Pauperization and Inequalities in the rural economy in Morocco during the Protectorate (1917-1956)

Preliminary draft

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Abstract

Colonial Morocco is a classic case of large transformation from subsistence to cash-crop agriculture spurred on by private settlers possibly resulting in the massive pauperization of the rural population. Using height as a measure of human well-being, I explore regional inequalities caused by French agricultural settlement during the Protectorate. Agricultural structural changes, the so called «mise en valeur agricole », implemented by French settlers in Morocco (1912-1956) had arguably mixed impacts on Moroccan standards of living. On one hand, the introduction of capital-intensive cash-crops increased total productivity and earnings of agricultural labour. On the other hand, the high concentration of European land diverted land and water resources from the traditional farmers, and reduced their revenue. In this study, I take advantage from different sources of heterogeneity in French settlement in Morocco to investigate its effects. I test several channels of causality: land concentration, water access, capital endowment, diversion of labor and access to international markets. We use two identification strategies to estimate the true colonization effect using a difference-in-difference model and an instrumental variables to purge the potential self-selection bias. This study relies on a first-hand pooled cross-section dataset of 58,000 georeferenced Moroccan individuals spanning from 1917 to 1955, containing anthropometric data from military enrollment archives as a measure of human well-being. This work participates to the stream of economic history literature aiming at quantifying the impact of colonization in colonized countries in the short and long run.

1 Introduction

Did the settlement of European farmers in Africa affect the standards of living of the population during colonization? The current literature has not yet given clearcut answers to the question, neither positive or negative. Theories elaborate alternative hypotheses on the effect of farming methods and openness to trade in the context of colonial economies. On the one hand, European investments when introducing new technologies, high-yielding crops and more efficient techniques, triggered increase in productivity of land and agricultural output. The local population located near European settlements could have benefited from this through lower food price, higher revenue from their land or higher wage from agricultural work. As such, living standards in regions with high European settlement concentration would have positively diverged from the rest of the territory. On the other hand, European settlement by its extractive nature, may had a negative effect on the local population, diverting water and land, lowering traditional farming and increasing food price through the reduction of subsistence agriculture. European agriculture may have benefited the few privileged, colons and rural notables.

I propose in this paper to investigate the effect of French farmers settling in colonial Morocco between 1912 and 1956. The case of Morocco is a classic case of agricultural reorientation from subsistence to an extractive cash-crop system dating back to the colonization and that have persisted until today. Different scholars in history, anthropology, economics have documented the transformation of the rural sector and patterns of exportation under colonisation.The literature describes a growing impoverishment of the rural population despite the improvement introduced in agriculture and the increase of agricultural output. With sparse information on revenues, economists such as Samir Amin or Abdelaziz Bellal report a decrease in standards of living and a rise in revenue gap.

The timing of private settlement is an appropriate framework to investigate different channels of transmission from French agricultural transformation to standards of living and inequality. I use spatial data on European lands at various time periods and individual anthropometric data extracted from military files. I am able with a pooled cross-section dataset of 58,000 Moroccan born between 1890 and 1935 and enrolled between 1917 and 1956 to

derive indices of average standard of living and of inequality at the village unit based on height.

I ask two questions : did French farmers induce a lowering of standards of living in the rural sector? Did it lead to a rise in inequalities? Generally speaking did the so-called French «mise en valeur agricole»entail an economic divergence between territories?

Existing evidence, although rare, in the economic history literature tend to show that the introduction of cash-crop system is beneficial to output and standards of living. In an unpublished work, Moradi & al. (2013) show height gains in colonial Ghana in cocoa producing regions. Ayuda and Puche (2017) demonstrate a rise in average height but increased inequalities in the irrigated area of Valencia at the beginning of the agrarian capitalism.

However there are reasons to believe that the case of colonial Morocco differed from the aforementioned examples. Colonial Morocco lived through an extractive economic system where agrarian transformation was oriented towards exportation. The comparison with Valencia may not hold. Moreover, Morocco had long pre-existing agrarian structures, especially where French farmers settled. This brutal transformation may have distorted the occupational and revenue structure of the rural society.

