British law and caste identity manipulation in colonial India: the Punjab Alienation of Land Act.

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I analyze the impact of the creation of an "agricultural tribe" category by the Punjab Alienation of Land Act of 1901, the membership of which was almost compulsory in order to buy or sell land. Using original panel data built from the decennial census of Punjab from 1881 to 1921. I show, using various triple difference strategies, that in the districts where the law was enacted, caste groups manipulated their caste identity in order to claim an affiliation to the castes and tribes registered as agricultural by the British administration. This points to both the role of the British administration in the making of caste as a salient identity in colonial Punjab, as well as the ability of caste groups to manipulate their identity in response to economic incentives. More broadly, it questions the impact of any ethnic based policy on the definition of ethnic groups themselves.

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Introduction

This paper analyzes the impact on the caste system of a land policy reform, the Punjab Alienation of Land Act, passed in 1901 by the British administration in Punjab. By creating an "agricultural tribes" category, the membership of which was almost compulsory to buy or sell land, it created a very strong incentive for caste groups to manipulate their caste identity in order to claim membership to a caste group actually considered as an agricultural tribe[1] so as to be able to enter the land market. By using caste census data from 1881 to 1921, I am able to follow the population of the different caste groups of the Province of Punjab, and thus to evaluate the impact of the enacting of this law on the tendency of caste groups to respond to the incentives given to them by the British administration.

This paper is related to several strands of the economic literature. First of all, it is very close in spirit to the growing literature studying the role of the British institutions in India in several colonial and contemporary outcomes (Iyer (Forthcoming), Banerjee and Iyer (2005), Banerjee and Somanathan (2007), Chaudhary (2009)), and thus, more generally, to the literature focusing on the understanding of the long term determinants of development (Acemoglu, Johnson and Robinson (2001), Engerman and Sokoloff (1997)). Then, it is also linked to the study of ethnicity which has now become a very large strand of the mainstream economic literature. Indeed, ethnic fractionalization has been associated with lower provision of public goods (Alesina, Baqir and Easterly (1999), Miguel and Gugerty (2005)), lower growth (Acemoglu, Johnson and Robinson (2001), Alesina and La Ferrara (2005)) or lower quality of government (La Porta et al. (1999), Easterly and Levine (1997)). For India, more than ethnic identity, it is caste that has been at the center of attention with studies such as Banerjee and Somanathan (2007), Banerjee, Somanathan and Iyer (2005) or Chaudhary (2006). Those studies, in line with the research on ethnic fractionalization, typically find that caste fractionalization leads to lower public good access, both in colonial times and in more recent periods. According to this literature, ethnic or caste identity appears therefore to be a key aspect of economic development. However, this type of studies typically consider ethnic identities to be exogenously given. Indeed, all those studies rely on cross section data and thus have to make such an exogeneity hypothesis [2], while it has been widely acknowledged in social sciences that ethnic identity might not be as fixed as it is often assumed[3] and might thus respond endogenously to institutional or economic incentives, and lead to spurious results. Moreover, and certainly more importantly, if the results of this literature are robust, then understanding the origin and evolution of ethnic or caste identities is essential to think about the solutions to bring to the issues they raise. Indeed, if ethnic

[1] The tendency of caste and caste associations to manipulate their caste names in colonial times has been widely studied by social scientists, and is presented in more details in the body of this paper.

[2] Most of those study use data collected often decades before their measured outcome, and thus argue that their exogeneity hypothesis is not too strong.

[3] The so called "constructivist" approach underlines that ethnic composition of a region as well as individuals or groups ethnic identities might evolve in response to the context (see Posner (Forthcoming) for a review)

identities appear to be fixed, then they might be thought as a curse as unalterable as geographical characteristics, with very little margin for political action to limit their negative influence. However, if they respond to their environment, and it particularly, to their institutional environment, then political action to reshape them in a way such as to prevent such negative outcomes to arise might be efficient.
However, the documentation of this aspect has proven tricky, as it requires to follow ethnic groups through time in order to ascertain their evolution. For ethnic groups, the study of Michalopoulos (2008) demonstrates the link between ethnic group formation and very long term geographic determinants. In the Indian context, the only attempt to understand the evolution of the number of caste groups I am aware of is the one by Ban and Rao (2007), which points to a causal impact of the post independence land policy on the number of caste groups.
To my knowledge, this paper is the first one to empirically raise the question of and demonstrate the link between colonial institutions and more traditional institutions, such as ethnicity or the caste system[4]. It thus poses a bridge between the two different strands of literature discussed above, and points to the need of addressing the issue of the role of the interaction of the two in the development of a country. Moreover, this paper is also the first one to try to address the question of group identity manipulation using panel data, hence allowing more convincing econometric techniques to be used. Indeed, being able to follow caste groups populations at the district level both before and after 1901, I can evaluate precisely the impact of the Punjab Alienation of Land Act on the trend of the population of the caste groups affected by the law.
The first part of the paper presents the law and gives some historical perspective, the second part describes the data being used, the third part is dedicated to the different empirical strategies and robustness checks while the last part rules out other potential interpretations of the results found.

1 Historical background

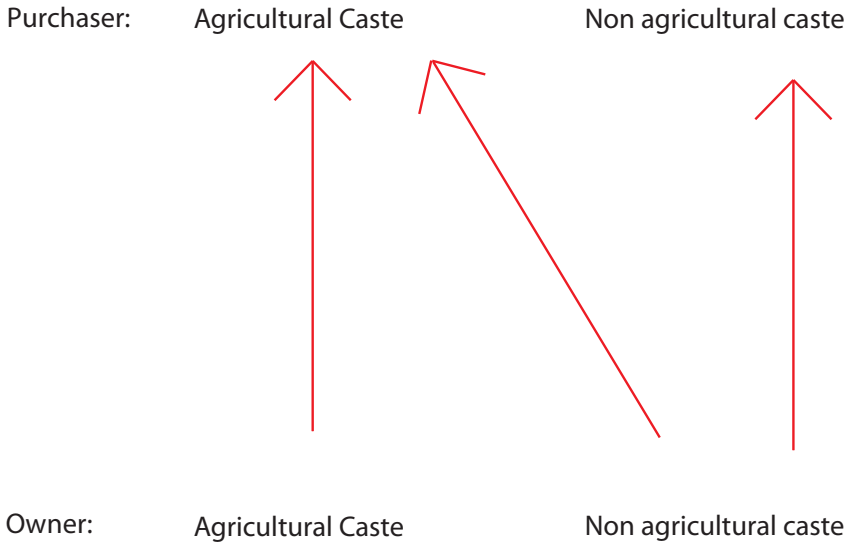
1.1 The Punjab Alienation of Land Act

By the end of the 19th century, the debt of the peasantry had become a concern for the British authorities : *"One of the most significant domestic problem confronting the Indian government [...] was the growing indebtness of the cultivating classes and a concomitant transfer of landed property [...] to urban moneylenders."* Barrier (1966). This concern was of particular importance in the Province of Punjab, since the Indian army was largely recruiting in the Province (see for example Tai Yong (2005) on that matter). Hence, avoiding rural agitation in that Province was a prime concern and *"...the driving force behind government attempts to find solution to debt and land transfer was fear for its own position [...]."* (Barrier, 1966). The act, which was put in application

