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Johnson, Noel D and Koyama, Mark  
George Mason University

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# Taxes, Lawyers, and the Decline of Witch Trials in France\*

Noel D. Johnson<sup>†</sup> and Mark Koyama<sup>‡</sup>  
George Mason University

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## Abstract

This paper explores the rise of the fiscal state in the early modern period and its impact on legal capacity. To measure legal capacity, we establish that witchcraft trials were more likely to take place where the central state had weak legal institutions. Combining data on the geographic distribution of witchcraft trials with unique panel data on tax receipts across 21 French regions, we find that the rise of the tax state can account for much of the decline in witch trials during this period. Further historical evidence supports our hypothesis that higher taxes led to better legal institutions.

**Key words:** Rule of Law, Witchcraft, France, Institutions, Fiscal Capacity, Legal Capacity

**JEL classification:** H1, K0, K1, N0, N43, P48

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<sup>†</sup>Assistant Professor. njohnsoL@gmu.edu

<sup>‡</sup>Assistant Professor. mkoyama2@gmu.edu

‘Prolonged witch hunting is as good a barometer as any for measuring weakness in a state’ (Soman, 1989, 17).

## 1 INTRODUCTION

There is a growing consensus amongst scholars in development, sociology and political economy that fiscal and legal capacity—the ability of a state to raise tax revenues and to uphold the rule of law—are important determinants of economic prosperity. However, the process through which legal capacity is acquired remains poorly understood. In this paper we investigate the relationship between fiscal and legal capacity by studying the rise of the tax state and the decline in witch trials in early modern France.

While there is an extensive historical literature examining the rise of the tax state, there is relatively little written about how investments in fiscal capacity during the early modern period affected other institutions of interest to economists, such as those which structured trade or the legal system (see Mann, 1986; Brewer, 1988; Tilly, 1985, 1990; Ertman, 1997; O’Brien, 2011). We follow in the tradition of Heckscher (1955) who argued that fiscal decentralization in early modern Europe generated legal fragmentation and that this legal fragmentation impeded economic development because it reduced effective market size and created holdup and coordination problems.

While data on fiscal capacity across French regions is relatively easy to compile, legal variables are much more scarce. We attempt to overcome this obstacle by arguing that the relatively ample data on witch trials can be used to study the emergence of legal centralization and the ‘rule of law’. Using historical evidence we establish that witchcraft was, in fact, a very difficult crime to prosecute if prosecutors and judges adhered to the letter of the law. Witches were most likely to be tried and convicted in regions where judges and magistrates departed from established legal statutes. Witch trials were, as the opening quote from Alfred Soman indicates, symptomatic of weak state and legal institutions (see Levack, 2006). We develop a simple model to formalize the logic behind our argument that witchcraft trials can be used as a measure of legal fragmentation.

To test the relationship between the rise of the fiscal state and the imposition of centralized legal standards (or the rule of law), we combine our witchcraft data with tax receipts from twenty-one French regions. This is a unique data set as other countries do not have information on both witch-trials and tax collection at the *regional* level during the sixteenth and

seventeenth centuries. We find that regions with higher taxes were less likely to try witches and that the rise of the fiscal state across much of France during the mid-seventeenth century can account for much of the subsequent decline in witch-trials. These results are robust across a range of different econometric specifications and our findings are supported by additional historical and qualitative evidence.

Our paper makes the following contributions. First, our results have important implications for work in political economy as they present empirical evidence that fiscal and legal capacity are indeed complements as theorized by Besley and Persson (2007, 2009, 2011). The historical approach adopted in this paper thus informs both theoretical work on the conditions under which rulers invest in fiscal and legal capacity (Acemoglu, 2005; North et al., 2009; Besley and Persson, 2011) and empirical cross-country work that investigates the causes or consequences of investment in fiscal capacity (Bockstette et al., 2002; Chanda and Putterman, 2007; Dincecco, 2009, 2010; Dincecco et al., 2011). Second, our findings are of historical significance as they demonstrate that legal and fiscal centralization, rather than a decline in superstition, can account for the end of the witch trials in early modern Europe. Third, this paper develops a unique panel data set of French tax revenues for the seventeenth century that can be used in the future by other scholars. To our knowledge, we are the first to actually put together consistent panel data measuring legal and fiscal variables across French regions during this period.

Finally, our arguments suggest that economists studying the origins of the modern state and economic growth have been overly influenced by the development path taken by Britain. Britain, or at least England, was a uniquely centralized state from the middle ages onwards. British elites were able to overcome holdup problems and efficiently reallocate property rights (Mokyr and Nye, 2007; Bogart and Richardson, 2009, Forthcoming). This precocious centralization means that Britain does not necessarily provide the best case-study for analyzing the process through which states acquire fiscal and legal capacity. We suggest that the example of France, which emerged from the middle ages legally and fiscally fragmented, may be more relevant for the study of how states might acquire fiscal or legal capacity today.<sup>1</sup>

The structure of the rest of the paper is as follows. Section 2 details the historical reasons for the fragmented nature of the French legal system in 1600. In Section 3 we develop a simple model whose assumptions are based on historical evidence to argue that witch trials can be

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<sup>1</sup>Moore (2008) contains an excellent overview of the literature on ‘fiscal bargaining’ in developing countries.

used as a proxy for this legal fragmentation. We introduce the data on taxes, witch-trials, and our empirical strategy in Section 4. Section 5 provides further historical evidence in support of our argument. Section 6 concludes.

## 2 FISCAL AND LEGAL FRAGMENTATION IN EARLY MODERN FRANCE

To understand how a state acquires legal capacity, we need to study a state that lacked it. France, at the end of the sixteenth century did not possess a centralized legal or tax system. This reflected the way French monarchs had gradually added territories to their growing kingdom since the middle ages. Moreover, as more and more territories were added, the king was forced to concede old, and sometimes new, privileges to the regions so as to ensure their loyalty. In the words of one economic historian, the complexities of the resulting fiscal and legal system almost ‘defy description’ (Hoffman, 1994, 227–230).<sup>2</sup>

Legal and fiscal fragmentation reflected the underlying political equilibrium of the French monarchy. This was based on a time-tested and simple *quid pro quo*: The ruler used his military power to protect local privileges, and in exchange, local elites gave the king their political and fiscal support. France was a ‘natural state’ and control over local courts was a source of rents for the provincial nobility (North et al., 2009). The disbursement of these revenue streams helped to ensure domestic peace (Major, 1962, 1964, 1994).

The legal authority of the Crown was weak in many parts of the country as well. In some regions the provincial nobility still reigned as semi-independent rulers. Even in those areas where the authority of the monarchy was strong, local families dominated the regional parlements and elections.<sup>3</sup> As a result, there was ‘a lack of a coherent and common set of laws,’ and ‘the absence of unified laws even within each governmental region’ (Moote, 1971, 8). Provincial elites dominated the local seigniorial courts and used them to maintain their power (Beik, 1985, 81). Positions were often hereditary and a source of patronage. Rampant venality and the growing number of offices resulted in ‘perennial jurisdictional conflicts among the courts and in great expense to litigants who faced a vast judicial hierarchy if they

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<sup>2</sup>See also Goubert (1969). J. Russell Major observed that during the middle ages the French monarch had to make concessions to local interests in order to survive: ‘They had encouraged the codification of local customs instead of trying to create a common law. They had accepted the growth of provincial loyalties . . . In short, at the very time when they appeared to be creating a unified kingdom by driving the English out, they were permitting the formation of centrifugal forces that threatened to keep the nation forever divided’ (Major, 1994, 58).

