INCOME SHOCKS AND THE CONSOLIDATION OF DEMOCRACY: THE FRENCH CASE

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Abstract

This paper examines the link between economic development and political institutions by analyzing the circumstances which allowed for the consolidation of democracy in France between 1876 and 1889, after nearly a century of political instability. Our results establish a causal relationship between the increase in the vote share of the incumbent coalition of republican parties and the increase in income, which is shown to stem from a lack of negative income shocks in the agricultural sector. However, other measures of wealth, particularly those related to human capital accumulation such as high literacy, are found not to have any effect.

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1. Introduction

It is still debated whether economic development determines the onset and the survival of democracy.[1] The influential modernization hypothesis, found in the works of Lipset (1959), Dahl (1971) and Rueschemeyer et al. (1992) among others, considers that economic growth, which increases income and allows for high human capital accumulation, fosters political participation and eventually enables the establishment and the consolidation of democratic institutions[2]. Some studies, e.g., Barro (1999), find a positive link between income and democracy in pooled regressions, but Acemoglu et al. (2008, 2009) argue that this relationship breaks down when fixed effects are included.

Instead, studies by Acemoglu and Robinson (2001, 2006), Acemoglu et al. (2009) and Moore (1966) argue that differences at critical historical junctures explain the divergent of economic and political paths of various countries. In particular, Acemoglu and Robinson (2006), Berger and Spoerer (2001), Geddes (1999), Haggard and Kauffman (1995), argue that the timing of democratic transitions is often related to economic

[1] There is a related literature investigating whether democracy is propitious to economic development. Studies by Barro (1996) and Mulligan et al. (2004) among others find that democracy has no robust effect on growth while others, e.g., Giavazzi and Tabellini (2005), Jones and Olken (2005), Rodrik and Wacziarg (2005), Papaioannou and Siourounis (2008) argue that there is a positive, but weak, effect of democracy on economic development. In addition, Przerworski et al. (2000) find that political instability hurts growth, especially in authoritarian regimes.

[2] Many studies have criticized the modernization hypothesis. They explain the willingness of ruling elites to share power with groups whose goals they may oppose by emphasizing the role of ideology (Tilly, 2004), the broader context of constitutional bargaining (Congleton, 2004, 2007), or external pressures that are conceptualized as a threat of revolution (Justman and Gradstein, 1999, Acemoglu and Robinson, 2000, 2006, Boix, 2003). Other studies suggest that the extension of the suffrage was a consequence of economic changes that made democracy more profitable for the ruling elite. This might be the case if property rights are better protected under democracy (Gradstein, 2007), if democracy enhances human capital accumulation (Bourguignon and Verdier, 2000) or if a significant fraction of the elite can benefit from greater provision of public services under democratic governments (Lizzeri and Persico, 2004).

recessions. Such a point is notably made in recent studies by Bruckner and Ciccone (2009) and Burke and Leigh (2010) who show that negative transitory economic shocks caused by large rainfall can lead to significant democratic changes.[3]

This paper reexamines the link between economic development and political institutions by focusing on the circumstances which allowed for the consolidation of democracy in France between 1876 and 1889, in the first years of the Third Republic. Such a focus on the economic and political situation of a single country at a critical historical juncture provides an alternative to the empirical studies on democratization which rely on cross-country regressions and therefore tend to overlook that the establishment and consolidation of a democracy is rarely a smooth process: the ruling elites may oppose relinquishing power with groups whose goals they oppose and they can be supported by a sizeable fraction of the population in their endeavor.[4]

For instance, France became a democracy in the nineteenth century in spite of substantial popular resistance. In fact, the majority of the representatives elected in 1871 under universal male suffrage to the *Assemblée Nationale* following the demise of the Second Empire headed by Napoleon III, were a priori hostile to the establishment of a Republic. But they were divided between two monarchist groups and partisans of the Bonaparte (Imperial) family. As a result, some conservative members of the *Assemblée Nationale* became disillusioned by the rivalries within the Anti-Republican camp. They defected to the Republican group, under the assurance that the Republic would protect private property rights and prevent France from falling into anarchy. Eventually, the

[3] Miguel et al. (2004) and Dell et al. (2008) on the economic and political impact of weather conditions.

[4] Twentieth-century totalitarian movements which sought to subvert democracy, e.g., Fascism, are a case in point.

Assemblée Nationale voted for the establishment of the Third Republic on 30 January 1875 by a one-vote majority. Democracy was thus established in France as the default regime, because its opponents were not able to unite behind a single leader.[5]

However both the Monarchist and the Bonapartist politicians did not immediately renounce their political objectives and still sought to overthrow the Third Republic. They would however fail as the incumbent coalition of republicans would win all the legislative elections until World War I. But the Monarchist and Bonapartist causes had already been dealt a fatal blow at the start of the 1890s when they lost the backing of the Catholic Church. Until then, the catholic laity and clergy had viewed the republican regime with hostility, as they associated the republicans with the 1789 French Revolution and the religious persecutions it had entailed. But after the 1889 parliamentary elections, Pope Leo XII realized that the Republic had been consolidated. He then instigated the policy of *ralliement* (French for rallying), which stated that French Catholics need not oppose the Republic and he encouraged them to infuse the Republic with Catholic values. While the *ralliement* did not soften the hostility of the Republicans against the Church, it nevertheless led many Catholics to rally to the Republic and forsake their support for the monarchy and for the empire.

Various explanations have been put forward to explain the victories of the republican coalition in the first five elections of the Third French Republic (1876, 1877,

[5] Persson and Tabellini (2009) argue that a random move towards democracy creates a virtuous circle which consolidates democratic regimes. This is because democracy slowly fosters an accumulation of civic and social capital, which Persson and Tabellini (2009) refer to as "democratic capital", which eventually has an indirect effect on economic growth because it lowers the probability of a reversal to dictatorship. While it could actually be argued that democracy was established in France by random move, the data in this study do not allow us to directly test Persson and Tabellini (2009)'s theory. This is left for future research.

1881, 1885, 1889), before the *ralliement*. It has been argued that the Republic was bound to triumph because of the majority of individuals always prefer a democratic regime (see Mayeur, 1973, 1984 for a discussion)[6]. It has also been suggested that a majority of Frenchmen were already republican by the mid-19th century (Gouault, 1954). However, both explanations conflict with the quick demise of the Second Republic (1848-1851), Napoleon III (1851-1870)'s popularity and the Monarchist victory in the 1871 elections.

An explanation that is often discarded pertains to economic growth. This is because the 1873-1896 period, which covers the first years of the Third Republic, was characterized by a recession in the agricultural sector as well as by an economic stagnation in the industry and in the nascent service sector (Asselain, 1984, Levy-Leboyer and Bourguignon 1990). This can notably be seen in Figures A1 and A2 where we graph Levy-Leboyer and Bourguignon (1990)'s estimates of GDP and GDP per capita in France between 1848 and 1913: it was only in the second half of the 1890s that the French economy started growing again at rates which were similar to those of the 1850s and 1860s. [7] However the national economic stagnation of the 1873-1896 period actually masks differences in income between the different regions of France.

As such, this study examines whether the support for the republican politicians, who defended democracy and represented the incumbent regime in each *département*[8], can be explained by the improvement in local economic conditions in France. Two reasons may explain why local economic conditions might have mattered more than

[6] This point is made at a more theoretical level by Acemoglu and Robinson (2006).

[7] Toutain (1987), Bourguignon and Levy-Leboyer (1990) and Maddison (2001) provide slightly different estimates of the GDP in nineteenth century France that nonetheless show that the late 1870s and the 1880s were characterized by economic stagnation.

[8] *Départements* are administrative divisions of the French territory which were created in 1790.

national circumstances. First, nineteenth century France was not a fully integrated country, both from a cultural and an economic point of view.[9] Second, the representatives to the lower house of Parliament were not elected on national single party lists but in small to medium-sized constituencies where local circumstances might have a large impact.

In this study, we exploit the fact that the coalition of republican parties represented in each parliamentary election the incumbent government at the national level. This allows us to use vote share regression models in line with Fair (1978) and Wolfers (2007), so as to examine whether the incumbent republican coalition was able to remain in power because of increases in income and in other measures of human development between 1876 (the first election of the Third Republic) and 1889 (the last election before the *ralliement*).

To establish a causal relationship from the increase in income to the success of the republican coalition, we use exogenous variation in monthly rainfall in the French *départements*. Such an Instrumental Variable (IV) approach seems credible because the French economy in the nineteenth century was still mostly based on agriculture. In fact, Solomou and Wu (1999) find that weather shocks had an overall impact of ±1.0% on the French GDP between 1870 and 1913.

In addition, by using rainfall as an IV, this paper relates to the literature pertaining to the voters' motive when they engage in economic voting. Indeed, while it is usually acknowledged that voters condition their support for incumbent politicians on the performance of the economy during the incumbents' term in office (see Lewis-Beck and

[9] Weber (1976) discusses the construction of French identity during the nineteenth century.

Stegmaier, 2000, for a survey), some studies, e.g., Patty and Weber (2007), Wolfers (2007), argue that economic voting mostly reflects the voters' irrationality. In the context of the nascent Third Republic, such a perspective on the voters' behavior leaves the possibility that the republicans won the elections because of economic growth at the local level which could mainly be attributed to luck, i.e., to the absence of transitory negative income shocks caused by rainfall.

Our results establish a causal relationship between the increase in the vote share of the incumbent coalition of republican parties, and the increase in income, which we proxy through tax receipts. Our regressions, which include year- and *département*-fixed effects, indicate that the support for (respectively, opposition to) the incumbent coalition of republican parties grew (decline) with the positive (negative) change in income. However, other measures of wealth, and in particular those related to human capital accumulation, such as low fertility rates and high literacy, are found not to have any effect. As such, our results question the relevance of modernization theory but nevertheless suggest that there was a causal link between higher income and the electoral victories of the republicans consolidation of the democracy in France.

This relationship in turn is shown to mostly depend on luck: In most *départements*, the lack of negative transitory income shocks caused by large rainfall led voters to support the incumbent republican regime. Conversely, in the *départements* where weather shocks were more numerous, voters suffered from negative income shocks and opposed the republican incumbents. As such, this paper suggests that transitory negative income shocks hindered the consolidation of the republican regime in France.

The rest of this article is as follows. Section 2 provides some historical background on the establishment and consolidation of the Third French Republic. Section 3 discusses the data and the methodology. Section 4 analyzes the results. Section 5 concludes.

2. The establishment of the Republic in nineteenth-century France

2.1. Political instability in nineteenth-century France

Between the fall of Napoleon I's empire in 1815 and the start of WWI in 1914, France was characterized by a strong political and constitutional instability. King Louis XVIII was returned to power by the coalition of countries that overthrew Napoléon I in 1815. He would reign until 1824 and would be the last French King not to be overthrown. This might have been because he understood he could not fully roll back all the economic and political changes that the French Revolution had wrought on France. Indeed it is often said that his successor (and brother), King Charles X was overthrown in 1830 because he tried to restore features of the Monarchy prior to the 1789 French Revolution. Charles X would be the last Bourbon *Légitimiste* king, i.e., from the senior branch of the Bourbon family. This is because he was succeeded by King Louis-Philippe I, who belonged to the cadet branch of the Bourbon family, called the *Orléans* branch.[10] In theory, Louis-Philippe I was a constitutional monarch who reigned but did not govern; in practice, he played a salient role in politics. Eventually Louis-Philippe I was overthrown in 1848, when a series of bad harvest led to famines and discontent within France.

[10] Louis-Philippe's father was Louis Philippe Joseph d'Orléans (Orléans is a French town), who was a cousin of Louis XVI, Louis XVIII and Charles X. During the French Revolution, Louis Philippe Joseph d'Orléans changed his name to Louis-Philippe Egalité (equality in French) to show his support for revolutionary ideas. He also voted in favor of the execution of his cousin King Louis XVI in January 1793, but was later guillotined in November of that year.

Republicans used the political void created by the 1848 revolution to proclaim the Second French Republic on 24 February 1848. Some of the accomplishments of this regime are noteworthy: it abolished slavery in the French colonies and instituted universal (male) suffrage.[11] However it also established a political system which gave equal power to the executive and the legislative branches of government. This created conflicts between President Louis-Napoléon Bonaparte, who was Napoleon I's nephew, and the Parliament. Eventually, in 1851, Louis-Napoléon Bonaparte exploited political circumstances to stage a coup which suppressed the institutions of the Second Republic. He crowned himself Emperor of the French a year later under the name Napoléon III.

However Napoléon III would abdicate on 1 September 1870, after the defeat of the French army by Prussian forces at the battle of Sedan. When the Parisian population learnt of this defeat, demonstrations broke out, the Parliament was invaded and the proclamation of the Republic was made in Paris's city hall. France had de facto become a republic, but was not yet one de jure.

2.2. The birth of the Third Republic

Following the demise of the empire, the provisional French government headed by Adolphe Thiers organized elections under universal male suffrage in February 1871 to elect an *Assemblée Nationale* whose representatives would establish the new French political institutions.

[11] France was the first European country to introduce universal male suffrage in 1848. However women were only allowed to vote in 1944. See Huard (1991) for an historical overview.

The elections returned a majority of monarchist representatives who opposed the establishment of a republic.[12] But they were unable to agree on a constitution and a king. The *Légitimistes* favored a return to pre-1789 institutions while the *Orléans* supported a constitutional monarchy, where the king's power would theoretically be limited and the Parliament would play an important role. They were in a deadlock and were not able to solve their disagreements, even as the parliamentary by-elections were favorable to the republicans and even to the Bonapartists.[13]

However, if all the republicans were hostile to the monarchy, they also disagreed on many institutions of the future republic. But the most left-wing republicans eventually decide to moderate some of their stances for the sake of the Republic. They notably agreed on the creation of an upper house of Parliament (called *Sénat*) alongside a lower house (called *Chambre des députés*). At the same time, some of the conservative members of the *Assemblée Nationale*, mostly from the *Orleanist* group, became disillusioned with the rivalries in the Monarchist camp. They progressively joined the Republican group, under the assurance that the Republic would protect private rights and oppose socialism.[14] Thus, on 30 January 1875, following a proposal of centrist

[12] Following the elections, the French government faced an insurrection in Paris, called *La Commune*, led by socialists and anarchists who did not accept the outcome of the February 1871 elections. This insurrection was quelled in late May 1871 when tens of thousands are said to have died in fighting. This repression of *La Commune* had a long-term depressing effect on the strength of the socialist movement in France.

