Extractive Taxation and the French Revolution*

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Abstract — We study the fiscal determinants of the French Revolution, exploiting plausibly exogenous variation in the salt tax—one of the most extractive institutions of the *Ancien Régime*. Implementing a Regression Discontinuity design (RDD), we find that crossing the tax border increases the number of riots. These effects already appear in the 1750s, but become stronger over time and peak in the 1780s. Next, we combine the RD model with temporal and spatial variation in weather conditions during the 1780s. We document that, by increasing wheat prices, negative weather shocks amplify the effects of the salt tax on riots. In the second part of the paper, we connect the discontent generated by the salt tax to the French Revolution. First, we show that riots spread across space through a process of contagion. Second, we provide evidence that areas burdened by a higher salt tax rate report more complaints against taxation in the list of grievances collected by the king in the spring of 1789. Third, we document that legislators representing areas with a higher salt tax burden are more likely to demand the end of the monarchy and then, in 1793, to vote in favor of the death sentence for the king.

Keywords: Extractive taxation, regime change, French Revolution, state capacity.

JEL codes — D74, H20, H31, O23

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"The Old Regime [...] perished because its tax system struck only the inferior classes."

— Norberg (1994), p. 256

1 Introduction

Extractive taxation is considered one of the main causes of the French Revolution (Norberg, 1994).[1] The fiscal system of the French *Ancien Régime* placed disproportionate burdens on the peasantry, while exempting the nobility and the clergy. Extractive taxation, together with the lack of public goods provision, deepened popular resentment and eroded the legitimacy of the monarchy. Mounting fiscal pressure and soaring grain prices fueled citizens' discontent. By the summer of 1789, widespread riots against the French monarchy had exploded. Despite its prominence, to the best of our knowledge, no systematic evidence exists on the hypothesis that extractive fiscal institutions were an important determinant of the French Revolution.

In this paper, we seek to fill this gap, exploiting geographic variation in the incidence of the *gabelle du sel* (or, the salt tax), one of the most "iniquitous institutions of the *Ancien Régime*" (Sands and Higby, 1949). First introduced as a temporary measure in the mid-13th century, and then made permanent one century later, in 1780 the salt tax accounted for about 22% of the royal revenues (Touzery, 2023). The salt tax varied across regions, along 22 different tax borders—creating large and long-lasting discontinuities in tax rates. Because public goods provision was minimal and centered around royal prerogatives, such as national defense and justice, a higher tax burden did not correspond to higher redistribution.

Leveraging the sharp discontinuities in tax borders, we test whether municipalities subject to a higher salt tax experienced more revolts against the monarchy in the years leading up to the French Revolution. We retrieved and geolocalized data on all historical salt tax borders from the Digital Archives of the National Library of France, which we cross-referenced with newly hand-collected information on the salt tax rate prevailing in each jurisdiction on the eve of the French Revolution. We combine these data with a comprehensive dataset assembled by Chambru and Maneuvrier-Hervieu (2024) that provides a fine-grained localization of uprising events before, during, and after the French Revolution.

We deploy a non-parametric Regression Discontinuity (RD) approach with optimal bandwidth and polynomial order selection following Calonico et al. (2014) around the salt tax borders. We find that crossing the salt tax border leads to a discontinuous increase in the number of riots. The effects of the salt tax appear already in the 1750s, but grow over time, peaking in the 1780s.

[1] For a detailed discussion of the multifaceted causes of the French Revolution, see Lefebvre (1951); Ladurie (1971); Lefebvre (1973); Shapiro et al. (1998); Neely (2008) among others.

According to our estimates, crossing the border from a low to a high tax municipality increases riots by 17% of a standard deviation. Crossing the tax border also increases the probability that at least one riot occurs. Decomposing riots into different categories, we find that results are driven by tax-related riots, while the salt tax does not lead to changes in riots related to other domains—such as food scarcity or labor conditions. Additionally, we show that results are not driven by riots related to smuggling. This is important to rule out concerns that our estimates may pick up the effects of the government's attempts to curb illicit salt smuggling—something that increased conflict between the citizens and the state (Davoine et al., 2024).

Results are robust to a large number of checks. First, we document that the sample of municipalities around the tax border is balanced along several variables. Via extensive balance tests, we formally show that local characteristics (such as altitude, presence of a river, presence of Roman or 18^{th} century infrastructure, soil fertility) vary smoothly around the salt tax borders. Second, we perform a placebo exercise to verify that there are no changes in riots when redrawing "artificial" borders, just a few kilometers away from the actual ones. Third, we present both qualitative and formal evidence that the salt tax borders do not systematically overlap either with other administrative borders or with other features that might directly impact citizens' propensity to protest (such as ancient Roman or religious borders, provincial boundaries, etc.). For each salt tax border, we describe the process that led to its placement and perform robustness tests by alternatively excluding borders with similar origins. Reassuringly, our results are not driven by any specific border or any specific origin type. Fourth, we replicate the analysis including different controls and degree polynomials, using alternative bandwidths and specifications, accounting for spatial correlation in the error term, and implementing a "global approach."

Our preferred interpretation of the results is that, consistent with the historical literature reviewed in Section 2 below, extractive taxation reduced citizens' support for the state, and eventually induced them to revolt. Since the salt tax slowed down economic development (Giommoni and Loumeau, 2022), it is possible that our results partly capture an income effect. In the baseline specification, we control for 1780 municipality population—the best, though admittedly imprecise, proxy for economic development at the time. However, we cannot—nor want to—rule out the possibility that our results reflect both extrinsic and intrinsic motivations.

A related, though separate, question is why, since the salt tax had been in place for centuries, its effects became strongest after 1780. Historical accounts point to the importance of droughts that, during the 1780s, destroyed the harvest, increased wheat prices, and triggered riots throughout France (Lefebvre et al., 1947; Waldinger, 2021). We conjecture that the eruption of discontent was stronger in places that had historically been burdened by a higher salt tax, where weather

shocks re-activated citizens' frustration and opposition to the state. To test this hypothesis, we augment the baseline RD model by interacting local weather shocks—in particular, higher than average temperatures in the growing season—with the gap in the salt tax rate between bordering municipalities. Besides shedding some light on why the effects of the salt tax became stronger in the 1780s, this approach allows us to control for municipality fixed effects, thereby absorbing any municipality time-invariant feature, including economic development.

We find that higher than average temperatures trigger more riots in municipalities historically burdened by a higher salt tax, as compared to neighboring municipalities subject to the same weather shock but on the lower side of the tax border. According to our estimates, comparing a high-tax to a bordering low-tax municipality, a 20% increase in the growing season temperature (about 2.5°C) increases riots by 7% of a standard deviation. After verifying that higher than average temperatures lead to higher wheat prices, we confirm our previous results by estimating 2SLS regressions that instrument wheat prices with weather shocks.

Our analysis suggests that the salt tax was one of the many factors behind the riots of the 1780s, which eventually culminated in the French Revolution (Chambru and Maneuvrier-Hervieu, 2024). In the second part of the paper, we seek to link more directly the salt tax to the fall of the *Ancien Régime*. First, we apply techniques commonly used in statistics and machine learning to define clusters of events that were geographically and temporally close to each other.[2] We show that clusters were larger where the salt tax was higher, and that otherwise similar riots diffused more quickly and to a larger extent across municipalities subject to a higher salt tax. We further document that "super-spreader" events (i.e., riots that were followed by a large increase in riots in the surrounding areas) were more likely to originate in municipalities subject to a higher salt tax.

Second, we leverage historical information from the *cahiers de doléances* (literally the "lists of grievances"). Between January and April 1789, the King asked the nobility, the clergy, and the Third Estate to collect the list of grievances concerning any topic related to the public sphere broadly defined. These were aggregated to the *bailliage* level, and then transmitted to Paris during the *États Généraux* of May 1789.[3] We use data from Shapiro et al. (1998) to obtain the number and type of grievances submitted by the Third Estate at the *bailliage* level. Estimating cross-sectional regressions, we document that areas burdened by a higher salt tax rate expressed more complaints against taxation, and the salt tax in particular.

[2]Formally, we make use of BDSCAN (Density-Based Spatial Clustering of Applications with Noise). This is a clustering algorithm that identifies arbitrarily shaped clusters, naturally isolate outliers (i.e., "noise"), and avoid the need to specify the number of clusters in advance. See also Ester et al. (1996) for more details.

[3]During the *Ancien Régime*, the *bailliage* (in the north of France) or *sénéchaussée* (in the south) referred to a local administrative, financial, and judicial district—just above the parish. In 1789, France had 435 *bailliages* (Gay et al., 2024).

Third, we collected data on newly elected members of the *Assemblée Législative* (the legislature of the Kingdom of France from October 1, 1791, to September 20, 1792) from the National Assembly's archives. Estimating individual-level regressions, we document that legislators who represented areas subject to a higher salt tax were more likely to support the abolition of the monarchy. Using newly digitized data on the votes cast in January 1793 by members of the *Convention Nationale*, we also document that legislators originating from high salt tax regions were more likely to vote for the death penalty for the king.

Our paper is related to different strands of the literature. First, a vast historical literature has explored the causes of the French Revolution (Tocqueville, 1856; Marion, 1921; Lefebvre et al., 1947). Recent work in economics has shown that weather shocks triggered social conflicts in pre-industrial France and during the Revolution (Furet, 1981; Chambru, 2019; Waldinger, 2021) and that exposure to the American Revolution increased support for the French Revolution a decade later through a process of ideological transmission (Jha and Wilkinson, 2023; Ottinger and Rosenberger, 2023). To the best of our knowledge, our paper is the first to provide systematic evidence on the hypothesis proposed by Marcel Marion that "The Old Regime [...] perished because its tax system struck only the inferior classes" (Norberg, 1994).[4]

Second, our results complement the literature on state capacity. Several papers have documented the importance of mass warfare for the rise of modern nation states and their ability to collect tax revenues (Tilly, 1990; Gennaioli and Voth, 2015; Stasavage, 2016). Others have linked the development of efficient taxation systems and the implementation of inclusive policies to state capacity, showing that the latter promotes economic growth (Besley and Persson, 2010; Cantoni et al., 2019; Chambru et al., 2021). However, not all state-building experiences have been successful. Focusing on the salt tax border surrounding the area of Paris, Davoine et al. (2024) show that when the French monarchy cracked down against illicit salt smuggling in the 1740s in an attempt to raise tax revenues, violent revolts erupted. Unable to to set up effective taxation systems, weak states may engage in rent-seeking behavior, levying extractive taxes—such as the salt tax—to maximize revenues (Besley and Persson, 2009). Extractive taxation may erode the legitimacy of the state, induce citizens to withdraw their support, and eventually lead to the fall of the regime. This idea goes back to the notion of the "social contract" proposed in moral and political psychology (Locke, 1690; Rousseau, 1762; Hobbes, 1651), and has been discussed in several important works in history and political science (Tilly, 1985; Levi, 1997). Our paper provides systematic evidence in support of this idea, focusing on the French *Ancien Régime*—an archetypical example of a weak and extractive state.

[4] A large literature has also examined the economic consequences of the French Revolution (Acemoglu et al., 2011; Squicciarini and Voigtländer, 2016; Chambru et al., 2021; Giommoni and Loumeau, 2022; Loumeau, 2023).

Finally, we complement the literature on institutional change and regime transition. Acemoglu and Robinson (2000) argue that the elites extend the franchise as a commitment for redistribution, under the threat of a revolution. Other papers have linked the emergence of democracy to broader trends in economic development (Lipset, 1959) as well as to negative economic shocks (Huntington, 1993; Gasiorowski, 1995; Brückner and Ciccone, 2011). We complement these papers by documenting that, consistent with Acemoglu and Robinson (2000), if the elites do not democratize when the revolution threat binds, the regime may be overturned by violent revolts. More broadly, our work provides evidence of the fiscal determinants of regime change and revolutions.

The remainder of this paper is organized as follows. Section 2 describes the historical background. Section 3 presents the data. Section 4 presents the main results, and documents that the salt tax increased riots. Section 5 provides evidence on the link between the salt tax and the French Revolution. Section 6 concludes.

2 Historical background

2.1 Fiscal institutions during the Ancien Régime

Before the Revolution, the French monarchy raised approximately 80% of the royal revenues through taxes, while the remaining 20% came from the royal domain (about 7%) and tariffs (about 13%). Direct taxes included the *Taille*, the *capitation*, the *vingitème*, and the *dixième*; indirect taxes consisted of the *Gabelle* (i.e., the salt tax), *taxes on goods* such as tobacco, a *stamp tax*, and the *octroi*. Representing 12% of revenues in its early years, the salt tax became more important over time, accounting for as much as 22% of total revenues during the 18th century (see Figure A1). The rising importance of the salt tax was due to two factors. First, the level of direct revenues from the royal domain remained stable over time. Hence, as the Kingdom expanded geographically and prospered economically, the relative share of the royal domain in the overall Kingdom budget diminished. Second, salt consumption increased between the 13th and the 18th centuries, as both the population and the economy grew.[5]

Representing about 2% of the population, the aristocrats and the clergy were often exempted or offered preferential treatment when facing taxes. These exemptions were a source of frustration for the Third Estate (i.e., the remaining 98% of the population). Figure A2 shows a popular caricature from 1789 representing the hard-working Third Estate carrying both the nobility and the clergy on its back. The first item mentioned in the pockets of the nobility is "sel et tabac" (salt and tobacco). The legend reads "A faut espérer q[u]'eu jeu là finira b[i]entôt" ("Hopefully,

[5]See Touzery (2023) for further details.

this game will be over soon"). This echoes Norberg (1994)'s idea that the extractive tax system in place was an important driver of the French Revolution.

The administrative division of the *Ancien Régime*, largely inherited from Roman and medieval institutions, was complex. A key feature of the system was that different administrative entities with non-overlapping boundaries fulfilled state functions at the local level (e.g., raising royal or church taxes; administering justice; etc.). Public goods provision was minimal, and revenues raised by the Crown through taxes were used for traditional royal prerogatives—military, monetary, justice, infrastructure, and police—which were either uniform or varied smoothly across space. A complete description of *Ancien Régime*'s administrative functions is beyond the scope of this paper. In the interest of space, in the next two sections, we focus on the institutions governing the salt tax. For a more comprehensive description, see also Nordman et al. (1995).

2.2 *The salt tax: An extractive form of taxation for 550 years*

The *Gabelle du Sel*, or the salt tax, was first introduced as a temporary tax in 1246 by Philip IV the Handsome to finance crusading ambitions in the Middle East. The initial motivation for the tax was that the non-crusading peasantry would participate in this "holy enterprise" by providing financial support. In 1318, aware of "the displeasure they cause our people," French King Philippe le Bel published an *ordonnance* (displayed in Figure A4) to reassure the public about the temporary nature of the salt taxes:[6] "Firstly, regarding the fact that our subjects doubted whether the salt tax (gabelle) [...] would last in perpetuity; we made it known and declared to them that it was not our intention for the said gabelle [...] to last forever."[7]

Despite "the displeasure" generated to the people, the salt tax became permanent under Charles V in the second half of the 14th century, and remained in place until its abrogation after the French Revolution in 1789.[8] In 1680, French King Louis XIV acknowledged that the "prosperity of my people" remained a priority, but also added that the salt tax was necessary to finance the "Great and Glorious War."[9] After the Revolution, Napoleon reinstated the salt tax in 1806, making it both spatially uniform and lower than the one prevailing during the *Ancien Régime*. The salt tax was abrogated in 1945.

The salt tax was highly unpopular, and is considered "one of the iniquitous institutions of

[6] Authors' own translation from: "pour la déplaisance qu'elles font à notre peuple" (*Source:* Ordonnances faites par le roi Philippe le Bel, le 25 fevrier, l'an 1318, touchant la gabelle, aides et impositions; see also Figure A4).

[7] Authors' own translation from: "Premièrement, sur ce que nos sujets doutoient, que la gabelle du sel [...] durasse à perpétuité; Nous leur fismes dire et déclarer, que notre intention n'etoit pas, que lesdites gabelles [...] durassent toujours" (*Source:* Ordonnances faites par le roi Philippe le Bel, le 25 fevrier, l'an 1318, touchant la gabelle, aides et impositions; see also Figure A4).

[8] Royal ordinances in 1366, 1372, and 1379 made the salt tax permanent (Sands and Higby, 1949).

[9] Authors' own translation from: "le soulagement de nos peuples" and from "La Grande et Glorieuse Guerre" *Source*: Ordonnances de Louis XIV. roy de France et de Navarre, sur le fait des gabelles & des aydes, 1680 (see also Figure A5).

the Ancien Régime" (Sands and Higby, 1949). For one, as most other taxes, it burdened disproportionately the Third Estate, while the clergy and the aristocrats were exempted or given preferential treatment. Moreover, even though the salt tax was proportional to the quantity of salt purchased and was added to the final price, it varied substantially across space. Figure 1 plots the variation in salt tax rates across regions, reproducing the 1781 *Cartes des Gabelles*.

In the *pays de grandes gabelles* area (literally, the "country of high salt tax"), as the region around Paris was referred to, the salt tax rate was so high that the sale price of salt was nine to ten times its net cost. As the French Kingdom had the monopoly over salt production and controlled selling points, it could set its price. According to Beaulieu (1903), in 1662, the wholesale price of a given quantity of salt in Paris was 4 livres and 10 sous, while the price to the consumer was 42 livres, 4 sous, and 7 deniers, implying a tax rate close to 1000%. In other parts of the Kingdom, the consumer price of the same quantity of salt was much lower—from 2.5 livres in Bretagne to 13 livres in Normandie to 7 livres around Bordeaux. Figure A6 presents graphically the discontinuity in the final price of salt across bordering regions. Note that the impact of transport on the after-tax price was very marginal. On average, the price of salt jumped from 13 livres per minot to about 40 livres for the same quantity. Since public goods provision was minimal, a higher tax burden did not imply more redistribution.

According to the *Cartes des Gabelles*, on the eve of the French Revolution, there were as many as 22 salt tax borders. Most of the borders had been in place for centuries and had changed little over time. The exact location of the tax borders depended on various historical factors, each shaped by specific events and circumstances. For example, the border between the *Grandes Gabelles* (around Paris) and *Provinces Rédimées* (around Bordeaux) follows the military line at the end of the 100 years war in 1453. The border placement between the *Grandes Gabelles* and *Quart-Bouillon* (around Normandie) is determined by a broad radius–exceeding a day's journey on horseback–centered around the salt marshes of the Mont-Saint-Michel Bay. In Appendix C, we provide a more systematic and detailed, segment-by-segment account of the historical contingencies that determined the positioning of each border. There, we also conduct a series of robustness tests to address potential concerns about endogeneity arising from strategic considerations in border placement. We do not find evidence that tax borders systematically overlap with other features that may, in turn, influence the citizens' propensity to revolt against the state.

Besides its spatial inequality, a second feature made the salt tax particularly obnoxious to people. In high tax areas, people were forced to purchase a fixed quantity of salt: one minot per year for 14 people over eight years old (corresponding to 3.4 kg per person). This amount was close to the estimated yearly need for an adult (including usage for production and agriculture),

implying that the salt tax was essentially a *forced* method of taxation. Since few alternatives to salt existed and because even in low tax areas the price of salt was high, historians estimate that individuals living in regions with a low salt tax rate consumed between 3.5 and 4 kg of salt per year on average. For this reason, the effective consumption of salt did not differ much around the tax border.

Illustrating the large, and spatially heterogeneous burden of the salt tax, Morineau (1972) estimated that the average household in the high tax area paid about 13% of its annual income in salt tax, as compared to 2.5% in the low tax area. Back of the envelope calculations indicate that, in 2021, the incidence of the tax for the average French household would range from 805 (low tax) to 4,189 Euros (high tax). The cost incurred by households in the high salt tax areas was similar to the sum of healthcare and transport expenditures for the average household in 2018.[10]

To closely monitor the price and the purchase of salt, citizens were assigned to a royal salt storehouse based on their residence. Salt storehouses (*grenier à sel*, in French) had a monopoly on salt sales, and were evenly spread across the Kingdom at approximately 10 km to 15 km to guarantee that tax collectors (*gabelous*, in French) could complete a round-trip within the same day.[11] To minimize the probability that households under-reported their size in high tax areas, public officials conducted yearly checks-in. Tax collection was centrally organized: from Paris, the King sent tax collectors to the different regions. We are not aware of evidence indicating that regions differed in the methods and tools used to collect the salt tax.

The salt tax was opposed also because collection methods were vexatious, the monitoring system in place was stringent, and fraud was heavily penalized, with common sentences including the death penalty. As Chanel et al. (2015) puts it, "[...] the Fermes générales developed a rigid system of surveillance and coercion backed by drastic penal codes." The rigor of the control methods was such that it inspired a well-known rhyme: "Ils sont partout, les Gabelous! [*The tax collectors are everywhere!*]" (Touzery, 2023).

Due to the spatial variation in tax rates, smuggling emerged as soon as the salt tax system was implemented. In general, smuggling gained prominence in the early- to mid-18th century with the influx of goods—primarily tobacco—from the United States and the French colonies. As with most illicit historical activities, it is challenging to determine the exact scale of smuggling. Hugo (1838) estimates that only around 2,000 families were engaged in this illegal trade—an estimate that likely understates the true extent of smuggling, given anecdotal evidence and the

[10] Data on 2021 net household disposable income and 2018 households' budget come from the OECD and INSEE, household budget, 2018, respectively.