<sup>3</sup>The parlements were judicial bodies, akin to courts of appeal, but with an added legislative component.

were entitled to appeal a decision from a lower court' (Hamscher, 1976, 160).

The existence of competing and overlapping jurisdictions resulted in impediments to market integration such as numerous internal tariff barriers and different systems of weights and measures across regions (Heckscher, 1955, 55-56).<sup>4</sup> Local public goods (such as irrigation projects) could not be provided as high transactions costs created holdup problems (Rosenthal, 1992). Disputes over contested property rights could go on for years and often litigants ran up high legal bills (Collins, 1995). Johnson (2006, 12-13) discusses how the fragmented system of collecting indirect taxes contributed to high marginal tax rates and corruption. Legal fragmentation also impeded the formation of coalitions capable of holding the king to account (Balla and Johnson, 2009).<sup>5</sup> This evidence suggests that legal fragmentation was extremely costly, but, while there are ample qualitative examples of these costs, quantifiable evidence is generally lacking. Little data survives from old regime trials and none of it on a country-wide scale. Hence it is difficult to measure legal fragmentation and centralization. Witch-trials provide a way around this problem because data on them exist and because the fact that a region was willing to try someone as a witch tells us something substantive about local legal procedure and its effect on the lives of ordinary people.

### 3 WITCH TRIALS AS A PROXY FOR LEGAL FRAGMENTATION

#### 3.1 *The Legal Centralization Hypothesis*

The underlying causes of the 'witch craze' of the early modern period remain a puzzle which continues to defy explanation (Briggs, 1996a, 51-53).<sup>6</sup> We do not attempt to solve this

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<sup>4</sup>The north and south of France had different systems of regulation and administration. To transport goods between Rouen and Nantes one paid thirty different tolls and each provided an opportunity for a local official to overcharge by as much as 300 or 400 percent (Heckscher, 1955, 85-85).

<sup>5</sup>See Jha (2010) for an example of the importance of fiscal and legal institutions in sustaining reforming coalitions in seventeenth century Britain.

<sup>6</sup>There are many theories. Jenson (2007) advocates a theory of scapegoating and observes that by 1560, groups that had been singled-out as scapegoats during medieval times, principally Jews and lepers, were no longer present in large numbers in western Europe. MacCulloch (2003) stressed the importance confessional divisions played in legitimizing large-scale judicial executions for religious deviants. Kamen (1971) emphasized growing Malthusian tensions as a rising population began to push against diminishing returns in agriculture resulting in traditional forms of social security and collective insurance coming under pressure across Europe. This interpretation was particularly influential in the historiography on English witchcraft (see Thomas (1971) and Macfarlane (1970)). At the same time, temperatures fell and weather conditions worsened during the early modern 'little ice age' (Behringer, 1995, 1997). Behringer (1995) argues that the upsurge in witchcraft persecutions in the second part of the sixteenth century was partly a response to 'unnatural' weather conditions. For instance, he argues that the 'prerequisite' for the witch-hunts in

puzzle, but simply note that, across much of Europe, rulers and courts tried witches because there was a demand for them to do so, and that there was a large amount of between and within country variation in the number of witches tried.<sup>7</sup> In some regions few if any witches were put on trial, whereas some small cities and bishoprics in Germany were alone responsible for thousands of executions. To a large extent this variation can be explained in terms of differences in legal standards and procedures. We argue that, all else equal, witchcraft trials were more likely to take place in regions that were legally fragmented and that legal centralization led to a decline in the number of trials. We call this the legal centralization hypothesis.

This hypothesis is surprising because traditional accounts of the European witch trials emphasize the role either of the Catholic Church, the Roman Inquisition, or the state as the initiators of the witch hunts (see Russell, 1972; Cohn, 1975; Larner, 1981). However, more recent historical research suggests that, in fact, central governments were in general ‘a moderating influence’ on witch persecutions (Levack, 1996, 14) and that well organized states did not ‘tolerate genuine witch-hunting for very long’ (Briggs, 1996*b*, 190-191).<sup>8</sup> Historians have noted that judges of local or ‘inferior’ jurisdictions usually demonstrated much more zeal in prosecuting witches than did the central authorities, and when left to their own devices they generally executed more witches than when they were closely supervised by their judicial superiors’ (Levack, 2006, 97). At the local level, superstitious belief, unconstrained by judicial procedure, was often enough to bring about a witch prosecution.

The crime of witchcraft had two components: ‘maleficia’, or harm through supernatural means, and ‘diabolism’, or crimes relating to the devil. Maleficia could range from harming cattle or causing a blight on grain to actually committing homicide. For example, in 1611 Jacques Jean Thiébaud in Montbéliard was accused of killing the livestock of neighbors and

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south-west Germany in the 1590s was ‘a series of storms damaging crops and resultant crop failures. Oster (2004) finds quantitative support for Behringer’s hypothesis. This correlation between bad weather and witch-trials, however, does not explain why many parts of Europe which experienced bad weather in this period did not go on to try large numbers of witches. As we will see, there was a tremendous amount of variation in witch prosecutions across regions within France.

<sup>7</sup>The mass trials in Würzburg were preceded by rumors about witches eating a child and witchcraft was mentioned in a general petition by the townsfolk to the Bishop (Roper, 2004, 28) Local officials responded ‘to popular demands for action against witches, both because they sincerely believed in the reality of the crime and because such action did advance their own prestige’ (Briggs, 2007, 21).

<sup>8</sup>See Henningsen (1980), Seitz (2009), and Bever (2009) for examples of central authorities restricting trials on the grounds that established legal standards were being undermined. Contrary to popular imagination, the Inquisition in Spain, a ‘highly centralized, national institution,’ controlled local witch prosecutions and prevented large-scale or widespread trials (Levack, 1999, 15).

making them sick.<sup>9</sup> In the eyes of the members of the local community, maleficarum was almost always the primary source of tension and conflict with the accused. It was only when the witches were brought to trial that the other half of the official ideology came into play, ‘diabolism’. Diabolism was defined as having dealings with the Devil or his agents. Attendance at a ‘Devil’s Sabbath’, flying through the air, the use of magic powders or unguents, were identified as common behavior among witches (Cohn, 1975; Roper, 2004).<sup>10</sup>

Witchcraft was difficult to prosecute under conventional legal procedures and standards of proof. Maleficia may have sometimes actually occurred and, in rare cases, may even have left evidence. However, diabolism was, by its nature, beyond the pale of rational legal procedure. Since dealings with the devil existed only in the fantasies of accusers and (rarely) the accused, it was a thought crime. In order to get around the difficulty of prosecuting a suspected witch according to traditional standards of legal proof, local judges turned to the theories of the demonologists.<sup>11</sup> These writers claimed witchcraft was an ‘exceptional crime’ (*crimen exceptum*) (Larner, 1980). As the demonologist Henri Boguet put it ‘[w]itchcraft is a crime apart ... Therefore the trial of this crime must be conducted in an extraordinary manner; and the usual legalities and ordinary procedures cannot be strictly observed’ (Boguet, 1929, 211-212). The Devil was seen as extremely cunning and endowed with the ability to enable witches to resist interrogation.<sup>12</sup> To break the hold of Satan it was often necessary to resort to torture since the application of standard rules of evidence would result in the vast majority of accused witches being acquitted. The demonologist Jean Bodin argued that the ‘proof of such evil is so obscure and difficult that not one of a million witches would be accused and punished if regular legal procedure were followed’ (quoted in Midelfort, 1972, 19). As Soman writes, ‘[i]n order to prosecute witches cheaply and efficiently the crime needed to

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<sup>9</sup>... [Il fait mourir] par sorcelerie et predice pouldre ung cheval jument rouge appartenant à Huguenin Martin,... une vache appartenant à Jean Paris de Bian, ung velot aux Belotz, une vache et deux velots à Claude Caburret, et plusieurs besteaux à Jean Perrenot, ensorcelé et donné maladie à Marguerite Fillon...’ (Tuetey, 1886, 9).

