence of common lands not only reflects the different stock of structural social capital, but also serves to highlight the social consensus that these spaces generated, particularly in those areas that better resisted the privatization pressures. The concept of social cohesion has indeed been used to explain why common lands survived in some areas⁵¹⁴. As explained in chapter 2, local communities employed different strategies to defend their commons and most of them required different degrees of collective action⁵¹⁵.

⁵⁰⁹ Ferri, 'Reorganización de los regadíos'; Pérez Picazo, 'Gestión del agua'.

⁵¹⁰ Pérez Picazo and Lemeunier, 'Los regadíos murcianos'; J. Inglada, 'El intervencionismo municipal en el control, regulación y financiación del regadío oscense en el siglo XVII', in C. Laliena (coord.), *Agua y progreso social: Siete estudios sobre el regadío en Huesca, siglos XII-XX* (Huesca, 1994).

⁵¹¹ Calatayud, 'El regadío antes la expansión agraria'; J.M. Ramón i Muñoz, 'Infraestructuras hidráulicas y regadío en la cuenca catalana del Ebro, 1850-2000', in V. Pinilla (coord.), *Gestión y uso del agua en la cuenca del Ebro en el siglo XX* (Zaragoza, 2008).

⁵¹² Balboa, 'La historia de los montes'; Jiménez Blanco, 'El monte'; Iriarte, 'Common lands'.

⁵¹³ GEHR, 'Más allá de la "propiedad perfecta"'.
⁵¹⁴ Ibid; Iriarte, 'La pervivencia de bienes comunales'; Balboa, 'La historia de los montes'; Serrano, 'La defensa del comunal'.

⁵¹⁵ See chapter 1.3 for a detailed summary of the different strategies followed by the local communities to defend their commons.

According to Lana, despite the great changes caused by the emergence of capitalism and liberalism, the notion of ‘community’, understood as a social network built around formal and informal norms, survived where common property and collective practices did not disappear⁵¹⁶. Likewise, the protest movements sparked by the disappearance of common lands during the second half of the 19th century and early 20th century can be seen as a collective learning process that also contributed to the emergence of agricultural associations, especially in those areas where opposition was relatively successful⁵¹⁷. The less favoured groups mobilized demanding the recovery of common property and peasants’ associations were formed with the aim of collectively purchasing common lands⁵¹⁸. In Navarra, for instance, some of these associations established around the resistance against the privatisation of common lands became agricultural cooperatives during the 1920s⁵¹⁹. In fact, the defence of the common lands was one of the principles of the Cooperatives Federation in Navarra⁵²⁰. Similarly, the popular movements formed around the defense of traditional land tenure systems in Catalonia (*rabassa morta*) generated intense social interactions that may have played a significant role in the emergence of agricultural associations that ultimately became cooperatives⁵²¹. The same logic was in place in León where the communal regime not only survived despite the pressures imposed by the new market economy and the liberal

⁵¹⁶ Lana, ‘From equilibrium to equity’, p. 170.

⁵¹⁷ J.M. Gastón, *¡Vivan los comunes! Movimiento comunero y sucesos corraliceros en Navarra, 1896-1930* (Pamplona, 2010), pp. 38-46.

⁵¹⁸ A. Sabio, ‘Resistencias campesinas a la venta de comunales en Aragón. Las vías legales para amortiguar impactos, 1855-1985’, in J.A. Piqueras (ed.), *Bienes comunales: Propiedad, arraigo y apropiación* (Madrid, 2002); Lana, ‘From equilibrium to equity’.

⁵¹⁹ See Majuelo and Pascual, *Del Catolicismo agrario*, p. 132-133; and Gastón, *¡Vivan los comunes!* Significantly, the struggle around the recovery of the commons that had been privatised during the 19th century constituted the main social issue in Navarra during the first third of the 20th century.

⁵²⁰ Majuelo and Pascual, *Del Catolicismo agrario*, pp. 165-169.

⁵²¹ J. Planas and F. Valls Junyent, ‘¿Por qué fracasaban las cooperativas agrícolas? Una respuesta a partir del análisis de un núcleo de la Cataluña *rabasaire*’, *Investigaciones de Historia Económica*, 7 (2011).

state, but also gave support to new types of ‘collectivism’ in the form of dairy and creamery cooperatives⁵²².

To sum up and according to Greene, ‘social capital would include an entire range of institutions, practices, devices, and learned behaviours that permit individuals and groups to render physical spaces productive and social and cultural spaces agreeable’⁵²³. Common lands and irrigation communities fulfilled both conditions, thus nurturing social capital and potentially contributing to the emergence of cooperatives. In this regard, Gallego et al. argue the preservation of communal practices may have promoted collective action⁵²⁴. Although an explicit link is not proposed, Carmona and Simpson agree that common lands and irrigation communities formed the basis of local cooperation among farmers in the period prior to the emergence of cooperatives⁵²⁵. Joining a cooperative demanded the solidarity and unlimited liability of their members when relying on loans from banks or credit from input suppliers, which meant that a high amount of mutual trust was needed. It also required avoiding opportunistic behaviour when dealing with the cooperative. Therefore the existence of common lands and irrigation communities may have enhanced the likelihood of the emergence of cooperatives by providing a long-term experience on formal and informal monitoring and enforcement mechanisms, thus facilitating the required mutual knowledge and trust to participate in this kind of collective endeavour. Reputation mechanisms would be embedded in the functioning of both common-property and cooperative institutions and information would flow in both ways, increasing the costs of defection to potential cheaters since social sanctions would extend from one institution to the other and to the

⁵²² Serrano, ‘La defensa del comunal’, p. 455.

⁵²³ J.P. Greene, ‘Social and cultural capital in Colonial British America. A case study’, in R.I. Rotberg (ed.), *Patterns of social capital: Stability and change in historical perspective* (Cambridge, 2001), p. 153.

⁵²⁴ D. Gallego, I. Iriarte and J.M. Lana, ‘Las Españas rurales y el Estado, 1800-1930’, in R. Robledo (ed.), *Las sombras del progreso. Las huellas de la historia agraria* (Barcelona, 2010), p. 98.

⁵²⁵ Carmona and Simpson, *El laberinto*, pp. 234-235.

local community in general. Being disloyal would therefore be highly destructive for one's reputation⁵²⁶. Although applied to cooperatives the following reasoning is also suitable to common lands and irrigation communities: 'the information and the enforcement advantages of cooperatives are interconnected in the sense that they enabled the enforcement of behaviour upon members that lowered information costs'⁵²⁷. The diffusion of information about the potential benefits of cooperation was also easier since it could be shared in regular interactions or at more formal meetings. Likewise, past experiences of successful cooperation seem to be an important factor determining future collective endeavours since they provide organizational skills, trust and a psychological stimulus⁵²⁸. Henriksen also notes that 'some prior experience with self-help organization and in self-governing institutions' was especially valuable when starting a cooperative⁵²⁹. More recently, Svendsen and Svendsen, *The creation and destruction of social capital*, argue that the emergence of cooperatives builds on cooperative values and practical cooperative structures inherited from the past. Similarly, agricultural associations in France built on former precedents of local cooperation⁵³⁰. Although in passing, Planas actually mentions that the lack of cooperative experience could have been a factor explaining the failure of Spanish cooperative movement⁵³¹. If past experiences on collective action are absent, cooperation undeniably becomes a highly demanding endeavour⁵³². Common lands and irrigation communities may have therefore increased farmers' cooperative knowledge and experience in a long-run process of 'collective learning' that is beneficial for

⁵²⁶ Van der Hallen, 'The transaction cost approach', p. 10.

⁵²⁷ Henriksen, 'Avoiding lock-in', p. 66.

⁵²⁸ A.O. Hirschman, *Getting ahead collectively: Grassroots experiences in Latin America* (New York, 1984); Ostrom, *Governing the commons*; Putnam, *Making democracy work*; J.-P. Platteau, *Institutions, social norms and economic development* (Amsterdam, 2000).

⁵²⁹ Henriksen, 'Avoiding lock-in', p. 68.

⁵³⁰ Baker, *Fraternity among the French peasantry*.

⁵³¹ Planas, 'Cooperativismo y difusión', p. 111.

⁵³² Ostrom and Ahn, 'Introduction', p. xxiv.

collective action and economic development, and particularly to the emergence of cooperatives.

5.3 Methodology

In order to test the arguments outlined above about the emergence of cooperatives in Spain, a model is built containing the variables that traditionally have been employed to explain this process, together with the potential influence of social capital. Data, available for 44 provinces in inland Spain, have been collected from population censuses, statistical yearbooks, official reports and secondary sources⁵³³. Apart from shedding light on the ultimate factors that promoted the cooperative movement, this approach has the advantage of comparing areas which were operating within the same legal and institutional context and is thus able to qualify the widely held argument that blames the state for the failure of Spanish cooperatives. It also allows for isolating elements that are not visible in cross-country comparisons.

The importance of cooperatives in every province is measured by the proportion of members over the active male agrarian population in 1923⁵³⁴. Although the proportion of inputs purchased collectively or the agricultural production marketed through cooperatives may be a better indicator of their importance, there is hardly any data on these issues at the provincial level⁵³⁵. The first cooperatives were founded in the late 19th century but they did not really proliferate until the beginning of the 20th century. Moreover, the general weakness of the cooperative movement, nonetheless,

⁵³³ Data on the Basque Country is not included due to the lack of information on common lands. The Canary and the Balearic Islands are the other provinces with missing data in some of the variables.

⁵³⁴ Jefatura Superior de Estadística, *Anuario Estadístico de España, 1924-25*; Dirección General del Instituto Geográfico y Estadístico, *Censo de población de España, 1920*.

⁵³⁵ Federico, *Feeding the world*, p. 169. The data on cooperative membership should also be regarded with caution given the problems hidden by the official sources. See Garrido, 'El cooperativismo agrario', p. 116-117.

impeded the consolidation of many of these initiatives⁵³⁶. Before 1910, 1,559 agricultural associations had been established around the country but 63 per cent of them had vanished by 1916. The use of 1923 as the reference date is therefore aimed to account for the consolidation of the cooperative movement. Likewise, a time gap between the dependent and the independent variables is considered in order to identify the conditions that facilitate successful collective action and avoid reverse causality problems. As a result, most of the explanatory variables refer to 1900 as the reference date. Summary of the statistics of the variables employed in this chapter are presented in Appendix E.

The initial stock of social capital is measured by the importance that common lands and irrigation communities had in the different Spanish provinces at the beginning of the 20th century. As already argued, the persistence of common lands despite the privatisation process greatly varied between different regions, while the existence of irrigation systems reflected old traditions of cooperation in response to environmental conditions⁵³⁷. On the one hand, the proportion of agricultural land irrigated by a system of canals and *acequias* is employed as a proxy for irrigation communities⁵³⁸. On the other hand, common lands are measured as the proportion of common lands over the total provincial area⁵³⁹. However, since common lands could be exploited either privately or collectively, this variable is also split up into two by taking into account the fraction of total uses that were being enjoyed privately or

⁵³⁶ Garrido, 'Why did most cooperatives fail?'.

⁵³⁷ GEHR, 'Más allá de la "propiedad perfecta"'; Domínguez, *La riqueza de las regiones*.

⁵³⁸ Ministerio de Fomento, *Medios que se utilizan para suministrar el riego a las tierras y distribución de los cultivos en la zona regable* (Madrid, 1918); Gallego, 'Pautas regionales'.

⁵³⁹ Artiaga and Balboa, 'La individualización'; GEHR, 'Más allá de la "propiedad perfecta"', Gallego, *Más allá de la economía de mercado*.

collectively⁵⁴⁰. As previously argued, the relative importance of these institutions in each region is expected to positively influence the emergence of cooperatives.

The hypothesised role of social capital must be tested against other potential explanations. Established accounts on the emergence of Spanish cooperatives point to the existence of economic incentives and the degree of access to land as crucial factors explaining cooperative behaviour. The existence of economic incentives, on the one hand, induced the collective effort necessary to promote cooperatives. Low commercialisation levels implied less demand for the services that cooperatives could offer, so the importance of the cooperative movement is expected to be greater in highly commercialised contexts⁵⁴¹. The fraction of people living in cities bigger than 5,000 inhabitants is employed to account for the existence of market incentives⁵⁴². Other variables accounting for market incentives, such as the importance of commercial crops and industrialisation, are also tested using the proportion of arable land devoted to vines, olive trees and fruit trees and the gross industrial value added per capita⁵⁴³. However, since these variables do not affect the results, they have not been reported here.

On the other hand, the existence of a relatively significant group of small and middle-sized farms, providing the size of their plots was large enough, has been regarded as the main explanation behind the geographically diverse success of Spanish cooperative movement⁵⁴⁴. There are various reasons for a connection between access to

⁵⁴⁰ GEHR, 'Estadísticas históricas'. The average proportion of these types of user-rights over the commons between 1870 and 1903 is used to avoid unexplained short-run variations. As explained in chapter 3, the data however that distinguish collective and private user-rights must be taken with caution since their values mixed market and non-market considerations. See GEHR, 'Política forestal y producción'; Jiménez Blanco, 'El monte'.

⁵⁴¹ Sanz Lafuente, 'La Asociación de Labradores'; Carmona and Simpson, *El laberinto*; Martínez Soto, 'El cooperativismo de crédito'.

⁵⁴² Tafunell, 'Urbanización y vivienda'.

⁵⁴³ Figures taken from GEHR, *Estadísticas históricas*; and Rosés et al. 'The upswing of regional income inequality'.

⁵⁴⁴ Garrido, 'Why did most cooperatives fail?'.

land and the propensity to cooperate. Firstly, although the economic benefits to small and medium landholders seem clear, the same is not true for large landowners that were able to operate efficiently privately⁵⁴⁵. However, non-economic motives such as fear of social conflict or the seeking of votes and prestige may have counteracted that trend⁵⁴⁶. Interclass cooperation indeed grew in importance after World War I, which implied a push to the cooperative movement⁵⁴⁷. Secondly, economic, social and political inequality negatively influences a community's co-operative capacity⁵⁴⁸. The less-favoured groups, dissatisfied with the existing distribution, will not agree with co-operative arrangements that perpetuate the status quo and the elites, eager to maintain their privileges, will try to prevent any collective action that may undermine it. Inequality increases transaction and enforcement costs of cooperative arrangements because 'the degree of confidence or trust that individuals have in the likelihood that others will play their part in a cooperative arrangement ... may be low'⁵⁴⁹. Although it seems that a minority of large landowners did indeed support cooperatives as a way of preventing social conflict, Spanish rural elites generally opposed the cooperative movement in order to secure their control over labour, land and credit markets⁵⁵⁰. The widespread poverty of farmers has also been regarded as one of the main factors behind the failure of cooperatives in Spain given their lack of capital and access to credit⁵⁵¹. Furthermore, cooperatives offer no clear benefits to landless peasants⁵⁵². Therefore,

⁵⁴⁵ Ibid, p. 191; O'Rourke, 'Culture, conflict and cooperation', p. 1368.