[11] Figure A3 illustrates the location of the salt storehouses along the Loire River between Tours and Orléans.

significant presence of smuggling in French folklore.

Regardless of its precise magnitude, particularly relevant to our study is the salience of salt smuggling. Due to the extractive nature of the taxation system, smugglers were often perceived by the populace as "Robin Hood" figures (Kwass, 2014). The most well-known of these figures was Louis Mandrin (1725–1755), a smuggler of salt, tobacco, and other controlled goods. Highly popular during his lifetime, he was eventually captured and executed in 1755 (Kwass, 2014). In his 1755 *Testament politique*, Mandrin was aware of his popularity and already forsaw the political unrest to come: "*What is this criminal that all of France is talking about? Whom everyone pities, whom the whole world regrets, for whom an infinite number of people would wish to ransom his life with their own blood? It is a mystery that the politics of Versailles can easily unravel. I die content if this event can serve to open the eyes of the ministry. The moment is decisive*" (Mandrin, 1755).[12] Mandrin remains a prominent figure in French folklore, and has inspired at least seven films and television series, numerous popular songs, and museum exhibitions.[13] Beyond the historical act of smuggling, the enduring nature of his popularity as a symbol of resistance against extractive institutions reflects the deep frustrations experienced by the French people under the *Ancien Régime*.

2.3 *Cracks in the system*

Over centuries, extractive fiscal institutions generated latent discontent among the French people. Analyzing the *cahiers de doléances*, a lists of grievances drawn up between January and April 1789 at the King's request, Shapiro et al. (1998) show that taxes, and the salt tax in particular, were a central point of frustration for the Third Estate. Complaints about taxes represented about 25% of all grievances submitted by the Third Estate. Against this backdrop, a series of events in the late 18th century triggered social discontent and fueled revolts against the monarchy. As shown in Figure 2, around 100 riots occurred across France in each year in the 1750s and 1760s. The yearly number of riots increased slightly in the following two decades, with peaks around 1768 and 1775, and then in 1788 and 1789, when more than 800 riots were recorded.[14]

The description of riots reported in Chambru and Maneuvrier-Hervieu (2024) illustrates well

[12] Authors' own translation from: "Qu'est ce que c'est que ce criminal dont toute la France parle? Qu'un chacun plaint, que tout le monde regrette, à qui un infinite de gens voudroient racheter la vie de leur propre sang? C'est un mystère que la politique de Versailles peut aisément developer. Je meurs content si cet évènement peur server à faire ouvrir les yeux au ministère. Le moment est décisif." (Mandrin, 1755, p.1)

[13] Mandrin has been the subject of multiple films and television adaptations, reflecting his enduring presence in French popular culture. These include Mandrin (1924, silent film), Mandrin, 1st Period: The Liberator (1948), Mandrin, 2nd Period: Tragedy of a Century (1948), The Adventures of Mandrin (1952), Mandrin (1962, based on a book by Arthur Bernède), Mandrin, Gentleman Robber (1971, TV series, 6 episodes), and Les Chants de Mandrin (2011, The Ballads of Mandrin).

[14] The 1765-69 increase in riots was due to a series of shocks to the price of wheat, while that of 1775 reflects the "Flour wars"—namely a series of riots that followed rising bread prices and food shortages.

the frustration of the people against the salt tax in those years. In Bons-en-Chablais, on April 4, 1779, a riot is described as a "conflict between the population and salt tax guards on a fair day." Similarly, in Caen, on March 3, 1781, the following event took place: "During a house search, the salt tax officers were initially attacked by 4 to 5 individuals, who then rallied others, soon forming a group of 15 to 20 people from outside the house." This last riot shows that, despite the high punishment risk, an initial event attracted broader support by nearby individuals.

Already in 1755, Mandrin noticed the latent discontent in people over France, and almost predicted the revolution that would later come: "*Honest people [...] were only waiting for a favorable opportunity to declare themselves; the example of some would have inspired others, and the revolution would then have become widespread. [...] The most famous revolutions [...] have always begun with sparks*" (Mandrin, 1755).[15]

A severe drought hit France in 1788, leading to significant underproduction of grain. This caused prices of grain—especially wheat—to soar by 40% in 1789, relative 1788 (see also Figure 3). Historians and economists have argued that the drought was a major driver of the French Revolution (Labrousse, 1944; Ladurie, 1971; Lefebvre, 1973; Neumann, 1977; Neumann and Dettwiller, 1990; Waldinger, 2021). Interestingly, Figure 3 documents that the surge in riots was higher in municipalities where the salt tax was above median. This suggests that the drought and subsequent price increases may have acted as a spark on land already parched by salt taxation. In Section 4, we provide systematic evidence in support of this idea.

In 1781, Louis XVI's finance minister Jaques Necker made public his *Compte rendu au Roi* (or, the "Report to the King"). The document represented the first general overview of the Kingdom's finances available to the public, and about 100,000 copies were sold in just a few weeks. The report publicly revealed both the spatial disparities in the tax burden and the lists of pensions to nobles, including the names and amounts paid by the State. Moreover, the report painted an overly positive picture of the Kingdom's finances, omitting the loans contracted by the French State in support of the American War of Independence. As soon as the real degree of indebtedness of the Kingdom emerged, confidence in the solvency of the State plummeted.

2.4 The French Revolution

Facing a dire financial situation, on January 24, 1789, the King summoned the *Etats Généraux*: "We need the support of our loyal subjects to help us overcome the various difficulties we are currently facing, particularly with regard to the state of our finances." The *Etats Généraux*, which had been last convened in 1614, brought together representatives from all the parts of the

[15] Authors' own translation from: "Les honnêtes gens [...] n'attendoi[en]t qu'une occasion favorable de se déclarer, l'exemple des uns eût animè les autres, et la révolution alors devenoit génerale. [...] Les plus fameuses revolutions [...] ont toujours commencé par des étincelles." (Mandrin, 1755, p.2)

Kingdom, belonging to the three estates of society: the clergy, the nobility, and the Third Estate. Their opening session in Versailles on May 5, 1789, is often considered as the beginning of the French Revolution. The King's opening speech was criticized for lacking serious intentions to implement any structural reform, and focuses solely on raising taxes. Dissatisfied and aware of the country's economic and political expectations, on June 17, after a month of negotiations, the deputies of the Third Estate declared themselves as the *Assemblée nationale*, asserting that they represented "at least ninety-six percent of the nation."

On July 14, 1789, mobs stormed the Bastille in Paris. This episode was followed by a series of far-reaching measures enacted by the National Assembly. These included the abolition of feudal privileges, which dismantled the economic and social structures of the *Ancien Régime*, the establishment of state control over the Catholic Church's vast wealth and influence, and the adoption of the *Declaration of the Rights of Man and of the Citizen*, which laid the ideological groundwork for modern democracy and economic liberalization. The subsequent three years were marked by intense political conflict and economic instability. After a short-lived constitutional monarchy, Louis XVI was overthrown on August 10, 1792. The French *Première République* was created and a constituent assembly, the *convention nationale*, was elected in September 1792. Examining 33 charges against Louis Capet (the name adopted to call the King as a citizen), the National Convention sentenced the former King to death in January 1793.

3 Data

This section describes the data and presents the summary statistics for the main variables considered in our analysis.

Salt tax. Relying on historical records from the Archives of the National Library of France, we geo-referenced the map of all salt tax discontinuities.[16] The primary source of local information comes from the 1781 Necker's map of the salt tax zones in France (see also Figure 1). Even though the map includes both the zones and the tax rate in place, it is imprecise at high spatial resolutions, as those needed when implementing our analysis below. To overcome this limitation, we hand collected and digitized the list of the salt tax rates levied in all locations across the Kingdom available in the *Ordonnances de Louis XIV. roy de France et de Navarre, sur le fait des gabelles & des aydes* (1680, see also Figure A5).[17] We combined this dataset with geo-referenced maps of the *Ancien Régime* institutions made available by Gay et al. (2024).

[16]Online access to historical map archives can be found here: https://gallica.bnf.fr/html/und/cartes/cartes?mode=desktop.

[17]The full title of the original document is: *Ordonnances de Louis XIV. roy de France et de Navarre, sur le fait des gabelles & des aydes. Données à S. Germain en Laye aux mois de may & juin 1680. Registrées en la Cour des Aydes les 11. may & 21. juin 1680.* Publicly available online from the National Library of France, BnF.

Comparing the tax rates applied in 1680 and in 1781 allows us to verify that the salt tax was highly persistent and changed little over time. In our analysis, we omit municipalities in the bottom quartile of the tax gap distribution. These are municipalities for which the discontinuity in the salt tax rate is minimal (less than 10 pounds per minot), and thus unlikely to be salient, or even visible, to local residents.[18] On average, the salt tax rate in the municipalities in our main regression sample was about 30 pounds per minot (Table A1, Panel A), but varied substantially across space (Figure A7).

Local weather shocks. In Section 4.2, we combine information on the salt tax rate with local weather shocks occurring between 1780 and 1789. Local-level data on yearly growing-season temperature and precipitation for this historical period come from Luterbacher et al. (2004) and Pauling et al. (2006).[19] These are gridded datasets, with grids measuring approximately 50 by 50 km, reconstructed by paleoclimatologists based on several sources and often used in the economic literature (e.g., Sequeira et al., 2020). Following Waldinger (2021), we calculate the ratio of growing-season temperature and precipitation in each year over their long-run (1750 to 1800) growing-season means.[20] For our analysis, we match each municipality to the corresponding grid and, since growing-season conditions influence the harvest with a lag, we assign to the riots occurring in a given year the deviations in temperature and precipitation prevailing in the previous year. Figure A8 displays temperature (Panel A) and precipitation (Panel B) deviations focusing on 1788—when a major drought hit France and caused pervasive crop failures (Lefebvre, 1973; Neumann and Dettwiller, 1990). As documented in the literature (Waldinger, 2021), 1788 temperature and precipitation shocks were especially severe in Southern and Eastern parts of France.

Riots. Data on the number of riots come from Chambru and Maneuvrier-Hervieu (2024). The original dataset covers more than 20,000 episodes of violence across countries from the year 1,000AD onwards. We focus on events occurring in contiguous France between 1750 and 1789, and classified by Chambru and Maneuvrier-Hervieu (2024) as economic and political riots. Economic riots refer to tax-, food- or labor-related events. Political riots are classified as protests against the authority, against the feudal institutions, or other unspecified political uprisings.[21] Relying on the information of the city that hosted the riot events, we obtain the number of riots

[18] As shown below, however, results are robust to including all borders.

[19] As in Waldinger (2021), we define the growing season as the spring and the summer (March to August).

[20] Results are robust to using alternative time windows to compute long-run means.

[21] More specifically, we classified as "political" the riots labeled by Chambru and Maneuvrier-Hervieu (2024) as "Conflict with local and/or national authorities", "Feudal conflict", and "Political conflict". Moreover, we classified as "economic" the events labeled as "Food riot", "Labour riot", and "Tax riot". We exclude events that lack any description or that, given their description, are unlikely to capture citizens' uprising. This is because they may not represent instances of revolts. However, below, we show that results are robust to including also these excluded events.

recorded in a given municipality over a given time period. Figure A9 plots the distribution of riots across France between 1750 and 1789. Revolts were scattered around the entire country, but were more likely to occur around the salt tax borders. Panel A of Table A1 confirms that the number of riots, both over the entire 1750-1789 period and over the 1780-89 decade, was on average higher in municipalities close to salt tax borders, as compared to the entire France.[22] This is consistent with tax inequality being more visible and salient to people there. Our analysis below confirms this conjecture.

Citizens' complaints. We measure the complaints expressed by the French population at the onset of the French Revolution using the *Cahiers de doléances*. Literally the "lists of grievances," the *Cahiers de doléances* were the result of a survey commissioned by King Louis XVI in the spring of 1789. The King asked the nobility, the clergy, and the Third Estate to collect the list of grievances concerning any topic related to the public sphere broadly defined. The grievances were aggregated to the *bailliage* level, and then transmitted to Paris during the *États Généraux*. We rely on the data assembled by Shapiro et al. (1998) to obtain the number and type of grievances submitted by the Third Estate at the *bailliage* level. The most common set of complaints were against the state, and accounted for about 35% of all grievances (Figure A10). Taxation represented the second largest source of anger, representing about 20% of all complaints in the list of grievances. On average, *bailliages* submitted 70 complaints against taxation—and 4% of these explicitly mentioned the salt tax (Table A1, Panel B).

Voting behavior of members of Parliament. We collected novel data on the political leaning and department of origin of each member of the Legislative Assembly, i.e., the legislature of the Kingdom of France from October 1, 1791, to September 20, 1792, from the archives of the National Assembly. According to our classification, about 15% of legislators represented a group advocating for a change away from the monarchy (Table A1, Panel C).[23] From the archives of the National Assembly, we also extracted the votes cast by members of the *Convention Nationale* in January 1793 to decide over the death penalty for the King. For each member, we observe the department of origin and the vote on the three questions asked at the *Convention Nationale* (see also Figure A11). The first question asked whether the King was guilty; the second question asked if French people (as opposed to the *Convention Nationale*) should vote on the King's final sentence; the third question asked whether the King should be sentenced to death. While most legislators (98.8%) answered "*oui*" (yes) to the first question, there was more variation in how they answered to the second and the third questions (Table A1, Panel D). More than a third of

[22] For consistency, in Panel A of Table A1, we exclude the municipalities in the bottom quartile of the tax gap distribution.

[23] We classify the following political groups as "Pro-change:" *Gauche*, *Constitutionnels*, *Montagne*, *Girondins*, *Constitutionnels modérés*, *Extréme gauche*.

legislators (38.8%) voted in favor of the public referendum, hoping that this would have spared the King from the death penalty. Most legislators, more than two thirds, who answered "no" to the second question then voted to sentence the King to death: 64.6% *Convention Nationale* members answered "yes" when asked whether the King should be sentenced to death.

Additional variables. We complement the datasets described above with a series of local demographic and economic control variables. These come from The National Institute of Statistics and Economic Studies and Cagé and Piketty (2023) for demographic outcomes, as well as from the National Institute of Geographic and Forest Information for spatial data.

4 The salt tax and riots

In this section, we examine the relationship between the salt tax and riots. First, estimating a Regression Discontinuity (RD) model, we find that crossing the tax border from low to high tax municipalities increases the number of riots (Section 4.1). Second, we combine the RD model with time and spatial variation in weather conditions, and document that higher than average temperatures during the growing season trigger more riots in municipalities with a higher salt tax rate (Section 4.2).

4.1 Regression discontinuity analysis

Empirical strategy. We begin by estimating a RD model that compares similar and spatially close municipalities, which were subject to different salt tax rates (see also Section 2). Let $i \in I$ be a municipality, defined by its centroid, $\boldsymbol{c}_i = (c_i^x, c_i^y)$. Consider $\overline{\boldsymbol{B}}$ as the infinite set of border points constituting the salt tax borders, and define the subset $\boldsymbol{B} \in \overline{\boldsymbol{B}}$ of border points $\boldsymbol{b}_i = (b_i^x, b_i^y)$ such that the euclidean distance to the salt tax border $d_i = ||\boldsymbol{c}_i - \boldsymbol{b}_i||$ is minimized. Let the two zones $\mathscr{A}^+$ and $\mathscr{A}^-$ be the treatment (i.e., the municipality with the higher tax rate, compared to the nearest tax border) and the control (i.e., the municipality with the lower tax rate, compared to the nearest tax border) areas, respectively. A location is assigned to one and only one tax border (the nearest).

Location, relative to the nearest salt tax border, acts as the forcing variable. Assignment into treatment is a function of a municipality's location relative to the border. Treatment status of municipality i is defined as $T_i = \mathbb{1}\left[\boldsymbol{c}_i \in \mathscr{A}^+\right]$. Denote the outcome vector by $\boldsymbol{Y}$. The discontinuity of the expected outcomes at the geographical border can be expressed as:

$$\tau(\boldsymbol{d}) \equiv \mathbb{E}[\boldsymbol{Y}_1 - \boldsymbol{Y}_0 | d_i = 0] = \lim_{\boldsymbol{d} \to 0}[\boldsymbol{Y} | \boldsymbol{c} \in \mathscr{A}^+] - \lim_{\boldsymbol{d} \to 0}[\boldsymbol{Y} | \boldsymbol{c} \in \mathscr{A}^-]. \tag{1}$$

We estimate the following empirical model:

$$Y_i = f(d_i) + \boldsymbol{\eta}_{b_i} + \beta_1 T_i + \boldsymbol{X_i'\gamma} + \varepsilon_i, \qquad \text{if } -h \leq d_i \leq h. \tag{2}$$

The dependent variable, Y_i, is the number of (political and economic) riots that occurred in municipality i in different time windows. The main regressor of interest, T_i, is the border treatment variable defined above. The regression also includes different polynomial orders of the distance to the border, $f(d_i)$, salt tax border fixed effects, $\boldsymbol{\eta}_{b_i}$, and additional municipal controls (coordinates, soil fertility, and 1780 population), $\boldsymbol{X_i'}$.[24] Standard errors are clustered at the *bailliage* level. Because standard local polynomial estimators may be sensitive to the specific bandwidth (h) used, we employ mean squared error optimal bandwidths, which are valid given the robust approach in Calonico et al. (2014).

The main analysis below focuses on the 1780-89 decade, though we also show results for other decades as well. For the 1780-89 decade, the optimal bandwidth is 33.49 km, and the sample includes 13,113 of the 34,477 municipalities in contiguous France.[25] Note that our sample does not include Paris, which is more than 50 km away from the closest tax border, reducing concerns that results from the RD analysis may be driven by events happening there. Also and importantly, salt production sites are always at least 50 km away from the tax borders.

In Figure 4, we formally test whether the salt tax rate varies discontinuously at the tax border, estimating a regression similar to that in equation (2), where the dependent variable is the salt tax rate (rather than the number of riots). The RD plot shows that the salt tax rate jumps at the border, moving on average from 12 to 40 pounds per minot.[26]

Validity. The main identifying assumption behind our empirical strategy is that only the salt tax rates, and not other variables that might influence citizens' propensity to protest, vary discontinuously at the tax borders. One specific concern is that some segments of the salt tax border coincided with other administrative borders or with geographical features, such as rivers and soil suitability. Section 2 and Appendix C discuss the origin of the salt tax borders, presenting both anecdotal and more formal evidence in support of the notion that the exact

[24] In the baseline specification, we use second-order polynomials. When including covariates, we follow the approach in Calonico et al. (2019). Soil fertility is measured with three variables: an indicator of soil fertility obtained from the European Soil Database, the average silt content in the soil (at 100-200cm depth), and the average nitrogen content in the soil (at 30-60cm depth).

[25] In France, there are 34,477 municipalities. However, once we exclude those that span salt tax borders at the bottom quartile of the distribution, this number becomes 25,564.

[26] The figure is obtained by pooling together all the borders (and excluding the borders with tax gap in the bottom quartile of the distribution). We obtain similar results, not reported for brevity, when considering each border separately. Figure A12 shows that, as expected, the discontinuity in the salt tax rate is an order of magnitude smaller when considering municipalities in the bottom quartile of the tax gap distribution.

placement of salt tax borders was plausibly exogenous. Below, we also test the robustness of results to excluding different border segments one at the time.

To corroborate the identification strategy, we examine whether the sample is balanced around the border. Since the salt tax had negative and persistent effects on economic development, which appeared well before 1780 (Giommoni and Loumeau, 2022), we focus on characteristics that are either time-invariant or pre-determined relative to the introduction of the salt tax. In Figure A13, we consider the presence of a Roman road, a city or a road reported on the Cassini map, and a diocese or an archidiocese (Panels A to E), as well as municipal surface, altitude, soil fertility, and the presence of a river (Panels F to I).[27] In Figure A14, we consider different soil characteristics, including silt and nitrogen level (important proxies for land's intrinsic suitability for agriculture). Reassuringly, coefficients are quantitatively small and imprecisely estimated, suggesting that the sample is balanced along these characteristics.

Main results. Figure 5 presents the RD plot from equation (2) for the period between 1750 and 1789. Results indicate that the number of riots jump when moving from the "low tax" (coded with negative distance) to the "high tax" (coded with positive distance) side of the border. We report the corresponding point estimate and standard errors in Table 1, column 1. The coefficient is statistically significant, and indicates that moving from the low to the high tax side of the border increases the number of riots by 12.4% of a standard deviation.

Subsequent columns of Table 1 replicate the baseline RD regression separately for the six decades between 1750 and 1809. These estimates, also displayed graphically in Figure 6, show that the effects of the salt tax grew over time, becoming statistically significant and quantitatively relevant after 1760. Consistent with the historical literature (Touzery, 2023), our results suggest that dissatisfaction with the system of extractive taxation peaked in the 1780s—the decade leading up to the French Revolution. As expected, the relationship between the salt tax and riots disappears after 1790. According to the coefficient reported in column 5 of Table 1, for the 1780-89 decade, crossing the tax border increases riots by 17.1% of a standard deviation (or, about 127% of the mean) of the dependent variable. Motivated by these patterns, from now onwards, we focus on the 1780-89 decade, unless otherwise specified.