<sup>10</sup>In the condemnation of Thiébaud, mentioned above, there were also accusations of diabolism: ‘...[il sa] donné au diable, prins icelluy pour son maistre et promis destre son valet, recue sa marcque, et retenu et approuvé le nom de Grappin, fait pact et convention avec lui, reçu de ses pouldres diabolicques affin de nuyre aux créatures rainsonnables et leurs biens soubz le signal et entremise dudict Grappin, son maistre par imprécations des dictes pouldres et accouchements, occultes, assistez aux ensembles nocturnes des sorciers, appelé sabat...(Tuetey, 1886, 9).

<sup>11</sup>In France, the most well known demonologists and the dates of their tracts were: Jean Bodin (1579), Nicolas Rémy (1595), Martin Del Rio (1599), Henri Boguet (1602), and Pierre de Lancre (1612 and 1622).

<sup>12</sup>Thus when witches attended nightly sabbaths it was believed that phantoms of their bodies remained in beds allaying the suspicions of husbands or wives. It was believed that the Devil would assist his minions to withstand torture without confessing. Torture therefore had to be applied until her resistance collapsed’ (Roper, 2004, 47).



be redefined and the rules of evidence relaxed... Learned demonological theory came to the rescue and found ready acceptance within the ranks of subaltern magistrates' (Soman, 1992, 13). Under the influence of the ideas of men like Jean Bodin, suspected witches were tried using evidence that was poor in both quantity and quality.<sup>13</sup>

The unobservable nature of the crime combined with the use of torture created a self-replicating logic to witchcraft trials. Accusation led to torture, which led to further accusations. This logic is illustrated by the following example which took place in 1599 in the area of Bazuel which lies in the North of France. A widow named Reine Perceval was accused of sorcery and brought to the local abbey for interrogation. Initially, she denied the accusations, despite the attempts of her interrogator to coerce her confession by pointing to another recently accused woman who, by admitting to the crimes, was released. The trial transcript records prosecutor as asking, 'Why don't you confess, like Yzabeau Dubailles has done? You see that once she confessed to monsieur Le Bailly he released her to go after Mathieu Hennocque paid for her expenses (Muchembled, 1979, 131).'<sup>14</sup> Later, under torture, the widow Perceval did confess to being a witch and named several 'accomplices'. The interrogator asked if she knew those who danced with her at the Devil's Sabbath and her response was recorded as, '... many time Yzabeau Dubaille was there, and Péronne Devauchelle, Péronne Hacquinos from haut d'Ors [the neighboring village], with one other person from that region, Maryette Dupard, and making their oaths danced past midnight... (Muchembled, 1979, 132)'.<sup>15</sup> Importantly, several of those Perceval eventually accused were from the neighboring village. For under the duress of torture, it is probably easier to betray a partial acquaintance than one's own friend or close neighbor

Law codes and central state authorities recognized the dangers associated with using torture to extract confessions (Langbein, 1977). Roman canon law permitted torture in part because it imposed a much higher burden of proof than had earlier Germanic law codes. Unless

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<sup>13</sup>As with torture, evidence taken from children was not admissible in normal criminal cases but judges like Pierre de Lancre in the Labourt justified relying on statements from children as young as six because doing otherwise would be 'very dangerous for the republic, and especially for a country as infected as Labourt' (quoted in Williams, 1995, 119).

<sup>14</sup>Que ne confessez vous, comme a fait Yzabeau Dubailles? Voila qu'elle at confesset à monsieur le bailly et il la laisse aller sur caution de Mathieu Hennocque pour les despens.

<sup>15</sup>'... plusieurs fois Yzabeau Dubaille y avoit esté, et Péronne Devauchelle, Péronne Hacquinos du haut d'Ors [village voisin], avecque et une aultre jeune dudit lieu, Maryette Dupard, et faisoient leur dites dansse par la minuict...' It was often not even necessary to have a confession for others to become implicated. Being related to the accused was often enough to cast suspicion and bring one in for questioning (Muchembled, 1979, 138-140).

there were two eyewitnesses to a crime a suspect could only be condemned if he or she confessed. The importance of obtaining a confession was thereby elevated, and this led to legal authorities condoning torture as a means of extracting a confession, particularly in cases where it was difficult to obtain other forms of conclusive evidence. Nevertheless the *Lex Carolina* of 1532 in Germany and The *Ordinance of Villers-Cotterets* of 1539 in France limited the use of the judicial torture (see Roper (2004, 46) and Levack (1996, 82–88)). Torture was intended to be used to obtain information that could be externally verified, information that ‘no innocent person can know’ (quoted in Langbein, 1977). The magistrates conducting the interrogation were to refrain from suggestive questioning and torture could be only be repeated a certain number of times (Langbein, 1977). Had these rules been adhered to witch cases would have been infrequent.<sup>16</sup> However, legal restrictions and limits on the use of torture were often ignored in witchcraft cases, especially when judges and magistrates were influenced by popular opinion.<sup>17</sup>

It was costly in a purely financial sense to try an individual witch (Briggs, 1996*b*; Lea, 1957).<sup>18</sup> Furthermore, fear of witchcraft could get out of control and result in lynchings and murders or in devastating mass trials in which large numbers of individuals who would not usually be suspected of witchcraft came under suspicion. Hence, both local and central authorities had an incentive to treat witchcraft accusations with a degree of skepticism. However, this judicial skepticism had to be weighed against a genuine fear that witchcraft posed an existential threat to society. This fear justified treating witchcraft as a *crimen exceptum*. The discretionary power that this distinction allowed enabled courts to convict more suspects than otherwise would be possible and to employ extraordinary legal procedures such as torture, ordeals, circumstantial evidence or the testimony of child witnesses.

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<sup>16</sup>Torture was not generally used in England and the number of witches tried in England was comparatively small (Sharpe, 1996). The exception that proves the rule is the East Anglian witch hunt of the 1640s where witch hunters exploited the breakdown in central authority and generated a witch panic (Gaskill, 1996).

<sup>17</sup>Thus in Scotland, torture was often used even though it ‘was administered illegally, without warrant from the privy council. Indeed, the council took action on more than one occasion to imprison or prosecute those who tortured witches. The main difference, therefore, between the English and the Scottish use of torture is not that the laws of one country allowed its use, whereas the laws of the other did not, but that the central government of one country was generally able to enforce its own strict rules regarding the use of torture whereas the government of the other could not’ (Levack, 2008, 23).