[13] Between October 1873 and February 1875, republicans won 16 by-elections while the bonapartists won six and the monarchists only one.

[14] On 13 November 1872 Republican leader Adolphe Thiers famously declared in Parliament: "The Republic will be conservative, or it will not be". Such a statement underlines the fact that the French republicans were opposed to the Monarchy or the Church, but most of them were not left-wing, either by 19th century or by modern standards.

representative Henri Wallon, France became a republic by a majority of 353 votes against 352.[15] The adoption of additional constitutional laws pertaining to the powers of the State and to the houses of Parliament followed soon afterwards.

2.3. The consolidation of the Third Republic

2.3.1. Parliamentary elections in France, 1876-1889

Once the institutions of the Third Republic had been adopted, elections had to be held. They were crucial because the anti-Republican camp had not given up on the objective to overthrow the Republic. In particular, the Monarchists, who represented the largest anti-Republican group, hope to impose their interpretation of the constitution of the Third Republic which would pave the way to a restoration of the Monarchy. They wanted the President to be able to choose ministers and govern without the approval of the parliamentary representatives because they had succeeded in electing to the Presidency one of their own, Patrice de MacMahon.[16] Conversely, the Republicans wanted to keep the President in a ceremonial role. The executive power would be vested in the Prime Minister whose government would only answer to the members of Parliament.

In such a context, the first elections to the upper and lower houses of Parliament would be crucial. For the 30 January 1876 elections to the *Sénat*, whose members were not elected in a direct vote by the people but by politicians with a local mandate, e.g., mayors and members of *département* councils, the anti-republican camp did not obtain a

[15] Under the voting rules of the *Assemblée Nationale*, three readings were needed to adopt a bill. While the first reading of Wallon's bill only passed by one vote (353 votes against 352), his bill passed by a larger majority in the next two readings (413 votes 248 against on the second reading, and 425 votes against 254 on the third reading).

[16] The President was elected by the members of Parliament, not by the people in a general election.

clear-cut majority.[17] The Republicans then won the elections to the lower house held on 20 February and 5 March 1876: they obtained 360 representatives against 150 for the anti-Republicans (including 75 Bonapartists), in spite of the single-member constituency election system, with a two-round majority procedure which supposedly favored the anti-Republican representatives. [18]

In those circumstances, Patrice de MacMahon was in a conundrum. He wanted to govern but could not pass laws in Parliament because a majority of the representatives were republican. At the same time, he did not want Republican leader Léon Gambetta to become Prime Minister. Eventually, MacMahon decided to indefinitely adjourn the *Chambre des députés* and invoked on 18 May 1877 his right to choose "councilors who think like [him]". On 20 May, 363 republican representatives signed a manifesto which denounces a "policy of reaction and adventures". In return, MacMahon called for new elections to the lower house of Parliament.

These elections were held on 14 and 28 October 1877 and returned a majority of 323 republican representatives against 208 anti-republicans, half of whom were Bonapartist. Even though MacMahon thought for a while he could still form a government which would not have any relationship with the lower house of Parliament,

[17] On 30 January 1876, 119 anti-republican senators, including 40 Bonapartists, were elected against 92 republicans. But in addition to these senators, the *Assemblée Nationale*, had decided to elect 75 "irremovable" senators, who would sit till they died and who would not be replaced after their death. The leaders of the anti-Republican camp had hoped to use these "irremovable" senators to control the upper house of Parliament, but they did not foresee the extent of the divisions and the rancor between many Monarchist and Bonapartist backbenchers whose chose to vote for republican candidates. Eventually, 60 out of the 75 "irremovable" Senators were republican.

[18] Most, but not all, republicans favored a proportional list system at the department-level which had been used in the elections during the Second Republic. Still a single-member constituency system with a two-round majority procedure was established.

he eventually accepted the republican interpretation of the constitution. He resigned on 30 January 1879 and was replaced by republican politician Jules Grévy, who on 4 February 1879, called William Waddington to form the first government which would fully act in accordance with the republican principles.

The monarchists were demoralized after their failures in 1876 and 1877 and they did not even file candidates in 252 of the 541 constituencies in the 1881 parliamentary elections. But the first round of the 1885 elections turned out to be catastrophic for the republican candidates. Even though they had chosen a proportional list system, which they believed to give them an advantage over their opponents, they only managed to have 127 representatives elected against 176 anti-republican representatives. Facing this difficult situation, the republicans united in the second round in the name of "republican discipline": this meant that only the republican list which obtained the highest number of votes remained in the second round. Eventually, the republicans obtained a majority of votes and seats in the second round: there were 383 republicans and 201 conservatives, including 65 Bonapartists.

Still, even after the victories of the republicans in four general parliamentary elections, the Republic would still be threatened by an individual who had initially supported it. General Ernest Boulanger was a very popular War Minister who had lost his portfolio in 1887 because other republicans thought he was unreliable. He then started gathering around him all the individuals who were dissatisfied with the regime. There were left-wingers who resented parliamentary shenanigans and sought a stronger executive form of government, right-wing nationalists who thought that the Republic was unable to undertake the war against Germany which would avenge France from the

humiliating 1870 defeat, Monarchist politicians who hoped for a coup which would enable the restoration of the Monarchy and working classes which were hit by the economic crisis. But Boulanger committed tactical mistakes and eventually did not dare to stage a coup against the Republic. His supporters abandoned him and the republicans prosecuted him for conspiring against the State on 4 April 1889. He immediately fled to Belgium and never came back to France.[19]

While the Boulanger crisis would trigger a realignment of the political forces within the republican camp, notably leading some of the most left-wing republicans to seek alliance with the socialists, it had little or no effect on the outcome of the elections in 1889. Republicans had obtained 4,327,162 million votes in 1885 and received 4,529,008 million votes in 1889; the anti-republicans got 3.541,384 million votes in 1885 and 3.424,373 million votes, including 718,014 votes for Boulanger supporters, in 1889. Eventually, because of a return to single-membership constituencies, the republicans obtained 366 seats in the *Chambre des députés*, against 168 anti-republicans and 42 Boulanger supporters.

2.3.2. The *ralliement*

At the start of the 1890s, Pope Leo XIII tried to mend the relationship of the Church with the French Republic. His policy of *ralliement* stated that Catholics need not oppose the Republic and he encouraged them to infuse the Republic with Catholic values. Most,

[19] Boulanger would commit suicide on 30 September 1891 in Belgium on the grave of his mistress Marguerite de Bonnemains, two months and a half after she died.

French Catholics rallied to the Republic: they stopped supporting Monarchist and Bonapartist politicians who progressively became remnants of a previous age.[20]

The Republic had triumphed and the political debates would not focus on the nature of the political regime anymore. Instead, they would deal with the role of the Catholic Church within the new Republic. In spite of the *ralliement,* the Republicans still viewed the Church with hostility and eventually achieved their objective to separate Church and State in 1905 (Franck, 2010).

It would be wrong to consider in hindsight that democracy would eventually triumph in France. In the first years of the Third Republic, many republican politicians dreaded a coup which would overthrow democracy. First, they were keenly aware that in the last *plebiscite* of the Second Empire held on 8 May 1870, Napoleon III obtained the support of 7.35 million voters and was only opposed by 1.57 million voters.[21] Second, they were also aware that a sizeable share of the French population in the 1870s still maintained a certain level of Catholic observance, and the mutual hostility between Republican and Catholics was not a priori propitious to the consolidation of democracy. Third, the two previous Republican experiences in France had been short, and were each time terminated in coups that established autocratic regimes: the First Republic lasted seven years (1792-1799) and the Second Republic only three (1848-1851).

As we discussed in the introduction, various explanations were given for the consolidation of the Third Republic and the electoral success of the coalition of

[20] None of these *ralliements* was more stunning than that of representative Albert de Mun. He declared a couple of days before Pope Leo XIII's statement about the ralliement in 1892 that the horrors of the French Revolution stood between the republicans and him but ran in the 1893 elections as a Catholic who had rallied to the republic.

[21] 1.9 million registered voters abstained.

republican parties against their anti-democratic opponents in the 1876, 1877, 1881, 1885 and 1889 general parliamentary elections which were held under universal (male) suffrage. In what follows, we investigate whether the consolidation can be explained by income growth and the lack of negative income shocks at the local level.

It is important to note that in each of these elections, the coalition of republican parties represented the incumbent majority. While the members of this coalition differed on many aspects of economic, national and foreign policy, they agreed to defend the Republic against any attempt at restoring a Monarchy or an Empire.

3. The data and empirical methodology

Our dataset comprises information on the 86 French mainland *départements*, excluding Corsica and the French overseas territories.[22] Table 1 describes our variables while Table 2 presents descriptive statistics. We also discuss our empirical methodology in this section.

[Table 1 here] [Table 2 here] [Table 3]

3.1. Dependent variables: turnout and election results

3.1.1. Turnout

To compute the turnout based on the population which was eligible to vote in each election, we combine data on the number of voters from Lancelot and Lancelot (1970)

[22] Corsica is excluded because information on the amount of direct taxes collected by the French state is available but the amount of indirect taxes is not. In additional regressions which are available upon request, we solely focus on the amount of direct taxes and introduce Corsica in our sample; we find that the results are not modified. Furthermore, the overseas territories that are excluded from our study are *Algérie*, *Inde Française*, *Guyane*, *Guadeloupe*, *Martinique*, *La Réunion*, *Cochinchine*, and *Sénégal*. This exclusion is motivated on two grounds. First, we do not possess reliable information on the characteristics of these territories. Second, even if we had such information, we would have to distinguish between French settlers, who were allowed to vote, and the local population, which could not.

and on the total adult male population age 21 and above from the *Recensement Général de la France*. In addition, we compute the turnout based on the number of registered voters which we also obtain from Lancelot and Lancelot (1970). Table 3 reports these figures for each election at the national level.

As can be seen in Tables 1 and 3, there are substantial differences between these two measures. This is because individuals who did not want to vote may have decided not to register to vote in the first place.

3.1.2. The vote share of the incumbent republican coalition

We construct our dependent variable as the share of votes obtained by the candidates of all the republican parties in the general parliamentary elections to the lower house of Parliament[23] held in 1876, 1877, 1881, 1885 and 1889. In each *département*, we obtain the vote share received by each candidate – or list of candidates, depending on the electoral rules in each election- from the *Archives Nationales* (series B IIC et F1cIII). We double-checked the political affiliation of the winning candidates in the dictionaries of the French representatives in Robert and Cougny (1889) and Jolly (1960).

Table 3 reports the vote share and the number of representatives in the five elections at the national level for the Republicans and their opponents. It shows that the number of votes remained for each camp more or less the same during each election, except in 1881 where the Monarchists and Bonapartists barely fought. Still the electoral rules sometimes meant that a higher share of the votes at the national level did not necessarily translate into a higher share of representatives in Parliament. For instance, the

[23] We cannot replicate this test for the members of the upper house of Parliament since they were not elected in a direct vote by the people but by politicians with a local mandate, e.g., mayors and members of departmental councils.

republicans obtained 4,028,153 votes in 1876 and 393 seats in Parliament, and got 4,307,202 votes in 1877 but only 313 seats. In any case, the Republicans managed to retain a majority of seats in Parliament throughout the period, as can be seen in Figures 1 to 5 which display the share of republican representatives elected in each election.

[Figure 1 here] [Figure 2 here] [Figure 3 here] [Figure 4 here] [Figure 5 here]

3.2. Explanatory variables

Our explanatory variables are built following the information found in two official publications of the French government. The *Annuaire Statistique de la France* is the annual census that gives information on educational achievement, the number of births, and of individuals living in urban areas or working in industries in each *département*. The *Bulletin de Statistique et de Legislation Comparée* provides data on public finances, and in particular, on the amount of taxes collected in each *département*.

At this point, a remark is in order: we seek to explain the outcome of the elections based on the economic situation when the elections were held. In this respect, the second round of the 1877, 1881, 1885 and 1889 was held during the second semester of those years but that of the 1876 election took place in February 1876. As such, it is reasonable to assume that the farmers' income in the 1877, 1881, 1885 and 1889 would have depended on the outcome of the harvest which had been nearly or fully completed by the time of the elections. However this is unlikely to have been the case for the 1876 elections whose outcome might have been influenced by the harvest of the previous year. As a result, we choose to explain the outcome of the 1877, 1881, 1885 and 1889 elections by the economic situation and the rainfall quantities in those respective years, but relate the 1876 election results to the economic circumstances in 1875.

3.2.1 Wealth

To test our hypothesis that voters returned politicians from the incumbent republican coalition because of an increase in income, we collect measures of wealth in every *département*. Since we cannot rely on modern data like the Gross Domestic Product (GDP) per capita at the *département*-level, our proxy for wealth is the amount of tax receipts (in thousand French Francs) per capita collected by the French State in each *département*.[24]

Like in many other countries, the French tax receipts stem from two sources: indirect taxes and direct taxes.[25] Indirect taxes were excise taxes, mostly levied on alcohol, sugar, coffee and tobacco. Conversely, direct taxes were levied on people and their real estate. They did not comprise an income tax, which was only levied in France for the first time in 1914, but were instead made of four components. There was one tax on the value of the land (*contribution foncière*), a second tax on the value of the houses and buildings (*contribution personnelle et mobilière*), one on the number of doors and windows of each house (*contribution des portes et fenêtres*) and a trading tax based on the benefits of trading and industrial companies (*contribution des patentes*). In addition, direct taxes included a series of additional taxes levied on horses, pools and gaming clubs.