[4]Of course, this question has already been studied in other social sciences, see for example Posner (2005) for Africa or Bayly (1999) and Dirks (2001) for India.

in June 1901 creates an "agricultural tribe"[5] category for which the selling or buying or land was restricted : a member of an agricultural tribe could transfer the property of his land (be it by sale or by mortgage) only to an other member of an agricultural tribe[6]. Figure **??** gives a representation of the working of the land market under the Alienation of Land Act. As can be seen in Figure 2, the "agricultural tribes" owned

Figure 1: Land market under the Punjab Alienation of Land Act.



the large majority of the land sold, which resulted in an almost complete exclusion of non agricultural tribes members from the land market[7]. Indeed, as underlined by Barrier (1966), the law was successfully enforced : *"Sales to non agriculturists ceased after 1901."* [8]. The enforcement of the land can also be even more convincingly noted in Table 3 in which it can be seen that from 1901 onwards, the amount of land transferred is much lower than it was before (with the exception of the 1912-1913 peak, which is due to the Colonisation of Government Lands Act of 1912, as already mentionned). The act was then reinforced by the Punjab Pre Emption acts of 1905 and 1913 who grave pre

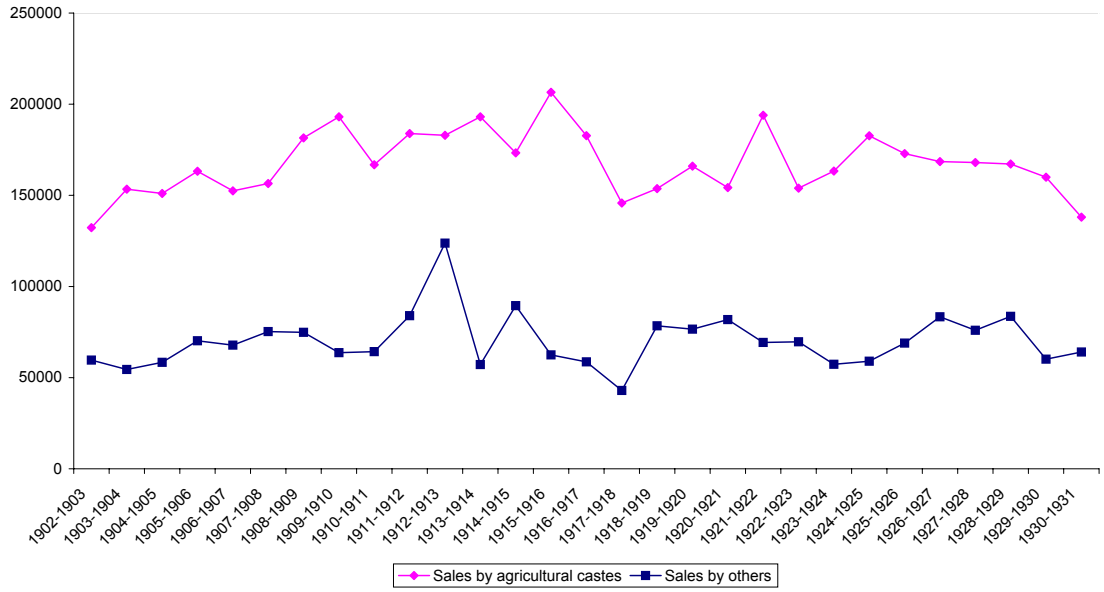
[5]In colonial writings, the distinction between a "tribe" and a "caste" if very unclear, as underlined in Kaul (1912)*"...in vulgar parlance, the terms Caste and Tribe are used as synonyms"*. Throughout this paper, I will thus write caste or tribe indifferently.

[6]See Annex 1 for the text of the Act.

[7]It is to be noted that if Figure 2 reports the sales of land owned by the agricultural tribes, it does not report the sales of land owned only by non agricultural tribes, as the statistic "sales by others" also refers to the sales made by the Government of Punjab, which it sold mainly to members of agricultural tribes. The peak of 1911-1913 in the "sales of others" is for example due to the Colonisation of Government Lands Act of 1912 which allowed tenants in the "Canal Colonies" of Punjab to buy their land from the government (Ali, 1988).

[8]Other references emphasize the impact of the law on the non agricultural castes, such as :*"by means of this act moneylenders were practically wiped out of the land market"* Hirashima (1978)

Figure 2: Sales of land by "agricultural" status (in acres). Province of Punjab, 1902-1932.



Source: Report of the Land Revenue Administration of the Punjab, 1932.

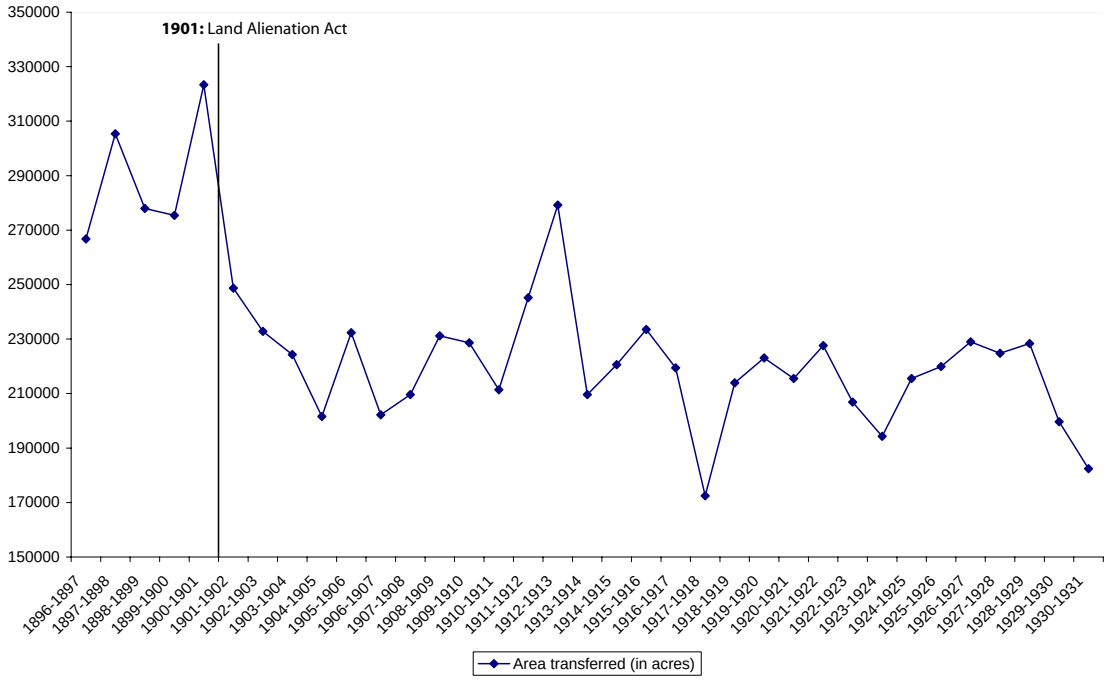
emption rights on land sales to members of agricultural tribes. In a Province in which the population lived in rural areas in its vast majority, being considered as a member of agricultural tribes became critical after the enacting of the act, as it was the only way to have access to land ownership. The law thus created a very strong incentive to be listed as an "agricultural tribe".