<sup>18</sup>Lea provides extensive evidence that the ‘cost of these trials were large’. He notes that the trial of ‘Catherine Jeannot (1652) amounted to 480 fr. 3 gros. Those of Pierre Tournier-Faucillier and his wife (1655), 437 fr. 1 gros 1 blanc each, and they were rarely much less than 500 fr. This consisted chiefly in the large fees paid to everyone concerned, from the arrest to the execution, for every act and service performed’ (Lea, 1957, 1206).

The problem was that the witch trials were not only a response to fears of witchcraft, they also helped stoke these fears and hence the demand for trials. The effect that a trial had on belief in witchcraft in other regions resembles a negative externality. One channel for this externality was the way in which accounts of sorcery and satanic pacts were publicized by court transcripts. ‘The news of witch-hunts and executions in other parts of a country could easily fan popular fears and create a mood that was conducive to witch-hunting in a village or town. It was because of such communications that many hunts spread from village to village, even when confessing witches did not implicate accomplices outside their communities or when witch-hunters did not move from place to place’ (Levack, 2006, 178-179).

Local authorities either ignored, or were unable to internalize, the effect that trials in their region had in reinforcing the belief in witchcraft in other regions. Central authorities, however, faced stronger incentives to internalize this externality. This can explain why central authorities and higher courts often upheld stricter legal standards than did lower or local courts. Here we use the term ‘stricter’ as specifically meaning that central authorities were less likely to allow a deviation in legal procedure due to the influence of superstitious belief reinforced by popular opinion.<sup>19</sup> This reasoning can also explain the puzzling historical observation that legal centralization may have led to a decline in witch trials even though both local and central authorities continued to believe in the existence of witches.

### 3.2 A Simple Model of the Legal Centralization Hypothesis

To clarify our logic, we can formalize this argument using the following simple framework. Consider two regions  $i \in \{1, 2\}$ . Each region is under the authority of a local court, denoted by  $l_i$ . There is also a central court  $C$ .

Bottom-up demand for witchcraft trials is denoted by  $d_i^* \in \mathbb{R}^+$ . This is a function of the level of superstitious belief in region  $i$ ,  $\theta_i$ . Fear of witchcraft  $\theta$  is determined by a parameter  $\omega$  that reflects factors like bad weather and ideology. The strength of local belief is also influenced

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<sup>19</sup>Our discussion of witchcraft in this context is just a specific example of the pervasive trade-offs magistrates had to make between adapting the law to local custom versus enforcing formal legal procedure. For example, the region of Haute-Auvergne was split by the central government into two jurisdictions for the purposes of collecting the salt tax. As cheese making was a primary source of livelihood, this induced a great deal of smuggling which was, technically, against the law. Nonetheless, locals did not view smuggling as ‘wrong’ and local magistrates were less willing to prosecute than central authorities (thus reinforcing local belief in the legitimacy of the crime). As the central state asserted its authority during the seventeenth century, the letter of the law was increasingly enforced (Greenshields, 1994, 11, 41).

by the degree to which courts in nearby regions implicitly acknowledge superstitious belief by either prosecuting related crimes, or, failing to prevent locals from prosecuting such crimes themselves. The strength of this effect is captured by  $\beta \in (0, 1)$ .

Courts can respond to these demands by adapting its standards of evidence so as to try more witches. We denote these departures from established legal practices by  $s \in \mathbb{R}^+$ . A court that completely accommodates local demands for trials sets  $s_i = d_i^*$ . However, there is a cost to doing so:  $\gamma$ , which reflects the fact that witch trials were expensive and often led to other episodes of disorder. Thus, the local authority in region  $i$  minimizes the following quadratic loss function:

$$\min_{s_i^l} u_i^l = \frac{(s_i^l - d_i^*)^2}{2} + \frac{\gamma(s_i^l)^2}{2}. \quad (1)$$

Equation 1 illustrates the trade-off facing any authority in allowing legal procedure to be influenced by local superstitious belief. The first term states that there is a cost for not allowing legal procedure to conform to local belief. Failure to prosecute a witch when there is significant local support for this, may result in the formal courts losing legitimacy, or, in a more serious loss of social control. The second term indicates that there is also a direct cost to local authorities of allowing local fears of witchcraft to influence the law.

The objective function for the central authority is identical to the local authorities with the important difference that it is concerned with the deviation of legal procedure from official judicial norms in both regions. Hence it minimizes:

$$\min_{s_i^c, s_j^c} u^c = \frac{(s_i^c - d_i^*)^2}{2} + \frac{\gamma(s_i^c)^2}{2} + \frac{(s_j^c - d_j^*)^2}{2} + \frac{\gamma(s_j^c)^2}{2}. \quad (2)$$

We can now explicitly introduce the feedback process which captures the argument that attempts to accommodate popular fear of witchcraft led to these fears being validated. If a court was willing to hear evidence that had been coerced through torture this was interpreted by ordinary people as validating their belief in the existence of malevolent witches. For convenience consider the following linear function.

$$d_i^*(\theta_i) = \omega + \beta s_j,$$

for all  $i \in \{1, 2\}$ . If the central court does not overrule any decisions made in the local court,

the best response of the local court in region  $i$  is given by the first order conditions to (1):

$$\hat{s}_i^l = \frac{\omega + \beta s_j}{1 + \gamma}.$$

This is bounded at zero and increasing in  $s_j$ . Since the local court in region  $j$  faces the same problem, the symmetric Nash equilibrium sentence is given by:

$$\hat{s}_1^l = \hat{s}_2^l = \frac{(1 + \gamma + \beta)\omega}{(1 + \gamma)^2 - \beta^2} = \frac{\omega}{1 + \gamma - \beta}. \quad (3)$$

The equilibrium departure from standard procedure in the local region  $\hat{s}$  is increasing in  $\omega$  and  $\beta$  for  $\beta \in (0, 1)$ .

Now let us consider the problem facing the central court. The central court can intervene in local jurisdictions at a cost. If the central court intervenes it does so in both regions. From the first order conditions to (2) we obtain:

$$\begin{aligned} \hat{s}_i^c &= \frac{(1 - \beta)\omega + 2\beta s_j}{1 + \gamma + \beta}, \\ \hat{s}_j^c &= \frac{(1 - \beta)\omega + 2\beta s_i}{1 + \gamma + \beta}. \end{aligned}$$

The central authority permits the following departures from official procedure in response to local demands:

$$\hat{s}^c = \frac{(1 + \gamma + 3\beta)(1 - \beta)\omega}{(1 + \gamma + \beta)^2 - 4\beta^2} = (1 - \beta) \left[ \frac{\omega}{1 + \gamma - \beta} \right] = (1 - \beta)\hat{s}_i^l. \quad (4)$$

As with the local court solution, the central court also allows for greater influence of superstitious belief as  $\omega$  increases and as  $\gamma$  decreases. However, since the central court cares about deviation from official procedure in both regions, it internalizes the externality represented by  $\beta$  and it imposes greater discipline on the local courts than do the local authorities. Hence we should expect to observe fewer witchcraft trials in regions where the central authority has a strong presence.

