Trade Liberalization and Local Economic Activity: Evidence from the Savoy Great Free Zone

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June 2025

Abstract

We explore the effect of trade liberalization on long-run local economic activity using the historical case of the Savoy Great Free Zone (GFZ). Between the 1860 Savoyard annexation and WWI, the French customs line arbitrarily partitioned the department of Haute-Savoie, leaving the GFZ outside of the French customs area. Using a spatial regression discontinuity design and an original local-level dataset, we show that direct tax revenues, which were based on indicators of local economic activity and wealth, were significantly higher in the GFZ. This effect is persistent, lasts until the abolition of the zone, and is driven by greater land tax revenues. The effect appears to be driven by greater real income and capital accumulation due to access to cheaper consumer goods and inputs. Consistent with this explanation, while there are no major changes in land use and production of raw agricultural products, we find evidence of a greater relative number of agro-industrial and manufacturing establishments. Overall, our results point to sizable impacts of trade liberalization on long-run local economic activity.

Keywords: Trade liberalization, local economic activity, regression discontinuity, Great Free Zone, France.

JEL Codes: F14, N13, N33, N73, O12, O24.

Introduction

Global trade policy is undergoing a significant transformation. After decades of gradual, sector-focused liberalization, developed economies—most notably the United States—are experiencing a resurgence of protectionism. Some of the recent proposals have increasingly advocated broad-based tariffs applied uniformly across all products and trading partners. Yet historically, such sweeping, economy-wide tariff regimes have been exceptionally rare. Moreover, empirical evidence on the economic effects of broad liberalization remains mixed, reflecting the difficulty of disentangling trade shocks from concurrent political and institutional changes.

This paper studies the economic consequences of a unique historical experiment: the establishment of the *Grande Zone Franche* (GFZ), a free trade zone created in the French department of Haute-Savoie immediately following France's annexation of Savoy in 1860. Importantly, the GFZ emerged as a political compromise during France's annexation of Savoy rather than a response to the economy or a economic policy measure, meaning that it should be unrelated to economic confounders. Given the GFZ is a free trade zone, the GFZ represented a French sovereign territory located outside the French customs boundary. Consequently, inhabitants of the GFZ enjoyed exemption from French customs duties on foreign imports, particularly goods from neighboring Switzerland, while still retaining tariff-free access to goods from within the rest of France. Unlike typical scenarios involving differentiated tariff rates across countries, this uniform exemption eliminated possibilities for trade rerouting or selective market exposure, thus offering a unique opportunity for direct within-industry comparisons of treated and untreated communes. This framework allows us to observe how trade liberalization impacts economic activities at the local scale, complementing existing literature that typically emphasizes cross-industry or regional-level analyses.

The establishment and boundary delineation of the GFZ provide a notably exogenous setting ideal for empirical identification. Its institutional arrangement effectively generated a clear geographic discontinuity: within the same department, roughly two-thirds of the communes benefited from tariff-free conditions, whereas neighboring communes remained subject to standard French customs duties. Importantly, this boundary followed pre-existing administrative and natural borders established primarily for political purposes rather than economic considerations, providing a plausibly exogenous discontinuity.

More precisely, the historical context surrounding the creation of the GFZ is as follows: The Kingdom of Sardinia sought France's support for Italian unification, agreeing in return to cede Savoy and Nice to France. The annexation of Savoy raised significant concerns in Switzerland, primarily due to the region's intense economic interdependence with Geneva, where Savoy provided agricultural products in exchange for Geneva's manufactured goods. Additionally, the geopolitical implications of Geneva becoming entirely surrounded by France heightened these concerns. In this context, the GFZ had its origin in a miscalculation by Emperor Napoleon III, who initially looked to appease Swiss concerns by mentioning to Switzerland he could consider transferring Northern Savoy to Switzerland. This received backlash from the French establishment and hence, to correct this political mistake and as a compromise to help secure local support for French annexation, it was decided to expand the previous border zone and create the GFZ. While the customs line which run through Haute-Savoie appears to have been drawn up in a quick and arbitrary manner, this holds, in particular, for a large segment set at the Usses river. Its selection appears to be driven by the usefulness of having a clearly-defined natural feature to partition the old Sardinian province of Genevois, now entirely part of Haute-Savoie, into a Northern (inside GFZ) and Southern (outside GFZ) areas. Importantly, we collect a wide array of pre-annexation outcomes and confirm that this boundary divided an otherwise homogeneous region in terms of demographic, economic, and geographic characteristics.

We leverage this geographic discontinuity in a regression discontinuity (RD) design. We build a new commune-level dataset that we digitized from eight archival series that include municipal budgets, land and personal tax records, and detailed agricultural and industrial censuses covering seven census years between 1862 and 1914. Tax records are particularly valuable as indicators of local wealth, as at the time France relied heavily on direct taxation through four principal levies designed to reflect local economic activity, notably land and commercial property contributions.

Our findings using tax records suggest that communes within the GFZ experienced significant improvements in living standards, reflected in increased tax revenues after the establishment of the GFZ. Between 1878 and 1914, we find positive, sizable, and significant effects on per capita municipal revenues, local tax revenues, and the local tax base, corresponding to increases of 0.56, 1.0, and 0.35 standard deviations, respectively. We delve into the drivers of these effects by analyzing total direct tax revenues by tax contribution. The benefits emerge only gradually: immediately after

annexation total collections and land-tax proceeds do not differ from those outside the GFZ, yet by 1881 there are significant positive effects. The disaggregated results show that the overall impact is largely driven by revenues from the land contribution. These findings align with the GFZ impacting real incomes and wealth accumulation by *reducing living costs* and *cheaper inputs*, facilitated by access to lower-priced, duty-free foreign consumer and industrial goods, predominantly sourced from Switzerland.

We complement our tax-based findings by examining sectoral and demographic dynamics. Drawing on the 1891 census and pre–World War I agricultural records, we first document a pronounced reduction in public administration's employment share–an effect evident both adjacent to and beyond the zone's border and only partly attributable to French customs officials relocating on the GFZ's border, on the non-GFZ side. The workforce shifted towards the combination of the agricultural and industrial sectors, rather than to commercial activities. Although we do not find sizeable discontinuities in land use and production of raw animal goods, the number of agro-industrial establishments (i.e. industries related to adding value to agricultural produce) surges by over one standard deviation by 1914. Similarly, for industrial activities, we find a positive and statistically significant effect on the relative number of manufacturing establishments twenty years after annexation. These results are in line with increased economic activity and improved profitability dominating any possible drawback coming from import competition. They suggest that exposure to cheaper inputs, wider variety of them and industrial competition could have incentivized firms to innovate in the agro-industrial space (Goldberg et al., 2010; Medina, 2024).

Mapping the coefficients for local tax revenues over time–our only variable with digitized annual data–reveals a distinct structural break after 1895. This break is likely linked to agricultural policies. Annual estimates remain stable until 1895. After that year, they increase sharply and remain elevated. This turning point aligns precisely with the full enforcement of the Loi Méline. Under this law, France raised import duties significantly on most agricultural goods from other countries. However, GFZ produce was exempt from these tariffs. The timing strongly suggests that agro-industrial firms and farmers within the GFZ boosted profitability. They could sell their goods at tariff-inflated prices while benefiting from lower input costs.

Despite these pronounced economic and structural changes, population growth remained statistically unchanged between 1861 and 1911, reflecting the rural, land-tied character of Haute-Savoie,

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where moving into the GFZ required significant land purchases, livestock transfers, and likely liquidity constraints and community ties that limited migration responses.

These RD estimates capture an important metric and one we were interested in measuring. They estimate the total local equilibrium impact of the GFZ policy, which is the comprehensive effect that policymakers and communities would experience were such a free trade zone implemented in practice. Given free trade zones are not implemented in a vacuum, our estimates capture the real-world consequences of implementing tariff exemptions as part of free trade zones, which invariably operate within broader economic and social systems.

However, one may want to also analyze the pure direct effect of tariff exemption alone, without the possible spillover effects. These effects may occur for various reasons: (i) Informal trade and smuggling, likely generating positive spillovers by lowering living costs in adjacent non-GFZ communes; (ii) labor mobility, expected to be minimal in this rural region; (iii) market competition and displacement, which our demographic data and firm-location information gathered suggest was limited; and (iv) fiscal spillovers, which given the institutional design and spending rules, suggests that if something, additional GFZ-derived revenues financed departmental public goods that benefited non-GFZ communes. In this setting, most channels would make our previously RD estimates lower than what they would have without spillover effects, making our RD estimates a conservative lower bound on the direct GFZ effect.

We try to approximate possible spillovers with two complementary exercises: (a) exclude communes within 4 km of the border–where informal trade and movement are most likely–and (b) compare non-GFZ communes at varying distances beyond this buffer. These approaches, however, are subject to important caveats. Not only do these approaches relinquish the RD's core local comparability by discarding border observations and imposing stronger spatial homogeneity assumptions, but they also substantially reduce sample size in a historical context already constrained by data scarcity. Nevertheless, both specifications yield larger treatment effects on municipal and tax revenues[1], reinforcing that positive spillovers attenuate our baseline estimates and that the pure direct effect of the GFZ tariff exemption would be even greater.

Leveraging this rare, politically driven experiment in comprehensive tariff removal, our paper

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[1]We could only estimate local tax outcomes as the loss of observations for the agricultural and industrial outcomes made this test impossible.

complements five strands of the trade and development literature.

First, the literature on free trade zones is very limited. Yet, nowadays can provide insights into the effects of broad-based, simultaneous reforms. In this regard, we complement the empirical literature on free trade zones by examining a large-scale, uniform tariff exemption implemented without accompanying incentives or phased entry. Unlike prior studies of the Zollverein (Keller and Shiue, 2014) or China's Special Economic Zone (Wang, 2013)–which involved gradual expansion, targeted subsidies, or export-processing arrangements–we isolate the effects of a trade zone created for reasons unrelated to the economy and without phased roll-outs or targeted subsidies as the free trade zone was done at once for all communes and goods.

Second, we contribute to the literature on the long-run relationship between tariffs and growth, where findings remain mixed (O'Rourke, 2000; Vamvakidis, 2002; Clemens and Williamson, 2004; Irwin, 2002; Lampe and Sharp, 2013; Schularick and Solomou, 2011). Recent research has also examined how protectionist policy shapes regional development (Juhász, 2018). Our setting offers new evidence from a spatially focused, long-run context. We find that the GFZ increased direct tax revenues—a key measure of local wealth at the time—and economic activity without displacing core sectors like agriculture, suggesting that generalized liberalization can generate spatially uneven yet economically positive outcomes. Our findings also align with research linking trade openness to development (Frankel and Romer, 1999; Rodríguez and Rodrik, 2000; Feyrer, 2019), especially work that uses geographic or infrastructure variation to study local effects of market access (Duranton et al., 2014; Faber, 2014; Pascali, 2017; Donaldson, 2018; Bento, 2021; Flückiger et al., 2021). We show that tariff policy alone–without accompanying infrastructure investment–can also meaningfully shape local development trajectories.

Third, we complement to the literature on the spatial distribution of trade gains. Papers such as Topalova (2010); Kovak (2013); Dix-Carneiro and Kovak (2017); Autor et al. (2013) show that trade liberalization can result in long-lasting regional disparities when exposure varies and adjustment is constrained. These papers typically exploit variation in pre-reform industry composition. In contrast, the GFZ liberalization was sectorally uniform but spatially localized, enabling comparisons across communes that shared institutional and economic characteristics. This allows us to examine the effects of uniform liberalization when traditional sources of heterogeneity are minimized.

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Fourth, we speak to the literature on domestic market integration and internal border frictions. Even within nationally unified markets, policy or administrative divisions can generate meaningful economic differences. Holmes (1998) uses variation in labor policy at U.S. state borders to estimate effects on manufacturing, while Hillberry and Hummels (2008) and Atkin and Donaldson (2015) document substantial frictions in internal trade due to spatial clustering and transport costs. The GFZ created a de facto internal border within France, allowing us to assess how localized trade policy differences affect long-run economic outcomes. Our results complement this research by showing that even modest internal borders can generate persistent divergence in economic activity.

Finally, while we do not observe direct evidence on consumer prices or firm-level productivity, our findings are complemented by existing research on the mechanisms through which trade liberalization affects local economies. Historical accounts suggest that goods were significantly cheaper in the GFZ and that cross-border shopping was common, indicating meaningful price differences. Consistent with this, we find that local wealth–proxied by direct tax revenues–was significantly higher in the zone, alongside a greater presence of agro-industrial and manufacturing establishments.

These patterns align with findings by Fajgelbaum et al. (2020), who document nearly full tariff pass-through to U.S. consumer prices, and with research showing that lower trade costs raise firm productivity by cutting input expenses and broadening import access (Amiti and Konings, 2007; Goldberg et al., 2010; Halpern et al., 2015; Farrokhi and Pellegrina, 2023). This literature supports the idea that increased input variety and possible additional competition could have spurred the emergence of the agro-industry in the (e.g. Goldberg et al. (2010); Medina (2024)).

These previous input channels could be further amplified by enhanced supply-chain logistics. For instance, Xu (2022) shows that exogenous shocks to trade-financing conditions, which are akin to tariff shocks, also alter transaction costs and generate persistent, localized welfare effects. This trade-finance mechanism complements our findings by reinforcing how reduced trade-related costs drive long term economic outcomes in the GFZ. In our setting, the persistence of our effects is likely reinforced by limited labor mobility, a feature widely observed in other contexts (Topalova, 2010; Autor et al., 2013; Dix-Carneiro and Kovak, 2017).

The rest of the paper is divided as follows. Section 1 describes how the GFZ was established, its economic regime and how it came to an end. Section 2 details our data sources and identifi-

cation strategy. [Section 3](#) presents our analytical framework. [Section 4](#) presents our main results. [Section 5](#) concludes.

1 Context

In March 1860, France and the Kingdom of Sardinia signed the Treaty of Turin whereby the latter ceded the Duchy of Savoy and the County of Nice in exchange for French military support during the Italian unification process. The territory of Savoy, which comprised the Sardinian provinces (formerly referred to divisions) of Annecy and Chambéry, became the current French departments of Haute-Savoie and Savoie.

The Swiss government was gravely concerned about the annexation of Savoy. The Turin Treaty upheld two guarantees Switzerland had secured earlier: (i) Savoy's demilitarized status, set in 1815, and (ii) the 1816 "*petite zone franche*", a small free zone which run only along Geneva's border and differs from the much larger GFZ.[2] However, this did not placate Swiss concerns. Geneva, now almost encircled by French territory, depended on Savoyard agriculture, while Savoy itself bought Swiss manufactures funneled through Geneva. Hence, the new French customs border could result in significant trade disruptions, particularly if a Franco-Swiss diplomatic impasse arose.

Genevan leaders pressed France for assurances against a custom barrier. Faced with Swiss demands, French Emperor Napoleon III improvised a solution driven by national politics rather than local conditions. He first flirted with the idea of transferring northern Savoy to Switzerland ([Paul-Dubois](#), [1912](#)), but domestic backlash forced a retreat in favor of expanding the previous free zone into the "*Grande Zone Franche*". This measure appears to have been an "*indirect consequence of an imprudent maneuver by the Emperor, of a political error that he wanted to repair*"([Paul-Dubois](#), [1912](#), 802).

Napoleon III politically-driven fix produced an unusual customs landscape. As is the case with modern free trade zones, the GFZ remained French sovereign territory yet lay outside the French customs border. Goods of any origin entered the zone duty-free, while Zonians—GFZ inhabitants— could send domestic produce into the French interior on near normal terms. The GFZ border thus separated two tariff regimes: duty-free entry via Switzerland on one side, French

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[2]This small zone should also be distinguished from that in the Pays de Gex, which also border Switzerland, in the Ain department.

duties on foreign goods on the other. This sharp policy contrast across neighboring communes allows us to identify the effect of the GFZ and duty-free entry.

To setup the dual-trade-regime, the French government had to draw a brand-new internal customs border. It did so in haste. A decree of June 12th, 1860 set the end-points of the boundary. A second decree in 1898 merely clarified its course and made minor adjustments on the parts of the communes of Thorens and Evires included in the GFZ (Kinossian, 2014). As shown in Figure 1, the line runs eastward along the Usses river, a small tributary of the Rhone, until it meets the limit between the arrondissements of Annecy and Saint-Julien. Then, the custom border follows the limits of the arrondissement of Annecy, first with Saint-Julien and then with Bonneville. Afterwards, the customs line runs along the departmental limit of Haute-Savoie with Savoie, until it reaches the Italian border.

The section of the custom border which divides Haute-Savoie appears to split areas with similar demographic, economic and geographic characteristics, and similar political preferences. Communes excluded from the GFZ still voted overwhelmingly for annexation in the 1860 referendum, and even a decade later, local merchants in the city of Annecy, which was left out of the zone, lobbied to extend the zone by stating that "*the customs line of the Usses and the Aravis was a double error, a fiscal and political error*" (Ferrero, 1918, 111).

The partition of an otherwise homogeneous area is clearest along the section of the line that follows the Usses River, which will be our baseline treatment border. The Usses did not serve as a Sardinian administrative boundary. It splits the former province (ex-division) of Annecy and the previous province of Genevois. It also runs through the arrondissement of Saint-Julien. Most importantly, communes on both banks looked alike in terrain, and pre-annexation demographics and land use. Hence, the customs line appears to follow the Usses not because of pre-existing differences in local characteristics between both banks, but due to the administrative usefulness of having the custom border follow a natural feature which splits Haute-Savoie.

The rest of the border also did not follow policy-relevant boundaries. After the Usses, the customs line followed arrondissements limits. Arrondissements were, and still are, department administrative sub-divisions which implemented policies determined at the national and departmental level. They are not managed by elected officials but by government-appointed sub-prefects. While the arrondissement of Saint-Julien was created after annexation, the borders of Bonneville

follow those of the Sardinian district of Faucigny. However, as with French arrondissements, Sardinian districts (known as provinces pre-1959) had limited authority and were administrative units in charge of implementing national policy.

Figure 1 also shows the extent of the GFZ within the department of Haute-Savoie. The GFZ covered an area of 3,112 km^2, equivalent to two-thirds of Haute-Savoie and more than half of its population (Kinossian, 2014).

Figure 1: GFZ, Customs Line and the Communes of Haute-Savoie and Savoie
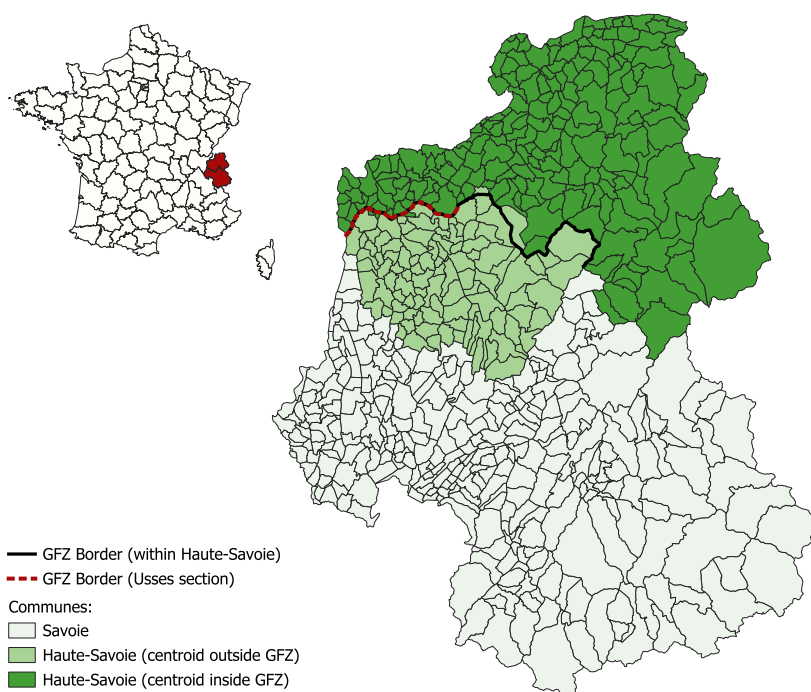
Notes: The map shows the communes of the departments of Haute-Savoie and Savoie, and the location of the GFZ. The black, bold line is the GFZ border within Haute-Savoie based on the 1899 Decree. The dotted red line is the section of the border which follows the Usses river and serves as our treatment border. Dark green and light green locations are Haute-Savoie communes located within and outside (based on their centroids) of the GFZ, respectively. See Section 2 for details on our sample and empirical strategy.