1.2 Its impact on the caste system

Various reports of the administration mention the different manners in which attempts to avoid the act were made. The first and most obvious one was to lobby the authorities in order to have the caste be entered in the list of "agricultural tribes". Indeed, the number of castes considered as agricultural increased over time. An other way to evade the act was to use "benami transactions": using a member of an agricultural tribe to buy or mortgage land for a member of a non agricultural tribe[9]. But the way mentioned in the reports that we are dealing with in this paper is caste identity manipulation, which is described at several occasions in the various Annual Reports on the Punjab Alienation of Land Act. Indeed, for the year 1904-1905, it is written: *"...menials that have acquired money are attempting to get themselves recorded as agricultural tribes with a view to*

[9]For example, in the Report on the Working of the Punjab Alienation of Land Act for 1908 : *"What are called benami transactions are reported from most districts. The money lender induces a member of an agricultural tribe [...] to take land on mortgage for the would be borrower."* (Punjab Government (1909))

Figure 3: Transfers of land property (in acres). Province of Punjab, 1896-1931.



Source : Report of the land revenue administration of the Punjab, 1932.

acquiring land..." (Punjab Government (1906)), while for the year 1906-1907, one can see mentions of "*...cases of evasive attempt to change tribal designation from a non agricultural to an agricultural tribe in order to defeat the provisions of the Act...*" (Punjab Government (1908)). This tendency is reported to be the due to individual action, as in the examples given here, but also sometimes to the mobilization of the caste as a whole: *"Frequent cases arise in which application is made by tribes not included in the group notified for the district to have the tribal designation altered to one so included"* (Punjab Government (1909)). Those attempts can also be found in various Census reports, that underline a tendency from caste associations to make claims towards the British administration in order to be considered as agricultural :in the Report on the Census of Punjab, 1911, for example : *"The introduction of the Punjab Alienation of Land Act [...]has naturally stimulated [...] a tendency to claim an affinity with one or the other of the castes declared by Government as agricultural"* Kaul (1912)[10].

This takes place in a wider context of caste identity manipulation all across India. Indeed, it has been widely documented (from Ghurye (1932) and Srinivas (1966) to Dirks (2001) and Bayly (1999)) that far from being fixed, the caste system, under the British

[10]This claims persisted through time and can also be found in the Report on the Census of Punjab, 1931: *"...on the present occasion more than ever before a tendency was noticeable in various localities,[...] to return a higher caste. One of the main reasons was a desire to be included in one of the agricultural tribes [...] to secure exemption from the provisions of the Punjab Alienation of Land Act."* Khan (1933)

rule, was evolving under the action of the caste associations (or caste "sabhas") which were formed in order to *"support social advancement"* Assayag (1995) and to gain access to the economic opportunities created by the British presence [11]. Authors such as Dirks (2001), argue that *"[...] caste is a modern phenomenon, that it is, specifically, the product of an historical encounter between India and Western colonial rule"*. Indeed, the British rule was a period of deep changes for the Indian society, in particular regarding caste. As finely underlined by Bayly (1999), the British Raj has given Indians incentives to turn caste into their salient ethnic identity : *"[...]from the early nineteenth century onwards, British rule significantly expanded and sharpened these norms and conventions, building many manifestations of caste language and ideology into its structures of authoritative government."* As a matter of fact, the Sepoy mutiny of 1857, which lead to the replacement of the East India Company by the British Crown for the administration of British India Iyer (Forthcoming), *" made it clear to the British that they knew fat too little about the colonized populations of India"* Dirks (2001). As, in what has been described as the "Orientalist" (Said (1978)) point of view, caste was to define one's characteristic, understanding India required to understand caste. Hence, caste became more and more at the center of colonial policies and data collection. From the 1880's, for example, caste identity became central in the recruitment policy into the army, in line with the "martial race" theory : some castes and "races" were seen as being more martial, more "warlike" and more disciplined than the others, thus making better soldiers (Omissi (1994)). It was thus those castes and "races" only that were allowed in the Indian army. Along the same lines, the Criminal Tribes Act of 1871 put entire caste groups under the suspicion of being criminal. The Punjab Alienation of Land Act, with its implicit view that caste identity is to define one's occupation, is clearly part of this moves towards caste directed legislation. However, contrary to recruitment in the army or suspicion to be a criminal which where of concern for only a minority, it affected deeply the life of the vaste majority of the inhabitants of the Province of Punjab, and thus creating a very strong incentive for caste identity manipulation.

2 Data

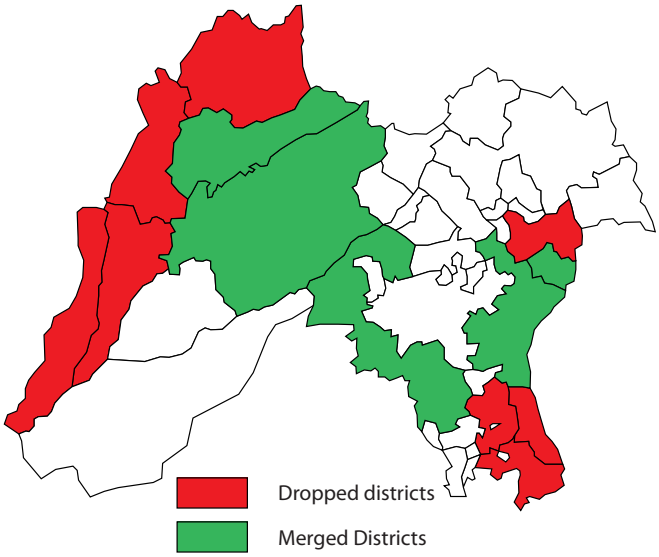
2.1 Caste Census Data

To estimate the impact of the Punjab Alienation of Land Act on caste identity manipulation, I have collected caste census data from 1881 to 1921. Indeed, from 1871 to 1931, every decennial Census collected caste data, which was then tabulated at the district level. As already mentioned, it has been widely documented that the Census was part of the mobilization strategies from caste associations, who were very often claiming for new caste names, making the following of each single caste very difficult across time, as both classifications and names might change across time. However, the Punjab Census data is of very good quality from 1881 to 1921: using the different Census reports and

[11] *"the associations began to press for places in the new administrative and educational institutions and for political representation"* Rudolph and Rudolph (1960)

the Glossary of the Tribes and Castes of the Punjab and North-West Frontier Province (Rose (1911)), I have been able to track all caste groups, taking into account the hundreds of changes in classification and names[12] and thus building what I believe is the first dataset following caste groups demography over time at such a fine level[13]. However, the various modifications of district borders and the partition of the North West Frontier Province from Punjab in 1901 as well as the creation of the Delhi Province in 1911 have led me to leave aside some districts while merging some others, in order to assure their comparability over time (see Figure 4).

Figure 4: British Punjab : dropped and merged districts



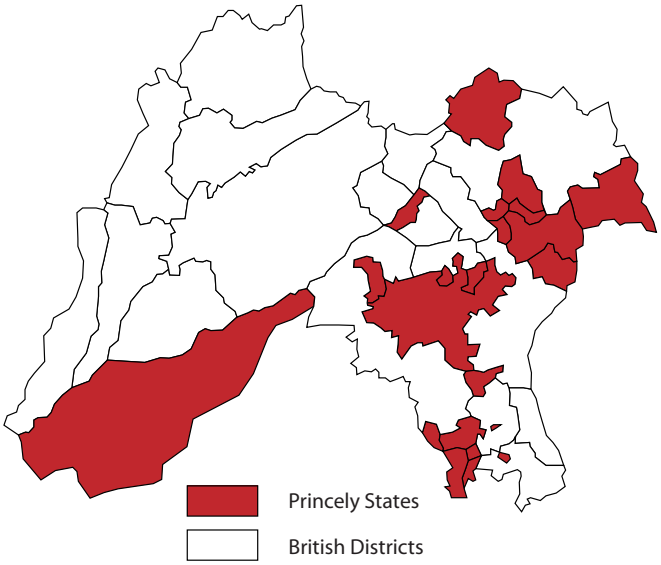
Overall, I am able to follow 76 caste groups, 15 of which are agricultural[14], which represent from 97% to 99% of the population of the 34 districts and states I am tracking

[12]The reason why I do not use the 1871 and 1931 Census is that they do not report Castes group at such a fine level as the other years, thus not allowing me to track all Castes for those years. Also, it has often been reported that Caste Census data is flawed due to people reporting their occupation or their region instead of their castes, but the Glossary and the Census reports do list those occupational and regional names, that I was thus able to identify and remove, and which account for a negligible part of the total population.

[13]Both geographically fine, at the district level, and fine at the caste level, since I follow caste groups, and not only "scheduled castes" and "scheduled tribes" as is usually the case in most datasets.

[14]More castes and tribes were actually considered as agricultural, but in order to be able to track them over time, I had to merge them either with other agricultural castes, or with non agricultural ones (which bias the results downward). I code as "agricultural" all caste or tribe defined as such in the Notifications of the 18th April 1904 and of 30th March 1906, found in the Reports on the Punjab Alienation of Land Act (Punjab Government (1905) and Punjab Government (1907)). Castes were defined as agricultural at the district level. Also, as I use the 1906 list of agricultural castes (I could not find reports on the Punjab Alienation of Land Act after 1908, and no modification of the list takes place between 1906 and

Figure 5: British Punjab : Princely States and British Districts



over time, which themselves contain 80% of the population of the Province of Punjab. I have thus built a district level panel of caste composition allowing to study through time at a very fine geographical level the response of caste groups to the Punjab Alienation of Land Act.

2.2 Descriptive Statistics

The whole Province of Punjab had a 24.4 million population in 1901, for an area of 354 634 square kilometers. It corresponds to the contemporary States of Punjab (Pakistan), Punjab (India), Himachal Pradesh (India) and Haryana (India). As for the rest of India, it was not entirely administered by the British, since some area, the Princely States, were under the rule of local Princes, and as such, were not subject to British law (see Iyer (Forthcoming) for more details, and Figure 5 for their localization), the population of the Princely states was 4.4 millions, thus leaving 19.9 millions under direct British rule.

The Province of Punjab was essentially rural, with 89% of the population living in a rural area[15], hence most of its population is directly concerned by the act, while the

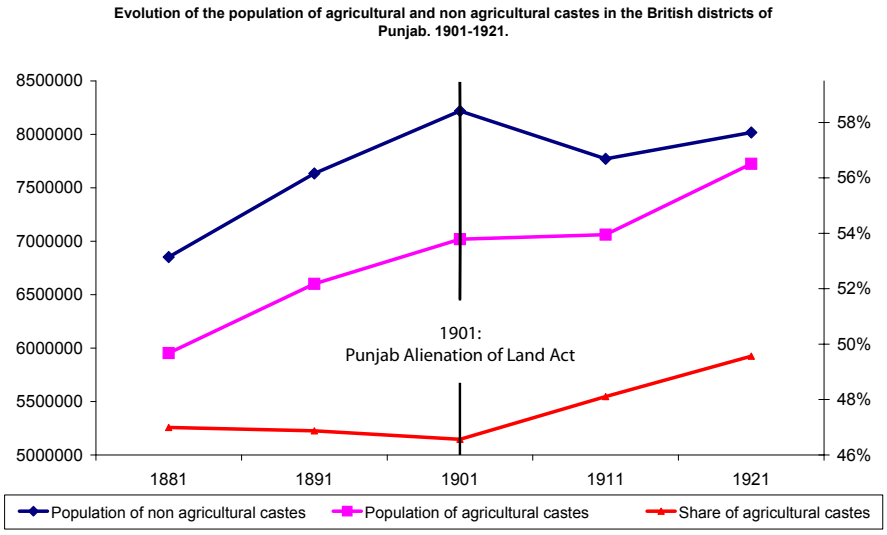
1908), I consider as non agricultural any caste entering the category after 1906, leading to a downward bias of my estimations.

[15]The Urban population is defined as "*(1) Every municipality of whatever size.(2) All civil lines not included within municipal limits.(3) Every cantonment.(4) Every other continuous collection of houses, permanently inhabited by not less than 5,000 persons, which the Provincial Superintendent may decide to treat as a town for census purposes.*" (Report on the Census of Punjab, 1901 Risley (1903))

Table 1: Descriptive Statistics : districts and states of Punjab, 1901.

	British Districts	Princely States
Mean Population (std deviation)	1397666 (1133804)	207298 (357096)
Mean Population/km2 (std deviation)	303.7 (177)	194.5 (126.6)
Mean Urban Population (std deviation)	10.9% (0.04)	9.9%(0.07)
Number of Districts/States	11	21

Figure 6: Evolution of the populations of agricultural versus non agricultural tribes in British districts of Punjab. 1881-1921.



urban population is also affected if it wanted to own land.

Among the British districts, the population was roughly cut in half between agricultural castes and non agricultural castes, as can be seen in Figure 6[16]. However, the differential evolution of the populations of the two groups is very striking : while the trends were very similar before 1901, after the enacting of the law, the population of the agricultural castes begins to increase much faster than it did before, while the population of non agricultural castes tends to have a much flatter trend than it had before.

This is in line with the effect I would expect the act to have : with its enactment, as the caste groups try to be included in the agricultural tribe category, I was expecting to see a rise in the population trend of agricultural tribes and a decline in the population trend of non agricultural tribes, as the non agricultural tribes manage to enter the agricultural castes.

[16]For the purpose of Figure 6 and Figure 8 only, I have separated the agricultural castes Dagi and Koli (which were 150,418 members in 1901) from the non agricultural Chamar (1,207,820 members in 1901), while I merged them (and consider the whole group as agricultural) in my data since in 1901, *"some of [the Dagi and Koli] returned themselves as [...] Chamars"* (Kaul (1912)). As the Dagi and Koli are not present in the Princely States of Punjab, allowing the separation permits to give a clearer picture of the repartition of agricultural and non agricultural castes, especially in the Princely States.

3 Empirical Approach

3.1 First identification strategy : non agricultural castes as a control group

The fact that only certain castes were considered as "agricultural" by the act does not allow to use a simple double difference strategy. Indeed, as "agricultural tribes" were not randomly selected, they are likely to exhibit systematic differences from non agricultural ones, and in particular, the growth rate of their population might be on average different from that of non agricultural castes. To account for this, I will turn to a triple difference strategy, comparing the variations in the caste populations of those two groups before and after the law. In this case, the identification relies on the much weaker hypothesis that the differences in the variation of the population of agricultural castes versus non agricultural tribes before and after 1901 would have remained stable in the absence of the law, and not that their variations themselves were similar. Hence, I will run regressions of the form :

$$\begin{aligned} ln(pop_{idt}) - ln(pop_{idt-1}) = constant + \beta agr_i + \gamma post1901_t \\ + \delta agr_i * post1901_t + \eta X_{dt} + \epsilon_{it} \end{aligned} \tag{1}$$

The growth rate (approximated by the difference in log) of the population of caste i in district d (if the regression is at the district level) during each of the periods t (1881-1901 and 1901-1921) is thus regressed on agr_i a dummy indicating whether caste i is an agricultural tribe, $post1901_t$ a dummy taking a value of 1 when the period is in the 1901-1921 interval and 0 in the 1881-1901 interval, and X_{dt} a set of District dummies, and district dummies interacted with the $post1901_t$ dummy, to control for any possible district specific change in trend [17] (if the regression is at the district level).

I use two main specifications of this regression. In specification 1, I regress the variation in caste population at the British Punjab level[18], while in specification 2 and 3, I regress the variation in caste population at each British district level, which allows me to control in specification 3 for any district specific change in trend that might have been driving the results (for example, a district with a higher than average share of agricultural tribes that would have been less exposed to some negative demographic shock).

As can be seen in Table 2 the very precisely estimated coefficient on the interaction between agr and post is superior to the coefficient on agr and remains of comparable range across specifications: the effect that we were anticipating is thus present, as after the law passes, the growth rate of agricultural castes increases relatively to that of non agricultural castes. Indeed, this points to a clear tendency for caste identity manipulation in response to the enacting of the law, with the average agricultural caste having a

[17] Adding an interaction between post and district dummies, makes the coefficients on post non comparable across specifications, as this interaction results in a decomposition of the post coefficient across districts. The coefficients on agricultural and post1901*agricultural remain comparable, however.

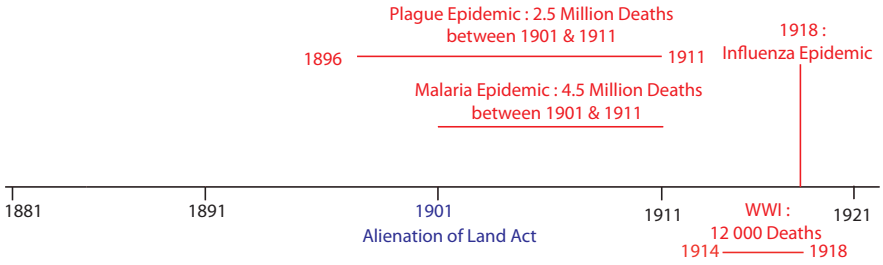
[18] For all the specifications at the Province level (all first specifications), I consider only the caste groups which account for more than 0.001% of the population under consideration.

Table 2: Within British Punjab impact of the Act. Dependent variable : difference in log-populations.

	State level	District level	
	(1)	(2)	(3)
post1901	-0.304***	-0.449***	-0.262***
	(0.0859)	(0.0469)	(0.0771)
agricultural	0.00392	-0.0673	-0.0705
	(0.0806)	(0.0450)	(0.0429)
post1901*agricultural	0.220**	0.320***	0.323***
	(0.0973)	(0.0630)	(0.0624)
Constant	0.167**	0.226***	0.0776
	(0.0731)	(0.0306)	(0.0498)
District Dummies	NO	NO	YES
post*District Dummies	NO	NO	YES
Observations	176	1137	1137
R^2	0.094	0.092	0.117

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 7: Main Demographic Shocks affecting the Punjab



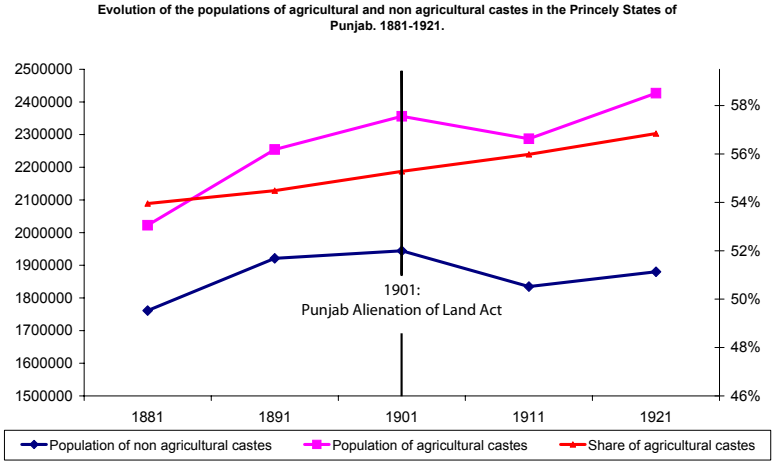
growth rate from 22 to 32 percentage points bigger than the one of the average non agricultural caste after 1901. As can be seen in specification 3, this effect is not driven by an outlier district, as the results remain robust to including an interaction term of post with district dummies, controlling for any district specific change in demography. However, the negative coefficient on the post dummy underlines the fact that after 1901, the average non agricultural caste tended to see its population increase on average less, leading us to suspect the existence of some demographic shocks that would affect Punjab after 1901.

3.2 Second Identification Strategy: Princely States as a control group

Hence, one might argue that the results obtained with the first identification strategy are not the results of the Punjab Alienation of Land Act, but solely that those demographic shocks affected more non agricultural tribes than agricultural ones : for example, it could well be that the non agricultural castes members tended to live in more urban area, in which the diseases might tend to spread faster. And as a matter of fact, the 1901-1921 period faced various episodes of epidemic, with plague, malaria and influenza killing millions, as can be seen in Figure 7.