Interpretation. Our preferred interpretation of the results is that extractive taxation reduced citizens' support for the state, and eventually induced them to revolt. This view resonates with the abundant historical evidence discussed in Section 2 that the salt tax fueled discontent against the monarchy and led to the riots that culminated in the French Revolution. It is also consistent with the broader notion that, when taxes are not matched by corresponding benefits

[27] The Cassini Map or Academy's Map is the first topographic and geometric map of the Kingdom of France as a whole. It was compiled by the Cassini family in the 18th century.

for the population, unrest and revolutions can occur, potentially leading to the fall of the regime (Levi, 1997; Acemoglu and Robinson, 2001; Goodwin and Rojas, 2015).[28] This may happen for two, complementary reasons. First, extractive taxation reduces the legitimacy of the state, and lowers citizens' intrinsic motivations to support it. Second, by extracting rents from the population and making local communities poorer (Giommoni and Loumeau, 2022), the salt tax may have triggered riots due to material (extrinsic) considerations.

Note that the extrinsic and the intrinsic motivation channels are complementary, and both are likely to mediate the impact of the salt tax on riots. In our baseline specification, we control for local population measured in 1780 to proxy for the effect of the salt tax on economic development at the onset of the French Revolution. We acknowledge that this variable is an imperfect proxy for economic development, and does not measure the individual conditions of people living in a given municipality. To further reduce concerns that municipalities on either side of the border differ along economic dimensions that we cannot measure, in Section 4.2 below, we augment the RD specification with time and spatial variation in local weather conditions and wheat prices. This allows us to absorb any remaining time-invariant difference between municipalities, including economic development, through the inclusion of municipality fixed effects. However, we cannot—nor want to—rule out that our results reflect the effects of the salt tax through both intrinsic and extrinsic motivations.

Robustness checks. In Table A2, we present a large battery of robustness checks. First, we show that results are unchanged when including borders at the bottom quartile of the tax gap distribution (column 2). The point estimate remains positive and statistically significant, but is about one third smaller than that in the baseline specification (reported in column 1). This is consistent with our interpretation: the tax gap in these additional borders was substantially smaller, and thus less noticeable and salient to people. Second, we verify that results are robust to the inclusion of riots other than those that Chambru and Maneuvrier-Hervieu (2024) define as "economic" and "political" (column 3) . Third, we show that results are robust to excluding large cities, defined as those with a population above the 95th percentile (column 4), using Pseudo Poisson Maximum Likelihood (column 5), defining the dependent variable in logs (column 6), and estimating the model away from the tax borders (column 7).[29]

Next, in Table A3, we show that results are robust to including quadratic polynomials (column 2) and to using different kernel and bandwidth selection methods (columns 3 to 5). To ad-

[28] While the French Revolution is one of the most renowned examples, similar patterns have emerged throughout history—from the 1905 Russian Revolution to the 1905-1911 Persian Constitutional Revolution to the 1910 Mexican Revolution.

[29] Results are robust to selecting the large cities using alternative thresholds. When taking the log of the number of riots, we add 0.01, given the large number of zeros in our sample.

dress potential concerns about spatial correlations, we also replicate the analysis by clustering standard errors at the *géneéralité* level (column 6) and using Conley (1999)'s adjusted standard errors (columns 7 and 8).[30] Moreover, we document that results are unchanged when arbitrarily modifying the bandwidth between 0.5 and 1.5 of the optimal bandwidth (Figure A15). Complementing these results, Figure A16 performs a placebo exercise permuting the border 10, 20, 30, and 40 km away from the actual one. Reassuringly, only when crossing the "real" tax border, the coefficient is positive and statistically significant.

As discussed above, an important question is whether the exact placement of the border is as good as random. The anecdotal evidence discussed in Section 2 and the more formal analysis presented in Appendix C suggest that, at the fine-grained geographic level of the optimal bandwidth (around 30 km), the placement of the borders was quasi-random. The balance checks presented in Figures A13 and A14 further support this notion. In Figure A17, we additionally show that results are robust to excluding different border segments—one at the time. In Panel A, we define borders according to their geography, dividing the French territory in 2 x 2 degree blocks and creating 25 different border segments. In Panel B, we define border segments according to their origin—as explained in detail in Appendix C (see also Figure C4). Then, we replicate the baseline specification (reported in the first dot from the left) excluding each border segment at the time.

Reassuringly, coefficients are positive and, in most cases, statistically significant at the 5% level. The coefficients become somewhat smaller and less precisely estimated in two instances (with p-values of 0.096 and -0.127, respectively). First, when excluding the borders in one north-western block (Panel A).[31] Second, when excluding the border segments whose origin coincides with the overlap between jurisdictions and *généralités* (Panel B). This latter test is particularly demanding, because excludes 36% of the municipalities in our sample. Overall, Figure A17 suggests that no single border (defined either in terms of its geography or in terms of its origin) is driving our results.

Heterogeneity by type of riot. In our baseline specification, we consider all the riots that Chambru and Maneuvrier-Hervieu (2024) classify as political or economic. Using the description of the event (when available), Chambru and Maneuvrier-Hervieu (2024) further decompose the political and economic riots in more granular categories. In Figure 7, we replicate the

[30] In column 8, where we use a 100 km distance threshold when applying Conley (1999)'s procedure, the point estimate is statistically significant at the 10% and the p-value is 0.081. The point estimate in columns 7 and 8 of Table A3 differs from that in column 1 because Conley (1999) adjusted standard errors apply spatial weighing based on distance. Hence, in columns 7 and 8, we use a uniform kernel (as in column 3); instead, our baseline specification uses a triangular kernel.

[31] The municipalities of this block are located in the following modern French regions: Normandie, Pays de la Loire, Centre val de Loire, and Nouvelle Acquitanie.

analysis presented in Figure 6, examining separately different categories of riots, as defined in Chambru and Maneuvrier-Hervieu (2024).[32] Panel A documents that the salt tax increases economic—but not political—riots. Panel B focuses on the different components of economic riots, separately considering events that are related to: taxes, food, and labor.[33] Consistent with our interpretation, the effects are entirely driven by riots against taxation. The fact that we observe no jump in food-related riots at the border also weighs against the idea that our results fully reflect the negative effect of the salt tax on economic development.

As discussed in Section 2, differences in the price of salt across tax borders encouraged the diffusion of illicit smuggling. When the king enforced a reform aimed at curbing salt smuggling in the 1730s, violent riots erupted (Davoine et al., 2024). Some of these events were the result of direct confrontations between field agents and smugglers. Others, instead, arose as the local population defended the smugglers, who, like Louis Mandrin (see Section 2), were viewed as local heroes fighting for the poor against an extractive and unjust state. To the extent that smuggling-related riots reflect citizens' grievances against taxation, they are consistent with our proposed interpretation. Moreover, since the crack-down against salt smuggling was implemented in the 1730s and given that our estimates become strongest in the 1780-89 decade, it seems unlikely that our results capture backlash against the reform.

However, to rule out the possibility that our findings are entirely driven by riots caused by the smuggling crack down, in Table A5, we explore the sensitivity of our estimates to excluding smuggling-related riots. To identify smuggling-related riots, we read through all riots reported in Chambru and Maneuvrier-Hervieu (2024), and selected those that contained any mention of salt smuggling.[34] In column 2, we replicate the baseline specification (reported in column 1 to ease comparisons) excluding smuggling-related riots, focusing on all economic and political riots (Panel A) and only on tax riots (Panel B). While coefficients are smaller than in column 1, they remain positive, statistically significant, and quantitatively relevant.

As discussed earlier, some riots that started with the apprehension of smugglers escalated, as the local population sided with the smugglers. Since these events may reflect latent local discontent against the state, it would be incorrect to remove them from the analysis. We thus create two additional versions of smuggling-related riots, excluding from the set of events used in column 2 those that: i) involved external parties distinct from both smugglers and state

[32] The corresponding results in tabular form are reported in Table A4.

[33] As displayed in Figure A18, tax, food, and labor riots account for, respectively, 44.8%, 46.9%, and 8.3% of all economic riots occurring in the 1780-89 decade.

[34] According to our classification, 171 of the 1,890 economic and political riots occurring in the tax border sample between 1750 and 1789 included at least one reference to salt smuggling in their description. These numbers are 167 and 1,042 for tax riots.

officers; and ii) either had external parties or included at least 50 people (or both).[35] Results, reported in columns 3 and 4 of Table A5, remain close to those in column 2.

Additional results. In Table A6, we provide additional results to deepen our understanding of the relationship between the salt tax and riots. In column 1, we restate the baseline. In column 2, we explore whether the salt tax affected not only the "intensive margin" (i.e., how many riots occurred in a given municipality), but also the "extensive margin" (i.e., whether at least one riot occurred in a given municipality). The dependent variable is a dummy equal to one if at least one riot occurred in the municipality over the 1780-89 period. The coefficient is positive, statistically significant, and quantitatively relevant: moving from the low to the high tax border increases the probability that at least one riot occurs by 2.9 percentage points or, 66% relative to the sample mean.

To identify the effects of extractive taxation through the RD model in equation (2), we compared municipalities on opposite sides of the tax border, regardless of the size of the tax differential. However, we would expect the tax-riots relationship to be increasing in the size of the tax gap. For one, a larger tax gap should be more visible—and thus, salient—to people. Moreover, a larger tax gap may fuel resentment if individuals value fairness. We test this conjecture in two complementary ways. First, in columns 3 and 4 of Table A6, we estimate the RD model separately for municipalities with a tax border below and above the sample median. Consistent with our hypothesis, the effects are driven by municipalities that span borders with a higher tax gap. Second, in column 5, we replicate the RD analysis with OLS, using as main regressor the gap between the own tax rate and the tax rate prevailing on the other side of the closest tax border.[36] The positive and statistically significant coefficient confirms results in columns 3 and 4, and indicates that citizens' propensity to revolt was higher when the tax gap was larger.

The baseline RD model also prevented us from estimating the elasticity of riots with respect to taxation—a policy relevant parameter. In column 6 of Table A6, we thus replicate the OLS regression of column 6, replacing the tax gap with the tax rate prevailing in the municipality. The coefficient is positive, statistically significant, and quantitatively relevant. According to our estimates, a 20 pounds per minot increase in the salt tax rate (approximately one standard deviation in our border sample) increases the number of riots by 10% of a standard deviation.

[35] With these restrictions, the number of salt smuggling riots goes from 171 to 139 and 121, respectively. We chose the threshold value of 50 to be conservative, and only consider as "escalated events" those with a very large number of agents. Results are unchanged (if anything stronger) when selecting lower thresholds (e.g., 15, 20, 30, etc.).

[36] To keep the analysis as comparable as possible to the RD model, we include only municipalities within 30 km away from the tax border (the closest integer value to the optimal bandwidth), and control for *bailliage* fixed effects, the municipality-level covariates included in the RD model (soil fertility, geographic coordinates, and 1780 population), distance from the border as well as the interaction between the latter and, respectively, the tax gap and each of municipality-level covariates. We cluster standard errors at the *bailliage* level.

Results are similar when taking the log of the tax rate (column 7).

4.2 Activating latent discontent: the role of weather shocks

A number of historical contingencies may explain why, even if the salt tax had been in place for centuries, its impact peaked in the 1780s. First, France's mounting fiscal crisis and reform attempts brought renewed scrutiny to an inefficient and regressive taxation system (Touzery, 2023). Second, the diffusion of the ideas about equality promoted by the Enlightenment and by the American War of Independence began to circulate among the French population, fueling demand for political change (Kaiser and Van Kley, 2010; Jha and Wilkinson, 2023). Third, and specifically for the 1780s, severe droughts caused crop failure, increased wheat prices, and fueled widespread discontent (Lefebvre, 1973; Neumann and Dettwiller, 1990; Chambru, 2019; Waldinger, 2021). We conjecture that weather shocks led to more riots in municipalities subject to a higher salt tax, by reactivating latent discontent, which had been fueled by centuries of extractive taxation. Figure 3, already presented in Section 2, provides suggestive evidence in support of this hypothesis, showing that, after the surge in wheat prices, riots increased more in municipalities with a higher salt tax. In what follows, we formally test this idea.

Empirical strategy. We focus on the 1780-89 decade, and augment the RD model from equation (2) with yearly variation in weather conditions across French municipalities. We estimate:

$$Y_{it} = \gamma_i + \delta_t + \beta_0 Z_{i,t} + \beta_1 Tax_i \cdot Z_{i,t} + \boldsymbol{X}'_{\boldsymbol{i,t}}\boldsymbol{\gamma} + \epsilon_{it} \tag{3}$$

where Y_{it} is the number of riots in municipality i in year t, Tax_i is the prevailing salt tax rate, $Z_{i,t}$ is the measure of weather shock defined in Section 3, and γ_i and δ_t are municipality and year fixed effects. The vector of controls $\boldsymbol{X_{i,t}}$ includes the interaction between year dummies and municipal-level covariates (soil fertility and 1780 population), the double interaction between distance to the closest tax border and weather shocks as well as the triple interaction between distance, weather shocks, and the tax rate.[37] To mirror the local analysis conducted in the RD model (2), we restrict attention to municipalities within 30 km from the tax border (the optimal bandwidth), and cluster standard errors at the *bailliage* level.

Results. We present the baseline results from equation (3) in Table 2. In column 1, we only consider temperature shocks, and do not include the interactions between year dummies and municipality controls. The positive and statistically significant coefficient indicates that the effect of the salt tax on riots becomes larger following years in which the municipality records higher than average temperatures during the growing season. In column 2, we present our preferred

[37] The main effects of the tax rate, the effect of the distance to the border and the interaction between the tax rate and distance are absorbed by the municipality fixed effects.

specification, which also includes the interaction between year dummies and municipality covariates. The coefficient remains positive and statistically significant.

According to the coefficient in column 2, a 20% increase in the growing season temperature (about 2.5°C) increases riots by 7% of a standard deviation more in a high tax, as compared to a low tax, municipality. These results complement those in Waldinger (2021) and Chambru (2019), by showing that weather shocks are amplified by extractive taxation. They also complement those from the baseline RD model in two ways. First, they shed some light on the question of why, even though the salt tax had been in place for centuries, its effects were strongest in the 1780s. Second, through the inclusion of municipality fixed effects, we can control for any remaining municipality characteristic (such as economic development) that may vary discontinuously at the border.

Robustness checks. The remainder of Table 2 explores the robustness of results reported in column 2. In column 3, we augment the baseline specification by controlling for deviations from average precipitation. The coefficient on the interaction between the salt tax and temperature is unchanged, while that on the interaction between precipitation and the tax rate is close to zero and imprecisely estimated. This suggests that only temperature—and not precipitation—shocks lead to more riots where the salt tax is higher. In column 4, we perform a placebo check, replacing the temperature shock measured during the growing season with that measured over the rest of the year (autumn and winter). The coefficient becomes three times smaller and is no longer statistically significant, supporting our interpretation that temperature shocks amplified the impact of the salt tax on riots through poor harvest and crop failure. In columns 5 and 6, we use alternative definitions of the shock that measure temperature in the spring and the summer, respectively. Finally, in column 7, we consider all municipalities, regardless of their distance from the border. Reassuringly, in all cases, the main coefficient of interest remains statistically significant and similar to that presented in column 2.

In Figure A19, we replicate the baseline specification from Table 2, column 2, by including leads and lags of the temperature shock (all fully interacted, as our main temperature shock). Reassuringly, the coefficient of interest (the one year lag of the temperature shock) remains positive, statistically significant (though only at the 10% level), and becomes somewhat larger than that in the baseline. Instead, the coefficients on the contemporaneous and on the one year lead temperature shock are not statistically significant, and are either negative or quantitatively very small.

Interpretation. One likely channel for the results in Table 2 is that higher than average temperatures led to crop failure and increased food prices. In turn, economic hardship re-

activated latent discontent and triggered more riots in areas that had historically been subjected to a higher salt tax. To test this hypothesis, we use data on wheat prices that are available at the *généralité* level from 1756 onwards (see also Section 3). In a first step, we estimate *généralité* level regressions that correlate wheat prices with the (one year lagged) temperature shock.[38] Results, reported in column 1 of Table 3, indicate that higher than average temperatures lead to higher wheat prices. In column 2, we also add precipitation shocks. The coefficient on temperature remains positive and statistically significant. Instead, even though the coefficient on precipitation shocks has the expected (negative) sign, it is not statistically significant. This may explain why the coefficient on the interaction term between precipitation shocks and the tax rate is not statistically significant in Table 2. Results are similar when estimating regressions at the municipality level both for those within 30 km from the border, without and with controls (columns 3 and 4), and for the full sample with controls (column 5).

In column 6 of Table 3, we estimate 2SLS regressions that instrument wheat prices (and all their interactions) with temperature shocks.[39] The positive and statistically significant coefficient confirms our findings in Table 2. It indicates that, by increasing wheat prices, temperature shocks amplified the effects of the salt tax and induced citizens to revolt more. According to the 2SLS estimate, one standard deviation increase in the price of wheat (or, 4.96 grams of silver per litre) increases riots by 24% of a standard deviation more in a high tax, as compared to a low tax, municipality.[40]

5 The salt tax and the French Revolution

In this section, we connect the effects of the salt tax on riots to the French Revolution. First, we document that riots spread over time and across space through a process of contagion that was stronger and more likely to originate in high tax areas (Section 5.1). Second, we show that areas burdened by a higher salt tax rate reported more complaints against taxation in the list of grievances compiled ahead of the 1789 *États Généraux* (Section 5.2). Third, we find that legislators representing areas historically subject to a higher salt tax were more likely to support the King's removal in 1791 and vote in favor of his execution in 1793 (Section 5.3).

[38] We include the 260 (out of the 280) *généralités* whose area is at least partly contained in the 30 km bandwidth around the closest tax border. Regressions also control for year and *généralité* fixed effects. We cluster standard errors at the *généralité* level.

[39] The values of the partial F-statistics for each separate first stage, reported at the bottom of Table 3, indicate that the instruments are strong.

[40] Note that wheat prices increased on average by 11 grams of silver per litre (from 22 to 33) between 1785 and 1789 (see also Figure 3).

5.1 Spread of riots

The French Revolution did not happen overnight. Rather, it resulted from the gradual accumulation of discontent that grew over time and eventually culminated in widespread upheaval (Touzery, 2023). In this section, we examine whether the salt tax favored the spread of revolts across space and over time through a process of contagion. To define clusters of events that are related to each other, we implement the Density-Based Spatial Clustering of Applications with Noise (BDSCAN)—an unsupervised learning algorithm commonly used in statistics to identify arbitrarily shaped clusters without imposing restrictions on the number of clusters in advance (Ester et al., 1996).[41]

When selecting the number of riots included in a cluster, we face a trade-off. If the number is too low, we may assign to different clusters events that are actually related to each other; if the number is too high, we may incorrectly eliminate smaller, but still relevant, clusters. To strike a balance, we impose the condition that each cluster must include at least three riots, but all results are robust to using alternative threshold values. We define clusters along two dimensions: space and time. Intuitively, we seek to identify events that are close to each other because of both where and when they occurred.

We require riots within a cluster to be separated by $\epsilon = 0.05$ standard deviations of the dimensions considered: standardized time, latitude, and longitude. In our sample (all French municipalities over the period 1780-1789), this corresponds to 56 days, 9 km in longitude, and 11 km in latitude. We plot the resulting clusters in Figure A20, using a different color for each cluster. We depict the location of single riots that are not part of a cluster using gray crosses, and label "super spreader" the initial riot of a cluster. The patterns emerging from Figure A20 suggest that clusters are larger in areas burdened by a higher salt tax (represented using darker shades of blue in the map).

To test this visual impression, we collapse the data to the cluster level, and estimate OLS regressions that correlate the number of riots in a given cluster with the average salt tax rate prevailing in the municipalities included in that cluster. We report results in Table A7. In column 1, we consider all 519 clusters; in columns 2 and 3, we consider those in which the "super-spreader" event was a riot against the state and against poverty, respectively. The positive and statistically coefficients suggest that cluster of revolts were larger in areas burdened by a higher salt tax.

In column 4, we ask a different, though related question: were super-spreader events more likely to originate in municipalities with a higher salt tax? We return to the municipality-level

[41] BDSCAN also isolates outliers, thereby allowing researchers to focus on a set of clearly defined clusters.

sample, and define a dummy equal to one if a municipality hosted at least one super-spreader event (i.e., one of the riots that led to the formation of a cluster) during the 1780-89 period. The point estimate is positive and statistically significant, indicating that super-spreader events were more likely to occur in municipalities subject to a higher salt tax.

The results presented in Table A7 should be interpreted as only suggestive evidence, given their simple, correlational nature. However, they provide support to the notion that the salt tax favored the spread of riots across space and over time.