As can be seen in the descriptive statistics in Table 2, the indirect taxes represented the bulk of the tax receipts in France. However, since they were excise taxes, they were

[24] We do not have data on income inequality by department. In this respect, it seems that inequality was decreasing in France throughout the 19th century, but there remained differences between *départements*. On this issue, see Morrisson and Snyder (2000) and Piketty et al. (2006).

[25] On the French tax system in the nineteenth century, see Say (1889), Stourme (1893) and Leroy-Beaulieu (1906).

likely to vary substantially from one year to the next, depending on the current income of the French taxpayers. Conversely, the direct taxes represented the lesser part of the total tax receipts, but were less likely to fluctuate because of income shocks.[26]

3.2.2 Human capital

To account for the possibility that wealthier *départements* might have higher levels of economic and human development which would in turn increase the support for the incumbent republican coalition in those areas, our dataset includes measures of fertility and education. First, we compute the number of births per 1,000 women aged 15 to 49 in each *département*. We thus hypothesize that a low level of fertility, which is usually correlated with increased wealth, is associated with a high level of votes for the Republicans.

We also consider the differences in the educational achievement of individuals living in each *département*. Since only men aged 21 and above were allowed to vote during the Third Republic, we rely on the statistics for the French Army's conscripts, i.e., 20 year-old men, who were enrolled in each *département* in each election year. We single out men who were illiterate, i.e., who could neither read and/or write, as opposed to those who could read and/or write. As can be seen in Table 2, over the 1876-1889 period, only 15% of the French conscripts were illiterate.[27] This low figure should not be surprising:

[26] It must be pointed out that during the 1876-1889 period, the tax rates were modified, depending on the need for financing government spending. But since these changes in the tax rates were applied uniformly throughout the country, it remains the case that the amount of taxes collected by the French state at the national level would still reflect the relative wealth of each department in every election year.

[27] Since 1798, French law had compelled young men to report for military service when they turned 20 years old in the *département* where their father lived. This is presumably the *département* where these young men grew up so that their general level of literacy would reflect the general level of education of the *département*.

even though, primary school attendance until age 14 was only made compulsory in 1881, literacy rates had increased in France throughout the nineteenth century, especially after the passing of a law in 1833 that required all French towns to have a primary school located in their jurisdiction (Grew and Mulligan, 1991).

3.2.3 Urbanization and industrialization

Additional measures of economic development in our study include data on the urbanization rate and the occupations of the French population. In this respect, the rural exodus which had begun in the second half of the nineteenth century suggests that urban and industrial areas were richer than rural and agricultural regions, given.[28]

We thus collect data on the share of the urban population, as opposed to the rural population, in each *département*. We also rely on data on the share of individuals employed in the industrial and service sectors, while individuals employed in the agricultural sector make up our control group. As can be seen in the descriptive statistics in Table 2, during the 1876-1889 period, France remained still a rural country that was dependent on its agricultural sector: less than 30% of the French population lived in urban areas and less than 50% worked in the industrial and service sectors. [29]

Finally, we collected data on the number of kilometers of village road network in France. The provision of this public good can be viewed as a measure of the quality of institutional governance. If voters found that their constituencies were adequately

[28] Sauvy (1965) shows that emigration from the rural to the urban areas even continued after World War I.

[29] When interpreting the results, we will not fall into the ecological inference bias. Namely, if we were to find a positive and significant relationship between the change in the urbanization level and the vote share for the republican vote share, it would not mean that *départements* with a higher degree of urbanization voted more for the republican parties. In our framework, we view a change in the urbanization level as an increase in wealth.

provided with roads, they may vote for the incumbent parliamentary representatives, even though village roads were under the control of village/town mayors and not of the members of parliament, who were instead in charge of funding national and d*épartemental* roads. Such an emphasis on village roads is warranted by the data from the *Annuaire Statistique de la France* which shows that most of the road network in France during the 1876-1889 period was made of village roads: their share in the total road network in France even grew from 84.33% in 1876 to 91.28% in 1889. [30]

Still, taking into account the road network, and more generally income via our measure of taxes, into our empirical analysis raises question about endogeneity. Indeed, our study posits that economic growth has an effect on the republican parties' vote share, but it may be that the republican parties' vote share has an impact on income or on the redistribution of public goods. And even though there were few, if any, major redistribution policies in the first years of the Third Republic, we cannot fully rule out that republican politicians would try to sway the vote by engineering some redistribution policies either at their "core supporters" and/or at "swing voters".[31] For this purpose, we use instrumental variables which are discussed in the next section.

3.3. Rainfall

To solve for the potential endogeneity bias in our study, we rely on rainfall as a source of exogenous variation in tax receipts (and road construction) via agriculture

[30] The results which we discuss in Section 4 are not modified when we use the measure of total road network, which includes national and *départemental* roads, instead of simply the village road network. They are also not modified when we drop the village road network altogether from our specifications. These regressions are available upon request.

[31] On redistributive politics in democracies, see among others Cox and McCubbins (1986), Lindbeck and Weibull (1987), Dixit and Londregan (1996). On the emergence of social welfare policies in France, see Pedersen, 1993 and Dutton, 2002.

income. As we discussed in the introduction, extreme weather conditions could trigger negative income shocks in a country where a majority of the population worked in the agricultural sector. In turn, it may be hypothesized that these shocks would make it harder for republican incumbents to be reelected.

We collected from the *Annales du Bureau Central Météorologique de France* (Annals of the Central Meteorological Bureau of France) and from Garnier (1974) monthly quantities of rainfall in the main city (*chef-lieu*) of each *département* and use them as a proxy for the climate conditions prevailing in the whole *département*. This is a realistic assumption because *départements* were designed in 1790 to be of relatively small size so that it would take one day of horse travel at most to arrive in the *département*'s *chef-lieu* from any point in the *département*. In addition, we use in our regressions *département* fixed effects that capture the effects of local conditions with respect to the natural fertility of the soil whole the year fixed effects control for the possible impact of temperature anomalies.

Still it is worth noting that rainfall may only have limited explanatory power in relation to tax receipts via agricultural output. This is because soil moisture, which is the relevant consequence of rainfall, is also influenced by temperature. However we do not have data on temperature. In other words, our data on rainfall are only likely to be weak instruments for tax receipts.

In our analysis we use monthly rather than yearly data on rainfall. First the variations in rainfall in some months may have a higher impact on crops than in others. For instance, droughts or floods in September would have no impact on the income of farmers who grow up wheat, which is harvested in France from late June to late August,

but would have an impact on those who grow up maize, which is harvested in September Second it is obvious that abnormally low or high precipitations would only have an impact on voting if they were to occur before the elections, not afterwards. Such an observation leads us to drop the months of October, November and December from our analysis since the second round of the elections were always held at the latest in the first week of October.

In this study we use three measures of rainfall. First we use the logarithm of the quantity of monthly rainfall x_{jmt} for the main city j in each department in month m of year t

Second, we use the logarithm of the absolute deviation of rainfall which we define as follows

$$z = \left| \frac{x_{jmt} - \bar{x}_{jm}}{s_{jm}} \right| \quad (1)$$

where the logarithm of the quantity of monthly rainfall x_{jmt} for the main city j in each department in month m of year t is standardized by the mean $\bar{x}_{jm}$ and the standard deviation s_{jm} of the rain data from each station.

Third, we define the logarithm of squared deviation of monthly rainfall

$$z = \left(\frac{x_{jmt} - \bar{x}_{jm}}{s_{jm}} \right)^2 \quad (2)$$

We also employ additional approaches to measure the economic impact of precipitations, e.g., dummies for various rain thresholds, but we do not report them because they are not highly correlated with taxes.

3.4. Methodology

To find the determinants of the turnout and of the vote share of the republican coalition in the first five elections of the Third French Republic, the main regressions are

$$\ln(Turnout_{d,t}) = \alpha_d + \alpha_t + \beta \ln(X_{d,t}) + \varepsilon_{d,t} \quad (3)$$

and

$$\ln(Republican_{d,t}) = \alpha_d + \alpha_t + \beta \ln(X_{d,t}) + \varepsilon_{d,t} \quad (4)$$

where the *Turnout* variable assesses the turnout in each election, the *Republican* variable measures the Republican coalition's vote share, X represents the explanatory variable(s) that account(s) for higher income and higher human development, ε is an error term such that $\varepsilon \to N(0, \sigma^2)$, while the subscripts d and t represent the *départements* and the election years. Given the possibility of *département*-level time-invariant unobserved characteristics, which could be correlated with omitted factors, as well as to account for time trends that are common to all *départements*, we include the *département*-- and year-fixed effects α_c and α_t in Equations (3) and (4). These fixed effects also us to account for the fact that some *départements* may always have a high vote share for the republican parties, or that a particular election, e.g. the 1881 election where many anti-Republican voters abstained, might be particularly favorable for the candidates of the republican parties.

Equation (4) is similar to economic voting regressions employed by Fair (1978) and Wolfers (2007) to test for retrospective voting: if the coefficient β is significant and positive, it can be said that voters returned a Republican majority in the French Parliament because economic conditions improve in the first years of the Third Republic. The specification in Equation (4) also suggests that a change in economic circumstances has an immediate effect on the vote share of the republican parties' coalition. It is not however clear whether this conjecture is realistic, given the resistance that the Republic faced when it was created. Therefore, to take into account the possibility that economic

changes may have had a delayed effect on the support for the republican regime, we rerun, as a robustness check, Equation (4) with a lagged dependent variable

$$\ln(Republican_{d,t}) = \alpha_d+\alpha_t + \beta_1 \ln(X_{d,t})+ \beta_2 \ln(Republican_{d,t-1})+ \varepsilon_{d,t} \quad (5)$$

where $Republican_{d,t-1}$ is the lagged dependent variable and the other variables were defined above for Equations (3) and (4).

Equation (5) cannot be estimated with a pooled OLS estimator (Greene, 2008). However, the fixed effects OLS estimator can be consistent provided that in Equation (5),

$$\text{Cov}(Republican_{d,t-1}, \varepsilon_{d,t})=\text{Cov}(X_{d,t}, \varepsilon_{d,t})=0 \text{ as } T \to \infty \quad (6)$$

Furthermore, the fixed effects OLS estimator can be shown to become consistent when the number of time periods in the sample increases, i.e., as $T \to \infty$ (Wooldridge, 2002).

Still, it is possible that the fixed effects OLS estimator is not appropriate, i.e., that $\text{Cov}(Republican_{d,t-1}, \varepsilon_{c,t}) \neq 0$, because of endogeneity. We rely on two estimation strategies to overcome this problem. First, we estimate Equations (4) and (5) using the two-step robust variant of the Arellano-Bond (1991) GMM estimator, which eliminates unobserved individual specific effects by taking first differences. In this specification, the lagged levels of the dependent and explanatory variables, which are consistent with the moment conditions, are the instruments for the regression in differences. In addition, because the two-step estimator yields standard errors that are biased downwards, we rely upon the finite sample correction for the two-step covariance matrix developed by Windmeijer (2005) in order to obtain more accurate sample inference. Second, we use limited information maximum likelihood (LIML) methods and rely on monthly quantities

of rainfall which we discussed in Section 3.5.[32] In so doing we assess the relevance of the first-stage regressions by using the Anderson-Rubin statistic for the joint significance of multiple endogenous regressors. The Anderson-Rubin statistic is a F statistic which is not a formal test of weak instruments but is a cluster-robust test of the significance of endogenous regressors which remains valid even under weak instruments.[33]

4. Results

4.1. Local economic circumstances and turnout

In Tables 4 and 5, we report OLS estimates of Equation (3) to examine the relationship between voter turnout and economic growth in the first five elections of the Third Republic. In Table 4, our measure of turnout is the *Turnout Adult Male Population* variable which relates the number of voters to the total adult male population eligible to vote, i.e., age 21 and above; In Table 5 the *Turnout Registered Voters* variable computes the turnout as the number of voters out of the total number of registered voters. In both Tables, Columns (1), (3) and (5) only include our measures of income while Columns (2), (4) and (6) also comprise our other explanatory variables.

[Table 4 here] [Table 5 here]

We find that the amount of direct taxes per person has a significant and negative impact on the *Turnout Registered Voters* variable in only one of our regressions (Column 6 of Table 5). This result is indeed shown not to be robust in the other regressions. Furthermore, none of our other two measures of income (*Per Capita Tax* and *Per Capita*

[32] We also run all the instrumental variables regressions using 2SLS following Anderson and Hsiao (1982), but report only the LIML results since our first stage F-statistics suggest the possibility that our instruments are weak.

[33] There does not seem to be at this point a test for weak instruments when there are multiple endogenous regressors. See among others Moreira (2003, 2009) and Stock and Yogo (2005) on this issue.

Direct Tax) are significant in any regression. In addition, among the other explanatory variables, only the *Fertility* variable has a significant and positive effect in Table 4, but this result is not found in Table 5.

The regression results in Tables 4 and 5 therefore suggest that the economic changes which happened during the 1876-1889 period did not have any positive effect on turnout, and more generally, did not seem to have an effect on political mobilization, at least at the aggregate level.[34] But more importantly, it suggests that a sizeable share of the French population did not take any part in side in the struggle for the consolidation of the French Republic. Instead this struggle only concerned a limited share of the French population, which remained more or less constant as can be seen in Table 3 from the rather stable number of registered voters in each election.

4.2. Local economic circumstances and economic voting

In Tables 6 to 8, we report estimates of Equations (4) and (5) so to as determine the relationship between economic development and the vote share of the incumbent republican coalition in France between 1876 and 1889. Table 6 examines the impact of economic circumstances on the sum of direct and indirect taxes per capita while Tables 7 and 8 provide robustness checks by using the amount of direct taxes per capita and indirect taxes per capita respectively.