1.1 GFZ Economic Policy

The defining characteristic of the GFZ is that it was French territory outside of the French customs area. Foreign goods, therefore, entered duty-free, allowing Zonians to enjoy lower prices for consumption goods. This was particularly so for non-European products like coffee, tea, chocolate

and pepper which faced high import duties (Ferrero, 1918). Hence, Zonians were able to consume goods which were considered a luxury in other parts of France (Le Grix, 1905). The GFZ internal tax structure was similar to that of the rest of France. The only difference was the reduction or elimination of excise taxes for certain French consumption goods, such as beer, salt, sugar and tobacco, to allow them to compete with cheaper Swiss production (Ferrero, 1918).

As the GFZ was a unilateral concession by Napoleon III, Switzerland did not immediately grant lower duties to GFZ goods (Paul-Dubois, 1912). Partial reciprocity arrived only with the Franco-Swiss Trade Convention of June 1881, implemented in January 1883. The agreement reduced or eliminated Swiss duties for certain GFZ staples (e.g. butter, cereals, fruit, vegetables, wine, firewood, charcoal). These benefits were extended in 1895 and 1908 (Kinossian, 2014). Even after those enlargements, preferential treatment covered barely a quarter of the zone's exports to Switzerland; the rest still paid ordinary Swiss duties (Paul-Dubois, 1912). While Geneva benefited substantially from trade with the GFZ, calling the zone its "bread-basket," farmers elsewhere in Switzerland blocked deeper cuts for fear of competition (Paul-Dubois, 1912). Narrow Swiss concessions were reflected in duty-savings figures. While duty savings on Swiss products entering the GFZ and the Gex zone already exceeded 2.2 million gold francs in 1901, Zonian producers obtained exemptions worth only 0.16 million francs on their sales to Switzerland (Paul-Dubois, 1912).

Free entry for Swiss goods plus more advantageous conditions for GFZ produce led to significant trade between the GFZ and Switzerland. By 1910, the zone was exporting goods worth 22.6 million francs and importing goods worth 10.7 million francs from Switzerland. GFZ exports consisted largely of agricultural products (cereals, cheese, fruit, wine), while 90% of its imports from Switzerland were were industrial and retail items, notably agricultural machinery and metal hardware, specialty dyes and chemicals from Basel, tiles, and colonial groceries such as coffee and sugar (Kinossian, 2014; Paul-Dubois, 1912; Ferrero, 1918). Commercial exchange was drastically affected by WWI: GFZ exports and imports fell to 4.7 and 5.4 million francs, respectively in 1918.

Although no regional GDP series exist, a back-of-the-envelope benchmark underscores that the trade flow was substantial. Using Weir (1997)'s national GDP-per-capita estimate of 1,030 gold francs for 1905–1913 and the 1911 census count of 177 000 inhabitants, the GFZ's notional output was roughly 182 million francs. Taking two-way Swiss trade at approximately 33 million francs

(exports plus imports) yields a trade-to-GDP ratio of 18%. This share likely represents a lower bound. Haute-Savoie was predominantly agrarian and therefore probably poorer than the national average, which was likely skewed upward by the high GDP contribution of Paris.

Being outside of French customs meant that not all GFZ products could be freely exported to the rest of France. Initially, only some products entered the French interior duty free, the main being leathers, cheeses, and sawn wood (Conseil général de la Haute-Savoie, 1862). In 1863, a decree homogenized trading policy across free zones and established that the Ministry of Finance determines " *the quantities of natural or manufactured products from the country of Gex or of neutralized Savoie which can be admitted exempt from customs duties for the internal consumption of the Empire* " (Kinossian, 2014). These goods had to be produced by French nationals[3] and needed to be accompanied by a declaration of origin. In 1893, duty exemptions were expanded to other agricultural products not included in the initial 1863 decree (Kinossian, 2014).

Manufactured goods had less favorable conditions (Folliet and Duval, 1902). Amid industrialization, both France and Switzerland were more interested in protecting their manufacturing sectors. Exemptions were limited to factories operating before annexation[4] but as the May 1863 decree did not clearly restate this, this condition was not strictly enforced (Ferrero, 1918). In 1893, a ministerial decision settled the debate by granting exemptions to factories owned by French nationals which were in operation on January 1st 1893. Other manufacturing products were admitted at the minimum tariff (Folliet and Duval, 1902).

In response to falling agricultural prices during the 1880s and lobbying efforts led by Jules Méline–president of the Chamber's customs commission–a new tariff law, the Loi Méline, was passed in 1892 and fully implemented in 1895. Marking a sharp shift toward protectionism, the law significantly increased tariffs on agricultural imports. Importantly, these higher rates did not apply to goods originating in the GFZ (Paul-Dubois, 1912).

Trade between the GFZ and the French interior was substantial, though not comparable to that with Switzerland. Around 1900, the GFZ exported 8 to 10 million francs to the rest of France (Folliet and Duval, 1902). As with Swiss trade, most of these goods were agricultural products including livestock and cheeses.

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[3]Later, Swiss nationals leaving in the GFZ will be regarded as French nationals for this matter.
[4]Based on a July 1860 decree.

Figure 2: Timeline of Events Related to the GFZ
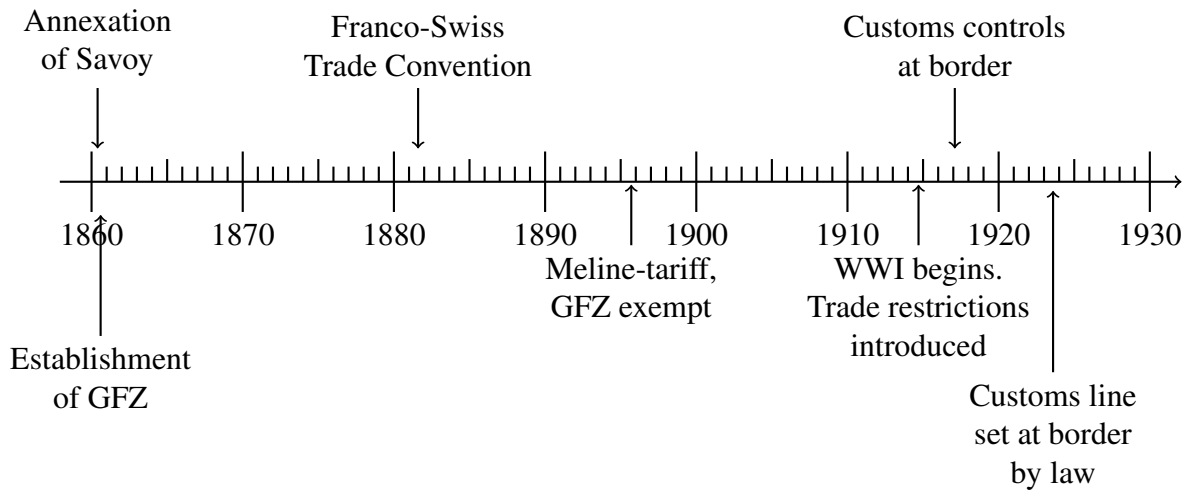
1.2 End of the GFZ

While the GFZ had been a contentious issue for decades, its demise started in World War I. After discussion in previous years, in 1917, France implemented custom controls at the Swiss border to prevent GFZ goods from entering Germany via Switzerland (Kinossian, 2014). Shortly after the war, France started the process to formally dissolve the GFZ as part of the Paris Peace Conference. However, France and Switzerland had differing interpretations of Article 435 of the Treaty of Versailles, which was meant to address issues regarding the Savoy neutrality and GFZ (Kinossian, 2014). In 1923, the customs line is established by French law at the Franco-Swiss border. To appease the Zonian population, certain temporary measures are promised liked an exemption of exit duties for local produce and reduced tobacco prices. As the Swiss disagreed with French actions, both governments agreed to look for international arbitrage. In 1932, the Permanent Court of International Justice affirmed that the Treaty of Versailles did not abolish the initial small free zone of 1816. Following the ruling, the French settled the custom line at the Haute-Savoie small zone, marking the definitive end of the GFZ.

The GFZ trade regime appeared to have, on aggregate, benefited the communes inside it. Evidence of this is the plan to transfer funds to GFZ communes as compensation for the zone's abolishment. In addition, the border communes of Evires and Thorens, which were partitioned by both the initial and final customs line, expressed their desire to remain in the zone when asked about it

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in 1896 (Kinossian, 2014).

2 Data and Method

2.1 Data

Our data consists of the 598 communes which made up the departments of Haute-Savoie (294) and Savoie (304) in 2015. We build a time-consistent database by manually matching past communes to 2015 ones.[5] Given the nature of the context and research question, most of the data is derived from the digitization and processing of multiple archival folders from the *Archives départementales de Haute-Savoie* (Departmental Archives of Haute Savoie - ADHS) and *Archives départementales de la Savoie* (Departmental Archives of Savoie - ADS). As the GFZ is located in Haute-Savoie, we focus our data-collection efforts in this department. This, together with differences in data availability across departmental archives, means that information for certain outcomes is available for Haute-Savoie only.

This section summarizes our main variables and their respective sources. Further details are provided in the Data Appendix (Appendix B).

GFZ Border. We geo-reference the customs line based on the law *Loi modificant le décret-loi du 12 juin 1860 relatif au tracé de la frontière douanière de la France en Savoie* of 1899 which clearly details the customs line.[6]

Pre-treatment Outcomes. We digitize the 1848 Sardinian Census (Regno di Sardegna, 1852) to compute population density and growth (between 1838 and 1848), and dwelling density. We combine this with information on population in 1858 from local public accounts to calculate growth between 1848 and 1858, and population density.

We test for balance in pre-treatment agricultural outcomes by digitizing the 1860 Agricultural and Industrial Survey (ADHS, 1860) carried out in Haute-Savoie only. The survey collected infor-

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[5]We consider the creation, merger, and dissolution of communes, but we do not account for territorial transfer between existing units.

[6]See Data Appendix for a discussion on differences between this demarcation and the original 1860 one, and how there were no controversies regarding the Usses section of the border.

mation on cultivation area and production for main crops of the time, including wheat, rye, oats, and potatoes. While the information is available for most Haute-Savoie communes, records were not found for all units.

Unfortunately, data on pre-annexation local public accounts is scarce. We first check for balance in local public accounts by calculating the local imposition for 1857. This is the local tax the communes could raise to cover the difference between local revenues and expenditures, and can serve as a proxy for local tax revenues. Appendix B provides details on this calculation. We complement our analysis by using local public accounts data for 1861. While this information is post-treatment, it can provide a good indicator of local conditions at the beginning of the GFZ period.[7]

Post-treatment Outcomes. We check for differences in local economic activity by using information on local public accounts. The modern French national income tax system came into force in 1917 only. Before that, direct tax revenues depended mainly on four main contributions known as the "four old ones" (*quatre vieilles*): the land contribution (*contribution foncière*), the personal-movable contribution (*contribution personnelle mobilière*), the tax on doors and windows (*impôt des portes et fenêtres*), and the patents contribution (*contribution des patentes*). Except for the patents contribution, which was a quota tax on commercial and industrial activities, the other contributions were distribution taxes (*impôts de rèpartition*). That is, the national government set the amount to be collected across the country and this burden was distributed across departments and communes based on indicators of local economic activity and wealth. For example, the land contribution was based on revenues generated by urban and rural land holdings. The distributed amount was known as the local principal. Communes would then charge additional tax cents or *centimes* per franc of principal to collect local tax revenue for local public goods and services (see Appendix B.1 for a more detailed discussion on the matter). Total municipal and local tax revenues have been used as a proxy of departmental and local income before (Montalbo, 2022, 2023).

We obtain information on local public accounts (total municipal revenues, local tax revenues, and local tax base) by digitizing multiple annual editions of the the Financial Situation of the

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[7]Further details on the specific sources used and a summary of the French tax system can be found in the Data Appendix (Appendix B).

Communes (*La Situation Financière Des Communes* - SFC).[8] We complement this with SFC data for three years from Piketty and Cagé (2023). Our data covers all census years between 1881 and 1911, as well as 1878 (first SFC year) and 1914 (last SFC year before WWII). For Haute-Savoie, we also collected the information for all years between 1882 and 1900. We complement this data by entering information from a survey on the local financial situation in 1862. Finally, we digitized the tax roll amounts statements (*Etat du Montant des Roles Généraux*) for census years to have disaggregated information on local tax revenues by type of contribution for all government levels.[9]

We check for changes in sectoral activity by digitizing information on workforce distribution across sectors from the 1891 census. For that census, commune summary tables with data on the number of individuals (and their dependents) by economic activity (e.g., agriculture, commerce, industry) can be found in the ADHS.[10]

We explore the effect on agricultural land use and agro-industrial activity using information from the 1910 Agricultural Survey. We complement our analysis by digitizing data from the 1892 Decennial Agricultural Survey (ADHS, 1892).[11] The survey collected detailed information on municipal agricultural land use and production. From it, we extract data on land use, and production of main crops and animal products.

Finally, we test the effect on manufacturing by digitizing information from the 1881 industrial survey (ADHS, 1881).[12] The survey appears to have been carried out in Haute-Savoie only as an initiative from the departmental prefect. The summary tables by arrondissements list businesses by industry and include firm location. From these, we obtain the number of industrial establishments by commune, including blacksmiths (*forgers*), mills (*moulins*), and sawmills (*scieries*).

Other Covariates. We calculate average elevation and slope for each commune using altitude data from Jarvis et al. (2008). We compute average municipal rainfall and temperature using information from Fick and Hijmans (2017), which aggregates data between 1970-2000.

Table 1 shows the descriptive statistics for our main pre and post-treatment outcomes.

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[8]See Figure A1 for a sample page of the 1901 SFC.

[9]See Figure A2 for a sample page of the 1891 Etat du Montant des Roles Généraux.

[10]See Figure A3 for a sample page of the 1891 census. Summary tables by commune for other census years have not been located and are, most likely, unavailable.

[11]See Figure A4 for a sample page of the 1892 agricultural survey.

[12]See Figure A5 for a sample page of the 1881 industrial survey.

2.2 Empirical Strategy

We estimate the effect of the GFZ using a sharp geographic regression discontinuity (RD) design that exploits the abrupt change in tariff policy at the zone's border. In essence, we compare economic outcomes in communes just inside the GFZ with those just outside, treating the GFZ boundary as treatment cutoff. This design recovers the local average effect of GFZ status at the border—the difference attributable to being on the tariff-exempt side versus the tariff-paying side—while holding constant the broader institutional changes that accompanied Savoy's annexation.[13]

Formally, following (Cattaneo et al., 2024a) on multi-score regression discontinuity (RD) designs, we assume a single treatment effect. In this setting, the RD estimand is:

$$\tau_{RD} = \lim_{d_i \downarrow 0} E\left[Y_{it} | d_i\right] - \lim_{d_i \uparrow 0} E\left[Y_{it} | d_i\right], \tag{1}$$

where Y_i is the outcome in commune i and d_i is the treatment assignment variable. d_i is the minimum distance between commune i's centroid and the treatment border for GFZ communes, and minus that distance for non-GFZ communes. Intuitively, τ_{RD} measures the jump in Y as one crosses from just outside to just inside the GFZ, comparing otherwise similar communes on either side of the border. This captures the total local effect of the policy as implemented, including both the direct benefits of tariff exemption and any local spillover or general-equilibrium effects that arise from the zone's presence. Given that in practice this is the effect that residents and firms experience when a zone is introduced, encompassing secondary impacts as well, this is a first-order estimate we are interested in capturing. We discuss later the effects of possible spillovers and how it affects the "pure" direct measure of creating the GFZ.

Our baseline specification focuses on the segment of the internal customs line that followed the Usses River in Haute-Savoie. This segment arbitrarily partitions the former province of Genevois into a northern, tariff-exempt zone and a southern, tariff-subject area.[14]

We estimate the discontinuity τ_{RD} using local linear regressions and implement the bias-corrected estimator of Calonico et al. (2014b) to select an optimal, data-driven bandwidth selector and obtain

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[13]In practice we implement a RD estimator with a triangular kernel, so observations farther from the boundary remain in the sample but enter with progressively smaller weights.

[14]A later decree in 1899 trimmed and straightened sections of the line, but the Usses segment remained essentially unchanged. To show that these minor revisions do not drive our results, we conduct various robustness checks described in Section 4.

robust standard errors. By focusing on a narrow window around the cutoff, we minimize the influence of any broader spatial trends. Our baseline results report the conventional estimate of τ^{RD} and standard errors, and the robust bias-corrected significance levels (Calonico et al., 2014a). Standard errors are computed using a nearest-neighbor-based variance estimator which is the standard option in Calonico et al. (2014b). Our results are very similar under alternative estimation choices, which we discuss later in Section 4 in conjunction with other robustness checks.

Since our treatment border is relatively smooth, our baseline estimates should be similar to those from previous parametric approaches (Dell, 2010) with bi-variate polynomials in latitude and longitude (Cattaneo et al., 2024b). Nonetheless, as a robustness check, we repeat the RD analysis introducing controls such as latitude and longitude. Most importantly, we also depart from the Calonico et al. (2014b) setting to follow Dell (2010) and compute OLS estimates using a second-order latitude and longitude polynomial and a restricted bandwidth.

The validity of our RD design rests on the assumption that the Usses River border cleanly divides otherwise comparable areas. In other words, absent the tariff regime difference, communes immediately north and south of the river would have evolved similarly. Formally, this means that our empirical strategy is valid if the expected outcomes based on treatment status, $E(Y_i(0)|d_i)$ and $E(Y_i(1)|d_i)$, are continuous in d_i. This may not hold if relevant municipal characteristics vary discontinuously at the GFZ border. Next we provide several pieces of evidence supporting this smoothness condition in this baseline specification.

First, the Usses river separated the treated and control communes within the same department (Haute-Savoie) and were subject to the exact same political and institutional changes during and after the 1860 annexation. All these communes underwent the transition from Kingdom of Sardinia to French rule together, inheriting the new French legal code, tax system, administrative structures within the department, and so on. By design, the only sharp policy difference at the Usses boundary was the customs status where crossing the river meant leaving the French tariff area. This localized comparison thus differences out any annexation-wide shocks or France-vs-Sardinia institutional gaps, isolating the effect of the GFZ's tariff exemption. Any broad changes in governance, education, or infrastructure after 1860 would have affected both sides equally had the GFZ not been created. Aside from this customs policy, we are not aware of any other differential shock hitting neighboring communes in one bank of the Usses and not the other during our sample. Thus, it is

likely that any jump in outcomes at the river line can be attributed to the GFZ regime rather than to unrelated historical events.

Second, roads, bridges and railway maps also show that there were no major infrastructure or market-access advantages skewed to one side of the Usses. The 19th-century transportation network in this region was uniformly underdeveloped, and importantly, the main roads and bridges that did exist tended to span the river rather than stop at it.

Finally and most importantly, we find no evidence of pre-existing disparities. If the GFZ and non-GFZ communes were fundamentally different even before the zone, it would violate the RD's continuity assumption. However, our data on demographics, land use, geography and taxation show smooth trends across the Usses prior to treatment. Table 2 shows the results, which are illustrated graphically in Figure 3 and Figure 4. This holds for both the Usses section of the customs line (Column 1 in Table 2), the treatment border for our main analysis, and for the section of the line which partitions the Haute-Savoie department (Column 2 in Table 2). Our analysis shows that there are no significant discontinuities in demographic characteristics such as population growth and population density in 1858 (Panel A of Table 2). This points towards balance in pretreatment economic conditions (which we further confirm with tax data) and that selective migration was unlikely. There are also no meaningful differences in agricultural land use and per capita production of the main agricultural crops (wheat, oats, and potatoes) at the time of annexation (Panel B of Table 2). Finally, we find no significant meaningful discontinuities in mean temperature, mean rainfall, mean altitude, and mean terrain slope (Panel C of Table 2). These balance tests alleviate concerns about pre-zone migration or sorting. Given observable similarities between both sides and the fact that they entered France together, any annexation-wide shocks would have affected them equally.