5.2 Citizens' complaints at the onset of the Revolution

As discussed in Section 2, between January and April 1789, the King asked the nobility, the clergy, and the Third Estate to record the list of grievances on any topic related to the public sphere, including tax-related issues. The grievances, collected in what became known as *cahiers de doléances*, were then aggregated to the level of the *bailliage*, and sent to Paris for discussion during the *États Généraux*. In this section, we examine whether *bailliages* subject to a higher salt tax reported more complaints against taxes—and against the salt tax in particular. We estimate OLS regressions that correlate the number of complaints against the salt tax with the tax rate prevailing in a given *bailliage*. We also control for soil characteristics, 1780 population, distance from the tax border, and a dummy equal to one for whether complaints come from the Third Estate.[42]

We present results in Table 4. In column 1, the dependent variable is the number of grievances. The positive and statistically significant coefficient indicates that one standard deviation increase in the salt tax (22 pounds per minot) leads to 1.72 more grievances against the salt tax (a 56% increase relative to the mean). In column 2, the dependent variable is a dummy equal to one if at least one grievance against the salt tax was reported. The coefficient is again positive and statistically significant, and implies that one standard deviation increase in the salt tax increases the probability of reporting at least one complaint against the salt tax by 17 percentage points (16% relative to the mean). Subsequent columns of Table 4 show that results are robust to expressing the number of complaints relative to tax (column 3) or all (column 4) complaints, scaling the number of complaints by population (column 5), taking the dependent variable in logs (column 6), presenting population weighed regressions (column 7), and estimating the model using Poisson (column 8).

[42]We use robust standard errors. Soil characteristics include average fertility as well as silth and nitrogen soil content. We control for Third Estate dummies because the list of grievances from a given *bailliage* could be either "generic" or specific to the Third Estate. Note that the data are missing for 225 *bailliages*. Reassuringly, whether or not a *bailliage* has information on the *cahiers de doléances* is uncorrelated with the prevailing salt tax rate (Table A8).

5.3 *Preferences and behavior of new legislators in Paris*

On June 17, 1789, the representatives of the Third Estate established the National Assembly, marking a decisive break from the traditional *Etats Généraux*. Tasked with drafting a new constitution, the Assembly sought to redefine France's political structure and implemented sweeping legislative reforms, such as the abolition of feudal privileges and the Declaration of the Rights of Man and of the Citizen. Among its most consequential challenges, the Assembly faced the question of whether to preserve or dismantle the monarchy, a debate that would ultimately reshape the course of the French Revolution.

Leveraging newly collected data on the characteristics of the members of the National Assembly (see also Section 3), we define a dummy equal to one if a legislator was part of a pro-change political group.[43] Then, in columns 1 to 3 of Table 5, we estimate individual level regressions that correlate the probability of belonging to a pro-change political group with the average salt tax rate prevailing in the department of origin of the legislator.[44] The positive and statistically significant coefficient indicates that legislators representing districts with a higher salt tax are more likely to join political groups supporting the end of the monarchy. This effect is quantitatively relevant: according to the coefficient presented in column 1, increasing the salt tax by one standard deviation (22 pounds per minot) increases the probability of being part of a pro-change group by 4.4 percentage points (or, 30% relative to the sample mean). Results are similar when excluding moderate (column 2) and aristocrat (column 3) legislators.[45]

In August 1792, the monarchy was overthrown, and the Legislative Assembly called for elections to create a new body: the *Convention Nationale*. In January 1793, members of the *Convention Nationale* were asked to decide over the fate of the King. As explained in Section 3, we retrieved data on the voting behavior of legislators on the three main questions they were asked in January 1793. Almost all legislators answered "yes" when asked the first question, namely whether they considered the king guilty (see also Table A1, Panel D). However, members of the *Convention Nationale* were more divided on the second and third questions, i.e., whether the people should decide over the king's final sentence and whether the king should be sentenced to death. We exploit this variation in the remainder of Table 5.

[43] We classify as pro-change the following political groups: *Gauche*, *Constitutionnels*, *Montagne*, *Girondins*, *Constitutionnels modérés*, *Extréme gauche*.

[44] After the Revolution, departments were established as the new electoral constituencies. In this analysis, we thus calculate the average salt tax rate at the department level. Regressions also include coordinates fixed effects, number of mandates fixed effects, department level controls (soil fertility, 1780 population, distance to the closest salt tax border, and a dummy indicating the presence of a roman road). Standard errors are clustered at the department level.

[45] We define as moderate the legisltator belogning to the following political groups: "Constitutionnels modérés", "Minorité modérée", "Modérés", "Centre", "Centre droit", and "Centre gauche". We identify aristocrat legislators from their surname—in particular from the presence of the nobiliary particle "de" (as well as all the possible variants).

In column 4, the dependent variable is a dummy equal to one for voting to let the people decide whether the king should be sentenced to death—something that more moderate legislators hoped would have saved the king.[46] The negative and statistically significant coefficient suggests that legislators representing areas historically burdened by a higher salt tax were less inclined to support a popular vote, anticipating that this would have resulted in a more lenient sentence. In column 5, the dependent variable is a dummy equal to one if the legislator voted to sentence the king to death. The coefficient is positive and statistically significant, indicating that legislators coming from areas with a higher salt tax rate were more likely to support the death penalty for the king. Increasing the salt tax by one standard deviation increases the probability that a legislator voted to sentence the king to death by 13.2 percentage points (or, 21% relative to the sample mean).

6 Conclusion

The French Revolution was a watershed moment in history, marking the collapse of the *Ancien Régime* and the emergence of modern political and economic institutions (Acemoglu et al., 2011; Chambru and Maneuvrier-Hervieu, 2024). While its causes were complex and multifaceted, a longstanding idea in the literature is that extractive taxation played a crucial role in fueling discontent and accelerating the collapse of the monarchy (Norberg, 1994; Touzery, 2023). To the best of our knowledge, ours is the first paper to provide systematic empirical evidence in support of this hypothesis.

We exploit plausibly exogenous variation in the borders of one of the most extractive taxes of the *Ancien Régime*: the *gabelle du sel*, or salt tax. Using a Regression Discontinuity (RD) approach, we document that, on the eve of the French Revolution, more riots occurred in municipalities where the salt tax was higher. Augmenting the RD model with spatial and time variation in growing season temperature, we find that negative weather shocks, which destroyed the harvest and increased wheat prices, amplified the effects of the salt tax by re-activating latent discontent.

In the second part of the paper, we link the salt tax and the revolts it generated to the French Revolution. First, we show that the riots spread over time and across space through a process of contagion. Second, relying on the list of grievances collected by the king in the spring of 1789, we provide evidence that areas burdened by a higher salt tax reported more complaints against taxation. Third, we document that legislators representing areas with a higher salt tax were more likely to join political movements that demanded the end of the monarchy and to vote in favor of the death penalty for the king in 1793.

[46] We control for the same set of variables included in columns 1 to 3. The only control that is excluded in columns 4 and 5 is the number of mandates fixed effects, since the *Convention Nationale* had just been formed.

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Tables

TABLE 1 – RIOTS AROUND THE SALT TAX BORDER

Dep. var.: Economic and political riots	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Period: 1750-1789	Specific decade					
		1750	1760	1770	1780	1790	1800
High tax area	0.124 **	0.037	0.073 **	0.099 *	0.171 **	-0.068	-0.023
	(0.054)	(0.031)	(0.036)	(0.055)	(0.075)	(0.068)	(0.028)
N	12,652	12,402	12,910	11,990	13,113	10,205	13,935
Bandwidth (in km)	31.66	30.68	32.68	29.19	33.49	23.01	37.01347

Notes: The table show non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 2. The dependent variable captures the number of political and economic riots, over different periods of time and it is standardized. In column 1 the dependent variable captures the total number of riot in the period 1750-1789. In columns 2-7 the dependent variable captures the number of riot in the corresponding decade. The standardization in column 1 is done on the entire period 1750-1789, while in the column 2-7 in the entire period 1750-1809. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, standard errors are always clustered at the bailliage level.

TABLE 2 – WEATHER SHOCKS, SALT TAX, AND RIOTS (1780-1789)

Dep. var.: Political and economic riots	(1) Main without controls	(2) Main	(3) Controlling for precipitation shock	(4) Placebo shock: Autumn+Winter	(5) Shock: only Spring	(6) Shock: only Summer	(7) Global analysis
Temperature shock*Salt tax rate	0.0091 **	0.0093 **	0.0103 *				0.0078 **
	(0.004)	(0.004)	(0.005)				(0.003)
Precipitation shock*Salt tax rate			0.0013				
			(0.003)				
Temperature shock (placebo)*Salt tax rate				0.0039			
				(0.003)			
Temperature shock (Spring)*Salt tax rate					0.0042 *		
					(0.002)		
Temperature shock (Summer)*Salt tax rate						0.0127 *	
						(0.007)	
N	113,320	112,990	112,990	112,990	113,320	113,320	234,450
Bandwidth (in km)	30	30	30	30	30	30	global

Notes: The table shows the results of the reduced form from the estimation of model 3. The dependent variable is always standardized and it captures political and economic riots. "Temperature shock" indicates the temperature shock, at the municipal level, which is defined for the growing season (spring and summer) of the previous year. The analysis covers the period 1780-1789 and a bandwidth of 30km is always applied. The specification always includes municipality and year fixed effects as well as the controls included in model 2 (population in 1780 and soil fertility) interacted with year fixed effects. Standard errors are always clustered at the bailliage level. In columns 1 the specification does not includes the controls. In column 3 the specification also controls for the precipitation shock and the interaction between precipitation shock, salt tax rate and distance to the tax border (with all double interactions and uninteracted terms), respectively. In column 4 the temperature shock is computed on the non-growing seasons (autumn and winter). In columns 5 and 6 the temperature shock is only based on the spring and on the summer temperature, respectively. Column 7 shows the global analysis, without specifying any bandwidth. The sample always includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution.

TABLE 3 – IMPACT OF TEMPERATURE SHOCK ON WHEAT PRICE & IV ANALYSIS

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.:	Wheat price					Economic and Political riots
	Aggregation: Généralité		Aggregation: Municipality			
	Main without controls	Main	Main without controls	Main	Global analysis	Main
Temperature shock	21.0984**	17.2181**	20.8394***	21.6257 ***	23.6456 ***	
	(7.982)	(7.600)	(3.894)	(4.221)	(3.403)	
Precipitation shock		-3.6733				
		(2.305)				
Temperature shock*Salt tax rate						0.0013*
						(0.001)
N	260	260	113320	112990	234450	112990
Bandwidth	30	30	30	30	global	30
SW F-stat (comp. 1)						111.9938
SW F-stat (comp. 2)						29.86597
SW F-stat (comp. 3)						90.18151
SW F-stat (comp. 4)						44.49213

Notes: The table shows the results from the estimation of model X (columns 1-5) and the results of the IV analysis (column 6). The dependent variable is wheat price in columns 1-5 and the number of political and economic riots (standardized). The analysis is aggregated at the generalite level in column 1-2 and at the municipality level in columns 3-6. "Temperature shock" indicates the temperature shock which is defined for the growing season (spring and summer) of the previous year. The analysis covers the period 1780-1789 and a bandwidth of 30km is always applied, with the exception of the analysis of column 5 which includes all municipalities. The specification always includes generalite and year fixed effects in columns 1-2, municipality and year fixed effects in columns 3-6 and the controls included in model 2 (population in 1780 and soil fertility) interacted with year fixed effects. In column 2, the specification also controls for the precipitation shock. The sample always includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Standard errors are clustered at the généralité level in column 1, 2 and 7 and at the bailliage level in columns 2-6.

TABLE 4 – SALT TAX AND GRIEVANCES AGAINST IT

Dep. var.:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
No. of grievances	Baseline	1[at least 1]	Relative to /Tax Comp.	Relative to /All Comp.	Salt comp (per 10,000)	log(0.01+x)	Weighed by pop	PPML
Salt Tax	0.078***	0.008***	0.081***	0.018***	0.009**	0.050***	0.038***	0.024***
	(0.013)	(0.001)	(0.017)	(0.003)	(0.005)	(0.007)	(0.015)	(0.003)
Observations	225	225	225	225	225	225	225	225
R-squared	0.610	0.232	0.142	0.415	0.262	0.400	0.673	
Pseudo R-squared								0.343
Mean dep. var.	3.036	0.729	4.368	0.814	0.405	-0.590	2.576	3.036
Mean Salt Tax	29.66	29.66	29.66	29.66	29.66	29.66	30.26	29.66

Notes: The table shows the results from the estimation of OLS models, in columns (1) to (7), and a PPML model, in column (8) in which the dependent variable is regressed on the Bailliage's salt tax rate. The units of observation are the number of observations from an Estate at the Bailliage level. All specifications include a dummy for whether the complaints come from the Third Estate, on top of average fertility, silth and nitrogen soil content, agglomeration population in 1780, and distance from the tax border. In column (7), observations are weighed by the agglomeration population in 1780. Robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

TABLE 5 – IMPACT OF SALT TAX ON NATIONAL ASSEMBLY

	(1)	(2)	(3)	(4)	(5)
Dep. var.:	Pro-change political group			Vote "yes"	
	Baseline	Excluding moderates	Excluding aristocrats	Decision based on a popular vote	Death of the King
Salt tax rate	0.002**	0.003**	0.002*	-0.008***	0.006**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
N	706	579	596	623	617
Dep. var. mean	.147	.177	.134	.401	.632
Dep. var. sd	.354	.382	.341	.490	.482

Notes: The table shows the results from the estimation of an OLS model in which the dependent variable is regressed on the salt tax rate at the department level (computed as a weighted average of the tax rate at the municipal level, which uses municipal population as weight). The unit of observation is the member of the national assembly in 1791 and 1793. The tax rate is the average tax level in the department of origin of the member of the assembly, weighted by population in 1780. The following political groups are classified as "Pro-change": *Gauche*, *Constitutionnels*, *Montagne*, *Girondins*, *Constitutionnels modérés*, *Extréme gauche*. The variables "Death of the King" and "Decision based ona popular vote" indicate the share of members of the Assembly voting "yes" for that specific question. The specification always includes coordinates fixed effects, number of mandates fixed effects (only in columns 1-3), and a set of controls varying at the department level (soil fertility population in 1780, distance to the closest salt tax border and a dummy indicating the presence of a roman road). Finally, the error term is clustered at the department level.

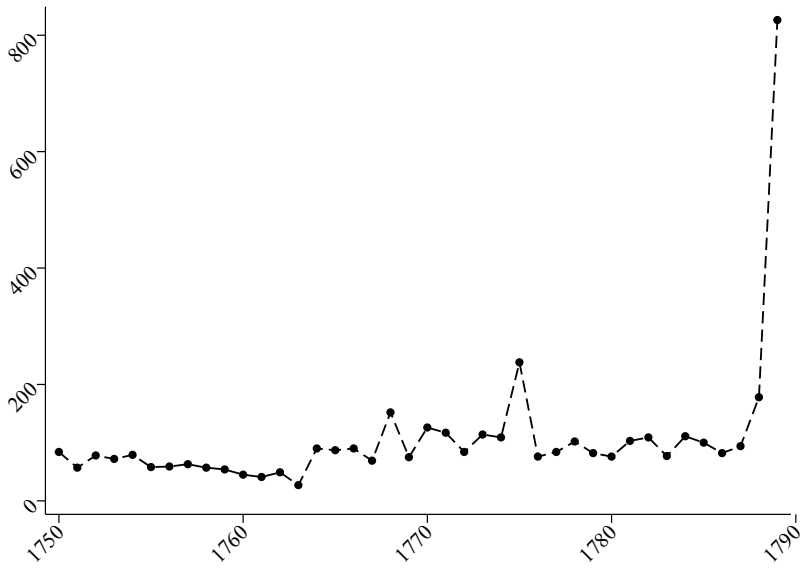
Figures

FIGURE 1 – SALT TAX MAP (NECKER, 1781)



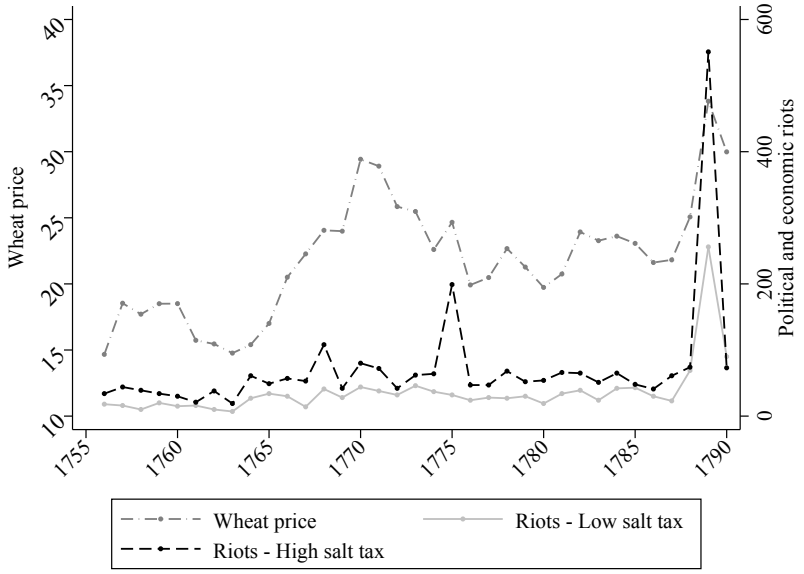
Notes: The figure shows the map of the gabelle in 1788 and it highlights the areas marked by a different tax rate, that generate the 22 tax border in analysis. Source: National Library of France, BnF.

FIGURE 2 – NO. OF RIOTS OVER TIME



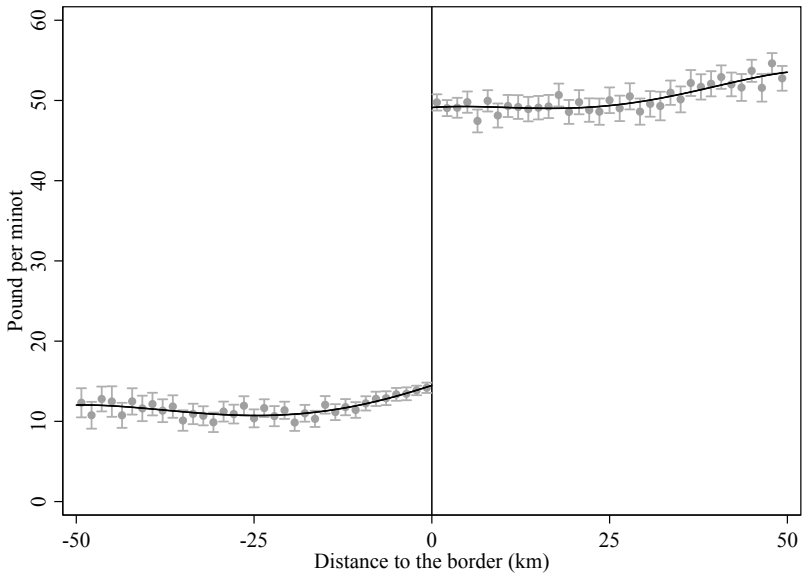
Notes: Figure shows the number of riots across the Kingdom of France (borders of 1789), in the period 1750-1789, with a focus on political and economic riots using the classification by Chambru and Maneuvrier-Hervieu (2024).

FIGURE 3 – WHEAT PRICE SHOCK AND RIOTS



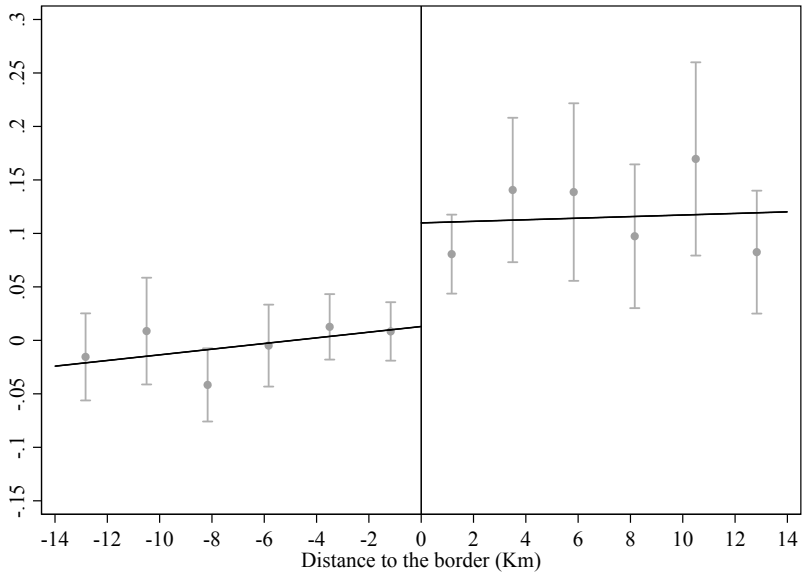
Notes: The figure shows the evolution of wheat prices and riots in the period 1756-1790. Wheat prices are expressed in grams of silver per litre and they are based on the original records from Labrousse (1933). "Riots - High salt tax" indicates the riot events that took place in the areas where the salt tax rate is above the median level, while "Riots - Low salt tax" those that took place in the areas where the salt tax rate is below the median level. The riot data are based on the classification by Chambru and Maneuvrier-Hervieu (2024).