**Result 1** *The central authority always permits (weakly) fewer witchcraft trials than does the local authority:  $s_i^l \geq s_i^c$  for  $i \in \{1, 2\}$ .*

An outstanding example of how concern with public order led higher legal authorities to at-

tempt to dampen popular fears of witchcraft and other manifestations of superstitious belief comes from a report by the lieutenant of the Paris police, René Voyer comte d'Argenson. He was concerned with judicial abuses concerning, '...false soothsayers, fake witches... all people who distribute powders, talismans, or pantacles (Mandrou, 1979, 279)'.<sup>20</sup> After mentioning the slippery nature of these crimes due to the lack of evidence, he argued that the true cost to society is the publicity created by the trials themselves. He wrote,

It seems that the shock that one makes among the public by introducing a formal trial of this type creates a type of scandal which dishonors religion and makes the protestants more rebellious; I believe, therefore, that all of the leaders of these groups of abominations must be by the authority of the King dispersed and secured at the asylum... where they can be fed as paupers and forgotten about forever... (Mandrou, 1979, 280-281)'.<sup>21</sup>

In the next section we investigate the relationship between fiscal centralization and the enforcement of strict legal procedure, which we proxy using data on witch trials. As our theory implies, more trials should have been correlated with lax judicial procedure. If this argument is accepted, then by investigating the relationship between fiscal capacity and witch trials, we should be able to identify whether fiscal and legal capacity were complements or substitutes in France during the early-modern period.

#### 4 EMPIRICAL ANALYSIS: DID FISCAL CONSOLIDATION LEAD TO A DECLINE IN WITCH TRIALS?

We have argued that witch trials provide a measure of legal capacity in early modern France. What was the relationship between witch trials and fiscal consolidation? The seventeenth century was a period of fiscal consolidation in France. The political-equilibrium of the late medieval or renaissance monarchy came under strain as higher costs of war, associated with the military revolution, obliged the French crown, first during the Ministries of Cardinals Richelieu (1624-1642) and Mazarin (1642-1661), and then under Louis XIV's Finance Minister Jean-Baptiste Colbert (1665-1683) to establish a centralized fiscal system. Our

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<sup>20</sup>... les faux devins, les prétendus sorciers... toutes les personnes qui distribuent des poudres, des talismans ou des pantacles.

<sup>21</sup>Il semble mesme que l'esclat qu'on fait dans le public en intruisant les procez de cette qualité form une espèce de scandale qui deshonne la religion et rend les protestants plus indociles; je croyais donc que tous les chefs de ces caballes d'abominations doivent estre par l'autorité du Roy dispersez et renfermez à l'hospital... pour y estre nouris en pauvres et oubliez pendant longtemps...



**Figure 1:** Total tax revenues and tailles revenues, 1600–1695

hypothesis is that as the central government increased fiscal capacity across France, it also imposed greater discipline on the courts. This increased discipline by the central government should show up as a negative correlation between fiscal capacity and witchcraft trials. It is important to emphasize that the central government did not link higher tax revenues with suppressing witch trials. Rather, collecting taxes required standardized and properly enforced judicial procedures and the central government was in a better position to reorganize and coordinate the enforcement of judicial rules than local authority.<sup>22</sup> The model in the previous section illustrates one aspect of the coordinating role of the central government, that of internalizing the negative externality on legal procedure of local superstitious belief. A side-effect of this process of the substitution of central for local authority, was the decline in witch trials. Centralized legal institutions led to less judicial discretion, improved standards of evidence, and increasingly standardized law enforcement, and thus had the inadvertent effect of reducing the number of witches tried as we have outlined above.

Figure 1 shows the increase in the fiscal capacity of the monarchy during the seventeenth century.<sup>23</sup> The dashed line shows the *per capita* silver value of all revenues collected. These

<sup>22</sup>See Wallis and North (2011) for a discussion of the importance of the coordinating role of the ‘dominant coalition’ in generating the institutional innovations often associated with modern states, including more impersonal and uniform legal procedures.

<sup>23</sup>All data come from Richard and Bonney (2011). ‘Total Revenues’ are equal to the sum of extraordinary revenues and ordinary revenues. ‘Tailles Revenues’ are simply the value of the tailles, which is a subset

include both ordinary tax revenues in addition to loans and temporary financial expedients. The solid line shows the revenues coming directly from the primary direct tax collected by the crown known as the *taille*. The vertical dashed lines indicate the dates France fought in the Thirty Years War (1635-1648). As is clear from Figure 1, while revenues were increasing throughout the century, there is a marked jump in the regime's capacity to collect taxes through the *tailles* starting around the entry to the Thirty Years War. Whereas increases in revenues between 1600 and 1635 tended to come from so-called 'extraordinary' sources, such as loans (voluntary and forced) and temporary taxes, after 1635 there was a dramatic rise in revenues coming from 'ordinary' sources, such as the *taille*. This shift from extraordinary towards ordinary sources of revenue around the middle of the seventeenth century represented a dramatic increase in the fiscal capacity of the state.

The overall numbers of witch-trials between 1500 and 1720 in France (solid line) compared to the rest of Europe (dotted line) is illustrated in Figure 2. As discussed above, witchcraft prosecutions started around 1550 across all of Europe. Furthermore, while the overall number of trials in France was lower in total than in the rest of Europe (2,274 versus 4,435), French regions were very active in persecuting witches between 1550 and the middle of the seventeenth century.<sup>24</sup> The most interesting fact illustrated by Figure 2 is the abrupt end to French witch-trials between 1635 and 1660 (marked by vertical lines) compared to the rest of the Europe. This suggests that something unique happened in France around the middle of the seventeenth century that was correlated with a decline in witchcraft persecutions.

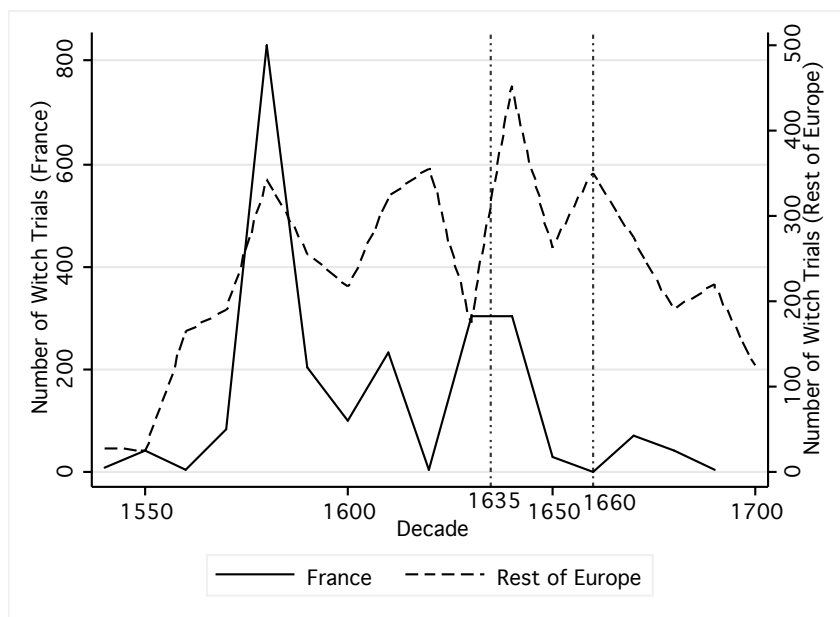
Indeed at the same time that witch-trials were disappearing in France the fiscal capacity of the centralized state, as measured by per capita receipts through the *tailles*, was increasing dramatically. Between 1635 and 1660 *taille* revenues per capita rose by a factor of four. This evidence of a positive correlation between aggregate tax receipts and the aggregate number of witch-trials in France is suggestive, but it would be better if we could exploit the regional variation in taxes and trials over time in order to test two propositions: (1) at a given moment in time, were trials more likely to occur in regions with lower fiscal capacity? (2) Within a given region, as tax revenues per capita increased over time, did this correlate

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of ordinary revenues (usually about two-thirds of ordinary revenues). All series are converted into silver equivalents. We use *généralité* level *taille* receipt data from Malet. We use population data from around 1700 contained in (Dupâquier, 1988) to create per capita values. We then converted these numbers into real values using data on the silver content (in grams) of the *livre tournois* provided by (Wailly, 1857). The Figure shows the log of *taille* receipts per capita in grams of silver.

<sup>24</sup>We should note that one very important omitted region in Europe is the German States where some of the most severe witch-hunts occurred during the period (Midelfort, 1972).





**Figure 2:** Witch trials in France and the rest of Europe, 1540–1700. The data for France is from the panel constructed by authors and described in greater detail below and in Appendix A. The data on the ‘Rest of Europe’ comes from Oster (2004) and includes numbers on trials in the Bishopric of Basel, Essex, Estonia, Finland, Geneva, the Home Circuit (England), Hungary, Neuchatel, and Scotland.

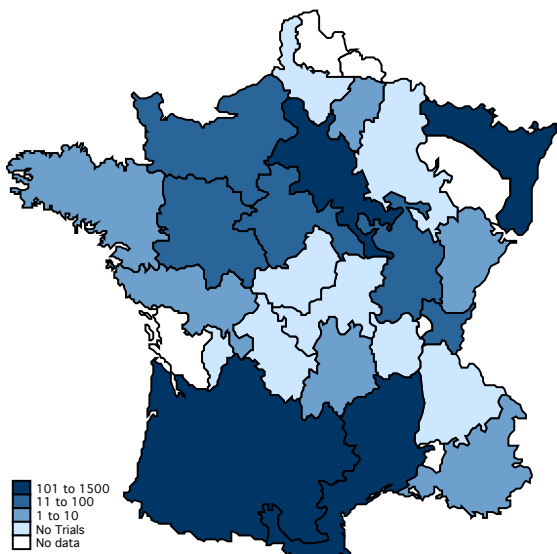
with a lower likelihood of a trial?

#### 4.1 The Data

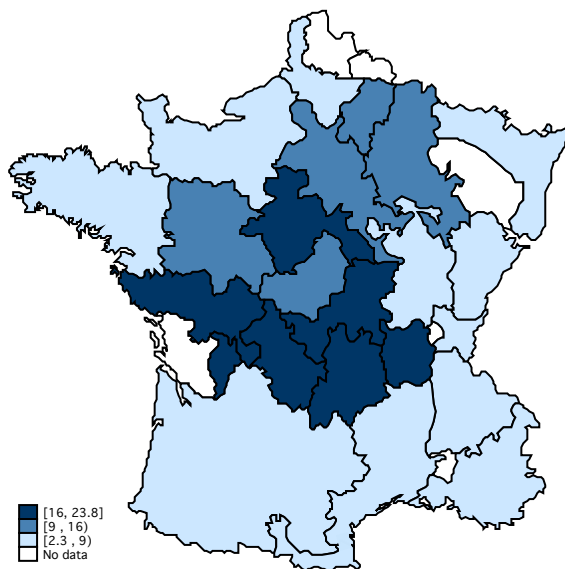
To answer these two questions we create a panel spanning the years 1550-1700 for witchcraft trials and *taille* revenues across twenty-one regions in France. We focus on the *tailles* as our measure of fiscal capacity for several reasons. The *tailles* regions, known as *généralités*, were fairly stable from about the fourteenth century until the Revolution. This is in stark contrast to the indirect tax regions which were constantly being consolidated and split apart. Another attractive feature of the *taille* data is that Jean-Roland Malet published the details of the royal budgets from the entire seventeenth century down to the *généralité* level at the end of the eighteenth century (Bonney, 1995). This represents a huge amount of fiscal detail relative to the summary accounts (known as the accounts ‘*abrégés*’) which are our only other source of consistent revenue data for France, but which, unfortunately, only contain nationally aggregated receipts.

One problem with constructing this data set is that the data from Malet on regional *tailles*

receipts does not extend to the period 1550-1599. The first way we address this issue is by splitting the panel into three time periods (1550-1609, 1610-1649, 1650-1699) and assuming that regional tax receipts between 1600 and 1609 are good proxies for receipts between 1550 and 1599. We call the data set constructed in this way the ‘Malet Data’.



**Figure 3:** Distribution of witchcraft trials across French généralités. Source: see Appendix A.

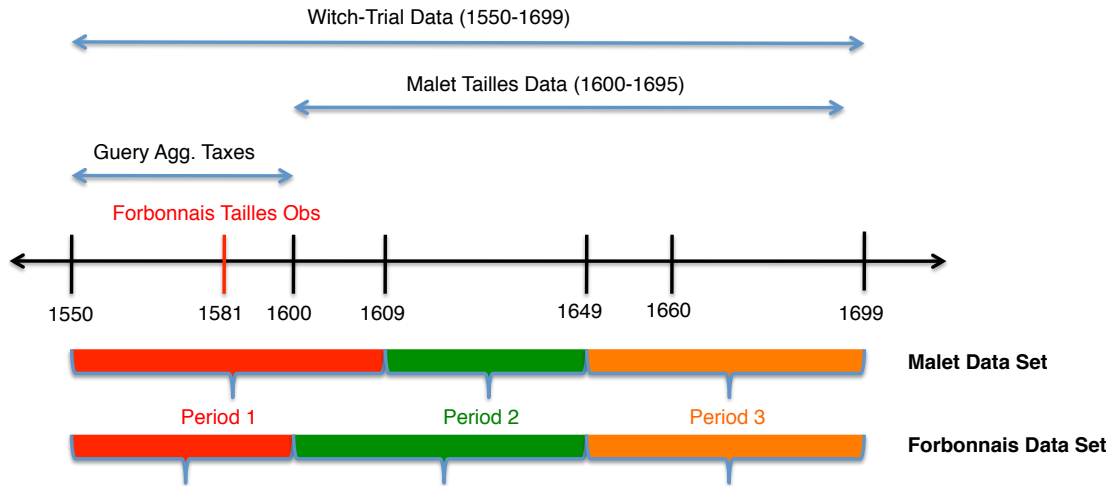


**Figure 4:** Tailles receipts across French généralités. Source: see text.

An alternative method we use to fill in the tax revenue data for the sixteenth century is to make use of two additional historical sources of data. In his eighteenth century history of the monarchy’s finances, François Véron de Forbonnais recorded taille receipts from all the généralités for a single year in the sixteenth century, 1581 (de Forbonnais, 1758). In addition, we have the aggregate amount of ordinary revenue going to the absolute monarchy for eleven of the years between 1550 and 1599.<sup>25</sup> By assuming that tailles receipts were about two-thirds of ordinary revenue in the average year (which is consistent with seventeenth century data), and using the disaggregated Forbonnais data as weights, we can impute regional taille receipts for the eleven years that we have aggregate data. Then, as illustrated in Figure 5, we average the data into three fifty year periods (1550-1599, 1600-1649, 1650-1699) in order to create an alternate data set we refer to as the ‘Forbonnais Data’.

Table 1 gives descriptive statistics for the Malet and Forbonnais data sets. There are data

<sup>25</sup>The aggregate revenues were compiled by Guéry (1978). The years are: 1557, 1567, 1574, 1576, 1577, 1581, 1582, 1586, 1588, 1596, and 1597.



**Figure 5:** Witchcraft and tax data sets. The Malet data set runs from 1600 to 1695. To make it compatible with our witch data set we use the taille receipts from 1600–1609 as proxies for the receipts between 1550 and 1559. The Forbannais data set uses the geographical distribution of tax receipts from 1581 in order to allocate the aggregate tax revenues compiled by Guéry (1978) for the period between 1550–1599.

covering twenty-one regions over three time periods which gives us a sample size of sixty-three. The fragmented nature of the tax system in early-modern France means that variation in fiscal capacity between regions at any given time is significantly higher than the variation within a given region over time.

The means and standard deviations reported in Table 1 also indicate that there is significant over dispersion in the count of witch-trials. In the Malet Sample, the standard deviation of Sum Trials is four times greater than it’s mean. Five or six regions account for most of the raw numbers of trials, even though over half of the regions in France experienced at least one trial between 1550 and 1700. This is a short-coming of the witch trial data and it prevents us from presenting a more nuanced picture of legal capacity across regions. We defend its use on three grounds. First, assuming the use of appropriate econometric techniques, there are no technical reasons to reject the data simply for being over-dispersed.<sup>26</sup> Second, there are simply no other measures of legal outcomes across French regions for this period. Finally, even relatively small numbers of trials in a region are consistent with lax legal standards of the type described in our theory. As Michel de Montaigne wrote in his *Essais* ‘it is putting a very high price on one’s conjecture to roast a man alive for them’ (Montaigne, 1580, 1910).

<sup>26</sup>For example, Krueger and Malecková. (2003) investigate the relationship between education and income on terrorist activity across countries using similarly over-dispersed data.

Even one witch prosecution says quite a bit about a region’s dedication to the law. For this reason, as a first cut for looking at the effect of fiscal capacity on witch-trials we create a dichotomous variable called ‘Witch Trials’ equal to 0 if a region experienced no witchcraft prosecutions during the period and is equal to 1 if at least one witch was prosecuted. This variable should also be more robust to outliers, thereby providing a check on our results.

Figure 6 depicts the relationship between real taxes per capita across French regions and the likelihood that the region had at least one witch trial during the period. Dark bars represent fiscal capacity in regions with no witch-trials. Light bars represent regions with at least one trial. The numbers in the bars (n) represent the number of regions with and without witch-trials. Numbers in parentheses indicate the total number of trials recorded. Figure 3 provides strong support for our hypothesis that as the fiscal capacity of the central state increased, rule of law also improved. Regions with high amounts of fiscal capacity were also unlikely to prosecute individuals for witchcraft. Furthermore, while fiscal capacity in witchcraft regions failed to increase throughout the 150 year period, the number of regions engaging in witchcraft prosecutions declined. Between 1550 and 1609, twelve out of twenty-one regions had trials. Between 1610 and 1649, this declined to seven out of twenty-one and after the dramatic increase in fiscal capacity illustrated in Figure 2, only three out of twenty-one regions had trials. Importantly, Figure 3 also shows that, on average, tax collections across witchcraft regions were constant. By contrast, fiscal capacity in regions without trials either increased or stayed the same over all periods. This implies that regions which abandoned trials were doing so at the same time as their tax capacity was increasing. Were this not the case, then the average fiscal capacities of the no trials regions would be pulled down by the former witchcraft regions.

#### 4.2 *Econometric Analysis*

In order to investigate the relationship between fiscal capacity and witch trial prosecutions further we exploit the panel structure of the data so as to control for factors other than fiscal capacity which may have led to a decrease in trials but that are difficult to observe. For example, a time variant factor which may have been common to all regions would be changes in preferences (mentalités) regarding witchcraft. Perhaps people (or even just judges) stopped believing in the existence of witches (e.g. Monter 1968). We can control for this using period dummies in a formal regression framework. Another possible source of bias stems from unobserved time-invariant factors which are unique to the individual regions but

Panel A: Malet Sample						
		Mean	Std. Dev.	Min	Max	Observations
Log Taxes Per Capita	overall	2.15	0.96	0.00	3.57	N = 63
	between		0.81	0.83	3.17	n = 21
	within		0.54	0.73	3.94	T = 3
Witch Trials (dummy)	overall	0.35	0.48	0.00	1.00	N = 63
	between		0.31	0.00	1.00	n = 21
	within		0.37	-0.32	1.02	T = 3
Sum Trials (count)	overall	35.89	151.00	0.00	1032.00	N = 63
	between		88.26	0.00	347.67	n = 21
	within		123.55	-311.78	720.22	T = 3

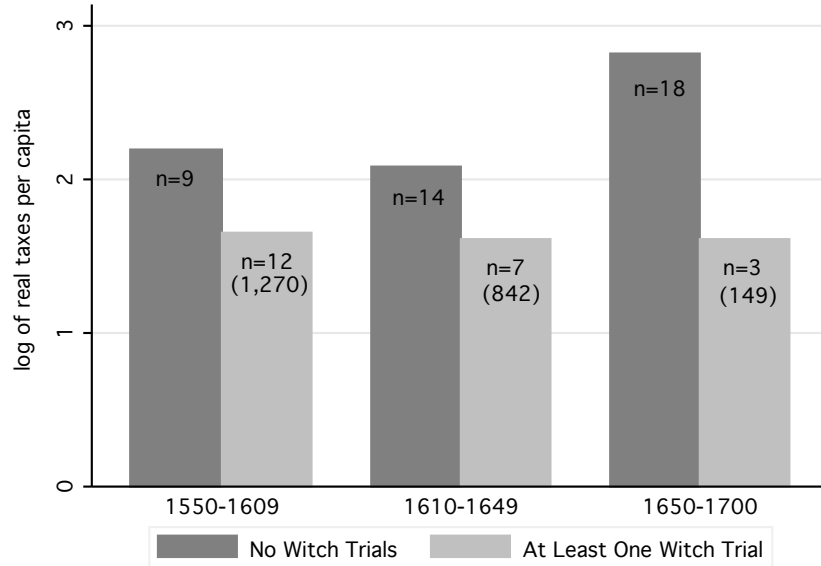
  

Panel B: Forbonnais Sample						
		Mean	Std. Dev.	Min	Max	Observations
Log Taxes Per Capita	overall	2.29	1.00	0.00	3.65	N = 63
	between		0.85	0.83	3.36	n = 21
	within		0.54	1.03	4.09	T = 3
Sum Trials (count)	overall	35.89	149.23	0.00	1001.00	N = 63
	between		88.26	0.00	347.67	n = 21
	within		121.37	-311.78	689.22	T = 3

**Table 1:** Descriptive Statistics

may be correlated with both witch-trials and fiscal capacity. For example, a region with a great deal of political instability (e.g. border regions such as Alsace or Franche-Comté) might have relatively low tax receipts and a high likelihood of having witchcraft trials. Failure to take account of these unobservable factors might cause us to falsely assign a causal role to fiscal capacity for the decrease in witch-trials. We control for these potential sources of bias using region dummies (fixed effects).