We provide further evidence on the lack of meaningful pre-GFZ economic differences by using local public accounts (a proxy for local income and wealth) data for 1861. In particular, we check for differences in the principal for the four main contributions, imposable revenues from land property, and tax roll entries. The information on the principal and entries should have been produced in the second half of 1860, after annexation. However, it should still serve as a relatively good proxy for local economic conditions when the GFZ was created. In 1861, municipal authorities could have charged additional taxes (*centimes*) over the principal of direct contributions in

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response to expectations of greater economic activity in the GFZ. Nonetheless, the principal itself is less likely to have been modified substantially to reflect economic changes produced by the GFZ. This reasoning can also be extended to the number of entries in the 1861 roll.

Table 3 shows the results for 1861 local public account data. We find no statistically significant discontinuities. There is no evidence of an effect on the per capita principal from direct contributions, on the natural logarithm of per capita imposable revenue from land properties, and on entries in the tax roll for each contribution. The lack of meaningful differences for the first two outcomes is illustrated graphically in Figure 5. This, together with the previous results, suggests similar levels of economic activity on both sides of the border.

3 Analytical Framework

How can the GFZ trade regime affect local economic activity and municipal revenues? While other mechanisms may be at play, we distinguish consumption-side and production-side channels and discuss their impact on outcome variables for which we have data:

Consumption channel: Lower living costs.   Because the GFZ lay outside the French customs zone, GFZ consumers did not have to pay tariffs on goods coming from Switzerland (or anywhere else). By the beginning of WWI, Swiss imports to the GFZ were valued at more than 10 million francs, 34% of which were retail products (Kinossian, 2014). Assuming competitive pass-through, as research shows it occurs (Irwin, 2019; Fajgelbaum et al., 2020), where changes in landed costs fully translate into changes retail prices, removal of these tariffs would directly increase real household purchasing power. Indeed, it is argued that, in the GFZ, purchasing power was between 15% and 20% higher than in the French interior (Kinossian, 2014).

Higher real incomes should expand demand for normal local public goods (roads, sanitation, schooling)[15]; and thus communes should respond by having preferences for higher additional centimes, so we expect municipal-revenue and local-tax rates to rise even without any change in sectoral production. Direct indicators of demand for public spending, direct price or wage micro-data are unavailable, so we rely on the tax side–the four direct taxes–as a proxy for shifts in household

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[15]Commune-level public provisions are left to the commune's authorities

real income.

Production channel 1: Cheaper imported inputs (cost-side shock). Duty-free entry of Swiss inputs of production such as machinery and fertilizer, lowers the unit-cost curve of GFZ producers who employ those inputs. This boosts net profitability and real incomes, increasing local tax revenues in the same way than the channel on lower living costs.

Regarding agricultural and industrial output, we may observe that these rise if complementary bottlenecks (such as water-power or fuel) are slack. This itself can further increase local activity and local taxes. For example, On the other side, if they bind, output production could remain flat while profits still climb.

Academic literature has shown cheaper inputs play a very important role. For example, Amiti and Konings (2007) demonstrate significant increases in productivity that arise from lower tariffs on input prices. Farrokhi and Pellegrina (2023) show similar results for agriculture as farmers adopt modern technology and boost profits. New imported varieties that arise from tariff liberalization can also help reduce the the effective input price, boost productivity and help firms introduce new products (Goldberg et al., 2010; Halpern et al., 2015).

Finally, the outcome on sectoral shares is also ambiguous. If France had the same tariffs for inputs used in industry or farming (leaving aside output prices for discussion as a different channel), the relative price of agriculture versus industry does not need to change due to changes in input prices and therefore we should not observe changes in factor reallocation, such as labor shares. However, if a certain industry experiences higher cost savings due to either differential initial tariff removal or due to differences in the input mix between tradeables and non-tradeables, then the relative prices of agriculture and industry may change and shift labor towards the most profitable sector.

Production channel 2: Import competition in manufacturers. As France tried to protect its industry, tariffs on final industrial products were larger than those on agricultural products. Hence, the GFZ could have generated a particular decrease in final industrial products compared to agricultural ones. This decreases profitability in the industrial sector. Hence, while industrial establishments in the French interior could have developed due to the protection granted by the customs border,

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GFZ industrialists may have been unable to compete in a free trade environment. If this channel outweighs the cost savings from reduction in input prices, we should observe that tax receipts from patents, which tax commercial and industrial establishments, should decline.

Furthermore, if this channel dominates, we should observe a decrease in industrial output and establishments, while agriculture may absorb displaced labour, raising farm output. Similarly, labour shares should shift away from industry towards agriculture or local services.

However, research also suggests that import competition can drive innovation and quality upgrading as firms seek to escape competition. Medina (2024) shows that Peruvian firms facing Chinese import competition successfully reallocated resources toward high-quality production and exports. Applied to the GFZ context, Swiss competition might have similarly spurred innovation and specialization among GFZ manufacturers, partially offsetting the direct competitive displacement effects. In such case, we could also observe innovation or higher quality output in either industry or agriculture.

Production channel 3: France's interior-tariff asymmetry favouring agriculture. A third mechanism operates through the trade regime's impact on the allocation of labor and capital within the GFZ, driven by differential export access to the broader French market. Throughout this period, agricultural goods originating from the GFZ enjoyed relatively easier access to France's internal market compared to industrial products. This preferential treatment notably included agro-industrial activities–such as milling and cheese production–which were classified as agricultural products for tariff purposes (Paul-Dubois, 1912).

Although industrial enterprises established after the annexation were officially excluded from duty-free access, in practice this restriction was not enforced until the 1890s. A significant policy shift occurred when a decree in 1893 explicitly limited duty-free interior market access solely to enterprises established prior to that date. Critics of the GFZ frequently cited this policy shift as evidence that the trade regime disproportionately advantaged agriculture at the expense of industrial development. Consequently, the tariff regime effectively elevated prices received by farmers in the interior market relative to those obtained by industrial establishments, thereby skewing investment incentives and profitability toward agriculture.

The mechanism just described becomes even more powerful once national tariff policy turned

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decisively protectionist. As described in Section 1, through the Méline law, tariffs on agricultural products in particular saw a significant increase, with the new maximum tariffs being between 15% to 30% (Le Monde, 2014). However, this law did not apply to GFZ products. Therefore, GFZ producers could still import duty free from Switzerland while selling their products inside price at the higher, tariff-protected prices. This therefore could have widened the gap between output prices and input costs, pushing farm profits even higher.

To sum up, the effect of France's interior tariff asymmetry policy would then be to decrease the number of manufacturing establishments, while potentially increasing agro-industrial or purely agricultural activities. Consequently, the impact on municipal revenues due to resource reallocation is ambiguous. On the one hand, increased agricultural activity should raise revenues from taxes on non-built land properties. On the other hand, if the decline in manufacturing outweighs the growth in agro-industrial establishments, the overall contribution from industrial patents is likely to decline. Similarly, labor allocation is expected to mirror these changes: employment should shift away from manufacturing toward agricultural and agro-industrial sectors.

However, from 1895 onwards, when Méline duties were fully established, the potential benefits in agriculture should drive higher profits and therefore increase local tax revenues. While we would like to observe the yearly effects on agricultural and industrial production by year, we only count with local tax revenues by year. Therefore in the next section we only analyze this channel through yearly local tax revenues.

Production channel 4: Preferential access to Swiss markets after 1881. In 1881, the Franco-Swiss Trade Convention gave preferential access to certain GFZ goods (mostly agricultural) by granting more favorable tariffs. This means that zone's producers could sell the allowed products to Switzerland at world prices (or close to these), whereas neighbouring non-GFZ communes still paid the usual Swiss import tariff. Hence, the convention raises the output price received by GFZ exporters without changing their input costs and therefore may have increased real income in the GFZ relative to bordering areas in the French custom zone. It also generates preferential treatment of some agricultural products relative to industrial ones.

If this channel is strong enough, which may not be given that as discussed in Section 1, preferential treatment covered barely a quarter of the zone's exports, we should expect a distinct, post-1882

jump in our outcomes. First, we should expect higher local tax revenues through an increase in real income from GFZ exporters that benefited from the convention. Second, in terms of agricultural output, we should observe that benefited farmers now have additional incentives to expand their production and possibly upgrade into higher-value processed goods. Thus, there should be an acceleration of agricultural production and agro-industrial establishments during 1880s. As of industrial output, it may not benefit as much, and thus should not observe an increase of similar magnitude than agriculture. Finally, employment should drift toward farming and agro-processing, boosting the agricultural share while holding down the growth of sectors that did not benefit from the trade convention.

4 Results

We first explore the effect of the GFZ on direct tax revenues. We estimate the impact on per capita municipal revenues, local tax revenues and the local tax base.[16] These measures are based on the four main direct contributions of the pre-WWI French tax system. These, in turn, depend on indicators of local economic activity and wealth (see Appendix B.1 for details). The closest reflection of local wealth are the local tax revenues. Local tax revenues measure the francs collected by each commune through additional centimes (local tax cents) approved by its municipal council, approximating the francs collected by each commune from its residents to finance both ordinary expenditures (e.g. road maintenance, sanitation) and extraordinary outlays (e.g. public school co-financing). Because these additional cents required prefectural approval, the resulting revenues reflect the commune-level willingness to pay for public goods—making local tax revenues a direct proxy for real-income-driven demand for local services.

Figure 6 shows a clear positive jump at the GFZ border for all three series, especially local tax revenues. Table 4, Table 5 and Table 6 report estimates for the period between 1878 and 1914, as well as decade estimates for per capita municipal revenues, local tax revenues, and the local tax base, respectively. In addition, we report coefficients for 1862 (year in which a survey of municipal accounts was carried out) and 1878 (the first year the SFC was published).[17] While there were no significant effects in our proxy year for the annexation (1862), over 1878–1914, average per capita

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[16]See Appendix B.2 for data sources and construction

[17]As stated in Appendix B.2, we cannot compute local tax revenues for 1862.

municipal revenues, local tax revenues, and local tax base increase by 0.56, 1, and 0.35 standard deviations, respectively. Gains persist from 1878 until the onset of WWI.

These patterns could reflect lower living costs boosting households' willingness to pay for public services, as well as cheaper Swiss machinery and inputs increasing profitable activity.

Decade estimates reveal important distinctions between municipal revenues, local tax revenues, and the underlying tax base. Municipal revenues exhibit greater volatility, as they include supplementary income sources–such as communal property rents and user fees–in addition to tax cents.[18] By contrast, local tax revenues track only the francs collected from additional centimes and rise smoothly from 0.68 standard deviations in the 1880s to 1.2 standard deviations in the 1910s.

The tax base, which captures each commune's principal liability (i.e. the base over which additional centimes are applied), adjusts more slowly and peaks in the 1890s. This lag reflects its dependence on lagged cadastral valuations and departmental budget allocations. More specifically, national budget laws first set the department's total principal liability based on the previous year's revenues (and what the nation wanted to collect). Next, authorities allocate that liability among communes using historic tax-roll averages and property valuations, which often trail actual economic conditions. As a result, the tax base incorporates GFZ-driven income gains only gradually.[19]

We now turn to the year-by-year decomposition of local tax revenues. Figure 7 plots RD estimates of the per-capita local tax revenues for each year from 1881 to 1901. On a yearly basis, we confirm that the estimates are all positive and statistically significant with a trajectory that is broadly flat until 1895 and then accelerates starting then.

The post-1895 surge is most plausibly linked to the benefits the Meline tariffs likely brought to the agricultural sector. As we described in Section 3, France adopted a protectionist stance while GFZ products could mostly enter duty-free to France's interior. Hence, GFZ producers, still able to sell duty-free inside France yet source cheaper inputs across the Swiss border, could have seen significantly higher profits and with this, spur local economic activity and local tax revenues after

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[18]The effect for 1920s (which includes data for 1920 and 1923), while positive and statistically significant should be interpreted with caution. As noted in Appendix B.2, for various reasons including distortions generated by WWI, municipal revenues increased dramatically in the 1920s. Hence, the estimate, mean and standard deviation for that decade are not directly comparable to previous years.

[19]For distribution taxes (all but patents), departmental authorities split the department's principal across communes. While this division was supposed to reflect current local conditions and departmental authorities had a degree of discretion over the principal, they often relied on past taxable revenues.

1895.

By contrast, the Franco-Swiss trade convention of 1881 (implemented 1883) did not seem to have any significant visual effect on local tax revenues. However, its 1895/1908 enlargements could have contributed to the larger local tax revenues though these may have occurred due to the Meline tariffs (particularly because barely a quarter of zone exports qualified for Swiss duty preferences).

Direct Tax Revenue by Contribution.   Having established in the preceding subsection that GFZ communes experienced a significant rise in overall direct tax receipts, we now turn to examine the composition of this increase. Specifically, we disaggregate total tax revenues—that is, the combined receipts from all levels of government (national, departmental, and local)—into their four constituent components: land, personal-movable, patents, and door-and-window taxes.

Table 7 shows the estimates for total revenue from all contributions alongside land tax by year. These results are illustrated graphically in Figure 8 and Figure 9. The effects mirrors those for local accounts discussed before: in 1862, we find no significant discontinuities in the total amount to be collected and the land contribution revenues; by 1881 and 1891, however, both show marked and statistically significant increases in GFZ communes. This pattern is consistent with a gradual strengthening of the GFZ's fiscal impact over time relative to their non-GFZ counterparts.

The estimates for other contributions are reported in Table 8. While the effects for the personal-movable and patents contributions are not statistically significant, we do observe an upward trend in their coefficients over time. For instance, the personal-movable contribution estimate rises from –0.13 to 0.41 standard deviations between 1862 and 1891. These changes suggest that the fiscal impact of the GFZ may have extended beyond land taxation in later years.

That said, the land contribution clearly dominates the overall pattern. As shown above, the land tax not only contributes the largest gains in absolute terms but also exhibits the strongest relative effect. A larger effect in absolute terms is to be expected, as the land tax was the most important one revenue-wise out of all four. However, the land tax also exhibits the largest effect in relative terms by a significant margin. In 1881 and 1891, the estimated effects on land tax revenue are equivalent to 1.12 and 0.75 standard deviations, respectively—substantially larger than the effects for the other contributions. Within the land contribution, the effect is almost entirely driven by an

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increase in tax revenues from non-built properties.[20] Since non-built land is related to agricultural activities, these could have occurred due to preferable treatment of agriculture where land may be capturing expected profits in this sector.

Robustness Checks. We check for the robustness of our main estimates under various specifications. We include covariates, change assignment variable, and vary the assignment variable polynomial and estimation bandwidth. The results reported in columns 2 to 6 of Table 9 show that our estimates are robust. In particular, we find no significant differences when we depart from the Calonico et al. (2014b) approach to follow (Dell, 2010) and compute OLS estimates for an indicator variable for the zone controlling for a second-order latitude and longitude polynomial.

In addition, we explore whether our results hold when including split communes taken away from our baseline sample, and when using extended segments of the treatment border. Regarding the latter, we repeat our analysis using the border sections which partition the former province of Genevois and the department of Haute-Savoie (i.e., the whole GFZ customs border which does not follow departmental boundaries). We observe similar results. The only difference is that, for the extended treatment boundaries, the estimate for municipal revenues is not statistically significant, though we still observe significant and sizable effects for local tax revenues and local tax base.

, while we are interested in capturing the total equilibrium effect of the GFZ, which includes the pure direct effect plus spillovers, Section 4.3 discusses the possible impact of spillover effects. In sum, we argue that the estimates above are likely a lower bound to the pure direct effect.

4.1 Agricultural and Industrial Activity

Did the GFZ regime boost direct-tax revenues by expanding agricultural and industrial activity, and did it change the local economic mix? Although the list of channels is not exhaustive–and the data do not let us pin down their individual weights–Section 3 outlines several forces that may have operated at once. *Lower living costs* and *duty-free Swiss inputs* could have fostered growth in both sectors, while *preferential access to Swiss buyers* and *France's interior-tariff policy* may have particularly encouraged agriculture. Additionally, stronger competition from finished Swiss goods could have displaced certain industries.

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[20]The split between non-built and built properties was not reported in 1881 or before.

Workforce distribution. We provide quantitative evidence on these arguments by first checking the distribution of the workforce and their dependents across the main economic sectors according to the 1891 census. Table 10 and Figure 10 show the results, both in table format and RD plot. A key takeaway is the reallocation of population away from public administration and toward other sectors. Specifically, there is a drastic drop of 9.2 percentage points in the share of the population involved in public administration. As expected, there is an increase in public servants near the customs line on both sides of the border, with a larger rise on the non-GFZ side. This can be explained by French customs officials living in bordering communes. However, the estimate is not only capturing a negative effect around the border. Further away from the line, the pattern of results is similar, where the percentage of the population involved in public administrative is lower in the GFZ relative to comparable communes outside it. This shift is consistent with greater economic opportunity in the private sector, potentially driven by higher real incomes or improved profitability due to cheaper inputs, as discussed in Section 3.

The workforce did not shift into commerce but rather into agriculture and industry. The share of the population in industry rose by 4.8 percentage points–around 0.4 standard deviations–but this estimate is not statistically significant, possibly due to limited power given the sample size. The increase in agriculture shows a similar pattern. When combining agriculture and industry, the GFZ shows a statistically significant gain of 8.9 percentage points (0.8 standard deviations), suggesting a meaningful reallocation of labor toward the private sector. This shift is consistent with mechanisms such as reduced living costs and cheaper imported inputs improving the relative returns to private-sector work. The absence of a decline in industrial employment, despite greater exposure to Swiss goods, also suggests that import competition did not significantly harm local industry in this setting.

Agriculture. Agriculture dominated the local economy on both sides of the border, and our RD estimates for 1892 and 1910–each derived from distinct data sources due to availability–paint a consistent picture of mostly small land-use adjustments accompanied by strong growth in agro-processing.

The 1892 results (Table 12), based on agricultural census data, show an 11.9 percentage-point increase (more than one standard deviation) in the municipal area devoted to wheat, while oats and potatoes display no clear discontinuity. This rise in wheat cultivation suggests farmers may have

reallocated land toward certain higher-value staples. However, the local agricultural statistics from 1910 (Table 11) indicate that acreage dedicated to major crops remained small and statistically unchanged, with a similar stagnation observed in livestock numbers. The limited responsiveness in land use and livestock suggests the presence of other bottlenecks constraining agricultural capacity, even though reduced input costs from Switzerland, along with tariff concessions for agriculture from both Switzerland and France's interior, would have nonetheless improved net returns.

Yet, agro-industrial establishments, data for which there is only data for 1910 and comes from local agriculture statistics, surged by 6.3 per 1,000 inhabitants (over one standard deviation)–a large and statistically significant jump. Disaggregating by type shows positive (though insignificant) increases in both mills and dairy facilities. This expansion in agro-industry is consistent with higher disposable income from lower cost of living, cheaper and possibly a larger variety of Swiss inputs going into agriculture. Moreover, possible competition in the manufacturing sector could have motivated firms to innovate with higher quality agricultural produce by opening agro-industrial establishment (akin to Medina (2024)). These results are also in line with asymmetric agricultural benefits resulting from tariff policies of Switzerland and France's interior with the GFZ. In particular, this growth aligns with Méline's tariffs introduced in 1894. Under these tariffs, agricultural products imported from other countries faced significant duties. However, goods originating within the GFZ were exempt from these tariffs. Consequently, local agro-industrial producers gained a distinct competitive advantage.

Industry. Information on industrial activity is relatively limited, but the 1881 Haute-Savoie industrial survey, which lists of all manufacturing units by type of activity and includes information on location, still shows an effect of the GFZ. Table 13 shows a positive and statistically significant discontinuity in the total number of manufacturing units per capita, driven partly by an increase in carpentry workshops (Figure 12). Point estimates for other important industrial establishments, including large-scale mills and sawmills, are also positive, although not statistically significant.

This expansion in manufacturing units could have stemmed from increased economic activity and improved profitability, driven by lower living costs and reduced prices for imported inputs. In contrast, the data offer little support for the import-competition channel being a dominant factor: if finished Swiss products had crowded out local makers, we would expect a fall, not a rise, in

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workshop numbers. Concessions from France's interior, and to a lesser extend by Switzerland after the Swiss-Franco Convention, applied mostly to agriculture, so they are unlikely to explain the industrial uptick.