In each Table, Columns (1) and (4) provide OLS estimates of Equation (4). In addition, Columns (2) and (5) report LIML estimates of Equation (4) while Columns (3)

[34] On the economic determinants of voter turnout, see the surveys by Aldrich (1993), Dhillon and Peralta (2002) and Geys (2006).

and (6) report GMM estimates of Equation (5).[35] Our regressions only include our tax measures in Columns (1) to (3) and comprise our additional explanatory variables Columns (4) to (6). Furthermore, for each LIML regression, we report the first-stage regression results where the instruments are the logarithm of monthly rainfall; we note that the Anderson-Rubin statistics indicate that the variables in our regressions are jointly significant, even though the instruments are weak.

[Table 6 here] [Table 7 here] [Table 8 here]

4.2.1. Income and democracy

The OLS regressions in Table 6 show that there is a positive relationship between the electoral victories of the incumbent republican coalition between 1876 and 1889 and the increase in wealth. This finding holds whether or not we decompose the total amount of taxes per capita collected by the French state in each *département* between direct taxes per capita in Table 7 and indirect taxes per capita in Table 8. This suggests that the vote share of the incumbent republican coalition increased in the *départements* which benefited from economic growth during the 1876-1889 period. Conversely, in the *départements* where the amount of collected taxes decreased, and which underwent a recession, the vote share of the republican coalition declined.

The regressions in Table 6 show that the effects of an increasing of income on the republican vote were small but could nonetheless sway the outcome of the election in close races. Column 1 of Table (6) shows that an increase in 1000 French Francs in total tax receipt per person in each department increased on average the vote for the incumbent republican coalition by 0.124 percentage points. Furthermore, the marginal effects of a

[35] We also run LIML regressions of Equation (5) and find similar results. These results are available upon request.

1000 French Francs increase in indirect and direct tax per capita amounted to 0.109 percentage points (in Column 1 of Table 7) and 0.705 percentage points (in Column 1 of Table 8)[36].

In addition, the positive relationship between the amount of taxes per capita and the vote share of the republican coalition is shown to hold when we include in the OLS regressions shown Column (5) of Table 6, 7 and 8 the additional explanatory variables which pertain to the occupations of the workforce, the degree of urbanization, the fertility rate and the village road network in each *département*. In fact, none of these additional variables has a significant effect on the vote share of the republican coalition. This result thus suggests that there was not a straightforward relationship between human capital accumulation and the support for democracy in France in the first years of the Third Republic.

4.2.2. Rainfall and the consolidation of democracy in France

The Arellano-Bond GMM regressions and the LIML regressions in Tables 6, 7 and 8 confirm that an increase in the overall amount of taxes per individual had a positive effect on the reelection of the republican incumbents. In particular, in the LIML regressions, the positive relationship between higher income and the vote for the republican incumbents is actually shown to hold, whether our proxies for income are the total tax receipts in Table 6, the direct tax receipts in Table 7 or the direct tax receipts in Table 8 which we instrument with the squared deviations of rainfall. [37] In addition we

[36] Such a result should be put in perspective. In our 1876-1889 sample, the average amount of direct tax per capita in each *département* was 2455.67 Francs while the average amount of indirect tax per capita was worth 11138.94 French Francs.

[37] In the first stage of the regressions, the quantities of rainfall in October, November and December were dropped out of the first-stage regressions of the LIML regressions because the second round of the

note that these results are robust to our using as IVs the absolute deviations of monthly rainfall in Table 9 and the squared deviations of monthly rainfall in Table 10. It must also be noted that the size of the coefficients in those regressions are slightly higher than in the OLS regressions. This observation suggests that our OLS estimates may underestimate the actual impact of the increase in income on the consolidation of the republic in France.[38]

[Table 9 here] [Table 10 here]

The results reported in the first-stage of the LIML regressions in Tables 6, 7 and 8 show the impact on rainfall on income and ultimately, on the consolidation of democracy: they show that large rainfall in March, April and June, i.e., in spring, had a negative impact on income. Indeed, large precipitations in spring may provoke floods and lead to highly moisturized soils, thereby destroying crops.[39]

An additional result, which is less robust, is that large precipitations in September could however have a positive impact on income. This finding is line with the fact that

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elections in the 1877, 1881, 1885 and 1889 elections were held before those months. In addition, the quantity of rainfall in May was also removed because its inclusion led us not to accept the null hypothesis of J-test.

[38] Similarly Burke and Leigh (2010) find that their IV estimates are larger than their LPM estimates in their analysis of output contraction on democratic change.

[39] Our finding that floods had a negative impact on income is somewhat close to that of Hidalgo et al. (2010) who observe that both droughts and floods lower agricultural income in Brazil. It can however be contrasted the studies by Besley and Burgess (2002) on India and by Miguel et al. (2004) on Africa which report that floods increase crop yields. It must be noted that this result in line with the historical evidence that floods caused substantial damages to farmers in France: they were indeed listed as a source of losses for the agricultural sector in the official publications of the French government (*Statistique de la France* & *Annuaire Statistique de la France*) along with fire, hail and frost. At the same time, it does not seem that drought was an issue in the years that coincided with the consolidation of democracy in France.

the absence of droughts at the start of harvest time, i.e., those that are harvested in September and October such as maize or wine, is beneficial to cultivators.

To check the robustness of our LIML regressions, we run a falsification test: we regress our three measures of income (Per capita tax, Per capita direct tax, Per capita indirect tax) on monthly rainfall in year t+1 instead of year t. The results are reported in Tables 11, 12 and 13 where we respectively use as IVs the logarithm of monthly rainfall, its absolute deviation, and its squared deviations.

[Table 11 here] [Table 12 here] [Table 13 here]

We find that the coefficients of future rainfall are not correlated with our main measure of income, the *Per capita tax* variable, as well as with our two lesser measure, the *Per capita indirect tax* variable. In addition we find that future rainfall is found to be correlated with the *Per capita indirect tax* variable in some of our regressions. However these results seem unrealistic as they suggest that floods caused by large precipitations in February have a positive effect on agricultural income. As such, it may be argued that our falsification test overall confirm that future rainfall does not explain present income.

All in all, the first stage of the LIML regressions suggests that part of the success of the incumbent republican coalition might be attributed to luck: they were returned in the *départements* where rainfalls were not substantial enough to have a negative impact on agricultural income. Such results provide an explanation for the consolidation of the republic in France, and more generally, have implications for the literature on economic development and the transition from dictatorship to democracy.

First, these results are in line with the studies surveyed by Lewis-Beck and Stegmaier (2000) which show voters engage in economic voting and condition their

support for incumbent politicians on the performance of the economic during the incumbent's term in office. More precisely, they suggest that voters returned the incumbent republican coalition in the areas where there were not any negative income shock caused by large rainfall. As such, they provide some additional support to Wolfers (2007)'s argument that voters are irrational as they do not filter out observable shocks.

Second, this article shows that negative income shocks, provoked by large amounts of rainfall, have positive effects on the consolidation of democracy. As such, its perspective is different from the studies by Bruckner and Ciccone (2009) and Burke and Leigh (2010) who find that large rainfall trigger negative income shocks that make the transition from dictatorship to democracy more likely. However these results do not necessarily contradict each other. In fact, they are in line with the studies of Przeworski et al. (2000), Przeworski and Limongi (1997) and Slovik (2008) which consider that the conditions that allow for the transition from dictatorship to democracy are not necessarily identical to those that allow for the consolidation of democracy.

Third, we find that higher wealth is associated with higher support for the republican parties but our results also show that the other factors which are associated with higher human capital and economic development did not have any impact on election outcomes. At the same time, it is unclear that this result suggests that modernization theory is only of limited relevance on explaining the survival of the republic in France. It is indeed uncertain whether there could be changes in literacy or fertility rates in 13 years that might be substantial enough to have a positive effect on democracy. However it would appear that there had been increases in human capital during the nineteenth century which led France to be at a critical historical juncture in the

1870s and 1880s. In those years, the consolidation of democracy in France was enabled by the lack of transitory negative income shocks in election years in most *départements*, and as such by luck. It is thus tempting to consider that the majority of the French population would have supported the regime that would have been established by the *Assemblée Nationale* after the fall of the Second Empire, be it a Republic, a constitutional Monarchy, and maybe an absolute Monarchy.

5. Conclusion

This paper focuses on the election results of the first five elections of the Third Republic, which were held between 1876 and 1889. We seek to explain how the coalition of republican parties, which represented the incumbent regime, won all these elections against their opponents whose objective was to overthrow the Republic.

We find that the growth in income at the local level explains the victory of the incumbent republican coalition. Conversely, it was defeated in the constituencies which suffered from transitory negative income shocks provoked by large quantities of rainfall.

The results thus suggest that the French voters between 1876 and 1889 rewarded the incumbent government, which happened to be the coalition of the republican parties, because its establishment coincided with a period of income growth in many, but not all, French regions. It thus calls into question other theories which have put forward other factors, such as the secularization of French society or higher literacy, as the reason for the survival of the Republic in France after 1870.

Finally, while it is usually thought that economic crises provide a window of opportunity that eases the transition from dictatorship to democracy, this study shows that negative income shocks may delay the consolidation of democracy. In this respect, it is

worth noting that after the *ralliement*, the Republican regime was not seriously contested until the mid-1930s, when France was hit by the Great Depression.

Appendix

Figure A1 graphs the growth of GDP in France between 1848 and 1913 while Figure A2 provides the fluctuations of GDP per capita during the same period.

[Figure A1 here] [Figure A2 here]

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Table 1. Variables and definitions.

Dependent variables	
Turnout adult male population	Share of the number of voters on the total adult male population aged 21 and above in each *département*
Turnout registered voters	Share of the number of voters on the number of registered voters in each *département*
Republican	Share of the votes obtained by Republican candidates in each *département*
Explanatory variables	
Per capita taxes	Amount of taxes per capita collected in each *département* by the French state (in thousand French Francs)
Per capita indirect taxes	Amount of indirect taxes per capita collected in each *département* by the French state (in thousand French Francs)
Per capita direct taxes	Amount of direct taxes per capita collected in each *département* by the French state (in thousand French Francs)
Fertility	Births per 1,000 women aged 18-49 in each *département*
Illiterate	Share of the French army's conscripts (men aged 20) unable to read and write in each *département*
Industry	Share of the workforce that works in the industrial sector in each *département*
Services	Share of the workforce that works in the service sector in each *département*
Urban population	Share of the population living in urban areas in each *département*
Roads	Network of village roads (in kilometers)
Instrumental variables	
January	Rainfall (in cm^3) in each *département* during the month of January
February	Rainfall (in cm^3) in each *département* during the month of February
March	Rainfall (in cm^3) in each *département* during the month of March
April	Rainfall (in cm^3) in each *département* during the month of April
May	Rainfall (in cm^3) in each *département* during the month of May
June	Rainfall (in cm^3) in each *département* during the month of June
July	Rainfall (in cm^3) in each *département* during the month of July
August	Rainfall (in cm^3) in each *département* during the month of August
September	Rainfall (in cm^3) in each *département* during the month of September
October	Rainfall (in cm^3) in each *département* during the month of October
November	Rainfall (in cm^3) in each *département* during the month of November
December	Rainfall (in cm^3) in each *département* during the month of December
Instrumental variables for falsification test	
$January_{t+1}$	Rainfall (in cm^3) in each *département* during the month of January in the year following the election
$February_{t+1}$	Rainfall (in cm^3) in each *département* during the month of February in the year following the election
$March_{t+1}$	Rainfall (in cm^3) in each *département* during the month of March in the year following the election
$April_{t+1}$	Rainfall (in cm^3) in each *département* during the month of April in the year following the election
May_{t+1}	Rainfall (in cm^3) in each *département* during the month of May in the year following the election
$June_{t+1}$	Rainfall (in cm^3) in each *département* during the month of June in the year following the election
$July_{t+1}$	Rainfall (in cm^3) in each *département* during the month of July in the year following the election
$August_{t+1}$	Rainfall (in cm^3) in each *département* during the month of August in the year following the election
$September_{t+1}$	Rainfall (in cm^3) in each *département* during the month of September in the year following the election
$October_{t+1}$	Rainfall (in cm^3) in each *département* during the month of October in the year following the election
$November_{t+1}$	Rainfall (in cm^3) in each *département* during the month of November in the year following the election
$December_{t+1}$	Rainfall (in cm^3) in each *département* during the month of December in the year following the election

Table 2. Summary statistics.

	Mean	Std. Dev	Min	Max
Dependent variables				
Turnout adult male population	0.213	0.057	0.02	0.95
Turnout registered voters	0.750	0.084	0.08	0.88
Republican	0.698	0.326	0.15	0.90
Explanatory variables				
Per capita taxes	19.90	35.31	6.92	728.65
Per capita indirect taxes	11.24	34.74	0.91	724.83
Per capita direct taxes	8.66	5.22	2.16	37.01
Fertility	3.31	2.08	0.12	21.46
Illiterate	0.15	0.10	0.01	0.56
Industry	0.26	0.12	0.02	0.64
Services	0.14	0.07	0.02	0.44
Urban population	0.28	0.17	0.00	1
Roads	2858498	4390681	256	47100000
Instrumental variables				
January	56.02	77.98	0	1474
February	64.53	38.55	0	201
March	60.15	31.27	5	148
April	80.39	37.69	0	328
May	80.68	47.61	7	286
June	66.44	45.77	4	353
July	52.35	35.90	0	200
August	55.06	36.47	0	233
September	58.36	47.03	0	280
October	86.20	57.89	3	306
November	70.63	49.31	2	320
December	55.90	35.39	2	334
Instrumental variables for falsification test				
$January_{t+1}$	52.45	36.40	0	232
$February_{t+1}$	32.97	29.73	0	184
$March_{t+1}$	53.65	31.64	0	201
$April_{t+1}$	76.22	38.90	0	347
May_{t+1}	89.02	45.30	0	286
$June_{t+1}$	67.08	38.50	0	225
$July_{t+1}$	64.96	40.80	0	248
$August_{t+1}$	68.93	50.16	0	360
$September_{t+1}$	59.30	65.83	0	1001
$October_{t+1}$	92.31	76.05	0	1066
$November_{t+1}$	99.70	124.96	0	2434
$December_{t+1}$	75.48	48.51	0	252

Notes:
• This table provides descriptive statistics for the variables listed in Table 1.
• There are 430 observations for each variable.