⁵⁴⁶ See J. Planas, 'Identidades, corporativismo y autonomía del campesinado en la acción colectiva agraria. Cataluña, 1890-1920', *Historia Agraria*, 50 (2010), p. 169.

⁵⁴⁷ Garrido, 'El cooperativismo agrario', p. 134.

⁵⁴⁸ C. Boix and D.N. Posner, 'Social capital. Explaining its origins and effects on government performance', *British Journal of Political Science*, 28 (1998).

⁵⁴⁹ P. Bardhan, 'Water community: An empirical analysis of cooperation on irrigation in South India', in M. Aoki and Y. Hayami (eds.), *Communities and markets in economic development* (Oxford, 2001), p. 252.

⁵⁵⁰ Garrido, 'Why did most cooperatives fail?', pp. 191-192.

⁵⁵¹ Ibid, p. 190.

⁵⁵² Baker, *Fraternity among the French peasantry*, p. 41.

high levels of inequality in the access to the land would not promote cooperatives⁵⁵³. Access to land is measured as the fraction of landowners and tenants over the agricultural population⁵⁵⁴. Likewise, in order to account for the potential negative effect of really small plots, a proxy assessing the average size of plots is also calculated by dividing agricultural land between landholders⁵⁵⁵, and is included as an interaction term. Since the existence of a broad layer of small and medium size farmers has been considered the main factor behind the Spanish cooperatives, these variables are expected to be positive correlated with cooperatives.

Although human capital has been considered a crucial element for the emergence of cooperatives in other countries⁵⁵⁶, its influence has been overlooked in the Spanish case. The positive effects of education on economic development have been widely recognized⁵⁵⁷. Regarding its potential influence in the cooperative movement, effective collective action is only achieved when capable agents are also present⁵⁵⁸. High levels of human capital facilitate the diffusion of information and the recruitment of local entrepreneurs for cooperative endeavours⁵⁵⁹. Planas indeed considers that the diffusion of agricultural knowledge was an important, but hidden and therefore dismissed,

⁵⁵³ It is also true that this variable may also affect social capital, since the incentives that promote cooperation are more effective among social groups who shared interests and values. Polarization leads to rent-seeking behaviour and reduces consensus and farmer cooperation. See Banerjee et al., 'Inequality, control rights, and rent-seeking: Sugar cooperatives in Maharashtra', *Journal of Political Economy*, 109 (2001); O'Rourke, 'Culture, conflict and cooperation', p. 1360.

⁵⁵⁴ Dirección General del Instituto Geográfico y Estadístico, *Censo de la población de España, 1860*. Given the lack of information for this variable in 1900, data from 1860 must be used. Another option is to use data from 1920 but the source only provides information about landowners and the rest of agrarian population, which makes the distinction between tenants and wage earners not possible.

⁵⁵⁵ Figures taken from Gallego, 'Pautas regionales' and GEHR, 'Más allá de la "propiedad perfecta"'.
⁵⁵⁶ Henriksen, 'Avoiding lock-in'; O'Rourke, 'Culture, politics and innovation'.

⁵⁵⁷ M.J. Bowman and C.A. Anderson, 'Human capital and economic modernization in historical perspective', in L. Stone (ed.), *Schooling and society: Studies in the history of education* (Baltimore, 1976); Sandberg, 'Ignorance, poverty'. See also the references mentioned in the previous chapter. For an analysis of the Spanish experience, see Núñez, *La fuente de la riqueza*; 'Within the European periphery'.

⁵⁵⁸ A. Krishna, *Active social capital: Tracing the roots of development and democracy* (New York, 2002).

⁵⁵⁹ Henriksen, 'Avoiding lock-in', p. 60; Svendsen and Svensen, *The creation and destruction*, p. 82

function of the Spanish cooperatives⁵⁶⁰. It is also important to acknowledge that a high literacy rate also makes possible the recruitment of officials and clerks that can keep the records and deal with the tasks required by the market and official issues. It seems that Spanish agricultural associations employed personnel with hardly any experience in business and accountancy, which surely hindered their possibilities of success⁵⁶¹. From a more general perspective, education improves social or cultural skills and promotes the psychological and attitudinal changes congruent with a market economy where change and innovation are pervasive⁵⁶². But a modernizing agriculture requires not only an educated, but also a healthy population⁵⁶³. In late 19th and early 20th century agriculture, health and strength were as important as literacy or numeracy⁵⁶⁴. Therefore, given the relative backwardness of Spanish agriculture at the end of the 19th century and the diverse situation in different regions, the peasants' bio-physical welfare should be taken into account when assessing the levels of human capital⁵⁶⁵. In this regard, Prados de la Escosura finds that nearly 25 per cent of the Spanish population lived below the poverty line of \$2 a day per person in 1900⁵⁶⁶. Educational levels and bio-physical welfare are indeed closely intertwined since a more educated population is more aware of health status and its causes and, consequently, is going to pay more attention to appropriate diets and hygiene habits. Both variables are indeed positively

⁵⁶⁰ Planas, 'Cooperativismo y difusión', p. 111.

⁵⁶¹ Martínez Soto, 'El cooperativismo de crédito', p. 146.

⁵⁶² M.J. Bowman, 'Education and economic growth: An overview', in T. King (ed.), *Education and income: A background study for World Development Report* (Washington, 1980); T.W. Schultz, 'Investing in people: Schooling in low income countries', *Economics of Education Review*, 8 (1989).

⁵⁶³ Schultz, *Transforming traditional agriculture*, p. 175.

⁵⁶⁴ S.J. Horrell, J. Humphries and H.-J. Voth, 'Destined for deprivation: Human capital formation and intergenerational poverty in nineteenth-century England', *Explorations in Economic History*, 38 (2001), p. 347.

⁵⁶⁵ R.W. Fogel, 'New sources and new techniques for the study of secular trends in nutritional status, mortality, and the process of aging', *Historical Methods*, 26 (1993); Martínez Carrión, 'El nivel de vida'.

⁵⁶⁶ Prados de la Escosura, 'Inequality, poverty', p. 369.

correlated in 19th century Spain⁵⁶⁷. In order to prevent multicollinearity problems, the Physical Quality of Life Index is thus employed as a proxy for expanded human capital⁵⁶⁸. This indicator combines literacy, infant mortality and life expectancy, and has been developed for the Spanish provinces by Domínguez and Guijarro⁵⁶⁹. Given the homogeneity of the sources from which it is built, this index is highly accurate and extremely helpful to analyse health and educational outputs in developing economies⁵⁷⁰. Human capital is expected to positively influence the emergence of cooperatives.

Lastly, a bunch of controls are also incorporated to account for other potential relationships that may affect the propensity to cooperate. These variables include the importance of the agricultural sector, the settlement pattern, population density, land productivity, total irrigated land, soil quality and ruggedness⁵⁷¹. A higher fraction of the

⁵⁶⁷ J.M. Martínez Carrión and J.J. Pérez Castejón, 'Creciendo con desigualdad. Niveles de vida biológicos en la España rural mediterránea desde 1840', in J.M. Martínez Carrión (ed.), *El nivel de vida en la España rural, siglos XVIII-XX* (Salamanca, 2002), pp. 449-450..

⁵⁶⁸ M.D. Morris, *Measuring the condition of the World's poor. The Physical Quality of Life* (New Delhi, 1979).

⁵⁶⁹ R. Domínguez and M. Guijarro, 'Evolución de las disparidades espaciales del bienestar en España, 1860-1930: El Índice Físico de Calidad de Vida', *Revista de Historia Económica*, 18 (2000).

⁵⁷⁰ Ibid, pp. 114-115. Literacy, that is, the proportion of the population who could read and write, is an appropriate indicator of human capital in the first stages of development, especially when the general level of education is low, which makes it suitable for analysing the Spanish case during this period (see Bowman and Anderson, 'Human capital'; Sandberg, 'Ignorance, poverty'; Núñez, *La fuente de la riqueza*). Infant mortality has been used as a proxy for health since it reflects patterns of hygiene and the nutritional status of the population, which denotes the balance between the intake of nutrients and the claims against it in the form of physical activity and exposure to various diseases (see Fogel, 'New Sources'; Martínez Carrión, 'El nivel de vida'). Life expectancy assesses the extent to which appropriate conditions can be maintained. For an analysis of this index in different European countries, see G. Federico and G. Toniolo, 'Italy', in R. Sylla and G. Toniolo (eds.), *Patterns of European industrialization. The nineteenth century* (London, 1991). Zamagni has indeed encouraged a more widespread use of this indicator among economic historians (see V. Zamagni, 'An international comparison of real wages, 1890-1913: Methodological issues and results', in P. Scholliers (ed.), *Real wages in 19th and 20th century Europe. Historical and comparative perspectives* (Oxford, 1989), p. 125).

⁵⁷¹ While the agricultural sector is measured by the proportion of the active population working on agriculture, population density divides inhabitants by the geographical area and the settlement pattern refers to the number of settlements (*caseríos* are not counted as settlements) per 100 km² (Dirección General del Instituto Geográfico y Estadístico, *Censo de la población de España, 1900*; Dirección General del Instituto Geográfico y Estadístico, *Nomenclátor de las ciudades, villas, lugares, aldeas y demás entidades de población de España* (Madrid, 1904); Instituto Nacional de Estadística, *Anuario Estadístico de España*, 2000). Land productivity is obtained by dividing agrarian output by productive land, while total irrigated land refers to the fraction of agricultural land irrigated by any means (Ministerio de Fomento, *Medios que se utilizan*; Gallego, 'Pautas regionales'). The ruggedness index

labour force employed in agriculture reflects economically backward rural societies where the benefits of cooperation may have been lower. A more disperse settlement pattern may have also reduced the propensity to cooperate by making social interaction and the diffusion of information more difficult. Population density, on the contrary, may have facilitated collective action for the opposite reasons. Land productivity, soil quality and ruggedness try to control for the expected benefits of cooperation, since not every area, nor every crop, offered the same opportunities to the development of cooperatives⁵⁷². Land productivity, in particular, also controls for the potential increase in productivity that either common land or irrigation communities may have promoted not through social capital, but through a different mechanism. Furthermore, the inclusion of total irrigated land also aims to separate the effect that irrigation *per se* could have had on agricultural organisation and productivity from the effect of the management of irrigation systems by irrigation communities⁵⁷³. Summary statistics of the variables employed are reported in Appendix E.

5.4 Results

Table 5.1 reports the results of a series of OLS cross-section regressions testing the hypothesis outlined above. Columns (1) and (2) report the baseline specification, relating the importance of cooperatives with the variables that account for social capital, as well as to those regarding market opportunities, access to the land and

quantifies terrain irregularity by combining the altitude between neighbouring cells using GIS (Goerlich and Cantarino, 'Rugosidad del terreno'). Lastly, soil quality is a measure of a province's suitability for agricultural purposes. This variable combines climate, soil, and terrain characteristics measured by the FAO's Global Agro-Ecological Zones. This information is available online at <http://www.iiasa.ac.at/Research/LUC/GAEZ/index.htm>. This geographic raster data are converted into one variable at the provincial level by taking the average of the points within that territory. For a more detailed explanation of this procedure, see J. Fenske, 'Does land abundance explain African institutions', *MPRA Working Paper*, 30967.

⁵⁷² F. Galassi, 'Measuring social capital: Culture as an explanation of Italy's economic dualism', *European Review of Economic History*, 5; Carmona and Simpson, *El laberinto*, p. 237.

⁵⁷³ The land irrigated by canals and *acequias*, managed by irrigation communities, constituted a 55 per cent of the total irrigated land.

human capital. Column (3) extends the set of variables including the different controls explained above. The high explanatory power of the model should be stressed, since it explains 83 per cent of the variation of the dependent variable. The variables assessing social capital have a highly significant statistical influence on the emergence of cooperatives in early 20th century Spain. The existence of irrigation communities is strongly correlated with the propensity to cooperate. The relationship between common lands and agricultural associations is more complex since, although common lands *per se* are not significant, there is either a negative or a positive statistically significant link depending on the importance of collective practices on the commons. In those areas where the local community was more involved in the use of the commons, the importance of cooperatives was higher. However, when commons were enjoyed privately, their influence was negative, indicating the presence of powerful elites that monopolised these resources, not only preventing the building of social networks around them, but also increasing inequality. This outcome points to the destruction of social capital brought about by the privatisation of both property- and user-rights carried out throughout the 19th century. The loss of control over the management and use of these resources limited the room to cooperate and the increasing social conflict that this process generated broke some of the links which held local communities together.

The incentives to cooperate seem to be enhanced by the presence of a wealthy market, as shown by the positive correlation between urbanisation and the dependent variable, although its effect is not significant when different controls are included. Apart from stressing weak internal demand as a key constraint on Spanish modernisation⁵⁷⁴, this may be explained by the deficiencies of the urbanisation proxy to

⁵⁷⁴ Nadal, 'A century of industrialization'.

account for long-distance trade. In this sense, the low cooperative success of North-western Spain, specialised in perishable dairy products and meat, may be due to the long distance to the main markets and the high transportation costs⁵⁷⁵. Resorting to foreign markets of dairy products and meat was also limited by protectionism since, by increasing the relative cost of cattle fodder, it impeded the region's ability to compete efficiently, thus closing the path that Denmark, for example, had followed⁵⁷⁶.

TABLE 5.1 THE EMERGENCE OF COOPERATIVES IN EARLY 20th CENTURY SPAIN

	Dependent variable: Membership in agrarian cooperatives 1923				
	OLS			IV	
	(1)	(2)	(3)	(4)	(5)
Common Lands	-0.041 (0.072)				
Common Lands* Collective Uses		0.030 (0.069)	0.357*** (0.098)	0.258* (0.143)	0.542** (0.255)
Common Lands* Private Uses		-0.355* (0.182)	-0.574*** (0.110)	-0.723*** (0.254)	-0.675*** (0.131)
Irrigation Communities	0.565*** (0.166)	0.676*** (0.171)	0.363** (0.147)	1.634*** (0.469)	0.569 (0.457)
Physical Qual. Life Index	0.803*** (0.150)	0.745*** (0.140)	0.535*** (0.102)	0.656*** (0.195)	0.457*** (0.149)
Urbanisation	0.191** (0.083)	0.244*** (0.085)	0.091 (0.106)	0.428*** (0.156)	0.109 (0.129)
Access to Land	0.198 (0.137)	0.277** (0.127)	0.076 (0.090)	0.521** (0.212)	0.135 (0.147)
Access to Land* Aver. Plot Size	0.005 (0.005)	0.007 (0.005)	0.009* (0.005)	0.016** (0.007)	0.011** (0.005)
Controls	No	No	Yes	No	Yes
Observations	44	44	44	44	44
R-squared	0.54	0.57	0.83	0.24	0.80

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. For simplicity, the intercept is not reported. Controls include population density, agricultural population, settlement pattern, land productivity, irrigation, ruggedness index and soil quality.

⁵⁷⁵ Carmona and Simpson, *El laberinto*, p. 256.

⁵⁷⁶ Van Zanden, 'The first green revolution', p. 232.