4.2   Population Growth

Could the GFZ's advantages have translated into faster population growth? It is plausible that potential lower living costs and new job opportunities may have attracted residents from neighboring communes. Ex-ante, this seems unlikely. Most communes on both sides of the border were relatively rural with limited commercial and industrial activity compared to other French departments. Migration at the time usually implied moving from the countryside to large cities. Moreover, given the agricultural nature of the area, for most locals, moving from one side of the border to the other would have implied buying agricultural plots on the GFZ side. Liquidity constraints and local agricultural community attachment may have dissuaded potential movers.

Table 14 reports the effect of the GFZ on annual population growth rates for various periods. Figure A10 illustrates by census cycle. For the full post-annexation period (1861-1911) we find no effects: the point estimate is near zero and these are not significant. From 1891 onward, the coefficient is marginally positive, with two cycles–1896-1901 and 1906-1911–showing more meaningful positive jumps (though not significant). However, in general, we do not find significant discontinuities nor a consistent pattern.

4.3   Spillover Effects

The RD design is intended to capture the total local effect of the GFZ policy–that is, the immediate benefits to treated communes plus any indirect spillovers onto nearby areas. In practice, this total local equilibrium impact is most relevant for policymakers, since it reflects what residents and firms actually experienced when the zone was introduced. Therefore, we were mostly interested in this estimation and this is what the previous sections have focused on.

However, if one were instead interested in the pure direct effect of tariff exemption alone, then spillovers to the control side would complicate interpretation. Positive spillovers (benefits leaking into untreated communes) would cause the observed RD gap to understate the zone's direct gains,

whereas negative spillovers (harms to neighbors) would inflate the RD estimate beyond the direct effect. We next estimate possible spillover effects and then discuss four plausible spillover channels – assessing for each whether it would bias the RD estimate upward or downward – and describe how our design and historical context mitigate these concerns.

To approximate the presence of spillovers, we conduct two tests. The first involves eliminating communes within 4 kilometers of the GFZ border, both treated and untreated, and re-estimating our RD model. The choice of 4 kilometers balances the objective of removing potentially contaminated areas against the significant reduction in effective observations (leaving only 36% of the original effective sample). The intuition behind this test is that if spillovers primarily affect communes near the border–due, for example, to labor mobility, smuggling, or informal trade–removing these observations should alter our estimates significantly. The second test has a similar idea and compares outcomes within non-GFZ communes only, examining whether those closest to the GFZ border (within 4 kilometers) differ systematically from those further away.

Interpreting these spillover tests require cautions. They require significantly stronger assumptions that may not hold. Our baseline RD approach leverages quasi-random assignment within a tight bandwidth around the 1860 customs line, ensuring credible comparability between treated and untreated communes. In contrast, the spillover tests inevitably weaken this logic: trimming the 4-kilometer buffer discards precisely the communes that anchor local randomization, and analyzing only control communes abandons the RD framework entirely, assuming comparability between nearby and distant untreated communes. Moreover, given the limited historical data, removing nearest neighbors dramatically reduces effective sample size and significantly reduces statistical power. As we explain later, this also means that we cannot conduct spillover tests over some variables as we lack sample size.

Table 15 presents our results on local tax revenues, municipal revenues, and the local tax base. Comparing Panel A (baseline) with Panel B (trimmed RD, excluding communes within 4 km of the border), we observe that the coefficient for local tax revenue doubles, and municipal revenue nearly triples, remaining statistically significant. This suggests that if spillovers existed, they likely benefited non-GFZ communes near the border. Consequently, our baseline results could represent a lower bound of the true direct effect of the GFZ, had spillovers not occurred. For the local tax base—a naturally lagging measure dependent on cadastral updates—the trimmed RD shows only

an 8% increase. However, an important caveat is the substantial reduction in effective observations, which are the observations that meaningfully contribute to the RD treatment-effect estimation given the kernel weighting and bandwidth. Effective observations dropped by 64%, from 146 (75 non-GFZ, 71 GFZ) in the baseline to 53 (28 non-GFZ, 25 GFZ) in the trimmed specification, limiting our ability to trim further. This severe reduction, coupled with historical data constraints, prevented us from reliably conducting spillover tests on other outcomes such as agricultural and industrial employment shares, as well as manufacturing and agricultural production, since effective observations fell (fewer than 25 observations, and in some cases below 10 observations).

Panel C of Table 15 provides a complementary OLS analysis, comparing non-GFZ communes located within 4 km of the border to those situated between 4 and 15 km away. The logic here is that, if spillovers occurred, communes closer to the border would experience significantly different outcomes. However, we find no statistically significant differences, and the coefficients are small in magnitude. Nevertheless, interpreting this result requires caution, as it relies on the assumption that nearby and more distant communes are directly comparable. This is possibly not the case and the reason that motivated our original RD design.

Overall, these tests indicate that our main RD findings are unlikely to be driven by spillovers. If anything, spillovers may have actually attenuated our baseline estimates by positively benefiting nearby control communes. To further understand these dynamics, we next discuss potential spillover channels in detail. Given data limitations, we rely primarily on our econometric estimates and historical accounts to illustrate these mechanisms.

Informal Trade and Smuggling. A first potential spillover is informal cross-border trade. GFZ communes could import cheap Swiss goods duty-free, creating an incentive for smuggling into adjacent non-GFZ communes. Indeed, historical sources mention that since prices were significantly cheaper in the GFZ, some smuggling took place. Smugglers would purchase some goods in the GFZ and sell them in French markets outside the zone (Paul-Dubois, 1912; Annecy-Ville, 2023). If residents of non-GFZ communes accessed cheaper salt, coffee, sugar, and other goods via the zone, their cost of living should have fallen, generating a positive spillover that would bias the RD estimate downward (diminishing the observed gap). This would make the RD estimate a lower bound to the net effect of the zone.

Labor Mobility. A second channel is labor mobility. In theory, industries in GFZ communes might attract job-seekers from just outside. Such movement would transfer some benefits to the non-zone side (if workers brought income home) but could also drain their most productive labor (a negative spillover). However, as shown earlier, we find no evidence of in-migration into GFZ communes. As previously suggested, the area's predominantly agricultural profile may help explain this pattern. Hence, our estimates are unlikely to capture labor-market spillovers.

Market Competition and Displacement. A third channel is market competition. On the one hand, producers within the zone might have out-competed or displaced businesses located just outside it, as the GFZ provided GFZ communes with advantages such as access to a larger Swiss market and cheaper inputs. This competitive edge could have attracted customers and economic activity away from the non-GFZ side of the Usses river, having a positive effect on our estimates. On the other hand, the GFZ's trade policy imposed disadvantages on zone producers selling industrial goods to the French interior, due to France's protective stance that led to higher tariffs on such products. As such, some argued the GFZ would be disfavourable for industries since both the Swiss and French market would be closed for them (Paul-Dubois, 1912). Consequently, some producers might have relocated from the GFZ to the interior of France to avoid these tariffs, resulting in downward pressure on our estimates compared to a scenario without such spillovers. However, it is likely this spillover is very limited. Had a substantial number of firms moved across the border, we would expect a correspondingly large rise in population. Yet no such demographic surge appears in the data. Both sides of the GFZ border near the Usses remain predominantly agricultural, and the industrial growth within the GFZ that we observe is concentrated in carpentry and other agriculture-related activities.

Fiscal policies. One could imagine that the GFZ could also create possible spillovers through fiscal channels. These could arise when the contributions of some communes to their departmental revenues change in proportions that differ from the department's spending share on them.

The institutional design of French departmental finance sharply limits the scope for fiscal spillovers in either direction. Each commune is first assessed a fixed principal liability, calibrated to its share of previous tax rolls (mostly affected by cadastral values, which lag, as shown by our

results on the principal). After that, the department council can vote to add the same small percentage on top of every commune's bill to pay for shared departmental projects like roads that span across communes. Because the rate is identical across the department, richer (and, after 1860, faster-growing) GFZ communes automatically contribute more francs, but strictly in proportion to their lagged determined principal. Expenditures, by contrast, must be of general departmental interest; with expenditures satisfying a prefectural countersignature and a council majority that spans all arrondissements. Importantly, any one-sided spending could be questioned by those negatively affected as not truly departmental.

Within this framework, a positive spillover to non-GFZ communes could arise if (i) GFZ prosperity enlarged the common pool and (ii) the council devoted the additional funds to projects that non-GFZ communes also use, such as river bridges or feeder roads. Given the GFZ's communes saw a natural increase in their share and expenditures must be benefitial to the department as a whole, it is likely that the extra revenue generated by GFZ communes contributed to common public goods used by non-GFZ commues. This would make our estimated treatment effect a conservative lower bound of the direct effect without fiscal policies spillovers.

Conversely, a negative spillover that inflates the measured GFZ impact would require the council to steer a disproportionate share of the common revenues back into the GFZ while the rest of the department continued to finance its uniform fraction of the levy. Doing so would entail classifying GFZ-only works as "general interest," in addition to prefectural reviews. As discussed, this is unlikely and could be questioned by the parties negatively affected by this. Hence, these revenue and spending rules imply that departmental fiscal spillovers, if anything, are likely to run from GFZ to non-GFZ communes.

5   Conclusion

This paper studies the long-run effects of trade liberalization on local economic activity. To identify these impacts, we leverage the quasi-random partition of the department of Haute-Savoie by the French customs line after its annexation to France in 1860. We collect a unique dataset with newly digitized information on municipal-level outcomes for the post-annexation era until the onset of WWI.

Our results show, that the GFZ had a positive effect on direct tax revenues. From the late 1870s until the onset of WWI, we find a positive and sizable impact on municipal revenues, local tax revenues, and the value of the local tax base. The increases in these measures point to greater real incomes leading to more wealth accumulation, as the French tax system was based on four main tax contributions which were meant to capture local economic prosperity. We explore the impact by type of contribution and show that the effect on tax revenues can be explained by greater land tax collection.

We then examine the effect of the GFZ on sectoral activity. We find that the GFZ led to a shift in the distribution of the workforce away from public administration into other sectors. Regarding agricultural activity, while there are no significant effects in land use, there is evidence of greater agro-industrial activity. This is consistent with our main finding on direct tax revenues and point to lower living costs and cheaper inputs leading to greater wealth and capital accumulation. With respect to manufacturing, there is evidence of greater activity as we find positive impacts on the relative number of manufacturing establishments.

These results illustrate the meaningful consequences of trade liberalization on long-run local economic activity. However, our research design has certain limitations. This should be considered when interpreting our findings and when extending them to other contexts. Historical regression discontinuity designs usually involve a lower number of observations relative to more modern settings with individual or census-tract data. Hence, our estimates will not be as precise. Moreover, the use historical data is more prone to measurement error due to mistakes at the collection and digitization stages. Nonetheless, we consider our results to be informative for the debate on trade policy.

References

ADHS (1857): "Tableau de l'imposition locale par commune," Archives Départementales de Haute-Savoie: 6 FS 33.

——— (1858): "Bilan d'après les budgets de 1858," Archives Départementales de Haute-Savoie: 6 FS 42.

——— (1860): "Questionnaire agricole et industriel par communes - Etats communaux," Archives Départementales de Haute-Savoie: 6 M 930 - 933.

——— (1862): "États de la situation financière des communes du département," Archives Départementales de Haute-Savoie: 6 M 985.

———— (1881): "Statistique industrielle de 1881 - Tableaux récapitulatifs par types d'établissements et par communes," Archives Départementales de Haute-Savoie: 6 M 678 - 6 M 681.

———— (1892): "Enquête de 1892 - Tableaux synoptiques des réponses par communes," Archives Départementales de Haute-Savoie: 6 M 665 - 6 M 668.

ADS (1868): "Situation financière: 1862-1868," Archives Départementales de la Savoie: 4 O 5.

AMITI, M. AND J. KONINGS (2007): "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia," *American Economic Review*, 97, 1611–1638.

ANNECY-VILLE (2023): "L'histoire des contrebandiers en Haute-Savoie," .

ATKIN, D. AND D. DONALDSON (2015): "Who's Getting Globalized? The Size and Implications of Intra-national Trade Costs," .

AUTOR, D. H., D. DORN, AND G. H. HANSON (2013): "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," *American Economic Review*, 103, 2121–68.

BENTO, P. (2021): "Trade without "scale effects"," *Canadian Journal of Economics/Revue canadienne d'économique*, 54, 1252–1274.

BLANC, J. (1898): *Histoire des principes de la répartition et de la quotité dans l'impôt direct*, V. Rivière.

BLOCH, H.-S. (1940): "The Evolution of French Taxation—An Historical Sketch," *The Bulletin of the National Tax Association*, 25, 266–273.

BOUCHARD, L. (1871): "Les budgets du Second Empire et le régime financier en France," *Revue des Deux Mondes (1829-1971)*, 91, 212–242.

CALONICO, S., M. D. CATTANEO, AND R. TITIUNIK (2014a): "Robust Data-driven Inference in the Regression-Discontinuity Design," *Stata Journal*, 14, 909–946.

———— (2014b): "Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs," *Econometrica*, 82, 2295–2326.

CATTANEO, M. D., N. IDROBO, AND R. TITIUNIK (2024a): *A Practical Introduction to Regression Discontinuity Designs: Extensions*, Cambridge University Press.

CATTANEO, M. D., R. TITIUNIK, AND R. YU (2024b): "Estimation and Inference in Boundary Discontinuity Designs," Tech. rep., working paper.

CLEMENS, M. A. AND J. G. WILLIAMSON (2004): "Why did the tariff–growth correlation change after 1950?" *Journal of Economic Growth*, 9, 5–46.

CONSEIL GÉNÉRAL DE LA HAUTE-SAVOIE (1862): *Rapport du Prefet et PRoces-Verbal des Seances*, Annecy: Louis Thesio.

DELL, M. (2010): "The persistent effects of Peru's mining mita," *Econometrica*, 78, 1863–1903.

DIX-CARNEIRO, R. AND B. K. KOVAK (2017): "Trade Liberalization and Regional Dynamics," *American Economic Review*, 107, 2908–46.

DONALDSON, D. (2018): "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure," *American Economic Review*, 108, 899–934.

DURANTON, G., P. M. MORROW, AND M. A. TURNER (2014): "Roads and Trade: Evidence from the US," *The Review of Economic Studies*, 81, 681–724.

FABER, B. (2014): "Trade Integration, Market Size, and Industrialization: Evidence from China's National Trunk Highway System," *The Review of Economic Studies*, 81, 1046–1070.

FAJGELBAUM, P. D., P. K. GOLDBERG, P. J. KENNEDY, AND A. K. KHANDELWAL (2020): "The Return to Protectionism," *The Quarterly Journal of Economics*, 135, 1–55.

FARROKHI, F. AND H. S. PELLEGRINA (2023): "Trade, Technology, and Agricultural Productivity," *Journal of Political Economy*, 131, 2509–2555.

FERRERO, M. (1918): *Genève, Gex et Savoie. Neutralité Douanière. Les Zones Franches*, L. Barnéoud.

FEYRER, J. (2019): "Trade and Income—Exploiting Time Series in Geography," *American Economic Journal: Applied Economics*, 11, 1—-35.

FICK, S. AND R. HIJMANS (2017): "WorldClim 2: new 1km spatial resolution climate surfaces for global land areas," *International Journal of Climatology*, 37, 4302–4315.

FLÜCKIGER, M., E. HORNUNG, M. LARCH, M. LUDWIG, AND A. MEES (2021): "Roman Transport Network Connectivity and Economic Integration," *The Review of Economic Studies*, 89, 774–810.

FOLLIET, A. AND C. DUVAL (1902): *La Vérité sur la Zone Franche de la Haute-Savoie*, Raffin.

FRANKEL, J. A. AND D. ROMER (1999): "Does Trade Cause Growth?" *The American Economic Review*, 89, 379—-99.

GOLDBERG, P. K., A. K. KHANDELWAL, N. PAVCNIK, AND P. TOPALOVA (2010): "Imported Intermediate Inputs and Domestic Product Growth: Evidence from India," *The Quarterly Journal of Economics*, 125, 1727–1767.

HALPERN, L., M. KOREN, AND A. SZEIDL (2015): "Imported Inputs and Productivity," *American Economic Review*, 105, 3660–3703.

HILLBERRY, R. AND D. HUMMELS (2008): "Trade responses to geographic frictions: A decomposition using micro-data," *European Economic Review*, 52, 527–550.

HOLMES, T. J. (1998): "The Effect of State Policies on the Location of Manufacturing: Evidence from State Borders," *Journal of Political Economy*, 106, 667–705.

IRWIN, D. A. (2002): "Interpreting the tariff–growth correlation of the late 19th century," *American Economic Review*, 92, 165–169.

——— (2019): "Tariff Incidence: Evidence from U.S. Sugar Duties, 1890–1914," *National Tax Journal*, 72, 599–616.

JARVIS, A., H. REUTER, A. NELSON, AND A. GUEVARA (2008): *Hole-filled seamless SRTM data V4*, International Center for Tropical Agriculture, www.diva-gis.org/gData.

JUHÁSZ, R. (2018): "Temporary protection and technology adoption: Evidence from the napoleonic blockade," *American Economic Review*, 108, 3339–3376.

KELLER, W. AND C. H. SHIUE (2014): "Endogenous Formation of Free Trade Agreements: Evidence from the Zollverein's Impact on Market Integration," *The Journal of Economic History*, 74, 1168–1204.

KINOSSIAN, Y. (2014): "Frontières à l'intérieur, frontières à l'extérieur: les portes lémanique et alpine, 1848–2013'," *Histoire économique et sociale de la Savoie de*, 23–80.

KOVAK, B. K. (2013): "Regional Effects of Trade Reform: What Is the Correct Measure of Liber-

alization?" *American Economic Review*, 103, 1960–76.

LAMPE, M. AND P. SHARP (2013): "Tariffs and income: a time series analysis for 24 countries," *Cliometrica*, 7, 207–235.

LE GRIX, H. (1905): *Les zones franches de la Haute-Savoie et du pays de Gex*, L. Larose & L. Tenin.

LE MONDE (2014): "Jules Méline (1838-1925), chantre du protectionnisme," .

MEDINA, P. (2024): "Import Competition, Quality Upgrading, and Exporting: Evidence from the Peruvian Apparel Industry," *The Review of Economics and Statistics*, 106, 1285–1300.

MONTALBO, A. (2022): "Primary education and economic growth in nineteenth-century France," *Cliometrica*, 16, 277–332.

——— (2023): "Landholding inequality and the consolidation of democracy: evidence from nineteenth-century France," *The Journal of Economic History*, 83, 203–241.

O'ROURKE, K. H. (2000): "Tariffs and growth in the late 19th century," *The economic journal*, 110, 456–483.

PASCALI, L. (2017): "The Wind of Change: Maritime Technology, Trade, and Economic Development," *American Economic Review*, 107, 2821–54.

PAUL-DUBOIS, L. (1912): "Suisse et Savoie: la zone franche de la Haute-Savoie," *Revue des Deux Mondes (1829-1971)*, 10, 794–819.

PIKETTY, T. AND J. CAGÉ (2023): *Une histoire du conflit politique: élections et inégalités sociales en France, 1789-2022*, Paris: Seuil.

REGNO DI SARDEGNA (1852): *Informazioni statistiche raccolte dalla Regia Commissione Superiore: Censimento della Popolazione per L'anno 1848*, Torino: Stamperia Reale.

RODRÍGUEZ, F. AND D. RODRIK (2000): "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence," *NBER Macroeconomics Annual*, 15, 261—325.

SCHULARICK, M. AND S. SOLOMOU (2011): "Tariffs and economic growth in the first era of globalization," *Journal of Economic Growth*.

TOPALOVA, P. (2010): "Factor Immobility and Regional Impacts of Trade Liberalization: Evidence on Poverty from India," *American Economic Journal: Applied Economics*, 2, 1–41.

TRUCHY, H. (1900): "Le système des impôts directs d'Etat en France," *Revue d'économie politique*, 937–964.

VAMVAKIDIS, A. (2002): "How Robust is the Growth-Openness Connection? Historical Evidence," *Journal of Economic Growth*.

