A Historical Geographic Information System of the Grandes Gabelles in Early Modern France*

Eva Davoine† Joseph Enguehard‡ Victor Gay§ Igor Kolesnikov¶

February 2025

PRELIMINARY AND INCOMPLETE

Abstract

This note presents the development of a parish-level historical geographic information system (GIS) for the seventeenth-century French salt tax system of the gabelles based using an original manuscript map collection from 1665: Sanson's *Atlas des gabelles*. In addition, it offers a detailed account of the tax system and provides international comparisons to contextualize its significance.

*Victor Gay gratefully acknowledges funding from the ANR under grant ANR-17-EURE-0010 (Investissements d'Avenir program) and ANR-20-CE38-0015 (ObARDI) for financial support.

†UC Berkeley. Email: eva_davoine@berkeley.edu.

‡Department of Economics, École normale supérieure de Lyon, Lyon, France. Email: joseph.enguehard@ens-lyon.fr.

§Department of Social and Behavioral Sciences, Toulouse School of Economics and Institute for Advanced Study in Toulouse, University of Toulouse Capitole, Toulouse, France. Email: victor.gay@tse-fr.eu.

¶UC Berkeley. Email: igor_kolesnikov@berkeley.edu.

1. Introduction

This note presents a novel historical Geographic Information System (GIS) of the *gabelle du sel* (salt taxation) in early modern France (henceforth, gabelle). As a cornerstone of the French monarchy's finances since the mid-thirteenth century, the gabelle taxation system has garnered significant attention from scholars, as it provides an insightful case study for understanding the expansion of the fiscal capacity of early modern states (Beaulieu, 1903; Pasquier, 1978; Hocquet, 2012; Giommoni and Loumeau, 2022). A key characteristic of this taxation system was its pronounced spatial heterogeneity, reflecting the institutional complexity of *Ancien Régime* France. However, knowledge of its spatial distribution has so far relied on imprecise maps that do not allow for granular spatial analysis.

The main contribution of this note is to overcome this limitation by bringing rich, yet underutilized sources to the data. Our primary source is a collection of maps from an administrative survey: Sanson's (1665) *Atlas des Gabelles*. These maps precisely display the frontiers of salt tax districts (*greniers à sel*) at the level of parishes within the *Pays de Grandes Gabelles*, which covered the northern half of France and generated the majority of gabelle revenues. Notably, these frontiers remained essentially stable until the repeal of the gabelle in 1790 during the French Revolution.

By leveraging this rich historical source, we offer a detailed spatial representation of the gabelle taxation system, which will be valuable for future applied research. Additionally, we provide historical insights into the structure and significance of the French salt tax.

The note is organized as follow. Section 2 provides an overview of the gabelle institution in Ancien Régime France, with a particular focus on its administration within the Grandes Gabelles, the region for which detailed historical maps are available in Sanson (1665). Section 3 details the methodology we use to map each parish to its corresponding gabelle jurisdiction. Section 4 examines the extensive information contained in these maps regarding the spatial organization of the Grandes Gabelles. Section 5 then estimates the tax burden of the gabelle. Finally, Section 6 situates the gabelle within a broader international context, emphasizing that salt taxation was a common fiscal instrument in early modern states.

2. Institutional Background

Taxation in Ancien Régime France The taxation system in Ancien Régime France included both direct and indirect taxes (Touzery, 2024). Direct taxes included the *taille* (an income tax only levied on the commoners), the *capitation* (a head tax introduced in 1695), and the *vingtième* (an additional tax on income and property established in the early eigh-

teenth century, initially as the *dixième*). Indirect taxes included various *aides* (consumption taxes, mostly on alcoholic beverages), *traites* (internal customs), and the gabelle—with different regional declensions. To these numerous taxes can be added the state monopoly on tobacco as well as the various duties paid to the king.

Overall, the gabelle was one of the most lucrative sources of revenue for the state as it accounted up to 15 percent of its total tax revenues (Guéry, 1978; Enguehard, 2020), thus making it the most substantial indirect tax in early modern France (Beaulieu, 1903; Pasquier, 1978).[1]

Gabelle taxation The term *gabelle* meant both a tax on salt and a legal salt monopoly system. Originally, it denoted an indirect tax levied on various agricultural and industrial products in medieval France—it included wine, cloth, and wheat. However, from 1342 onward, the term became specifically associated with the taxation of salt. Nevertheless, it was not formally codified until Louis XIV's ordinance of May 1680.[2] Two subsequent edicts—issued in May 1726 and June 1727—further stabilized the system by reorganizing the tax jurisdictions of the territory into *greniers à sels*. This structure remained unchanged until the gabelle was abolished during the Revolution—though several subsequent regimes reinstated the tax under various forms until its definitive abolition under the Fourth Republic in 1945 (Hissung-Convert, 2009).

Salt then played a vital role in daily life as it served as the primary means for the preservation of food (Hocquet, 1987). It was essential for producing cured meats and for drying both fish and meat. Additionally, salt was a crucial dietary supplement for livestock. In some places, salt was also part of in-kind wage payments.[3]

In the most heavily taxed region, the Pays de Grandes Gabelles, salt was subject to a royal monopoly and was stored and sold exclusively in designated retail shops: the greniers à sel (henceforth, greniers). In these establishments, the gabelle tax was part of the final price of the salt. The monarchy granted the right to sell salt to private contractors through a farming system, requiring them to pay an upfront fee. These contractors subsequently sought to recover their investment by selling salt in the greniers, which incentivized them to impose high prices on consumers—not only to recoup the initial payment due to the king,

[1] This is documented in numerous primary sources, such as Mathon de la Cour's (1788) *Collection des comptes-rendus [...] concernant les finances de la France* or Mallet's (1789) *Comptes rendus de l'administration des finances du Royaume de France*. See also the *Divers tableaux des dépenses* for various (tax) farms over the eighteenth century, available at https://gallica.bnf.fr/ark:/12148/btv1b90572595.

[2] The original text of the ordinance of May 1680 is available at https://books.google.de/books?id=G6cbTcBGeUoC&hl.

[3] The French word for wage (*salaire*) actually derives from the latin *salarium*, itself a derivative a *sal*, salt. The original meaning probably referred to a direct payment in salt or to a payment in a currency that could be used for the purchase of salt.

but also to maximize profit.

The gabelle taxation system was composed of six regions each governed by different regulations: the Pays de Grandes Gabelles, the Pays de Petites Gabelles, the Pays de Salines, the Pays de Quart-Bouillon, the Pays Rédimés, and the Pays Exempts de Gabelle (Figure 1). These regional disparities in taxation systems translated into substantial salt price differentials across the kingdom, creating strong incentives for smuggling salt across gabelle frontiers. The high tax burden in some regions—especially in the Pays de Grandes Gabelles—encouraged the illicit trade of salt from lower-taxed or exempt areas, resulting in widespread contraband networks and persistent efforts by the state to suppress unauthorized salt circulation.

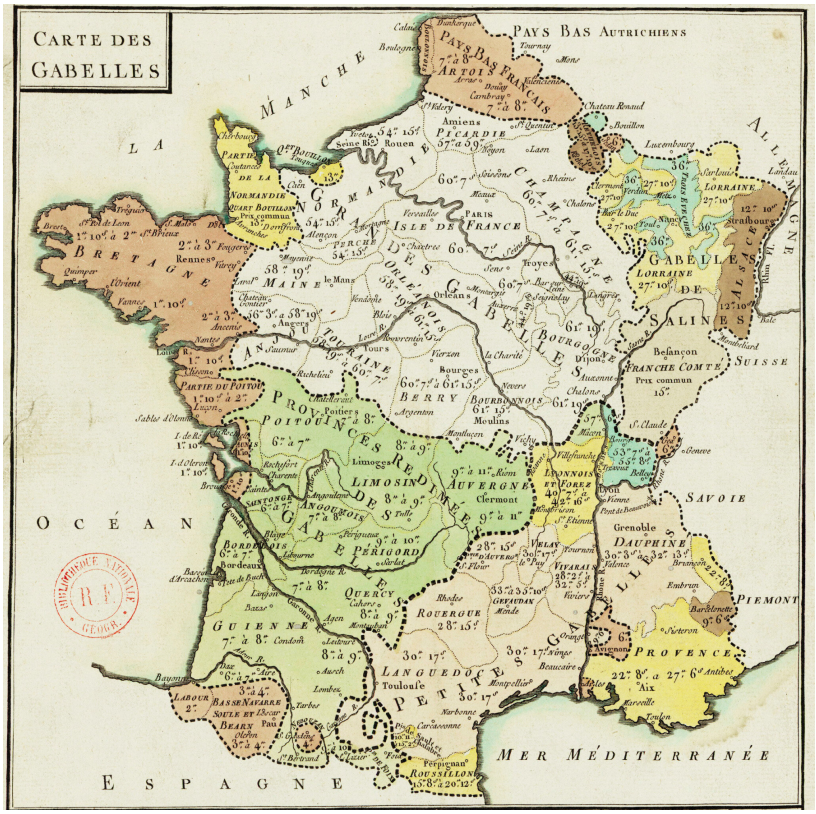

Figure 1. Map of Gabelles in 1781

Notes. This figure displays distribution of gabelles taxation zones based on the 1781 *Carte des gabelles* available on Gallica under Archival Resource Key (ARK): 12148/btv1b8445425x.