The variables that represent access to the land, either the fraction of landholders or its interaction with the average size of the plot, appear to have had a significant impact on cooperation rates. In this regard, it is not only important that access to land was widespread, but that the plots worked by farmers were large enough to provide sufficient financial resources to secure their operations. This result does support previous interpretations that stress the importance of a wide layer of small, but especially medium-size farmers, as a condition to cooperate⁵⁷⁷. In this sense, the extreme land fragmentation of northern Spain could have been a barrier due to the farmers' lack of capital. In addition, the estimated effects of inequality may be downward biased for two main reasons. Firstly, in those regions where access to land was more concentrated, cooperatives may have been over represented since the extreme poverty of their members led to low levels of activity and a high degree of failures despite, their initial proliferation. This effect is perhaps not reflected in the data⁵⁷⁸. Secondly, there is a wide consensus that, although the geography of land inequality did not vary due to the privatization of common lands from 1860 onwards, the gap between regions increased⁵⁷⁹. Therefore, employing data on 1860 instead of 1900 may also produce a downward bias in the estimated coefficients.

Lastly, the Physical Quality of Life Index shows a highly significant and positive correlation with the propensity to cooperate. The high levels of human capital in northern Spain thus contributed to the emergence of cooperatives. This result should be stressed since the role of human capital, although important for other countries, has been overlooked in the Spanish case.

Therefore, the OLS estimates show a positive effect of the existence of collectively-used resources on the emergence of cooperatives. However, it may be the

⁵⁷⁷ Garrido, 'Why did most cooperatives fail?'

⁵⁷⁸ Garrido, 'El cooperativismo agrario', p. 134.

⁵⁷⁹ Rueda Herranz, *La desamortización*, p. 66.

case that an omitted variable is correlated with common lands, irrigation communities and cooperatives, thus biasing those results. In other words, unobserved provincial characteristics may be behind both the existence of collectively-used natural resources and the emergence of cooperatives. In order to overcome the identification problem, an instrumental variable approach is employed which exploits the variation in collectively-used natural resources that arose from differences in each province's climatic conditions. This strategy has the added benefit of yielding potentially consistent estimates even though collectively-used lands and irrigation communities may be measured with error. The measurement error that may exist in the dependent variable, even though it is a less worrisome issue in terms of endogeneity, is also addressed by the use of instrumental variables.

On the one hand, the second chapter of this dissertation has shown that climate constraints are correlated with the persistence of common lands in Spain. Given that water (or the lack of it) constituted the primary constraint on Spanish agricultural yields, if production needed to be increased, the only available choice was to expand arable land, predominantly at the expense of common lands. The need to expand arable land was lower in humid Spain, since without this restriction production could be increased through a more intensive use of the territory. The persistence of collective lands in humid Spain was thus partly caused by the greater capacity of its agriculture to increase production, without resorting to the expansion of arable land, and by the function that the commons themselves fulfilled to support these high agricultural yields by supporting livestock that could provide fertiliser and workforce. The average annual rainfall is therefore employed as an instrument for collective lands.

On the other hand, irrigation systems and the irrigation communities that managed them historically developed with more intensity in those areas where rainfall

was scarce and greatly diverged between seasons and where floods episodes appeared more frequently⁵⁸⁰. These infrastructures aimed at both regulating the river basin (thus lowering environmental risks) and facilitating irrigation. Consequently, an index interacting average annual rainfall and intra-annual variability of precipitation, measured by the coefficient of variation of monthly rainfall, is employed as an instrument for irrigation communities.

Built using long-term climate series data from 1901 to 2002⁵⁸¹, both instruments are clearly exogenous and thus plausibly uncorrelated with the propensity to cooperate. Although this condition is difficult to test, the history of the development of cooperatives in Spain supports this claim since it does not seem that climate constraints affected the emergence of cooperatives. A potential concern is that both instruments influenced the emergence of cooperatives through their impact on agricultural productivity instead of through the social capital promoted by collectively-used resources. This issue is addressed by controlling for soil quality, ruggedness and agricultural productivity. This identification strategy relies on the assumption that, holding everything else constant, environmental constraints impact the emergence of cooperatives only through the existence of common lands and irrigation communities. Using a cross-sectional data set of countries, Felix-Rota argues that temperate climates enjoy higher levels of social capital, which would affect the identification strategy explained above⁵⁸². However, including the temperature deviation from the national average, together with rainfall and altitude⁵⁸³, does not affect the results reported here. In fact, none of the climate variables are shown to be statistically significant. Therefore,

⁵⁸⁰ Domínguez, *La riqueza de las regiones*, p. 110; Pérez Picazo and Lemeunier, 'Los regadíos murcianos', p. 28.

⁵⁸¹ Goerlich, 'Datos climáticos históricos'.

⁵⁸² M. Felix-Rota, 'Social capital and climate', *Cuadernos de Economía: Spanish Journal of Economics and Finance*, 33 (2010).

⁵⁸³ Instituto Nacional de Estadística, *Anuario Estadístico de España, 2000*; Goerlich, 'Datos climáticos históricos'.

the argument that climate conditions may promote social capital and contribute to the emergence of cooperatives is not supported in this case. In fact, what the instrumental variable approach shows here is that certain environmental features can facilitate the existence of particular institutions, but only when these institutions are in place, can social capital be generated and sustained.

Columns (4) and (5) in table 5.1 report the results of the IV regressions. Both instruments show a significant relationship with the instrumented variables in the first stage. The IV estimates hardly change the results obtained by the OLS regression, contributing to support the hypotheses argued here. However, although the influence of collectively-used lands on the propensity to cooperate is clearly shown in the IV estimates, the effect of irrigation communities becomes insignificant after including controls. It may be possible that the hypothesised positive role of irrigation communities on social capital has been overstated. According to Garrido, British and French reports carried out in the 19th century misunderstood the democratic functioning of irrigation communities in Spain, and their works greatly shaped the image that social scientists have of these institutions today⁵⁸⁴. Attending the irrigators' assemblies required owning irrigated land and only a minority of farmers fulfilled this condition. It was also commonplace that the ordinances stated that only landowners who owned a certain amount of irrigated land could be members of these committees. In addition, an important share of irrigated land became increasingly owned by urban investors, a trend which accelerated in the 19th century. The interests of large landowners thus dominated the functioning of these institutions. However, despite all these limits to a more widespread participation, Garrido concedes that it is possible that most irrigators did

⁵⁸⁴ S. Garrido, 'Aprendiendo a regar imperios. Ingenieros, España y la India Británica', *Historia Social*, 73 (2012).

have a high degree of indirect involvement⁵⁸⁵. In this sense, the insignificance of the irrigation communities' estimates in the IV regression is perhaps due to the statistical effect of losing degrees of freedom when adding more control variables and the complexity introduced by the instrumental variable procedure itself. Its p-value on column (5) is indeed only 0.223. Likewise, the consistency of the OLS and IV estimates make it unlikely that the positive relationship between collectively-used resources and the emergence of cooperatives is due to omitted variable bias. Performing a Hausman test shows that differences in OLS and IV estimates are not systematic. If endogeneity is not an issue, OLS estimators would be preferred since the 2SLS approach increases the variance of the estimators. This would support the argument that the non-statistical significance of the irrigation communities' IV estimates when controls are included is due to high standard errors. This interpretation is consistent with the high explanatory power of the model which only leaves 17 per cent of the variation of the dependent variable unexplained.

The estimated magnitudes of the relationship between common lands and cooperatives are not only statistically significant but also economically important. Table 5.2 reports the standardised beta coefficients of the variables of interest. A one-standard-deviation increase in the stock of collectively-used common lands is associated with a 0.61-0.92 standard deviation increase in the importance of cooperatives in 1923, depending on the estimation performed. On the contrary, the presence of privately-used common lands negatively affected the building of cooperatives by 0.30 to 0.36 standard deviations. The impact of irrigation communities ranges from 0.24 to 0.38 standard deviations, although its statistical significance is more dubious, as commented above. As shown in the table, high levels of human

⁵⁸⁵ Ibid, p. 49.

capital are also a key element in sustaining the cooperative movement. Lastly, it should be stressed that it is not only important that access to land was widespread, but that the plots worked by farmers needed to be large enough to provide enough financial resources to secure their operations.

TABLE 5.2 STANDARDISED COEFFICIENTS ON THE EMERGENCE
OF COOPERATIVES IN EARLY 20TH CENTURY SPAIN

	OLS	IV
	(1)	(2)
Common land* Collective Uses	0.605***	0.917**
Common land* Private Uses	-0.304***	-0.357***
Irrigation Communities	0.245**	0.385
Physical Quality Life Index	0.476***	0.407***
Urbanisation	0.189	0.227
Access to land	0.090	0.160
Access to land* Average Plot Size	0.269*	0.338**

Including all control variables. *, **, or *** denotes significance at 10, 5 or 1 per cent level.

5.5 Concluding remarks

The existence of collectively-used resources, especially common lands, contributed to the emergence of cooperatives in early 20th century Spain by providing the social networks that facilitated the diffusion of information and the building of mutual knowledge and trust. The result that trust is essential to the development of cooperatives is consistent with the experience of other countries, such as the successful example of Denmark and the less triumphant cases of Ireland, Belgium or Italy. In this sense, the case of the commons is particularly illuminating since its positive effect on collective action is only visible when the access to them had not been privately

appropriated. Human capital, both educational and bio-physical, is also a crucial element when explaining the diverse regional pattern of agricultural associations.

The longstanding traditions of local cooperation around collective resources were weakened during the transition to capitalism by both the expansion of markets and the intervention of the state. The privatization process that from the 18th century affected not only their property rights, but also the collective practices over the surviving commons, may have had unintended consequences for economic development by negatively affecting the possibility of resorting to cooperation mechanisms different from the market. Although there is no uniform recipe to promote collective action at the local or regional level, this paper has tried to stress the importance of local social networks. However, the macro links explored here must be complemented by analyzing the mechanisms that account for these relationships at the micro level.

CONCLUSION

As the previous chapters illustrate, the persistence of the commons in some Spanish regions was not detrimental to economic development, at least relative to the institutional arrangements that succeeded them. On the contrary, during the early stages of modern economic growth, the communal regime not only did not limit agricultural productivity growth, but indeed constituted a crucial part of the functioning of the rural economics in a number of ways. On the one hand, these collective resources complemented rural incomes and, subsequently, sustained households' consumption capacity. The reduction in life expectancy and heights in the provinces where privatisation was more intense, as well as the negative effect on literacy levels, strongly supports that the privatisation of the commons deteriorated the living standards of a relatively large part of the population. On the other hand, the communal regime also significantly contributed to financing the municipal budget. Deprived from this important source of revenue, local councils became unable to adequately fund local public goods and ended up increasing local taxes. Lastly, the social networks developed around the use and management of these collective resources facilitated the diffusion of information and the building of mutual knowledge and trust, thus constituting a vital ingredient of the social glue that held these rural communities together. All things considered, the persistence of the commons in some regions provided peasants with cooperation mechanisms different from the market and made the transition to modern economic growth more socially sustainable. Hence, the long-standing belief in the existence of a trade-off between equity and efficiency appears to be utterly misleading.

In this regard, Robert Allen's conclusion that enclosing the commons allowed British rural elites to redistribute in their favour part of the existing agricultural surplus, rather than significantly increasing it, can therefore also be applied to the dismantling

of the communal regime in Spain⁵⁸⁶. Notwithstanding other factors, as analysed in chapter two, the importance of the distributional conflicts surrounding institutions, rather than efficiency considerations, to explain their persistence or their demise is especially relevant here⁵⁸⁷. The dismantling of the communal regime contributed to consolidating an unequal land structure at the expense of poor farmers and peasants⁵⁸⁸. In Extremadura, western Andalusia and some regions of central Spain, the privatisation of common lands was one of the keys of the property accumulation carried out by the local elites⁵⁸⁹. Although the commons appears to have been a relatively efficient institution for a large share of the population, large landowners accelerated their dismantling in order to lay their hands on a bigger share of the economic pie⁵⁹⁰. The attack on the commons had to be obviously more subtle. It is however telling that the arguments that, from the late 18th century and throughout the 19th century, were advanced regarding the supposed inefficiency of the communal regime came mostly from representatives of the upper classes. According to Tomás y Valiente, the main aim behind the *General Disentailment Act* was benefiting those who had the means to buy the disentailed property⁵⁹¹. The landowning elite controlled the political power and, as in other European countries before, was able to pass the legislation which best served

⁵⁸⁶ Allen, 'The efficiency'; *Enclosure*; 'Community and market'. Rephrasing this author, most Spanish men and women would have been better off had the privatisation of the commons never occurred. For the original, see Allen, *Enclosure*, p. 21.

⁵⁸⁷ Ogilvie, 'Whatever is', p. 662-665. A similar distinction between 'class efficiency' and 'productive efficiency' can be found in A. Bhaduri, 'Economic power and productive efficiency in traditional agriculture', in B. Gustafsson (ed.), *Power and economic institutions. Reinterpretations in Economic History* (Aldershot, 1991).

⁵⁸⁸ Tortella, "Agriculture", p. 47; Nadal, 'A century', pp. 63-64. See also a recent account in Gallego et al., 'Las Españas rurales', pp. 94-100.

⁵⁸⁹ GEHR, 'Más allá', p. 120. As shown in chapter 1, the dismantling of the commons was more intense in these regions, which also suffered a highly unequal land distribution.

⁵⁹⁰ Echoes of the idea that private property regimes or market institutions did not arise spontaneously but had to be actively promoted also resonate here. See K. Polanyi, *The great transformation: The political and economic origins of our time* (Boston, 2001).

⁵⁹¹ Tomás y Valiente, 'El proceso de desamortización', pp. 15-16. See also Simón Segura, *La desamortización*, p. 295.

their interests⁵⁹². These aims were nonetheless masked under an elaborate rhetoric praising its potential benefits for the nation's welfare.

If common lands were not a primitive and relatively inefficient institution, we should therefore need to look somewhere else to explain Spanish agricultural backwardness⁵⁹³. This is, however, not to say that privatisation was negative *per se* but that the timing of the process and the way it was carried out had negative consequences on different economic and social dimensions. The previous chapters highlight that the effect of enclosure depended on the context in which it was applied. In this sense, the idea that the low urbanisation rates, scant manufacturing activity and poor income levels prevalent in the Iberian Peninsula during the 19th century did not provide the adequate economic incentives to trigger a rapid modernisation of the agricultural structures is common place⁵⁹⁴. Likewise, as commented above, the distributional effects of privatisation should not be taken lightly. Not for being often repeated is the old argument less true: the *Disentailment* missed the chance to reform the unequal structure of land property, especially in some regions⁵⁹⁵. In addition, for multiple reasons that are beyond the scope of this dissertation, the public sector was unable or unwilling to intervene and prevent, or even correct, the negative consequences which were likely to

⁵⁹² Fontana, *Cambio económico y actitudes políticas en la España del siglo XIX* (Barcelona, 1973), pp. 161-165. For recent assessments of the Spanish political system during this period, see Moreno Luzón, 'Political clientelism'; Curto et al., 'Pork-barrel politics'. See also Gallego et al., 'Las Españas rurales', pp. 99-100.