Table 3. Turnout, number of votes and number of representatives in the lower House of Parliament, 1876-1889

		Election year				
		1876	1877	1881	1885	1889
Number of registered voters		9,696,461	9,948,070	10,124,850	10,190,485	10,428,323
Number of votes (including blank votes)		7,367,635	7,857,075	6,764,423	7,861,332	7,762,810
Republicans	Number of Votes	4,028,153	4,307,202	5,128,142	4,327,162	4,529,008
	Percentage of Votes	55.71%	54.63%	74.13%	54.99%	56.94%
	Representatives in the lower House of Parliament	393	313	457	383	366
Monarchists & Bonapartists	Number of Votes	3,202,335	3,577,282	1,789,767	3,541,384	3,424,373[a]
	Percentage of Votes	44.29%	45.37%	25.87%	45.01%	43.06%
	Representatives in the lower House of Parliament	140	208	88	201	210
Population (in thousands of inhabitants)		36,830	37,000	37,590	38,110	38,370

[a] This figure includes the 718,014 votes for the Boulangist candidates.

Sources: Lancelot and Lancelot (1970) for the data on turnout, Mayeur (1984) and Barjot et al. (2008) for the data on the votes and the seats in Parliament, and Annuaire Statistique de la France (1922, pp *11-*12) for the data on the French population.

Notes: We report the number of votes for in the first round of the parliamentary elections. Elections were held on 20 February and 5 March 1876, 14 October and 28 October 1877, 21 August and 4 September 1881, 4 October and 18 October 1885, 22 September and 6 October 1889.

The 1876, 1877, 1881 and 1889 elections were held under a two-round majority system at the *arrondissement* level (*arrondissements* are subdivisions of *département*) whereby one candidate would be elected in each *arrondissement*. It must be noted that the borders of the *arrondissements* were identical in 1876, 1877 and 1881, but were modified in 1889. The 1885 elections were held under a two-round majority system at the *département*-level where candidates would run on lists.

Note that throughout that period, the borders of the *départements* were not modified.

Table 4. Turnout of the adult male population, 1876-1889.

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)
	Dependent variable is *Turnout Adult Male Population*					
Per capita taxes	0.329	0.273				
	[0.262]	[0.200]				
Per capita direct taxes			0.342	0.283		
			[0.277]	[0.214]		
Per capita indirect taxes					-0.13	-0.073
					[0.262]	[0.214]
Fertility		0.148		0.145		0.187
		[0.070]**		[0.071]**		[0.099]*
Illiteracy		0.008		0.001		-0.013
		[0.033]		[0.033]		[0.035]
Urban population		0.094		0.094		0.127
		[0.141]		[0.139]		[0.199]
Industry		0.021		0.019		0.017
		[0.034]		[0.033]		[0.039]
Services		-0.02		-0.02		-0.014
		[0.044]		[0.043]		[0.047]
Roads		0.007		0.006		0.004
		[0.005]		[0.005]		[0.009]
Constant	-2.58	-2.538	-2.329	-2.33	-1.494	-1.681
	[0.786]***	[0.686]***	[0.596]***	[0.559]***	[0.221]***	[0.441]***
R^2	0.28	0.37	0.29	0.38	0.1	0.26
Within R^2	0.285	0.373	0.294	0.378	0.104	0.257
Adjusted R^2	0.276	0.357	0.285	0.362	0.094	0.237
F-stat	15.679	11.853	15.736	11.81	26.141	12.607
Pr > F	0.000	0.000	0.000	0.000	0.000	0.000
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	430	430	430	430

Notes:
• The dependent variable is the turnout of voters in each *département* based on the total adult male population. All the variables are in logarithms.
• Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.

Table 5. Turnout of the registered voters, 1876-1889.

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)
	Dependent variable is *Turnout Registered Voters*					
Per capita taxes	0.002	0.003				
	[0.013]	[0.010]				
Per capita direct taxes			0.007	0.008		
			[0.009]	[0.007]		
Per capita indirect taxes					-0.196	-0.19
					[0.120]	[0.114]*
Fertility		-0.004		-0.005		-0.005
		[0.020]		[0.020]		[0.021]
Illiteracy		0.011		0.012		0.006
		[0.031]		[0.031]		[0.029]
Urban population		0.004		0.003		0.005
		[0.007]		[0.006]		[0.008]
Industry		-0.008		-0.008		-0.009
		[0.021]		[0.020]		[0.021]
Services		0.033		0.032		0.033
		[0.037]		[0.037]		[0.036]
Roads		0.01		0.01		0.009
		[0.009]		[0.009]		[0.009]
Constant	-0.279	-0.269	-0.288	-0.277	-0.109	-0.101
	[0.042]***	[0.206]	[0.024]***	[0.199]	[0.106]	[0.263]
R^2	0.2	0.21	0.2	0.21	0.21	0.21
Within R^2	0.203	0.206	0.203	0.206	0.206	0.21
Adjusted R^2	0.193	0.185	0.193	0.186	0.197	0.189
F-stat	27.535	16.024	28.479	16.282	28.266	16.395
Pr > F	0.000	0.000	0.000	0.000	0.000	0.000
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	430	430	430	430

Notes:
• The dependent variable is the turnout of voters in each *département* based on the total number of registered voters. All the variables are in logarithms.
• Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.

Table 6. The support for the Republican coalition: taxes per capita and monthly rainfall, 1876-1889.

	OLS	LIML	GMM	OLS	LIML	GMM
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable is *Republican*					
Per capita taxes	0.124	0.335	0.406	0.126	0.723	0.234
	[0.050]**	[0.146]**	[0.210]*	[0.043]***	[0.289]**	[0.120]*
Republican(previous election)			0.183			-0.039
			[0.119]			[0.110]
Fertility				0.01	0.063	0.028
				[0.057]	[0.098]	[0.053]
Illiteracy				0.046	-0.088	-0.058
				[0.095]	[0.062]	[0.185]
Urban population				-0.018	-0.155	0.04
				[0.038]	[0.118]	[0.082]
Industry				-0.09	-0.274	0.1
				[0.145]	[0.145]*	[0.232]
Services				0.055	-0.264	-0.18
				[0.109]	[0.166]	[0.202]
Roads				-0.021	-0.092	0.024
				[0.034]	[0.051]*	[0.020]
Constant	-0.821	-1.449		-0.606	-3.299	
	[0.152]***	[0.449]***		[0.447]	[1.346]**	
R-squared	0.13			0.14		
Within R2	0.132			0.136		
Adjusted R2	0.122			0.114		
F-stat	13.433			7.213		
Prob > F	0.000			0.000		
Hansen J-test			5.015			62.759
Prob J-test			0.414			0.106
AR(1) test			-4.554			-3.249
Prob. of AR(1) test			0.000			0.001
AR(2) test			1.685			0.791
Prob. of AR(2) test			0.092			0.429
Anderson-Rubin F		13.463			6.883	
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	344	430	430	344

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	First stage - Per capita tax	
January	0.033	-0.017
	[0.046]	[0.032]
February	0.014	0.029
	[0.047]	[0.036]
March	-0.092	-0.022
	[0.054]*	[0.038]
April	-0.318	-0.178
	[0.112]***	[0.067]**
June	-0.155	-0.051
	[0.049]***	[0.036]
July	-0.020	0.030
	[0.030]	[0.022]
August	-0.032	-0.002
	[0.040]	[0.025]
September	0.083	0.023
	[0.031]**	[0.027]
Fertility		0.026
		[0.125]
Illiteracy		-0.084
		[0.043]*
Urban population		0.278
		[0.164]*
Industry		0.198
		[0.099]*
Services		0.487
		[0.121]***
Roads		0.037
		[0.047]
Constant	5.050	5.054
	[0.641]***	[0.697]***
F-stat	4.76	1.70
Partial R-squared of excluded instruments	0.1493	0.0586

• The dependent variable Republican represents the change in the share of votes obtained by the Republican candidates in each *département*. All the variables are in logarithms.
• Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.
• In Columns 2 and 5, the amount of direct and indirect taxes per capita is instrumented by the logarithm of monthly rainfall.

Table 7. The support for the Republican coalition: direct taxes per capita and monthly rainfall, 1876-1889.

	OLS	LIML	GMM	OLS	LIML	GMM
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable is *Republican*					
Per capita direct taxes	0.109	0.51	0.327	0.11	1.657	0.185
	[0.053]**	[0.245]**	[0.172]*	[0.045]**	[0.722]**	[0.102]*
Republican(previous election)			0.177			0.061
			[0.121]			[0.126]
Fertility				0.011	-0.007	0.019
				[0.057]	[0.201]	[0.046]
Illiteracy				0.042	0.021	0.009
				[0.096]	[0.118]	[0.172]
Urban population				-0.016	-0.362	-0.026
				[0.036]	[0.303]	[0.086]
Industry				-0.091	-0.182	0.159
				[0.145]	[0.149]	[0.235]
Services				0.056	-0.282	-0.161
				[0.109]	[0.195]	[0.206]
Roads				-0.022	-0.127	-0.202
				[0.035]	[0.079]	[0.244]
Constant	-0.686	-1.535		-0.467	-4.273	
	[0.121]***	[0.538]***		[0.451]	[1.919]**	
R-squared	0.13			0.13		
Within R2	0.131			0.134		
Adjusted R2	0.12			0.112		
F-stat	12.415			6.415		
Prob > F	0.000			0.000		
Hansen J-test			6.323			62.17
Prob J-test			0.276			0.116
AR(1) test			-4.513			-3.284
Prob. of AR(1) test			0.000			0.001
AR(2) test			1.673			1.072
Prob. of AR(2) test			0.094			0.284
Anderson-Rubin F		16.28			9.51	
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	344	430	430	344

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	First stage for Per capita direct taxes	
January	0.004	-0.018
	[0.034]	[0.026]
February	-0.013	-0.004
	[0.031]	[0.029]
March	-0.090	-0.040
	[0.040]**	[0.033]
April	-0.173	-0.093
	[0.070]**	[0.049]*
June	-0.077	-0.020
	[0.033]**	[0.031]
July	-0.007	0.017
	[0.020]	[0.016]
August	-0.052	-0.025
	[0.028]*	[0.021]
September	0.028	-0.008
	[0.023]	[0.020]
Fertility		0.051
		[0.122]
Illiteracy		-0.108
		[0.039]***
Urban population		0.219
		[0.143]
Industry		0.057
		[0.078]
Services		0.216
		[0.100]**
Roads		0.035
		[0.040]
Constant	3.692	3.212
	[0.421]***	[0.597]***
F-stat	3.83	1.10
Prob F-stat	0.0008	0.3714
Partial R-squared of excluded instruments	0.1	0.0293

• The dependent variable Republican represents the change in the share of votes obtained by the Republican candidates in each *département*. All the variables are in logarithms.
• Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.
• In Columns 2 and 5, the amount of direct and indirect taxes per capita is instrumented by the logarithm of monthly rainfall.

Table 8 The support for the Republican coalition: indirect taxes and monthly rainfall, 1876-1889.

	OLS	LIML	GMM	OLS	LIML	GMM
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable is *Republican*					
Per capita indirect taxes	0.705	0.69	2.822	0.744	0.93	1.858
	[0.344]**	[0.271]**	[1.602]*	[0.370]**	[0.387]**	[0.842]**
Republican(previous election)			0.121			0.086
			[0.129]			[0.103]
Fertility				0.032	0.111	0.053
				[0.059]	[0.058]*	[0.046]
Illiteracy				0.055	-0.17	0.079
				[0.096]	[0.052]***	[0.171]
Urban population				-0.007	0.013	0.035
				[0.040]	[0.051]	[0.070]
Industry				-0.085	-0.271	0.029
				[0.147]	[0.123]**	[0.161]
Services				0.056	-0.157	-0.009
				[0.107]	[0.132]	[0.150]
Roads				-0.02	-0.062	-0.251
				[0.033]	[0.035]*	[0.213]
Constant	-1.05	-1.038		-0.86	-1.931	
	[0.288]***	[0.239]***		[0.520]	[0.817]**	
R-squared	0.13			0.14		
Within R2	0.131			0.135		
Adjusted R2	0.121			0.113		
F-stat	11.096			5.382		
Prob > F	0.000			0.000		
Hansen J-test			12.287			73.479
Prob J-test			0.342			0.113
AR(1) test			-4.097			-3.601
Prob. of AR(1) test			0.000			0.000
AR(2) test			1.215			0.908
Prob. of AR(2) test			0.224			0.364
Anderson-Rubin F		12.345			7.542	
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	344	430	430	344

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	First stage for Per capita indirect taxes	
January	0.030	0.002
	[0.018]	[0.013]
February	0.027	0.033
	[0.020]	[0.013]**
March	-0.001	0.018
	[0.021]	[0.013]
April	-0.145	-0.086
	[0.047]***	[0.025]***
June	-0.078	-0.031
	[0.022]***	[0.014]**
July	-0.013	0.013
	[0.014]	[0.011]
August	0.020	0.024
	[0.019]	[0.012]*
September	0.054	0.032
	[0.014]***	[0.013]**
Fertility		-0.025
		[0.019]
Illiteracy		0.024
		[0.016]
Urban population		0.059
		[0.030]*
Industry		0.141
		[0.035]***
Services		0.271
		[0.043]***
Roads		0.002
		[0.014]
Constant	1.358	1.842
	[0.254]***	[0.194]***
F-stat	7.66	5.70
Partial R-squared of excluded instruments	0.2262	0.1973

• The dependent variable Republican represents the change in the share of votes obtained by the Republican candidates in each *département*. All the variables are in logarithms.
• Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.
• In Columns 2 and 5, the amount of direct and indirect taxes per capita is instrumented by the logarithm of monthly rainfall.