This note focuses on the spatial distribution of salt jurisdictions (greniers) in the Pays de Grandes Gabelles, which brought the greatest share of the salt tax revenues to the central state.[4] The region comprised the following regions, depicted by the white central area in

[4]Necker (1784) estimated that the Grandes Gabelles represented 78.5 percent of the total revenue from the salt tax in 1784.

Figure 1: Île-de-France, Soissonnais, Picardie, Champagne, Orléanais, Touraine, Bourbonnais, Berry, Normandie, Bourgogne, Nivernais, and Anjou. Within this territory, salt was not only subject to high taxation, but also to mandatory consumption. The enforcement of this mandatory salt consumption varied according to the type of grenier, which were classified into *greniers de vente volontaire* and *greniers d'impôt*. A detailed explanation of the distinctions between these two types can be found in Appendix B.

3. Mapping the Grandes Gabelles in Seventeenth-Century France

3.1. Sanson's Atlas des Gabelles

Our historical GIS of the Pays de Grandes Gabelles is based on Sanson's (1665) *Atlas des gabelles*.[5] This manuscript atlas displays the spatial extent of each jurisdiction of the Grandes Gabelles along with statistical information. Specifically, it precisely documents the territory of the Grandes Gabelles across 21 maps and tables—each covering a *généralité* or a gabelles *département*—and clearly delineates the territorial reach of each jurisdiction of the gabelles administration. As discussed above, these are generally greniers à sel, but they also include *chambres à sels*, *magasins*, as well as control zones on the periphery. Figure 2 provides an excerpt from the atlas: the map of the généralité of Bourges. Appendix Table A.2 provides a specific list of the maps and types of constituencies included in the atlas.[6]

Each map is followed by a table containing statistics relevant to the constituency of each grenier à sel: the number of parishes associated with the grenier; the number of fiscal fires (*feux*), laborers, nobles, and clergymen; the consumption of salt in *minot* per fourteen constituents (*gabelants*); and the price of *minot* imposed across taxation regimes—we provide the list of variables contained in these tables in Section 4 below.

3.2. Mapping Methodology

We develop a methodology that overcomes the technical limitations of this manuscript atlas, in particular its lack of a proper coordinate reference system (CRS) and the uncertainty of the toponyms of parishes displayed on the maps.[7] Our methodology consists of first

[5] A digital version of this manuscript atlas is available at the Bibliothèque nationale de France under ARK 12148/btv1b525091213. We use a custom-made, higher resolution version of this atlas in TIFF format, which we scanned at the library of the University of Chicago.

[6] Sanson's (1665) atlas also contains a general map of the entire area of the Grandes Gabelles. Although less detailed than the other maps, it provides the location of brigades that secured the boudaries of the Grandes Gabelles frontiers against smuggling by *faux-seniers*, generally located in the control zones.

[7] We follow Gay, Gobbi and Goñi (2024) and do not resort to the vectorization of frontiers of gabelles jurisdictions, a method commonly used in the construction of GISs based on historical maps, e.g., by Perret, Gribaudi and Barthelemy (2015) for France's roads in the late eighteenth century, or Ostafin et al. (2020)

Figure 2. Greniers à Sel of of the Généralité of Bourges

Notes. This figure provides an excerpt from Sanson (1665) corresponding to the map of the généralité of Bourges.

manually assigning each parish to a specific gabelles jurisdiction based on a visual comparison between maps from the atlas and a point layer representing the locations of Ancien Régime parishes. The point layer we use is based on Cristofoli et al.'s (2021) dataset, which provides the coordinates of all 44 thousand parishes that appear on Cassini's map of France (*Carte générale de la France*) surveyed between 1756 and 1789 (de Dainville, 1955; Pelletier, 1990).[8] We then label each parish point with its name and attribute it to a given gabelles jurisdiction, using SANDRE's (2017) shapefile of the hydrographic network to help us locate parishes on Sanson's (1665) maps—Appendix Figure A.1 provides an example of our methodology.[9] This methodology generates a point-layer shapefile of 15,829 parishes with a gabelles jurisdiction

for the administrative organization of Austrian Silesia in the nineteenth century. This method would have led to considerable inaccuracies given the lack of proper CRS of these hand-drawn maps and the fragmented nature of gabelles jurisdictions. On these types of issues, see Arnaud and Suarez (2023).

[8]We provide more details on the geolocalization of parishes that appear on Cassini's map of France in Appendix C.

[9]Each parish point is associated with a set of names: those that appear on Cassini's map (variable `nom_cassini`), those in the 1793 census (variable `nom_an_3`), those in the 1801 census (variable `nom_1801`), and those in the 1999 census (variable `nom_1999`). We use the first set of names, which we supplement with other names when they are missing (1,596 observations out of the 43,792).

attribute. In a second step, we construct the polygon-layer shapefile of the Grandes Gabelles. To that end, we project all 15,829 parish points onto IGN's (2021) commune polygons, project the gabelles attributes onto these polygons, and dissolve them based on those attributes.

The resulting shapefile of gabelles constituencies is potentially subject to some (limited) inaccuracy, as the shapefile of contemporaneous communes does not exactly correspond to Ancien Régime parishes, as there were nearly 44 thousand parishes then versus 35 thousand communes in 2021.[10] Despite their stability over time, the boundaries of some contemporaneous communes are the result of mergers of former parishes that occurred between the Revolution and today (Bideau and Verdier, 2024). As a result, some of these communes may be split between two gabelles jurisdictions, making the resulting shapefile potentially inaccurate at its frontiers in a few cases.[11] We provide users with the ability to mitigate these potential sources of inaccuracy by making the point layer available so that users can project these points onto any commune- or parish-level shapefile and aggregate the results into the polygons best suited for their purpose.

4. Content of the Grandes Gabelles Historical GIS

Our historical GIS of Ancien Régime Grandes Gabelles contains a polygon-form shapefile and an associated tabular dataset, which content we describe below.[12]

4.1. The Grandes Gabelles Historical GIS Shapefile

The shapefile of our historical GIS is displayed in Figure 3—the corresponding shapefile in point form is displayed in Appendix Figure A.2. It represents 249 gabelles jurisdictions, covering 34 percent of the territory of the Kingdom of France at the eve of the Revolution. The attribute table associated with this shapefile contains several variables that characterize each gabelles jurisdiction, including an identifier, a name, a type, a reference table identifier and name, the reference map from Sanson's (1665) atlas, and the name of the GIS coder. Below, we describe each of these variables, which are listed in Table A.1.

[10] On methodological issues using contemporaneous units to create historical GISs, see Gay (2021, p. 192), Gay, Gobbi and Goñi (2024, p. 54), and Stapel (2023, pp. 8–9).

[11] We are constrained to use a shapefile of contemporaneous communes because a shapefile of parishes does not exist at this time—this is among the endeavors of the ongoing COMMUNE HIS-DBD project, which is scheduled to make these shapefiles available in 2025.

[12] As discussed above, the shapefile is also available in point form. The content of its attribute table is similar to the polygon-form shapefile, except that it contains various parish-level variables based on Cristofoli et al.'s (2021) data file: each parish cassini identifier, its name as it appears on the Cassini maps and on the 1793, 1801, and 1990 censuses, and its geographic coordinates in RGF93 projection.