FIGURE 4 – FIRST STAGE: SALT TAX AROUND THE BORDER



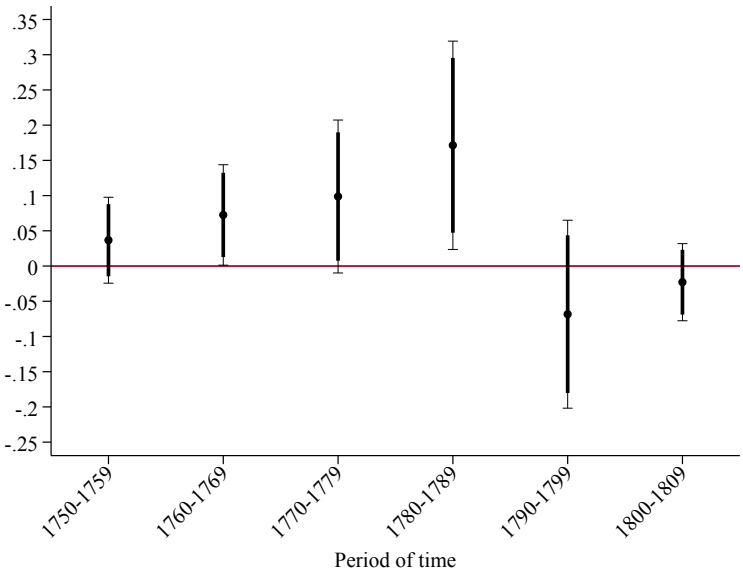
Notes: The plot shows non-parametric RD estimates following Calonico et al. (2014). The dependent variable is the salt tax rate (expressed in pound per minot) according to Figure A7. The focus is on the tax borders in the second, third and fourth quartile of the tax differential. The treatment area (i.e., the area with a higher tax rate, compared to the nearest tax border) is coded positively.

FIGURE 5 – RIOTS AROUND THE SALT TAX BORDERS (1750-1789)



Notes: The plots show non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 2. The dependent variable is political and economic riots, in the period 1750-1789, and it is standardized. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, the error term is clustered at the bailliage level. The coefficient is .0948 (with a standard error of .0410).

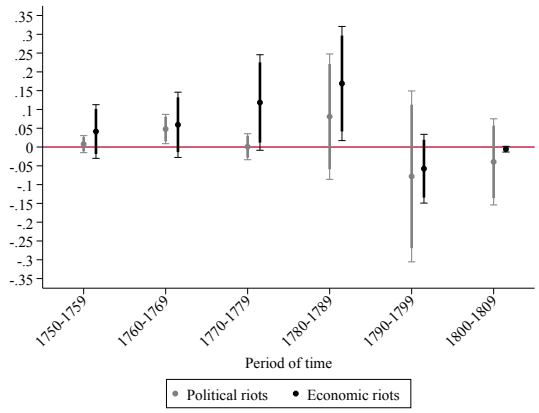
FIGURE 6 – RIOTS AROUND THE SALT TAX BORDERS



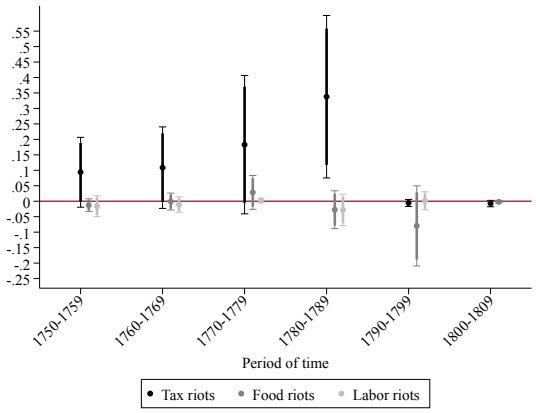
Notes: The plot shows non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 2. The dependent variable is political and economic riots, for different periods of time (bins of 10 years), and it is standardized. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, the error term is clustered at the bailliage level.

FIGURE 7 – RIOTS AROUND THE SALT TAX BORDERS: TYPE OF RIOT

(A) ECONOMIC AND NON-ECONOMIC



(B) TYPES OF ECONOMIC RIOTS



Notes: The plots show non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 2. Panel A shows the analysis using as dependent variable the number of political riots and economic riots. Panel B displays the analysis using as dependent variables tax riots, food riots and labour riots. The dependent variable is always displayed for different periods of time (bins of 10 years), and it is standardized. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, the error term is clustered at the bailliage level.

Online appendix (not copy-edited or formatted) for: T. Giommoni, G. Loumeau and M. Tabellini. *"Extractive Taxation and the French Revolution"*.

Online appendix for
"Extractive Taxation and the French Revolution"

T. Giommoni, G. Loumeau and M. Tabellini

A Supporting material

A.1 Tables

A.2 Figures

B Data

B.1 Text analysis on riots description

C Salt tax borders

C.1 Historical background of main borders

C.2 Border placement tests

Online appendix (not copy-edited or formatted) for: T. Giommoni, G. Loumeau and M. Tabellini. *"Extractive Taxation and the French Revolution"*.

A Appendix: Supporting material

A.1 Tables

TABLE A1 – DESCRIPTIVE STATISTICS

	Entire France			Optimal bandwidth (30 km)		
	Mean	SD	No. obs.	Mean	SD	No. obs.
Panel A: Municipality level sample						
Salt tax rate	35.39	23.27	25,564	30.32	22.24	12,559
Tax rate diff (abs. value)	37.07	13.56	25,564	35.51	13.29	12,559
Political and Economic riots (1750-1789)	.010	.994	25,564	.040	1.20	12,559
Political and Economic riots	.051	.391	25,564	.064	.475	12,559
Economic riots	.033	.345	25,564	.041	.423	12,559
Political riots	.017	.145	25,564	.022	.164	12,559
Tax riots	.014	.177	25,564	.026	.243	12,559
Food riots	.016	.235	25,564	.013	.242	12,559
Labor riots	.001	.075	25,564	.002	.099	12,559
Mun. population 1780	19,615.6	117,725.4	25,561	4291.23	18822.11	12,557
Panel B: Cahiers Analysis						
Salt Tax	29.297	22.341	195			
No. Complaints: Taxes	70.621	78.824	195			
No. Complaints: Salt Tax	3.503	5.485	195			
Salt tax complaints, rel. to all	.804	.946	195			
Salt tax complaints, rel. to tax comp.	4.138	3.901	195			
Salt tax complaints, per 100,000 people	4.670	13.335	195			
Panel C: Political group analysis (1791)						
Pro-change political group	.152	.359	775			
Salt tax rate (origin dept.)	29.96	21.63	707			
Moderate political group	.187	.390	775			
Aristocrat	.158	.365	775			
No. mandates in Assembly	1.59	1.01	775			
Panel D: Death penalty of the king (1793)						
Vote "yes": The king is guilty	.988	.107	690			
Vote "yes": Decision popular vote	.388	.487	689			
Vote "yes": Death of the king	.636	.481	682			
Salt tax rate (origin dept.)	30.48	21.42	627			

Notes: This table reports descriptive statistics. The time span covered is 1780-1789 if not differently specified. In panel (a), the sample consists of the municipalities located around the 22 salt tax borders according to Figure A7; it includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. The first three columns do not use any bandwidth, while the second three use a bandwidth of 30 km. The salt tax rate is expressed in pound per minot. The wheat price is expressed in grams of silver per litre. In panel (b), the sample includes only the bailliages for which we ave cahiers data. In panels (c) and (d), the unit of observation is the member of the national assembly in 1791 and 1793. The tax rate is the average tax level in the department of origin of the member of the assembly, weighted by population in 1780. The variable Pro-change political group is a dummy indicating the following political groups: *Gauche*, *Constitutionnels*, *Montagne*, *Girondins*, *Constitutionnels modérés*, *Extréme gauche*. The variables "Death of the King" and "Decision based ona popular vote" indicate the share of members of the Assembly voting "yes" for that specific question.

TABLE A2 – RIOTS AROUND THE SALT TAX BORDER (1780-1789): ROBUSTNESS CHECKS

Dep. var.:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Economic and political riots	Baseline	Baseline - All borders	Baseline - All riots	Poisson	Excluding big cities (top 5%)	Outcome in logarithm	Global analysis
High tax area	0.171**	0.101**	0.159**	0.574***	0.175**	0.143**	0.121**
	(0.075)	(0.050)	(0.073)	(0.216)	(0.077)	(0.066)	(0.036)
N	13,113	14,995	13,188	13,096	12,832	13,454	24,733
Bandwidth	33.49	22.71	33.77	33.4	33.80	34.91	250

Notes: The table show non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 4.1. The dependent variable captures the number of political and economic riots in the period 1780-1789 and it is standardized. The dependent variable does not include salt smuggle related riots in column 2. In column 4 all types of riots are included (not just political and economic events). The dependent variable is expressed in logarithm in column 7. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. With the exception of column 3, in which all French municipalities are included. Big cities are excluded from the sample in column 6: those are cities that belong to the top 2.5 percentile (with population above 51,517 inhabitants). A global analysis, in which the bandwidth is not specified, is reported in column 8. The analysis displayed in column 5 is a Poisson regression. Finally, standard errors are always clustered at the bailliage level.

TABLE A3 – RIOTS AROUND THE SALT TAX BORDER(DECADE 1780): ROBUSTNESS CHECKS

Dep. var.:	Economic and political riots							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High tax area	0.171**	0.149*	0.183**	0.181**	0.196**	0.172**	0.183**	0.183*
	(0.075)	(0.085)	(0.078)	(0.079)	(0.077)	(0.072)	(0.086)	(0.105)
N	13113	14003	11632	12193	12520	12179	11632	11632
Bandwidth (in km)	33.49	37.37	27.86	29.92	22.96	29.87	27.86	27.86
Specification	Baseline	Quadratic Polynomial	Uniform Kernel	Epanechnikov Kernel	Bandwidth Select 'msetwo'	Cluster 'generalite'	Conley SE 50 km	Conley SE 100 km

Notes: The table presents non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, along with robustness checks for different polynomial orders, bandwidth selection methods, kernels, and cluster robust standard errors, according to model 2. Column 1 uses the default kernel, optimal bandwidth, and polynomial order selected by the procedure. Column 2 selects a quadratic polynomial order. Columns 3 and 4 use the Uniform and Epanechnikov kernels, respectively. Column 5 applies the bandwidth selection method 'msetwo,' which allows for different bandwidths for the left and right sides, with bandwidths of 22.96 and 39.67 for the left and right sides, respectively. Column 6 clusters the standard errors at the generalite level instead of the bailliage level. Columns 7 and 8 replicate column 3 and use Conley standard errors, which account for spatial correlation for observations within a 50 km and 100 km radius, respectively. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Standard errors of column 1-5 are always clustered at the bailliage level.

TABLE A4 – RIOTS AROUND THE SALT TAX BORDER (1780-1789): TYPE OF RIOTS

	Number of riots					
	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.:	Economic and political	Economic	Political	Tax	Food	Labour
High tax area	0.171**	0.169**	0.081	0.338**	-0.027	-0.028
	(0.075)	(0.077)	(0.085)	(0.134)	(0.031)	(0.026)
N	13,113	12,790	11,688	13,439	11,300	11,261
Bandwidth	33.49	32.20	28.02	34.82	26.73	26.58

Notes: The table show non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 4.1. The dependent variable captures the number of riots, defined in different ways, it covers the period 1780-1789 and it is standardized. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, standard errors are always clustered at the bailliage level.

TABLE A5 – RIOTS AROUND THE SALT TAX BORDER (1780-1789): EXCLUDING SALT SMUGGLE RIOTS

	(1)	(2)	(3)	(4)
	Baseline	Excluding salt smuggling riots		
			keeping escalated events	keeping escalated and large events
Panel A: Pol. and econ. riots				
High tax area	0.171**	0.137**	0.143**	0.146**
	(0.075)	(0.067)	(0.068)	(0.069)
N	13,113	12,481	12,552	12,444
Bandwidth	33.49	30.97	31.25	30.85
Panel B: Tax riots				
High tax area	0.338**	0.286**	0.298**	0.299**
	(0.134)	(0.116)	(0.117)	(0.118)
N	13,439	13,878	13,840	13,799
Bandwidth	34.82	36.78	36.62	36.42

Notes: The table show non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 4.1. The dependent variable captures the number of political and economic riots (in panel A) and tax riots (in panel B) in the period 1780-1789 and it is standardized. The dependent variable does not include salt smuggle related riots in columns 2-4. In column 3 the riots related to salt smuggle but "escalated" are included: these are the events in which external parties are involved (beyond to the smugglers and state officers). In column 4 the riots related to salt smuggle but "escalated" are included, as well as the large events: these are the events in which external parties are involved (beyond to the smugglers and state officers) and those in which more than 50 people are involved. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, standard errors are always clustered at the bailliage level.

TABLE A6 – RIOTS AROUND THE SALT TAX BORDER (1780-1789): ADDITIONAL RESULTS

Dep. var.:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Economic and political riots	Baseline	Binary outcome	Tax Gap below median	Tax Gap above median	OLS	OLS	OLS log(tax rate)
High tax area	0.171**	0.029**	0.041	0.358**			
	(0.075)	(0.013)	(0.078)	(0.167)			
Tax rate diff.					0.003***		
					(0.001)		
Tax rate						0.006***	0.128***
						(0.002)	(0.044)
N	13,113	13,403	7,602	3,297	12,217	12,217	12,217
Bandwidth	33.49	34.69	28.44	21.08	30	30	30

Notes: The table show non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidth and polynomial order selection, according to model 4.1. The dependent variable captures the number of riots, defined in different ways, it covers the period 1780-1789 and it is standardized. In column 2 the dependent variable is a dummy variable capturing whether a riot event took place and in column 3 it captures the number of participants in the riot events, expressed in logarithm. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. The analysis reported in column 4 (5) includes only municipalities with absolute tax gap value below (above) the median. In Column (6) an OLS analysis is performed where the dependent variable is the standardized number of economic and political riots, while independent variable is the tax gap. In column (7), the independent variable is the tax rate and t. Column (8) performs a similar analysis, but the independent variable is the tax rate expressed in logarithm. The analysis of column 5 is a standard OLS model where the dependent variable is regressed on the tax rate difference around the tax border. Finally, standard errors are always clustered at the bailliage level.

TABLE A7 – SALT TAX, RIOT CLUSTERS AND "INITIAL" RIOTS

	(1)	(2)	(3)	(4)
Dep. var.:	Cluster size: # of riots in cluster			1["super spreader" riot]
	All clusters	Initial: against State riot	Initial: poverty riot	–
Salt tax	0.344***	0.133***	0.502***	0.0017***
	(0.035)	(0.019)	(0.048)	(0.0003)
N	519	111	389	34221

Notes: The table shows the results from the estimation of OLS models in which the dependent variable is regressed on the salt tax rate at the cluster level in columns (1)-(3), and at the municipal level in column (4). Column (1) looks at all clusters, whereas columns (2) and (3) study only clusters with an initial riot against the state and against poverty, respectively. All specifications include the average fertility, silt and soil content, agglomeration population in 1780, and distance from the tax border. Robust standard errors in parentheses, standardized betas in square brackets.

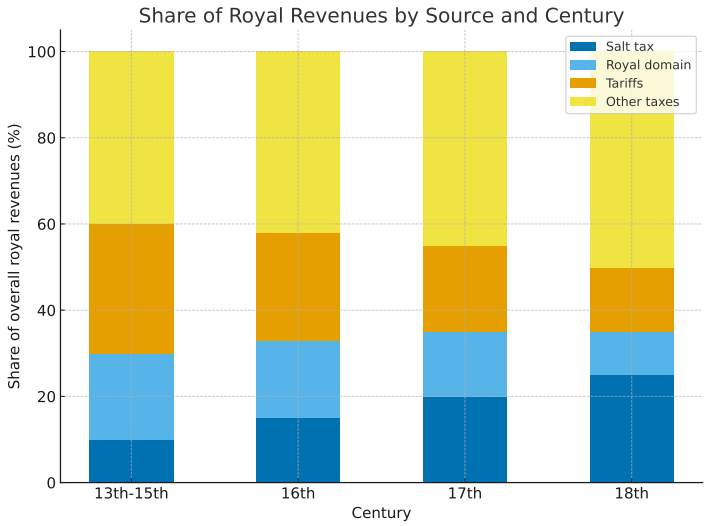
TABLE A8 – MISSING CAHIER DATA AND SALT TAX

Dep. var.:	(1)	(2)	(3)	(4)
	1[Missing Cahier Data]			
Salt Tax	0.002	0.002	-0.001	-0.004
	(0.001)	(0.001)	(0.003)	(0.005)
Observations	417	417	417	417
R-squared	0.005	0.019	0.177	0.295
Mean dep. var.	0.540	0.540	0.540	0.354
Mean Salt Tax	30.99	30.99	30.99	30.99

Notes: The table shows the results from the estimation of an OLS model in which the dependent variable, a dummy taking value 1 when there are no grievances from a Bailliage, is regressed on the Bailliage's salt tax rate. The unit of observation is the Bailliage. In column (2), we include agglomeration population in 1780; in (3), we add Generalite fixed effects. Lastly, in column (4), we weight by agglomeration population. Standard errors are clustered at the Generalite level.

A.2 Figures

FIGURE A1 – IMPORTANCE OF SALT TAX FOR ROYAL REVENUES INCREASES OVER TIME



Source: Touzery (2023) and the official royal public finance records from the National Library of France, BnF.

FIGURE A2 – SATIRE OF THE THIRD ESTATE CARRYING THE NOBILITY AND THE CLERGY (1789)



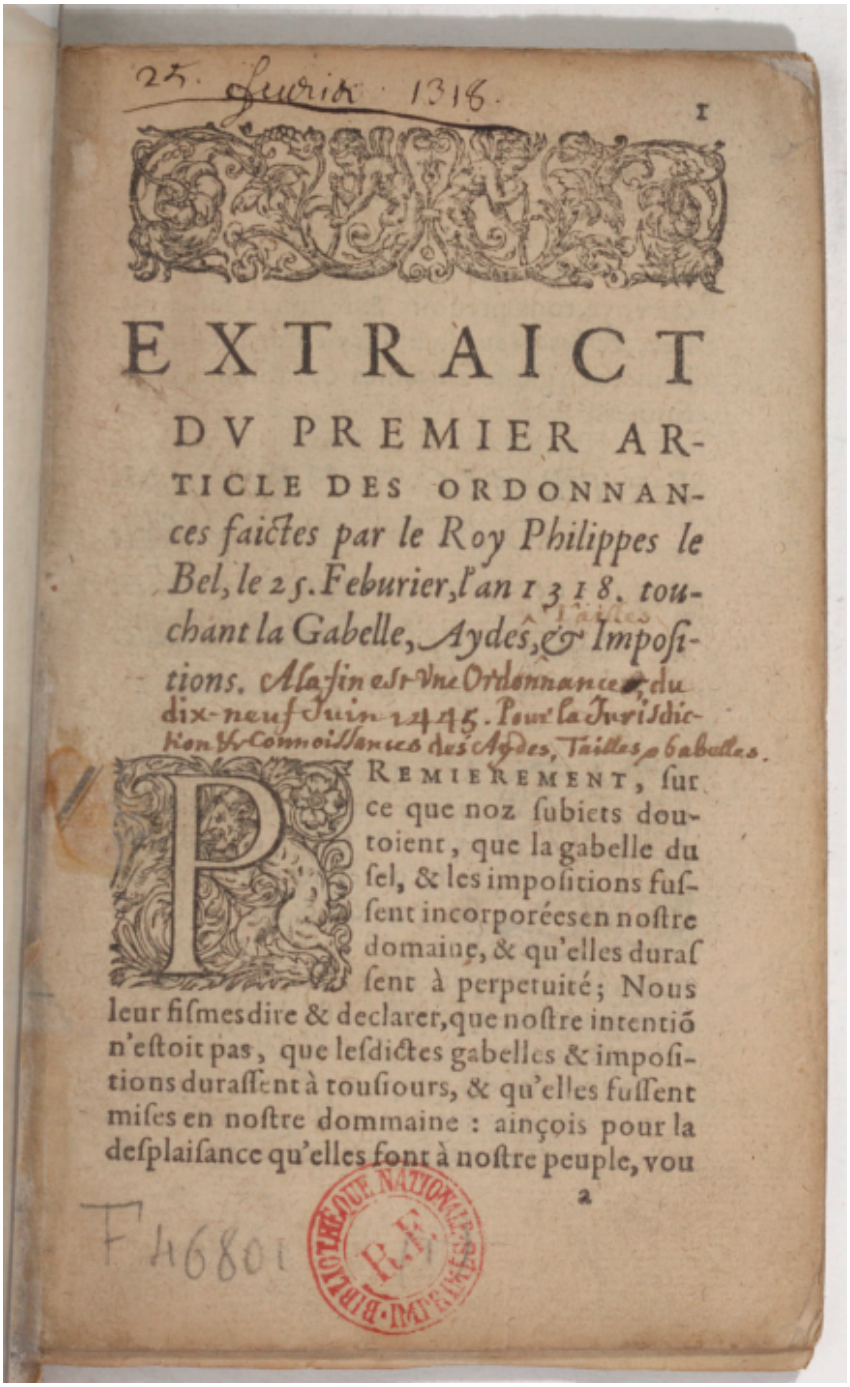
Notes: Popular caricature representing the hard-working Third Estate carrying the nobility and clergy. The legend reads "A faut espérer q[u]'eu jeu là finira b[i]entôt" ("Hopefully, this game will be over soon"). Out of the nobility's "full" pocket, the first item listed is "sel" ("salt").

FIGURE A3 – THE ROYAL SALT STOREHOUSES (1709)



Notes: Squared shields indicate the location of a salt storehouses. Tours and Orléans are approximately 100km apart. *Source:* National Library of France, BnF.