⁵⁹³ Although the agricultural sector has been traditionally blamed for the Spanish poor economic performance during the 19th century, the current consensus contends that farmers were capable of adopting innovations but the low demand arising from the manufacturing and urban sector was unable to create the incentives to do so. The slow growth of Spanish agricultural productivity remains nonetheless a controversial topic. For recent approaches to these issues, see Pujol et al., *El pozo de todos los males*; Carmona and Simpson, *El laberinto*; V. Pinilla, 'Sobre la agricultura y el crecimiento económico en España (1800-1935)', *Historia Agraria*, 34 (2004); Clar and Pinilla, 'The contribution of agriculture'.

⁵⁹⁴ Simpson, *Spanish agriculture*; Pujol et al., *El pozo*; Carmona and Simpson, *El laberinto*; Pinilla, 'Sobre la agricultura'.

⁵⁹⁵ Costa, *Colectivismo agrario*; Carrión, *Los latifundios*; Malefakis, *Agrarian reform*; Simón Segura, *La desamortización*. Spanish liberalism, however, never seriously considered reforming land ownership distribution. This type of agrarian reform had to wait until the advent of the II Republic (1931-1936). See Robledo, *Economistas*; 'Política y reforma agraria'.

result from the process⁵⁹⁶. If Spain had been a more advanced economy, land had been more equitably distributed, the central government had provided local councils with alternative reliable sources of funding to replace the forgoing revenues arising from the commons, and/or the public sector had stepped in to fulfill the functions which were provided by these collective resources, the outcome of the privatisation process would surely have been different.

In any case, instead of considering private, public and collective arrangements as mutually exclusive, it is more useful to consider them as complementary. In complex socio-ecological systems, institutional diversity indeed becomes an end in itself⁵⁹⁷. In this regard, privatisation processes often eliminate the institutions that support a market economy, especially in developing regions where market failures are widespread and the state is absent⁵⁹⁸. The social cohesion and the social networks that the commons generated served as a complement to the market by providing certain basic services, such as credit access, diffusion of information, mutual assistance and a kind of social security net⁵⁹⁹. In addition, the welfare of peasant families and their capacity to take advantage of the opportunities that were opening up depended on the whole array of assets that they could rely on⁶⁰⁰. The dismantling of the communal regime undoubtedly reduced their room for manoeuvre and their capacity to successfully participate in market exchanges, either in the land, labour or capital markets⁶⁰¹.

⁵⁹⁶ Potential effects which were nonetheless perfectly known for those implementing these reforms. The Parliamentary discussions regarding this particular and the numerous warnings that the disentanglement process arose are well documented. See Simón Segura, *La desamortización*; Moral Ruiz, *La agricultura*; Gómez Urdañez, 'Doctrinas y realidades'.

⁵⁹⁷ E.Ostrom, *Understanding institutional diversity*, p. 256; Gallego, *Más allá*, pp. 144-152.

⁵⁹⁸ Timmer, 'Agriculture', p. 1490.

⁵⁹⁹ Gallego, *Más allá*, pp. 32, 168-169.

⁶⁰⁰ Ibid., p. 165. Apart from access to the commons, the rural households' room for manoeuvre was shaped by the level of access to other resources, such as land or credit, the possibility of obtaining alternative incomes (wages, sales or remittances) and the cohesion of local and familiar networks.

⁶⁰¹ The efficiency of the market depends on the room for manoeuvre of those participating in the exchange. See A. Bhaduri, 'Forced commerce and agrarian growth', *World Development*, 14 (1986).

It is also crucial to stress that institutions are multifaceted and their overall efficiency cannot be properly assessed by just focusing on their most visible feature. As Sheila Ogilvie forcefully argues, the effect of any institutional change needs to be addressed by looking at all the different dimensions which might be affected by it⁶⁰². Positive consequences on one domain might be more than offset by its impact on other realms of the economic and social body. The commons definitely were a multifaceted institution which not only played a role in the functioning of the agricultural system but did also help securing a minimum standard of living for large shares of the population and contributing to the finances of local councils, not to mention their role holding the social ties of the community together. Although I have attempted to honour this claim and analysed this institutional change in all its complexity, other potential links between the privatisation of the commons and economic development have remained unexplored. As argued below, however, these absences do not alter the picture depicted here.

On the one hand, it is usually argued that the British enclosures led to increasing inequality⁶⁰³. Spanish historiography has also long defended that the dismantling of the communal regime especially affected the living standards of the bottom part of the rural population and accentuated existing inequalities⁶⁰⁴. Drawing on a multitude of local studies, the consensus now seems to be that privatisation reinforced the prior land ownership structure⁶⁰⁵. Where access to land was relatively broad, wide layers of the rural population benefited from privatisation. Where inequality was high, large landowners took advantage of their privileged position to monopolised the sales which,

⁶⁰² Ogilvie, 'Whatever is', p. 668.

⁶⁰³ Humphries, 'Enclosures'; Allen, *Enclosure*; Neeson, *Commoners*. Although these claims have been contested. See Shaw-Taylor, 'Parliamentary enclosure'; Clark and Clark, 'Common rights'.

⁶⁰⁴ See, for instance, Simón Segura, *La desamortización*, p. 253; Tomás y Valiente, 'El proceso de desamortización', p. 30; Ortega Santos, *La tragedia*; Gallego et al., 'Las Españas rurales', pp. 98-99.

⁶⁰⁵ Rueda Herranz, *La desamortización*; Jiménez Blanco, 'El monte'.

in turn, promoted even more land concentration. As Gabriel Tortella has pointed out, the lack of homogenous information on the evolution of inequality has nonetheless prevented drawing stronger conclusions on this issue⁶⁰⁶. However, in collaboration with other colleague, I have recently estimated provincial income inequality and poverty levels during the period under study here⁶⁰⁷. This research shows that, after taking into account other determinants of inequality, the persistence of common lands is correlated with lower levels of inequality. Although a high level of inequality was conventionally thought to be behind higher rates of savings and investments and thus promoting economic growth, mounting research, both theoretical and empirical, now stresses the negative effects of inequality on economic development⁶⁰⁸. The unequal distribution of land ownership has indeed been considered as one of the main causes of the poor performance of Spanish agriculture and the lack of a more rapid industrialisation⁶⁰⁹. The image portrayed here regarding the effect of enclosure can therefore be considered as a conservative assessment, since the negative consequences coming from a more unequal access to the land on economic development have not been directly addressed.

On the other hand, one of the aims of the privatisation of the commons was to alleviate the finances of the Spanish Crown and reduce the public debt. The *General*

⁶⁰⁶ Tortella, 'A slow moving sector', p. 45.

⁶⁰⁷ F.J. Beltrán Tapia and J. Martínez Galarraga, 'Inequality and early economic growth in Spain, 1860-1930', paper presented at the *European Historical Economics Society Congress* (London, September 2013). This paper can be found in http://www.ehes.org/beltran_tapia.pdf.

⁶⁰⁸ D.K. Gupta, *The economics of political violence* (New York, 1990); T. Persson and G. Tabellini, 'Is inequality harmful for growth?', *American Economic Review*, 84 (1994); R. Perotti, 'Growth, income distribution and democracy: What the data say', *Journal of Economic Growth*, 1 (1996); A. Alesina and R. Perotti, 'Income distribution, political instability and Investment', *European Economic Review* 40 (1996); Deininger and Squire, 'New ways', 1998; Engerman and Sokoloff, 'History lessons'; D. Acemoglu et al., 'Institutions as a fundamental cause of long-run growth', in P. Aghion and S.N. Durlau (eds.), *Handbook of Economic Growth*, vol. 1 (Amsterdam, 2005); Easterly, 'Inequality'; Byerlee et al., 'Agriculture for development: Toward a new paradigm', *Annual Review of Resource Economics*, 1 (2009); Galor, *Unified growth theory*; D. Acemoglu and J.A. Robinson, *Why nations fail. The origins of power, prosperity and poverty* (New York, 2012). For a summary of this literature, see Beltrán Tapia and Martínez Galarraga, 'Inequality'.

⁶⁰⁹ J. Nadal, *El fracaso de la revolución industrial en España, 1814-1913* (Barcelona, 1975); Tortella, *The development*. See also R. Domínguez, 'Desigualdades sociales y crecimiento económico regional en España a largo plazo', *Revista de Historia Industrial*, 22 (2002) and P. Pascual and C. Sudriá, 'Notas sobre El pozo...', *Historia Agraria*, 28 (2002), pp. 214-215; Pinilla, 'Sobre la agricultura', p. 151-152; Clar and Pinilla, 'The contribution', p. 313.

Disentailment Act stipulated that local councils had to be compensated for the loss of these resources. According to the legal text, 20 per cent of the sale value would directly go to the state, while the remaining 80 per cent would belong to the municipalities but transformed in perpetual and inalienable public debt yielding a 3 per cent annual return⁶¹⁰. These public bonds, however, not only did quickly depreciate but the State often failed to honour the outstanding payments⁶¹¹. As shown in chapters 3 and 4, there is indeed ample evidence that municipal finances deteriorated during this period. The provision of local public goods was subsequently negatively affected and the local tax burden is likely to have increased⁶¹².

It is true nonetheless that the potential positive effect on the finances of the central state, and the positive externalities arisen from it, has not been analysed here. It has been argued, however, that the main reason behind the *General Disentailment Act* was not a distressing financial background but the political aim of benefiting a small elite⁶¹³. It is also worth stressing that a significant part of the private appropriation of the commons took place by illegal means and, therefore, never ended up contributing to the public coffers⁶¹⁴. In any case, between 1855 and 1900, the value of the municipal estates which ended up in private hands was 1,120.3 million pesetas⁶¹⁵. Moral Ruiz, however, claims that the amount raised was negligible given that it only meant a minor part of what was collected by the Lottery revenue⁶¹⁶. Moreover, the previous figures

⁶¹⁰ J. del Moral Ruiz, *Hacienda central y haciendas locales en España, 1845-1900* (Madrid, 1984), pp. 105-106; García Sanz 'Introducción', p. 28.

⁶¹¹ Moral Ruiz, *Hacienda central*, pp. 30-31, 106-107. The members of the parliament enacting the *Disentailment Act* were perfectly aware of the uncertain reliability of those pieces of paper. See Simón Segura, *La desamortización*, pp. 170-178.

⁶¹² Moral Ruiz, *Hacienda central*; García and Comín, 'Reforma liberal'.

⁶¹³ Tomás y Valiente, 'El proceso de desamortización', p. 15.

⁶¹⁴ López Estudillo, 'Los montes públicos', pp. 83-90; Balboa, 'La historia', p. 111; Jiménez Blanco, 'El monte', pp. 148-149.

⁶¹⁵ Moral Ruiz, *Hacienda central*, p. 104.

⁶¹⁶ *Ibid.*, p. 104.

include the funds obtained from the sale of municipal urban buildings, so they overestimate the amount of money generated by selling common lands.

Notwithstanding the previous arguments, around one third of the funds raised by the *Disentailment Act* ended up subsidising investments in road and railway infrastructure, and two thirds were devoted to the payment of debt interests and debt amortisation. Given that the railway network was mostly funded with foreign capital, it has been suggested that the contribution so obtained could not have made much of a difference⁶¹⁷. However, the disappointing pay-off which the first phase of the building of the railway network yielded casts some doubt on the potentiality of those externalities⁶¹⁸. The remaining two thirds of the amount collected certainly contributed to reducing the public debt. However, given that the Crown's finances suffered a chronic deficit and the state continued accumulating debt, the importance of this positive effect remains doubtful⁶¹⁹. Although more research on these issues is needed, we can tentatively agree with Gabriel Tortella that the disentailment, as a fiscal policy, did not constitute the panacea which was heralded⁶²⁰. According to Francisco Comín, given the large volume of public debt in circulation compared to the value of the

⁶¹⁷ Tomás y Valiente, 'El proceso de desamortización', p. 31.

⁶¹⁸ See G. Tortella, *Los orígenes del capitalismo en España. Banca, industria y ferrocarriles en el siglo XIX* (Madrid, 1975), pp. 183-200, 274-292; Nadal, *El fracaso*, pp. 50; Fontana, *Cambio económico*, p. 176. Also in F. Comín, 'Comentarios en torno al ferrocarril y crecimiento económico español entre 1855 y 1913', *Revista de Historia Económica*, 19 (1983). The railway mania of the period 1855-1866 and the subsequent excess capacity resulted in the financial panic of 1866 which badly affected the immature Spanish financial system. The economic impact of the establishment of the railway network in Spain has recently been revisited. See A. Herranz, 'Infraestructure and economic growth in Spain, 1845-1935', *Journal of Economic History*, 64 (2004).

⁶¹⁹ Moral Ruiz, Hacienda central, pp. 28-31; G. Tortella, 'La economía española, 1830-1900', in M. Tuñón de Lara (ed.), *Historia de España. Revolución burguesa, oligarquía y constitucionalismo*, vol. 8 (Barcelona, 1981), pp. 141-148; Comín, *Hacienda y economía*, p. 414; J. Fontana, 'Deuda pública, evolución de la Hacienda y crecimiento económico. Algunas sugerencias para su estudio', in F. Comín and J. Zafra (dir.), *Historia de la Hacienda en España (siglos XIX y XX). Homenaje a D. Felipe Ruiz Martín* (Madrid, 1991), pp. 104-105.

⁶²⁰ Tortella, 'La economía española', pp. 139.

disentailed property, it was indeed naïve to expect that this reform was going to solve the problems of the Treasury⁶²¹.

In addition, it can be argued that the positive effect of the disentailment on the State's financial capacity was more than offset by the consequences of the vast amount of land which flooded the market. On the one hand, the massive purchase of land under the *Dissentailment Act* prevented capital from being directed to more productive sectors⁶²². Instead of invested in manufacturing activities or transport infrastructures, financial resources were diverted into purchasing land. On the other hand, the main obstacle preventing the modernisation of the Spanish agricultural sector was the relative prices of the productive factors⁶²³. Due to the relative factor endowments, capital was dear and land and labour cheap. Farmers subsequently rather expanded arable land and resorted to wage labour than investing in artificial fertilisers or machinery. The massive increase on the land supply due to the disentailment undoubtedly prevented land prices to increase, reinforcing farmers' preferences to cheaply expand the land under cultivation, even running into diminishing returns⁶²⁴. Likewise, the privatisation of the commons made peasants dependent on wage labour⁶²⁵, thus pushing salaries downwards. Moreover, the unequal distribution of land, strengthened by the Madoz Law, created extreme asymmetries in the labour and land

⁶²¹ Comín, *Hacienda y economía*, p. 43.

⁶²² Tortella, *Los orígenes*, p. 224; Nadal, *El fracaso*, p. 83. See also, E. Giral i Raventós, 'Problemas históricos de la industrialización valenciana', *Estudios Geográficos*, 112 (1968), pp. 387-388; F. Tomás y Valiente, 'Recientes investigaciones sobre la desamortización: Intento de síntesis', *Moneda y Crédito*, 131 (1974), p. 135; Simón Segura, p. 300.