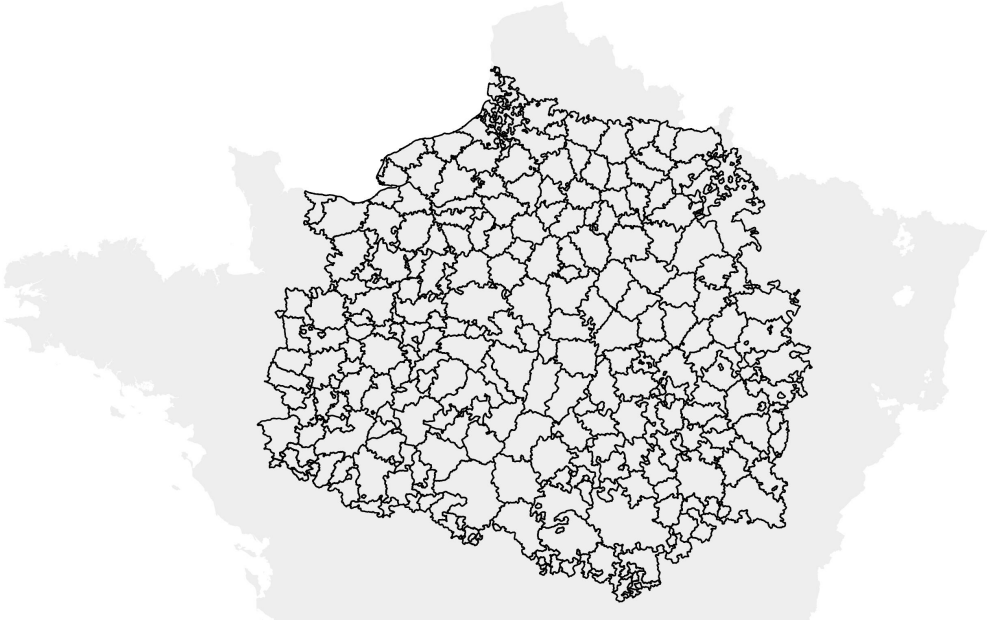

Figure 3. Gabelles Jurisdictions in 1665

Notes. This figure displays gabelles jurisdictions based on Sanson's (1665) *Atlas des gabelles*. The underlying shapefile of the Kingdom of France in gray is from Gay, Gobbi and Goñi (2023).

Gabelles jurisdiction identifiers Each gabelles jurisdiction is characterized by an identifier under variable name `grenier`.[13] They are five-digit identifiers that uniquely identify each gabelles jurisdiction in the atlas. They are the concatenated output of three identifiers: the first (two-digit) identifier corresponds to the reference table associated with the map in which the gabelles jurisdiction appears; the second (one-digit) identifier corresponds to the jurisdiction's type (see below); and the third (two-digit) identifier corresponds to the jurisdiction's order as it appears in its reference table. For instance, the identifier for the grenier à sel of Bourges—displayed in Figure 2—is `04101`: it is attached to the reference table `04`, it is a grenier à sel jurisdiction (`1`), and it is the first jurisdiction to appear on its reference table (`01`).

Gabelles jurisdiction names The names of gabelles jurisdictions correspond to the town in which their seats were located. We provide these names in several forms: a short form that corresponds to the most representative name of the jurisdiction (`grenier_name`), usually the name of the city where its seat was located—for instance, `Bourges`—and a long form

[13] We list variable names as they appear in the `dta` and `txt` files associated with the shapefile. The corresponding variable names in the shapefile's attribute table can be found in Table A.1. These are slightly different due to the technical limitations of GIS processing software when it comes to variable names.

Table 1. Variables in the *Grandes Gabelles Historical GIS* Shapefile

Variables		
dta / txt	dbf	Description
grenier	GRENIER	Grenier à sel identifier
table	TAB	Table identifier
table_type	TAB_TYP	Table constituency type
table_name	TAB_NS	Table constituency name (short, upper case)
table_name_prop		Table constituency name (short, proper case)
table_name_long	TAB_NL	Table constituency name (long, upper case)
table_name_long_prop		Table constituency name (long, proper case)
grenier_type	GRE_TYP	Grenier à sel type
grenier_flag	GRE_FLG	Grenier à sel flag
grenier_name	GRE_NS	Grenier à sel name (short, upper case)
grenier_name_prop		Grenier à sel name (short, proper)
grenier_name_long	GRE_NL	Grenier à sel name (long, upper case)
grenier_name_long_prop		Grenier à sel name (long, proper case)
cl_flag	CL_FLG	Grenier à sel chef-lieu flag
cl_noacass	CL_CASS	Grenier à sel chef-lieu cassini identifier
cl_insee	CL_INSEE	Grenier à sel chef-lieu INSEE 2021 identifier
cl_nom_cassini	CL_NC	Grenier à sel chef-lieu cassini name (proper case)
cl_nom_1793	CL_N1793	Grenier à sel chef-lieu 1793 name (proper case)
cl_nom_1801	CL_N1801	Grenier à sel chef-lieu 1801 name (proper case)
cl_nom_1999	CL_N1999	Grenier à sel chef-lieu 1999 name (proper case)
cl_nom_2021	CL_N2021	Grenier à sel chef-lieu 2021 name (proper case)
cl_position_x	CL_X	Grenier à sel chef-lieu latitude in RGF93
cl_position_y	CL_Y	Grenier à sel chef-lieu longitude in RGF93

Notes. This table reports the variables contained in the `dbf`-format attribute table of the *Grandes Gabelles Historical GIS* shapefile and the associated `dta`- and `txt`-format data files. See the main text for variable definitions and typologies. The data further contains a set of seat variables, starting with `cl2`, for gabelles constituencies that combine a grenier à sel and a chambre à sel.

(`grenier_name_long`) that also includes its gabelles jurisdiction type—for instance, `Grenier à sel de Bourges`.[14]

Gabelles jurisdiction types As discussed above, there were several types of gabelles jurisdiction: mainly greniers à sels, but also chambres à sel, magasins à sel, as well as control zones on the periphery. In addition, some greniers and chambres sometimes appear together on the atlas, e.g., the grenier à sel of Mondoubleau and the chambre à sel of Saint-Calais in the généralité of Orléans. We therefore provide a typology of jurisdiction types along five categories, itendified by a one-digit identifier: greniers à sel (`1`, 185 jurisdictions), chambres à sel (`2`, 26 jurisdictions), greniers and chambres à sel together (`3`, 11 jurisdictions),

[14]We normalize place names according to their toponymy in the 1793 census, which contains the first nomenclature of place names in France. For instance, we enter the name `Grenier à sel de Buzançais` instead of `Grenier à sel de Buzançois` as it appears on Sanson's (1665) atlas.

magasins à sel (4, 3 jurisdictions), and control zones (5, 24 jurisdictions). We display the spatial distribution of gabelles jurisdiction types in Appendix Figure A.3.

In addition, we provide a variable (grenier_flag) that indicates whether a given gabelles jurisdiction has statistical information available in its reference table. While 217 of the 249 jurisdictions have statistical information available, the 3 magasins à sel and 24 control zones do not. Moreover, 4 of the greniers and chambres à sel reported together also have combined statistical information. Finally, the chambre à sel of Montfaucon does not appear in its reference table.

Gabelles jurisdiction seats Our shapefile also contains information on the location of the seat(s) (*chef-lieu*) of each gabelles jurisdiction, that is, the location of the offices of gabelles agents and the building (*grenier*) where the salt was held. In particular, we indicate each seat's Cassini and INSEE identifiers (cl_noacass and cl_insee), name on Cassini's map (cl_name_cassini), name in the 1793 (cl_name_1793), 1801 (cl_name_1801), 1999 (cl_name_1999), and 2021 (cl_name_2021) censuses, as well as the spatial coordinates in RGF93 projection (cl_position_x and cl_position_y). In the case of greniers and chambres à sel reported together, we also provide information on the seat of the corresponding chambre à sel with variable names starting with cl2.[15] We flag the existence of these second seats by the variable cl_flag.