Table 9. The support for the Republican coalition: LIML regressions where taxes per capita are instrumented by the absolute deviation of monthly rainfall

	(1) LIML	(2) LIML	(3) LIML	(4) LIML	(5) LIML	(6) LIML
	Dependent variable is *Republican*					
Per capita taxes	0.3	0.618				
	[0.139]**	[0.268]**				
Per capita direct taxes			0.438	1.05		
			[0.228]*	[0.533]**		
Per capita indirect taxes					0.643	0.875
					[0.265]**	[0.390]**
Fertility		0.067		0.031		0.11
		[0.087]		[0.132]		[0.057]*
Illiteracy		-0.099		-0.048		-0.17
		[0.059]*		[0.083]		[0.051]***
Urban population		-0.128		-0.218		0.014
		[0.106]		[0.198]		[0.050]
Industry		-0.245		-0.144		-0.26
		[0.136]*		[0.118]		[0.123]**
Services		-0.213		-0.147		-0.143
		[0.153]		[0.149]		[0.131]
Roads		-0.087		-0.101		-0.062
		[0.047]*		[0.058]*		[0.035]*
Constant	-1.343	-2.864	-1.383	-2.825	-0.998	-1.837
	[0.427]***	[1.259]**	[0.504]***	[1.455]*	[0.236]***	[0.816]**
Anderson-Rubin F	10.937	5.652	13.47	8.591	9.873	5.894
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	86	86	86	86	86	86
Observations	430	430	430	430	430	430

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	First stage - Per capita taxes		First stage - Per capita direct taxes		First stage - Per capita indirect taxes	
January	0.042	-0.014	0.011	-0.016	0.031	0.002
	[0.043]	[0.032]	[0.032]	[0.026]	[0.017]*	[0.012]
February	0.002	0.021	-0.019	-0.009	0.021	0.030
	[0.045]	[0.034]	[0.029]	[0.027]	[0.019]	[0.012]**
March	-0.094	-0.026	-0.091	-0.043	-0.003	0.016
	[0.051]*	[0.035]	[0.037]**	[0.031]	[0.021]	[0.012]
April	-0.338	-0.182	-0.187	-0.096	-0.151	-0.086
	[0.099]***	[0.061]***	[0.062]***	[0.046]**	[0.041]***	[0.022]***
June	-0.139	-0.046	-0.067	-0.017	-0.072	-0.029
	[0.045]***	[0.034]	[0.031]**	[0.029]	[0.021]***	[0.013]**
July	-0.013	0.026	-0.004	0.014	-0.009	0.012
	[0.025]	[0.018]	[0.017]	[0.013]	[0.012]	[0.009]
August	-0.025	-0.003	-0.044	-0.023	0.020	0.020
	[0.035]	[0.023]	[0.025]*	[0.019]	[0.017]	[0.012]
September	0.073	0.025	0.026	-0.004	0.047	0.029
	[0.028]**	[0.024]	[0.021]	[0.019]	[0.012]***	[0.011]**
Fertility		0.024		0.050		-0.026
		[0.125]		[0.122]		[0.019]
Illiteracy		-0.082		-0.106		0.024
		[0.042]*		[0.038]***		[0.017]
Urban population		0.275		0.217		0.058
		[0.162]*		[0.142]		[0.029]*
Industry		0.196		0.056		0.140
		[0.098]**		[0.077]		[0.034]***
Services		0.484		0.213		0.271
		[0.121]***		[0.100]**		[0.043]***
Roads		0.034		0.034		0.001
		[0.047]		[0.041]		[0.014]
Constant	5.058	5.104	3.669	3.213	1.390	1.891
	[0.581]***	[0.676]***	[0.385]***	[0.580]***	[0.228]***	[0.186]***
F-stat	5.09	1.98	4.01	1.23	7.76	5.72
Partial R-squared of excluded instruments	0.1604	0.062	0.1088	0.0325	0.2320	0.1918

Notes: • The dependent variable Republican represents the change in the share of votes obtained by the Republican candidates in each *département*. All the variables are in logarithms.
• Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.

Table 10. The support for the Republican coalition: LIML regressions where taxes per capita are instrumented by the squared deviation of monthly rainfall

	(1)	(2)	(3)	(4)	(5)	(6)
	LIML	LIML	LIML	LIML	LIML	LIML
	Dependent variable is *Republican*					
Per capita taxes	0.31	0.65				
	[0.140]**	[0.269]**				
Per capita direct taxes			0.453	1.182		
			[0.230]**	[0.561]**		
Per capita indirect taxes					0.667	0.913
					[0.267]**	[0.389]**
Fertility		0.066		0.022		0.111
		[0.090]		[0.147]		[0.058]*
Illiteracy		-0.096		-0.033		-0.17
		[0.060]		[0.090]		[0.052]***
Urban population		-0.137		-0.251		0.012
		[0.109]		[0.219]		[0.050]
Industry		-0.253		-0.151		-0.267
		[0.137]*		[0.125]		[0.123]**
Services		-0.228		-0.175		-0.152
		[0.155]		[0.158]		[0.132]
Roads		-0.088		-0.107		-0.062
		[0.048]*		[0.062]*		[0.035]*
Constant	-1.373	-2.994	-1.413	-3.137	-1.018	-1.899
	[0.430]***	[1.264]**	[0.506]***	[1.528]**	[0.237]***	[0.817]**
Anderson-Rubin F	11.667	5.974	14.451	9.144	10.357	6.148
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	86	86	86	86	86	86
Observations	430	430	430	430	430	430

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	First stage - Per capita taxes		First stage - Per capita direct taxes		First stage - Per capita indirect taxes	
January	0.021	-0.007	0.005	-0.008	0.016	0.001
	[0.022]	[0.016]	[0.016]	[0.013]	[0.008]*	[0.006]
February	0.001	0.010	-0.010	-0.004	0.010	0.014
	[0.022]	[0.017]	[0.015]	[0.014]	[0.009]	[0.006]***
March	-0.046	-0.011	-0.046	-0.021	0.000	0.010
	[0.026]*	[0.018]	[0.019]**	[0.016]	[0.011]	[0.006]*
April	-0.169	-0.092	-0.094	-0.048	-0.076	-0.044
	[0.049]***	[0.030]***	[0.031]***	[0.023]**	[0.010]***	[0.011]***
June	-0.069	-0.023	-0.033	-0.009	-0.036	-0.014
	[0.023]***	[0.017]	[0.016]**	[0.015]	[0.010]***	[0.007]**
July	-0.007	0.012	-0.002	0.007	-0.005	0.005
	[0.013]	[0.009]	[0.009]	[0.007]	[0.006]	[0.005]
August	-0.013	-0.003	-0.022	-0.012	0.009	0.009
	[0.018]	[0.011]	[0.013]*	[0.009]	[0.009]	[0.006]
September	0.038	0.015	0.013	-0.002	0.025	0.017
	[0.015]**	[0.012]	[0.011]	[0.010]	[0.006]***	[0.005]**
Fertility		0.024		0.050		-0.027
		[0.125]		[0.122]		[0.019]
Illiteracy		-0.081		-0.106		0.025
		[0.042]*		[0.038]**		[0.016]
Urban population		0.275		0.217		0.057
		[0.162]*		[0.142]		[0.029]*
Industry		0.196		0.056		0.140
		[0.098]**		[0.077]		[0.034]***
Services		0.486		0.213		0.273
		[0.121]***		[0.100]**		[0.043]***
Roads		0.034		0.034		0.000
		[0.047]		[0.041]		[0.014]
Constant	5.049	5.098	3.668	3.212	1.381	1.886
	[0.583]***	[0.674]***	[0.387]***	[0.579]***	[0.229]***	[0.184]***
F-stat	5.06	2.10	3.98	1.23	7.84	5.95
Partial R-squared of excluded instruments	0.1605	0.0628	0.1087	0.0325	0.2332	0.1985

Notes: • The dependent variable Republican represents the change in the share of votes obtained by the Republican candidates in each *département*. All the variables are in logarithms.• Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.

Table 11. Falsification test: Taxes and monthly rainfall in the year following the election (1st stage)

	(1)	(2)	(3)	(4)	(5)	(6)
	First stage - Per capita taxes		First stage - Per capita direct taxes		First stage - Per capita indirect taxes	
$January_{t+1}$	-0.01	-0.016	-0.007	-0.014	-0.003	-0.002
	[0.021]	[0.018]	[0.020]	[0.018]	[0.003]	[0.004]
$February_{t+1}$	-0.007	-0.013	-0.017	-0.022	0.01	0.009
	[0.020]	[0.021]	[0.020]	[0.021]	[0.003]***	[0.003]***
$March_{t+1}$	0.007	0.016	0.005	0.015	0.002	0.001
	[0.015]	[0.016]	[0.014]	[0.015]	[0.005]	[0.004]
$April_{t+1}$	0.008	0.022	0.006	0.021	0.002	0.002
	[0.023]	[0.020]	[0.023]	[0.021]	[0.004]	[0.004]
$June_{t+1}$	-0.027	-0.036	-0.024	-0.034	-0.003	-0.002
	[0.033]	[0.032]	[0.033]	[0.032]	[0.003]	[0.003]
$July_{t+1}$	-0.142	-0.139	-0.141	-0.138	-0.001	-0.001
	[0.125]	[0.127]	[0.126]	[0.128]	[0.004]	[0.004]
$August_{t+1}$	0.042	0.041	0.043	0.042	-0.001	-0.0005
	[0.031]	[0.034]	[0.031]	[0.034]	[0.003]	[0.003]
$September_{t+1}$	0.026	0.025	0.022	0.022	0.004	0.003
	[0.024]	[0.023]	[0.024]	[0.023]	[0.002]	[0.002]
Fertility		0.144		0.149		-0.005
		[0.106]		[0.106]		[0.006]
Illiteracy		-0.035		-0.019		-0.016
		[0.037]		[0.028]		[0.015]
Urban population		0.112		0.111		0.002
		[0.204]		[0.203]		[0.004]
Industry		0.044		0.045		-0.001
		[0.058]		[0.059]		[0.013]
Services		-0.022		-0.02		-0.002
		[0.056]		[0.055]		[0.014]
Roads		-0.01		-0.007		-0.003
		[0.018]		[0.014]		[0.004]
Constant	3.403	3.36	2.595	2.556	0.808	0.804
	[0.445]***	[0.676]***	[0.445]***	[0.672]***	[0.036]***	[0.074]***
F-stat	5.377	6.848	3.676	4.672	10.84	8.418
Partial R-squared of excluded instruments	0.177	0.222	0.143	0.192	0.238	0.235
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	430	430	430	430

Notes: All the variables are in logarithms. Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.

Table 12. Falsification test: Taxes and absolute deviation of monthly rainfall in the year following the election (1st stage)

	(1)	(2)	(3)	(4)	(5)	(6)
	First stage - Per capita taxes		First stage - Per capita direct taxes		First stage - Per capita indirect taxes	
$January_{t+1}$	-0.009	-0.012	-0.006	-0.011	-0.002	-0.001
	[0.017]	[0.016]	[0.017]	[0.015]	[0.003]	[0.003]
$February_{t+1}$	-0.006	-0.011	-0.014	-0.018	0.008	0.008
	[0.017]	[0.018]	[0.017]	[0.017]	[0.003]***	[0.003]***
$March_{t+1}$	0.006	0.015	0.004	0.013	0.002	0.001
	[0.014]	[0.015]	[0.013]	[0.014]	[0.004]	[0.004]
$April_{t+1}$	0.01	0.024	0.008	0.022	0.003	0.002
	[0.025]	[0.022]	[0.025]	[0.022]	[0.004]	[0.004]
$June_{t+1}$	-0.02	-0.027	-0.017	-0.025	-0.003	-0.002
	[0.028]	[0.027]	[0.028]	[0.027]	[0.003]	[0.003]
$July_{t+1}$	-0.126	-0.122	-0.125	-0.121	-0.002	-0.001
	[0.112]	[0.114]	[0.113]	[0.115]	[0.004]	[0.004]
$August_{t+1}$	0.035	0.034	0.036	0.034	-0.001	-0.001
	[0.027]	[0.030]	[0.027]	[0.029]	[0.003]	[0.003]
$September_{t+1}$	0.023	0.023	0.019	0.019	0.004	0.003
	[0.020]	[0.020]	[0.020]	[0.020]	[0.002]*	[0.002]
Fertility		0.145		0.15		-0.005
		[0.107]		[0.107]		[0.006]
Illiteracy		-0.034		-0.018		-0.016
		[0.037]		[0.028]		[0.015]
Urban population		0.112		0.11		0.002
		[0.205]		[0.204]		[0.004]
Industry		0.041		0.041		-0.0002
		[0.059]		[0.059]		[0.013]
Services		-0.017		-0.014		-0.003
		[0.057]		[0.057]		[0.014]
Roads		-0.009		-0.006		-0.003
		[0.017]		[0.014]		[0.004]
Constant	3.328	3.271	2.515	2.462	0.813	0.809
	[0.369]***	[0.617]***	[0.367]***	[0.611]***	[0.034]***	[0.073]***
F-stat	5.576	7.276	3.797	4.926	10.957	8.306
Partial R-squared of excluded instruments	0.184	0.238	0.149	0.208	0.259	0.267
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	430	430	430	430