⁶²³ Pinilla, 'Sobre la agricultura', p. 150.

⁶²⁴ Not to mention that land was not only regarded as a safe asset but also as a status good. A great deal of the purchases was made with that on mind, rather than with the aim of improving agricultural methods. The complaints about absent landowners are common place in Spanish historiography and it has often been argued that Spanish bourgeoisie invested in land in order to resemble the nobility. See Artola et al., *El latifundio*; Bernal, *Economía e historia*; Sagner, 'Estímulos y obstáculos'.

⁶²⁵ López Estudillo, 'La privatización', p. 93; GEHR, 'Diversidad', pp. 130-131; Ortega Santos, *La tragedia*, p. 21; Jiménez Blanco, 'El monte', p. 146.

markets, thus reinforcing a system of incentives which allowed landowners to maximise their rents without modernising their farms⁶²⁶.

The absences described above therefore do not cloud the image portrayed here, which can be safely considered as a conservative evaluation of the negative consequences of the privatisation of the commons in 19th century Spain. In any case, a more accurate assessment of these issues requires new research efforts. In this sense, overcoming the lack of data on the stock of common lands at the end of the 18th century should constitute a priority which would fundamentally advance our understanding of the ‘forgotten’ disentanglement of the first half of the 19th century. Likewise, as pointed out in the introduction, the results presented in this dissertation rely on provincial averages, what hides some of the variation within those regions and also yields a relatively small number of observations, thus reducing the power of the analysis. A finer-grain investigation, going down to more disaggregated levels of analysis, would surely address those concerns and provide a better view of how the different mechanisms at play worked at the local level. In this regard, I hope that my desire to provide an overall portrayal of the dismantling of the communal regime, not only regarding the whole of the Spanish geography, but also encompassing the different dimensions affected by it, has not unduly fallen under an excessive generalisation and missed the richness of detail intrinsic in such a multifaceted phenomenon. Not only is a more accurate evaluation of our recent past at stake. Given that developing countries are also facing massive privatisations of natural resources⁶²⁷, a proper understanding of

⁶²⁶ Pascual and Sudriá, ‘Notas sobre El pozo’, pp. 214-215; Pinilla, ‘Sobre la agricultura’, p. 151.

⁶²⁷ E. Ostrom et al. (eds.), *The drama of the commons* (Washington, 2002). The commons nowadays actually constitute a much wider category than the one analysed here. See also N. Dolsak and E. Ostrom (eds.), *Commons in the new millennium: Challenges and adaptation* (Cambridge, Mass., 2003); G. Bravo and M. de Moor, ‘The commons in Europe: From past to future’, *International Journal of the Commons*, 2 (2008).

how past societies faced similar challenges would improve our ability to deal with these processes today.

APPENDIX A

TABLE A.1 SUMMARY STATISTICS. COMMON LAND PERSISTENCE

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Common lands, 1860	46	25.9	17.0	1.1	60.9
Privatisation, 1860-1930	46	8.8	6.8	-0.4	28.1
Urbanisation	49	19.5	16.8	2.0	66
Population density	49	37.4	21.8	12.5	97.4
Market potential	47	0.90	0.73	0.18	3.40
Landowners	46	0.36	0.09	0.16	0.52
Plot size	46	12.6	8.31	0.8	32.7
Collective user-rights	46	0.58	0.27	0.01	1
Exempted common lands	46	0.08	0.08	0	0.34
Population dispersion	49	4,799	4,615	695	20,210
Humidity	49	4.4	2.1	1.6	9.2
Ruggedness	49	33.1	14.4	9.4	75.2
Altitude	49	17.4	19.2	0	70.8
Distance to Mad/Bcn	49	252.6	256.4	0	1742

Source: See text.

APPENDIX B

Total agricultural output

Data on agricultural production is taken from Gallego⁶²⁸. This author worked out information gathered by the Grupo de Estudios de Historia Rural to provide direct estimations of real agricultural output in 1900 and 1930 (in pesetas)⁶²⁹. This author provides disaggregated information on the different agricultural sub-sectors: agriculture, livestock and forestry.

Common lands

Given the hybrid nature that characterized the concept of the “commons” in 19th century Spain, this paper, following Iriarte, identifies common lands as those lands that were collectively managed at the local level, in spite of their ownership being collective, municipal or public⁶³⁰. Thus, rather than using the data offered by the GEHR for the availability of common lands in Galicia, this dissertation employs the data provided by Gallego, based on the estimates made by Artiaga and Balboa, that takes into account not only public lands, but also those collectively-owned. Unfortunately, no data for the three provinces in the Basque Country is available. See the introduction for a discussion of this assumption. Common lands are measured in hectares.

However, the communal regime in Spain involved two main types of access to the land: a direct but regulated access for all members of the community (*comunales*) or a temporary cession of user-rights to particular individuals in exchange for a monetary income (*propios*). The importance of collective user-rights is measured by the fraction of total uses which were being enjoyed collectively⁶³¹. In order to avoid unexplained short-run variations in the data, the average proportion of collective practices over the periods 1861-70, 1903-13 and 1920-32 is used to account for the years 1860, 1900 and 1930, respectively. However, as mentioned in the text, this variable turned out to be statistically insignificant in all specifications so it was dropped from the analysis.

Land

Apart from the commons, two other main types of land are considered. On the one hand, following the Grupo de Estudios de Historia Rural, the area of forests, pastures and meadows (*montes, dehesas y pastos*) which was not held in common is calculated by subtracting the

⁶²⁸ Gallego, ‘Pautas regionales’.

⁶²⁹ GEHR, *Estadísticas históricas*. The methodology employed to deflate the figures of 1930 is explained in Gallego, ‘Pautas regionales’, pp. 266-267.

⁶³⁰ Iriarte, ‘Common lands’.

⁶³¹ GEHR, *Estadísticas históricas*.

total productive land from the arable land and the commons⁶³². On the other hand, arable land is also taken from Gallego and the GEHR⁶³³. However, the intensity of cultivation depended on the amount of land left fallow and the possibility to resort to irrigation, so the importance of both elements is estimated.

The intensity of rotations is measured through the fraction of land left fallow when cultivating cereals and leguminous plants. While data for 1930 is the average from 1930-1935, the figure for 1900 is the average from the periods 1886-1890 and 1903-1912⁶³⁴. Since no data is available for 1860, the data for the period 1886-1890 is used instead. The only exception is the province of Alicante which has no data for 1886-1890, so only the information in 1903-1912 is employed for both 1900 and 1860.

The amount of land irrigated is taken from contemporary governmental reports⁶³⁵. Irrigated area for 1930 is calculated by summing up the area irrigated for each crop. Given the lack of information regarding irrigation in some crops in this date, information from 1935 is used. Since no distinction between dry-farming and irrigation is made for some crops, various decisions have been made. Among the cereals, the agronomists in charge of the report Junta Consultiva Agronómica indicates that rice, millet (*panizo*) and pearl millet (*mijo*) are cultivated in irrigated land in early 20th century⁶³⁶. Together with these two cereals, all *huerta* crops are assumed to be farmed in irrigated lands, while those fruit trees expected to be cultivated in dry-farming (*secano*) are left out (*higuera*, *almendro*, *castaño*, *nogal* or *algarroba*). Given that alfalfa, a fodder crop, 'was almost exclusively cultivated in irrigated land'⁶³⁷, it is also assumed to be irrigated. In the case of artificial pastures, the percentage under irrigation in 1922, the only date when the area devoted to them is split up into dry-farming and irrigated, is applied to the area in 1935⁶³⁸. Particular crops presenting suspicious figures have been corrected using data from 1930. The figures so calculated are consistent with information coming from regional studies when available. The numbers obtained have been corrected if major flaws were found

⁶³² GEHR, 'Más allá de la "propiedad perfecta"', p. 136. The total productive land is the result of deducting unproductive areas, such as marshlands, waterways and the space occupied by cities, from the provincial area. This figures are taken from Gallego, 'Pautas regionales'.

⁶³³ Ibid.; GEHR, 'Más allá de la "propiedad perfecta"'.
⁶³⁴ GEHR, *Estadísticas históricas*.

⁶³⁵ Comisión de Estadística General del Reino, *Anuario estadístico de España, 1858* (Madrid, 1859); Junta Consultiva Agronómica, *El regadío en España* (Madrid, 1904); Junta Consultiva Agronómica, *Medios que se utilizan para suministrar el riego a las tierras y distribución de los cultivos en la zona regable. 2 vols.* (Madrid, 1918); and Dirección General de Agricultura, *Anuario estadístico de la producciones agrícolas* (Madrid, 1935).

⁶³⁶ Junta Consultiva Agronómica, *El regadío*, p. 14.

⁶³⁷ Dirección General de Agricultura, *Anuario estadístico*, p. 398.

⁶³⁸ GEHR, *Estadísticas históricas*. In some cases, the information appearing in the governmental surveys is dubious. For instance, the area devoted to artificial pastures in 1922 is only 175 (and not irrigated) when it was 11,175 and 10,539 in 1910 and 1930 respectively (Ibid., p. 193). Cantabria's artificial pastures are also considered to be cultivated in dry-farming (Ibid., p. 384). In the Basque country, the reports systematically show that all artificial pasture is not irrigated. Strange trends are also reported for Badajoz and Cádiz (Ibid., pp. 250, 344).

by looking up at regional studies⁶³⁹. For instance, Garrabou and Pujol reduce the extremely high figure of Lérida in 1900⁶⁴⁰. Also, Pérez-Picazo, Sánchez-Picón, Lana, Gallego and Ibarra and Pinilla provide more accurate figures for Murcia, Almería, Navarra, Logroño and Zaragoza respectively⁶⁴¹. The divergence between the figures for Córdoba in 1860 and 1900 is likely to be a typo, so the former has also been corrected. Likewise, given its subsequent evolution, Alicante and Albacete present an extremely high number in 1900, so the information in 1914 is used instead. A case in point is that of some Atlantic regions in 1860. The historical source assigns them with large amounts of irrigated area, especially devoted pastures. It seems, however, that some of them were not proper irrigation systems but areas which simply took advantage of the humid weather. Given that these areas do not generally appear as irrigated in the historical sources used for 1900 and 1930, a conservative approach has been taken regarding these regions and, subsequently, the figures for La Coruña, Lugo, Orense and León have been corrected. Lastly, given its subsequent evolution, the source for 1860 is also likely to have overestimated the irrigated area in provinces such as Guadalajara, Palencia, Salamanca, Soria, Teruel and Zamora, so the number in 1900 is used instead.

Labour supply

The size of the agricultural working population is taken from different Population Censuses as collected by Rosés et al.⁶⁴². A number of problems arise when dealing with the agricultural labour force. Firstly, population censuses do not consistently distinguish between workers employed in agriculture, livestock breeding or forestry. However, as mentioned in the text, this is not a problem when analyzing the whole agricultural sector. Secondly, the lack of consistency between censuses regarding female working population advises to rely only on male workers, a usual procedure both in Spanish and international historical literature⁶⁴³. Consistency between censuses also recommends using data of 1877 instead of 1860. It seems

⁶³⁹ I would like to thank M.J. Prados Velasco, J.A. Serrano, A. Sánchez Picón and D. Soto Fernández and V. Pinilla for their feedback on this issue.

⁶⁴⁰ R. Garrabou and J. Pujol, 'El canvi agrari en la Catalunya del segle XIX', *Recerques*, 19 (1987), p. 46.

⁶⁴¹ M.T. Pérez-Picazo, 'Cambio institucional y cambio agrario: La gestión del agua en los regadíos del Segura, s. XIX y XX', *Áreas*, 17 (1997), p. 104; A. Sánchez Picón, 'Los regadíos de la Andalucía árida (s. XIX y XX): Expansión, bloqueo y transformación', *Áreas*, 17 (1997), p. 112; J.M. Lana, 'Desequilibrios hídricos y transformaciones del regadío en la Navarra seca, 1841-1936', in R. Garrabou and J.M. Naredo (eds.), *El agua en los sistemas agrarios. Una perspectiva histórica* (Madrid, 1999), p. 366; D. Gallego, *La producción agraria de Álava, Navarra y La Rioja, desde mediados del siglo XIX a 1935* (Madrid, 1986); and P. Ibarra and V. Pinilla, 'Regadío y transformaciones agrarias en Aragón (1880-1990)', in R. Garrabou and J.M. Naredo (eds.), *El agua en los sistemas agrarios. Una perspectiva histórica* (Madrid, 1999), p. 407.

⁶⁴² Rosés et al., 'The upswing'.

⁶⁴³ Van Zanden, 'The first green revolution'; O'Brien and Prados de la Escosura, 'Agricultural productivity'; Erdozain and Mikalerena, 'Las cifras de activos agrarios'; Nicolau, 'Población'; Prados de la Escosura, 'Inequality'.

nonetheless that the population distribution did not change much between 1860 and 1877, while there was enough variation between 1877 and 1900.

Livestock

Provincial numbers of horses, mules, oxen, donkeys, pigs, goats and sheep have been taken from the livestock censuses published in 1865, 1905, 1929 and compiled by the GEHR⁶⁴⁴. These numbers have been transformed into a comparable figure using the live weights coefficients for each species provided by Flores de Lemus in 1917⁶⁴⁵. Given the lack of information, the size of animals and the fraction of them stalled are assumed to be constant throughout the period, although an increase in both variables may be in place, especially during the first decades of the 20th century. Since livestock provided traction and fertilizer, this variable has been partitioned into two: draught energy and organic manure.

On the one hand, given that only horses, mules, oxen and donkeys are able to be employed in agricultural tasks, their numbers have been transformed into potential draught power by applying the coefficients in Simpson⁶⁴⁶. On the other hand, the fertilizing capacity is measured based on the livestock total live weight calculated above. Following the methodology employed in Gallego and Zapata, total live weights are transformed into tons of manure depending on the intensity in the use of manure in each area⁶⁴⁷. In addition, in order to be able to compare the livestock fertiliser capacity with that of modern fertilisers, its actual fertilising nutrients, in terms of phosphorus pentoxide (P₂O₅), nitrogen (N) and potassium oxide (K₂O),

⁶⁴⁴ GEHR, *Estadísticas históricas*. The livestock census of 1891 has being dismissed given its low quality. See Ibid., p. 85 and Simpson, *Spanish agriculture*, p. 104. Livestock censuses are extensively reviewed in GEHR, 'Contribución al análisis histórico de la ganadería española, 1865-1929 (I)'; and GEHR, 'Contribución al análisis histórico de la ganadería española, 1865-1929 (II)'. Although the different censuses included young animals, somewhat reducing their reliability, the different studies that have analysed them have stressed their appropriateness to discern patterns and trends. See GEHR, GEHR, 'Contribución al análisis histórico de la ganadería española, 1865-1929 (I)', p. 137; García Sanz, 'La ganadería española', p. 87.