To investigate such a link, I am faced with identification problems at different stages of the econometric set-up. First, there may be a self-selection bias in the sample of soldiers I am examining. Contrary to the rest of the French colonial territories, compulsory conscription was not introduced in Morocco so we may ask if the population examined is representative of the society. First a comment. I am not comparing military individuals with the rest of the population, but different groups of soldiers between them. Second I am treating the self-selection problem which may bias the comparison of height by resorting to an IV methodology based on war culture transmission. The second problem is to identify the true effect of concentration of French farmers. I exploit the structure of the pooled cross-section dataset to implement a difference-in-difference set-up in order to purge pre-existing conditions affecting standards of living. The rest of the paper is as followed. Historical background of colonial Morocco will be discussed in II. In III I describe the dataset and IV explains the methodology.

2 Historical background

The Treaty of Fès signed on the 30th of March 1912 organised the French Protectorate in Morocco, following the last military campaign of the colonial Army in 1911 in Chaouia. After Tunisia, with the Treaty of Bardo in 1881, France established a second Protectorate in North Africa, in periphery of its three Algerian departments.

The Cherifian Kingdom, massively indebted to French banks to face its huge public deficit, had already conceded most of its sovereign economic levies to the bank consortium led by Paribas, including trade tax revenue. Internal conflicts in the Palace and tax peasants' revolt in Chaouia forced the Sultan to accept the Protectorate and to transfer royal prerogative to the General Residency. The latter receives the mission to equilibrate public finance and to modernize the State. The Treaty of Fès bestows the task to «implement administrative, financial and judiciary reforms »to the colonial power. Moreover, the Protectorate is assigned the mission of modernization of the education and army.

The transformation of Moroccan cities and countryside starts quickly after. The residency takes credits for public infrastructure, private investments inflow into various sectors, the colonial economy starts to organize. The beginning of the Protectorate in Morocco echoes the economic and commercial expansion of the French Empire.

Public and private investments serve public infrastructure (especially transport and communication), agriculture and mining extraction. The Moroccan economy, which relies the most on agriculture among North African countries, experiences a large disruption of its national production. Colonial agriculture sets a break with traditional agriculture, focusing on land reform – privatization of the public domain and seizure of the tribal lands – technological equipment and exclusive access to foreign markets.

A new form of agricultural production takes place aside of the traditional sector. On the one hand, traditional farming is characterized by collective sharing of the lands, is intensive in labour, and intended to local markets

and auto-consumption (cereals, vegetables and cattling). On the other hand, European farms are characterized by an intensive production and land concentration (6,000 farms sharing one million hectares), by the use of motorized equipments and qualified workers, driven towards crop exportation (citrus, grapes, soft wheat). Workers replace peasants, announcing the installation of a capitalist economy. The land reform which delimits and reduces the collective property to the advantage of private property, gives also birth to a new form of land ownership, emanating from the urban Moroccan bourgeoisie, who delegates exploitation to a tenant.

Agrarian reforms lead to a surge in agricultural exports. Agricultural nominal output rises all along the colonial period but at the same rate than demographic growth. Revenue from the mining industry and public infrastructure triggers economic growth, agriculture instead does not contribute to the national added-value. Average individual revenue rises all over the forty-for years of the Protectorate.

The question of the distribution of the benefits of economic transformation needs to be addressed at this point. How did the standards of living of the Moroccan farmer and of the agricultural worker evolve? We can verify a transformation of the conditions of living in the rural sector in a descriptive manner. The fix weekly remuneration replaces the risky *khemissat*, a remuneration indexed to the fifth of the output. The local population transforms its consumption, turning to imported products, especially when the harvest turns bad. However, we cannot generalize this picture, as still 88 percent of the agricultural production emanates from the traditional sector in 1955.

Observations of the Moroccan society in the late Protectorate depict a general impoverishment in the rural and urban populations and an absolute decrease in agricultural output. At the end of the period, the colonial model founded on an extractive economy, protectionism, public transfers and debt financing is unstable. In order to proceed with industrialization and public construction, local budgets necessitate additional revenue that the local economy cannot trigger. Commercial imbalance which never succeeded to remain above zero since 1920, reaches a 40 percent deficit in 1955. Consumption per capita did not grow despite agrarian improvement and the rise in consumption of imported products. Samir Amin refers to a triple imbal-

ance in 1955 : *«public account imbalance, current account imbalance both remedied by external aid, and on top social imbalance characterized by the impoverishment of the Muslim rural and urban masses. The stagnation of the traditional agriculture and the hostility towards industrialization are at the origin of this unharmonious development»* .