Reference tables We provide a set of variables that identify to which reference table in the atlas each gabelles jurisdiction is associated: a two-digit identifier (table) ranging from 01 to 15 in the order that each table appears in the atlas; a short- and long-form name for each table as it appears in the atlas (table_name and table_name_long), for instance Bourges and Généralité de Bourges; and the type of administrative constituency to which the table refers table_type), which can be a Généralité (1) or a Département (2).

Reference map We also provide the map in which the gabelles jurisdiction appears (map). The list of these maps is available in Appendix Table A.2.

GIS coder Finally, we provide the name of the researcher who manually entered each jurisdiction based Sanson's (1665) into a historical GIS, under variable name coder.

[15] In addition, it remains uncertain whether the grenier à sel 14103 had its seat in Beaufort or in Rosnay.

5. Assessing the Salt Tax Burden on Taxpayers

In this section, we use the salt sales, prices, and demographic information in Sanson's (1665) statistical tables to assess the weight of the salt tax in family budgets around 1665. In the absence of data on local income, we rely on the national wage estimates from Ridolfi (2019). Since the tax was operated through a state monopoly, we assume that the cost of salt paid by tax officers in each grenier to supply their warehouses would be the local market price if the salt market was free and untaxed. The implicit tax is thus the difference between the legal price of salt and that cost. The average salt tax burden B_k^{IJ} in a given set of greniers I for a given type of sales J (forced sales, voluntary sales, or both) and type of worker k is given in Equation 1, where S_i^j denotes the salt sales of type j in grenier i; p_i^j, the legal price of salt; c_i, the cost of salt; H_i, the number of taxpaying households; w_k, the daily wage of workers of type k; D, the number of days worked per year; and n, the number of wage earners per households.

$$B_k^{IJ} = \frac{\overbrace{\sum_{i,j \in I \times J} S_i^j (p_i^j - c_i)}^{\text{Total salt taxes}}}{\underbrace{w_k D n \sum_{i \in I} H_i}_{\text{Total household income}}} \tag{1}$$

Wages According to Ridolfi (2019), the average nominal daily wage of an unskilled agricultural worker was about 9.5 *sous* in 1665 (0.475 *livres tournois*), and that of a skilled urban building craftsman, approximately 20 *sous* (1 *livre tournois*), all accounting for both monetary and in-kind payments. However, information on where these wages lie in the distribution of income is necessary to provide sound estimates of the tax burden.

Income distribution While we do not know the precise income distribution in France for 1665, Morrisson and Snyder (2000, Table 3, p. 66) have proposed estimates for 1788. Agricultural day laborers represented 36 percent of the population. Based on the categories of Morrisson and Snyder (2000), we can define a large group of poor classes that excludes nobles, clergy, urban bourgeois, large-scale farmers, shopkeepers and artisans, and comprises 70 percent of the population. We find that the average household income in that group was 123 percent of the household income of agricultural day laborers in 1788. Therefore, applying an upward correction of 23 percent to the wage of unskilled agricultural workers, we can approximate the average income of the bottom 70 percent in 1665.

Working time Following the literature on early modern living standards, Ridolfi (2019) relies on a conventional 250 worked days per year. More recently, Maneuvrier-Hervieu and Chambru (2024)—based on data for Normandy—have suggested that this figure could have increased up to 300 in the eighteenth century. Thus, we consider a middle estimate of 275 days, in line with their figures for the mid-seventeenth century.

Household structure Sanson's (1665) statistical tables amount to an average of 3.3 taxpayers per household—taxpayers (*gabelants*) being all individuals older than 8 years old in non-exempted households.[16] In his demographic study of the Sanson's (1665) statistical tables, Cabourdin (1969) estimates the total household size with children by multiplying the number of taxpayers by the ratio 4/3, a reasonable order of magnitude for the age structure in this context. The resulting 4.4 individuals—among which 2.4 children—are close to the conventional figure of 4 adult consumption units per wage earner used in the living standard literature, including Ridolfi (2019). Therefore, we simply consider one wage earner per household in Sanson (1665).

Cost of salt (net of tax) Instead of an indirect tax on private transactions, the gabelles were a state monopoly over the distribution of salt, making it difficult to assess the exact amount of the tax. Therefore, we take the cost of salt paid by the greniers officers in Sanson's (1665) statistical tables as what would households pay in the absence of any tax, if salt was competitively provided and sold at its marginal cost.[17] The resulting estimates, based on Equation 1 and the parameters in Table 2, are reported in Table 3. We distinguish the two different types of tax districts described in Appendix B.

The bottom 70 percent of the population in the Grandes Gabelles thus paid about 6 percent of their income in the salt tax. There are striking differences by type of tax district. The burden of the salt tax was almost doubled in districts with forced sales, as compared to districts with "voluntary" sales only. The burden could thus vary between 2 percent (for skilled workers in districts without forced sales) to 10 percent (for agricultural laborers in a district with forced sales). The order of magnitude of the salt tax burden—roughly around 5 percent of income—is substantial. As visible in the last column of Table 3, the salt budget would only be around 0.5 percent of income in the absence of any tax. In the Grandes Gabelles, the salt tax thus multiplied this amount tenfold. On the contrary, 0.5 percent is a

[16] It appears that, in many cases, a multiplier of 3 or 4 was applied to derive the number of taxpayers from the number of households in the Sanson's (1665) statistical tables. That is why use the number of households instead of the number of taxpayers in our calculations.

[17] In practice, the state tried to pressure producers to take costs down, but this has little impact on the final cost which is mostly transport.

Table 2. Parameters for Assessing the Salt Tax Burden

Parameter		Value	Source
Daily wage (unskilled agricultural laborer)	w_u	£0.475	Ridolfi (2019)
Daily wage (skilled urban worker)	w_s	£1	Ridolfi (2019)
Average daily income of the bottom 70 %	w_{70}	$1.23 \times w_u$	Morrisson and Snyder (2000)
Worked days per year	D	275	MHC (2024)
Wage earners per household	n	1	Cabourdin (1969)

Notes. This table shows the parameters used in Equation 1 resulting in the salt tax burden estimates shown in Table 3. *MHC (2024)* refers to Maneuvrier-Hervieu and Chambru (2024).

Table 3. Salt Tax Burden (% of income)

	No FS districts	FS districts	All districts	Salt cost
Agricultural laborer	4.9	9.9	7.6	0.7
Skilled urban worker	2.3	4.7	3.6	0.3
Bottom 70 %	4.0	8.0	6.1	0.5

Notes. This table shows the percentage of household income paid in salt tax in the Grandes Gabelles by type of salt tax district and worker type. The first three columns are based on Equation 1 for different sets of tax districts. *FS* refers to "forced sales." The last column shows the cost of salt as a percentage of household income, averaged over all districts.

plausible estimate for the salt tax burden in the fully exempted regions of Brittany and the North.

Furthermore, many of these households were close to the subsistence level. According to Ridolfi's (2019), agricultural wage laborers were even below subsistence, with a welfare ratio evolving between 0.6 and 0.9 for the period 1660–1790. Applying our previous upward correction to describe the bottom 70 percent, this translates into a range of 0.7 to 1.1 basket of essential expenses. This means that the salt tax crowded essential expenses out and would likely absorb all income for non-essential expenses in case of good times.

How does this compare with a major indirect tax on an essential good nowadays, the gas tax? In the United States, household expenditures for gasoline accounted for approximately 4 percent of pre-tax income in 2013.[18] In France, where the Yellow Vest movement took place, the expense in fuel was about 5 percent of the total expenses of French households

[18]Source: https://www.eia.gov/todayinenergy/detail.php?id=9831.

in 2022—half of which going in taxes.[19] The orders of magnitude of budget shares are thus similar. What makes the salt tax special in comparison is that almost all of it was taxes. This feature of the salt tax, combined with the rules of mandatory consumption (*sel d'impôt*), blurred the line between indirect and direct taxation. Furthermore, the situation only got worse over the eighteenth century for the agricultural working class in the high-tax region. In fact, real wages were on a decreasing trend everywhere in France (Ridolfi, 2019), while salt tax rates increased.[20] However, the overall tax burden increased even more, thus reducing the share of the salt tax in the government budget in the last years of the Ancien Régime.