⁶⁴⁵ Flores de Lemus, 'Sobre una dirección'. This is a standard strategy in Spanish agrarian historiography. See, for instance, GEHR, 'Contribución al análisis histórico de la ganadería española, 1865-1929 (I)' p., 150; GEHR, *Estadísticas históricas*, p. 83; Gallego, 'Transformaciones técnicas'; García Sanz, 'La ganadería española', p. 91; Simpson, *Spanish agriculture*, p. 103. Live weight is measured in tons using the following coefficients: horses (0.326), mules (0.326), donkeys (0.172), oxen (0.371), sheep (0.030), goats (0.034) and pigs (0.077).

⁶⁴⁶ J. Simpson, 'La elección técnica en el cultivo triguero y el atraso de la agricultura española a finales del siglo XIX', *Revista de Historia Económica*, 5 (1987), p. 282. The draft energy coefficients are the following: 1 for mules, 0.75 for horses, 0.67 for oxen and 0.47 for donkeys. Kander and Warde employ slightly different coefficients for horses (1) and donkeys (0.33) reflecting perhaps their relative performance in a different environmental context. See Kander and Warde, 'Energy availability', p. 23.

⁶⁴⁷ Gallego, 'Transformaciones técnicas', p. 225; Zapata, *La producción agraria de Extremadura y Andalucía Occidental, 1875-1935* (Madrid, 1986), pp. 1538-1539. Given that there is data on the actual manure consumption in 1919, the intensity on the use of manure is calculated by putting that figure in relation to the importance of livestock in that date. Logroño, Tarragona and Valencia show dubious figures, so they are calculated as the average of the neighbouring provinces.

are computed for each type of animal. However, as mentioned in the text, multicollinearity problems prevent employing these series simultaneously in the regression analysis.

Chemical fertilisers

Gallego provides a complete picture of the provincial consumption of modern fertilizers in 1932⁶⁴⁸. It can be safely assumed that, for 1860, apart from the early diffusion of guano in a few Mediterranean provinces (see below), no chemical fertilizers were employed in Spanish agriculture. The situation in 1900 is somewhat different. Although their diffusion had been very slow in general terms, the use of these inputs had already progressed in several regions, especially in the Mediterranean coast and the Ebro valley⁶⁴⁹. Although no information at the provincial level is available for 1900, Alonso de Ilera, a Spanish agronomist, provides an account of the consumption of chemical fertilisers by province in 1907 and 1908⁶⁵⁰. Given that the use of these inputs at the national level increased between 1900 and 1907/08⁶⁵¹, the provincial figures are adapted accordingly assuming that the relative distribution between provinces did not change between those dates. The figures obtained are mostly consistent with the qualitative assessments about the importance of the use of modern inputs in each province given by agronomists in several reports conducted by the central state⁶⁵². Lastly, following Gallego, these gross figures are converted into equivalent nutrient units of nitrogen (N), phosphorous (P_2O_5) and potash (K_2O)⁶⁵³.

However, the assumption that there was no consumption of modern fertilizers in 1860 may be misleading since guano was relatively relevant in some areas during the second half of the 19th century⁶⁵⁴. Guano was intensely used in paddy fields and orange grooves in Valencia, a region which, together with Britain, pioneered in importing guano from Africa and South America⁶⁵⁵. Data on guano imports from Catalonia and Valencia is taken from Porqueres⁶⁵⁶.

⁶⁴⁸ Gallego, 'Pautas regionales'.

⁶⁴⁹ Gallego, 'Transformaciones técnicas'.

⁶⁵⁰ A. Alonso de Ilera, 'Empleo de los abonos químicos en la agricultura española', *El progreso agrícola y pecuario*, 15 (1909).

⁶⁵¹ Gallego, 'Transformaciones técnicas', p. 223.

⁶⁵² Junta Consultiva Agronómica, *Avance estadístico sobre cultivo y producción del cereal y de leguminosas asociadas en España. 3 vols.* (Madrid, 1891); Junta Consultiva Agronómica, *El regadío en España*. Taking into account that two provinces are missed due to the lack of data (Balears and the Canary Islands), adding up the provincial consumption so computed (122,203 tons) is relatively similar to the national figure (143,000 tons) estimated by Simpson, *Spanish agriculture*, p. 120-123.

⁶⁵³ Gallego, 'Transformaciones técnicas', p. 224. A standard procedure widely employed in the literature See Hayami and Ruttan, *Agricultural development*; and Craig et al., 'International productivity patterns'.

⁶⁵⁴ Gallego, 'Transformaciones técnicas', p. 174.

⁶⁵⁵ Simpson, *Spanish agriculture*, p. 102. The first shipment of guano arrived in Valencia in 1844, only four years later than to a British port. See E. Mateu, 'Difusión de nuevas tecnologías en la agricultura valenciana, siglo XIX', *Agricultura y Sociedad*, 66 (1993), p. 53.

⁶⁵⁶ B. Porqueres, *Importación y utilización de abonos en los países catalanes, 1849-1919* (Unpublished thesis, Universidad de Barcelona, 1965). I am thankful to Domingo Gallego for kindly sharing this document.

Although no other data is available about other provinces, the bias imposed by this lack of information is negligible due to the fact that these two regions consumed 97 per cent of the total Spanish imports of this fertilizer in 1862/63, a figure which had hardly decreased by 1900⁶⁵⁷. Given the availability of data and the need to prevent unexplained short-run variations, the average figures for the periods 1862/65 and 1895/1900 are employed. The total regional imports are allocated among each province using their relative importance in the consumption of chemical fertilizers in 1900. Finally, in order to homogenise these figures with those of chemical fertilisers, the actual chemical content of Peruvian guano is considered: nitrogen (12.3 per cent), phosphorus (9.5 per cent) and potassium (2.5 per cent)⁶⁵⁸. In any case, the results reported in the text remain unchanged regardless whether the series on artificial fertilizers contains guano or not.

Modern machinery

A complete census of agricultural machinery, providing quantitative information about all sorts of different machines, is only available for 1932. Given that tracing back all this information for the previous periods is almost impossible, only three types of machinery are used as proxies for the introduction of mechanical innovations in cereal farming: modern ploughs, threshing machines and tractors⁶⁵⁹. Historical sources do not mention any of these innovations around 1860, so it is assumed a value of 0 to all of them at that date. Estimations for 1900 are based on the information provided by agronomists working in each province at the end of the 19th century⁶⁶⁰. This qualitative and quantitative information is contrasted with regional figures provided in different studies and corrected if necessary⁶⁶¹.

⁶⁵⁷ Around 23,098 tons of guano a year were imported into these two regions between 1862 and 1865. These figures rose during the second half of the 19th century and began to decrease in the 1890s to become unimportant in the first decades of the 20th century (imports between 1895/1900 averaged 17,666 tons a year).

⁶⁵⁸ This information is available online from the Oregon State University Extension Service at <http://extension.oregonstate.edu/lane/sites/default/files/documents/lc437organicfertilizersvaluesrev.pdf>

⁶⁵⁹ Modern ploughs refer to the sum of different types of mouldboards and multiple-furrow ploughs. They not only achieved more depth but also turned the soil, thus bringing nutrients to the surface. See Simpson, 'La elección técnica', p. 280.

⁶⁶⁰ Junta Consultiva Agronómica, *Avance estadístico*. The situation in 1890 is representative of 1900 because, apart from involving almost negligible stocks of modern machinery, imports of machinery were only significant between 1875 and 1886 since the end-of-the-century crisis and subsequent protectionism dramatically cut back imports of modern inputs. See Gallego, 'Transformaciones técnicas', p. 209; Martínez Ruiz, *Trilladoras y tractores*, p. 46.

⁶⁶¹ Gallego, 'Transformaciones técnicas'; V. Pinilla, *Entre la inercia y el cambio*. El sector agrario aragonés, 1850-1935 (Madrid, 1995); Simpson, 'La elección técnica'; J. Simpson, 'Cultivo de trigo y cambio técnico en España, 1900-1936', *Noticiario de Historia Agraria*, 11 (1996); L. Fernández Prieto, 'Selección de innovaciones en una agricultura atlántica de pequeñas explotaciones. Galicia, 1900-1936. La adopción de las trilladoras mecánicas', *Noticiario de Historia Agraria*, 14 (1997); Martínez Ruiz, *Trilladoras y tractores*; and A. Cabral, *Renovación tecnológica y mecanización de la agricultura en Cádiz, 1850-1932* (Cádiz, 2000).

Firstly, except in some regions, modern ploughs were hardly used in 1900⁶⁶². Bearing this in mind, the qualitative assessments provided by agronomists point to whether or not this new equipment was either completely ignored, known by a minority and relatively or widely spread. In order to transform this qualitative information into figures, each province is classified in one of those four groups. The estimated number of modern ploughs is then computed by assuming that, accordingly, each group had 0, 2.5, 5 or 10 per cent of the ploughs existent in 1930⁶⁶³.

Secondly, regarding more advanced agricultural machinery, it can be safely assumed that it was not employed in 1860⁶⁶⁴. Although their importance at the national level was still anecdotal by 1900, the diffusion of labour-saving technology had nonetheless progressed in a few provinces, especially in Cádiz and Seville⁶⁶⁵. Information for 1900 is mostly qualitative but the sources sometimes stated the number of those apparatus that agronomists knew to be operating in a particular province. The total national figure obtained by this procedure is 177. Given that the total number of *locomóviles*, part of the ‘set’ including a thresher machine, imported between 1862 and 1893 was 310, and that not all of them were likely to be operating in 1890, this figure is plausible⁶⁶⁶. Additional corrections have nonetheless been made. The original source in 1891 points to the existence of numerous thresher machines in the province of Barcelona. Given that Cádiz and Seville, with 30 and 90 thresher machines respectively, were the provinces where this technology was more widespread, a figure of 30 apparatuses is assumed. Likewise, the source indicates the presence of ‘some’ thresher machines for rice in the province of Valencia in 1891. These ‘some’ is assumed to be 3⁶⁶⁷.

Thirdly, the number of tractors is considered in order to account for the motorisation of agriculture. Martínez Ruiz shows that the first tractors arrived to the peninsula in 1902, so it can be safely assumed that tractors were unknown in 1860 and 1900⁶⁶⁸. Complete quantitative information regarding tractors is available for 1930⁶⁶⁹.

⁶⁶² Simpson, ‘La elección técnica’, p. 280.

⁶⁶³ When there is some doubt in ascribing one province between two groups, an average is employed.

⁶⁶⁴ The first tests applying steam engines to agriculture in Spain were carried out at the end of the 1850s and throughout the 1860s. See Martínez Ruíz, *Trilladoras y tractores*, p. 28; Cabral, *Renovación tecnológica*.

⁶⁶⁵ Martínez Ruiz, *Trilladoras y tractores*, pp. 23-24, 49. In this regard, while only 2.5 per cent of the national cereal output was threshed using steam power, the province of Seville threshed 19.7 per cent of its cereals by this means (Ibid., p. 62). By 1932, the national figure had grown to 22.3 per cent (Ibid., p. 74).

⁶⁶⁶ Ibid., pp. 45-46. It should be noted that *locomóviles* and thresher machines were purchased together as a ‘set’. In this regard, Clayton, one of the British companies selling this machinery in Spain, exported the same number of threshing machines than ‘locomoviles’ between 1861 and 1891 (Ibid., p. 45).

⁶⁶⁷ A different series was computed grouping threshing machines and corn shellers together but the results of the empirical analysis remain unchanged.

⁶⁶⁸ Ibid., p. 114.

⁶⁶⁹ Gallego, ‘Pautas regionales’.

Lastly, once a series for each of these inputs is obtained, they are collapsed together under the category of modern machinery by employing average prices provided by Martínez Ruíz⁶⁷⁰.

Other variables

Urbanisation is measured as the proportion of population living in cities bigger than 5,000 inhabitants and the gross value added by non-agricultural activities per capita respectively⁶⁷¹. Literacy rates are taken from Núñez⁶⁷². Inequality in access to the land is measured through the fraction of landowners over active agricultural population⁶⁷³. Since data on land ownership is only available for 1860 and 1920, linear interpolation is employed to estimate the figure for 1900. For 1930, the information on 1920 is used.

Regarding the time-invariant factors, average rainfall, rainfall variation and average temperature come from long-term series data⁶⁷⁴. Likewise, while the ruggedness index quantifies terrain irregularity by comparing the altitude between neighbouring cells using GIS, altitude is measured as the fraction of provincial land over 1,000 metres⁶⁷⁵. The population settlement pattern refers to the number of hectares per parish⁶⁷⁶. Lastly, distance to big cities, either Madrid, Barcelona or Bilbao, is computed as the minimum geographical distance from the provincial capital to any of those cities.

⁶⁷⁰ Martínez Ruiz, *Trilladoras y tractores*, pp. 90, 144.

⁶⁷¹ Tafunell, 'Urbanización'.

⁶⁷² Núñez, *La fuente de la riqueza*.

⁶⁷³ Dirección General del Instituto Geográfico y Estadístico, 'Censo de la población de España, 1860'; 'Censo de la población de España, 1920'.

⁶⁷⁴ Goerlich, 'Datos climáticos históricos'.

⁶⁷⁵ Goerlich and Cantarino, 'Rugosidad del terreno'; Instituto Nacional de Estadística, *Anuario estadístico de España, 2000*.

⁶⁷⁶ Comisión de Estadística General del Reino, *Anuario Estadístico de España, 1859-1860*.