WANG, J. (2013): "The Economic Impact of Special Economic Zones: Evidence from Chinese Municipalities," *Journal of Development Economics*, 101, 133–147.

WEIR, D. (1997): "Economic Welfare and Physical Well-Being in France, 1750–1990," in *Health and Welfare during Industrialization*, ed. by R. H. Steckel and R. Floud, University of Chicago Press, chap. 5, 161–200, NBER Working Paper Series.

XU, C. (2022): "Reshaping Global Trade: The Immediate and Long-Run Effects of Bank Failures*," *The Quarterly Journal of Economics*, 137, 2107–2161.

Figures and Tables

Figure 3: Balance on Pre-GFZ Demographic and Geographic Characteristics
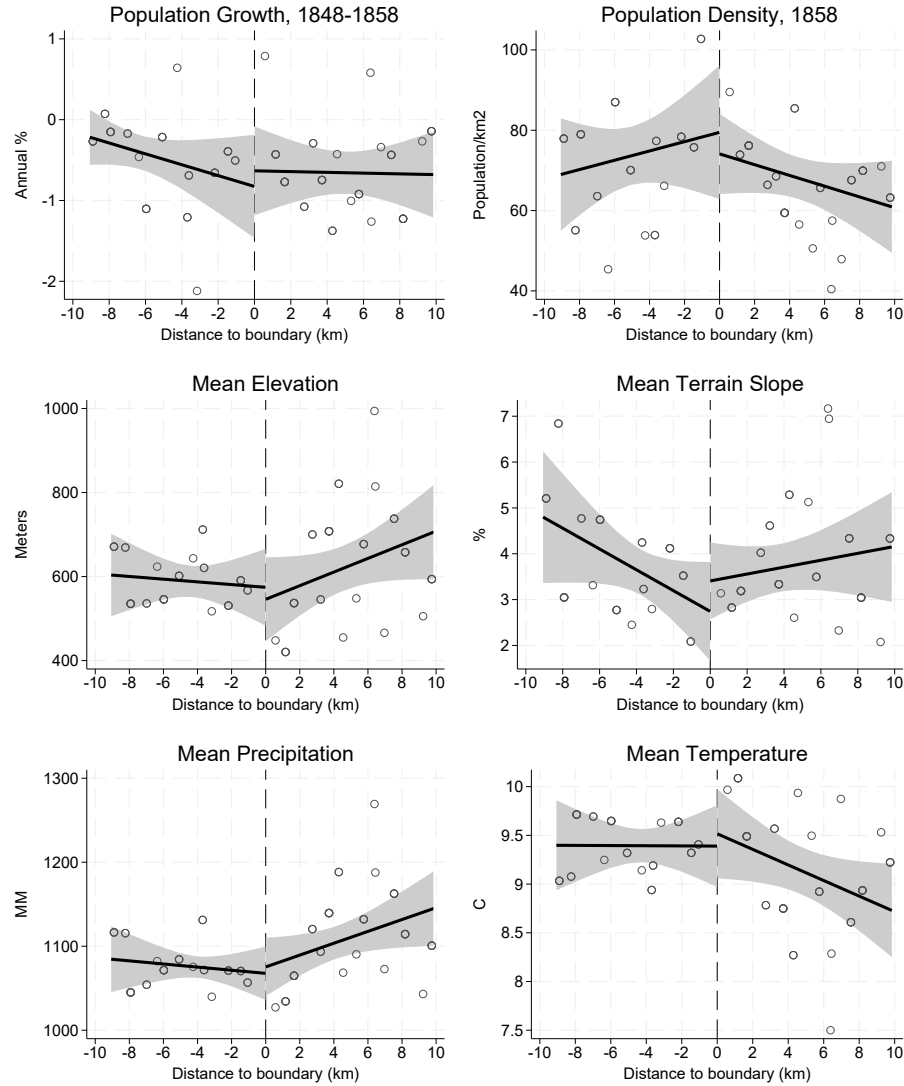
Notes: From the top, left to right, the graphs plot average annual population growth between 1848 and 1858, population density in 1858 (population in 1858 divided by current surface area), mean elevation, mean terrain slope, mean temperature, and mean precipitation. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 4: Balance on Agricultural Outcomes (1860)

AREA CULTIVATED
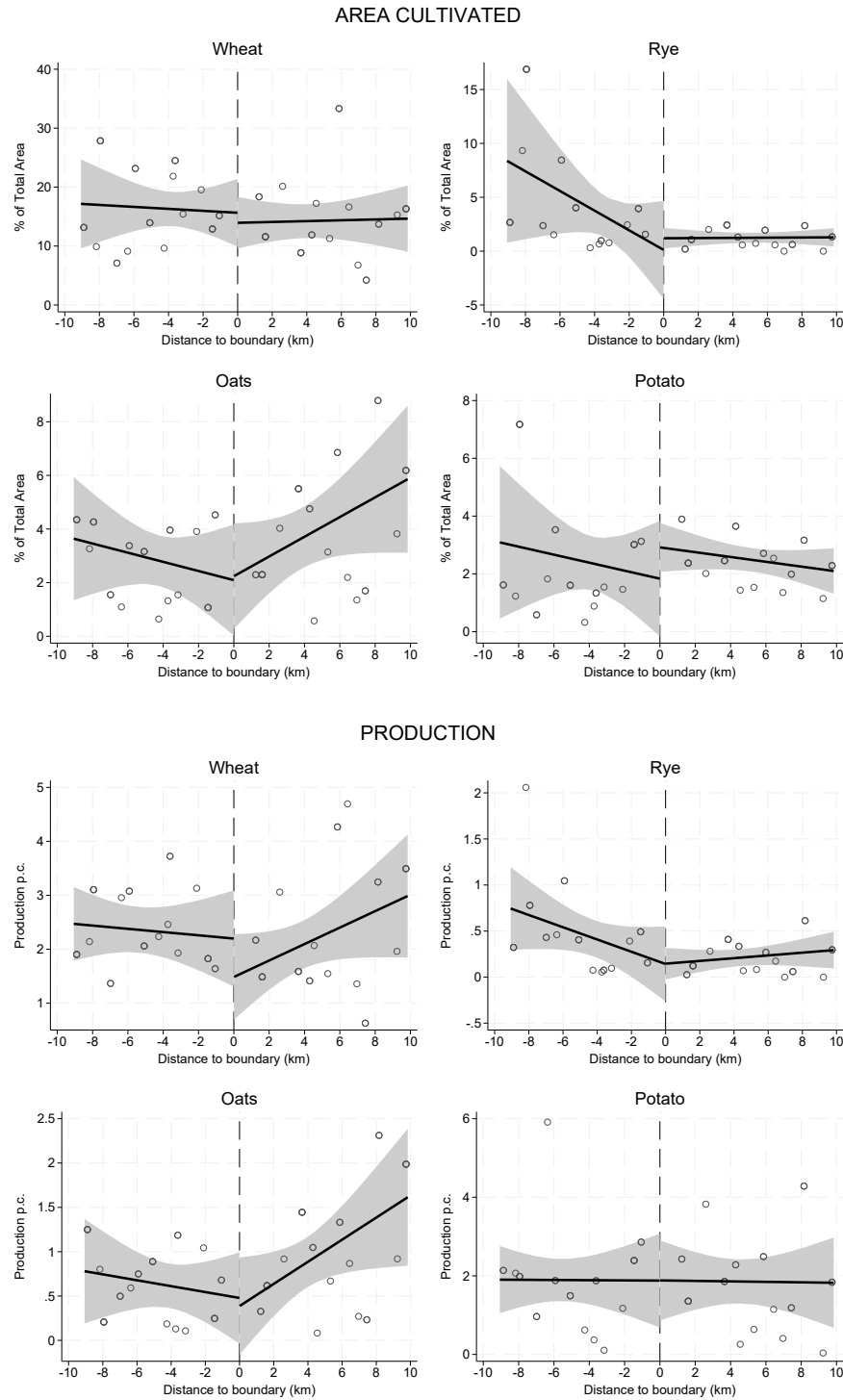
PRODUCTION

Notes: From the top, left to right, the graphs plot the area allocated to wheat, rye, oats, and potatoes in 1860, and the per capita production of wheat, rye, oats, and potatoes in 1860 measured in hectolitres. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 5: Balance on Local Public Accounts (1861)
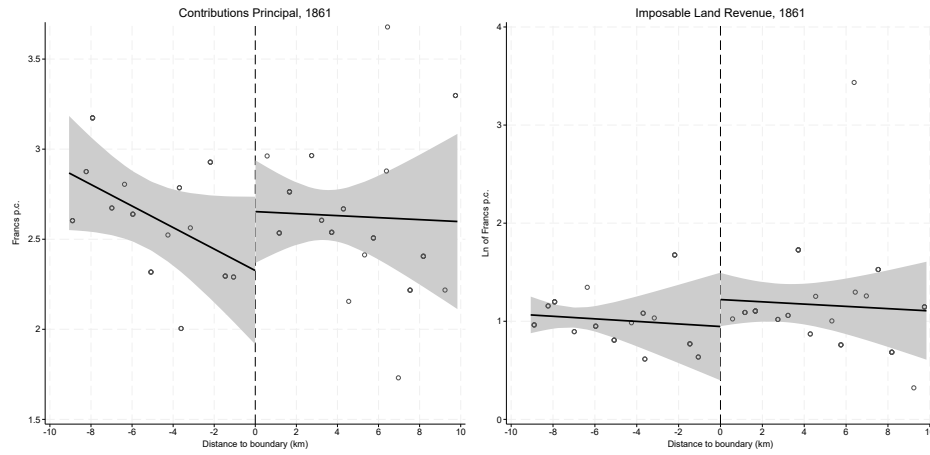
Notes: From left to right, the graphs plot the per capita contributions principal and the natural logarithm of the per capita imposable revenue from land properties. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 6: Effect of the GFZ on Local Public Accounts (1878 - 1914)
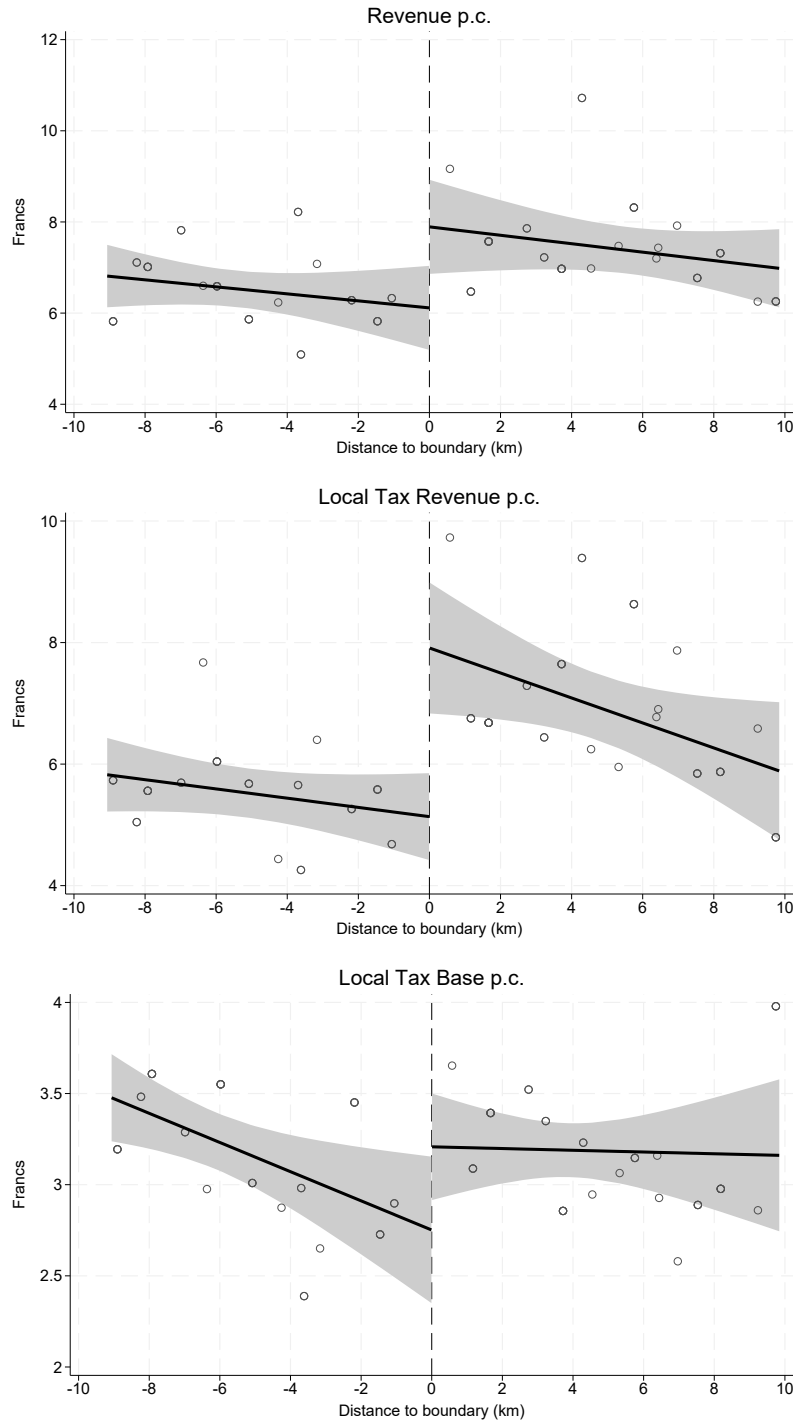
Notes: From the top, the graphs plot average per capita municipal revenues, per capita local tax revenues and per capita local tax base for the period 1878 to 1914. The average corresponds to the mean of values for 1878, 1914, and for all census years in between (1881, 1886, 1891, 1896, 1901, 1906 and 1911). The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 7: Effect of the GFZ on Local Tax Revenues p.c.
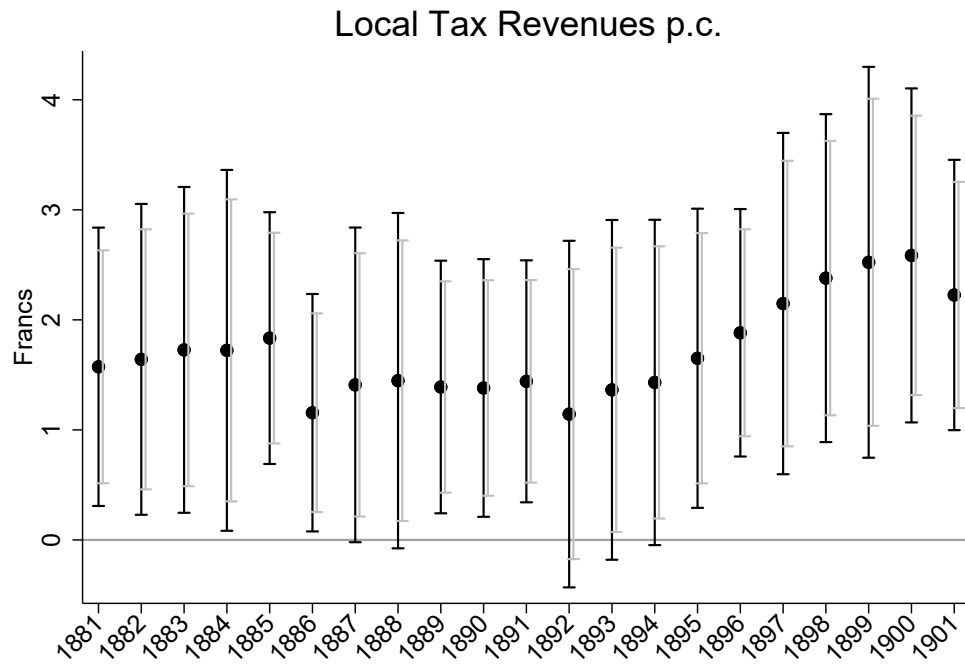
Notes: The graph plots the RD coefficients for local tax revenues per capita for every year between 1881 and 1901.

Figure 8: Effect of the GFZ on Direct Contributions
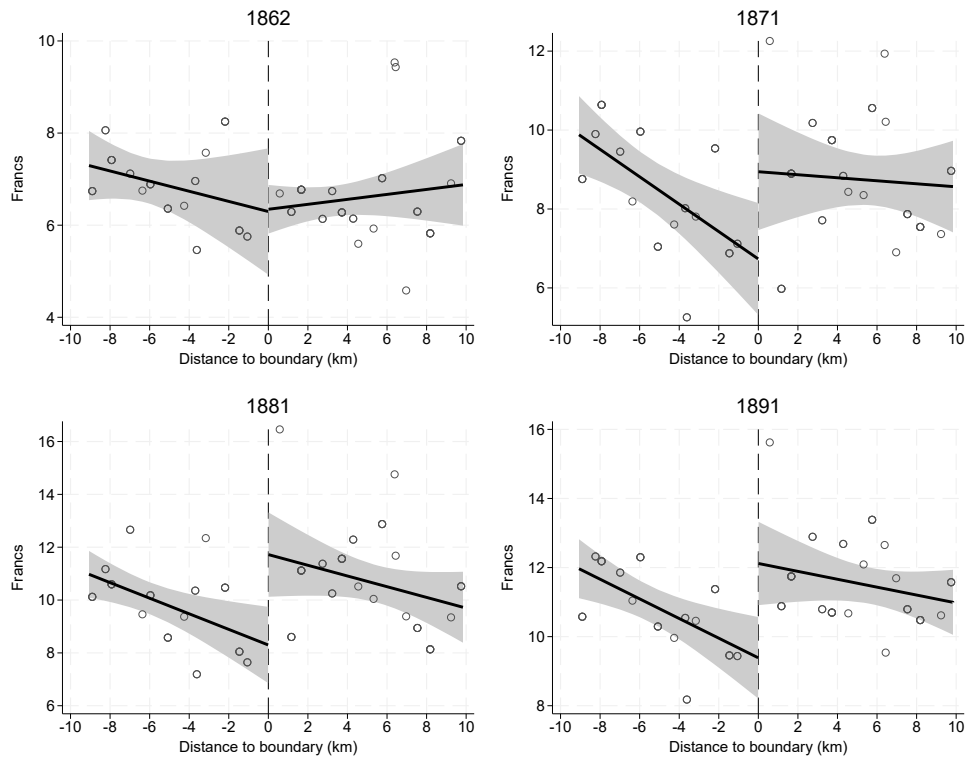
Notes: From left to right, the graphs plot the total amount collected from the four main direct contributions (land, personal-movable, doors and windows, and patents) in 1862, 1871, 1881 and 1891, respectively. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 9: Effect of the GFZ on Land Contribution
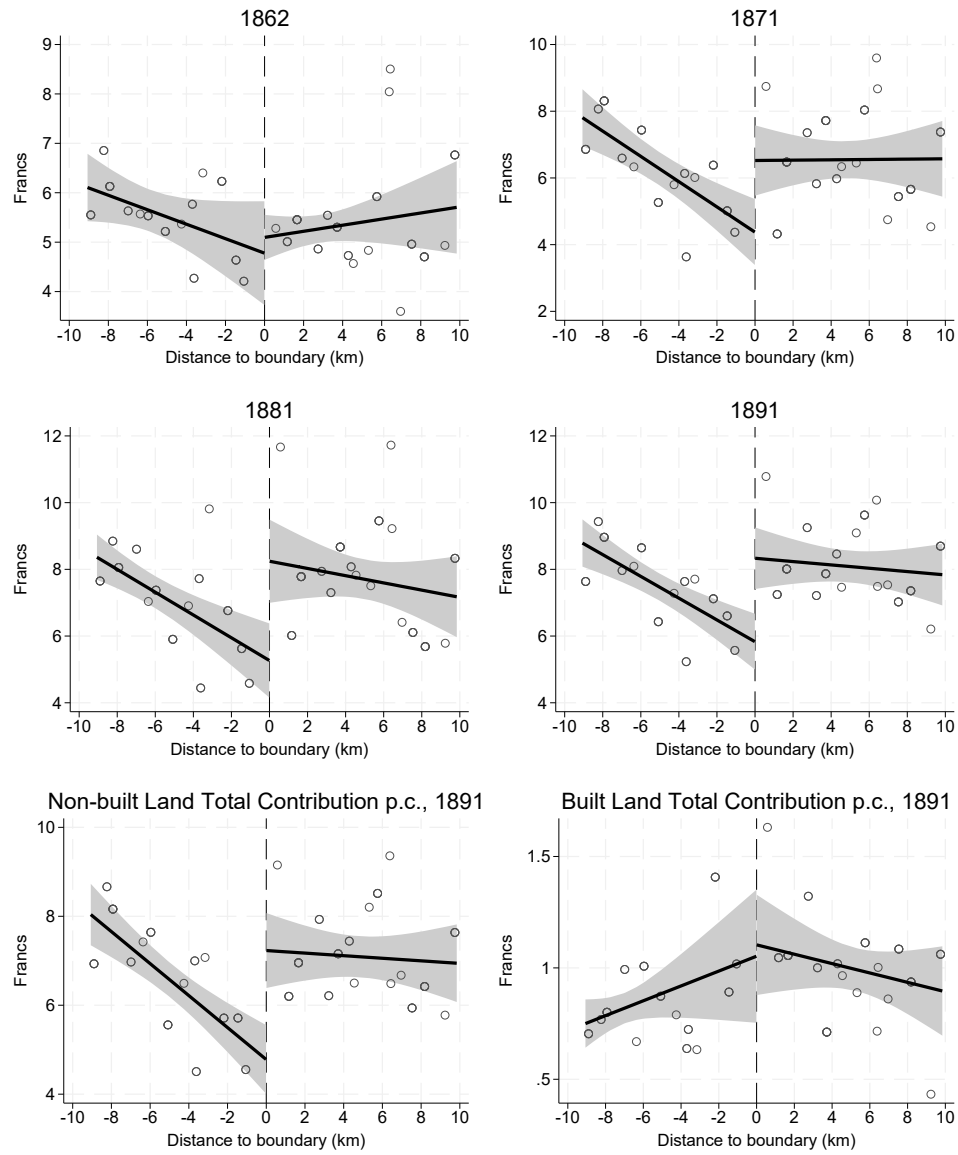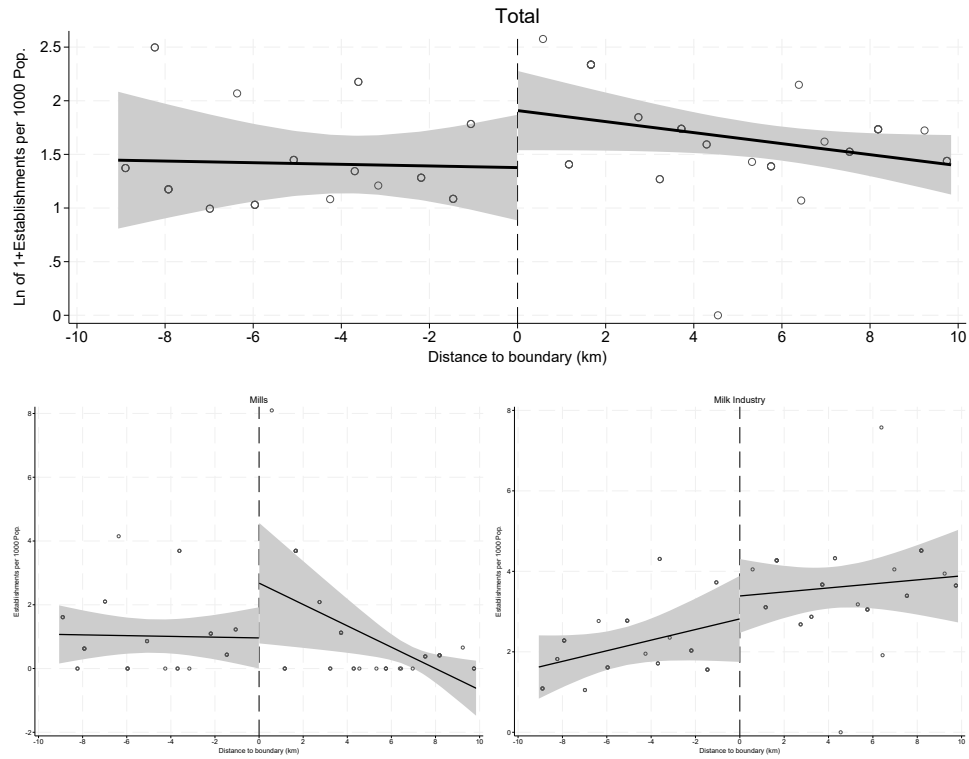

Notes: From left to right, the graphs plot the total amount collected from the land contribution in 1862, 1871, 1881 and 1891, respectively, and the amount collected from non-built land and built land in 1891, respectively. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 10: Effect of the GFZ on Workforce Distribution (1891)
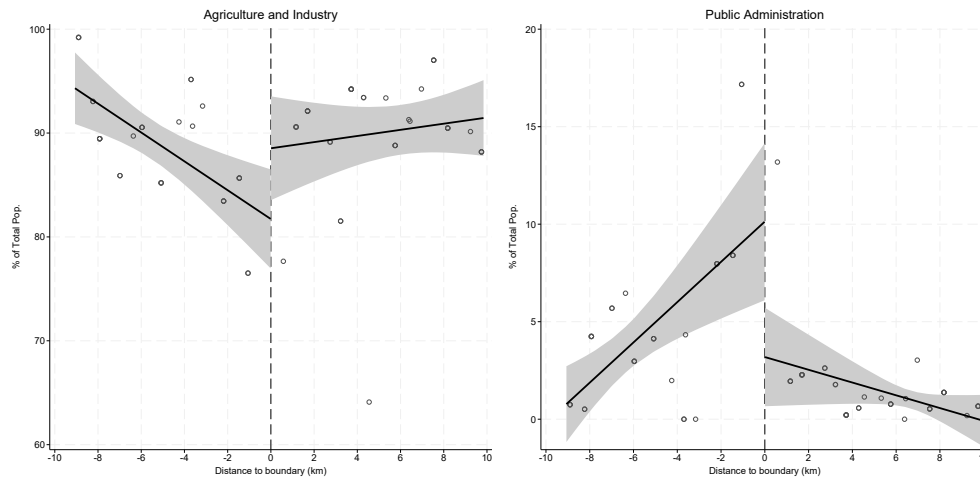
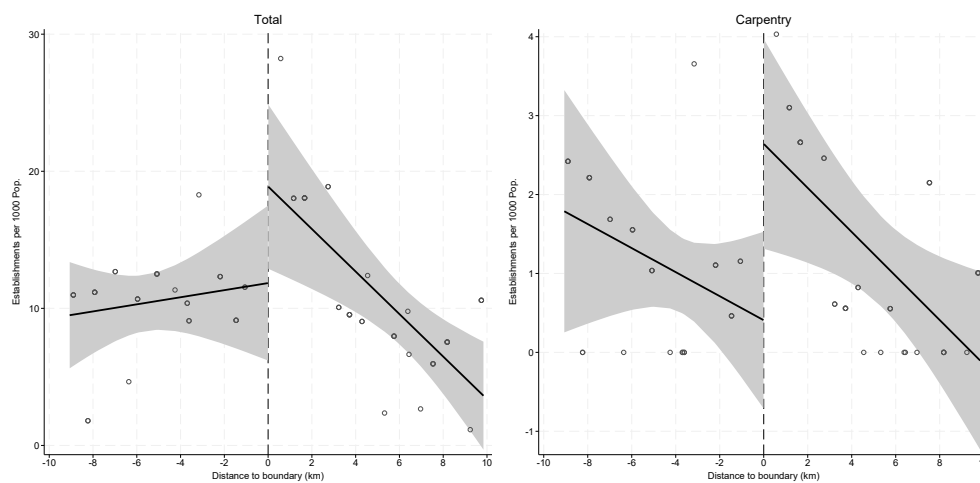*Notes:* From left to right, the graphs plot the percentage of the population in agriculture and industry, and public administration in 1891. The percentages include the both workers and their families following the statistical summaries produced as part of the 1891 census. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 11: Effect of the GFZ on Agro-Industrial Establishments (1910)

Notes: From the top, left to right, the graphs plot the logarithm of the number of total agro-industrial establishments, and the number of mills and milk industry establishments per 1000 inhabitants. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure 12: Effect of the GFZ on Manufacturing Units (1881)

Notes: From left to right, the graphs plot the total number of manufacturing establishments and carpentry units per capita in 1881. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Table 1: Summary Statistics for Main Variables

Variables	Obs.	Mean	S.D.	Min	Max
Commune in GFZ	593	0.32	0.47	0	1
Distance to Usses Section of GFZ border, km	593	40.0	23.9	0.58	107
Municipal Finances					
Municipal Revenues p.c., francs:					
1862	589	6.08	4.71	1.08	91.6
Avg. 1878 - 1914	593	7.75	3.20	2.65	40.5
Local Tax Revenues p.c., francs (Avg. 1878-1914)	593	5.39	2.33	0.29	16.7
Local Tax Base p.c., francs:					
1862	573	2.97	1.00	0.76	7.60
Avg. 1878 - 1914	593	3.73	1.82	1.30	29.6
Contributions p.c. (1862), francs:					
Land	285	5.34	1.97	1.10	17.1
Total	285	6.90	2.42	1.83	25.1
Contributions p.c. (1891), francs:					
Land	289	7.26	2.82	1.02	36.4
Total	289	11.1	3.61	3.47	40.2
Population by profession (1891), % of total pop.:					
Agriculture	284	79.0	17.9	1.64	99.1
Industry	284	9.97	13.0	0	90.3
Commerce	284	3.79	8.61	0	98.5
Public Administration	284	1.67	2.58	0	19.3
Agricultural production (1892), hectoliters p.c.:					
Wheat	287	12.3	9.96	0	50.5
Oats	286	4.03	3.77	0	30.4
Potatoes	287	4.16	3.20	0	20.7
Manufacturing units (1881), p.c.:					
All Manufacturing	289	11.0	8.69	0	50.7
Blacksmith	289	0.89	1.24	0	6.5
Carpentry	289	0.87	1.82	0	16.9
Mills	289	2.06	2.53	0	22.8
Sawmills	289	1.30	2.15	0	13.0
Pre-zone Demographic and Economic Characteristics					
Population Growth (1848–1858), annual %	285	-0.64	1.53	-5.04	19.4
Population Density (1858), per km2	285	81.5	60.8	8.79	648
Dwelling Density (1848), per km2	593	15.1	11.7	0.69	112
Local Imposition (1857), Sardinian Lira p.c.	211	2.90	1.90	0	16.2
Local Tax Roll (Jan 1861), entries p.c.:					
Land	285	0.47	0.23	0.12	2.37
Personal and Movable	285	0.36	0.06	0.20	0.52
Doors and Windows	285	0.20	0.03	0.07	0.37
Patents	285	0.02	0.01	0	0.09
Agricultural production (1860), hectoliters p.c.:					
Wheat	214	1.79	2.59	0	25.8
Oats	215	1.14	1.89	0	18.1
Potatoes	213	2.78	4.22	0	44.2
Geographic Characteristics					
Mean Elevation, m a.s.l.	593	903	517	249	2,706
Mean Slope	593	7.84	4.48	0.58	22.7
Mean Rainfall, mm	593	1,179	163	916	1,727
Mean Temperature, C	593	8.14	2.57	-1.44	11.6

Notes: See Section 2.1 for data description and sources.

Table 2: Balance on Prezone Demographic, Economic, and Geographic Characteristics

| | RD | N. | Dep. Var. | |
| | Estimate | | Mean | S.D. |
	(1)	(2)	(4)	(5)
A. Pre-zone Demographic Characteristics				
Population Growth, annual %:				
(1838–1848)	-0.219	593	0.42	0.84
	(0.369)			
(1848–1858)	0.310	285	-0.64	1.53
	(0.580)			
Population Density (1858), per km2	-7.520	285	81.5	60.8
	(13.144)			
Dwelling Density (1848), per km2	-0.588	593	15.1	11.7
	(1.586)			
B. Pre-zone Economic Characteristics				
Land use by crop (1860), % of total area:				
Wheat	-0.686	211	11.4	13.3
	(3.571)			
Oats	0.120	213	3.87	6.84
	(1.391)			
Potatoes	0.525	213	4.99	20.9
	(0.901)			
Agricultural production (1860), hectoliters p.c.:				
Wheat	-0.261	214	1.79	2.59
	(0.701)			
Oats	0.081	215	1.14	1.89
	(0.331)			
Potatoes	-0.142	213	2.78	4.22
	(0.824)			
Local Imposition (1857), Sardinian Lira p.c.	0.308	211	2.90	1.90
	(0.983)			
C. Geographic Characteristics				
Mean Altitude, m a.s.l.	-73.076	593	903	517
	(61.813)			
Mean Slope	-0.095	593	7.84	4.48
	(0.586)			
Mean Rainfall, mm	-13.484	593	1179	163
	(19.697)			
Mean Temperature, °C	0.351	593	8.14	2.57
	(0.299)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 3: Balance on 1861 Local Public Accounts

	RD Estimate (1)	N. (2)	Dep. Var. Mean (4)	Dep. Var. S.D. (5)
Contribution Principal, francs p.c.	0.328 (0.278)	285	2.8	0.9
Imposable Land Revenue, ln of francs p.c.	0.082 (0.281)	285	1.27	0.97
Local Tax Roll, entries p.c.:				
Land	0.018 (0.065)	285	0.47	0.23
Personal and Movable	-0.015 (0.032)	285	0.36	0.06
Doors and Windows	0.014 (0.010)	285	0.20	0.03
Patents	-0.002 (0.007)	285	0.02	0.01

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 4: Effect of the GFZ on Municipal Revenues

	RD Estimate (1)	N. (2)	Dep. Var. Mean (4)	Dep. Var. S.D. (5)
Municipal Revenues p.c., francs:				
Avg. 1878 - 1914	1.734** (0.668)	593	7.7	3.2
1862	0.366 (0.501)	589	6.1	4.7
1878	2.553** (0.908)	593	6.3	3.3
1880s	2.151** (0.748)	593	6.7	3.3
1890s	1.161* (0.528)	593	7.0	2.8
1900s	1.195 (0.618)	593	7.9	3.4
1910s	2.018** (0.841)	593	10.2	4.5
1920s	21.455* (11.440)	593	71.9	52.1

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. The average for the period 1878 to 1914 corresponds to the mean of values for 1878, 1914, and for all census years in between (1881, 1886, 1891, 1896, 1901, 1906 and 1911). Decade averages correspond to the mean of values for census years in the corresponding decade. In the case of the 1910s, we average the values for 1911 and 1914. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 5: Effect of the GFZ on Local Tax Revenues

	RD Estimate (1)	N. (2)	Dep. Var. Mean (4)	S.D. (5)
Local Tax Revenues p.c., francs:				
Avg. 1878 - 1914	2.301***	593	5.4	2.3
	(0.521)			
1878	1.456**	593	3.6	1.9
	(0.588)			
1880s	1.384**	593	4.4	2.1
	(0.532)			
1890s	1.659***	593	5.0	2.5
	(0.547)			
1900s	2.412***	593	6.0	2.9
	(0.621)			
1910s	4.163***	593	7.1	3.5
	(1.013)			
1920s	2.371	593	10.2	7.3
	(2.205)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. The average for the period 1878 to 1914 corresponds to the mean of values for 1878, 1914, and for all census years in between (1881, 1886, 1891, 1896, 1901, 1906 and 1911). Decade averages correspond to the mean of values for census years in the corresponding decade. In the case of the 1910s, we average the values for 1911 and 1914. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 6: Effect of the GFZ on Local Tax Base

| | RD | N. | Dep. Var. | |
| | Estimate | | Mean | S.D. |
	(1)	(2)	(4)	(5)
Local Tax Base p.c., francs:				
Avg. 1878 - 1914	0.558**	593	3.7	1.8
	(0.230)			
1862	0.333	573	3.0	1.0
	(0.227)			
1878	0.343*	593	3.2	1.2
	(0.191)			
1880s	0.395*	593	3.3	1.4
	(0.196)			
1890s	0.493**	593	3.5	1.5
	(0.208)			
1900s	0.693***	593	4.0	2.4
	(0.249)			
1910s	0.649**	593	4.5	2.8
	(0.278)			
1920s	-0.547	593	4.8	4.9
	(0.465)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. The average for the period 1878 to 1914 corresponds to the mean of values for 1878, 1914, and for all census years in between (1881, 1886, 1891, 1896, 1901, 1906 and 1911). Decade averages correspond to the mean of values for census years in the corresponding decade. In the case of the 1910s, we average the values for 1911 and 1914. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 7: Effect of the GFZ on Total Contributions and Land Contribution Revenues

	RD Estimate (1)	N. (2)	Dep. Var. Mean (3)	S.D. (4)
Contributions Revenue p.c., francs:				
1862	0.102	285	6.9	2.4
	(0.807)			
1871	0.550	289	8.3	3.0
	(1.664)			
1881	2.584	289	10.0	3.1
	(1.709)			
1891	2.626*	289	11.1	3.6
	(1.181)			
Land Contribution Revenue p.c., francs:				
1862	0.373	285	5.3	2.0
	(0.625)			
1871	1.027	289	5.8	2.3
	(1.016)			
1881	2.627**	289	6.7	2.3
	(1.070)			
1891	2.118*	289	7.3	2.8
	(0.895)			
Non-built Land	2.353***	289	6.2	2.9
	(0.688)			
Built Land	0.097	289	1.1	0.8
	(0.224)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 8: Effect of the GFZ on Personal-Movable, Doors and Windows, and Patents Contribution Revenues

	RD Estimate (1)	N. (2)	Mean (3)	S.D. (4)
			Dep. Var.	
Personal-Movable Contribution Revenue p.c., francs:				
1862	-0.147	285	0.9	0.4
	(0.148)			
1871	-0.059	289	1.1	0.5
	(0.216)			
1881	0.244	289	1.4	0.6
	(0.220)			
1891	0.323	289	1.8	0.8
	(0.203)			
Doors and Windows Contribution Revenue p.c., francs:				
1862	-0.013	285	0.4	0.2
	(0.030)			
1871	-0.048	289	0.7	0.3
	(0.128)			
1881	0.022	289	0.9	0.4
	(0.118)			
1891	0.086	289	1.0	0.4
	(0.140)			
Patents Contribution Revenue p.c., francs:				
1862	-0.072	285	0.3	0.5
	(0.124)			
1871	-0.036	289	0.7	1.0
	(0.316)			
1881	0.169	289	1.0	1.3
	(0.374)			
1891	0.162	289	1.0	1.4
	(0.320)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 9: Effect of GFZ on Local Public Accounts Under Different Specifications

				RD Estimates						N.	Dep. Var.	
											Mean	SD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Municipal Revenues p.c. (1878 - 1914), francs	1.734**	2.060***	1.440*	1.683*	1.558	1.758	1.850***	1.148	0.931	593	7.75	3.20
	(0.668)	(0.586)	(0.794)	(0.889)	(0.717)	(0.614)	(0.605)	(0.696)	(0.619)			
Local Tax Revenues p.c. (1878 - 1914), francs	2.301***	2.078***	1.548***	2.308**	2.316**	2.305***	2.270***	1.563**	1.634**	593	5.39	2.33
	(0.521)	(0.517)	(0.549)	(0.766)	(0.608)	(0.534)	(0.494)	(0.591)	(0.697)			
Local Tax Base p.c. (1878 - 1914), francs	0.558**	0.741***	0.687**	0.724**	0.562*	0.423***	0.723***	0.587**	0.690*	593	3.73	1.82
	(0.230)	(0.213)	(0.271)	(0.286)	(0.230)	(0.191)	(0.236)	(0.244)	(0.340)			
Contributions p.c. (1891), francs:												
Total	2.626*	2.946**	1.801**	3.020*	2.493**	2.324**	2.846***	2.273*	2.834**	289	11.1	3.61
	(1.181)	(1.199)	(0.886)	(1.442)	(0.847)	(0.710)	(0.916)	(1.110)	(1.162)			
Land	2.118*	2.613**	1.875***	2.182	2.269**	2.187***	1.899*	2.303***	2.474**	289	7.26	2.82
	(0.895)	(0.832)	(0.640)	(1.269)	(0.631)	(0.535)	(0.784)	(0.710)	(0.895)			
Non-built Land	2.353***	2.657***	1.719**	1.677	2.149***	2.069***	2.023***	2.292***	2.378***	289	6.16	2.88
	(0.688)	(0.660)	(0.701)	(1.348)	(0.596)	(0.518)	(0.641)	(0.654)	(0.848)			
Personal-Furniture	0.323	0.053	-0.0912	0.452*	0.139	0.194	0.434**	0.161	0.190	289	1.84	0.80
	(0.203)	(0.168)	(0.231)	(0.260)	(0.167)	(0.150)	(0.176)	(0.207)	(0.259)			
Doors and Windows	0.086	-0.007	-0.115	0.134	0.052	0.020	0.099	0.005	-0.084	289	1.01	0.37
	(0.140)	(0.101)	(0.127)	(0.173)	(0.114)	(0.100)	(0.122)	(0.124)	(0.152)			
Patents	0.162	0.081	0.133	0.307	0.033	-0.076	0.460	-0.090	0.236	289	0.99	1.40
	(0.320)	(0.294)	(0.497)	(0.402)	(0.300)	(0.250)	(0.374)	(0.324)	(0.328)			
Estimation	RDR		OLS				RDR					
Polynomial Order	1st	1st	2nd Lat/Long	2nd	1st	1st	1st	1st	1st			
Baseline Covariates	No	Yes	No	No	No	No	No	No	No			
Bandwidth (km)	CCT	CCT	15km	CCT	15km	20km	CCT	CCT	CCT			
Standard Errors		NN	Robust					NN				
Customs Border					Usses				Genevois	H. Savoie			
Sample					Base			Incl. Splits		Base			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 1 reports our baseline RD estimates and standard errors for the treatment effect using a first-order polynomial and no covariates. Columns 2 to 8 show our estimates under different specifications: (2) controls for a broad set of covariates (latitude, longitude, mean altitude, rainfall and temperature); (3) presents OLS estimates controlling for a second-degree polynomial in latitude and longitude similar to Dell (2010); (4) uses a second-order polynomial; (5) uses a 15km bandwidth; (6) uses a 20km bandwidth; (7) includes border communes which are significantly split by the border (at least 20% of their area is in the opposite zone); (8) calculates distance to border based on an extended section of customs border which partitions the former province of Genevois; and (9) calculates distance to border based on an the whole customs border which partitions the department of Haute-Savoie. Columns 10 shows the number of observations available. Columns 11 and 12 present the mean and standard deviation for the corresponding variable as in Table 1. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 10: Effect of the GFZ on Workforce Distribution (1891)

| | RD | N. | Dep. Var. | |
| | Estimate | | Mean | S.D. |
	(1)	(3)	(4)	(5)
Population by Profession, % of total pop.:				
Agriculture+Industry	8.939*	286	89.2	11.4
	(4.399)			
Agriculture	3.482	286	79.6	17.5
	(5.517)			
Industry	4.800	286	9.7	12.1
	(2.951)			
Commerce	-0.118	286	3.5	6.5
	(2.224)			
Public Administration	-9.553**	286	1.7	2.6
	(3.913)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 11: Effect of the GFZ on Agricultural Activity (1910)

	RD	N.	Dep. Var.	
	Estimate		Mean	S.D.
	(1)	(3)	(4)	(5)
Land Use by Crop, % of total area:				
Wheat	-0.034	289	9.9	7.8
	(2.669)			
Oats	-2.282	289	3.9	3.2
	(1.440)			
Potatoes	0.162	289	4.4	2.9
	(1.409)			
Farm Animals, heads p.c.:				
Ox	0.020	289	0.04	0.04
	(0.019)			
Cows	-0.030	289	0.46	0.21
	(0.110)			
Agricultural Industry, establishments per 1000 pop.:				
Total	6.307**	289	4.51	6.1
	(2.751)			
Mills	1.779	289	1.0	1.6
	(1.173)			
Milk Industry	1.078	289	2.2	1.9
	(0.842)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 12: Effect of the GFZ on Agricultural Land Use and Production (1892)

	RD Estimate (1)	N. (3)	Dep. Var. Mean (4)	S.D. (5)
Land use by crop (1892), % of total area:				
Cultivated Area	4.266	288	86.4	14.9
	(7.875)			
Wheat	11.945**	288	12.3	9.9
	(4.843)			
Oats	0.262	288	4.0	3.8
	(1.474)			
Potatoes	0.135	288	4.2	3.2
	(1.187)			
Crop production (1892), hectoliters p.c.:				
Wheat	1.748	289	2.8	3.6
	(1.166)			
Oats	-0.142	289	1.4	1.5
	(0.565)			
Potatoes	1.168	289	6.4	13.2
	(1.878)			
Animal products (1892):				
Beef, kg p.c.	-3.923	289	5.8	8.9
	(3.798)			
Milk, litres p.c.	5.364	289	541	413
	(162.075)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 13: Effect of the GFZ on Manufacturing Units (1881)

| | RD Estimate | N. | Dep. Var. | |
| | | | Mean | S.D. |
	(1)	(3)	(4)	(5)
Manufacturing establishments, p.c.:				
Total	10.657*	289	11.0	8.7
	(5.627)			
Blacksmith	-0.643	289	0.9	1.2
	(0.783)			
Carpentry	3.225***	289	0.9	1.8
	(1.082)			
Mills	1.749	289	2.1	2.5
	(1.620)			
Sawmills	0.921	289	1.3	2.1
	(1.013)			

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 14: Effect of the GFZ on Population Growth

	RD Estimate (1)	N. (2)	Dep. Var. Mean (4)	S.D. (5)
Population Growth, annual %:				
1861 - 1911	0.029 (0.156)	593	-0.4	0.7
1861 - 1811	-0.095 (0.254)	593	-0.2	1.2
1881 - 1891	-0.257 (0.371)	593	-0.4	1.1
1891 - 1901	0.181 (0.258)	593	-0.5	1.4
1901 - 1911	0.336 (0.318)	593	-0.6	1.0
1911 - 1921	0.140 (0.336)	593	-1.1	0.9

Notes: Standard errors are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Column 1 reports the conventional RD estimates and standard errors for the treatment effect. Baseline estimates are obtained using a first-order polynomial and no covariates. The dependant variable is annual population growth rates for various periods. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). Column 2 shows the number of observations available. Columns 3 and 4 present the mean and standard deviation for the corresponding variable as in Table 1. * denotes significance at 10%, ** significance at 5% and *** significance at 1%.

Table 15: Effect of GFZ on Local Public Accounts (1878 - 1914) for Distant Communes

	Local Tax Revenues p.c.		Municipal Revenues p.c.		Local Tax Base p.c.	
	Estimate	Eff. N	Estimate	Eff. N	Estimate	Eff. N
Panel A: Baseline						
RD Estimate	2.301***	146	1.734**	124	0.558**	105
	(0.521)		(0.668)		(0.230)	
Panel B: Communes 4km plus away from GFZ border						
RD Estimate	4.888*	53	5.189*	53	0.604	49
	(2.453)		(2.828)		(0.433)	
Panel C: Within 4km vs Rest (non-GFZ)						
Non-GFZ within 4km	(0.627)		0.843		0.173	
	(0.663)	52	(1.040)	52	(0.363)	52
Non-GFZ abs. Distance	(0.047)		0.217		0.139	
	(0.070)		(0.195)		(0.064)	
Dep. Var. Mean	5.385		7.749		3.731	
Dep. Var. SD	2.334		3.203		1.818	

Notes: Panel A shows our baseline results. Panel B reports RD estimates for a sample which excludes communes within 4km of the treatment border. Panel C includes only non-GFZ communes within 15km of the border and reports OLS estimates and robust standard errors for an indicator variable for whether the commune is located within 4km of the border and for the absolute distance to the border. Standard errors in Panels A and B are estimated using a heteroskedasticity–robust nearest-neighbor variance estimator with the minimum number of neighbors equal to three. Significance levels are based on the bias-corrected confidence intervals following Calonico et al. (2014b). The last two rows present the mean and standard deviation for the corresponding variable as in Table 1. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$

Online Appendix for "Trade Liberalization and Long-Run Local Economic Development: Evidence from the Savoy Great Free Zone"

Table of Contents

A   Additional Figures and Tables

Figure A1: Sample Page from the 1901 Situation Financiere des Communes

Source: BnF Gallica (https://gallica.bnf.fr/ark:/12148/cb412872434/date).

Figure A2: Sample Page from the 1891 Etat du Montant des Roles Generaux

Source: Archives Departamentales de Haute-Savoie.

Figure A3: Sample Page from the 1891 Census

Source: Archives Departamentales de Haute-Savoie.

Figure A4: Sample Page from the 1892 Agricultural Census

Source: Archives Departamentales de Haute-Savoie.

Figure A5: Sample Page from the 1881 Industrial Survey

DÉPARTEMENT DE LA HAUTE-SAVOIE — STATISTIQUE INDUSTRIELLE
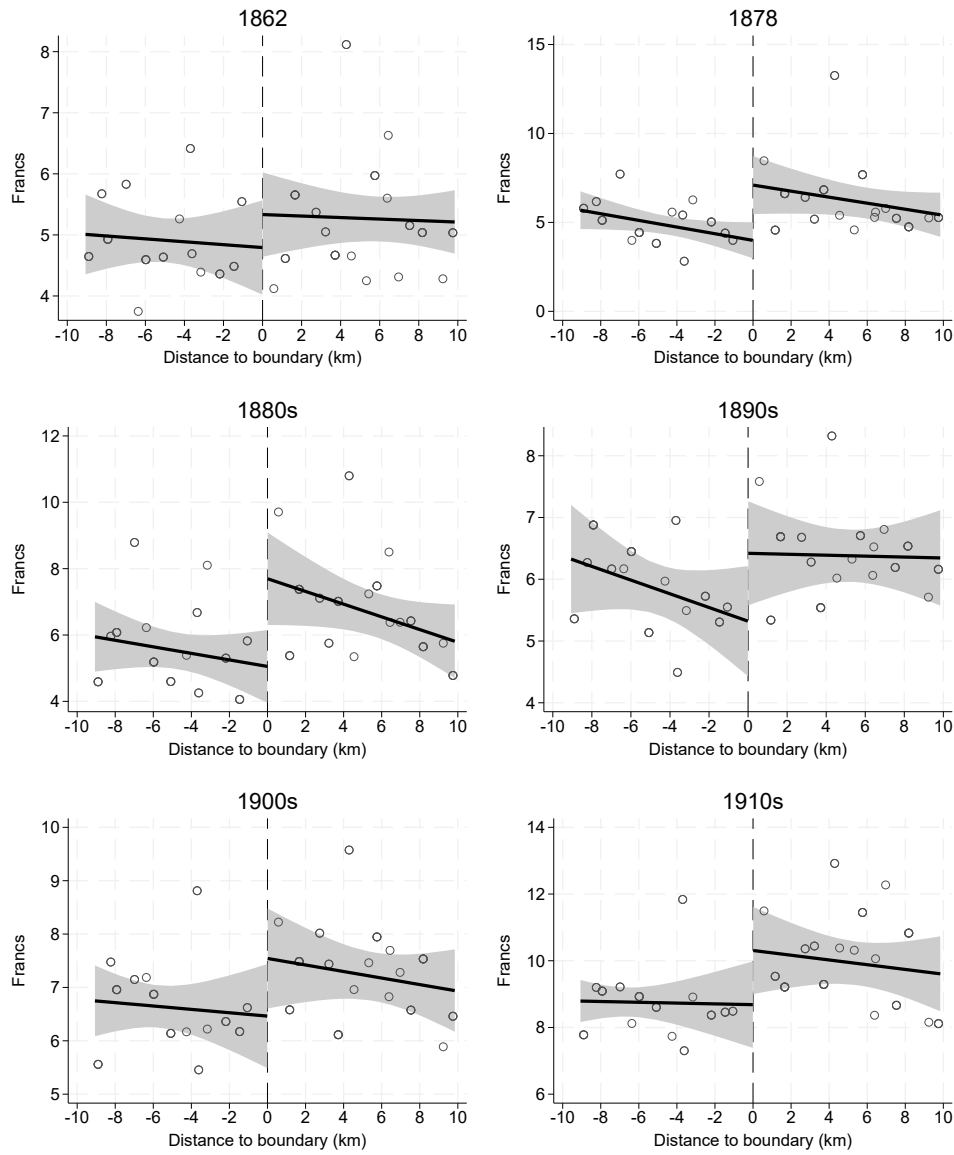
ARRONDISSEMENT DE *Thonon*

Désignation de l'industrie : *Charronnage*

Annecy, imp. Hérisson et Cie.

DÉSIGNATION DES COMMUNES (dans l'ordre alphabétique)	SIÈGE de L'ÉTABLISSEMENT	NOM du PROPRIÉTAIRE OU DIRECTEUR	Nombre d'établissements par commune	NOMBRE d'enfants de 10 à 12 ans employés dans l'établissement		NOMBRE d'enfants de 12 ans révolus à 16 ans		NOMBRE DE FILLES âgées de 16 à 21 ans	TOTAL		NOMBRE d'ouvriers adultes travaillant dans l'usine		SALAIRE MOYEN			INDICATION et nombre des machines employées	OBSERVATIONS
				garçons	filles	garçons	filles		garçons	filles	hommes	femmes	hommes	femmes	enfants		
Allinges	Allinges	Messiat Marie															
		Frossard Jacques															
Bellevaux	Bellevaux	Converset Joseph									1		3. »				
Bons	Bons	Faucher Marie															
	id	Trolliet Louis															
	Chez les Blancs	Blanc Michel															
	id	Blanc Louis															
Essert-Romand	La Salle	Veuiller François Joseph															
Excenevex	Excenevex	Chorens Joseph									1		3.50				
Neuvecelle	Rond Point	Ferray Ernest									1		3. »				
Sciez	sur les Crêts	Favre Louis															
	Sciez	Motringe Constantin															
Veigy	Veigy	Frütz Frütz															
		Dijon père et fils															
	id	Lambert Louis															
Yvoire	Yvoire	Jandin Louis															
			16								3		3.50				

*Source*: Archives Departamentales de Haute-Savoie.

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Figure A6: Effect of the GFZ on Municipal Revenue p.c.

Notes: From the top, left to right, the graphs plot per capita municipal revenues for 1862 and average per capita municipal revenues for the 1880s (1881 and 1886), 1890s (1891 and 1896), 1900s (1901 and 1906), 1910s (1911 and 1914) and 1920s (1920 and 1923). The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure A7: Effect of the GFZ on Local Tax Revenue p.c.
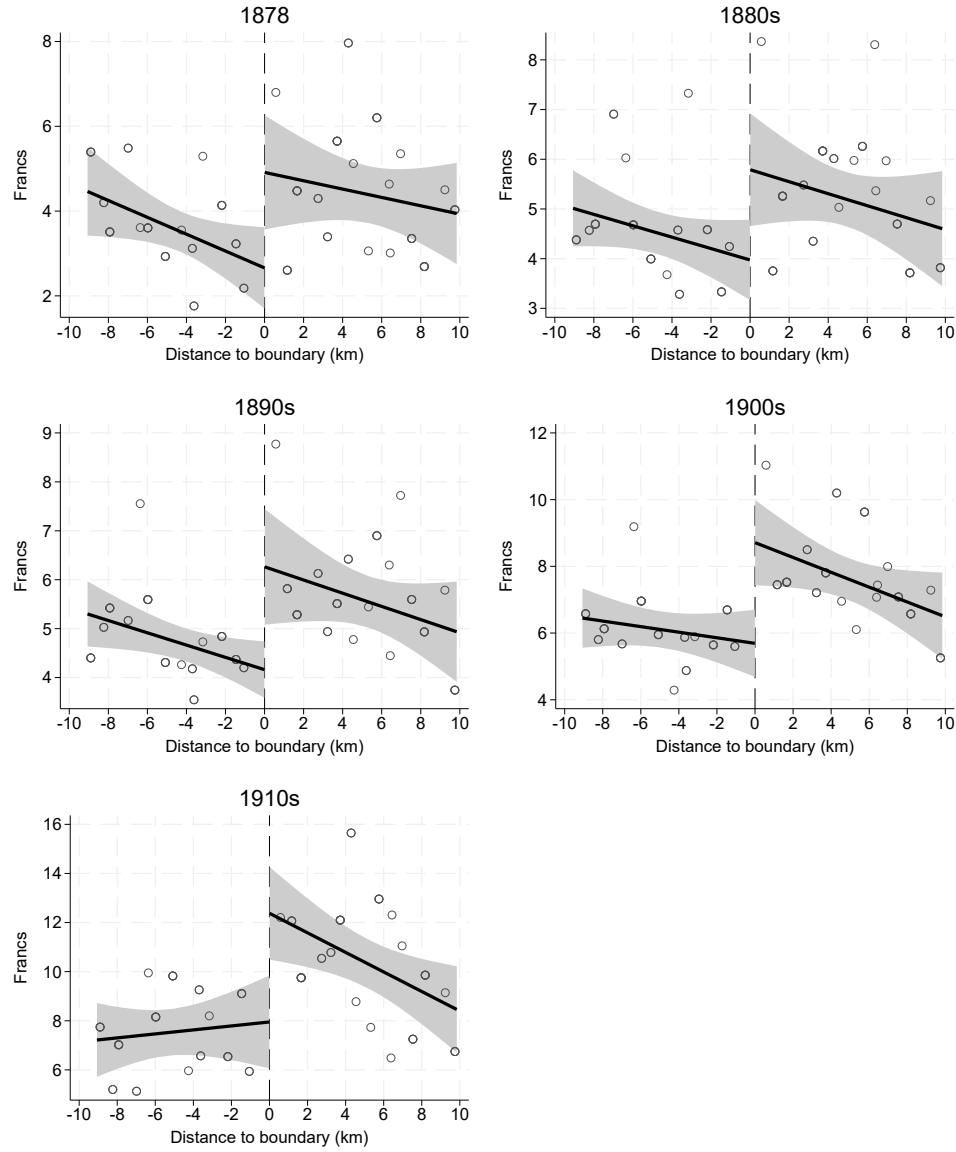
Notes: From the top, left to right, the graphs plot per capita local tax revenues for 1878 and average per capita local tax revenues for the 1880s (1881 and 1886), 1890s (1891 and 1896), 1900s (1901 and 1906), 1910s (1911 and 1914) and 1920s (1920 and 1923). The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure A8: Effect of the GFZ on Local Tax Base p.c.
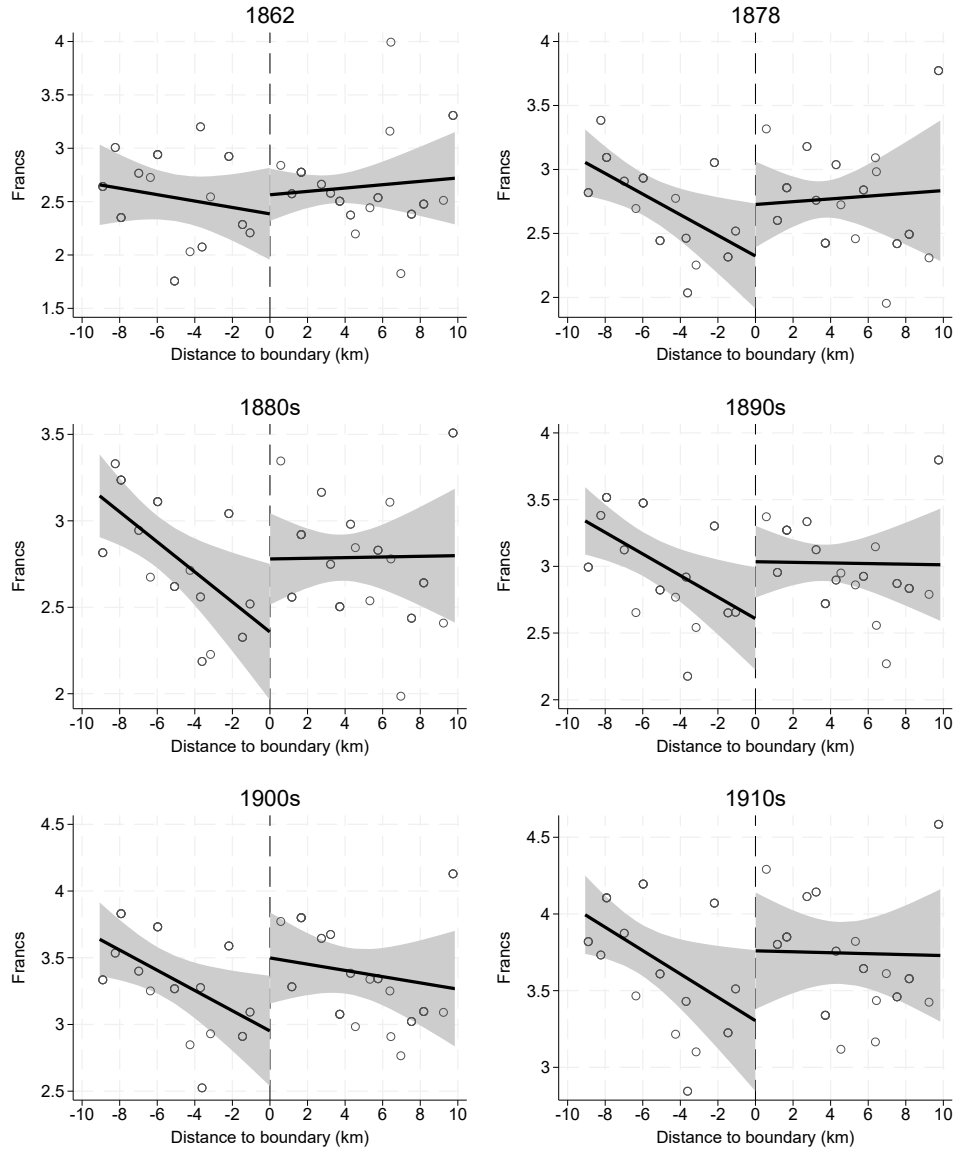
Notes: From the top, left to right, the graphs plot per capita local tax base for 1862 and average per capita local tax base for the 1880s (1881 and 1886), 1890s (1891 and 1896), 1900s (1901 and 1906), 1910s (1911 and 1914) and 1920s (1920 and 1923). The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure A9: Effect of the GFZ on Agricultural Land Use (1892)
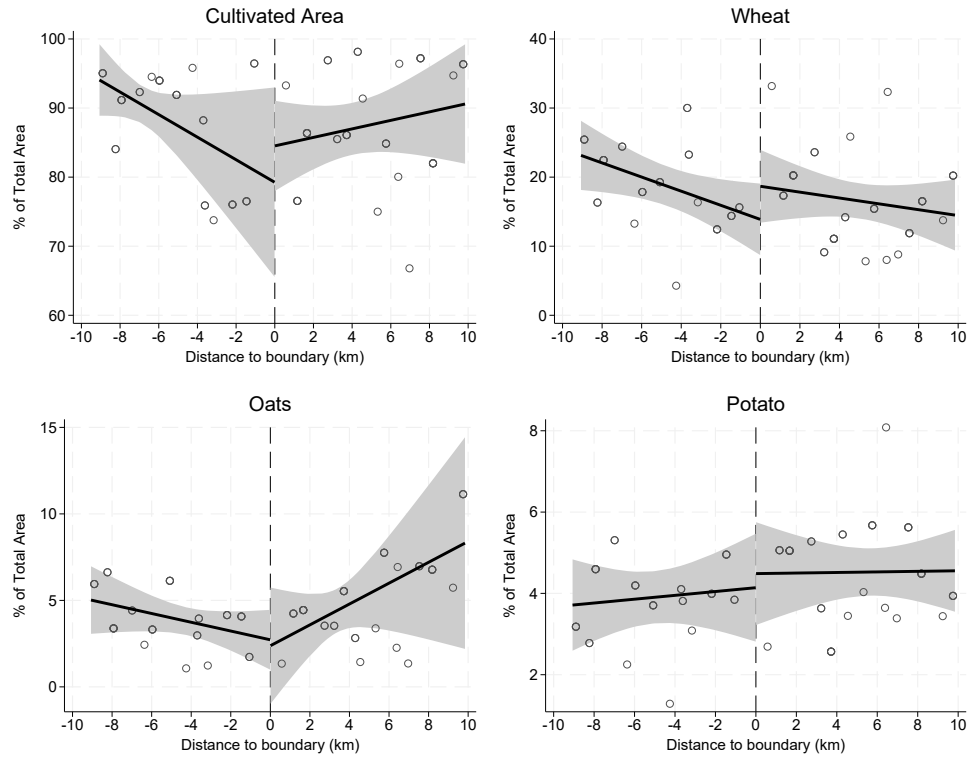
Notes: From the top, left to right, the graphs plot the area allocated to agricultural crops, wheat, oats, and potatoes in 1892. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