6. Comparative perspective

This section compares the French system of salt taxation to similar historical political entities which also levied a tax on salt. We particularly discuss the cases of Qing China from the seventheenth to the nineteenth century, the Russian Empire in the eighteenth century, the Ottoman Empire before 1861 and the Habsburg Empire before 1815. We compare these different systems of salt taxation across the following dimensions: geographic administration, price regulation and tax policy, and their contribution to government revenue.

Geographic coverage As outlined in Section 2, the administration of salt taxation in France exhibited significant regional variation. Similarly, Qing China, Russia, and the Ottoman Empire implemented heterogeneous salt tax systems across their territories, reflecting diverse administrative structures and economic conditions. In contrast, the Habsburg Empire was the only state among these cases to successfully standardize the administration of salt taxation across its domain.

The Qing China empire was divided into 11 distinct salt districts, within which all government-licensed salt trade was theoretically confined. The movement of salt between these districts was strictly prohibited. Exemptions from salt taxation were granted primarily in areas where high monitoring costs or active resistance from the local population made enforcement difficult.

In Russia, the salt administration was organized at the provincial level (LeDonne, 1975). Each province had a designated list of mines it could ship its salt from. In addition to that, the state allowed for some regional heterogeneity in setting prices.

[19] Figures from the then Ministry of sustainable development. Source: https://www.statistiques.developpement-durable.gouv.fr/edition-numerique/chiffres-cles-energie-2024/4-depenses-en-energie.

[20] Data on the trends of the salt tax rate, revenue and burden until the Revolution are presented in the Online Appendix of Davoine, Enguehard and Kolesnikov (2025).

The Ottoman Empire maintained a fragmented salt taxation system until 1861, administered through five regional authorities (Adshead, 1992). The central government directly controlled certain regions, such as the Intendancy of Salt in Constantinople and former Venetian territories. In contrast, other regions, including Egypt, Azerbaijan, and Crimea, possessed autonomy in the collection and assessment of salt taxes. This decentralized structure reflected the empire's diverse administrative practices and varying degrees of central oversight across its territories.

In contrast, the Habsburg administration of salt taxation was more homogeneous. Salt production was largely an imperial domain, with key sites such as the Salzkammergut directly controlled by the state (Adshead, 1992). Each territorial holding licensed its own traders, and the tax was levied on sales rather than on individuals. Traders had to acquire salt from a pre-defined saline as in the Russian case. All regions of the empire were subject to the licensing system and the sales tax. Tax-free zones existed only in the immediate vicinity of the state-controlled salt chamber estates.

Price regulation and tax policy This section compares how early modern states set salt prices and taxed consumption. Unlike France, where the state mandated the compulsory purchase of salt in certain regions, most states sought to monopolize production and distribution.

China employed a diverse set of pricing regimes for salt. While some counties operated without price regulation, others implemented fixed prices or maintained a regulated price range (Zelin, 2005; Wang, 2022). Price adjustments were administered directly by the imperial government. There was no policy of mandatory salt consumption. After the salt monopoly was introduced in 1705 in Russia, the government imposed a price floor on salt, but it did not establish an upper limit (PSZ, 1727; Troitskii, 1966). The exact price regime was set by the provincial governor. Before 1861, the Ottoman Empire had no unified pricing system. Rather, different jurisdictions used a combination of fiscal tools such as tolls, regalian rights (Azerbaijan), or sales tax (Egypt). In some other instances such as Crimean, rulers owned salines and controlled the trade directly (Adshead, 1992). The Habsburgs sold salt to licensed traders (Keckowa, 1981; Adshead, 1992). Certain groups, such as nobles, enjoyed privileges in the form of lower prices and could re-sell salt for profit. Generally speaking, the monarchy supervised regalian rights—licenses to sell in specific areas—through the Hofkammer, later the finance ministry (Bérenger, 1975).

Contribution to government revenue Like in France, revenues from salt taxation constituted a significant share of government income in China, Russia, and the Habsburg Monar-

chy. In each of these states, salt tax revenues are estimated to have accounted for approximately 10 percent of total government revenue, albeit at different periods—around 1850 in China and during the eighteenth century for both Russia and the Habsburg Monarchy. However, obtaining a similar estimate for the Ottoman Empire is more challenging due to the absence of a unified system of salt taxation.

7. Conclusion

Salt taxation was a widespread fiscal instrument in early modern states. This note describe the process of digitizing historical maps of French local salt tax regions from the seventeenth century to construct a GIS of the Grandes Gabelles, the most fiscally significant salt tax region. This newly structured dataset provides a foundation for in-depth analysis of the administration of one of the primary sources of government revenue during a pivotal period in French history.

References

Adshead, Samuel A. M. 1992. *Salt and Civilization.* New York, NY: Palgrave.

Arnaud, Jean-Luc, and Romain Suarez. 2023. "The Map, from Analogue to Digital. Modes of Processing and Elements of a Method." *Humanités numériques*, 7.

Beaulieu, Eugène-Pierre. 1903. *Les gabelles sous Louis XIV.* Paris: Berger-Levrault.

Bideau, Gabriel, and Nicolas Verdier. 2024. "An Unchanging Communal Gabric? The Necessary Geohistory of French Communes (1800–2024)." *Cybergeo: European Journal of Geography*, 1074.

Bérenger, Jean. 1975. *Finances et absolutisme autrichien dans la seconde moitié du XVIIe siècle.* Paris: Publications de la Sorbonne.

Cabourdin, Guy. 1969. "Gabelle et démographie en France au XVIIe siècle." *Annales de démographie historique*, Villes et villages de l'ancienne France: 293–314.

Cristofoli, Pascal, Marie-Christine Vouloir, Bertrand Duménieu, and Claude Motte. 2021. *Des chefs-lieux de Cassini aux communes de France (1756–1999) [database].* Paris: Laboratoire de démographie et d'histoire sociale [producer]; Paris: EHESS [distributor]. https://doi.org/10.5281/zenodo.4515223.

Davoine, Eva, Joseph Enguehard, and Igor Kolesnikov. 2025. "The Political Costs of Taxation." Working paper.

de Dainville, François. 1955. "La carte de Cassini et son intérêt géographique." *Bulletin de l'association des géographes français*, 251–2: 138–47.

Dekeyne, Christophe. 1998. "La BDTopo de l'IGN: une nouvelle ligne de production." *Mappemonde*, 49(1): 3.

Enguehard, Joseph. 2020. "The Measure of Disorder: Population, State-Building and Rebellion in Old Regime France, 1661–1789." Master's diss. Paris School of Economics.

Gay, Victor. 2021. "Mapping the Third Republic. A Geographic Information System of France (1870–1940)." *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 54(4): 189–207.

Gay, Victor, Paula E. Gobbi, and Marc Goñi. 2023. *Bailliages in 1789 France [database].* Harvard Dataverse. https://doi.org/10.7910/DVN/T8UXHK.

Gay, Victor, Paula Gobbi, and Marc Goñi. 2024. "The Atlas of Local Jurisdictions of Ancien Régime France." *Journal of Historical Geography*, 84: 49–60.

Giommoni, Tommaso, and Gabriel Loumeau. 2022. "Taxation with a Grain of Salt: The Long-Term Effect of Fiscal Policy on Local Development." CESIfo Working Paper 9997.

Guéry, Alain. 1978. "Les finances de la monarchie française sous l'Ancien Régime." *Annales. Économies, Sociétés, Civilisations*, 33(2): 216–39.

Hissung-Convert, Nelly. 2009. "L'impôt sur le sel à Salies-de-Béarn, la fin d'un privilège ancien sous le Monarchie de Juillet." *Annales du Midi*, 121(267): 365–84.

Hocquet, Jean-Claude. 1987. *Le Roi, le marchand et le sel.* Lille: Presses universitaires du Septentrion.

Hocquet, Jean-Claude. 2012. *Le sel et le pouvoir: de l'an mil à la Révolution française.* Albin Michel.

IGN. 1999. *BD TOPO [database].* Paris: IGN. https://geoservices.ign.fr/bdtopo.

IGN. 2021. *ADMIN-EXPRESS édition mars 2021 par territoire France métropolitaine [database].* Paris: IGN. https://geoservices.ign.fr/adminexpress.

Keckowa, Antonina. 1981. "Polish Salt-Mines as a State Enterprise (XIIIth-XVIIIth Centuries)." *Journal of European Economic History*, 10(3): 619–31.

LeDonne, John P. 1975. "Indirect Taxes in Catherine's Russia I. The Salt Code of 1781." *Jahrbücher für Geschichte Osteuropas*, 23(2): 161–90.

Mallet, Jean-Roland. 1789. "Comptes rendus de l'administration des finances du Royaume de France."

Maneuvrier-Hervieu, Paul, and Cédric Chambru. 2024. "Working Time, Holidays, and Labour Conditions in Early Modern Normandy." CERGIC Working Paper 2.

Mathon de la Cour, Charles-Joseph. 1788. *Collection de comptes-rendus, pièces authentiques, états et tableaux, concernant les finances de France, depuis 1758 jusqu'en 1787.* Lausanne, Paris: Cuchet, Gattey.

Morrisson, Christian, and Wayne Snyder. 2000. "The Income Inequality of France in Historical Perspective." *European Review of Economic History*, 4(1): 59–83.

Necker, Jacques. 1784. *De l'Administration des finances de la France.* Paris: Panckoucke.

Ostafin, Krysztof, Dominik Kaim, Tadeusz Siwek, and Anna Miklar. 2020. "Historical Dataset of Administrative Units with Social-Economic Attributes for Austrian Silesia 1837–1910." *Scientific Data*, 7: 208.

Pasquier, Jean. 1978. *L'impôt des gabelles en France aux XVIIe et XVIIIe siècles.* Geneva: Slatkine.

Pelletier, Monique. 1990. *La carte de Cassini. L'extraordinaire aventure de la carte de France.* Paris: Presses de l'École nationale des ponts-et-chaussées.

Perret, Julien, Maurizio Gribaudi, and Marc Barthelemy. 2015. "Roads and Cities of 18th Century France." *Scientific Data*, 2: 150048.

PSZ. 1727. *Complete Collection of the Laws of the Russian Empire [Polnoe Sobranie Zakonov Rossiskoi imperii].* , Volume 7. St. Petersburg:Printing House of the Second Department of His Imperial Majesty's Own Chancery. https://nlr.ru/e-res/law_r/content.html.

Ridolfi, Leonardo. 2019. "Six centuries of real wages in France from Louis IX to Napoleon III: 1250–1860." *The Journal of Economic History*, 79(3): 589–627.

SANDRE. 2017. *Cours d'eau–Métropole 2017–BD Carthage [database].* Paris: SANDRE. http://www.sandre.eaufrance.fr.

Sands, Theodore, and Chester Penn Higby. 1949. "France and the salt tax." *The Historian*, 11(2): 145–65.

Sanson. 1665. *Atlas des gabelles.* Paris: Bibliothèque nationale de France, GE-CC-1379.

Stapel, Rombert. 2023. "Historical Atlas of the Low Countries: A GIS Dataset of Locality-Level Boundaries (1350—1800)." *Research Data Journal for the Humanities and Social Sciences*, 8(1): 1–33.

Touzery, Mireille. 2024. *Payer pour le roi. La fiscalité monarchique. France, 1302–1792.* Ceyzérieu: Éditions Champ Vallon.

Troitskii, Sergei Martinovich. 1966. *Financial Policy of the Russian Absolutism in the 18th century.*

Wang, Runnan. 2022. "The Social Cost of State Monopoly: China's Salt Monopoly System and the Rise of Secret Societies, 1640–1910." Working paper.

Zelin, Madeleine. 2005. *The Merchants of Zigong. Industrial Entrepreneurship in Early Modern China.* New York, NY: Columbia University Press.

A. Appendix Tables and Figures

Table A.1. Variables in the *Grandes Gabelles Historical GIS* Shapefile

Variables		
dta / txt	dbf	Description
grenier	GRENIER	Grenier à sel identifier
table	TAB	Table identifier
table_type	TAB_TYP	Table constituency type
table_name	TAB_NS	Table constituency name (short, upper case)
table_name_prop		Table constituency name (short, proper case)
table_name_long	TAB_NL	Table constituency name (long, upper case)
table_name_long_prop		Table constituency name (long, proper case)
grenier_type	GRE_TYP	Grenier à sel type
grenier_flag	GRE_FLG	Grenier à sel flag
grenier_name	GRE_NS	Grenier à sel name (short, upper case)
grenier_name_prop		Grenier à sel name (short, proper)
grenier_name_long	GRE_NL	Grenier à sel name (long, upper case)
grenier_name_long_prop		Grenier à sel name (long, proper case)
cl_flag	CL_FLG	Grenier à sel chef-lieu flag
cl_noacass	CL_CASS	Grenier à sel chef-lieu cassini identifier
cl_insee	CL_INSEE	Grenier à sel chef-lieu INSEE 2021 identifier
cl_nom_cassini	CL_NC	Grenier à sel chef-lieu cassini name (proper case)
cl_nom_1793	CL_N1793	Grenier à sel chef-lieu 1793 name (proper case)
cl_nom_1801	CL_N1801	Grenier à sel chef-lieu 1801 name (proper case)
cl_nom_1999	CL_N1999	Grenier à sel chef-lieu 1999 name (proper case)
cl_nom_2021	CL_N2021	Grenier à sel chef-lieu 2021 name (proper case)
cl_position_x	CL_X	Grenier à sel chef-lieu latitude in RGF93
cl_position_y	CL_Y	Grenier à sel chef-lieu longitude in RGF93

Notes. This table reports the variables contained in the `dbf`-format attribute table of the *Grandes Gabelles Historical GIS* shapefile and the associated `dta`- and `txt`-format data files. See the main text for variable definitions and typologies. The data further contains a set of seat variables, starting with `cl2`, for gabelles constituencies that combine a grenier à sel and a chambre à sel.

Table A.2. Maps and Greniers in Sanson's (1665) Atlas des Gabelles

Map			Gabelle constituencies	
Identifier	**Type**	**Area**	**Type**	**Name (identifier)**
01	Généralité	Paris (North)	Greniers	Paris (01101), Brie-Comte-Robert (01102), Beauvais (01103), Compiègne (01104), Creil (01105), Dreux (01106), Étampes (01107), Lagny (01109), Mantes (01110), Meaux (01111), Melun (01112), Montfort (01113), Poissy (01116), Pontoise (01117), Provins (01118), Senlis (01119).
02	Généralité	Paris (South)	Greniers	Joigny (01108), Montereau (01114), Nemours (01115), Sens (01120), Tonnerre (01121), Vézelay (01122).
03	Généralité	Orléans (North)	Greniers	Orléans (02101), Beaugency (02102), Châteaudun (02104), Brou (02105), Cheverny (02109), Chartres (02110), Janville (02114), Vendôme (02116), Montoire (02117), Pithiviers (02120), Romorantin (02121), Sully (02122).
			Greniers et chambres	Blois et Mer (02303), Mondoubleau et Saint-Calais (02318).
			Chambre	Bonneval (02206).
04	Généralité	Orléans (South)	Greniers	Boiscommun (02107), Bonny (02108), Cosne (02111), Clamecy (02112), Gien (02113), La Charité (02115), Montargis (02119), Saint-Fargeau (02123).

Table A.2 —continued on next page

Table A.2 —Continued

Map			Gabelle constituencies	
Identifier	**Type**	**Area**	**Type**	**Name (identifier)**
05	Généralité	Moulins (South)	Greniers	Moulins (03101), Montluçon (03102), Gannat (03103).
			Chambre	Vichy (03204).
			Contrôles	Aigueperse (03580), Chambon (03581), Cusset (03582), Ébreuil (03583), Évaux (03584), Maringues (03585), Menat (03586), Pionsat (03587), Ris (03588), Saint-Pourçain (03589).
06	Généralité	Moulins (North)	Greniers	Decize (03105), Château-Chinon (03106), Moulins-Engilbert (03107), Luzy (03108), Saint-Pierre-le-Moûtier (03109), Nevers (03110), Saint-Saulge (03111), Sancoins (03112).
07	Généralité	Bourges	Greniers	Bourges (04101), Buzançais (04102), Dun-le-Roi (04103), Issoudun (04104), Saint-Amand (04106), Selles (04107), Sancerre (04108), Vierzon (04109).
			Chambres	La Châtre (04205), Montfaucon (04210).
			Contrôles	Angles (04580), Bélâbre (04581), Le Blanc (04582), Saint-Benoît (04584).
08	Département	Tours	Greniers	Tours (05101), Chinon (05103), Château-du-Loir (05106), Loches (05107), Langeais (05110), Le Lude (05111), Neuvy (05113), Saumur (05115).

Table A.2 —continued on next page

Table A.2 —Continued

Map			Gabelle constituencies	
Identifier	**Type**	**Area**	**Type**	**Name (identifier)**
			Greniers et chambres	Amboise et Chaumont (05302), Montrichard et Bléré (05312), Richelieu et Loudun (05314).
			Chambres	Bourgueil (05204), Sainte-Maure (05205), Preuilly (05208), La Haye (05209).
			Contrôles	Airvault (05580), Argenton-le-Château (05581), Châtellerault (05582), Jaulnay (05583), Latillé (05584), La Puye (05585), Thouars (05586).
09	Département	Angers	Greniers	Angers (06101), Candé (06102), Ingrandes (06103), Saint-Florent (06104), Cholet (06105), La Flèche (06106), Baugé (06107), Beaufort (06108).
			Chambre	Saint-Rémy (06209).
			Contrôles	Mauléon (06580), Mortagne (Anjou) (06581), Tiffauges (06582).
10	Département	Le Mans	Greniers	Le Mans (07101), La Ferté-Bernard (07105), Mayenne (07110), Ernée (07111), Laval (07112), La Gravelle (07113), Château-Gontier (07114), Craon (07115), Pouancé (07116), Malicorne (07117).
			Chambres	Ballon (07202), Loué (07203), Sillé (07204), Nogent-le-Rotrou (07206), Montmirail (07207), Bonnétable (07208), Bouloire (07209).

Table A.2 —continued on next page

Table A.2 —Continued

Map			Gabelle constituencies	
Identifier	**Type**	**Area**	**Type**	**Name (identifier)**
11	Généralité	Caen	Greniers	Caen (08101), Bayeux (08102).
12	Généralité	Alençon	Greniers	Alençon (09101), Fresnay (09103), Falaise (09104), Sées (09105), Argentan (09106), Bellême (09107), Exmes (09108), Mamers (09109), Mortagne (Alençon) (09110).
			Chambre	Carrouges (09202).
13	Généralité	Rouen (South)	Greniers	Andely (10110), Bernay (10111), Caudebec (10114), Évreux (10115), Gournay (10116), Gisors (10117), Louviers (10120), Neufchâtel (10121), Pont-de-l'Arche (10122), Vernon (10123), Verneuil (10124).
			Grenier et chambre	Rouen et La Bouille (10301).
			Chambres	Brezolles (10212), Conches (10213), L'Aigle (10219).
14	Généralité	Rouen (North)	Greniers	Dieppe (10102), Eu et Le Tréport (10103), Fécamp (10104), Honfleur (10105), Harfleur (10106), Le Havre (10107), Pont-Audemer (10108), Saint-Valery-en-Caux (10109), Lisieux (10118).

Table A.2 —continued on next page

Table A.2 —Continued

Map			Gabelle constituencies	
Identifier	**Type**	**Area**	**Type**	**Name (identifier)**
15	Généralité	Amiens	Greniers	Amiens (11101), Abbeville (11102), Aumale (11103), Corbie (11104), Doullens (11105), Forest-Montiers (11106), Grandvilliers (11107), Mers (11108), Montdidier (11109), Péronne (11110), Roye (11111), Rue (11112), Saint-Quentin (11113), Saint-Vallery (11114), Sainneville (11115).
16	Généralité	Soissons	Greniers	Soissons (12101), Cormicy (12103), Coucy (12104), Guise (12105), Laon (12106), Marle (12107), Noyon (12108), Vailly (12109), Château-Thierry (12111), Clermont (12112), Crépy (12113), Fère-en-Tardenois (12114), La Ferté-Milon (12115).
			Chambres	Aubenton (12202), Vervins (12210).
17	Généralité	Châlons	Greniers	Châlons (13101), Château-Porcien (13102), Joinville (13103), Reims (13104), Saint-Dizier (13105), Sainte-Menehould (13106), Vitry (13107), Épernay (13108), Sézanne (13109).
			Magasins	Donchery (13490), Mézières (13491), Rethel (13492).
18	Généralité	Troyes (East)	Greniers	Troyes (14101), Arcis-sur-Aube (14102), Beaufort [Rosnay] (14103), Bar-sur-Aube (14104), Mussy (14108), Nogent (14109), Saint-Florentin (14110), Villemaur (14111).

Table A.2 —continued on next page

Table A.2 —Continued

Map			Gabelle constituencies	
Identifier	**Type**	**Area**	**Type**	**Name (identifier)**
19	Généralité	Troyes (West)	Greniers	Chaumont (14105), Langres (14106), Montsaugeon (14107).
20	Généralité	Bourgogne	Greniers	Dijon (15101), Arnay-le-Duc (15102), Avallon (15103), Auxerre (15104), Bar-sur-Seine (15108), Châtillon (15111), Montbard (15114), Nuits (15117), Noyers (15118), Pouilly (15119), Saulx-le-Duc (15121), Saulieu (15122), Semur-en-Auxois (15123).
			Grenier et chambre	Beaune et Chagny (15307).
			Chambres	Seignelay (15224), Vitteaux (15228).
21	Département	Chalon-sur-Saône	Greniers	Auxonne (15106), Bourbon-Lancy (15109), Seurre (15110), Mont-Saint-Vincent (15115), Paray (15120), Saint-Jean-de-Losne (15126).
			Greniers et chambres	Autun et Montcenis (15305), Charolles et Perrecy (15312), Chalon-sur-Saône et Louhans (15313), Semur-en-Brionnais et Marcigny (15325).
			Chambres	Mirebeau (15216), Toulon (15227).

Table A.3. Summary statistics

	Mean	SD
Parishes	60.93	48.97
Households	4981.52	3947.87
Taxpayers	16425.30	13603.02
Salt cost	3.75	1.61
Tax price of salt	43.37	2.33
Extraordinary price of salt	40.02	2.56
Volume of salt sales in 1664 (tax)	33.67	44.93
Volume of salt sales in 1664 (extraordinary)	40.61	57.17

Notes. This table presents summary statistics collected from 1665 Atlas des Gabelles for 249 greniers (Sanson, 1665). Tax price of salt includes the King's duty on tax sales and the Collector's duty on tax sales that was realized in jurisdictions with the mandatory consumption (*greniers d'impôt*). Extraordinary price includes the King's duty on extraordinary sales and the Collector's duty on extraordinary sales. Extraordinary salt sales were practiced in both *greniers de vente volontaire* and *greniers d'impôt*. The cost of salt, and salt prices are measured in livres per minot.

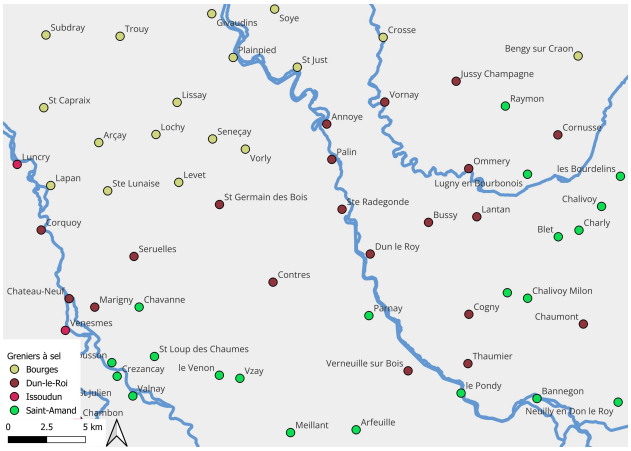

Figure A.1. Exemple of parish-level data collection for the salt tax district of Dun-le-Roi