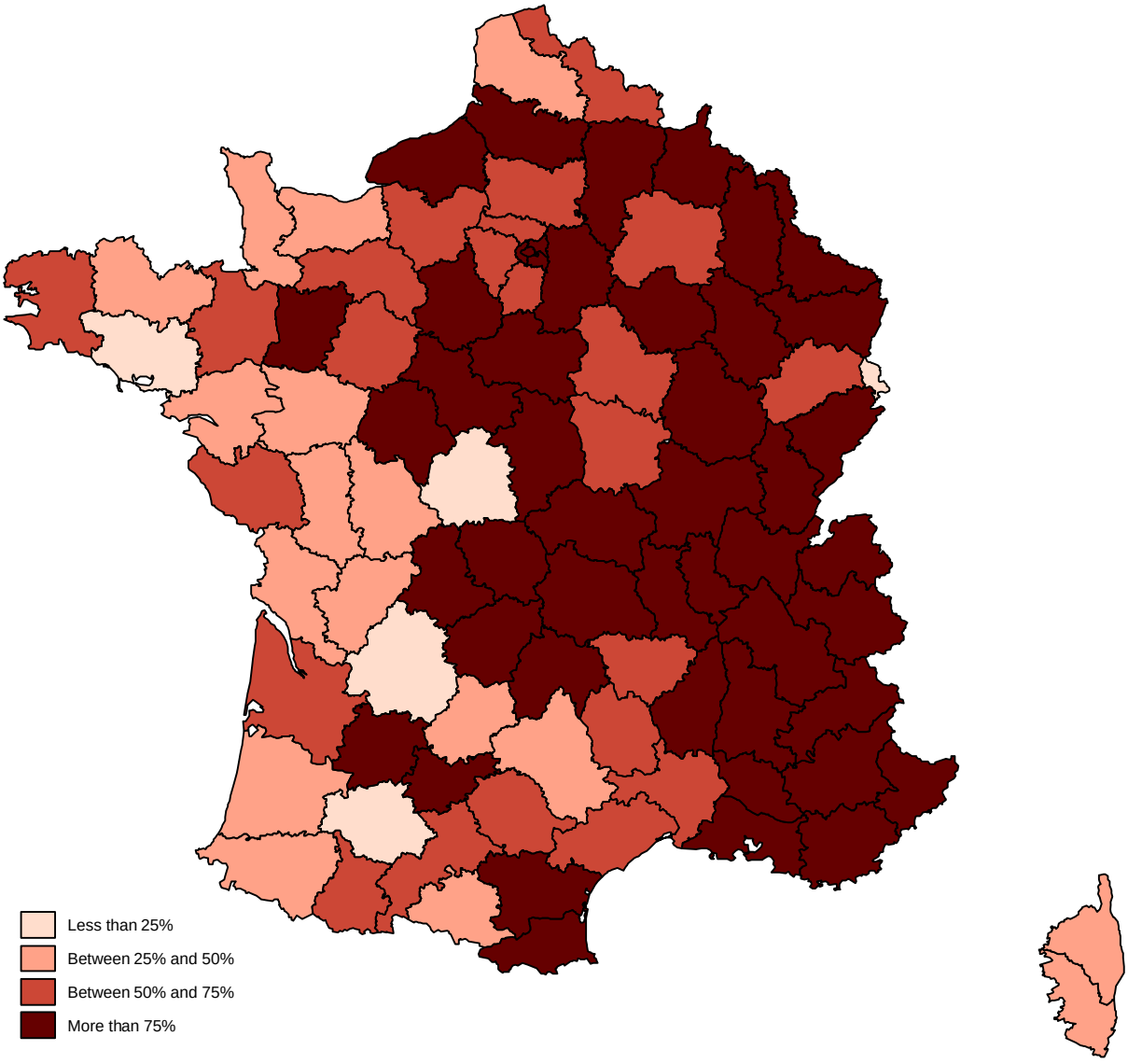
Notes: All the variables are in logarithms. Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.

Table 13. Falsification test: Taxes and squared deviation of monthly rainfall in the year following the election (1st stage)

	(1)	(2)	(3)	(4)	(5)	(6)
	First stage - Per capita taxes		First stage - Per capita direct taxes		First stage - Per capita indirect taxes	
$January_{t+1}$	-0.004	-0.006	-0.003	-0.006	-0.001	-0.001
	[0.008]	[0.008]	[0.008]	[0.007]	[0.001]	[0.002]
$February_{t+1}$	-0.003	-0.005	-0.007	-0.009	0.004	0.004
	[0.009]	[0.009]	[0.009]	[0.009]	[0.001]***	[0.001]***
$March_{t+1}$	0.003	0.007	0.002	0.007	0.001	0.001
	[0.007]	[0.008]	[0.007]	[0.007]	[0.002]	[0.002]
$April_{t+1}$	0.005	0.012	0.004	0.011	0.001	0.001
	[0.013]	[0.011]	[0.013]	[0.011]	[0.002]	[0.002]
$June_{t+1}$	-0.01	-0.014	-0.009	-0.013	-0.001	-0.001
	[0.014]	[0.013]	[0.014]	[0.013]	[0.002]	[0.002]
$July_{t+1}$	-0.063	-0.061	-0.062	-0.061	-0.001	-0.001
	[0.056]	[0.057]	[0.057]	[0.058]	[0.002]	[0.002]
$August_{t+1}$	0.017	0.017	0.018	0.017	-0.001	-0.0004
	[0.014]	[0.015]	[0.013]	[0.015]	[0.001]	[0.001]
$September_{t+1}$	0.012	0.011	0.01	0.01	0.002	0.002
	[0.010]	[0.010]	[0.010]	[0.010]	[0.001]*	[0.001]
Fertility		0.145		0.15		-0.005
		[0.107]		[0.107]		[0.006]
Illiteracy		-0.034		-0.018		-0.016
		[0.037]		[0.028]		[0.015]
Urban population		0.112		0.11		0.002
		[0.205]		[0.204]		[0.004]
Industry		0.041		0.041		-0.0002
		[0.059]		[0.059]		[0.013]
Services		-0.017		-0.014		-0.003
		[0.057]		[0.057]		[0.014]
Roads		-0.009		-0.006		-0.003
		[0.017]		[0.014]		[0.004]
Constant	3.328	3.271	2.515	2.463	0.813	0.809
	[0.369]***	[0.617]***	[0.367]***	[0.612]***	[0.034]***	[0.073]***
F-stat	5.574	7.273	3.796	4.921	10.955	8.306
Partial R-squared of excluded instruments	0.184	0.238	0.149	0.208	0.259	0.267
Département fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of clusters	86	86	86	86	86	86
Observations	430	430	430	430	430	430

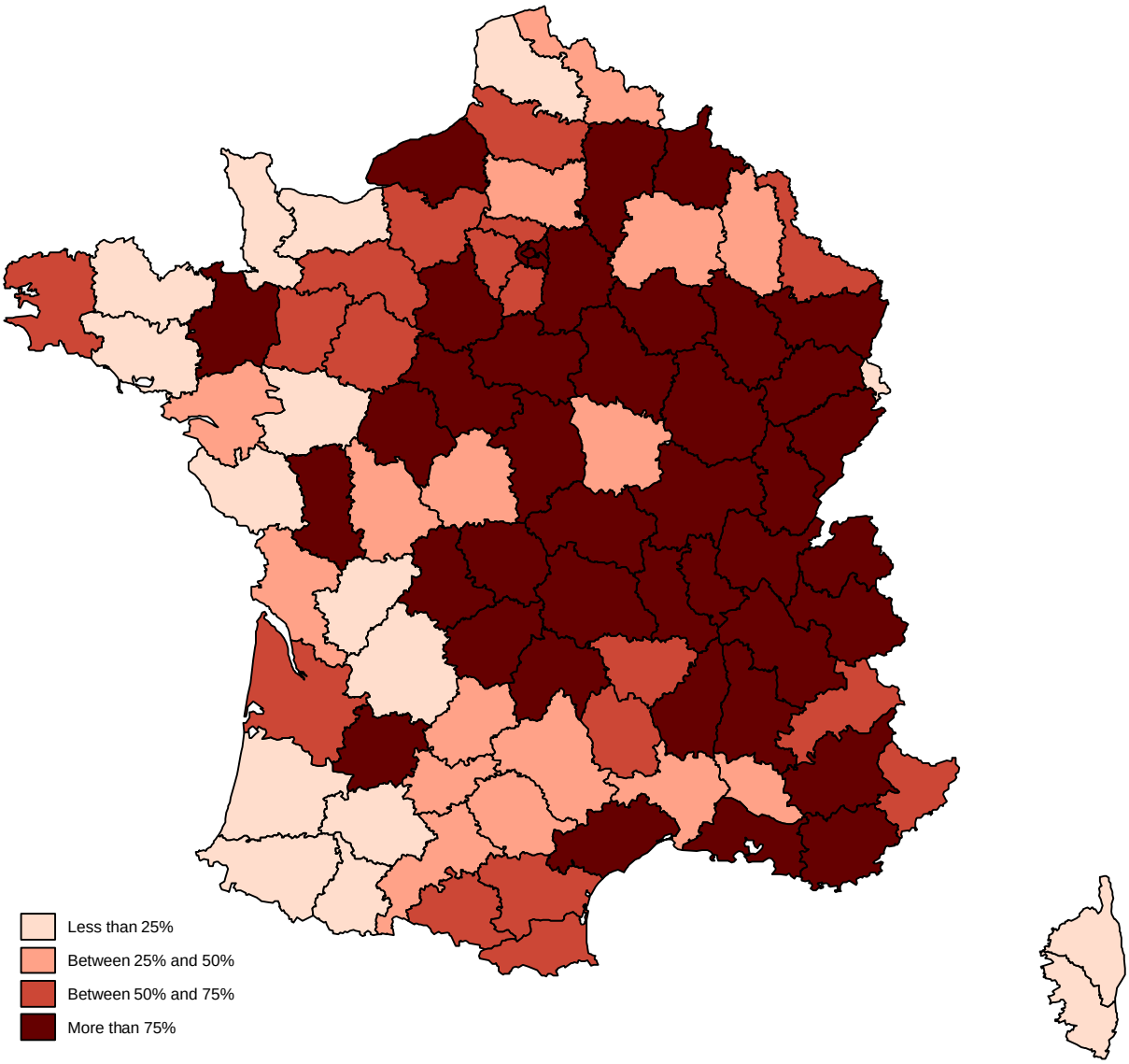
Notes: All the variables are in logarithms. Robust standard errors are given in brackets. *** indicates significance at the 1%-level, ** indicates significance at the 5%-level, * indicates significance at the 1%-level.

Figure 1. Share of republican representatives elected in each *département* in the 1876 elections



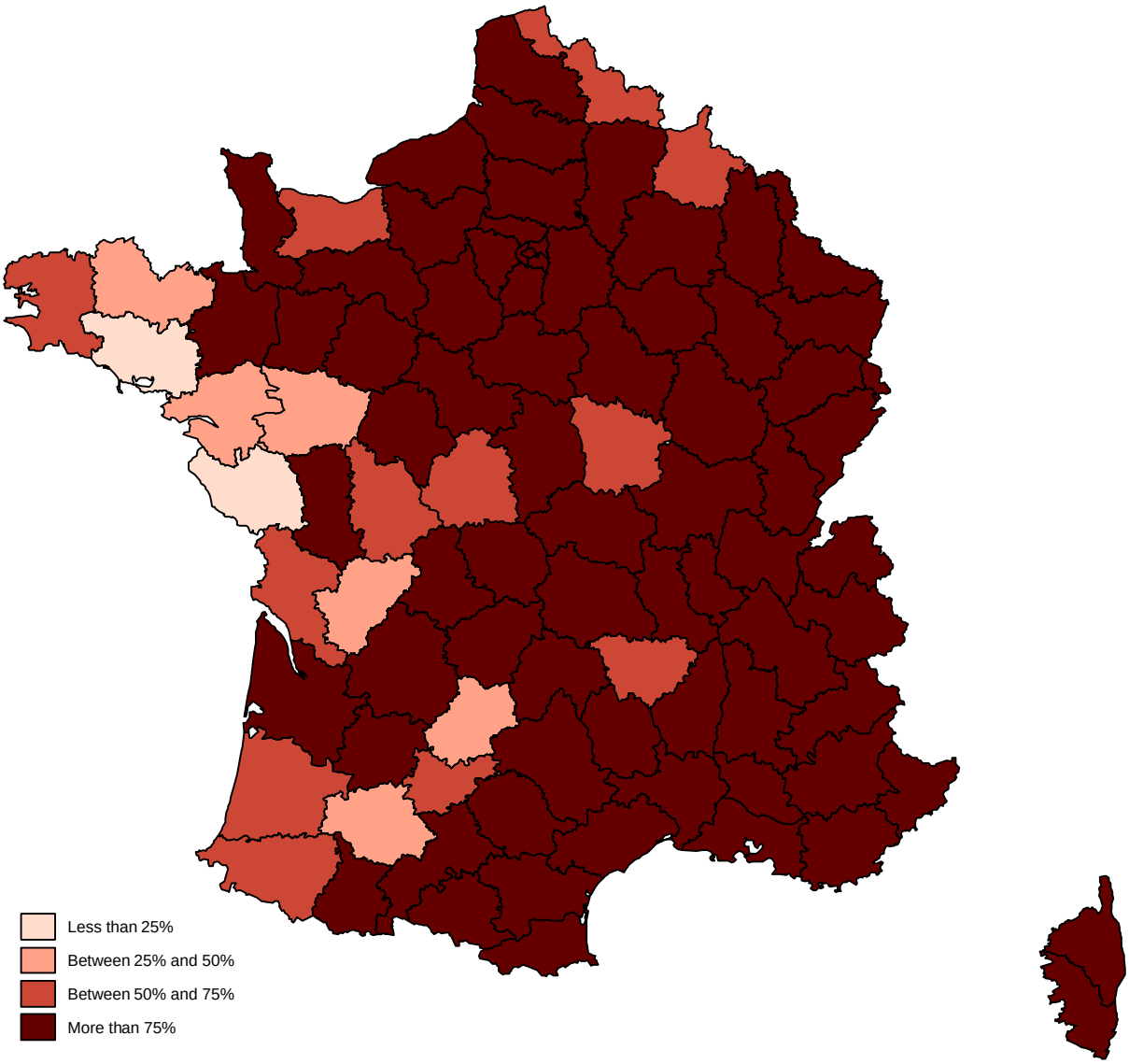
Source: *Archives Nationales* (series B IIC et F1cIII)