FIGURE A4 – ROYAL *ordonnances* ON SALT TAX, 1318



25. Feurier 1318.

I

EXTRAICT

DV PREMIER ARTICLE DES ORDONNANces faictes par le Roy Philippes le Bel, le 25. Feburier, l'an 1318. touchant la Gabelle, Aydes, & Impositions. A la fin est vne Ordonnance du dix-neuf Juin 1445. Pour la Jurisdiction & Cognoissances des Aydes, Tailles & Gabelles.

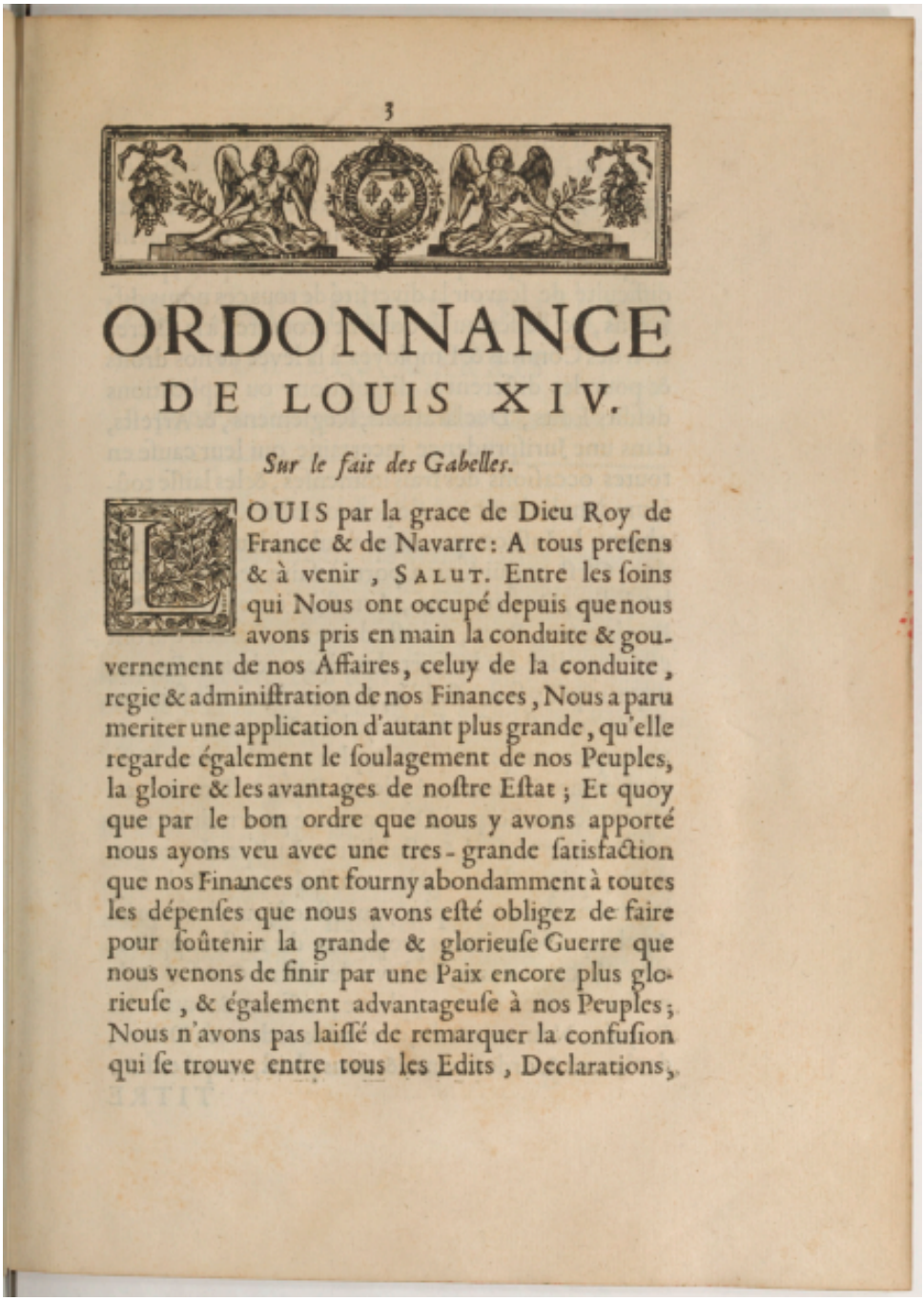
PREMIEREMENT, sur ce que noz subiets doutoient, que la gabelle du sel, & les impositions fussent incorporées en nostre domaine, & qu'elles durassent à perpetuité; Nous leur fismes dire & declarer, que nostre intentiõ n'estoit pas, que lesdictes gabelles & impositions durassent à tousiours, & qu'elles fussent mises en nostre dommaine : ainçois pour la desplaisance qu'elles font à nostre peuple, vou

a

F 16801 BIBLIOTHÈQUE NATIONALE R.F.

Source: Extraict du premier article des ordonnances faites par le roi Philippes le Bel, le 25 fevrier, l'an 1318, touchant la gabelle, aides et impositions. National Library of France, BnF.

FIGURE A5 – ROYAL *ordonnances* ON SALT TAX, 1680



3

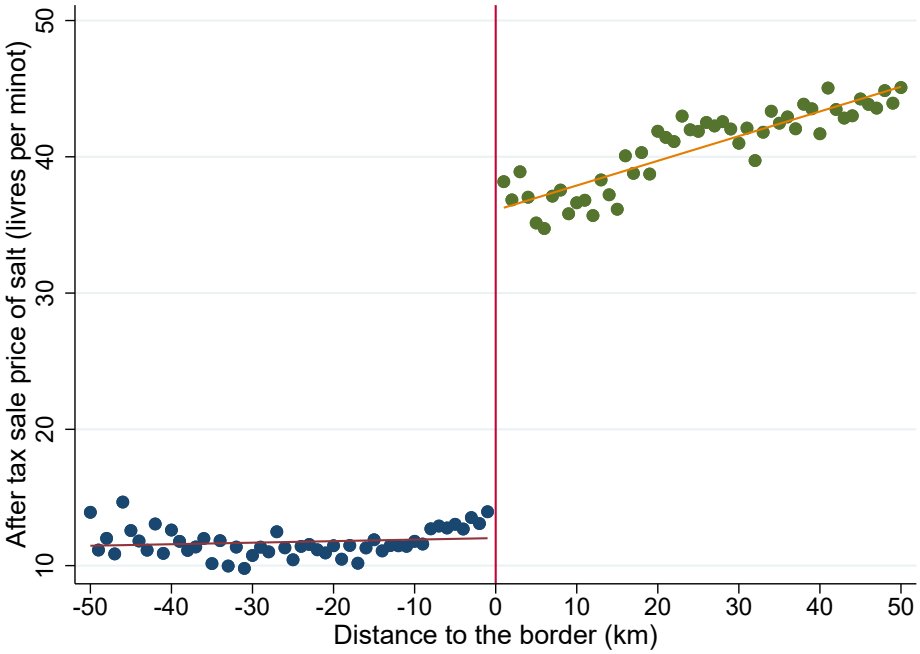
ORDONNANCE
DE LOUIS XIV.

Sur le fait des Gabelles.

LOUIS par la grace de Dieu Roy de France & de Navarre: A tous preſens & à venir, SALUT. Entre les ſoins qui Nous ont occupé depuis que nous avons pris en main la conduite & gouvernement de nos Affaires, celuy de la conduite, regie & adminiſtration de nos Finances, Nous a paru meriter une application d'autant plus grande, qu'elle regarde également le ſoulagement de nos Peuples, la gloire & les avantages de noſtre Eſtat; Et quoy que par le bon ordre que nous y avons apporté nous ayons veu avec une tres-grande ſatisfaction que nos Finances ont fourny abondamment à toutes les dépenſes que nous avons eſté obligez de faire pour ſoûtenir la grande & glorieuſe Guerre que nous venons de finir par une Paix encore plus glorieuſe, & également advantageuſe à nos Peuples; Nous n'avons pas laiſſé de remarquer la confuſion qui ſe trouve entre tous les Edits, Declarations,

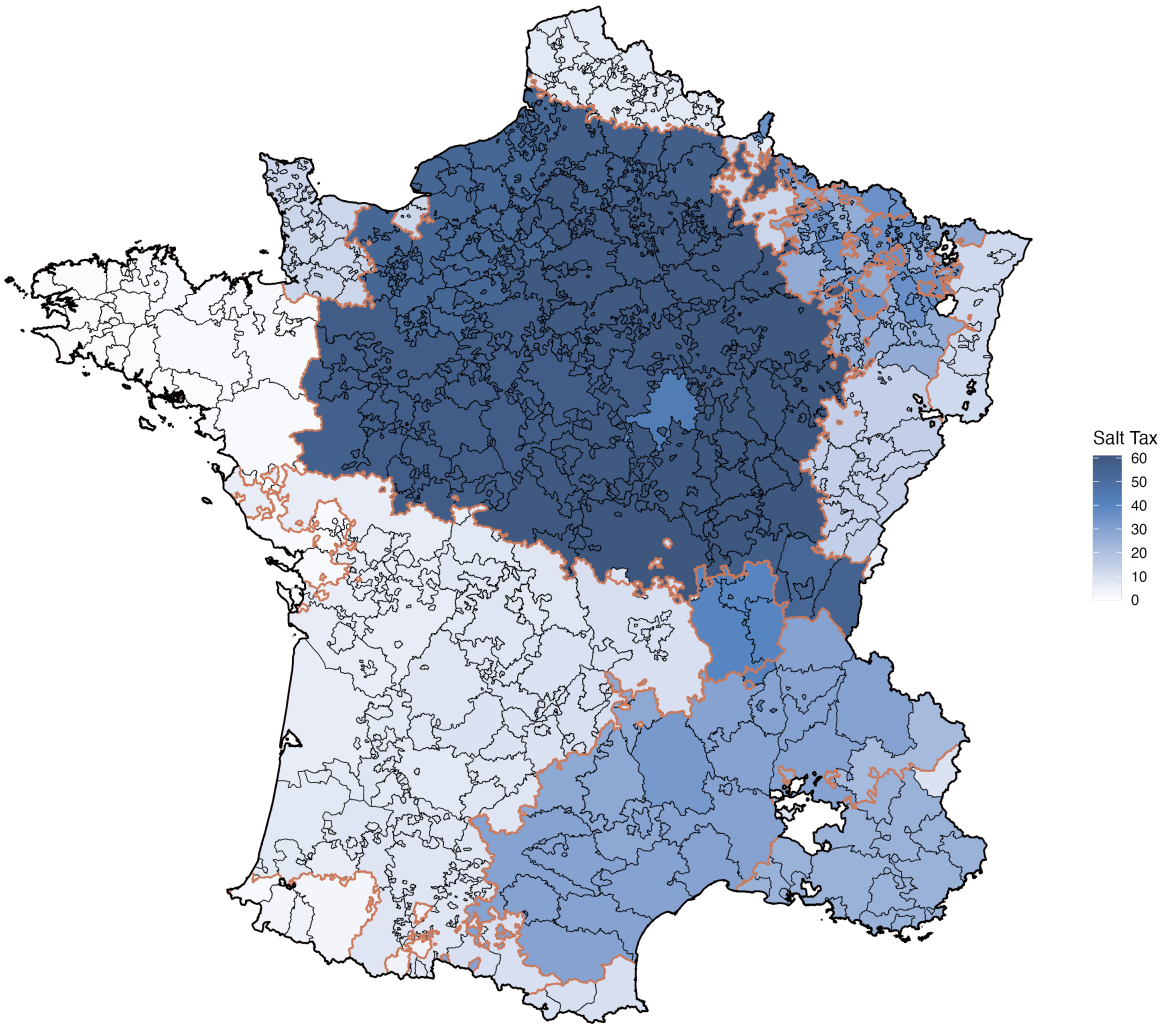
Source: Ordonnances de Louis XIV. roy de France et de Navarre, sur le fait des gabelles & des aydes. Données à S. Germain en Laye aux mois de may & juin 1680. Registrées en la Cour des Aydes les 11. may & 21. juin 1680. National Library of France, BnF.

FIGURE A6 – AFTER TAX PRICE OF SALT JUMPS AT THE BORDER



Notes: Authors' own computation based on novel local public finance data on salt taxation in the *Ancien Régime*.

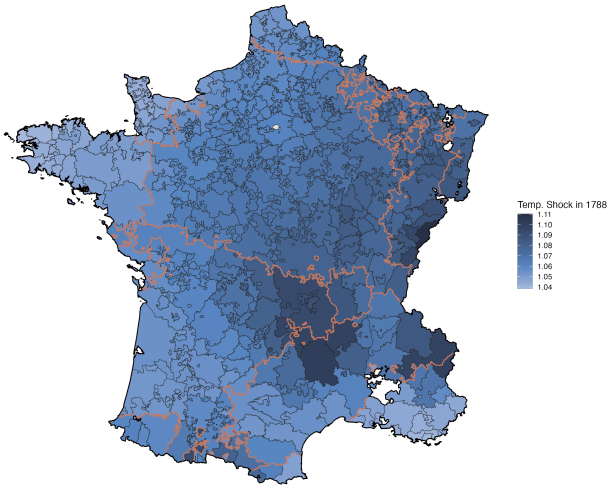
FIGURE A7 – SALT TAX AT *bailliage* LEVEL



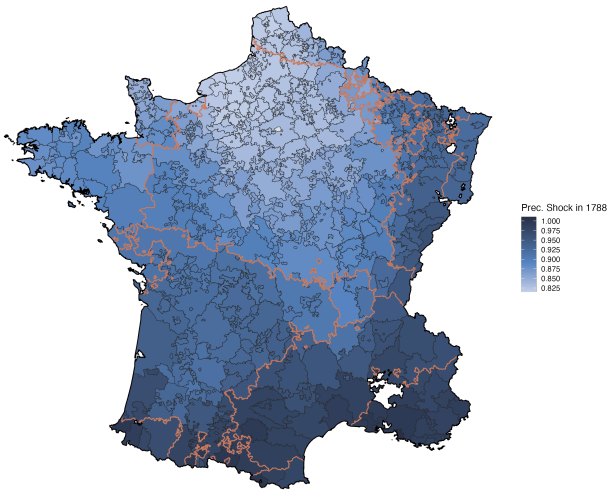
Notes: The figure plots the salt tax at the *bailliage* level, together with the salt tax border highlighted in yellow.

FIGURE A8 – WEATHER SHOCK AT *bailliage* LEVEL AND SALT TAX BORDER, 1788

(A) TEMPERATURE

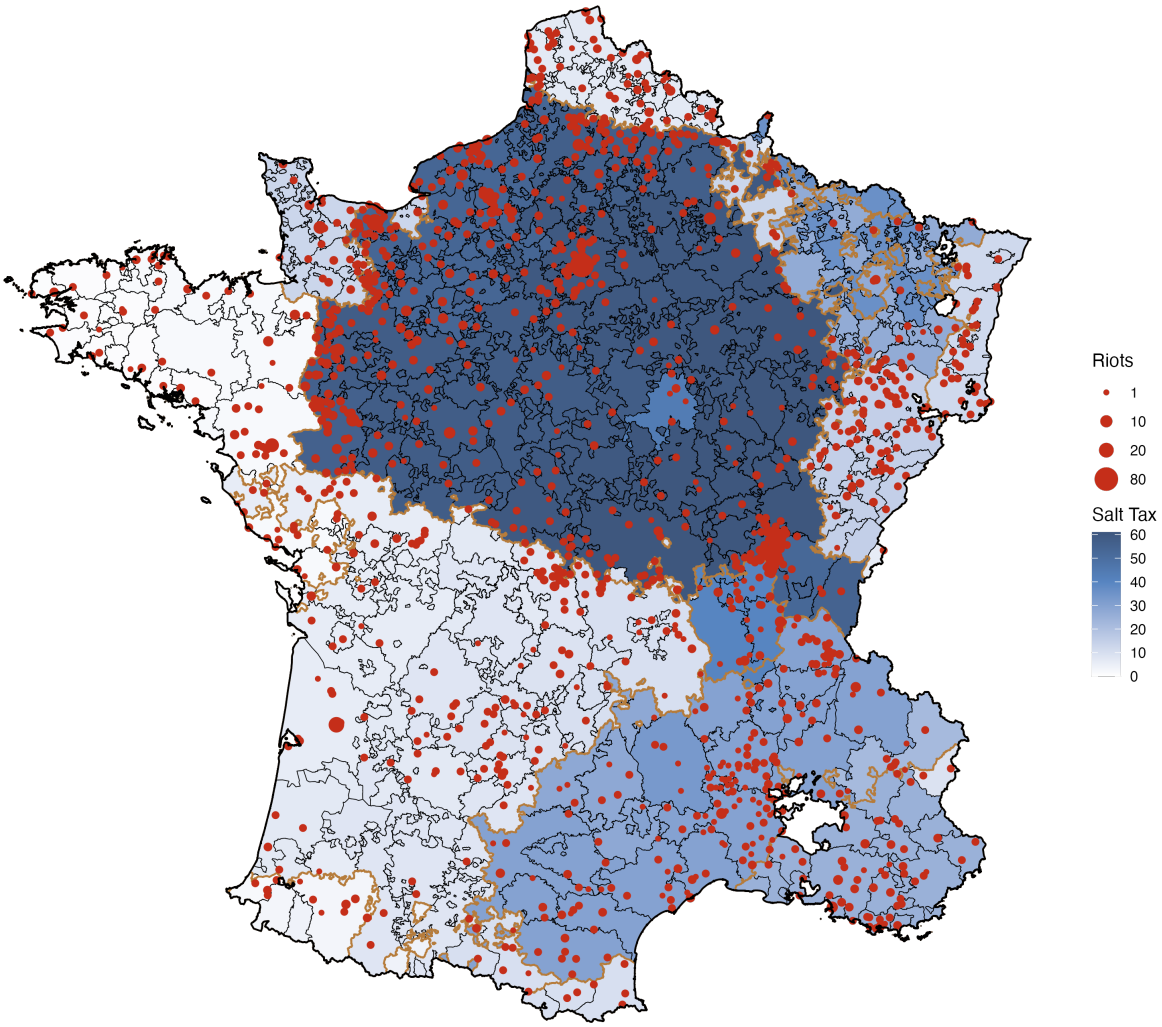


(B) PRECIPITATION



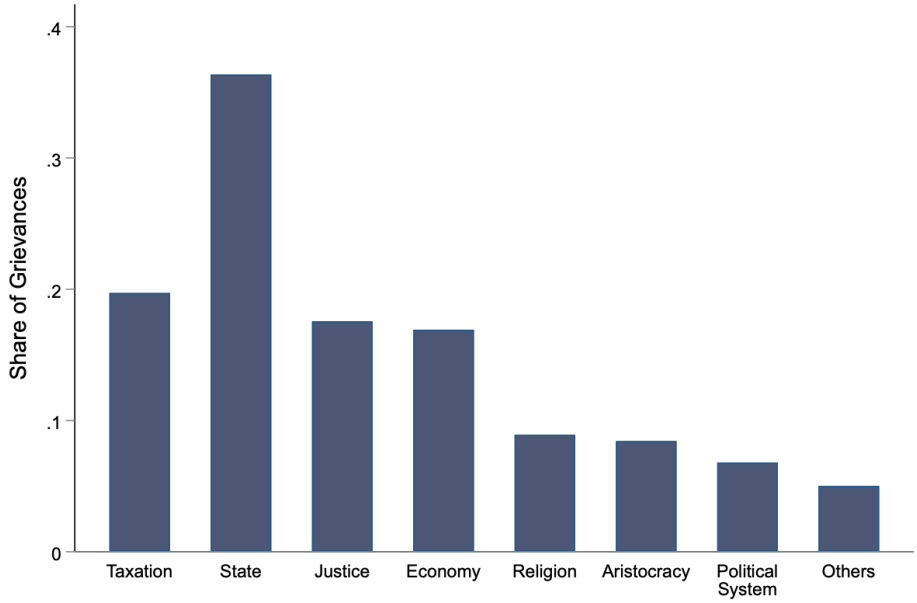
Notes: The figure plots the 1788 weather shock, defined as the average, across *bailliages*, of 1788 yearly values rescaled by their 1750-1800 average values, at the *commune* level, together with the salt tax border highlighted in yellow.