TABLE B.1 THE AGRICULTURAL SECTOR IN SPAIN, 1900

Province	Output per worker	Commons	Labour	Livestock	Chemical fertilisers	Other land	Arable land	Fallow (%)	Vines % Olive trees	Irrigated land	Capital
Álava	1.43	20,504	21,302.7	279.3				0.25	14,838	0	0.0
Ávila	1.22	137,178	54,477	57,981.2	73.8	326,472	272,450	0.49	19,192	31,908	0.0
Albacete	1.29	203,694	60,740	22,246.4	796.9	667,587	615,029	0.47	53,957	20,041	145.1
Alicante	0.60	29,950	110,557	13,964.1	1,186.2	267,053	260,897	0.50	120,150	51,386	24.8
Almería	0.49	135,577	90,944	15,958.0	211.1	427,893	217,380	0.55	5,688	22,112	0.0
Badajoz	0.93	133,863	165,934	89,006.5	710.4	1,398,256	575,478	0.47	52,473	4,271	159.8
Baleares	0.82	3,355	68,866	17,469.0		255,669	198,351	0.44	34,558	7,082	23.5
Barcelona	0.94	7,051	152,363	13,211.9	1,286.7	507,818	154,745	0.04	41,921	14,077	439.2
Burgos	1.61	254,560	90,613	70,621.7	205.1	566,726	546,539	0.45	38,000	15,300	61.7
Canarias		92,666	85,127	17,891.8			133,750	0.30	3,250	7,800	-
Castellón	1.11	25,829	87,060	26,873.5	1,052.1	338,316	273,655	0.37	80,296	30,120	78.4
Ciudad Real	1.46	180,907	83,831	36,573.4	307.2	1,206,730	573,114	0.52	113,760	17,668	81.2
Coruña, La	1.06	441,090	138,135	76,995.2	118.0	37,975	295,427	0.00	791	35,580	0.0
Cuenca	1.09	257,078	75,053	36,438.3	337.2	1,097,650	364,621	0.40	78,365	3,674	67.4
Cáceres	0.88	118,513	109,461	72,650.6	364.1	1,181,632	662,812	0.63	40,192	7,840	0.0
Cádiz	0.89	47,907	80,190	47,204.8	190.4	246,136	381,039	0.52	39,379	6,330	385.4
Córdoba	1.08	28,626	112,964	41,926.5	260.1	557,723	740,013	0.46	242,950	5,915	345.5
Gerona	0.86	41,342	72,375	21,971.5	314.3	416,041	93,466	0.00	24,855	7,700	123.3
Granada	0.76	140,752	137,187	24,927.9	1,280.4	716,496	363,152	0.53	46,649	105,371	72.7
Guadalajara	1.03	148,519	56,869	18,431.9	80.3	607,156	455,646	0.50	41,408	6,382	56.3
Guipúzcoa	1.94		33,824	22,630.6	140.5			0.00	25	150	86.9
Huelva	0.84	73,107	61,058	21,998.2	299.3	720,102	105,035	0.44	23,558	1,697	51.0
Huesca	1.57	236,530	71,275	57,656.9	215.5	830,745	376,525	0.46	68,047	30,467	1,052.9
Jaén	1.31	212,020	131,465	26,273.3	122.1	444,439	664,891	0.38	154,098	26,078	91.3
León	0.62	639,302	106,289	60,684.1	172.8	453,970	353,328	0.50	14,721	40,703	79.3

Logroño	1.36	124,528	46,386	22,168.5	654.6	124,937	201,446	0.45	56,249	33,267	18.2
Lugo	0.82	558,173	134,423	73,850.0	34.8	296,764	104,867	0.21	1,965	8,000	0.0
Lérida	1.57	254,565	81,629	35,686.1	484.6	491,326	402,232	0.48	97,003	94,852	59.2
Madrid	0.89	63,982	91,926	30,948.0	306.2	297,481	437,412	0.51	70,554	23,895	95.6
Murcia	0.90	151,121	146,619	21,262.1	885.0	270,124	679,233	0.53	57,977	56,001	29.3
Málaga	0.72	114,443	140,984	20,693.7	346.0	237,291	351,166	0.46	58,981	27,208	263.9
Navarra	1.32	458,230	80,871	50,545.5	808.8	259,753	255,862	0.37	44,884	40,000	134.7
Orense	0.94	406,623	115,429	71,023.2	24.3	180,133	107,144	0.03	11,877	14,864	19.6
Oviedo	1.40	358,008	138,101	105,775.9	381.0	485,092	126,400	0.00	1,837	6,450	131.1
Palencia	1.32	154,469	50,984	29,820.0	360.4	238,532	354,899	0.49	22,948	8,252	53.6
Pontevedra	1.20	244,133	102,499	38,331.0	250.1	68,176	110,184	0.00	6,356	31,536	0.0
Salamanca	1.15	148,029	85,534	60,707.5	499.3	610,903	430,668	0.40	18,345	282	8.8
Santander	1.27	265,166	60,624	45,977.1	286.4	188,743	30,281	0.00	830	500	11.1
Segovia	0.87	113,927	41,501	34,492.1	56.6	316,239	258,034	0.57	10,373	2,910	12.8
Sevilla	1.22	59,568	134,640	60,495.3	243.5	325,528	913,454	0.53	250,688	4,463	1,225.0
Soria	1.21	98,175	40,265	36,586.5	70.5	605,840	283,085	0.55	4,024	10,688	0.0
Tarragona	0.82	27,821	92,550	9,394.5	890.2	280,368	269,681	0.26	155,104	19,600	63.3
Teruel	1.52	279,116	69,112	49,701.9	483.1	589,538	463,439	0.46	44,290	36,207	108.8
Toledo	1.36	84,068	103,595	42,808.6	257.9	671,649	777,668	0.47	75,888	10,210	34.0
Valencia	1.25	274,536	206,193	44,423.1	9,148.5	270,885	397,714	0.27	134,022	101,000	113.0
Valladolid	1.22	86,050	67,137	19,812.2	304.1	126,175	575,791	0.45	82,824	3,028	191.7
Vizcaya	1.01		47,091	26,384.7	183.9			0.00	735	0	9.5
Zamora	0.90	62,754	76,723	67,893.4	144.8	621,339	320,665	0.33	40,077	3,300	20.8
Zaragoza	1.26	496,961	108,007	48,240.3	888.2	677,437	450,550	0.38	100,462	105,500	483.3

Sources: See text.

TABLE B. 2 THE AGRICULTURAL SECTOR IN SPAIN, 1900

Province	Output per worker	Commons	Labour	Livestock	Chemical fertilisers	Other land	Arable land	Fallow (%)	Vines % Olive trees	Irrigated land	Capital
Álava	1.97		17,555	21,193.6	1,561.9			0.18	3,985	591	2,711.4
Ávila	2.44	129,091	40,328	58,877.6	1,856.1	288,528	318,481	0.39	24,368	15,322	354.2
Albacete	1.70	175,817	55,270	41,977.7	6,567.1	430,006	880,487	0.44	82,800	28,874	4,901.0
Alicante	1.21	64,375	79,875	24,169.7	8,951.7	190,089	303,436	0.49	98,136	71,236	2,011.4
Almería	1.24	94,750	63,089	22,842.1	4,329.0	430,757	255,343	0.52	12,465	39,707	369.0
Badajoz	1.48	93,827	162,542	159,420.1	4,678.0	946,682	1,067,088	0.47	130,700	25,326	9,223.7
Baleares	2.05	3,907	54,953	38,844.7	5,633.0	218,494	234,974	0.27	30,770	24,522	3,227.1
Barcelona	2.60	8,211	102,969	40,464.0	10,552.1	404,241	257,162	0.04	124,810	45,605	3,516.2
Burgos	1.97	217,480	70,776	76,691.7	7,092.6	621,535	528,810	0.33	24,120	10,815	3,606.7
Canarias		94,290	54,665	29,871.8	14,991.1		121,234	0.68	5,819	16,008	872.9
Castellón	1.71	27,006	79,854	27,779.7	7,156.7	323,610	287,184	0.28	80,390	42,266	1,903.2
Ciudad Real	1.74	77,467	93,726	53,794.1	4,382.6	869,261	1,014,023	0.48	206,542	31,943	2,715.0
Coruña, La	2.73	367,247	113,697	155,899.4	8,064.7	218,716	188,529	0.00	988	48,853	10,776.9
Cuenca	1.62	163,118	81,630	50,329.1	8,453.5	582,936	973,295	0.42	107,583	15,726	5,389.7
Cáceres	1.85	102,628	78,122	120,929.6	5,490.1	726,130	1,134,199	0.63	64,561	12,084	2,622.5
Cádiz	1.00	41,237	78,114	39,123.3	1,851.1	375,021	258,824	0.37	30,993	8,165	4,186.9
Córdoba	1.36	21,067	134,206	105,427.7	3,796.8	521,319	783,976	0.43	249,670	18,367	9,480.1
Gerona	1.64	48,142	60,041	48,783.5	2,471.4	363,577	139,130	0.05	28,770	32,954	6,943.9
Granada	1.24	121,675	142,528	48,247.5	9,037.9	470,988	627,737	0.44	63,983	107,240	3,155.2
Guadalajara	1.95	147,832	45,652	50,633.6	1,807.3	673,162	390,327	0.44	35,190	13,821	3,341.4
Gipúzcoa	2.54		27,527	41,950.1	744.4			0.00	25	3,841	1,252.7
Huelva	1.00	53,803	65,929	41,092.3	3,547.2	664,390	180,051	0.30	43,330	5,660	2,071.0
Huesca	2.05	256,327	54,102	55,238.3	5,662.9	786,974	400,499	0.46	36,971	70,622	26,099.9
Jaén	1.17	226,284	149,102	59,040.2	1,811.7	380,784	714,282	0.39	305,150	41,754	3,376.7
León	1.79	623,285	85,484	106,618.7	1,259.4	400,933	422,382	0.41	31,344	51,635	3,502.6
Logroño	1.95	134,302	33,421	21,275.6	5,078.8	153,005	163,604	0.41	33,500	33,787	1,785.0
Lugo	2.73	534,775	109,058	254,820.9	2,320.3	260,144	164,885	0.11	4,914	2,732	4,448.2

Lérida	1.84	274,303	77,746	42,258.0	9,758.4	425,335	448,485	0.39	122,805	134,102	9,417.5
Madrid	2.59	56,395	45,294	49,232.9	4,623.7	413,451	329,029	0.40	56,185	27,516	2,470.5
Murcia	1.52	125,324	104,836	42,882.4	5,972.8	207,922	767,232	0.51	97,491	66,868	2,008.5
Málaga	1.35	61,698	123,529	52,040.7	7,009.9	230,521	410,681	0.31	119,174	38,436	5,679.1
Navarra	2.27	458,230	73,616	73,407.6	9,321.3	159,873	355,742	0.35	35,959	49,177	16,385.4
Orense	1.43	387,740	101,880	86,192.8	948.8	206,793	99,367	0.00	19,324	16,772	811.5
Oviedo	2.59	339,422	94,610	164,318.1	2,466.6	537,176	92,902	0.00	1,610	2,427	1,774.7
Palencia	2.37	165,880	33,776	41,772.4	3,914.2	172,350	409,670	0.43	7,512	10,823	2,325.9
Pontevedra	1.50	210,276	78,871	53,988.4	394.2	105,788	106,429	0.00	7,284	44,076	2,194.4
Salamanca	1.73	113,531	70,579	96,101.1	7,873.9	521,433	554,636	0.39	22,682	17,298	1,533.8
Santander	2.23	261,399	42,628	97,799.5	998.1	202,932	19,859	0.02	139	1,428	943.2
Segovia	2.98	105,149	32,224	43,204.2	3,944.1	185,755	397,296	0.37	9,500	3,135	99.1
Sevilla	1.65	43,839	141,283	118,941.1	11,168.3	508,860	745,851	0.31	225,692	17,142	10,300.4
Soria	1.91	150,794	32,010	51,367.6	2,889.8	552,712	283,594	0.48	1,904	7,352	879.1
Tarragona	2.04	49,308	74,120	15,424.8	15,853.7	162,318	366,244	0.15	164,164	48,630	4,666.8
Teruel	1.94	282,553	51,871	52,685.2	6,923.7	544,016	505,524	0.50	63,547	49,794	4,615.4
Toledo	1.56	74,294	115,275	74,083.4	3,369.1	316,773	1,142,318	0.45	166,119	27,517	2,242.1
Valencia	2.20	251,336	164,559	62,187.7	29,982.2	264,018	427,781	0.34	139,356	151,336	5,594.1
Valladolid	2.63	50,166	41,492	31,511.9	12,826.7	96,127	641,723	0.43	35,736	12,676	12,762.0
Vizcaya	2.20		31,692	40,793.2	2,732.8			0.03	532	4,245	767.9
Zamora	1.88	58,801	58,920	58,758.1	4,534.2	475,465	470,492	0.35	42,410	14,148	2,193.3
Zaragoza	2.05	563,525	92,273	59,276.0	17,542.4	506,782	554,641	0.38	84,688	102,964	24,790.6

Sources: See text.

TABLE B.3 SUMMARY STATISTICS. THE AGRICULTURAL SECTOR

Variable	Obs.	Mean	St. Dev.	Min.	Max.
Labour productivity	96	1.51	0.56	0.49	2.98
Commons	92	178,106	150,950	3,355	639,302
Arable land	92	412,159	257,046	19,859	1,142,318
Fraction fallow	98	0.35	0.18	0	0.68
Irrigation	98	28,663	30,949	0	151,336
Vines & olive trees	98	61,093	64,797	25	305,150
Pastures, forests...	90	440,050	262,269	37,975	1,398,256
Labour	98	85,074	38,142	17,555	206,193
Livestock	98	52,892.6	37,469.1	9,394.5	254,820.9
Chemical fertilisers	96	3,460	4,806	24	29,982
Capital	97	2,523.8	4,567.2	0.02	26,099.9
Literacy	98	60.5	20.9	25	100
Access to land	98	28.4	14.8	2	61
Urbanisation	98	26.8	19.0	2.3	74.2
Rainfall	98	53.6	20.9	28.6	117.5
Rainfall (coef. var.)	98	0.78	0.16	0.52	1.23
Temperature	98	12.9	2.2	9.7	17.4
Ruggedness	98	33.1	14.4	9.4	75.2
Altitude	98	17.4	19.2	0	70.8
Population dispersion	98	4,799	4,615	695	20,210
Distance to Mad/Bcn	98	252.6	256.4	0	1742

Sources: See text. Livestock and capital are expressed in thousands of units.

TABLE B.4 COMMONS AND AGRICULTURAL PRODUCTIVITY, 1900-1930

	Dependent variable: Agrarian output / Active agricultural population					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	0.02 (0.03)	0.03 (0.04)	0.07* (0.04)	0.02 (0.04)	0.03 (0.04)	0.09* (0.05)
Arable land	0.18** (0.08)	0.19** (0.08)	0.30*** (0.10)	0.18** (0.07)	0.19** (0.08)	0.30*** (0.08)
* % fallow	-0.34** (0.15)	-0.33** (0.17)	-0.26 (0.16)	-0.35** (0.14)	-0.34** (0.15)	-0.25* (0.14)
* % irrigated	0.07 (0.22)	0.04 (0.22)	-0.24 (0.26)	0.06 (0.23)	0.04 (0.22)	-0.28 (0.22)
Pastures, forests...	-0.08** (0.04)	-0.07* (0.04)	-0.05 (0.04)	-0.08** (0.03)	-0.07** (0.03)	-0.03 (0.04)
Livestock	0.31*** (0.06)	0.29*** (0.06)	0.30*** (0.05)	0.31*** (0.06)	0.29*** (0.06)	0.31*** (0.05)
Chemical fertilisers	0.11*** (0.03)	0.11*** (0.03)	0.09*** (0.03)	0.11*** (0.03)	0.11*** (0.03)	0.09*** (0.02)
Modern machinery	0.02* (0.01)	0.01 (0.01)	0.01 (0.01)	0.02** (0.01)	0.02 (0.01)	0.01 (0.01)
Urbanisation		0.00 (0.00)	0.01*** (0.00)		0.00 (0.00)	0.01*** (0.00)
Literacy		0.00 (0.00)	-0.01*** (0.00)		0.00 (0.00)	-0.01*** (0.00)
Access to land		0.00 (0.00)	0.00 (0.00)		0.00 (0.00)	0.00 (0.00)
d_1930	-0.11 (0.08)	-0.10 (0.08)	0.12 (0.09)	-0.11 (0.08)	-0.11 (0.08)	0.17** (0.08)
Controls	No	No	Yes	No	No	Yes
Observations	89	89	89	89	89	89
R-squared	0.75	0.76	0.85	0.75	0.76	0.85

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All input variables are divided between the active agricultural population and expressed in natural logs. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its standard deviation, ruggedness, altitude, population settlement pattern, distance to big cities and a coastal dummy.

TABLE B.5 COMMONS AND LIVESTOCK

	Dependent variable: Livestock (live weight)					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	0.18*** (0.05)	0.24*** (0.06)	0.20** (0.09)	0.23*** (0.05)	0.28*** (0.06)	0.24*** (0.09)
Pastures, forests...	0.27*** (0.06)	0.29*** (0.06)	0.37*** (0.08)	0.28*** (0.06)	0.28*** (0.06)	0.41*** (0.08)
Arable land	0.38*** (0.10)	0.40*** (0.09)	0.27** (0.13)	0.38*** (0.10)	0.37*** (0.09)	0.12 (0.14)
* % fallow	-0.15*** (0.03)	-0.16*** (0.03)	-0.07 (0.05)	-0.15*** (0.03)	-0.16*** (0.03)	-0.04 (0.04)
* % vines and olive trees	-0.10*** (0.03)	-0.12*** (0.04)	-0.14*** (0.05)	-0.09*** (0.03)	-0.12*** (0.04)	-0.12*** (0.04)
Chemical fertilisers	-0.11* (0.06)	-0.12* (0.06)	-0.04 (0.06)	-0.11** (0.05)	-0.12** (0.06)	-0.04 (0.06)
Modern machinery	0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.00 (0.02)	-0.01 (0.02)	-0.01 (0.01)
Urbanisation		0.01** (0.00)	0.01** (0.00)		0.01*** (0.00)	0.01*** (0.00)
Literacy		0.00 (0.00)	0.01 (0.00)		0.00 (0.00)	-0.00 (0.01)
Access to land		0.17 (0.37)	-0.14 (0.49)		-0.07 (0.40)	-1.16* (0.65)
d_1930	0.65*** (0.21)	0.66*** (0.23)	0.42 (0.28)	0.65*** (0.19)	0.70*** (0.21)	0.63** (0.29)
Controls	No	No	Yes	No	No	Yes
Observations	89	89	89	89	89	89
R-squared	0.56	0.59	0.72	0.55	0.59	0.69

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All variables expressed in natural logs. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its standard deviation, ruggedness, altitude, population settlement pattern, distance to Madrid or Barcelona and a coastal dummy.

TABLE B.6 COMMONS AND AGRICULTURAL PRODUCTIVITY IN ARID SPAIN, 1900-1930

	Dependent variable: Agrarian output / Active male agricultural population					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	-0.04 (0.03)	-0.02 (0.03)	0.06 (0.04)	-0.05 (0.04)	-0.04 (0.03)	0.06 (0.05)
Arable land	0.60*** (0.14)	0.60*** (0.15)	0.62*** (0.17)	0.61*** (0.13)	0.59*** (0.13)	0.63*** (0.14)
* % fallow	-0.72*** (0.21)	-0.68*** (0.24)	-0.58*** (0.20)	-0.72*** (0.19)	-0.66*** (0.21)	-0.59*** (0.16)
* % irrigated	0.66*** (0.24)	0.66*** (0.24)	0.20 (0.26)	0.74*** (0.24)	0.72*** (0.23)	0.24 (0.21)
Pastures, forests...	-0.02 (0.04)	0.01 (0.04)	-0.01 (0.04)	-0.01 (0.04)	0.01 (0.04)	-0.01 (0.04)
Livestock	0.22*** (0.06)	0.17*** (0.06)	0.26*** (0.07)	0.23*** (0.06)	0.17*** (0.06)	0.26*** (0.06)
Chemical fertilisers	0.10*** (0.03)	0.09*** (0.03)	0.08*** (0.03)	0.10*** (0.03)	0.09*** (0.03)	0.08*** (0.03)
Modern machinery	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.00 (0.01)
Urbanisation		0.00 (0.00)	0.01*** (0.00)		0.00 (0.00)	0.01** (0.00)
Literacy		0.00 (0.00)	-0.00 (0.00)		0.00 (0.00)	-0.01 (0.01)
Access to land		0.00 (0.00)	0.00 (0.00)		0.00 (0.00)	-0.00 (0.00)
d_1930	-0.17* (0.09)	-0.19* (0.10)	-0.00 (0.17)	-0.18** (0.09)	-0.20** (0.09)	0.08 (0.18)
Controls	No	No	Yes	No	No	Yes
Observations	77	77	77	77	77	77
R-squared	0.80	0.81	0.87	0.79	0.81	0.86

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All input variables are divided between the active agricultural population and expressed in natural logs. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its standard deviation, ruggedness, altitude, population settlement pattern, distance to big cities and a coastal dummy.

TABLE B.7 COMMONS AND LIVESTOCK IN ARID SPAIN

	Dependent variable: Livestock (live weight)					
	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Commons	0.10* (0.05)	0.12* (0.06)	0.14 (0.09)	0.11** (0.06)	0.14** (0.07)	0.23** (0.09)
Pastures, forests...	0.28*** (0.08)	0.37*** (0.09)	0.25** (0.10)	0.28*** (0.08)	0.35*** (0.08)	0.14 (0.13)
Arable land	0.47*** (0.11)	0.46*** (0.10)	0.33** (0.13)	0.46*** (0.11)	0.45*** (0.10)	0.10 (0.19)
* % fallow	-0.07* (0.04)	-0.05 (0.04)	-0.03 (0.05)	-0.08** (0.04)	-0.06 (0.04)	0.04 (0.05)
* % vines and olive trees	-0.07* (0.04)	-0.05 (0.05)	-0.06 (0.05)	-0.06* (0.03)	-0.05 (0.04)	-0.06 (0.05)
Chemical fertilisers	-0.09 (0.07)	-0.06 (0.07)	-0.01 (0.07)	-0.09 (0.07)	-0.07 (0.07)	-0.07 (0.07)
Modern machinery	0.01 (0.02)	-0.00 (0.02)	-0.00 (0.01)	0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Urbanisation		0.00 (0.00)	0.01 (0.00)		0.00 (0.00)	0.02*** (0.00)
Literacy		0.01** (0.00)	-0.00 (0.01)		0.01* (0.00)	-0.03** (0.01)
Access to land		-0.10 (0.43)	-0.09 (0.44)		-0.28 (0.48)	-0.37 (0.68)
d_1930	0.51** (0.25)	0.25 (0.29)	0.51 (0.35)	0.52** (0.23)	0.31 (0.28)	1.44*** (0.54)
Controls	No	No	Yes	No	No	Yes
Observations	77	77	77	77	77	77
R-squared	0.54	0.59	0.75	0.54	0.58	0.69

Robust standard errors between brackets; *, **, or *** denotes significance at 10, 5 or 1 per cent level. All variables expressed in natural logs. The instruments are the lagged values of the endogenous variables (commons, urbanisation, literacy and access to land). Controls include temperature, rainfall, rainfall interacted by its coefficient of variation, ruggedness, altitude, population settlement pattern, distance to bid cities and a coastal dummy.

APPENDIX C

TABLE C.1 BIOLOGICAL LIVING STANDARDS IN SPAIN, 1860-1930

	Life expectancy at birth			Heights				
	1863-70	1900	1930	1858	N	Mean	N	Mean
					1896-1904		1926-1934	
Álava	32,0	37,3	53,7		320	162,17	90	166,06
Albacete	30,0	32,1	47,3	161,24			23	164,89
Alicante	32,8	38,6	50,8	164,12			91	166,42
Almería	31,1	28,4	50,0	162,38	34	160,20	90	163,74
Ávila	24,9	30,4	45,6	162,74	320	160,39	96	161,49
Badajoz	28,8	31,3	47,9	162,22			233	164,57
Baleares	41,7	45,2	57,6	162,82	238	165,90	270	165,82
Barcelona	28,4	36,4	53,3	163,67	120	164,54	90	168,12
Burgos	30,6	33,0	46,9	158,52	320	158,91	141	163,08
Cáceres	25,7	30,7	44,3	161,23	320	159,32	180	161,82
Cádiz	29,9	32,9	44,7	163,33			90	163,72
Canarias		43,1	52,9		641	164,87	360	167,40
Castellón	29,3	36,6	51,5	161,88	318	162,68	92	164,37
Ciudad Real	29,6	34,8	46,9	162,38			80	164,05
Córdoba	30,4	29,5	48,5	161,31	207	160,13	90	164,42
Coruña, La	35,3	41,3	51,6	158,81	280	161,70	90	163,90
Cuenca	28,8	34,8	47,1	161,15	142	160,13	95	163,19
Gerona	31,4	35,0	55,8	163,76			86	167,28
Granada	29,1	30,8	50,4	161,44	234	160,48	90	164,11
Guadalajara	27,4	33,8	49,4	161,33	320	160,59	93	163,56
Guipúzcoa	34,4	41,1	54,6		120	165,96	80	168,86
Huelva	29,4	36,7	50,6	161,82	321	164,03	90	166,14
Huesca	25,4	36,2	53,0	160,57			90	164,20
Jaén	29,0	27,9	47,2	160,96	321	161,15	90	163,31
León	25,4	37,6	49,2	161,39			103	162,78
Lérida	27,3	37,2	56,3	162,14	320	163,11	91	166,02
Logroño	27,0	33,6	49,7	161,66	349	161,38	278	162,58
Lugo	35,5	41,5	53,2	158,50	320	161,01	90	162,66
Madrid	23,5	29,7	47,7	161,87	400	161,80	270	166,08
Málaga	33,4	33,4	50,5	162,07			90	163,98
Murcia	32,4	32,8	49,7	160,44			214	164,12
Navarra	29,6	37,2	52,9	161,77	320	162,12	270	165,83
Orense	30,0	36,6	52,3	157,29	160	162,06	90	162,57
Oviedo	37,2	39,7	53,2	159,12			168	165,29
Palencia	22,1	30,8	44,9	158,82			90	162,95
Pontevedra	37,1	45,1	52,8	155,89	280	161,26	90	162,95
Salamanca	28,6	36,1	48,9	161,57	160	158,32	118	162,10
Santander	36,1	39,6	51,8	161,00	275	160,78	99	167,13

TABLE C.1 BIOLOGICAL LIVING STANDARDS IN SPAIN, 1860-1930 (cont.)

	Life expectancy at birth			Heights				
	1863-70	1900	1930	1858	N	Mean	N	Mean
					1896-1904		1926-1934	
Segovia	25,0	33,0	49,0	160,30	280	160,08	113	162,32
Sevilla	31,8	31,0	47,0	163,71	323	164,09	90	165,65
Soria	28,9	33,1	49,6	161,45	317	159,82	93	162,24
Tarragona	32,7	40,1	57,3	164,07	320	162,88	92	166,90
Teruel	29,0	33,2	49,6	161,85	313	159,70	90	163,70
Toledo	28,6	33,8	49,8	160,40			116	163,23
Valencia	26,9	35,6	50,0	161,52	322	164,45	129	164,31
Valladolid	23,1	29,8	45,6	161,18	73	167,57	98	162,43
Vizcaya	34,3	34,7	52,6		120	164,55	96	166,62
Zamora	23,8	34,6	47,8	158,41	320	159,80	90	162,59
Zaragoza	23,7	30,7	49,0	161,80	252	168,07	90	164,43
SPAIN	29,8	35,0	49,9	160,93	9800	162,02	5978	164,54

Sources: See text.

TABLE C.2 SUMMARY STATISTICS. COMMONS AND BIOLOGICAL LIVING STANDARDS

Variable	Obs	Mean	Std. Dev.	Min	Max
Life expectancy	146	38.4	9.5	22.1	57.6
Heights	130	162.7	2.4	155.9	168.9
Migration	147	-1.7	5.5	-19.8	23.9
Common lands	138	20.4	16.4	0.7	60.9
Collective user-rights	138	42.3	30.1	0	100
Private user-rights	138	46.9	31.3	0	99.8
Population density	147	46.8	36.3	12.5	233
Agricultural population	147	70.0	14.2	15.0	93.3
Real GDP per capita	147	506.2	230.6	79.5	1,497.8
Urbanisation	147	24.4	12.6	2.0	74.2
Industrialisation	147	154.3	204.9	12.3	1,621.6
Literacy	147	49.6	23.9	14	100
Access to land	147	0.30	0.13	0.02	0.61

Sources: See Text

APPENDIX D

TABLE D.1 SUMMARY STATISTICS. COMMONS AND HUMAN CAPITAL

Variable	Obs	Mean	Std. Dev.	Min	Max
Literacy	147	49.6	23.9	14	100
Schooling expenditure	143	1.9	1.1	0.18	6.0
Commons	138	17.0	12.3	0.7	60.9
Population density	147	46.8	36.3	12.5	233
Agricultural population	147	70.0	14.2	15.0	93.3
Real GDP per capita	147	506.2	230.6	79.5	1,497.8
Urbanisation	147	24.4	12.6	2.0	74.2
Industrialisation	147	154.3	204.9	12.3	1,621.6
Life expectancy	146	38.4	9.5	22.1	57.6
Access to land	147	0.30	0.13	0.02	0.61
Gender literacy gap	147	24.4	12.7	4	64

Sources: see text. Literacy: fraction of population above 10 years old that was able to read and write; Schooling expenditure: expenses in staff and material per capita; Commons: percentage over total provincial area; Urbanisation: proportion of population living in cities bigger than 5,000 inhabitants; Industrialisation: percentage of the gross value added by non-agricultural activities per capita; Population density: total population divided by total area; Agricultural population: proportion of the male active population working on agriculture; Access to land: fraction of landowners over the agricultural population; Life expectancy at birth (in years); Gender literacy gap: percentage point difference between male and female literacy levels.

APPENDIX E

TABLE E.1 SUMMARY STATISTICS. COMMONS AND AGRICULTURAL COOPERATIVES

Variable	Obs	Mean	Std. Dev.	Min	Max
Cooperatives	44	13.0	9.2	1.5	38.5
Irrigation communities	44	4.4	6.2	0	27.1
Common lands	44	18.7	16.1	0.9	55.9
Collective user-rights	44	48.4	29.3	5.4	98.4
Quality of Life Index	44	47.7	8.2	31.2	66.0
Urbanisation	44	24.0	19.2	2.3	71.2
Land access	44	47.4	11.0	23.8	75.1
Average plot size	44	9.8	6.7	0.7	28.8
Agricultural population	44	39.5	12.8	15.2	80.7
Population dispersion	44	9.2	17.4	0.7	89.3
Population density	44	41.5	26.9	14.6	136.5
Land productivity	44	107.1	56.3	34.6	272.7
Ruggedness	44	31.4	13.4	9.4	75.2
Soil quality	44	5.0	0.6	3.9	6.7
Irrigated land	44	6.2	10.3	0	60.2
Rainfall	44	52.2	20.0	29.3	117.5
Rainfall (Coef. Var.)	44	0.78	0.15	0.52	1.09

Source: See text.

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