Figure A10: Effect of the GFZ on Population Growth
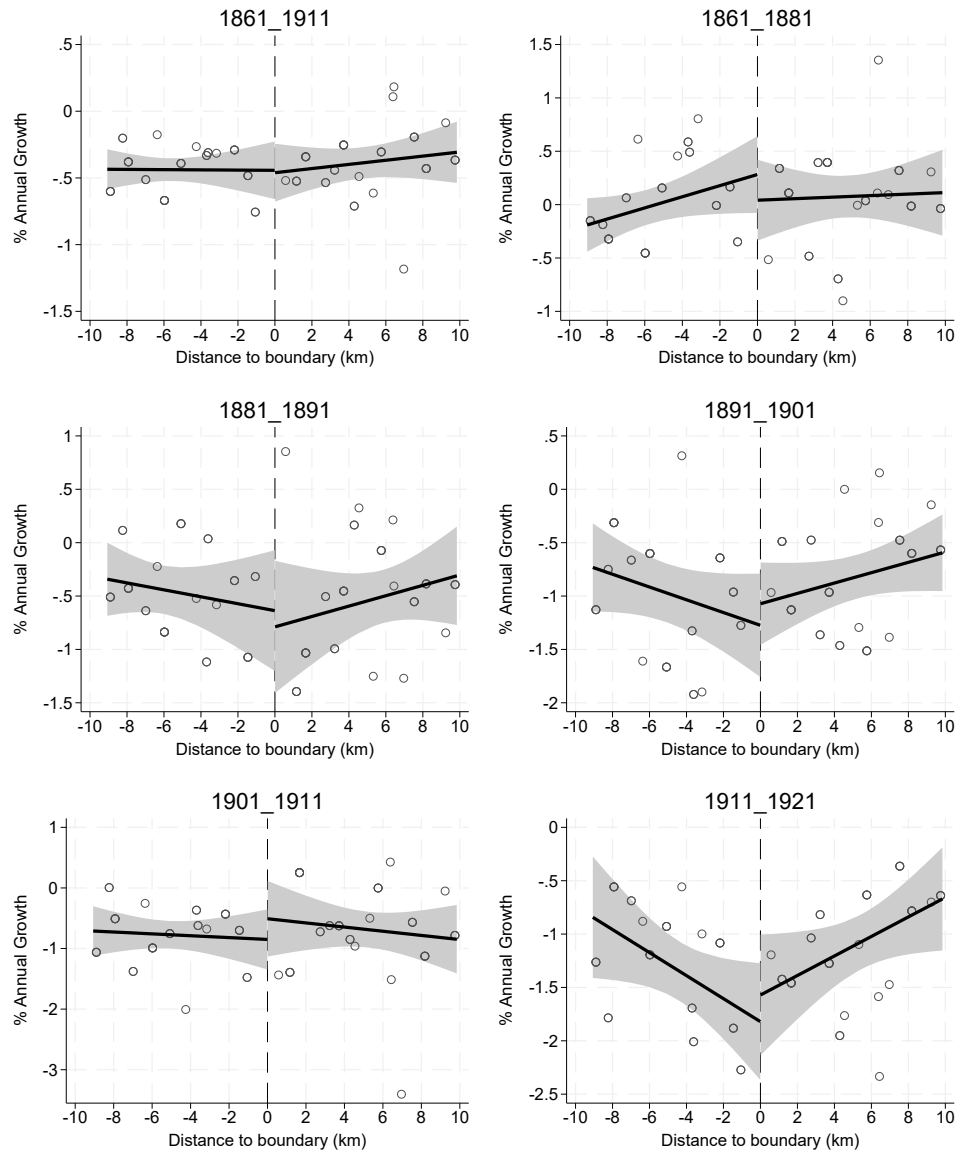
Notes: From the top, left to right, the graphs plot annual population growth rates between census years. The plots include a linear fit on each side of the treatment cutoff, and 95% confidence intervals (in grey) estimated using robust standard errors.

B Data Appendix

GFZ Border.   We compute distance to the treatment border following the demarcation detailed in the *Loi modificant le décret-loi du 12 juin 1860 relatif au tracé de la frontière douanière de la France en Savoie* of March 30th 1899. The law was issued to provide clarity and precision to the initial demarcation established by the *décret-loi* of June 12th 1860. The latter provided only specific points through which the customs border was to run. This was not an issue for the Usses segment of the border (and for our main analysis) as it was clear that the river constituted the customs border from the Rhone eastwards until around Duret, where the Usses ceases to be the limit between the arrondissements of Annecy and Saint-Julien. This is clear from the exposition of motives in the 1896 bill *Projet de Loi modificant le décret-loi du 12 juin 1860 relatif au tracé de la frontière douanière de la France en Savoie*, which serves as the bases for the 1899 law. There, it is stated that the 1860 decree establishes the GFZ in the old provinces of Chablais and Faucigny, and the part of Genevois north of the Usses. The bill argues that the only clarification needed with respect to the Usses section is that the border follows the right bank of the river rather than the course itself.

Pre-GFZ Local Public Accounts.   Local public accounts data similar to that used for our main analysis is not available for 1860 and for the years preceding annexation. We provide a proxy of municipal local tax revenues by computing the local imposition (*imposta communale* or *imposition locale*). This was the local tax the commune could raise to cover a positive difference between local expenditures (*spese comunali* or *passivo*) and local revenues (*entrate comunali* or *attivo*). From ADHS (1857), we have the 1857 local imposition for the communes of Faucigny. From ADHS (1858), we have information on revenues/assets and expenditures/liabilities for 1858 for the communes of Genevois. The same source provides the total local imposition for Genevois in 1857. We approximate the 1857 local imposition for the communes of Genevois by (i) calculating the difference between assets and liabilities for 1858 (i.e., the 1858 local imposition for each commune) and (ii) prorating the 1857 local imposition for the entire province using our values for 1858. For this calculation, we assume that those few municipalities with more assets than liabilities in 1858 (i.e., no local imposition) also had no local imposition in 1857.

We complement our balance tests on local public accounts by using data from the *Etat Général du Sous-Répartement entre les Communes* for direct contributions and the second part of the *Etat du Montant des Roles Généraux* for 1861.[21] The first provides data on the principal for the land, personal-movable, and doors and windows contributions. The second details the number of entries (*cotes*) in the tax rolls for each contribution, as well as the patents prinicipal and the imposable revenue from land property.

B.1 French Tax System

The tax system in existence during the GFZ period until the start of WWI dated back to the French Revolution. The Revolutionary government aimed to create a universal tax code based on the

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[21]Unfortunately, we have not been able to locate the first part of the document in the Departmental Archives. Hence, we do not have information on the total amount to be collected from each contribution.

proportional taxation of wealth (Bloch, 1940). Four main direct contributions, known colloquially as the "four old ones" (*quatre vieilles*) were established.

First, the land contribution (*contribution foncière*) was based on revenues from urban and rural land properties. This tax was later split in 1890 to differentiate between improved and unimproved land (Bloch, 1940). The first component was to capture real estate revenue, while the second was based on agricultural revenues. This contribution lasted as a separate tax until 1917, when it was integrated into the income tax system (Bloch, 1940). Second, the personal-movable contribution (*contribution personnelle mobilière*) was divided into two parts. The personal component (*cote personnelle*) was a flat tax per individual who could afford to pay a minimum rent, while the movable component (*cote mobilière*) was based on the rent paid for the individual's residence (Bloch, 1940). This contribution ceased to be a national tax in 1917, but remained as a local tax. Third, the tax on doors and windows (*impôt des portes et fenêtres*) was based, as it name states, on the number of doors and windows of residential buildings. Due to its controversial natural (it was perceived as a tax on air and sunlight and rich owners found ways to hide their building openings), the tax was abolished in 1917, though communes could still charge a local tax on this contribution until 1926 (Bloch, 1940). Finally, the patents contribution (*contribution des patentes* was a tax on commercial and industrial activity. It was divided into a fixed and a variable component. The first was a lump sum on the commercial or industrial unit based on the number of employees, local population and type of activity (Bloch, 1940). The second depended mainly on the rental value of the business' premises.

The first three contributions were distribution taxes (*impôts de rèpartition* or "apportioned taxes" as defined by Bloch (1940)), while the patents contribution was a quota tax (*impôt de quotité*).[22] For distribution taxes, the yearly budget law established the total contribution to be collected throughout the country and split it across departments. Departmental authorities would then, in turn, split or "repart" the departmental contribution or *contingent* across communes (Bouchard, 1871; Blanc, 1898). This was done based on the local tax roll entries for that contribution. The communal amount became the local contribution "principal" for the budget year. National, departmental and local governments could then charge additional tax cents (*centimes*) per franc of principal. On the other hand, for the patents contribution, the budget law set the structure of the fixed and variable components of the tax, but not the amount to be collected. Using this tax structure and the information on the patents tax roll, the contribution's principal was calculated. As with the other direct contributions, additional tax cents could be collected on top of the principal. Hence, in all cases, the total amount levied across all government levels for a given contribution would be the principal plus the amount collected from the additional national, departmental and local tax cents.

The "four old ones" were the basis of the French direct contribution system until the introduction of an income tax in 1914, which was only established in a form similar to the one of modern tax systems in 1917 (Bloch, 1940). In the 1900 national budget, their revenue represented more than 80% of direct contributions revenue (Truchy, 1900). Other income sources included minor taxes on other wealth indicators like horses and vehicles (e.g., *taxe sur les chevaux et voitures*) and the tax on securities (*taxe sur le revenu des valeurs mobilières*). The national government collected a significant fraction of its revenues from alternative sources such as customs duties and indirect

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[22]When the land contribution was split in two parts, the improved land tax ceased to be a distribution tax (Bloch, 1940).

contributions, including revenue from the state monopolies on tobacco, matches and fire powder (Truchy, 1900). However, the four contributions were the basis of local revenues.

B.2 Post-GFZ Local Public Accounts

Data on post-GFZ local public accounts is drawn from two main sources: (i) the Financial Situation of the Communes (*La Situation Financière Des Communes*, SFC), and (ii) the tax roll amounts statements (*Etat du Montant des Roles Généraux*). We provide details on these and other related sources below.

The SFC were annual publications which were produced between 1878 and 1914, and in 1920 and 1923.[23]. While the information produced varied slightly across years, these detailed the population, surface area, ordinary revenues, ordinary expenses, value of an additional tax cent (*valeur du centime*) and number of additional local tax cents. We have digitized the information for 1878, 1891, 1901 for both Haute-Savoie and Savoie, and for 1886, 1896, 1906, 1914 and 1923 for Haute-Savoie. We complement this with SFC data from Piketty and Cagé (2023) for 1881, 1911, and 1920. Hence, we have information for the first and last year of publication, and all census years in between. Finally, we digitized the 1862 statements of the financial situation of the communes (*Etat de la Situation Financière Des Communes*) produced as part of a nationwide report on local public accounts (ADHS, 1862; ADS, 1868).[24]

Revenues per capita. From the SFC, we extract ordinary revenues to compute municipal revenues per capita. Ordinary revenues include the value of ordinary and special local tax cents established in the yearly national budget laws, such as the 5 ordinary tax cents over the land and personal-movable contribution and the 5 special tax cents over all four contributions for local roads, and the additional tax cents to cover insufficient revenues (i.e., to cover ordinary expenditures).[25] The latter needed to be authorised by the departmental prefect. Ordinary revenues also covered what was categorized by pre-1891 SFCs as "annual revenues" (*revenus annuels*), which included, among other concepts, income from municipal buildings and movable properties, revenue from public lands, and a fraction of indirect taxes distributed by the national government. The *octroi* - a local tax on goods which entered the city - was also considered an ordinary revenue. However, this only existed in large urban communes.

It is important to note that pre-1891, the column which reported revenues in the SFC reported "annual revenues" and not total ordinary revenues. This meant that for most communes, the value reported was low. It is only in large urban communes, which collected the *octroi*, that we see a relatively high value. Hence, to increase the degree of comparability between pre and post-1891 revenues, we follow Piketty and Cagé (2023) and add local tax revenues to "annual revenues" to obtain total revenues. A caveat with this approach is that local tax revenues are calculated based on the total number of additional local tax cents, which include cents for both ordinary and extraordinary expenditures. Hence, this approach overestimates total ordinary revenues.

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[23]Additional documents were produced for 1929 and 1938 which do not contain communal-level data.

[24]A similar survey was carried out in 1868 but we have been unable to find the respective statement for Haute-Savoie in the Departmental Archives.

[25]Article 133 of the Municipal Law of 1884 (*Loi Municipale du 5 Avril de 1884*) clarifies what accounts as ordinary revenues.

It should also be noted that the post-WWI total revenue data (1920 and 1923) is not directly comparable to pre-WWI values. As stated in the 2020 SFC edition, post WWI, revenue data includes resources for various extraordinary expenditures, several of which are related to the war effort and the country's reconstruction. Moreover, revenues increased to reflect the changes in prices of factors of production due to war disruptions. In addition, as aforementioned in this section, the French tax system experienced a complete overhaul during WWI, with the introduction of a modern income tax structure. Hence, the municipal revenue figures for 1920 and 1930 are an order of magnitude greater than those for the pre-WWI period.

Finally, for 1862, we calculate a comparable measure of revenue by adding all revenues listed. We exclude remaining funds from previous years (*reliquat* to maintain homogeneity across departments. For 1862, these are not included as revenues for Savoie but appear to be included for Haute-Savoie.

Local tax base and local tax revenue per capita.   SFC data allows us to calculate to additional indicators correlated to local economic development and wealth: the local tax base and the local tax revenue. We follow Piketty and Cagé (2023) and calculate the local tax base and local tax revenue by multiplying the value of the tax cent times 100 and times the total number of additional local tax cents, respectively. The value of an additional tax cent reported in the SFC should be equal (or at least be almost equal) to one-hundredth of the sum of the principals of the four direct contributions. Hence, the local tax base reflects the value of the principals.[26]

Our local tax revenue indicator approximates the amount collected from all additional local tax cents, both ordinary and extraordinary.[27] It is not the exact amount as a few additional tax cents are levied on certain contributions only. For example, there are 5 ordinary tax cents included in ordinary revenues which are only applied on the principal of the land and personal-movable contribution. Starting in 1891, the SFC reported the *produit des centimes ordinaires et extraordinares*, which should equal the amount collected by all additional local tax cents. However, to have a common indicator throughout the SFC publication period, we adhere to the calculation in Piketty and Cagé (2023).

The statements which served as the basis for the 1862 report on local financial accounts did not include the value of the additional tax cent. Hence, we compute the local tax base by calculating the value of an additional tax cent from the imposition for primary education, which, at the time, was equal to 3 additional tax cents. Regarding local tax revenues, the statements do not report the total number of additional tax cents.[28] Hence, we cannot calculate local tax revenues for 1862.

The first part of the tax roll amounts statements report total tax collection from the four direct contributions. While the format of these statements may differ across departments and across time,[29] for Haute-Savoie, these detail the principal and the tax to be collected from additional

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[26]When comparing the local tax base to the principal reported in the tax roll amounts statements, there are some minor differences. This may be due to adjustments carried out between the date when the tax roll statements were completed and the date when the information was sent to national authorities for reporting in the SFC.

[27]Extraordinary tax cents help cover extraordinary expenditures which are, according to the 1884 municipal law, accidental and temporary expenses that require approval from the department prefect. This could include the development of specific local infrastructure projects.

[28]The statements include the additional tax cents for extraordinary expenditures and additional tax cents for several types of ordinary expenditures. However, several ordinary expenditures do not have their corresponding number of additional tax cents.

[29]The statements available for Haute-Savoie are more detailed than those for Savoie.

national, departmental, and local tax cents for each contribution. We have digitized the information for budget years 1862, 1877, and 1881.