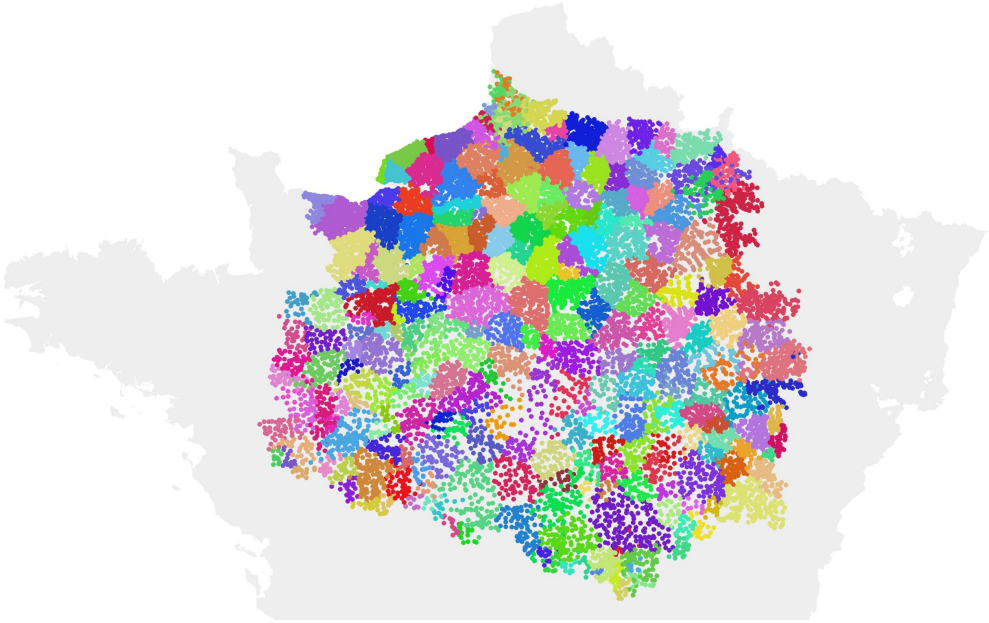

Figure A.2. Gabelles Jurisdictions in 1665

Notes. This figure displays gabelles jurisdictions based on Sanson's (1665) *Atlas des gabelles* as a point layer, where each point represents a parish based on Cristofoli et al.'s (2021) dataset. The underlying shapefile of the Kingdom of France in gray is from Gay, Gobbi and Goñi (2023).

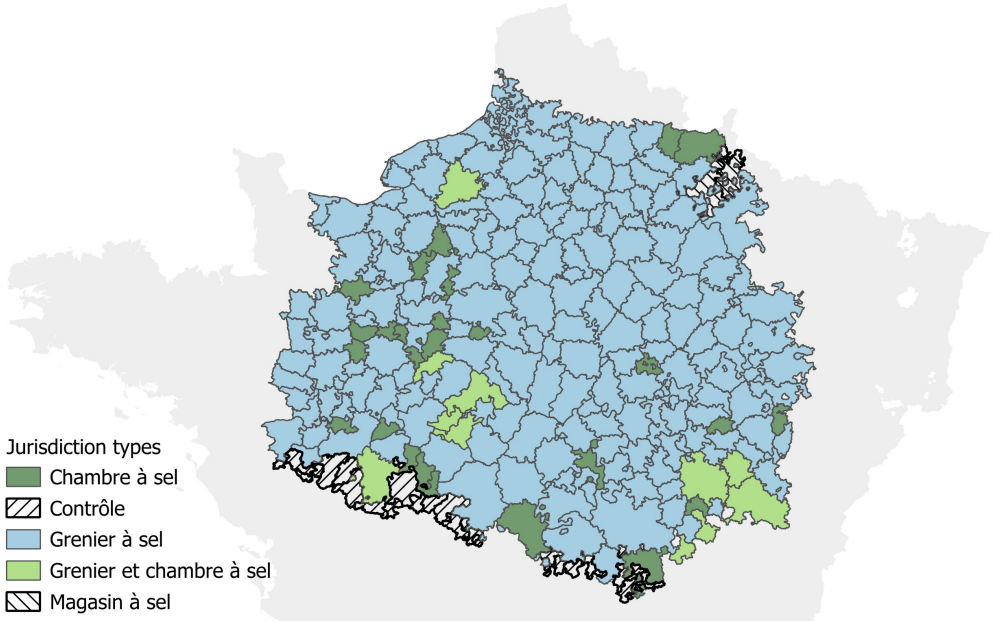

Figure A.3. Gabelles Jurisdiction Types

Notes. This figure displays gabelles jurisdiction types based on Sanson's (1665) *Atlas des gabelles*. The underlying shapefile of the Kingdom of France in gray is from Gay, Gobbi and Goñi (2023).

B. Details on the different types of greniers

Greniers de vente volontaire These greniers were established within the interior of the Grandes Gabelles region, where the risk of tax fraud was relatively low. Yet, they were also present along the border with the Pays de Petites Gabelles, where the tax differential between the two regions was minimal.[21] The limited arbitrage opportunities for salt smuggling at this border allowed for the establishment of greniers de vente volontaire.

Despite the name, in all greniers de vente volontaire there was a very strict obligation to buy at least one minot of salt per year (12 liters $\approx$ 100 pounds) for every fourteen people over the age of eight. This mandatory amount was for immediate consumption only (i.e., pour pot et salière seulement) and was called the Devoir de Gabelle. Salt for curing had to be purchased in addition. The sale was nonetheless said to be "voluntary," because people could buy salt whenever they wanted, and because the poor after 1724—those paying less than 30 sous of income tax or taille—could buy as much salt as they wanted.

Greniers d'impôt These greniers were situated on the outskirts of the Grandes Gabelles region, where the gabelle functioned as a direct tax. As in the greniers de vente volontaire, salt consumption was strictly mandatory. However, rather than purchasing salt as needed, residents were required to accept deliveries from the salt tax collector on a predetermined day, with purchase being compulsory (Sands and Higby, 1949). This stricter system was designed to prevent fraud and smuggling from neighboring exempt regions. In principle, this arrangement eliminated the need for the population to acquire additional salt through illicit channels. These greniers were strategically positioned near borders where the tax differential with adjacent regions was the most pronounced. Notably, a substantial concentration of greniers d'impôt was located near Brittany and the northern frontier, where the price difference with the Pays de Grandes Gabelles was particularly significant.[22] The extent of these zones was further expanded in 1726.

C. Geolocalization of Cassini parishes

To construct our historical GIS of the Grandes Gabelles, we rely on the Cristofoli et al.'s (2021) dataset, which provides the coordinates of all 44 thousand parishes that appear on Cassini's map of France (*Carte générale de la France*) surveyed between 1756

[21] At this border, as illustrated in Figure 1, the price of salt in the Pays de Grandes Gabelles was 61 livres and 19 sous, whereas in the Pays de Petites Gabelles, it was 57 livres and 6 sous in 1781.

[22] Figure 1 indicates a price difference of approximately 55 livres at the Brittany border and around 50 livres at the northern border.

and 1789 (de Dainville, 1955; Pelletier, 1990). Specifically, we use the 43,792 observations available in Cristofoli et al.'s (2021) file `lieux_cassini_devenus_communes.csv`. This file provides two types of coordinates in RGF93 projection: those based directly on the georeferenced Cassini maps (variable `position_cassini`) and those corresponding to the chef-lieu of parishes that later became communes and manually adjusted based on the 1999 BD TOPO (Dekeyne, 1998; IGN, 1999), for which 7,215 observations are missing (variable `position_1999`). Cristofoli et al.'s (2021) codebook specifically mentions: "Position du lieu tel qu'indiquée dans la BD-Topo IGN 1999 (position du chef lieu de commune) ou, si ce lieu n'est pas une commune en 1999, position approximative calculée pour un préplacement du lieu sur la carte (cas des communes ayant un jour existé mais non exitsante en 1999)." To assess which coordinates to use, we project them onto IGN's (2021) shapefile of 2021 communes polygons, append the corresponding INSEE commune identifier, and compare with the identifier provided in Cristofoli et al.'s (2021) dataset (variable `commune_mars_2021`). While original coordinates result in 1,669 misallocations, adjusted coordinates result in only 19 misallocations, mostly due to coordinates falling into water bodies. We therefore use the variable variable `position_1999` to construct our point layer of Ancien Régime France parishes, manually adjusting the remaining misallocated coordinates.