FIGURE A9 – SALT TAX AT *bailliage* LEVEL AND RIOTS



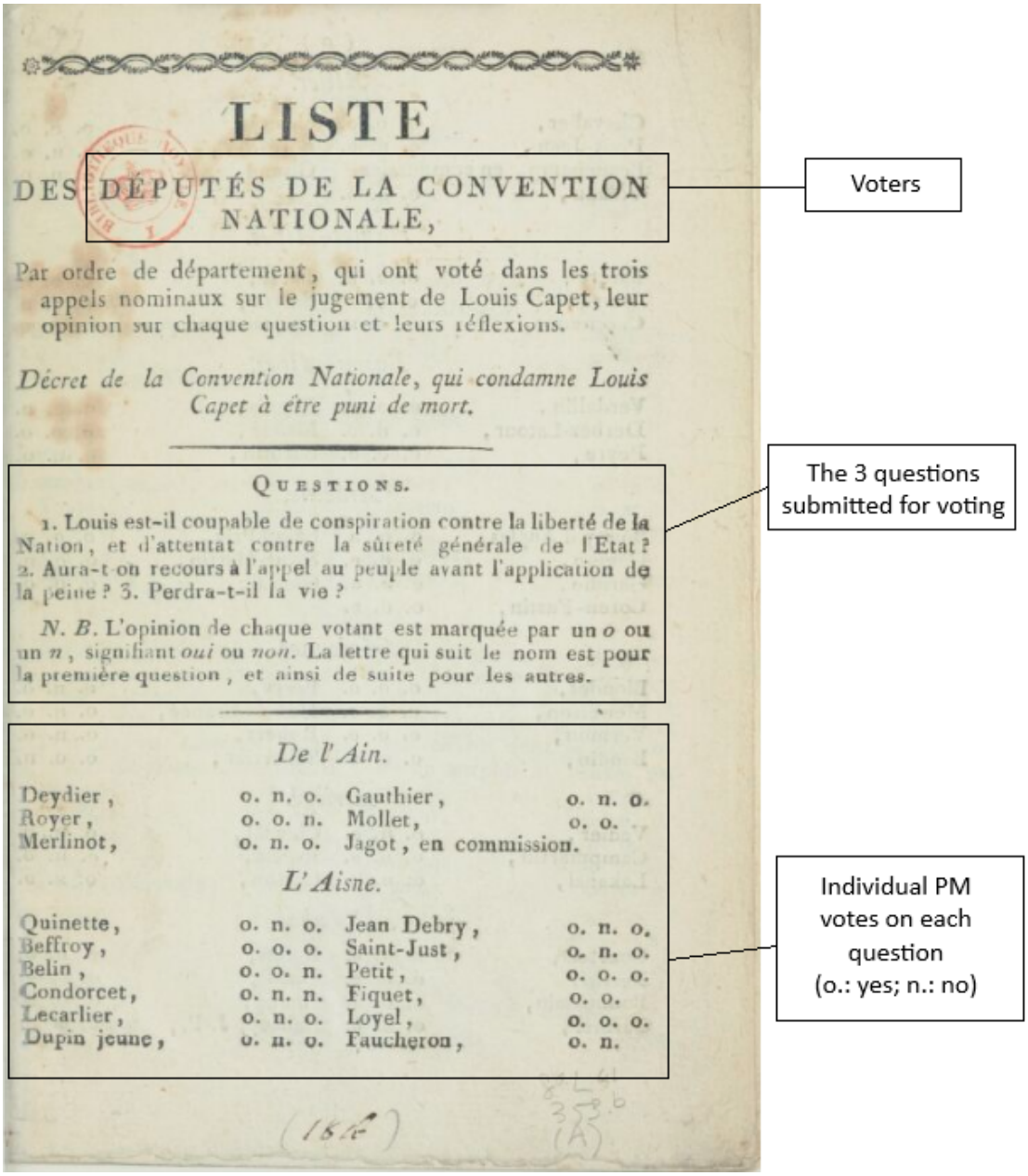
Notes: The figure plots the salt tax at the *bailliage* level, together with the salt tax border highlighted in yellow and the location of riots (1780-1789) in red; greater dots indicate a greater number of riots in that location.

FIGURE A10 – FREQUENCY OF COMPLAINTS



Notes: The graph plots the share of each category of complaint out of all complaints included in the cahiers data analysis. We follow the classification of Shapiro et al. (1998).

FIGURE A11 – DECREE DEATH PENALTY KING



LISTE

DES DÉPUTÉS DE LA CONVENTION NATIONALE,

Par ordre de département, qui ont voté dans les trois appels nominaux sur le jugement de Louis Capet, leur opinion sur chaque question et leurs réflexions.

Décret de la Convention Nationale, qui condamne Louis Capet à être puni de mort.

QUESTIONS.

1. Louis est-il coupable de conspiration contre la liberté de la Nation, et d'attentat contre la sûreté générale de l'Etat? 2. Aura-t-on recours à l'appel au peuple avant l'application de la peine? 3. Perdra-t-il la vie?

N. B. L'opinion de chaque votant est marquée par un *o* ou un *n*, signifiant *oui* ou *non*. La lettre qui suit le nom est pour la première question, et ainsi de suite pour les autres.

De l'Ain.

Deydier,	o. n. o.	Gauthier,	o. n. o.
Royer,	o. o. n.	Mollet,	o. o.
Merlinot,	o. n. o.	Jagot, en commission.	

L'Aisne.

Quinette,	o. n. o.	Jean Debry,	o. n. o.
Beffroy,	o. o. o.	Saint-Just,	o. n. o.
Belin,	o. o. n.	Petit,	o. o. o.
Condorcet,	o. n. n.	Fiquet,	o. o.
Lecarlier,	o. n. o.	Loyel,	o. o. o.
Dupin jeune,	o. n. o.	Faucheron,	o. n.

Voters

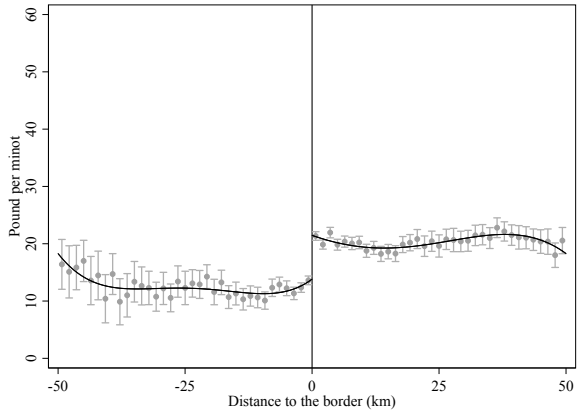
The 3 questions submitted for voting

Individual PM votes on each question (o.: yes; n.: no)

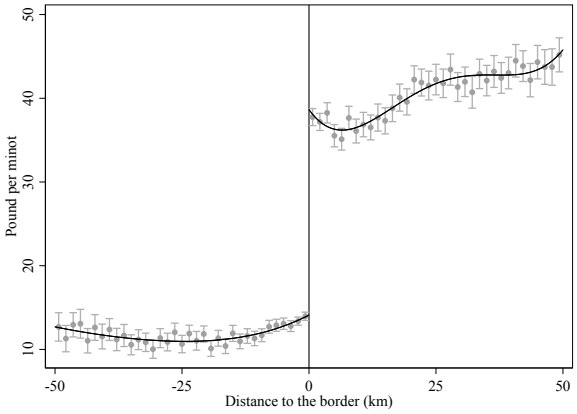
Notes: Source: National Library of France, BnF.

FIGURE A12 – FIRST STAGE: SALT TAX AROUND THE BORDER

(A) ONLY FIRST QUARTILE TAX GAP

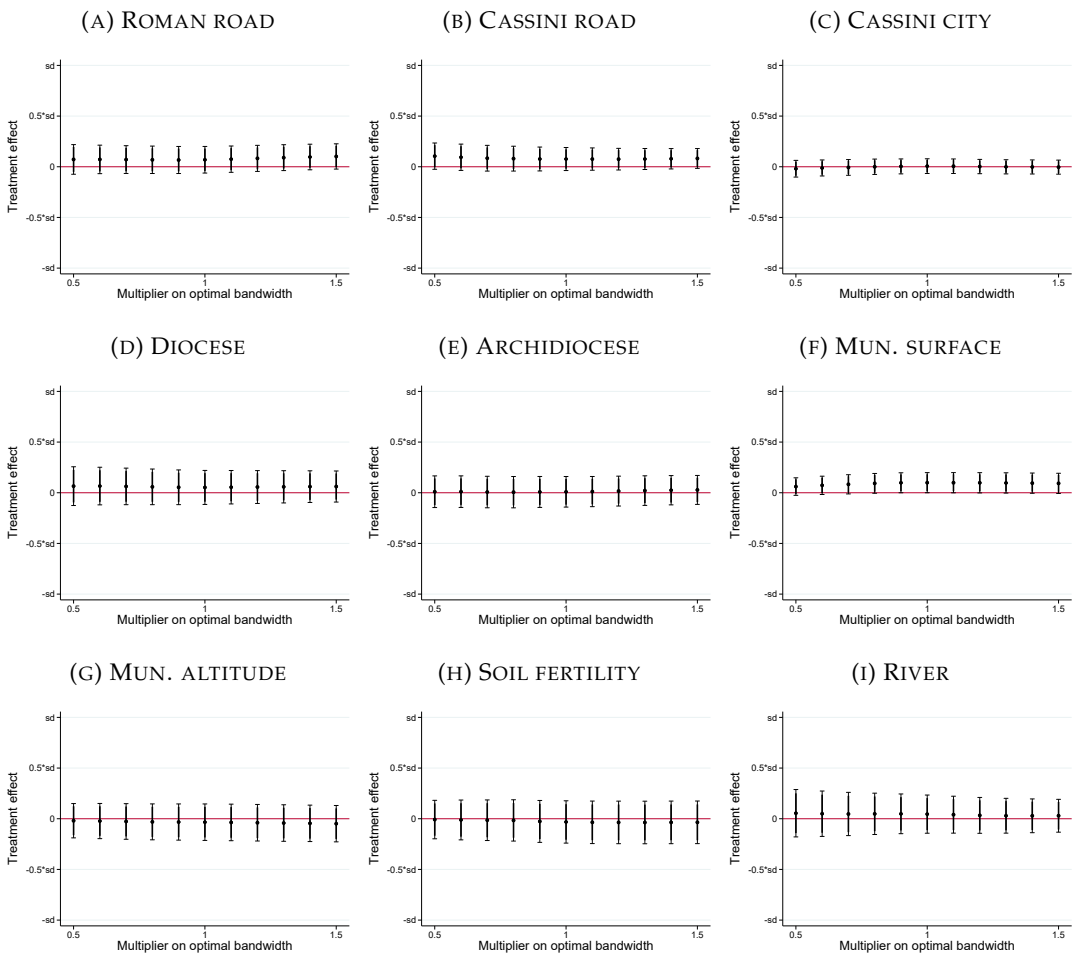


(B) ALL TAX BORDERS



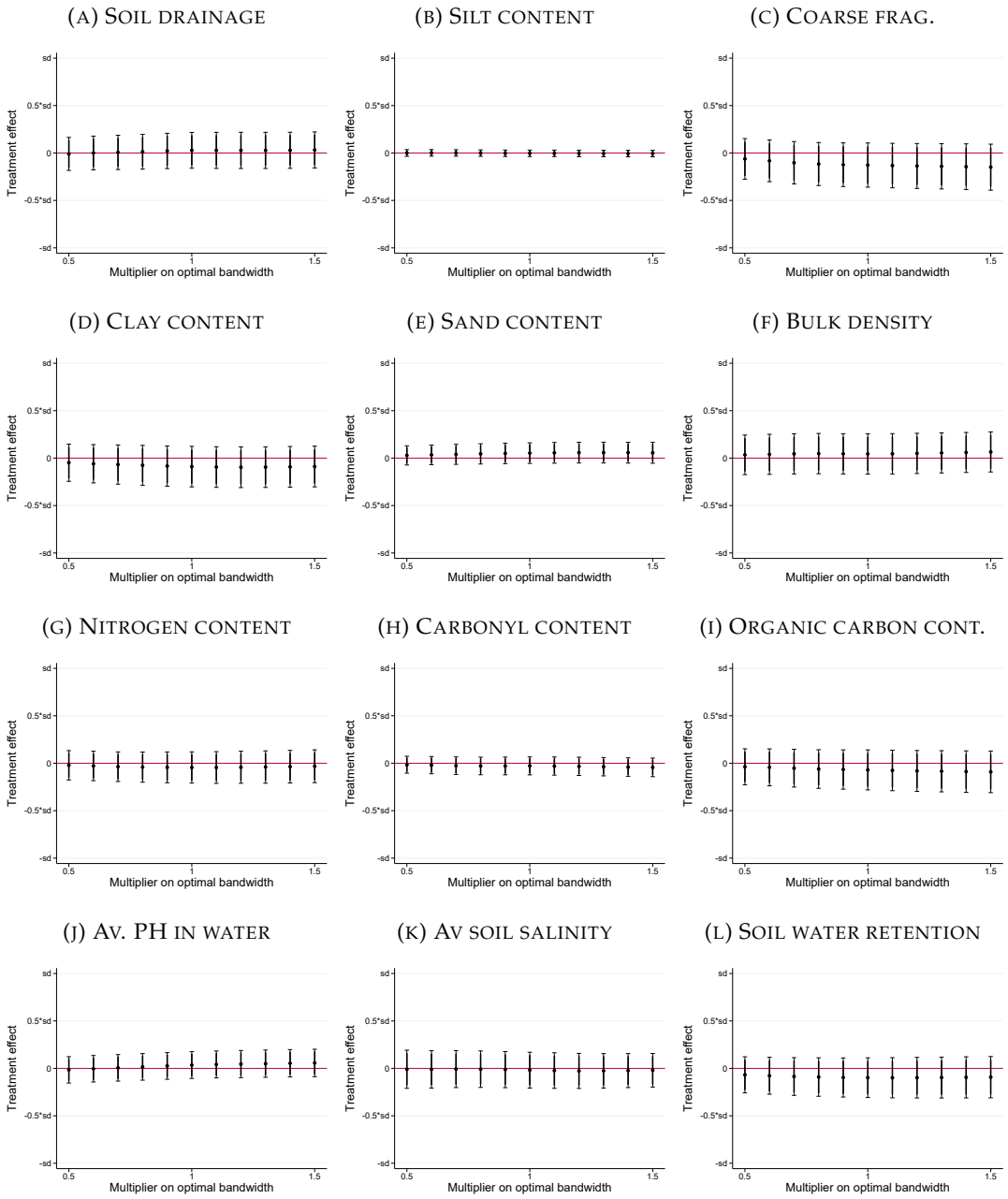
Notes: The plot shows non-parametric RD estimates following Calonico et al. (2014). The dependent variable is the salt tax rate (expressed in pound per minot) according to Figure A7. Panel A focusing on the borders in the first quartile of the tax gap dirferential and Panel B on all the tax borders. The treatment area (i.e., the area with a higher tax rate, compared to the nearest tax border) is coded positively.

FIGURE A13 – BALANCE CHECKS: MUNICIPAL CHARACTERISTICS



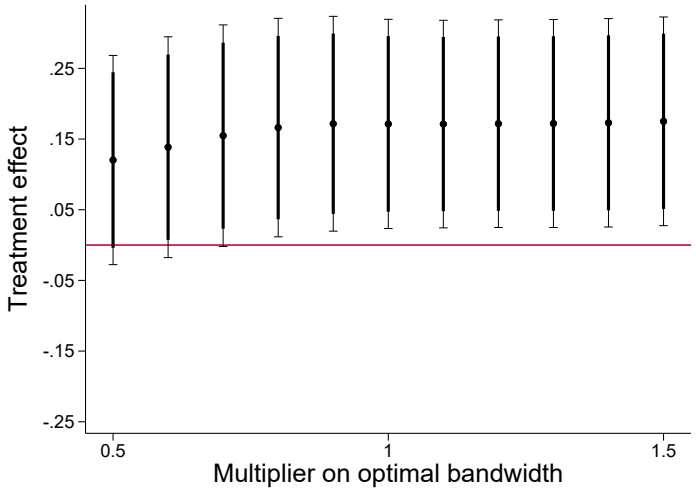
Notes: The figure shows the balance checks run on historical or geographic municipal characteristics. The analysis is a non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidths and polynomial order selection, according to model 2. For each outcome the coefficient estimated on several bandwidth is reported. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility – this last covariate is not included in the analysis of panel H). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, standard errors are always clustered at the bailliage level.

FIGURE A14 – BALANCE CHECKS: SOIL CHARACTERISTICS



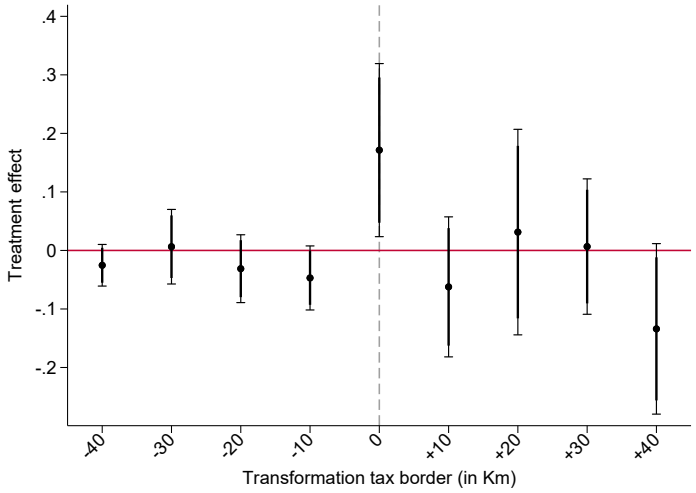
Notes: The figure shows the balance checks run on soil characteristics at the municipal level. The analysis is a non-parametric RD estimates following Calonico et al. (2014) under optimal bandwidths and polynomial order selection, according to model 2. For each outcome the coefficient estimated on several bandwidth is reported. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility – this last covariate is not included in the analysis of panels B and G). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, standard errors are always clustered at the bailliage level.

FIGURE A15 – RIOTS AROUND THE SALT TAX BORDER: BANDWIDTH SENSITIVITY



Notes: The plots show non-parametric RD estimates following Calonico et al. (2014) under optimal polynomial order selection, according to model 2. The bandwidth of the analysis are arbitrarily modified between 0.5 and 1.5 of the optimal bandwidth. The dependent variable is economic riots , for the period 1780-1789, and it is standardized. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, the error term is clustered at the bailliage level.

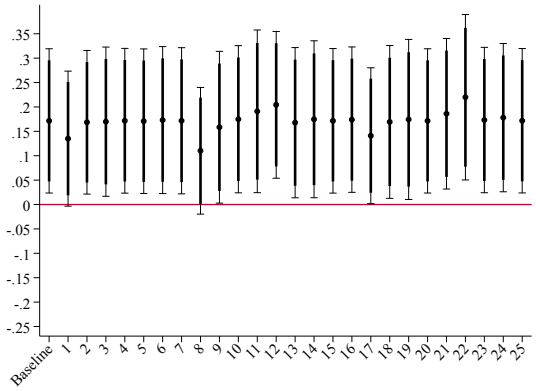
FIGURE A16 – RIOTS AROUND THE SALT TAX BORDER: FAKE BORDERS



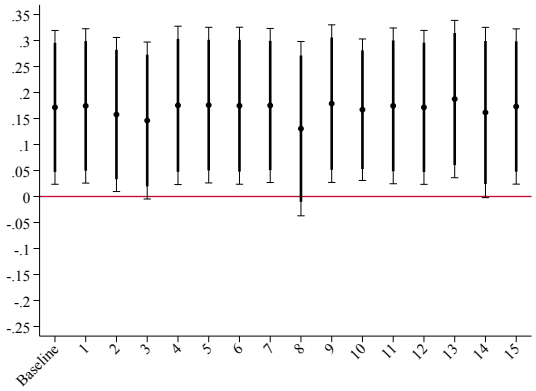
Notes: The plots show non-parametric RD estimates following Calonico et al. (2014) under optimal polynomial order selection, according to model 2. The graph shows placebo analysis in which the tax border has been permuted by $\pm$ 0/10/20/30/40 km. The dependent variable is economic and political riots , for the period 1780-1789, and it is standardized. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, the error term is clustered at the bailliage level.

FIGURE A17 – RIOTS AROUND THE BORDER: EXCLUDING SINGLE BORDERS

(A) CLASSIFICATION BASED ON GEOGRAPHY

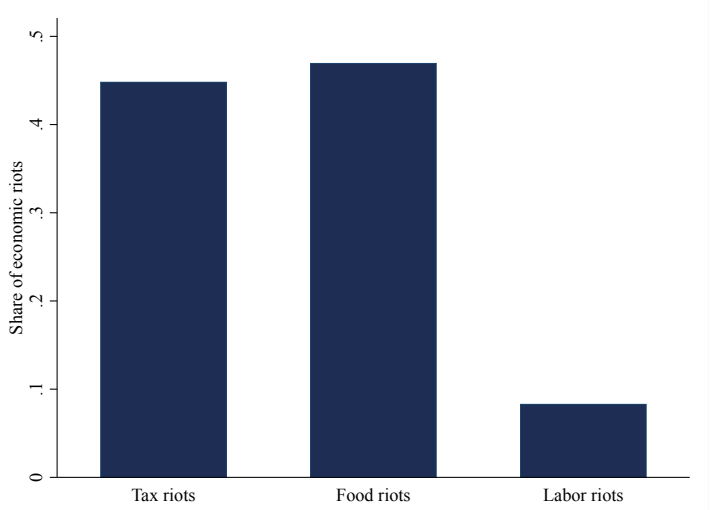


(B) CLASSIFICATION BASED ON ORIGIN



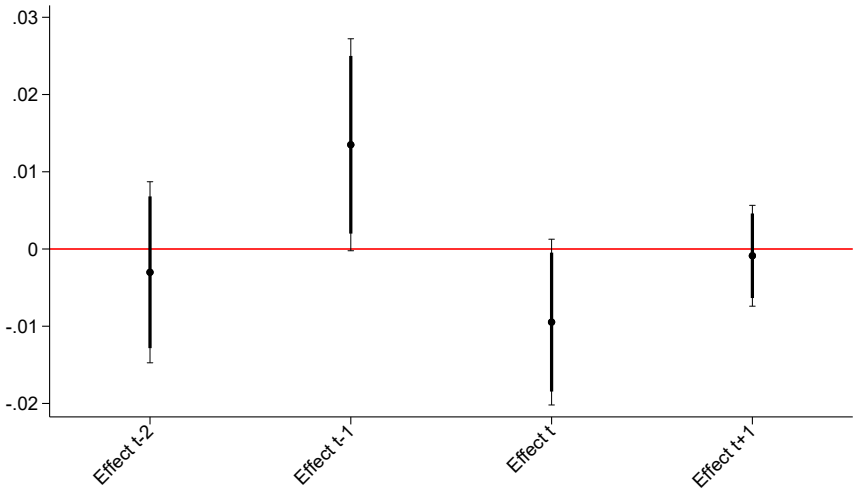
Notes: The plots show non-parametric RD estimates following Calonico et al. (2014) under optimal polynomial order selection, according to model 2. The dependent variable is economic and political riots, for the period 1780-1789, and it is standardized. The treatment captures the municipalities in the area with a higher rate, compared to the control group. The two plots show the analysis excluding every time a different border, as well as the baseline coefficient. In panel A, the border classification is based on geography: more specifically, French territory has been divided in blocks with sides of two degrees. In each regressions the borders located into one of these blocks are excluded. In panel B, the border classification is based on border origin: more specifically, every time a set of borders based on their origin (according to Figure C4) is excluded. The specification includes border fixed effects as well as a set of municipal controls (population in 1780, coordinates and soil fertility). The sample includes all French municipalities with the exception of those whose closest tax border displays a very small jump, as it belongs to the bottom quartile of the tax differential distribution. Finally, the error term is clustered at the bailliage level.