Scholars underline various causes for the economic failure of the Moroccan Protectorate: the dichotomy between an export-oriented agriculture which crowds out credit, and a peasant agriculture remained outside of the agrarian reforms and of the irrigated domain; too much concentration of the fertile lands in the hands of colons, detrimental to Moroccan land grouping and to rural employment; high exposition to international trade fluctuation; insufficient industrialization.

This paper proposes to investigate some of these possible channels of impoverishment, focusing on the evolution of standards of living in the rural area.

3 Data

The concept of nutritional status has now an established place in the set of possible measures of living standards. Anthropometric measures – height and weight – present desirable characteristics for comparative studies, appreciated by scholars in economic history or economics of development. First, they have the advantage of being reliable and homogenous across time and countries. They circumvent the use of imprecise indicators of revenue or wage, when existent. Anthropometric measures tend to be good predictors of economic conditions as they reflect biological welfare, which is determined not only by monetary income, but also by out-of-market products, service provisions, and on-farm consumption. Precisely, height is indicative of a nutritional status built during childhood.

Anthropometric data extracted from military conscription has been regularly used in various frameworks to estimate the evolution of standards of living (Ayuda and Puche, 2017), or to compare in cross-section different regions

or ethnic subgroups (Baten and Moradi, 2015). I use first-hand height data from military enrolment archives as a measure of human well-being, which have never been exploited in the Moroccan case. These archives stored by the French Army concern 400,000 Moroccan individuals enrolled in French regiments between 1908 and 1962. I am currently collecting a 10% sample from individual files sampled from a total of 400,000 files between 1917 and 1956. After enrolment in the army, the military administration kept an identity signalisation of the soldier,which consisted of the name, date and place of birth, place of residence, occupation, level of instruction and height. The particularity of military enrolment in Morocco was that compulsory conscription was never applied, compared to the rest of the French Empire. Therefore, the voluntary nature of enrolment will have to be treated, as it implied a self-selection bias, possibly on height.

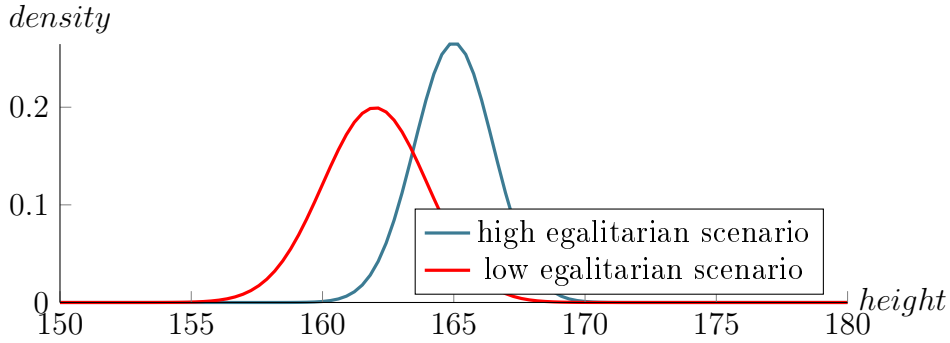
Height data are crossed with an index of concentration of European agricultural land. This information is collected from atlases produced by colonial administration registering all European settlements. The Atlas of 1955 provides geo-referenced data on land size and varieties of crop cultivated. I can thus compute an index of European farm concentration within an administrative unit, which will be the explanatory variable of interest. To provide with some descriptive statistics, we must know that European farming represented $6,8\%$ of total land and 15% of total agricultural output. French farmers concentrated the production of citrus (72% of total output)and of grapes (half of the fertile region of Meknès). European settlement was dense in several regions – Meknès, Fès, Gharb and Chaouia – where it held half of the territory.

4 Methodology

There are various anthropometric methods to estimate the extent of inequalities. Some authors have commonly used comparisons in mean height between different occupational or income groups. The main drawback from this method is however to rely on comparable and non-arbitrary occupational categories, which is quite unlikely in the case of historical data. Another method to avoid occupational classification is to use another moment of the height distribution of a population: standard deviation. Baten and Moradi hence suggest a measure of dispersion reflecting inequality within a population: the

coefficient of variation of height.

As height distribution is largely driven by biological variance, it is assumed to be normal. Allocation of nutritional and health resources adds input-induced variance. The more unequal the allocation of nutritional and health resources, the more the privileged grow taller compared to the rest of the population, and the more the underprivileged show a stunted growth. This results in a shift to the left of the mode and a more disperse distribution around the mean than the egalitarian case.