Figure 2. Share of the republican representatives elected in each *département* in the 1877 elections



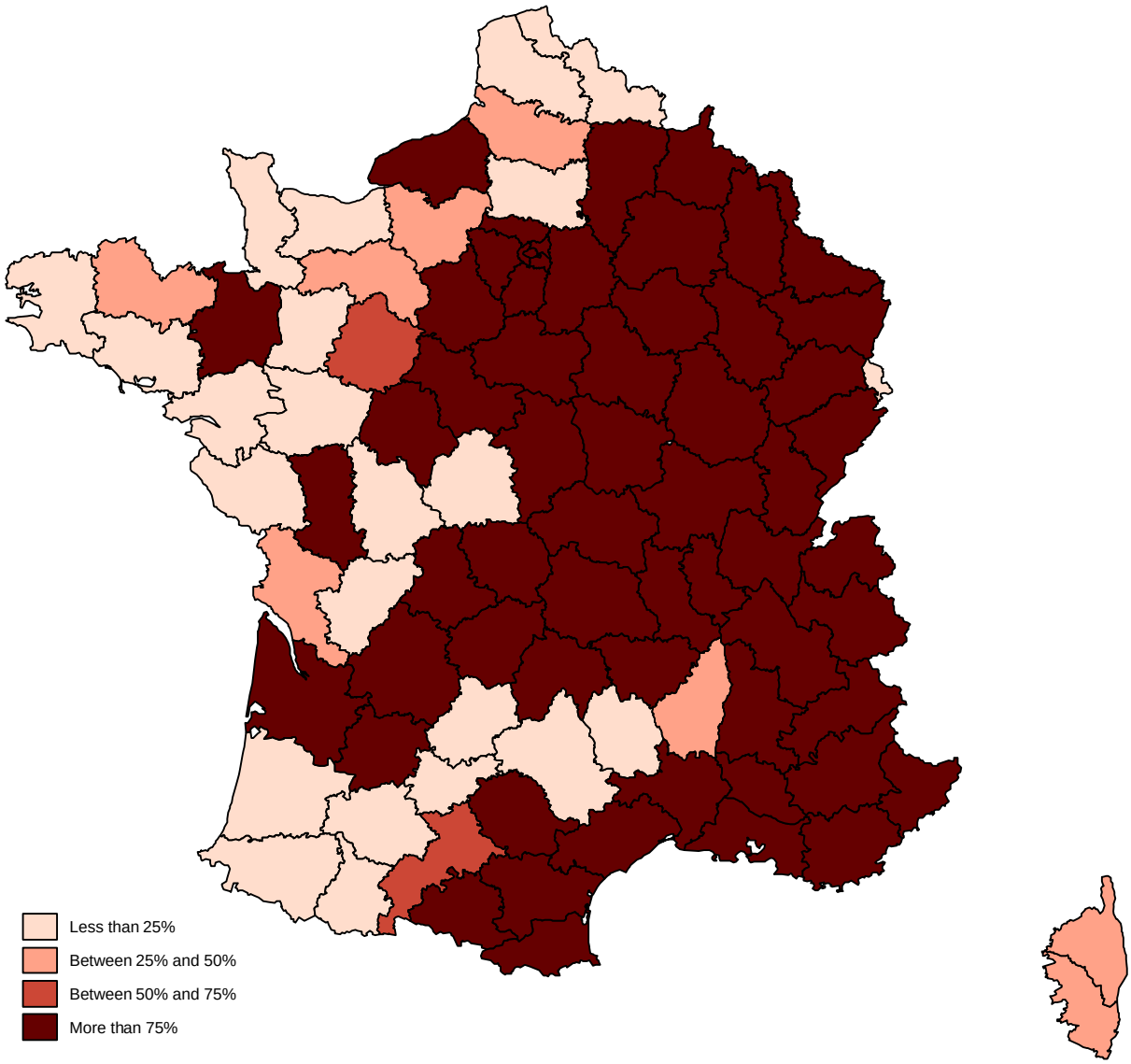
Source: *Archives Nationales* (series B IIC et F1cIII)

Figure 3 Share of the republican representatives elected in each *département* in the 1881 elections



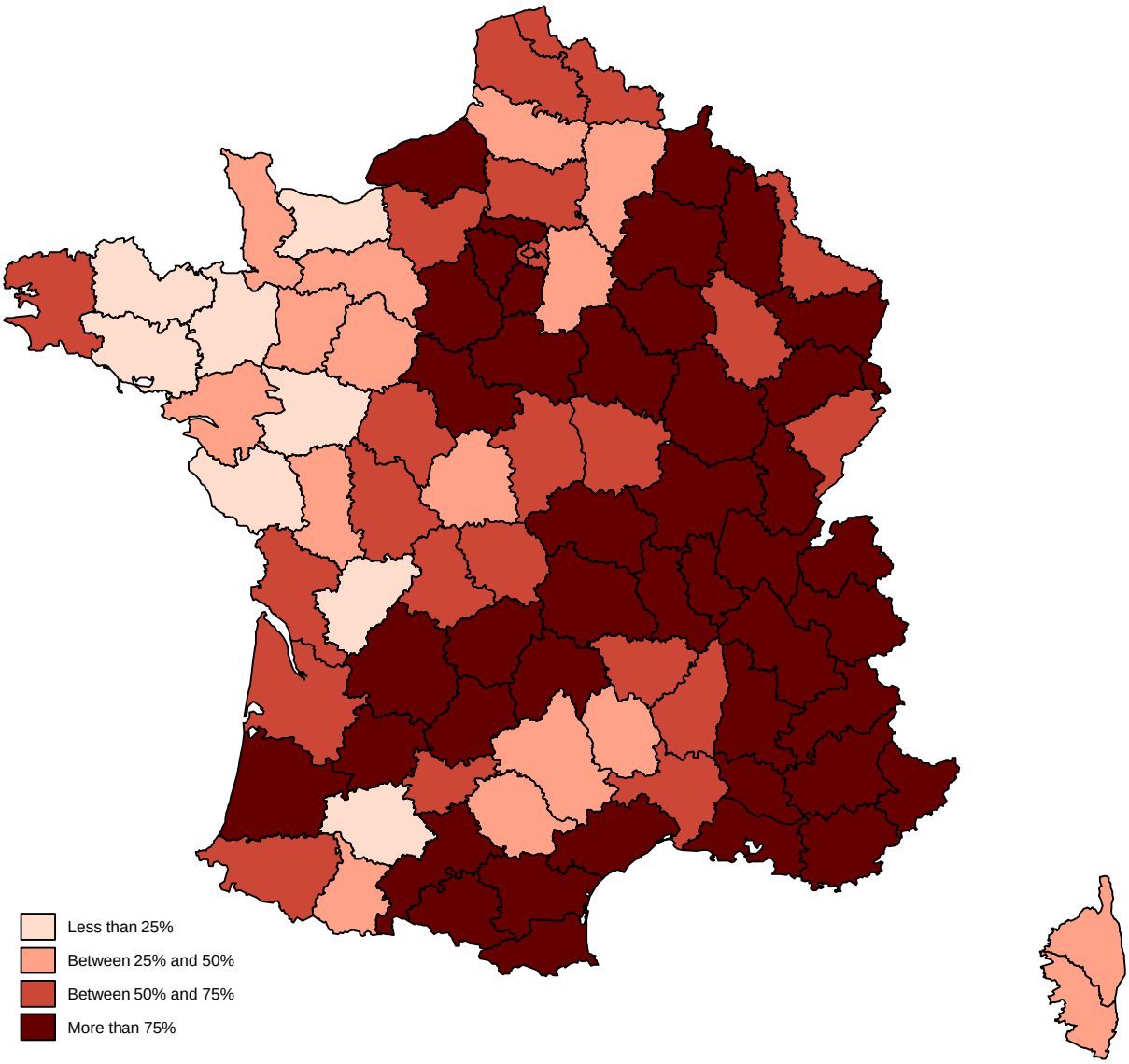
Source: *Archives Nationales* (series B IIC et F1cIII)

Figure 4. Share of the republican representatives elected in each *département* in the 1885 elections



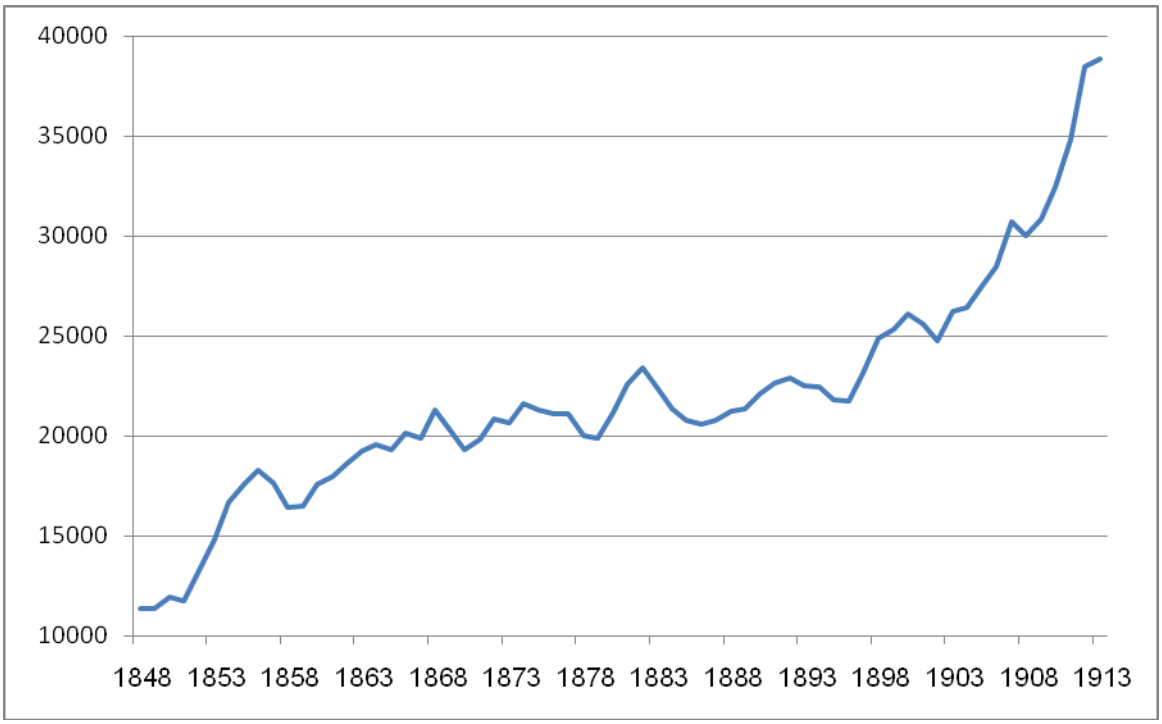
Source: *Archives Nationales* (series B IIC et F1cIII)

Figure 5. Share of the republican representatives elected in each *département* in the 1889 elections.



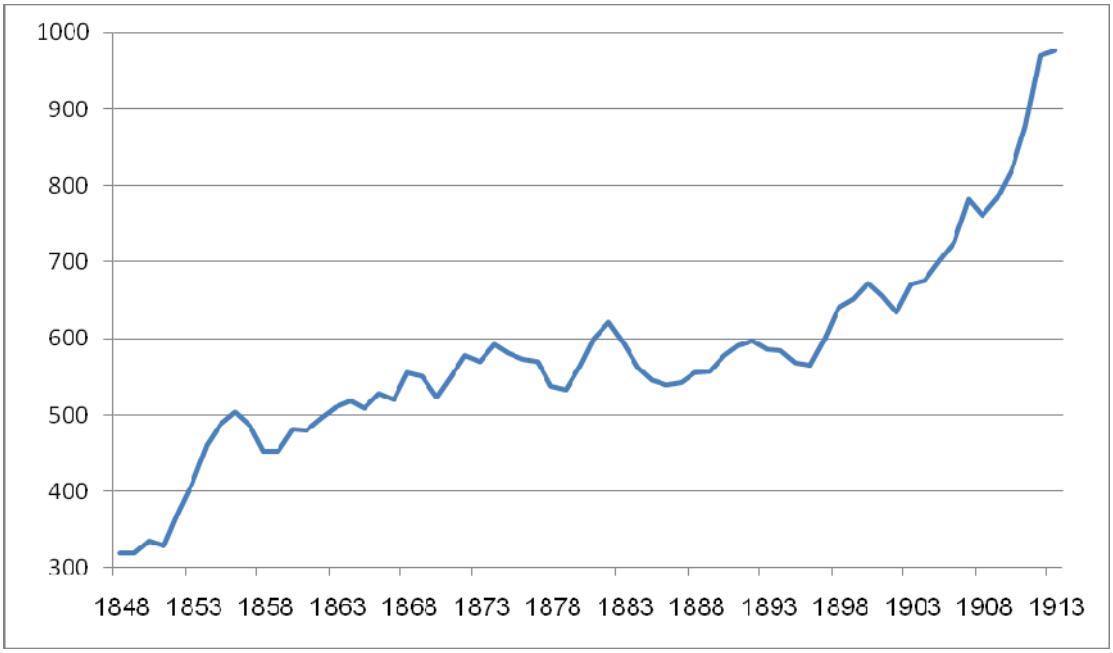
Source: *Archives Nationales* (series B IIC et F1cIII)

Figure A1. GDP in France, 1848-1913.



Source: Bourguignon and Levy-Leboyer (1990). The data on GDP are in million French Francs (current prices).

Figure A2. GDP per capita in France, 1848-1913.



Sources:
Bourguignon and Levy-Leboyer (1990) for the data on GDP (French Francs current prices). Annuaire Statistique de la France 1922 (p. 11*-12*) for the data on population.