To account for this, I use an other identification strategy: in line with the work of

Figure 8: Evolution of the populations of agricultural versus non agricultural tribes in the Princely States of Punjab. 1881-1921.



Iyer (Forthcoming), I use the fact that all of India was not under direct British rule. Indeed, the Princely States were under the rule of local Princes, and as such, were not subject to the British legislation, and in particular, to the Alienation of Land Act. Arguably, the States of Punjab faced the same epidemic as the British districts, due to their close proximity (as can be seen in Map 5), but were not concerned by the Punjab Alienation of Land Act, thus providing a counterfactual that allows me to control for the demographic shocks of the period: the castes located in the Princely States of Punjab are indeed similar to the castes of the British districts, are subject to the same epidemic, but are not concerned by the agricultural/non agricultural castes categories created by the law. Hence, if the variation in caste groups populations observed in British Punjab were to be attributed to the Alienation of Land Act, we would expect the Princely States caste groups not to exhibit any specific change around 1901 as was the case in British Punjab. Indeed, we can see in Figure 8 that the populations of both agricultural and non agricultural tribes exhibit relatively similar trends.

I will thus estimate regressions of the form :

$$\begin{aligned} ln(pop_{idt}) - ln(pop_{idt-1}) = constant + \beta agr_i + \gamma post1901_t + \delta agr_i * post1901_t \\ + \rho british_d * agr_i + \pi agr_i * post1901_t * british_d + \eta X_{dt} + \epsilon_{itd} \end{aligned} \tag{2}$$

With the same notation as in Model 1 and $british_d$ a dummy indicating whether district d is a British district or a Princely State, with alternatively the interaction of $british_d$ and $post1901_t$ replacing the interaction of district dummies and $post1901_t$, to control either for a British districts specific shock (ie. the demographic shocks affected asymmetrically British districts and Princely States, which might for example be due to the fact that British district were more densely populated as seen in Table **??**) or for district specific shocks, when the regressions are at the district level. These sets of dummies allow me to

Table 3: British districts vs Princely States. Dependent variable: difference in log-populations.

	Province level	District level	
post1901	-0.265*	-0.231***	-0.262***
	(0.137)	(0.0382)	(0.0774)
agricultural	0.205	0.0592	0.0533
	(0.168)	(0.0435)	(0.0418)
post1901*agricultural	0.0508	0.0201	0.0201
	(0.218)	(0.0588)	(0.0568)
british*agricultural	-0.201	-0.126**	-0.124**
	(0.187)	(0.0626)	(0.0601)
post1901*british*agricultural	0.170	0.300***	0.303***
	(0.239)	(0.0862)	(0.0846)
british	0.0810	0.0735*	
	(0.0865)	(0.0394)	
post1901*british	-0.0392	-0.218***	
	(0.161)	(0.0605)	
Constant	0.0858*	0.153***	0.0776
	(0.0460)	(0.0248)	(0.0500)
District Dummies	NO	NO	YES
post1901*District Dummies	NO	NO	YES
Observations	310	2329	2329
R^2	0.076	0.077	0.123

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

control for the fact that the epidemics might not affect all districts in the same manner, as well as for any district specific change in trend that might drive the result, as in the first identification strategy.

One has to keep in mind that this identification strategy tends to bias the coefficient downwards, as it assumes that the law had no impact in the State, which is far from being obvious: a person living in a Princely State but near a border with a British district would be affected by the law if it were to try to buy some land just on the other side of the border, and would thus face very similar incentives to that faced by a British district inhabitant.

We can see in Table 3 that the coefficients on the interaction of post, british and agr is significant in all the specifications but one and positive in all. Hence, it appears that the tendency for agricultural tribes to grow relatively faster than the non agricultural tribes after 1901 than before is only specific to British districts, the districts where the law was passed. This confirms the fact that the results obtained in our first identification strategy were not driven by asymmetric demographic shocks but by the impact of the law itself. Even more so, the estimated impact of the Act with this identification strategy is roughly consistent with the results obtained in the first one, with the average agricultural caste exhibiting an increase of the difference of its growth rate with the average non agricultural caste one of around 30 percentage points.

3.3 Third Identification Strategy: Time variation within the British districts

However, the former identification strategy is not devoid of potential bias. Indeed, the negative coefficient on the interaction of post1901 and british suggests that the

Table 4: First World War and Influenza robustness check : within British Punjab. Dependent variable : difference in log-populations.

	State level	District level	
	(1)	(2)	(3)
post1911	-0.156**	-0.308***	-0.369***
	(0.0726)	(0.0429)	(0.138)
agricultural	0.0459	-0.0846**	-0.0902***
	(0.0597)	(0.0334)	(0.0349)
post1911*agricultural	0.0967	0.246***	0.260***
	(0.0906)	(0.0547)	(0.0571)
Constant	0.0530	0.120***	0.241**
	(0.0387)	(0.0271)	(0.104)
District Dummies	NO	NO	YES
post*District Dummies	NO	NO	YES
Observations	176	1144	1144
R^2	0.043	0.052	0.092

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

British districts were more heavily affected by the demographic shocks of the beginning of the XXth century. One might thus suspect that this strategy does not convincingly control for their asymmetric impact on the two type of caste group, if, for example, the asymmetry of the impact grows larger with the size of the impact. To counter this critique, I will resort to a within British district strategy, exploiting the time variation inside the British districts of Punjab.

3.3.1 Controlling for the First World War and influenza epidemic

The first and more straightforward strategy is simply to remove as much demographic shocks as it is possible. Hence, to remove the impact of the First World War and Influenza epidemic, that both happen after 1911, I consider the restricted period of 1891-1911, thus completely negating any impact that those two shocks might have had in the results presented in the paper. I thus use the exact same specification used in model 1 and but using the two 10 years periods 1891-1901 and 1901-1911 instead of 1881-1901 and 1901-1921. Tables **??** present the results obtained. One can see that the results presented here are in line with the results obtained in the full 40 years sample, thus pointing to the fact that World War I and the influenza epidemic had nothing to do with the results obtained.

3.3.2 Controlling for the plague and malaria epidemics

However, one might still argue that, if not World War I and influenza, it could well be that it is the plague and malaria epidemics of the 1901-1911 period that drive the results. To control for that, I propose to verify whether a change in trend of the agricultural castes population happened around 1911: if the results obtained are driven by the demographic shocks happening during the 1901-1911 period, then we should see a trend specific to the 1901-1911 period, that would not persist after 1911, once the shocks have passed. Hence, if it is plague and malaria that drive the results, the difference in agricultural versus

Table 5: Plague and malaria robustness check : within British Punjab. Dependent variable : difference in log-populations.

	State level	District level	
	(1)	(2)	(3)
post1911	0.0692	0.0660**	0.150**
	(0.0709)	(0.0257)	(0.0734)
agricultural	0.143**	0.0614*	0.0606*
	(0.0681)	(0.0329)	(0.0317)
post1911*agricultural	-0.0608	0.0189	0.00869
	(0.0776)	(0.0416)	(0.0406)
Constant	-0.103*	-0.0884***	-0.136**
	(0.0614)	(0.0175)	(0.0553)
District Dummies	NO	NO	YES
post*District Dummies	NO	NO	YES
Observations	176	1022	1022
R^2	0.022	0.018	0.074

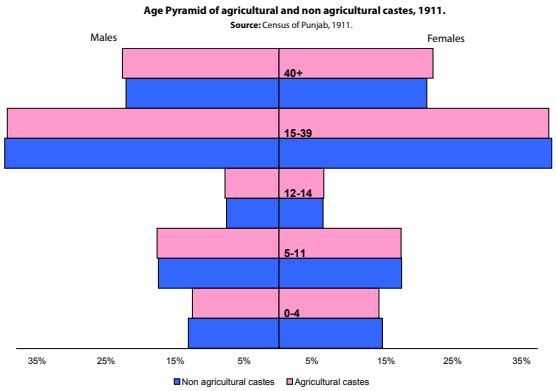
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

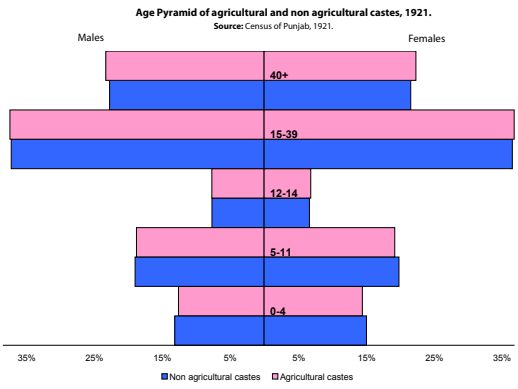
non agricultural castes population trend should be 1901-1911 specific, the identification assumption being here that plague, malaria, influenza and World War I being very different type of shocks (both in nature and in size), it is very unlikely that they would affect the population of agricultural and non agricultural castes in the same way.
I thus use the exact same specification used in model 1 but using the two 10 years periods 1901-1911 and 1911-1921 instead of 1881-1901 and 1901-1921. Table **??** present the results obtained. We can see that, while the coefficient on agr is positive and significant the specifications, pointing to the fact that agricultural castes tended to grow faster than agricultural ones in British districts during the whole of the 1901-1921 period, the coefficient on the interaction between post1911 and agricultural (in Table **??**) is small and non significant pointing to the fact that there was no change around 1911 in the tendency for agricultural castes to grow faster than non agricultural ones. Hence, overall, it appears that there is no change in the trend of the population of the agricultural castes around 1911, thus pointing to the fact that the shocks caused by the plague and malaria epidemics did not drive the results obtained, as the trend in the population of agricultural versus non agricultural castes remain constant across the 1901-1921 period[19].

4 Ruling out alternative interpretations

However, it is unclear how the impact of the law should be interpreted: while the anecdotal evidence taken from the Census and administrative reports points to caste identity manipulation, we can not yet rule out other interpretations.

[19] An other way to interpret those results is by taking them as a robustness check controling for the fact that the only change in trend in the data takes place around 1901, and not at an other date. In which case, to be complete, the exercise should be done for the 1881-1901 period as well. The results for this period can be found in Annex 2





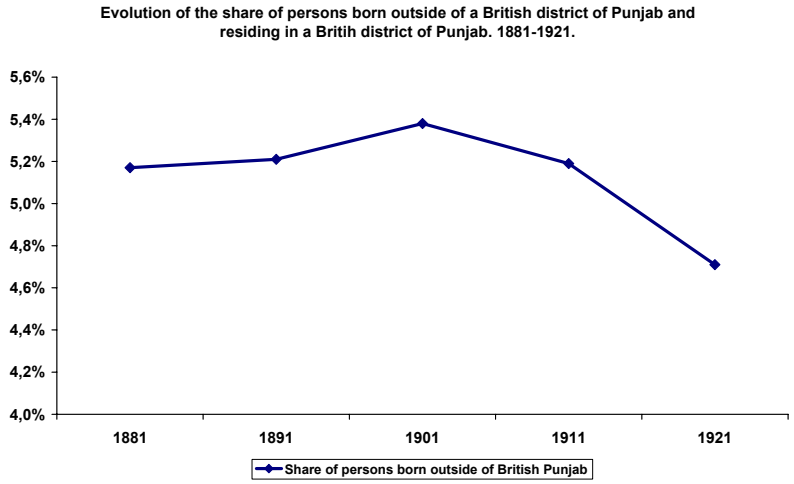
4.1 Better economic conditions for agricultural castes due to the Act

The most straightforward interpretation of the results might be to say that the fact that the agricultural castes grew faster than they used to after the law was enacted just shows that the law had attained its objective of giving better economic conditions to the agricultural castes. To assess the validity of this interpretation, I will look at the composition by age of each type of caste. Indeed if this interpretation was to be true, the structure of the age pyramid would appear to be different for each type of caste, with the base of the pyramid being larger for the agricultural castes, being able to both have more children and to lower their children death rate. The composition by age of certain caste is available for the whole Province of Punjab for the years 1911 and 1921. The 58 castes for which this information is reported in both years represent respectively 90% and 88% of the total population of Punjab. On can see in Figures **??** and **??** that the age structures of the two caste groups appear to be very similar at the two dates, pointing to the fact that the law seems not to have had a large impact on the fertility and infant death rate of the agricultural castes. Of course, the absence of the 1901 age pyramid is a problem for the interpretation of what is shown in those graph. However, if, in 1901, the base of the pyramid for the agricultural castes had been more thinner than it is for the non agricultural castes, then this would have translated 10 and 20 years later to a much thinner 12-14 or 15-39 age groups category, which is clearly not the case. Thus, even in the absence of a 1901 "baseline" age pyramid, we can rule out the possibility for this type of argument to rule the results.

4.2 Change in the caste composition of migration

However, an other very plausible interpretation would be that the results are entirely driven by migration: after the law passes, members of the castes that would be considered as agricultural in the British districts of Punjab face an incentive to migrate from their place of origin (outside of Punjab or a Princely State of Punjab) to a British district of Punjab in order to benefit from the status that the law gives to them, or, probably more

Figure 9: Evolution of the share of persons born outside a British District of Punjab in the British Districts of Punjab. 1881-1921.



convincingly, the other way around, with members of non agricultural castes leaving British Punjab, to find places in which they are allowed to by land. In order to rule out this interpretation, the first and most simple way is to look at the evolution of the caste composition of the Princely States, which has been presented in Figure 8. We can see that no change in the composition by caste of the Princely States seems to appear around 1901, clearly suggesting that no massive change in the composition of migration by type of caste is underway.

But to completely rule out this interpretation, I use the birth place statistics of the Census[20] summarized in Figure 9.

We can see that with being around 5%, immigration is fairly small, and seems to be decreasing after 1901. However, what can not be seen (as the birth place data is not detailed at the caste level) is whether the composition of migration has changed after 1901 towards more arrivals of members of agricultural tribes. Hence, I am going to be very conservative, and assume that all the persons born outside a British district of Punjab and enumerated after 1901 are actually members of such castes. To check if migration is indeed driving the results, I then recompute the variations of population of each caste group, but this time subtracting the population of immigrants (ie. number of persons born outside a British district recorded in such a district in 1921) from the population of agricultural tribes and by adding the population of emigrants[21] (ie. number of persons born inside a British district of Punjab and enumerated outside such districts in 1921), assuming that the migrants are distributed across the different castes proportionally to

[20] I thank Dave Donaldson for having given me access to this data.

[21] The data collection for emigration is still underway, so the results in this section are not definitive. In particular, I am using for a couple of states the stock of emigrants of 1911 or 1901 as a proxy for the stock of migrants in 1921. As the data is on stock and not on flows, I however expect those proxies to reflect relatively well the stock of emigrants of 1921.

Table 6: Migration robustness check: within British Punjab. Dependent variable: difference in log-populations.

	State level	District level	
	(1)	(2)	(3)
post1901	-0.204**	-0.361***	-0.205***
	(0.0859)	(0.0469)	(0.0766)
agricultural	0.00392	-0.0673	-0.0705
	(0.0806)	(0.0450)	(0.0429)
post1901*agricultural	0.0270	0.167***	0.169***
	(0.0973)	(0.0633)	(0.0632)
Constant	0.167**	0.226***	0.0776
	(0.0731)	(0.0306)	(0.0498)
District Dummies	NO	NO	YES
post*District Dummies	NO	NO	YES
Observations	176	1137	1137
R^2	0.047	0.062	0.090

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

their respective sizes[22]. This very conservative method artificially creates measurement error, as it considers all migrants as being member of one particular type of caste, which is of course a very unrealistic assumption, and also because, due to data limitation, I don't have access to proper migration data, but only to the birthplace of the inhabitants, meaning that I will consider as having immigrated after 1901 any person recorded in 1921 as being born outside a British District of Punjab, and thus will treat any person having immigrated before 1901 and still present in 1921 as having immigrated after 1901 (the same being true for emigrants). This second point not only creates measurement error, but also bias the coefficient downwards, as the same person will be recorded first before 1901 in the caste it belongs to (which might not be agricultural) and will then be subtracted from an agricultural caste population in 1921, thus artificially decreasing the variation in the difference between the trends of agricultural versus non agricultural tribes before and after 1901. Reproducing the two first identification strategies as earlier on (described in Models 1 and 2), but this time removing any influence that migration might have had, I am now able to see if the results obtained were or not only driven by migration.

As can be seen in Tables 6 and 7, despite the very conservative character of the method used and the measurement error it creates, the coefficient of interest are still of the expected sign when significant (the coefficients are of course, by construction, smaller than their counterpart in the former specifications), thus clearly ruling out the hypothesis that migration was driving the evolution of the population of the agricultural tribes after 1901.

[22]ie. I substract x% of the population of a district's immigrants from the population of an agricultural caste representing x% of the district's agricultural tribes population, the opposite exercise being done for emigrants and non agricultural castes.

Table 7: Migration robustness check: British Punjab vs Princely States. Dependent variable: difference in log-populations.

	Province level	District level	
post1901	-0.265*	-0.231***	-0.205***
	(0.137)	(0.0382)	(0.0770)
agricultural	0.205	0.0592	0.0533
	(0.168)	(0.0435)	(0.0418)
post1901*agricultural	0.0508	0.0201	0.0201
	(0.218)	(0.0588)	(0.0568)
british*agricultural	-0.201	-0.126**	-0.124**
	(0.187)	(0.0626)	(0.0601)
post1901*british*agricultural	-0.0237	0.147*	0.148*
	(0.239)	(0.0864)	(0.0851)
british	0.0810	0.0735*	
	(0.0865)	(0.0394)	
post1901*british	0.0607	-0.130**	
	(0.161)	(0.0605)	
Constant	0.0858*	0.153***	0.0776
	(0.0460)	(0.0248)	(0.0500)
District Dummies	NO	NO	YES
post1901*District Dummies	NO	NO	YES
Observations	310	2329	2329
R^2	0.059	0.057	0.106

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5 Conclusion

This paper shows, using different identification strategies, that the enacting of the Punjab Alienation of Land Act in 1901, by creating an "agricultural tribes" category with almost exclusive access to the land market (a huge economic advantage in a Province of Punjab whose population was still rural at almost 90% in 1921) has deeply affected the caste system. Indeed, caste groups were given a very strong incentive to manipulate their caste identity in order to benefit from the Act, and from 1901 on, the trend of the population of agricultural castes as measured by the Census exhibited an increase varying between 16 and 50 percentage points depending on the specifications, as compared to the trend of the population of non agricultural castes, this effect only taking place in the British district of Punjab and not in the Princely States, not concerned by the law. Moreover, I show that neither migration nor demography can alone explain the variation in population, underlining that the results are mainly driven by the ability of caste groups to manipulate their identity in response to administrative incentives.
This paper is thus, to my knowledge, the first to convincingly document the permeability of caste groups and the ability of castes and caste associations to react and adapt their caste identity in the relatively short term to their environment. Moreover, it clearly points to the role played by the British administration in the evolution of the caste system. Hence, it urges towards a deepening of the analysis of the different long term mechanisms of development being analyzed by economists by focusing in their interaction, to allow for a country specific-or even Province specific, as is the case here- analysis of the institutions and of their potential long term impact.

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Annex 1 : the Punjab Alienation of Land Act

Extract of the Punjab Alienation of Land Act :
Sanction of District Officer (Revenue) required to certain permanent alienations. Save as hereinafter provided a person who desires to make a permanent alienation of his land shall be at liberty to make such alienation where: the alienor is not a member of an agricultural tribe; or the alienor is a member of an agricultural tribe and the alienee is a member of the same tribe or of a tribe in the same group.

Annex 2 : Variations in trend around 1891.

This Annex presents an additional robustness check, controlling for any change in trend around 1891. The model used is the same as Model 1, apart from the fact that 1891 is now used as the turning point, instead of 1901, and that the periods under consideration are the ten years before and after 1891. Table **??** presents the results: the growth rate of the agricultural castes does not significantly differ from the non agricultural' ones.

Table 8: Change in trend around 1891 robustness check. Dependent variable : difference in log-populations.

	State level	District level	
	(1)	(2)	(3)
post1891	-0.0608	-0.00999	0.259*
	(0.0603)	(0.0454)	(0.153)
agricultural	-0.0419	-0.00587	-0.00532
	(0.0558)	(0.0449)	(0.0447)
post1891*agricultural	0.0878	-0.0787	-0.0849
	(0.0817)	(0.0559)	(0.0567)
Constant	0.114**	0.130***	-0.0181
	(0.0462)	(0.0364)	(0.113)
District Dummies	NO	NO	YES
post*District Dummies	NO	NO	YES
Observations	176	1215	1215
R^2	0.007	0.002	0.002

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1