Here is an illustration. Blue curve shows a mean at 165 cm and a standard deviation of 1,5 cm. Red curve demonstrates a lower mean at 162 cm and a standard deviation at 2 cm.

However standard deviation is not *per se* a satisfactory measure of inequality, as biological variance increases with average height. Therefore, Baten and Moradi (2005) suggest the use of a coefficient of variation that takes this effect into account, normalizing standard deviation by mean height. CV is the standard deviation σ expressed as the percentage of the mean μ.

$$CV_{c,t} = \frac{\sigma_{ct}}{\mu_{ct}} \cdot 100$$

Suffix c denotes the administrative unit or cell where individuals were born. Suffix t denotes the year of military enrolment. Each CV represents then the extent of inequality within a cohort of a relatively small geographical unit.

In our framework CV is linearly determined by:

$$CV_{c,t} = \lambda \cdot year_t + \delta \cdot privatecolo_{c,t} + \beta \cdot \mu_c + \epsilon_{c,t}$$

Year catches the fixed-effect of the administrative unit, year time varying determinants of CV and μ is a vector of time-invariant characteristics of cell. δ will measure the treatment effect of having a large presence of private colonizers within a cell, when colonization starts.

However, this cannot be estimated by ordinary least-squares, as we may suspect collinearity between presence of private colonization and time-invariant determinants.

The setup is nonetheless perfectly suited for a difference-in-difference design.

$$CV_{c,t} = \gamma \cdot europ_c + \lambda \cdot colonization_t + \delta \cdot europ_c \cdot colonization_t + \beta \cdot \mu_c + \epsilon_{c,t}$$

$europ_c$ designates the fraction of land occupied by Europeans between 0 and 1. $colonization_t = 1$ if the cohort was born after 1907. γ catches the time-invariant characteristics of cells with European settlement. λ catches the overall effect of colonization. δ catches the treatment effect of European settlement.

Within this framework we are thus comparing two sub-cohorts enrolled the same year but born in different units characterized by their presence of European farms. With the process of difference-in-difference, all differences that can be accounted by the pre-colonization period is removed. The high spatial resolution and the vector of covariates allow to reduce the error-term to the minimum. This is making the assumption that control (low European settlement) and treated group (high European settlement) would have had followed the same trend in the absence of colonization. There would not be any difficulty to assert such a statement if enrolment was randomly assigned across one cohort. This is the case of compulsory conscription. However, in the case of colonial Morocco, enrolment was in principle voluntary. Potential selection bias in the analysis could arise from the fact that the population distribution enrolling in the army is not the same between treatment and control group. Simultaneity issues can arise if there is a time-varying difference in height between treatment and control group arising from something else than European settlement. We can imagine for instance that size restrictions to enrol the army are different between treatment and control group and change over time. Size restriction is actually homogeneous all over the territory : approximately 158 cm was the minimum size requirement. Moreover if there is a pre-treatment difference of self-selection on height, this will

be caught by the time-invariant effect. But for a reason or another, it could be that the decision to enrol in the army is determined as much by height than by the treatment effect.

To relax the assumption of homogeneous selection between treatment and control group, we need to find an exogenous source of variation in the selection into army that does not affect height. Campante and Yanagizawa-Drott (2016) suggest a consistent instrument to introduce randomness in military enrolment. Their idea is based on the observation that individuals within a cohort whose father were enrolled in times of war are more prone to enrol in the army. In other words there is evidence of vertical transmission of war. Fathers whose age was around 21 at time of war had higher probability of enrolling in the army. Their instrument for military enrolment decision is the father's age-distance to 21 at time of war. They are thus comparing the group of individuals whose parents were older or younger than 21 when war burst, and the group of individuals whose parents were 21 at the same period. In our framework, we do not know if soldiers had military father. However we know total enrolment at the village level twenty years ago. We could thus rely on horizontal transmission of war from the parental generation who were enrolled during milestone military episodes. This would be a valid instrument for military enrolment not affecting height. For the generation that spent its childhood prior colonization, there is no possibility that enrolment decision was affected by height transformation due to colonization. This paper proposes hence to compare treated and control cohorts comparable in terms of horizontal war culture. War culture is being proxied by concentration of veterans from milestone military episodes.

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