FIGURE A18 – DECOMPOSITION OF ECONOMIC RIOTS (1780-1789)



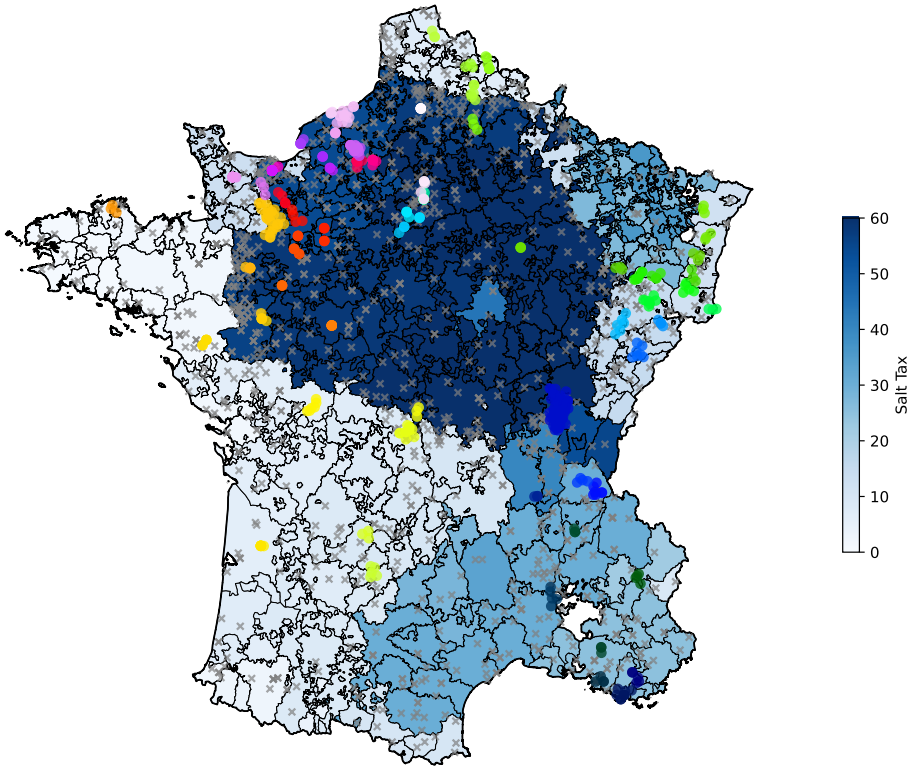
Notes: The plots shows the decomposition of economic riots according to the classification of Chambru and Maneuvrier-Hervieu (2024). The plot covers the period 1780-1789 and focuses on all French municipalities.

FIGURE A19 – IMPACT OF TEMPERATURE SHOCK ON RIOTS (1780-1789)



Notes: The plot shows the results of the reduced form from the estimation of model 3, augmented with leads and lags variables. The coefficients "Effect t-2/t-1/t/t+1" indicate the temperature shocks, at the municipal level, which are defined for the growing season (spring and summer) of the previous year. The analysis covers the period 1780-1789 and a bandwidth of 30km is always applied. The specification always includes municipality and year fixed effects as well as the controls included in model 2 (population in 1780 and soil fertility) interacted with year fixed effects. Standard errors are always clustered at the bailliage level.

FIGURE A20 – CLUSTERS OF RIOTS (DBSCAN) (1780-1789)



Notes: Choice of DBSCAN (Density-Based Spatial Clustering of Applications with Noise) as the clustering algorithm is motivated by its ability to identify arbitrarily shaped clusters, naturally isolate outliers (i.e., "noise"), and avoid the need to specify the number of clusters in advance. The minimum cluster size is set to 3 so that each cluster must contain at least three observations; a smaller threshold risks over-splitting events, whereas a larger threshold risks overlooking smaller but still significant clusters. The parameter $\epsilon = 0.05$ is chosen in the standardized feature space (time, latitude, and longitude, all standardized by their respective standard deviations) based on qualitative inspection of the data. Larger ϵ values were found to merge distinct events into excessively large clusters that spanned too far in space and time. Interpretation of ϵ in real-world units is achieved by converting 0.05 standard deviations back to days and kilometers for each subset of data. In the period considered (1780-1789), 0.05 standard deviations corresponds to roughly 56 days in time, approx. 9 km in longitude, and approx. 11 km in latitude.

B Appendix: Data

B.1 Text analysis on riots description

C Appendix: Salt tax borders

C.1 Historical background of main borders

We

Provinces Rédimées The rationale behind the *provinces rédimées* is entirely different. The precise placement of the border between the *provinces rédimées* and the *pays de grandes gabelles* is based on the border of the Duchy of Aquitaine when it first joined the French Kingdom in 1137 following the marriage of Alienor of Aquitaine and the French king. However, long before 1137 and until 1472, the exact placement of the border between Aquitaine and France had continuously changed. The political and military instability of the area is a consequence of its topology (Kitamura and Lagerlöf, 2019).[47] When the region finally joined the Kingdom of France in 1472, it was offered preferential treatment in terms of salt taxation. A tax was still levied but with a much lower rate than in the *pays de grandes gabelles*. Then, between 1537 and 1544, the King attempted to uniform (from above) the salt tax rate. This led to large social unrest in the future *provinces rédimées*. To ease the situation and given the financial pressure imposed on the Kingdom's finances by the Italian Wars, the King offered the region the possibility to pay a large lump sum fee in exchange for a reduced salt tax in the future. Hence, in 1553, the region redeemed itself from the "large" salt tax by paying the king a one-time fee of 1,194,000 livres.[48]

[47] More specifically, it coincides with what geologists call the *Seuil du Poitou*, i.e., where the *Paris* (Northeast) and *Aquitaine* (Southwest) sedimentary basins meet, and hence where we observe a gap between the ancient mountain ranges *Massif Armoricain* (Northwest) and the *Massif Central* (Southeast).

[48] The burden of the fee was carried by those that would have otherwise paid the salt tax. Yet, the fee paid by the clergy and aristocrats appears small in proportion of their economic importance. As such, this should have an attenuation effect on the salt tax border effect, if at all.

FIGURE C1 – FRANCE AFTER THE TREATY OF BRETIGNY (1360)

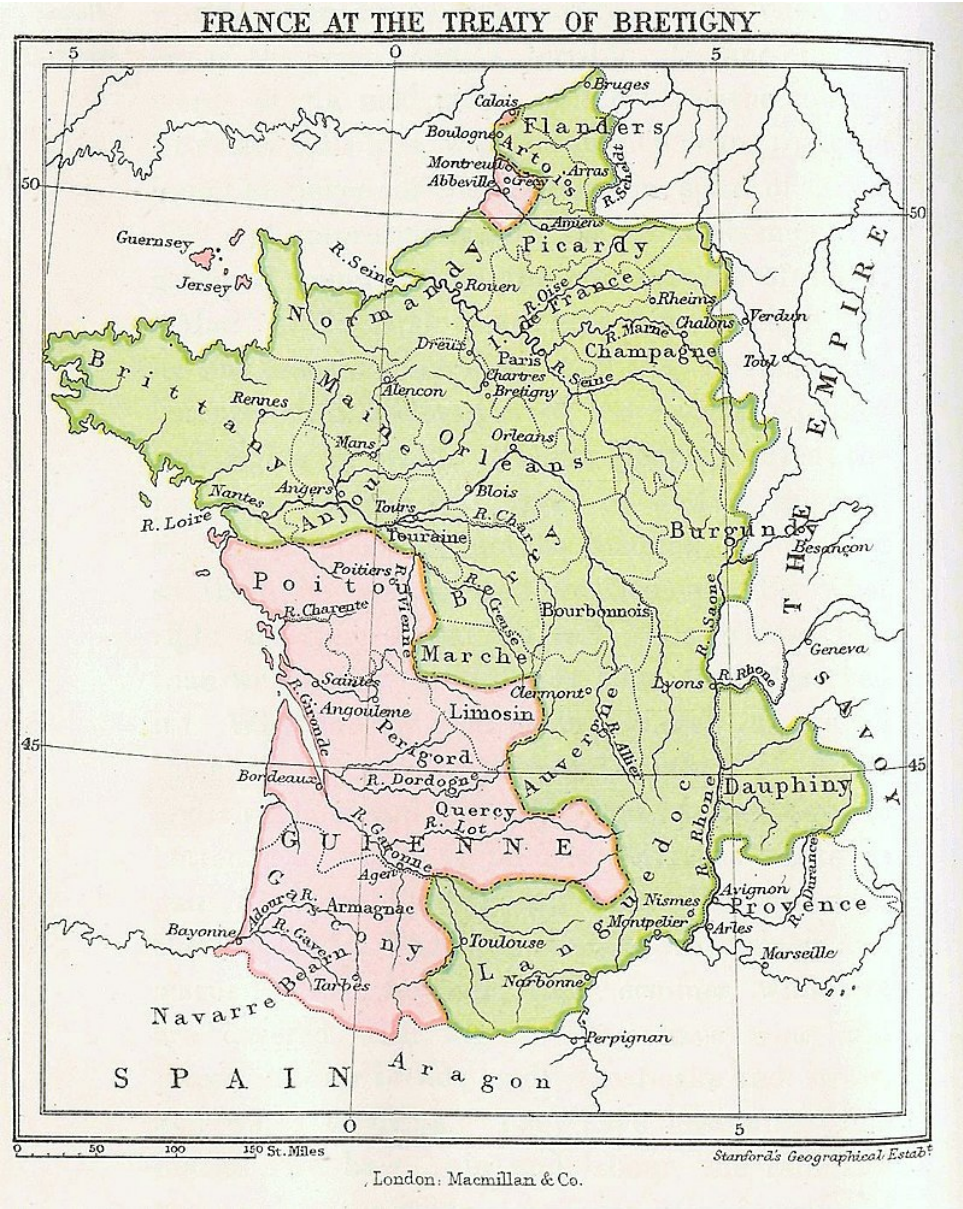
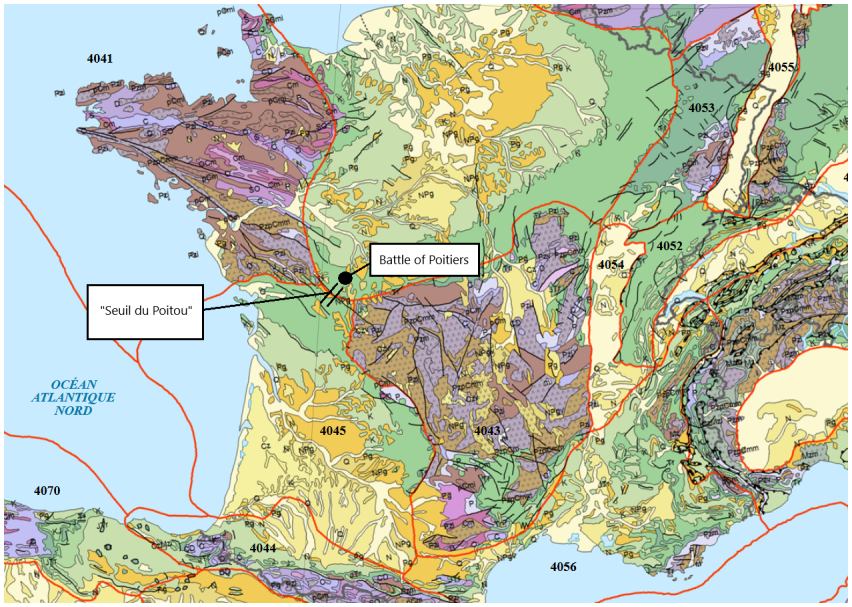
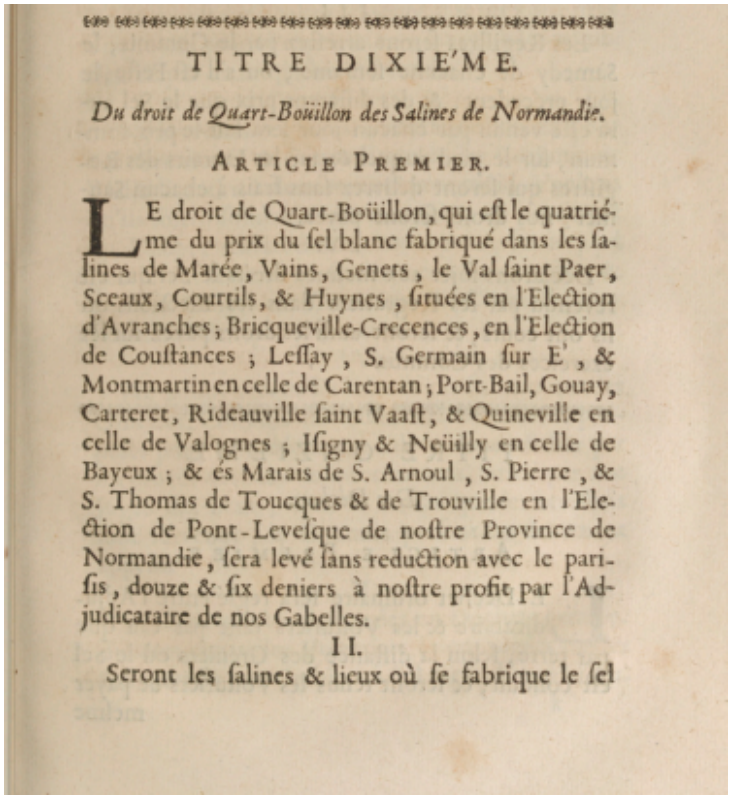


FIGURE C2 – LOCATION OF THE BATTLE OF POITIERS (1356)



Quart-Bouillon The border of the *quart-bouillon* area traces two large pseudo-circular arcs around highly productive salt marshes. This area famously includes the Mont-Saint-Michel salt marshes. Instead of paying a very large salt tax, one quarter of the local salt production was transferred to the King: hence, the name "quart-bouillon". It can literally be translated to "quarter of the stock". Salt was then sold for 13 livres (per minot). Given a wholesale price of about 4 livres, this leads to a 300% tax rate, which is large but much smaller than the 1000% rate in the HTA. The ceased salt was then sold throughout the kingdom. Importantly, the main salt marsh locations where salt was produced are not within the bandwidth in the estimations. Hence, the results are unlikely to be driven by the economic benefits of salt production.

FIGURE C3 – DECREE ON SALT TAX RATE AT LOCAL LEVEL (1680)



TITRE DIXIE'ME.

Du droit de Quart-Boüillon des Salines de Normandie.

ARTICLE PREMIER.

LE droit de Quart-Boüillon, qui eſt le quatriéme du prix du ſel blanc fabriqué dans les ſalines de Marée, Vains, Genets, le Val ſaint Paer, Sceaux, Courtils, & Huynes, ſituées en l'Election d'Avranches; Bricqueville-Crecences, en l'Election de Couſtances; Leſſay, S. Germain ſur E', & Montmartin en celle de Carentan; Port-Bail, Gouay, Carteret, Rideauville ſaint Vaaſt, & Quineville en celle de Valognes; Iſigny & Neüilly en celle de Bayeux; & és Marais de S. Arnoul, S. Pierre, & S. Thomas de Toucques & de Trouville en l'Election de Pont-Leveſque de noſtre Province de Normandie, ſera levé ſans reduction avec le pariſis, douze & ſix deniers à noſtre profit par l'Adjudicataire de nos Gabelles.

II.

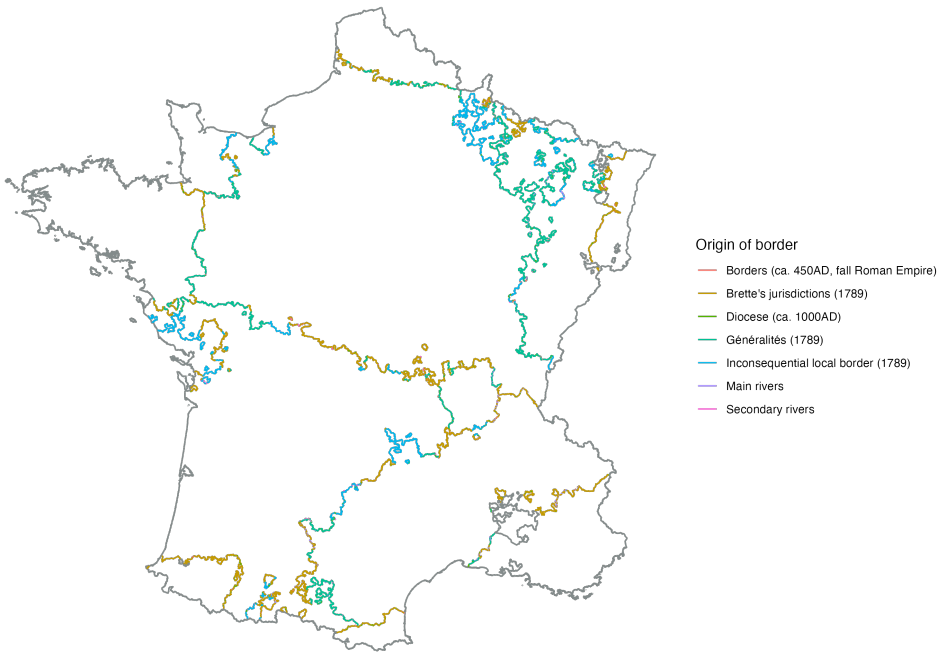
Seront les ſalines & lieux où ſe fabrique le ſel

Notes: XXX Source: National Library of France, BnF.

Pays de salines The placement of the borders of the *pays de salines* was directed by the underground salt density. Similarly, the *pays de salines* – literally "Country of Salines" is a region where salt is highly concentrated in the underground. *Saline* – a mixture of salt and water – naturally flows close to the surface. The border between the *pays de salines* and the *pays de grandes gabelles* contours the natural sources of saline around the current region of Jura close to the French-Swiss border. It is important to mention that whereas the probability of finding salty water when digging is higher in the *pays de salines*, this probability is smooth around the tax border. This probability increases smoothly following water infiltration patterns as one moves closer to the Alps.

C.2 *Border placement tests [TO BE UPDATED]*

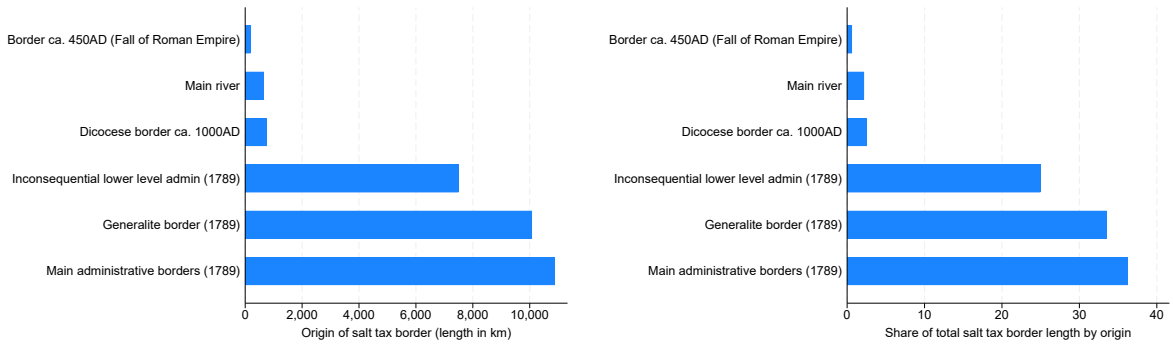
FIGURE C4 – ORIGIN OF THE SALT TAX BORDERS (BY 1KM SEGMENTS)



Notes: XXX.

FIGURE C5 – DECOMPOSITION BORDER SEGMENTS BY ORIGIN

(A) BY LENGTH (IN KM) (B) BY SHARE (%)



Notes: