Ethnic Cleansing and the Long-Term Persistence of Extractive Institutions: Evidence from the Expulsion of the Moriscos

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Abstract

This paper uses the 1609 expulsion of 300,000 Muslims from the Iberian peninsula to analyze the mechanisms through which exploitative institutions dampen the development of pre-industrial economies. The evidence suggests that the persistence of extractive arrangements in formerly Muslim lands stunted the development of the non-agricultural sector long after the expulsion. Arguably exogenous variation in the Christian re-settlers' human capital is then used to investigate the extent to which initial differences in human capital explain the observed divergence in between-institutional outcomes. The results cast doubt on the long-term importance of such differences and stress the role of institutions, at least for the specific case of early modern Spain.

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1 Introduction

In countless historical circumstances wealthy and powerful individuals have exploited the less fortunate for their own economic gain. Although this exploitation often served the short-term interests of the elites, recent research has highlighted the negative long-term effects of exploitative arrangements. Engerman and Sokoloff (2002) have argued that exploitative institutions created inequality across Central and South America which in turn discouraged economic growth for centuries. The empirical work of Acemoglu et al. (2001, 2002) has shown a robust relationship between "extractive" colonization and sluggish long-term economic growth. Finally, Nunn (2008) has demonstrated that African countries hit hardest by the slave trade economically under-performed areas that were largely spared.

While these macro-relationships stress a long-lasting negative relationship between exploitative institutional arrangements and subsequent economic outcomes, the mechanisms through which the presence of exploitative institutions in one period affects economic performance in the next remain a subject of debate.

This debate often centers on the relative impact of human capital and institutions on economic growth. Glaesar et al. (2004) emphasize the importance of human capital by showing that high levels of human capital are highly correlated with "good" institutions. They then raise the possibility that societies first develop high levels of human capital which in turn lead to institutional frameworks that encourage growth. In their view, the quality of institutions in a given society largely reflects its human capital. The simple imposition of "good" institutions on a given society is unlikely to endure in the absence of a sufficiently large stock of "good" human capital.

Recent work by Gregory Clark (2007) further stresses the importance of human capital, suggesting that institutional quality may be of secondary importance. Clark shows that England had "good" institutions for hundreds of years without much economic growth. He then argues that higher birthrates among the economically successful for hundreds of years led to "[t]he embedding of bourgeois values into the culture, and perhaps even the genetics" (Clark 2007, p. 11). In Clark's view these bourgeois values were what made England "different" from its neighbors on the eve

of the industrial revolution. The same set of institutions and incentives that had failed to produce growth for centuries spurred growth in the 18^{th} century because the evolution of English culture had changed the way individuals responded to these incentives.

Separating the relative importance of human capital and institutions has proven empirically difficult, since the two are highly correlated. This paper uses variation created by the 1609 expulsion of 120,000 Valencian[1] Muslims to both provide a unique micro-level test of the long-run effects of extractive arrangements and to investigate the extent to which initial between-institutional differences in human capital drive the results.

The paper begins in section 2 by providing a brief historical overview of the Muslim population in Valencia, detailing the institutions the Spanish[2] developed to exploit this population following the reconquest.[3] These exploitative institutions remained in place even after the Muslim population was forced to convert to Christianity in 1525, after which these crypto-Muslims were referred to as Moriscos. Valencia's landowners exploited their Morisco subjects. Prominent historians have called this relationship "colonial" –Moriscos were more like slaves than vassals.

Section 3 describes how the exploitative institutional arrangements remained in the formerly Morisco municipalities after Spain expelled its entire Morisco population in 1609. The persistence of extractive arrangements in these areas meant that only Valencia's least skilled workers migrated from Christian towns to the abandoned Morisco municipalities. Those with low human capital sorted into areas with exploitative institutions. Those with higher levels of human capital stayed in the Christian[4] areas that retained more benign institutional frameworks.

[1] Valencia is located on Spain's eastern Mediterranean coast.

[2] These "Spaniards" (for the purposes of this paper) were primarily from the kingdom of Aragon which would unite with Castile in 1479.

[3] The reconquest refers to the Christian military conquest of Muslim lands in the Iberian Peninsula. These lands had been conquered by Islam in 711. The reconquest was completed in 1492 with the fall of Granada.

[4] Obviously, following the expulsion Christians inhabited all of Valencia. Thus, when we refer to Christian lands we are referring to lands inhabited by Christians before the expulsion.

The third section goes on to describe how the resettlement process created arguably exogenous variation in human capital levels. Archival evidence combined with census data from 1609 and 1646 show how Christian areas that bordered Morisco areas prior to the expulsion lost significantly more of their population following the expulsion than Christian areas that did not border Morisco areas. The emigrants were on average poor and heavily indebted.

Christian areas that did not border Morisco areas saw a much smaller share of their "low" human capital emigrate. Consequently, the inhabitants of Christian towns that bordered Morisco areas in 1609 descended from the economically successful. The inhabitants of Christian areas that did not border Morisco municipalities in 1609 descended from a less "select" stock. Similarly, formerly Morisco areas that bordered Christian areas attracted settlers with significantly higher human capital than areas that were bordered by only Morisco areas before the expulsion. Thus, the repopulation process provides arguably exogenous variation in the initial level of the human capital of the Christian population within a given institutional framework.

Section 4 develops a simple model that investigates the effect of an increase in the agricultural extraction rate on the proportion of the population engaged in agriculture. In the absence of trade in agricultural products and large tax-induced drops in population, the model predicts that an increase in the extraction rate will decrease the proportion of the population engaged in non-agricultural activities. This decline is due to the fact that an increase in the extraction rate decreases the surplus available to the population, requiring the movement of individuals into the agricultural sector to meet subsistence needs. The model also shows that if an increase in the extraction rate decreases the overall productivity of the population, an increase in the extraction rate can lead to an increase in the proportion of the population engaged in agriculture even in the face of large tax-induced population changes.

In the fifth section I investigate these predictions using data from three censuses conducted in 1609, 1646 and 1787. In 1787 formerly Morisco areas employed roughly 8% more of their active population (two-thirds of a standard deviation) in agriculture than their Christian neighbors. This difference mainly translated into a smaller "manufacturing" sector in the formerly Morisco municipalities. These results are

robust to a variety of controls and do not seem to be driven by systematic differences in land quality or the severity of the 1609 population drop.

The section then uses the differences in human capital endowments created by the repopulation process to investigate the long-term importance of initial differences in human capital. The results cast doubt on the long-term importance of such differences, at least for the institutional and human capital endowments of early modern Spain.

In conclusion, the evidence suggests that extractive institutions stunted the development of the non-agricultural sector, highlighting the effects of exploitative arrangements in pre-industrial economies. Initial differences in human capital seem less important in explaining why formerly Morisco areas lagged behind their Christian counterparts.

2 Moriscos, Christians and the Early Modern Valencian Economy

2.1 The Economic Exploitation of the Muslim Population in Valencia

Crusader armies under king James I reconquered the Muslim kingdom of Valencia between 1229 and 1244. Before the reconquest, the kingdom was one of the richest in Spain and supported buoyant silk and paper manufactures in addition to advanced agricultural arrangements. Following the reconquest, the Christian re-conquerors remained a small minority among the Muslim majority for over a century.

The wealth of Muslim Valencia and the small numbers of available immigrants led king James I and his successors to rule in what Burns (1973, 1975) has described as a "colonial" manner. Meyerson (1991, p. 34) sums up the general attitude of the Christian rulers toward the Muslim population by explaining that "[the Muslim vassals] were [...] perceived by their lords primarily as exploitable labor. If the [Muslims] did not produce, there was nothing else, and least of all their religious af-

filiation, to justify their presence." The high levels of exploitation drove the majority of the Valencian Muslim population from prosperity to poverty by the eve of their forced conversion to Christianity in 1525.

After the forced conversion of Valencia's Muslims (afterwards known as Moriscos), the landed nobility did not decrease the extraction rates in Morisco areas.[5] An observer of the Morisco populations in 1595 compared the treatment of the Moriscos to that of Native Americans in Spain's overseas colonies by noting that "the lords are similar to the *Encomenderos de Indias:* they don't want them [the Moriscos] to [truly] convert so that they may continue to exact tribute" (Ciscar 1977, p. 68). Casey (1979) describes the relationship between Moriscos and their Christian lords in the 16^{th} century as "semi-colonial."

On the eve of their expulsion in 1609, Valencia's Morisco community represented 26% of the region's total population (Nadal 1976, p. 54). These Moriscos worked primarily on lands held by Christian nobles. While in theory Morisco and Christian peasants were subject to the same general feudal framework, Moriscos by the close of the 16^{th} century were treated more like slaves than vassals (Ciscar 1977, p. 90).

2.2 Moriscos, Christians and Institutions

The Spanish king, lesser nobles and the Catholic Church controlled the lion's share of the land in 16^{th} century Valencia. While some Moriscos worked on ecclesiastical lands, most worked on lands controlled by the nobility. These Moriscos worked in segregated regions.[6] The geographic distribution of Christian and Morisco areas had largely been determined following the reconquest of Valencia in the 13^{th} century. If a town had resisted in the reconquest, its Muslim population was expelled following its capture. If the town agreed to terms, the Muslim population was allowed to stay (LaPeyre 1959, p. 29). The geographic distribution of the Morisco municipalities is

[5] When the Muslims of Valencia were forced to convert to Christianity in 1525, they petitioned to have their tax rates lowered to the Christian rate. These petitions were in practice denied, moving a contemporary to observe in 1565 that "these new converts are forced to live like Christians and pay like Muslims" (Ciscar 1977, p. 68).

[6] There were a few areas inhabited by both Moriscos and Christians, but these were the exception.

detailed on the left hand map in figure 1.

Both Morisco and Christian peasants worked the lands under feudal arrangements. While the conditions governing each town and its surrounding area varied, both Muslims and Christians paid their lords on a regular basis for the right to work the lands. Payments in the Christian areas changed from sharecropping to fixed cash payments in the 14^{th} century. These terms were "enshrined in documents and charters which no subsequent *senyor* (lord) could set aside" (Casey 1979, p. 111). The cash payments were not indexed for inflation, and their real value steadily decreased throughout the Spanish inflation of the 16^{th} century.[7]

Thus, Christian peasants by the end of the 17^{th} century paid relatively light dues, and they vigorously resisted attempts to increase the devalued rates. This resistance meant that a lord that wished to increase the dues in a Christian area had to battle the inhabitants in expensive and time-consuming suits. The courts often ruled in favor of the peasants since these peasants possessed the original town charters from the 13^{th} and 14^{th} centuries which clearly stipulated their feudal dues. The socially and religiously marginalized Moriscos faced greater difficulties obtaining favorable verdicts, and their financial situation seems to have worsened throughout the course of the 16^{th} century.

In addition to dues on the harvest, both Christians and Moriscos paid for the use of "common areas" (such as mills, ovens...) maintained by the lords. Artisans also paid dues on their products although there is considerably less evidence on these dues, which do not seem to have been subject to rigorous enforcement since most of the population engaged in agricultural activities. Eugenio Ciscar[8] (2006, p. 132) suggests that most non-agricultural products were "totally or partially exempt from taxation."

The lords often hired representatives in their domains to directly collect dues although some lords preferred to farm out the right to collect payments. Regardless

[7]Hamilton (1934) is the classic reference for the inflation caused by large imports of Spanish bullion from the Americas.

[8]Eugenio Ciscar is a prominent historian of the effects of the expulsion of the Moriscos on Valencia.

of how the dues were collected, Moriscos almost always paid more than Christians. In addition to higher payments, Moriscos were often subjected to forced labor and were denied access to judicial recourse.

2.3 The Lords

The lords reaped many benefits from the Moriscos' widespread exploitation. Due to the marginal religious and social position of Moriscos, the nobles extracted much higher rents from them than they could from their Christian subjects. When the Inquisition and the Catholic Church began to suggest the expulsion of the Moriscos in the 1580s, the Valencian nobles staunchly defended their continued presence in Christian Spain despite their suspect religious practices.

Economic pressures in the late 16^{th} century seem to have increased the nobles' financial dependence on the Morisco population. Inflation throughout the 16^{th} century decreased landowners' real incomes (Ciscar 1977, p. 107). During this period, the Spanish Crown also increasingly burdened these nobles with extraordinary levies to support the vast Spanish Empire. The combination of these two factors forced the nobles to take out ever larger loans to meet their expenditures. In exchange for loans, they promised lenders (usually from the Valencian merchant class) a fixed payment each year usually in perpetuity (*censos*). Payments came from the revenues provided by both Morisco and Christian peasants. A detailed study of the nobles' financial situation by Ciscar (1977) has shown that the annual interest payments on the debts acquired by nobles during the 16^{th} century at times came close to their total income.

On the eve of the 1609 expulsion, many nobles were bankrupt. Ciscar (1977) has argued that the Spanish Crown used this financial crisis to convince the nobles to acquiesce to the expulsion. In this interpretation, the Spanish Crown promised to intervene on behalf of the nobles with their creditors following the expulsion and to give them the goods of the expelled Moriscos to help them pay off their debts.

Regardless of the underlying reasons, it appears that the nobles were increasingly unable (or unwilling) to withstand pressure from the Catholic Church and the Crown

to expel the Morisco population.

3 Exploitation after the Expulsion

On April 9, 1609 Phillip III secretly[9] signed a decree authorizing the expulsion of the Moriscos from Spanish lands.[10] Crown officials recalled the Spanish Navy and contracted merchant ships to ferry the Moriscos to North Africa. Between the announcement of the expulsion in 1609 and its conclusion in 1614, Spain expelled approximately 300,000 Moriscos. Roughly 120,000 of these came from the kingdom of Valencia. The remaining 180,000 were scattered throughout the rest of Spain (LaPeyre 1959). The Moriscos were generally shipped to North Africa, although skilled workers were allowed into northern Italy and others went to the heart of the Ottoman Empire.

For many years historians pointed to the 1609 expulsion as a primary factor in Spain's 17^{th} century economic downturn. Although recent studies have questioned this event's importance for the Spanish economy, there is a general agreement that the effects on the province of Valencia were grave.[11] Eugenio Ciscar sums up the evidence to suggest that the "principal effect [of the expulsion of the Moriscos] was the deepening of the economic crisis of the 17^{th} century [...] with other more long-lasting effects such as the disappearance of entire towns [...] and the duality of the seignorial regime" (Ciscar 1991, pp. 223-224).

The "duality of the seignorial regimes" after the expulsion consisted on the one hand of the towns inhabited by Christians prior to the expulsion. The institutional framework in these towns was relatively benign and reflected pre-expulsion arrange-

[9] The crown worried that the Moriscos would revolt or least stop working if they learned of their expulsion. Both of these fears proved justified. When the Valencian Moriscos learned of their fate a group rose in rebellion. When the Moriscos in Aragon (Valencia's Moriscos were the first to be expelled) learned of the plight of the Valencian Moriscos they ceased working in the fields.

[10] For a detailed overview of the process that led to the expulsion, see Harvey (2005) especially chapter nine.

[11] To the extent that an entire generation of Valencian historians attributed the failed Valencian industrialization of the 19^{th} century to the expulsion.

ments. On the other hand, municipalities that had been inhabited by Moriscos before the expulsion were subject to more exploitative arrangements (Ciscar 1991, p. 210). The following subsection explains how the institutions designed to exploit the Morisco population continued to exploit the Christian inhabitants of formerly Morisco lands long after the expulsion.

3.1 The Persistence of Extractive Institutions and Repopulation following the Expulsion

Immediately following the expulsion, both the lords and their creditors were in a desperate financial situation. Since the Morisco municipalities were completely deserted, the lords of formerly Morisco lands had both lost their source of livelihood and the ability to pay their debts. The lords' creditors, who depended on interest payments, were hardly in a better position.

Following the expulsion, many lords attempted to default on their loans.[12] These defaults led the lords' creditors to appeal to the Spanish Crown for assistance. The exchange between the Valencian lords, their creditors and the Spanish Crown generated documentation that allows us to observe how both creditor and debtor worked to maintain the previous institutional framework as far as possible to limit their individual losses.

As the lords attempted to repopulate the Morisco municipalities by attracting the inhabitants of the surrounding Christian communities, they had to choose between charging the incoming Christian settlers heavy taxes or not paying their creditors.[13] As it became clear that widespread default was not an option, the lords attempted to exploit the incoming Christian population just as they had exploited the Moriscos. The Spanish Crown rapidly issued declarations prohibiting the most abusive practices (such as the *açofras* or forced services) and warned that the repopulation of the formerly Morisco lands would be difficult if the lords insisted on exploiting the

[12] By 1614 over 70 of the 157 Valencian lords had demanded debt relief from the Spanish Crown and were joined in 1625 by another 17 (Boronat 1901, II, pp. 637-657).

[13] Lapeyre (1959, pp. 70,71). The lords obviously did not see their own ruin as a viable option!

Christian population as if they were Moriscos.[14]

3.1.1 The Repopulation Process, Extractive Institutions and Human Capital

The Crown's worries proved justified as the repopulation process continued. Archival evidence indicates that the retention of high extraction rates in the formerly Morisco municipalities led to pronounced adverse selection among the Christian re-settlers. A royal decree dated April 15^{th}, 1614 forbid creditors from confiscating the belongings of the re-settlers in order to settle past debts. The decree goes on to state that those who went to settle the formerly Morisco lands were "in their great majority [...] very poor and indebted" (Boronat 1901, II, p. 628). Many documents from the period state that the majority of the re-settlers came from the ranks of the economically disadvantaged (Ciscar 1991, pp. 189-190; Torres 1969, p 82).

This low level of human capital in the Morisco areas led the Spanish Crown to conclude in 1614 that some lords of formerly Morisco lands had lost income "not because of a drop in extraction rates [or population], but in the harm that results from the poverty and stupidity of the settlers" (Boronat 1901, II, pp. 641-642). The archival evidence suggests that the Moriscos municipalities inherited a perverse institutional framework and some of the worst human capital their Christian neighbors had to offer.

There was, however, a positive side to this pronounced adverse selection in Morisco areas. A contemporary of the events noted that Christian areas that bordered formerly Morisco areas "ha[d] benefited [...] because those who left were poor [and those who remained were the most] successful" (Ciscar 1991, pp.186-188).

Similarly, Morisco municipalities that bordered Christian areas had access to better settlers. In Morisco municipalities that were not easily accessible from Christian areas, however, the lords were forced to offer temporary (or permanent) concessions to attract any settlers at all. Even in the face of concessions settlers in more remote areas were "a miserable lot [when compared to the settlers in other Morisco areas]

[14]Royal document dated September 8, 1610 reproduced in Boronat (1901, II, pp. 605-606).

that [didn't] even possess tools or have the means to sustain themselves" (Ciscar 1991, p. 207).

Despite the adverse selection, the lords of formerly Morisco areas opted to retain as much of the extractive arrangements that had governed the Moriscos as they could.[15] Although the Christian re-settlers were not subject to the same abuses the Moriscos had suffered, a contemporary noted that they were "so burdened with [agricultural] taxes that it would [have been] impossible for them to [have] handle[d] any additional burdens" (Boronat 1901, II , p. 627).[16] Higher agricultural taxes constituted the main institutional difference between the Morisco and Christian areas, although there is some evidence that the inhabitants of formerly Morisco areas also had less influence in municipal decision making.

3.2 The Repopulated Towns and their Evolution

After 1630, when the repopulation process was largely complete, Christian and formerly Morisco towns appear to have evolved fairly independently of one another. There is little evidence of large scale immigration or emigration after 1630 (Casey 1979 , pp. 8) and trade in agricultural goods even over small distances was extremely limited (Castello 1978, pp. 53-54).[17]

[15] Although there is ample evidence that extractive institutions remained, the persistence of high levels of extraction in formerly Morisco lands might seem sub-optimal from the lords' standpoint. There are a few reasons this may have been optimal from the lords standpoint. Given that the best workers in the Christian towns were being taxed at sub-optimally low rates (from the lords' standpoint), any attempt to attract these workers would have required an "inefficiently" low extraction rate. In these circumstances, the lords seemed to have found raising the extraction rate until the least skilled workers began to leave in their best interest.

[16] A detailed study by Torres (1969) of the town charters of the formerly Morisco areas shows that the tax rates on agricultural goods often surpassed 40%. Tax rates in the Christian towns rarely was more than 25%.

[17] In a detailed study of the early modern Valencian economy Casey (1979, pp.31) notes the "essentially self-sufficient nature of the local economies of the interior, which was inevitable given the poor communications of the day [creating] great disparity in bread prices within the limits of the kingdom."

Thus, formerly Morisco municipalities started the post-expulsion period with significant disadvantages. In addition to significantly higher tax rates, these areas had been repopulated by some of the least skilled workers in the kingdom.

The Morisco municipalities grew in the years following the expulsion. Figure 2 details the aggregate evolution of 4 types of municipalities from 1610 through 1787: Christian municipalities and Morisco municipalities that did and did not border a municipality of a different faith.[18] Figure 2 shows that by 1787 the formerly Morisco areas had surpassed their 1609 population level, although their population growth rates from 1609-1787 lagged behind that of their neighbors that had been Christian before the expulsion.

As the 17^{th} century progressed, observers continually noted the poverty and underdevelopment of the formerly Morisco areas. By the 18^{th} century observers had reached a general consensus that the extractive arrangements in formerly Morisco municipalities created much poverty (Casey 1979, p. 44).

Perhaps the most convincing observations come from Cavanilles, a world-renowned 18^{th} century scholar. During his travels through the kingdom of Valencia between 1795 and 1797 he repeatedly commented on the negative effects the extractive arrangements had on economic development:

> Everywhere [the inhabitants of the formerly Morisco municipalities] [...] are loaded with seignorial tributes and appear to only work to fill the coffers of their lords [...t]his arrangement is opposed to industrial and agricultural progress; since no one wants to sweat and work to enrich another; especially since there are other lands in the kingdom [those inhabited by Christians prior to the expulsion] where the tax burden is light.[19]

While Cavanilles provides evidence that the extractive institutions that persisted in the Morisco areas dampened development, he also remarked how workers in some formerly Morisco areas appeared less motivated than those in others. In one town

[18] These data will be discussed in section 5.

[19] Cavanilles (1797, II, pp. 160, 202).

he noted that "the successors of the Moriscos 'slept' [...] until around 1750, but [...] have finally started working" in another he remarked that "everyone could be happy, as in other towns, if the men and women worked harder and the fruits of their labors were distributed more equitably" (Cavanilles 1797, II pp. 26, 372-373).

Although the lackadaisical attitudes of workers in some formerly Morisco municipalities could have been caused by the extractive arrangements in these areas, it might be the case that this behavior was due to the persistence of the initially low-levels of human capital among the settlers. We will investigate this question in greater detail in section 5.

4 A Model of the Effect of Institutions on the non-Agricultural Sector

Qualitative evidence from the previous sections suggests that formerly Morisco municipalities were less developed than areas that had more benign institutional frameworks. This section develops a simple model that investigates the effect of exploitative institutional arrangements on the distribution of the workforce across sectors.

4.1 Extractive Institutions and the Agricultural Sector

Throughout this section we equate extractive institutions with a higher tax rate τ. Consider total consumption of agricultural goods in municipality i in region j at time t: Φ^c_{ijt}. If we assume that municipality i can only consume what it produces (i.e. there is negligible trade in agricultural products with the surrounding towns[20]) then in each time period the following inequality must hold:

$$\Phi^c_{ijt} \leq (1 - \tau_{\Phi ijt}) A_{\Phi ijt} F_{\Phi ijt}(K_{\Phi ijt}, L_{\Phi ijt}) \tag{1}$$

[20] While this assumption is clearly violated by Valencia the capital (which imported large amounts of grain by sea), there is substantial evidence that most other areas largely consumed the agricultural goods they produced. See footnote 17.

where $\tau_{\Phi ijt}$ is the tax rate on agricultural production, $A_{\Phi ijt}$ is the level of agricultural production "technology", $F_{\Phi ijt}$ is a concave function, $K_{\Phi ijt}$ captures all non-labor inputs (including land quality) and $L_{\Phi ijt}$ represents the number of workers in the agricultural sector. If we assume food consumption is constant per capita ($\Phi^c_{ijt} = \overline{\varphi}_{ijt} N_{ijt}$), F to be a Cobb-Douglas production function with constant returns to scale and equation (1) holds with equality then (1) yields (after dropping subscripts for ease of exposition):

$$L = (\frac{\overline{\varphi} N}{(1-\tau) A K^{1-\sigma}})^{\frac{1}{\sigma}} \tag{2}$$

If the whole population produces foodstuffs then (2) implies:

$$N = K(\frac{(1-\tau)A}{\overline{\varphi}})^{\frac{1}{1-\sigma}}$$

The implications of this result are intuitive and straightforward.

Assume that the number of inhabitants in a given town are such that the "Malthusian" constraint does not bind (i.e. $N < K(\frac{(1-\tau)A}{\overline{\varphi}})^{\frac{1}{1-\sigma}}$). Thus, the inhabitants can produce either foodstuffs or other goods (these other goods can be traded). The only constraint on the number of workers in each sector is that there must be enough workers in the agricultural sector to feed the entire population. Consequently, $L_\alpha = N - L$ where L_α is the number of workers producing non-agricultural goods. This setup seems natural in subsistence economies, where allocating labor to provide services was a luxury. Individuals would first allocate labor to the agricultural sector to meet subsistence needs. If and only if there was a surplus would individuals leave the agricultural sector to specialize full time in providing other goods, otherwise these goods would be provided by each worker at home.[21] In times of famine, one would expect demand for non-agricultural goods to fall leading to a contraction in the non-agricultural sector.

[21] This point is supported by Cavanilles' observations during his travels through the kingdom. He notes that in the poorest regions the population produced clothes and other wares at home (Cavanilles 1797, II, p. 26).

A differential increase in the extraction rate would then change the proportion of the population producing non-agricultural goods by:

$$\frac{d}{d\tau}\frac{L_\alpha}{N} = -\frac{1}{\sigma}\left(\frac{\overline{\varphi}N^{1-\sigma}}{(1-\tau_\Phi)A_\Phi K_\Phi^{1-\sigma}}\right)^{\frac{1-\sigma}{\sigma}}\left[N^{-\sigma}\overline{\varphi}\left[\frac{(1-\tau)(1-\sigma)\frac{dN}{d\tau}+N}{(1-\tau)^2AK^{1-\sigma}}\right]\right] \tag{3}$$

Equation (3) shows that in the framework of the model, the change in the percentage of the population working in the non-agricultural sector associated with an increase in the tax rate is just the negative of the change the increase in the tax rate causes in the percentage of the population working in the agricultural sector. We assume that an increase in the extraction rate does not encourage population growth ($\frac{dN}{d\tau} < 0$). Thus, an increase in the tax rate will lead to a decrease in the percentage of the population working in the non-agricultural sector if $(1-\tau)(1-\sigma)\frac{dN}{d\tau} + N > 0$ which implies (letting $\frac{-\frac{dN}{d\tau}}{N} = \xi$)

$$\sigma > \frac{\xi - \frac{1}{1-\tau}}{\xi} \tag{4}$$

Note that $\frac{d\ln(1-\tau)}{d\tau} = -\frac{1}{1-\tau}$, $\xi = -\frac{d\ln N}{d\tau} = -\frac{d\ln\overline{\varphi}N}{d\tau}$ and $\sigma = \frac{dF}{dL}\frac{L}{F}$. The quantity $\frac{1}{1-\tau}$ is the percent increase in the crop needed to maintain subsistence consumption due to the increase in the tax rate. The quantity ξ is both the percentage decrease in the population due to an increase in the tax rate and the percentage decrease in agricultural output needed to maintain subsistence consumption due to the exit of peasants caused by the increase in the tax rate. The constant σ is simply the labor elasticity of agricultural production.

To better understand (4) let $\xi = 3$ and $\frac{1}{1-\tau} = 2$ and $\Delta\tau = 0.01$ so that the tax increase needs to be accompanied by (approximately) a 2% increase in agricultural production all else equal to maintain subsistence consumption due to the loss of production to taxes. The increase in the tax rate, however, also leads to a 3% decrease in the population and in the agricultural production needed to maintain subsistence consumption. Equation (4) tells us that the increase in the tax rate will lead to a decrease in the percentage of the population working in the non-agricultural sector if $\sigma > \frac{1}{3}$.

Intuitively, $\xi - \frac{1}{1-\tau}$ is the percentage of agricultural production that is no longer necessary due to the rise in the tax rate[22] or 1% in our example. Thus, the town needs 1% less agricultural output to meet subsistence needs which frees up $\frac{-\frac{dL}{d\tau}}{L} = \frac{1}{\sigma}$ percent of the labor force to engage in other activities. The only way the percentage of the population working in the non-agricultural sector can decrease is if the percentage decrease in the agricultural labor force is larger (in absolute value) than that in the general population or if $\frac{-\frac{dL}{d\tau}}{L} < \frac{-\frac{dN}{d\tau}}{N}$ which plugging in our numbers yields $\sigma > \frac{1}{3}$.

If we allow the extraction rate to affect the "technology" or efficiency of production then:

$$\sigma > \frac{\xi - \frac{1}{1-\tau} + \frac{\frac{dA}{d\tau}}{A}}{\xi} \tag{5}$$

equation (5) shows that even if the increase in the tax rate induces a large decrease in population so that $\xi - \frac{1}{1-\tau}$ is large it may be the case that overall productivity decreases enough to require an increase in the percentage of the population engaged in agricultural activities.

In sum, the model shows that in the absence of large tax-induced productivity changes and population drops areas subjected to higher extraction rates should have a smaller non-agricultural work force. This is due to the fact that an increase in the extraction rate decreases the surplus available to the population, requiring the movement of individuals into the agricultural sector to meet subsistence needs. If an increase in the tax rate decreases agricultural productivity (for example, by discouraging workers or encouraging the most productive members to leave), it is possible to observe a decrease in the non-agricultural sector even in the face of large population drops. This decrease, while indirectly caused by higher extraction rates, is due to the lower productivity of the remaining population.

[22] If $\xi - \frac{1}{1-\tau} < 0$ then the rise in the tax rate necessitates an increase in production and (4) holds trivially.

4.2 The Effect of Extractive Institutions on the Composition of the non-Agricultural Sector

The previous discussion suggests that an increase in the extraction rate decreases the total share of the population engaged in non-agricultural activities. The composition of the non-agricultural class, however, is not addressed. Let α_{ij} denote the proportion of the active population of town i in region j engaged in agricultural activities. Then the proportion of the active population engaged in other activities is: $1-\alpha_{ij} = \sum_k \chi_{ijk}$ where k indexes all possible occupations and χ_k is the share of occupation k.

An increase in the extraction rate will affect the proportion of the population working in a given sector of the non-agricultural economy by $-\frac{d\alpha_{ij}}{d\tau} - \sum_{k \neq l} \frac{d\chi_{ijk}}{d\tau} = \frac{d\chi_{ijl}}{d\tau}$. Even though an increase in the extraction rate requires a decrease in the overall proportion of the population engaged in non-agricultural activities, this decrease may be concentrated in "non-productive" areas. An increase in the extraction rate could even lead to an increase in a given sector if participation in other sectors decreases by a large amount. If extractive institutions did stunt the economic development of the formerly Morisco municipalities, we should see a significant decrease in the "productive" non-agricultural activities.

5 Quantitative Evidence

Theoretical considerations and the qualitative evidence suggest that the formerly Morisco municipalities should be underdeveloped[23] when compared to their non-Morisco neighbors. This section tests the prediction using data from censuses in 1609, 1646 and 1787.

[23] Underdeveloped is defined as having a smaller proportion of the population employed in "productive" non-agricultural activities.

5.1 The Data

Data on the population and location of Christian and Morisco municipalities come from the 1609 census.[24] Post-expulsion data comes from two additional censuses in 1646 and 1787.

The general census of 1609 was performed immediately before the expulsion to assess the relative size of the Morisco population. The number of households in a given municipality is provided, along with the religious affiliation of the inhabitants. The general census of 1646 provides the number of households in each municipal area.

Charles III ordered the 1787 census in order to evaluate the effects of the regime's modernization efforts. The quality of the census is universally recognized and has been dubbed "the most valuable census of the 18^{th} century" (Castello 1978, p. 13) The census provides details on the number and ages of the population in a given municipality as well as the occupations of the inhabitants. Workers are grouped into 11 general occupational categories[25]: agricultural workers, artisans, "industrial" or textile workers, lawyers, notaries, merchants, students, lay clergy, government workers, household servants and members of the lower nobility.

The categories "industrial" workers and artisans were designed to allow the Crown to "clearly differentiate individuals working in traditional artisanal activities (denoted artisans in the census) from those working in what were considered "innovative" sectors (denoted "industrial" workers)" (Castello 1978, p. 60). Castello (1978) has shown that census officials identified "innovation" exclusively with the textile industry independent of the production techniques used. Artisans included tailors, carpenters, shoe makers, smiths, tavern keepers, butchers and locksmiths among other activities.

Table 1 details summary statistics for the percentage of the 1787 active[26] population engaged in each sector. The first entry shows that roughly 80% of the Valencian

[24] This section follows Lapeyre (1959) and Castello (1978) closely.

[25] I have aggregated some of the more obscure subcategories for clarity.

[26] The results do not qualitatively change if we use the proportion of the total population.

population engaged in agricultural production. I have classified the remaining sectors into "productive" and "nonproductive" activities. Artisans were by far the most well represented "productive" sector. Household servants and the lay clergy were the largest "nonproductive" activities.

The 427 municipalities used in the analysis largely correspond to the 1609 municipal boundaries. The appendix explains the data in greater detail.

5.2 Testing the Hypothesis: Empirical Strategy

In the ideal world, we would observe two observations on the same municipality in each time period: one treated with extractive institutions, the other treated with a benign institutional framework. A close second best would randomly assign two types of institutions ("good" and "bad") to municipalities. Although both of these experiments are not feasible, the expulsion provides an experiment that plausibly approximates the randomly assigned "gold" standard.

Cavanilles in his 1797 description of the formerly Morisco areas describes the crux of the identification strategy. He noted that

> [T]he lords stipulated onerous conditions [when the Morisco lands were resettled] giving rise to what are today [1797] known as "free" and "burdened" lands in the same estate and often in two adjacent fields, if one belonged to a Morisco and the other to a Christian.[27]

The empirical strategy uses the fact that Morisco and Christian areas were often in very close proximity to identify the effect of the high extraction rates in the Morisco areas. The key identifying assumption is that if we restrict comparison to a small enough area, "treatment" with exploitative institutions is exogenous in the sense described below.

This strategy is detailed graphically in figure 1. The left hand map details the geographic location of the Morisco municipalities in 1609 and the right hand map

[27] Cavanilles (1797, II, pp. 161-162)

details the percent of the 1787 active population engaged in agriculture. The relationship between Morisco areas and large agricultural sectors is striking.

5.2.1 The Identification Strategy and the Agricultural Sector

The previously described "second best" test of the long-term effect of institutions on long-term economic outcomes would randomly assign two types of institutions ("good" and "bad") to municipalities. If the treatment of a given municipality i does not affect the outcome of its neighbors[28] (for example if trade is limited) then the difference $E[Outcome_{iT}|BadInstitutions_i = 1] - E[Outcome_{iT}|BadInstitutions_i = 0]$ would identify the average treatment effect of "bad" institutions on a given outcome at time T.

This experiment is not possible. The expulsion of the Moriscos, however, created a "natural experiment" that in some ways approximates this ideal situation. The formerly Morisco municipalities were "treated" with "bad" institutions following their reconquest. Whether or not a given municipality was treated with these exploitative arrangements depended on whether the Muslim population surrendered or fought as the Christian reconquering armies advanced (LaPeyre 1959, pp. 29). If resisting or surrendering was independent of the counterfactual outcome of municipality i,[29] then on the eve of the expulsion the mean comparison $E[Outcome_{i1608}|Morisco_i = 1] - E[Outcome_{i1608}|Morisco_i = 0]$ would identify the average treatment effect (on the treated) of "bad" institutions on a given outcome in 1608 along with other differences (e.g. culture) due to the fact that the Morisco municipalities were inhabited by crypto-Muslims and not Christians.

The expulsion removed the Moriscos without removing the extractive institutional arrangements. The expulsion, however, added at least one additional confound.[30] Morisco municipalities lost their entire populations while the surrounding Christian

[28] This is the assumption of stable unit treatment value (SUTVA).

[29] This assumption would be violated, for example, if the municipalities with the worst land were more likely to resist and bad land affected a given outcome.

[30] The adverse selection previously discussed was due, at least in part, to the institutional framework and will be discussed below.

municipalities did not. If the effects of this population shock decayed over time, by 1787 the mean comparison should identify the long-term effects of the exploitative institutional framework.

To provide some notation, consider Y_{ij1787} defined as the outcome of municipality i in region j in 1787. Each municipality was "treated" with an extractive or benign institutional framework depending on whether or not it was inhabited by Moriscos prior to the expulsion. Let $Y_{ij1787}(1)$ be the outcome of municipality i in region j in 1787 "treated" with exploitative institutions and $Y_{ij1787}(0)$ the outcome when treated with a more benign institutional framework.

The mean comparison at the regional level

$$E[Y_{ij1787}(1)|j = J, Morisco_{ij} = 1] - E[Y_{ij1787}(0)|j = J, Morisco_{ij} = 0] = \psi_j \quad (6)$$

will identify the average treatment effect[31] in a given region if treatment is ignorable (in the conditional mean sense) at this level of aggregation. As the regions of comparison become smaller and smaller, this assumption becomes increasingly plausible. We can estimate the weighted average of the region-specific average treatment effects (WATE), by examining the coefficient β in the regression

$$Y_{ij1787} = \alpha_j + \beta Morisco_{ij} + \varepsilon_{ij} \quad (7)$$

where $\hat{\beta} = \sum_j w_j \hat{\psi}_j$. Each region's estimate $\hat{\psi}_j$ of (6) is weighted by that region's share of the total variation of the dummy variable $Morisco_{ij}$, w_j. Regions that do not have both Christian and Morisco municipalities will be excluded from the weighted average. Thus, there is a trade-off when determining how finely to compare the data. As we consider increasingly smaller regions, the ignorability of treatment assumption becomes increasingly plausible but we are able to estimate the regional ATEs for a decreasing number of regions.

The results of (7) are presented in table 2. The first column shows that formerly Morisco areas employed roughly 9.6% (three-fourths of a standard deviation) more of their active population in agriculture than areas that had been Christian before

[31] On the treated.

the expulsion. This comparison, however, is made across all of Valencia ($\alpha_j = \alpha$) and it could be the case that Morisco municipalities were located in areas that were systematically different from Christian areas.

To address this concern, column (2) restricts comparison to 9 regions as defined by the Valencian historian Ardit (2008). To give a sense of the geographic area of comparison, consider that the entire kingdom of Valencia was smaller than the US state of New Jersey. The area of the largest region defined by Ardit is 1431 square miles (a 39 mile by 39 mile square), the smallest region is 517 square miles (23 miles by 23 miles). The results in column (2) show that comparing within these regions brings the point estimate down, although the Morisco municipalities still have much larger agricultural sectors than their regional neighbors.

Finally, historians and geographers have also divided Valencia into 32 *comarcas* or macro-municipal areas. The largest of these *comarcas* is 572 square miles and the smallest is 40 square miles. The results in column (3) show that comparing municipalities at this finer level does not alter the results.[32]

If "treatment" at the *comarca* level is ignorable, the addition of controls should not significantly affect the point estimates. Column (4) shows that the introduction of geography controls[33] as well as a control for the severity of the population shock following the expulsion do not significantly change the point estimate on the variable Morisco. Thus, the ignorability assumption seems plausible at the *comarca* level.[34]

[32] I also examined the sensitivity of the results to outliers. The results are extremely robust and I could not find a medium-sized group of Morisco and Christian areas where the Morisco areas do not have a statistically significant larger agricultural sector.

[33] These controls consist of the mean height and the standard deviation of heights in a given municipality and were constructed in the Spirit of Nunn and Puga (2008). Given the small areas considered, it is likely that the majority of differences in land quality were a function of the "ruggedness" (measured by the within municipality standard deviation of heights) of the land. See data appendix for details.

[34] All standard errors are clustered at the *comarca* level. These do not substantially change if we instead use heteroskedasticity-robust or homoskedastic errors. This result supports our assumption of little trade in agricultural products even within *comarcas*. We would expect significant negative correlation within *comarcas* if a few areas were producing most of the *comarca's* agricultural produce.

Columns (5) and (6) show that the decline in the non-agricultural sector in formerly Morisco areas translated mostly into a fall in what we have called "productive" activities. In sum, the data provide support for the model's prediction that the increased extraction rates in the Morisco areas strangled the development of the non-agricultural class in these areas. Moreover, this effect seems to have been concentrated in the most "productive" non-agricultural sectors.

Institutions or Human Capital? The previous results provide evidence that extractive institutions in the formerly Morisco municipalities dampened the development of the non-agricultural sector. Until now, the analysis has assumed these were direct effects of the exploitative arrangements in the formerly Morisco areas. This interpretation of the results suggests that Morisco areas remained underdeveloped because "bad" institutions directly dampened development by impoverishing the population and/or affecting productivity.

To address the possibility that initial differences in human capital are driving the results we use plausibly exogenous variation in the repopulation process of the formerly Morisco municipalities.

As previously noted, there is evidence that Christian areas that bordered Morisco municipalities prior to the expulsion lost significantly more of their population following the expulsion than areas that did not. Christian areas that did not border Morisco areas saw a much smaller share of their "low" human capital emigrate. Consequently, the 18^{th} century inhabitants of Christian towns that bordered Morisco areas in 1609 descended from the economically successful.[35]

This "border effect" is demonstrated empirically using census data from 1609 and 1646 in column (1) of table 3. Column (1) details the regression of the percent change in population between 1609 and 1646 on a dummy variable for whether a given municipality was Morisco in 1609, a dummy variable indicating whether a municipality bordered that of a different faith (Bord), an interaction term and controls. The coefficient on the dummy variable Bord shows that a Christian municipality that

[35] After 1630 there is little evidence of widespread immigration or emigration as previously discussed.

bordered a Morisco area on average lost 14% more of its population than Christian areas that did not. According to archival evidence, these emigrants were individuals with the lowest levels of human capital.

Column (1) also details that Morisco areas bordering Christian municipalities lost 41% more of their population[36] compared with 45% for those exclusively bordering Morisco areas, although the difference between the drops in Morisco areas is not statistically significant.[37] There is qualitative evidence, however, that Morisco areas that bordered Christian areas attracted settlers with significantly higher human capital than areas that did not.[38]

If these initial human capital differences remained important[39] in 1787, we would expect municipalities that bordered areas of a different faith in 1609 to be more developed[40] than those that did not.

To better understand this strategy suppose that a given outcome is related to the level of institutions and human capital by a differentiable function $f(INST, HC)$.[41] Variation in the resettlement process created 4 types of municipalities: 1) Christian municipalities that did not border Morisco municipalities in 1609 with "good" institutions (GI) and "average" human capital (HC), 2) Christian municipalities that bordered Morisco areas with "good" institutions and "better" human capital (HC+GHC), 3) Morisco municipalities that bordered Christian areas with "bad" institutions (BI) and "bad" human capital (MHC+MGHC) and 4) Morisco municipalities that were surrounded by Morisco municipalities that had "bad" institutions and the "worst" human capital (MHC).

[36] When compared to Christian areas that did not border Morisco areas.

[37] This may be due to the fact that the lords of the more isolated lands often lowered the rates to attract settlers. Unfortunately, a detailed explanation of the repopulation process is not possible here (see Ciscar (1977, 1991 and 2006) for details). Suffice it to say that the concessions seem to have been minor. There is qualitative evidence that the more isolated areas received the worst settlers in spite of these rebates.

[38] See section 3.1.1 for a more detailed discussion of the evidence.

[39] And were not systematically related to unobservables.

[40] Within a given institutional framework.

[41] We assume that for a small enough comparison group land quality can be considered constant.

For notational ease denote a given outcome in municipalities of type 1 by Y_{11}, outcomes in those of type 2 by Y_{10}, those of type 3 by Y_{01} and those of type 4 by Y_{00}. Then $Y_{11} - Y_{10} = f(GI, HC + GHC) - f(GI, HC) \approx f_2(GI, HC)GHC$ by a Taylor expansion. Similarly, $Y_{01} - Y_{00} \approx f_2(BI, MHC)MGHC$. Although we do not observe GI, MI, HC, GHC, MHC or f(·,·) under a few assumptions we can use the available information to ascertain the importance of human capital within a given institutional framework.

If the level of institutions and human capital before the expulsion was constant at the regional level in the Christian municipalities ($GI = \overline{GI}; HC = \overline{HC}$), then $E[Y_{11} - Y_{10}] \approx f_2(\overline{GI}, \overline{HC})E[GHC_{ij}]$ is the effect in 1787 of the mean increase in human capital in a given region due to the exodus of unskilled workers to Morisco areas. Similarly $E[Y_{01} - Y_{00}] \approx f_2(\overline{BI}, \overline{MHC})E[MGHC_{ij}]$.

To estimate these quantities we create a dummy variable $bord_{ij} = 1$ if a municipality bordered at least one municipality of a different religion in 1609. We then estimate

$$Y_{ij1787} = \sum_{k}^{2}\sum_{j}\beta_{kj} reg_j * R_{ijk} + \sum_{k}^{2}\gamma_k bord_{ij} * R_{ijk} + \varepsilon_{ij} \tag{8}$$

where reg_j is a dummy variable equal to one if a given observation belongs to region j, $R_{ij1} = Morisco_{ij}$ and $R_{ij2} = Christian_{ij}$ and the other variables are as previously defined. The coefficients γ_1 and γ_2 represent the WATE estimates within institutional frameworks (Christian or Morisco) of treatment with a higher level of human capital.

These results are presented in table 4 for the percentage of the active population in 1787. Column (2) shows that we cannot reject the hypothesis that differences in the level of the human capital of the re-settlers had no difference on the percentage of the 1787 population engaged in agriculture. This is true when we compare high and low human capital areas at the province, region and *comarca* levels.

Columns (3) and (4) detail similar comparisons for the percentage of the population engaged in "productive" and "nonproductive" non-agricultural activities. Column (3) shows that Morisco areas with better initial human capital had a larger pro-

ductive non-agricultural class than municipalities that got the worst settlers. Column (4) details that this difference is primarily driven by a significantly larger artisanal class in these areas.

Christian areas with initially higher human capital do not seem to have done significantly better than Christian areas that did not lose their unskilled workers. There is some evidence in column (6), however, that these areas had more workers employed in the innovative textile industries when comparison are made at the *comarca* level.

It is important to remember when interpreting these results that while trade in agricultural goods was limited, there is evidence that trade in artisanal goods and textiles was much less constrained.[42] Thus, a difference in the composition of the non-agricultural sector could be driven by systematic differences in trading opportunities. For example, former Morisco areas that were completely surrounded by Morisco areas were also surrounded by less developed economies in 1787.

When taken in unison, the results provide little evidence that lower initial human capital levels following the expulsion significantly dampened the size of the non-agricultural sector in 1787. There is some evidence that these initial differences may have mattered for the composition of the non-agricultural sector, although it is just as plausible that these results are being driven by differences in trading opportunities generated by the relative development of the surrounding areas.

The Relative Importance of Institutions and Human Capital The previous results suggest that the systematic differences in institutions between Morisco and Christian areas generated the observed differences in 1787. Given that we only observe variation in human capital within a given institutional framework, however, it still may be the case that the long-term effects of initial between-institutional differences in settler human capital drive the results.

The framework of Glaesar et al. predicts that Morisco areas that bordered Christian areas would have better institutions and economic outcomes in 1787 than

[42]This is due to high transportation costs that made agricultural trade largely unprofitable. Lighter and more expensive artisanal goods and textiles, however, were traded more extensively.

Morisco areas that did not since the higher levels of human capital in these areas would work to ameliorate the institutional framework. There is some evidence that the inhabitants of a few Morisco areas successfully worked to change the institutional framework for the better (Ciscar (1991), pp. 214-215). These institutional changes may have generated the larger productive sector in 1787 in the Morisco towns that bordered Christian areas. However, given that these institutional changes seem to have been minor it seems just as likely that the observed differences within Morisco areas are due to other factors. In general, the institutional framework in the Morisco areas appears to have remained consistently bad until the 19^{th} century. Similarly, there is little evidence in this period for institutional change within the Christian areas.

If the initial differences in human capital within Christian and/or Morisco areas was comparable to the initial differences in the human capital levels between institutional regimes, then it seems unlikely that Morisco areas in 1787 had worse institutions because the initial settlers had lower levels of human capital. The institutional regimes appear to have been difficult to change. Indeed, much of the good fortune of the Christian areas came from nominal contracts (and the willingness of the courts to uphold these contracts) that were devalued by the inflation of the 16^{th} century and not by concerted peasant action.

Clark (2007) predicts that the formerly Morisco areas would be less developed because the inhabitants had a less "industrious" culture than their neighbors. The experience of the Christian towns that bordered Morisco areas in 1609 is a direct test of Clark's hypothesis. Instead of a long process through which the culture of the economically successful spread by out-reproducing the unsuccessful, Christian areas that bordered Morisco areas simply saw most of their unsuccessful population leave overnight. Results in table 4 do not provide much evidence that cities where the inhabitants descended primarily from the economically successful outperformed areas where both the economically successful and unsuccessful remained.

In sum, variation in settlers' human capital within institutional frameworks combined with qualitative evidence provides little evidence that initial differences in human capital were crucial determinants of the size of the non-agricultural sector in

1787. Indeed, 18^{th} century writers often stress the industrious nature of the inhabitants of the Morisco areas and attribute their poverty to the perverse institutional framework.

An Empirical test of the Importance of Institutions and Human Capital Ideally, we would observe differences in the level of human capital between Christian and formerly Morisco municipalities following the expulsion. We could then directly assess the relative importance of human capital and institutions in explaining the observed long-term differences in outcomes between institutions. Unfortunately, we do not observe this difference. The observed difference of human capital levels within a given institutional framework, however, allows us to quantify under a few assumptions the relative importance of the initial level of human capital and the institutional framework.

Assume that a given outcome y_{ij} in municipality i and region j is a function of the institutional quality (I_{ij} where higher I denotes better institutions), human capital (HC_{ij}) and land endowment ($Land_{ij}$). We can then write $y_{ij} = f(I_{ij}, HC_{ij}, Land_{ij}) + \varepsilon_{ij}$ if we assume f is roughly linear[43] then y_{ij} becomes:

$$y_{ij} = \beta_1 I_{ij} + \beta_2 HC_{ij} + \beta_3 Land_{ij} + \varepsilon_{ij} \tag{9}$$

We observe whether or not a municipality was Morisco in 1609 which is related to institutions through

$$I_{ij} = \alpha_I + \gamma_I Mor_{ij} + \nu_{Iij} \tag{10}$$

where $\gamma_I < 0$ since formerly Morisco areas had worse institutions. In addition we observe variation in the level of human capital following the expulsion as previously described:

$$HC_{ij} = \alpha_H + \gamma_{1H} Mor_{ij} + \gamma_{2H} Bord_{ij} + \gamma_{3H} Mor * Bord_{ij} + \nu_{H_{ij}} \tag{11}$$

[43]It is not difficult to weaken this assumption, but weaker assumptions complicate the exposition without substantially changing the basic intuition and potential flaws.

here, $\gamma_{1H} < 0$ since settlers of Morisco areas had lower human capital, $\gamma_{2H} > 0$ since Christian areas that bordered Morisco areas were left with their best workers after the expulsion and $\gamma_{3H} > 0$ since Morisco areas that bordered Christian areas had access to better settlers.

Substituting (10) and (11) into (9) gives: $y_{ij} = \beta_1\alpha_I + \beta_2\alpha_H + [\beta_1\gamma_I + \beta_2\gamma_{1H}]Mor_{ij} + \beta_2\gamma_{2H}Bord_{ij} + \beta_2\gamma_{3H}Mor * Bord_{ij} + \beta_3 Land_{ij} + \beta_2\nu_{H_{ij}} + \beta_1\nu_{Iij} + \varepsilon_{ij}$

If the effect on a given outcome of an increase in human capital is roughly constant for all levels of institutions and human capital (i.e. if the linear approximation is decent) we can use the coefficients $\beta_1\gamma_I + \beta_2\gamma_{1H}$, $\beta_2\gamma_{2H}$ and $\beta_2\gamma_{3H}$ to get a sense of the relative importance of the initial level of human capital and institutions in explaining a given outcome. The quantities $\beta_2\gamma_{3H}$ and $\beta_2\gamma_{2H}$ should capture both the "productivity" effects of higher human capital and any post-expulsion change in the institutional framework caused by differentially high levels of human capital.

Assume that γ_{1H}, the difference in levels of human capital between Morisco and Christian municipalities, is smaller (in absolute value) than γ_{3H} which represents the difference in human capital between Morisco towns that had easy access to re-settlers and those who did not. We assume that β_1 and β_2 are the same sign (i.e. human capital and institutions affect a given outcome in the same way). If these conditions obtain then $|\beta_1\gamma_I + \beta_2[\gamma_{1H} + \gamma_{3H}]| < |\beta_1\gamma_I|$ is an underestimate of the effects of extractive institutions on a given outcome holding initial levels of human capital constant. We can similarly compute $\beta_1\gamma_I + \beta_2[\gamma_{1H} + \gamma_{3H} + \gamma_{2H}]$. Unless the variation in human capital between institutional frameworks is significantly larger than the observed within variation, the above strategy (under the stated assumptions) should give a rough estimate of the relative importance of institutions and human capital for a given outcome.

Estimates[44] of the quantities $\beta_1\gamma_I + \beta_2[\gamma_{1H} + \gamma_{3H}], \beta_1\gamma_I + \beta_2[\gamma_{1H} + \gamma_{3H} + \gamma_{2H}]$, $\beta_1\gamma_I + \beta_2\gamma_{1H}, \beta_2\gamma_{3H}$ and $\beta_2\gamma_{2H}$ are given in table 5 for the percentage of the active population engaged in agriculture, productive and nonproductive activities, artisanal activities, textiles, merchant activities, and for those defined as students.

[44]Estimates include *comarca* dummies as well as geographic controls.

Coefficients in the first row detail the combined effect of "bad" institutions and low levels of human capital. The second entry provides the estimate of the effect of losing "low" human capital when endowed with "good" institutions and human capital. The third entry gives an estimate of the effect of having better human capital settlers following the expulsion in Morisco areas. The fourth and fifth rows detail the estimates of the effects of "bad" institutions holding the human capital of the re-settlers constant.

Column (1) shows that the large agricultural sector in Morisco areas does not seem to be driven by differences in human capital. Column (2) shows that initial differences in human capital may be driving some of the results in the productive sector (although these results should be treated with caution as previously noted). The third column shows that the initial level of human capital seems irrelevant for the size of the unproductive sector. Columns (4), (5) and (6) further break up the results in the productive sector.

The results show[45] that the differences in the initial levels of the settler's human capital do not explain much of the variation in the size of the non-agricultural sector. Unless the differences in initial human capital levels between Morisco and Christian areas were substantially larger than those caused by the repopulation process within institutional frameworks, then under the stated assumptions we can conclude that the initial levels of settler human capital are at best of secondary importance.

5.3 Potential Confounds

The combination of quantitative and qualitative evidence suggests that the extractive institutions that remained in the formerly Morisco municipalities following the expulsion dampened the development of the non-agricultural sector. There is also evidence that this result is not solely driven by initial differences in the human capital of the settlers. There are, however, at least 3 additional confounds that may be driving the results.

The first alternative explanation of the results suggests that the population shock

[45] Under the stated assumptions.

the Morisco areas experienced, not the institutions, is the cause of observed differences in 1787. This hypothesis is not supported by the data. Columns (2), (3) and (4) in table 3 show that while the Morisco areas were significantly less densely populated in 1646 than their neighbors, this difference in 1787 is no longer statistically different from 0.[46] This suggests that the population in Morisco areas recovered after the expulsion. Moreover, the link between population density and the non-agricultural class is quite weak. Indeed, many areas with small 1787 populations had developed relatively large non-agricultural sectors.

The second explanation focuses on the assumption that agricultural trade did not occur between municipal areas. Although there is evidence that there was very little trade in agricultural goods across even small distances,[47] the identification strategy relies on municipalities that are in close proximity. It could be the fact that Morisco areas specialized in agriculture and traded agricultural goods for manufactures from Christian areas.[48] However, even if this were the case, it is unlikely that the Morisco areas would sort into the agricultural sector in the absence of some systematic differences between Morisco and Christian areas. While the possibility of local trade in agricultural products would require changing the model outlined in section 4, the basic result that the presence of extractive institutions dampens the development of the non-agricultural sector remains.

The third issue first recognizes that within-institutional variation in human capital following the expulsion may be small compared to the human capital differences between institutional regimes.[49] Second, it may be that the "within-cultural" variation in human capital we observe following the expulsion is very different than

[46] The 3 dropped observations in columns (2), (3) and (4) correspond to municipalities where the estimated areas were rounded to 0 by the GIS software.

[47] The largest Valencian cities are an exception to this general rule, and the results are not sensitive to the exclusion of these areas.

[48] It must be stressed that although this is a possibility it is not supported by the data or the qualitative evidence.

[49] It may also be the case that the linear approximation in (9) is poor. This may well be the case, although the fact that we observe little effect of an increase in human capital starting from both "good" and "bad" situations suggests this may not be an important problem.

"cross-cultural" variation.

Variation in human capital within-institutions may be smaller than that between-institutions although there is qualitative evidence from the repopulation process that the human capital in remote Morisco areas was initially considerably worse than that in less remote areas. Descriptions of the average level of human capital in the most isolated Morisco towns markedly differ from descriptions of settlers in areas that were less isolated. While those who settled less isolated areas were described as poor, those who went to the isolated areas were described as destitute and some engaged in criminal activities immediately following the settlements.[50]

The second point is certainly possible, and if true limits the external validity of the findings.

In sum, the available evidence points to the fact that the extractive institutions that remained in the Morisco areas following the expulsion dampened the development of the non-agricultural sector. While it is impossible to rule out that the low-levels of human capital that accompanied the settlers of these areas played a role in dampening development, the data do not provide much support for this hypothesis.

6 Conclusion

What would Valencia have looked like in 1787 had the formerly Morisco areas adopted the more benign institutions of the Christian municipalities following the expulsion? The evidence suggests these areas would have seen roughly 8% of their populations leave the agricultural sector, mainly to provide artisanal goods and other "productive" services.

The results suggest that extractive institutions in pre-industrial economies significantly dampen the emergence of a "manufacturing" sector. In the case of Valencia, this result provides some support for the hypothesis that the institutions established following the expulsion delayed the region's industrialization.[51]

[50] See Ciscar (2006), especially note 35.

[51] As has been argued by a generation of Valencian historians.

In addition to providing unique micro-level insights into the mechanisms through which exploitative institutions dampen the development of pre-industrial economies, the evidence allows us to analyze the role initial differences in human capital can have on long-term outcomes. The results suggest that initial differences in human capital have little long-run economic impact, at least for the institutional and human capital endowments of early modern Spain. It still may be the case, however, that differences in human capital "between-cultures" do have significant long-term effects.

Finally, Valencia following the expulsion of the Moriscos provides a unique opportunity to analyze the mechanisms through which extractive institutions persist. The evidence suggests that much of Valencia's financial and economic system was built around the exploitation of the Moriscos. After the expulsion, many of those who had become powerful due to the exploitation of the Moriscos had much to lose. The link between the welfare of Valencia's elite and the persistence of the kingdom's extractive institutions explains much of their endurance following the expulsion.

Valencian nobles were by no means unique in their exploitation of a group of people marginalized because of race, religion, or class. The case of Valencia holds important insights into the long-term implications of exploitation for both the exploited and for those who hold power. The economic exploitation of Valencian Muslims for over 300 years suggests that those who benefit from this exploitation may be dooming their descendants to poverty. While the Muslims of Valencia suffered under exploitative institutions for hundreds of years, these exploitative arrangements persisted even after their expulsion. The remaining Christian population remained poorer and less developed over 150 years after the expulsion due to the persistence of these extractive arrangements.

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Data Appendix

Data from the 1609, 1646 and 1787 censuses are provided by Badenes and Bernat (1994) and Castello (1978). I define a municipality as Morisco if its namesake town was inhabited solely by Moriscos in 1609. The small number of municipalities that were inhabited by both Christians and Moriscos before the expulsion are classified as Christian since these areas retained the institutional framework that governed the Christians following the expulsion.

I begin with the modern municipal boundaries of the *Comunidad Autónoma Valenciana* which contains 541 municipalities. The 1787 census details statistics for 554 municipal divisions. I used the *Instituto Nacional de Estadística*'s database on municipality boundary changes since 1842 and a variety of other sources to consol-

idate the 1787 data into 473 "super-municipalities." These 473 municipalities cover the entirety of the Valencian territory and would be the municipalities today if there had only been consolidation of municipalities and no splits between 1787 and today. Of these 473 municipalities 68 broke away between 1787 and the present day.

Equipped with the 1787 municipal boundaries, I then mapped the 1787 municipal areas into the 1609 boundaries using the correspondence provided by Badenes and Bernat (1994) using *mapa 1* in Ardit (2008) whenever ambiguity arose. This resulted in 427 municipalities that cover the entirety of Valencia with the exception of 4 1787 municipal areas that do not seem to be covered by the 1609 census or that I could not identify.[52] One additional municipality was not identified in the 1646 census leaving us with 426 of the 431 possible "1609" boundaries if we use data from 1609, 1646 and 1787 and 427 if we only use data from 1609 and 1787.

Geographic variables were calculated using GIS software and the 427 1609 boundaries in addition to the 4 unmatched 1787 boundaries that together cover the entirety of the Valencian territory. The altitude and "ruggedness" variables were calculated using the GTOPO30 (US Geological Survey) in the spirit of Nunn and Puga (2007). The mean altitudes are just the mean level of measured altitudes in a given area. Instead of using the average uphill slope, I consider the standard deviations of measured altitudes within the municipality to construct the "ruggedness" measure $SDAlt_k = [\frac{1}{N_k}\sum_k (h_{ik} - \overline{h}_k)^2]^{\frac{1}{2}}$ where k indexes municipalities, i indexes the measured altitudes by GTOPO30 within the municipal boundary, N_k is the number of measured altitudes in the municipal boundary, h_{ik} is the altitude of each 30 by 30 arc-second cell and $\overline{h}_k$ is the mean altitude in municipality k.

[52] The 1609 census refers primarily to the *la relación de Caraçena.* For areas where data are not available we use the *Las Décadas de Escolano.* This probably results in a small amount of double counting. See Badenes and Bernat (1994) for details.

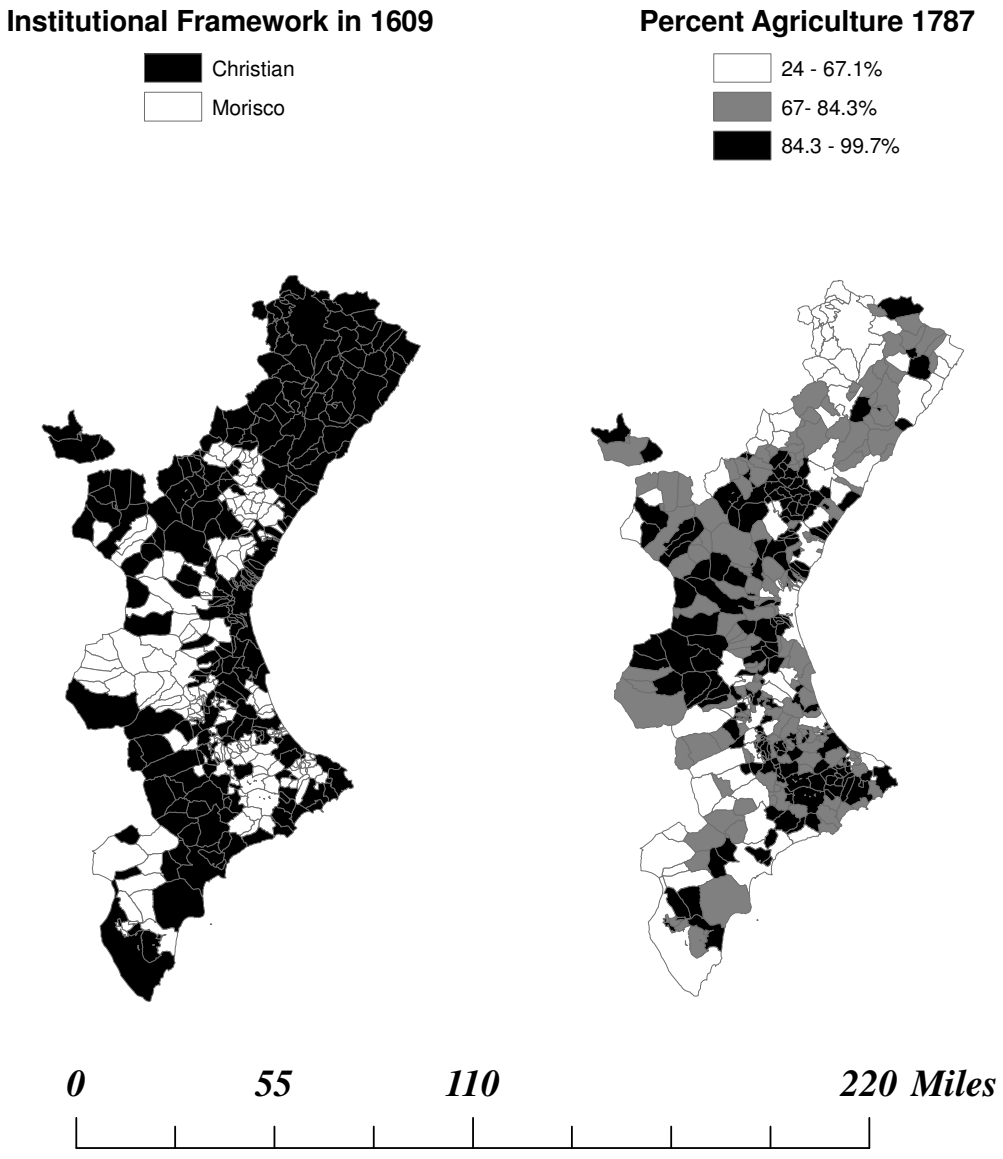

Figure 1: **Morisco and Christian Municipalities**

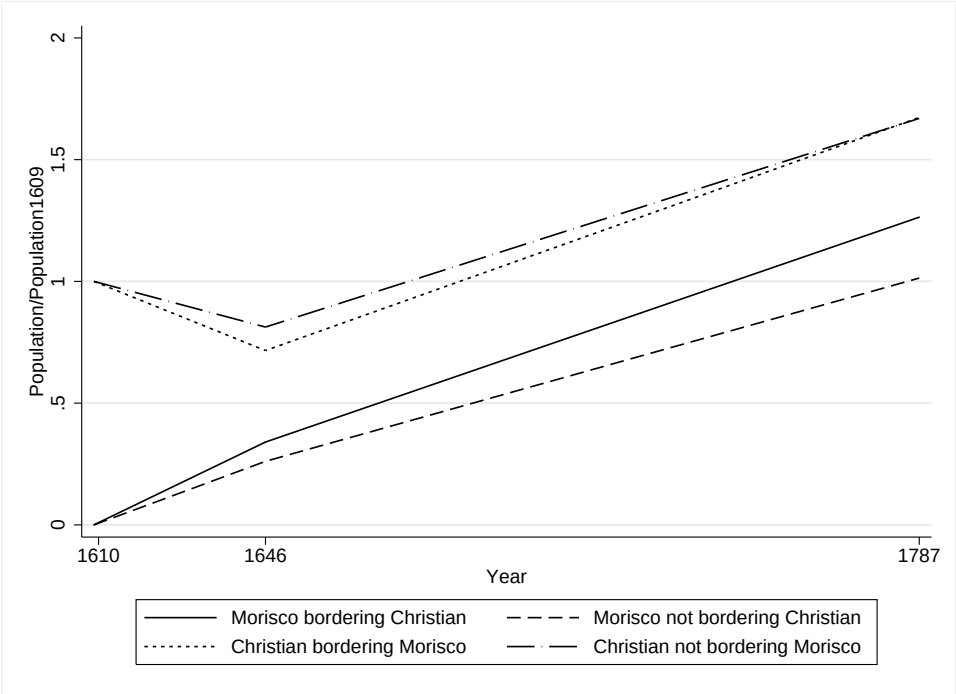

Figure 2: **Population Evolution following the 1609 Expulsion**

Table 1: **Distribution of Active Population in 1787**
Percent of active population*100 unless otherwise noted

"Sector"	*Occupation*	*Mean*	*St.dev.*	*Min*	*Max*
		(1)	(2)	(3)	(4)
Agriculture	Agriculture	79.64	13.69	24.03	99.72
	Artisans	7.00	6.75	0	49.04
	Textiles	1.94	6.37	0	61.37
"Productive"	Lawyers	0.14	0.28	0	2.38
Activities	Notaries	0.27	0.36	0	2.06
	Merchants	0.52	2.00	0	24.60
	Students	1.29	3.03	0	31.92
	Lay Clergy	2.26	1.98	0	17.24
"Nonproductive"	Government	0.82	2.80	0	37.22
Activities	Household Servants	6.00	5.72	0	40.00
	Lower Nobility	0.14	0.48	0	6.82
Population	1787(Individuals)	1801.05	5466.58	99	103197

Notes: N=431 municipalities

Table 2: **The Long-Term Effects of Extractive Institutions**
Percent of 1787 active population*100

	Agricult	***Agricult***	***Agricult***	***Agricult***	***Prod***	***Nonprod***
	(1)	(2)	(3)	(4)	(5)	(6)
$Morisco_{1609}$	9.63	8.19	8.11	7.86	-5.24	-2.63
	(1.81)	(1.44)	(1.67)	(1.95)	(1.42)	(1.00)
$SDAlt/100$				-1.93	1.48	0.44
				(1.50)	(1.15)	(0.65)
$Alt/100$				0.47	-0.02	-0.44
				(0.45)	(0.38)	(0.16))
$\%\Delta Pop$				-1.70	-0.08	1.78
				(2.27)	(1.54)	(1.18)
Region Dummies?	No	Yes	No	No	No	No
Comarca Dummies?	No	No	Yes	Yes	Yes	Yes
R^2	0.12	0.22	0.29	0.30	0.35	0.20
N	427	427	427	426	426	426

Standard errors clustered at the *comarca* level
Agricult: Percentage of active population employed in the agricultural sector
Prod: Percentage of active population employed in "productive" non-agricultural activities
$Nonprod$: Percentage of active population employed in "nonproductive" non-agricultural activities
$Morisco_{1609}$: Dummy variable equal to one if a given municipality was solely inhabited by Moriscos in 1609
$SDAlt/100$: Standard deviation of altitude within each municipality divided by 100
$Alt/100$: Mean altitude within each municipality divided by 100
$\%\Delta Pop$: Percent population change between 1609 and 1646
See text for additional details

Table 3: **Population Drop following the 1609 Expulsion**
Various Measures of Population

	$\%\Delta \boldsymbol{Pop}_{1609-1646}$	$\boldsymbol{PopDen}_{1609}$	$\boldsymbol{PopDen}_{1646}$	$\boldsymbol{PopDen}_{1787}$
	(1)	(2)	(3)	(4)
$Morisco_{1609}$	-0.45	-1.33	-4.89	-8.59
	(0.06)	(2.45)	(2.14)	(5.51)
$Bord$	-0.14	0.09	-1.19	-7.87
	(0.03)	(2.40)	(1.99)	(5.44)
$Bord * Mor$	0.18	2.48	2.18	8.41
	(0.05)	(2.72)	(2.14)	(5.81)
$SDAlt/100$	-0.04	-7.48	-4.01	-7.08
	(0.05)	(3.90)	(1.91)	(2.30)
$Alt/100$	-0.01	-0.44	-0.49	-1.35
	(0.01)	(0.34)	(0.18)	(0.38)
Comarca Dummies?	Yes	Yes	Yes	Yes
R^2	0.40	0.26	0.19	0.39
N	426	424	423	424

Standard errors clustered at the *comarca* level
$\%\Delta Pop_{1646-1609}$: Percentage change in population in municipality between 1609 on the eve the expulsion and 1646
$PopDen_{1609}$: Households per km^2 in the 1609 census
$PopDen_{1646}$: Households per km^2 in the 1646 census
$PopDen_{1787}$: Households per km^2 in the 1787 census. Households are estimated by dividing the number of individuals reported in the census by 5
$Morisco_{1609}$: Dummy variable equal to one if a given municipality was solely inhabited by Moriscos in 1609
$Bord$: Dummy variable equal to one if a given municipality bordered at least one municipality of a different faith
$SDAlt/100$: Standard deviation of altitude within each municipality divided by 100
$Alt/100$: Mean altitude within each municipality divided by 100
See text for additional details

Table 4: **The Effects of Human Capital Holding Institutions Constant**
Percent of 1787 active population*100

	Comparison	***Agricult***	***Prod***	***Nonprod***	*Artisan*	*Textiles*
Level of Comparison	(1)	(2)	(3)	(4)	(5)	(6)
	$Y_{11} - Y_{10}$	4.12	-3.79	-0.33	-2.92	-1.54
		(2.94)	(2.73)	(0.88)	(1.23)	(1.77)
Province	$Y_{01} - Y_{00}$	-2.23	2.46	-0.22	1.43	0.29
		(1.52)	(0.91)	(1.17)	(0.61)	(0.44)
	R^2	0.14	0.13	0.03	0.08	0.04
	$Y_{11} - Y_{10}$	0.88	-0.33	-0.55	-1.06	0.78
		(2.00)	(1.38)	(1.08)	(0.93)	(0.80)
Region	$Y_{01} - Y_{00}$	-1.76	2.85	1.09	1.67	0.49
		(1.78)	(1.05)	(1.49)	(0.64)	(0.56)
	R^2	0.98	0.66	0.67	0.59	0.29
	$Y_{11} - Y_{10}$	-0.54	1.26	-0.72	0.19	1.22
		(1.53)	(1.23)	(1.13)	(0.69)	(0.71)
Comarca	$Y_{01} - Y_{00}$	-2.06	3.21	-1.15	2.22	0.09
		(1.95)	(1.17)	(1.67)	(0.67)	(0.57)
	R^2	0.98	0.73	0.70	0.74	0.83

Notes: N=427 municipalities. Standard errors clustered at the *comarca* level
Y_{11}: "Treated" with "good" institutions and human capital. $N_{11} = 127$
Y_{10}: "Treated" with "good" institutions and "mediocre" human capital. $N_{10} = 111$
Y_{01}: "Treated" with "extractive" institutions and "bad" human capital. $N_{01} = 165$
Y_{00}: "Treated" with "extractive" institutions and "worst" human capital. $N_{00} = 24$
Agricult: Percentage of active population employed in the agricultural sector
Prod: Percentage of active population employed in "productive" non-agricultural activities
Nonprod: Percentage of active population employed in "nonproductive" non-agricultural activities
Artisan: Percentage of active population employed producing artisanal goods
Textiles: Percentage of active population employed in the textile industry
See text for additional details

Table 5: **The Relative Importance of Institutions and Human Capital**
Percent of 1787 active population*100

Quantity	Effect	***Agricult*** (1)	***Prod*** (2)	***Improd*** (3)	***Artisan*** (4)	***Textiles*** (5)	***Students*** (6)
$\xi \equiv \beta_1\gamma_I + \beta_2\gamma_{1H}$	$BI + BHC$	11.15	-7.49	-3.66	-4.04	-0.53	-2.24
		(2.94)	(2.22)	(2.14)	(1.03)	(1.22)	(1.05)
$\beta_2\gamma_{2H}$	$GHCHigh$	0.11	1.34	-1.45	-0.22	1.55	-0.61
		(0.11)	(1.24)	(1.05)	(0.68)	(0.77)	(1.01)
$\beta_2\gamma_{3H}$	$GHCLow$	-3.16	2.60	0.56	2.39	-0.98	1.49
		(2.12)	(1.70)	(1.87)	(0.83)	(1.19)	(1.05)
$\xi + \beta_2\gamma_{3H}$	BI_1	7.99	-4.89	-3.10	-1.66	-1.51	-0.76
		(2.73)	(1.25)	(0.86)	(0.43)	(0.99)	(0.44)
$\xi + \beta_2\gamma_{2H} + \beta_2\gamma_{3H}$	BI_2	8.10	-3.55	-4.55	-1.88	0.04	-1.36
		(1.77)	(1.36)	(1.23)	(0.78)	(0.84)	(0.95)

Notes: N=427 municipalities. Standard errors clustered at the *comarca* level
$BI + BHC$: Estimated effect of both bad institutions and bad human capital
$GHCHigh$: Estimated effect of an increase in human capital in areas with good institutions and high human capital
$GHCLow$: Estimated effect of an increase in human capital in areas with bad institutions and low human capital
BI_1: Estimate of the effect of extractive institutions holding human capital constant
BI_2: Second estimate of the effect of extractive institutions holding human capital constant
All regressions include *comarca* dummy variables, $SDAlt/100$ and $Alt/100$
See text for additional details