We begin by estimating the effect of our fiscal capacity measure on the probability of at least one trial occurring in a given region. If we define our dummy variable indicating a witch trial in region  $i$  in period  $t$  as  $w_{it}$ , then the probability that a trial occurs conditional on fiscal capacity is equal to  $P(w_{it} = 1 | c_{it})$ , where  $c_{it}$  is real tax receipts per capita from the Malet sample. The response probability for a trial is then  $\phi(\pi_0 + \pi_1 c_{it})$ , where  $\phi$  is the standard normal cumulative distribution function and the standard errors of the estimates of the  $\pi$  coefficients are asymptotically standard normal. The coefficient on  $\pi_1$  should be negative if



**Figure 6:** Fiscal capacity and witch-trials across French Regions, 1550–1700

**Malet Sample:** Dep. Var: Witchcraft Trials = 1, No Witchcraft Trials = 0

	Logit		Logit FE	
	(1)	(2)	(3)	(4)
Log Taxes Per Capita	-0.93*** (0.32) <b>[0.39]</b>	-0.84** (0.35) <b>[0.43]</b>	-3.67** (1.75) <b>[0.03]</b>	-5.73* (3.20) <b>[0.003]</b>
1609-1649 (dummy)		-1.07 (0.69) <b>[0.34]</b>		-2.53* (1.38) <b>[0.08]</b>
1650-1699 (dummy)		-1.69** (0.80) <b>[0.19]</b>		-1.76 (1.35) <b>[0.17]</b>
Obs	63	63	39	39
Groups	21	21	13	13
LR X <sup>2</sup>	10.06	15.42	10.44	17.22

**Table 2:** The Effect of Fiscal Capacity on Witchcraft Trials, 1550-1700

fiscal capacity decreases the probability of witch-trials. We estimate this specification using a logit estimator. The results of these regressions are reported in Table 2.

Column (1) of Table 2 reports the coefficient on fiscal capacity estimates for the base specification described above. Standard errors are reported in parentheses and odds-ratios are

given in brackets. The correlation between fiscal capacity and witch-trials is strongly negative and significant at the 1percent level. The odds ratio indicates that a one unit increase in the log of taxes in a region (about a standard deviation according to Table 1) is associated with a region being about two to three times less likely to have at least one witch trial. We add period dummies to the specification in column (2) in order to control for time variant factors common to all regions (e.g. changing beliefs about witchcraft). Relative to the first period (1550-1609), the coefficients on the time dummies indicate that all regions were about three times less likely to experience a witch trial between 1610-1649 and five times less likely to have a trial between 1650-1699, holding taxes constant. The significance and size of the coefficient on taxes remains relatively unchanged. This is strong support for the claim that differences in fiscal capacity across regions and over time explain much of the variation in witchcraft trials.

In columns (3) and (4) we restrict our attention to explaining witchcraft trials using only the variation in fiscal capacity within a region over time by allowing for region specific fixed effects using the conditional logit estimator. This results in eight regions being dropped from the analysis which have no variance in outcomes (so that the fixed effect perfectly predicts the likelihood of a witch trial). The coefficient in column (3) suggests that when a region's fiscal capacity increases by one unit, the odds that they have a witch trial decrease by a factor of thirty. When we add period dummies in column (4), thereby giving the coefficient on taxes a differences-in-differences interpretation, these odds blow up to a factor of 300.

In Table 3 we estimate a series of specifications using the raw count data on trials. An obvious empirical strategy would be to model the witchcraft count data as a poisson process. However, the mean and standard deviation reported for the Sum Trials variable in Table 1 indicates significant over-dispersion. Thus, a more appropriate approach is to assume a witch trial is a realization from a negative binomial distribution such that,

$$P(N_{it} = n_{it} | \lambda_{it}) = \left( \frac{r}{r + \lambda_{it}} \right)^r \frac{\Gamma(r + n_{it})}{\Gamma(n_{it} + 1)\Gamma(r)} \left( \frac{\lambda_{it}}{r + \lambda_{it}} \right)^{n_{it}}, \quad (5)$$

where the number of trials for region  $i$  at time  $t$  is a random variable  $N_{it} \in [0, 1, 2, \dots, n]$  with conditional mean value of  $\lambda_{it}$ .  $\Gamma$  is the gamma function and  $r$  is a dispersion parameter measuring the extent to which the variance of  $N_{it}$  exceeds its mean.<sup>27</sup> We then estimate the parameters of (5) using maximum likelihood assuming that the expected number of

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<sup>27</sup>For another recent application of the negative binomial distribution, see Krueger and Malecková. (2003)

Panel A: <b>Malet Sample</b> : Dep. Var.: Sum Trials = Count of Witchcraft Trials				
	Negative Binomial		Neg. Binomial FE	
	(1)	(2)	(3)	(4)
Log Taxes Per Capita	-1.33*** (0.46) <b>[0.26]</b>	-1.80*** (0.67) <b>[0.17]</b>	-0.76** (0.33) <b>[0.47]</b>	-0.73* (0.43) <b>[0.48]</b>
1609-1649 (dummy)		0.70 (1.07) <b>[2.02]</b>		-0.95** (0.50) <b>[0.39]</b>
1650-1699 (dummy)		1.54 (1.41) <b>[4.67]</b>		-1.53** (0.66) <b>[0.22]</b>
Obs	63	63	42	42
Groups	21	21	14	14
LR X <sup>2</sup>	8.03	9.10	5.20	10.37
X <sup>2</sup> of H <sub>0</sub> : α=0 (p-value)	0.00	0.00		

Panel B: <b>Forbonnais Sample</b> : Dep. Var.: Sum Trials = Count of Witchcraft Trials				
	Negative Binomial		Neg. Binomial FE	
	(1)	(2)	(3)	(4)
Log Taxes Per Capita	-1.39*** (0.45) <b>[0.25]</b>	-1.53*** (0.60) <b>[0.22]</b>	-0.73** (0.33) <b>[0.48]</b>	-0.91** (0.43) <b>[0.40]</b>
1609-1649 (dummy)		0.22 (1.12) <b>[1.25]</b>		-0.92* (0.51) <b>[0.40]</b>
1650-1699 (dummy)		0.66 (1.14) <b>[1.93]</b>		-1.68** (0.65) <b>[0.19]</b>
Obs	63	63	42	42
Groups	21	21	14	14
LR Test (p-value)	9.59	9.90	5.03	10.21
X <sup>2</sup> of H <sub>0</sub> : α=0 (p-value)	0.00	0.00		

**Table 3:** The Effect of Fiscal Capacity on Witchcraft Trials, 1550-1700



witch-trials is of the form,

$$\ln(\lambda_{it}) = \beta c_{it} + \epsilon_{it}, \quad (6)$$

where  $\lambda_{it}$  is simply the expected number of trials in region  $i$  at time  $t$ ,  $c_{it}$  is our measure of fiscal capacity, and  $\epsilon_{it}$  reflects unobserved heterogeneity.

Panel A of Table 3 reports the estimates of  $\beta$  in column (1). Standard errors are in parentheses. The number in brackets is the incident rate ratio (irr). In the first specification, the irr indicates that a one unit increase in fiscal capacity (which again, is about one standard deviation) leads to a change in the number of trials by a factor of 0.26. For example, the mean number of trials across all regions and periods is 44. Thus, the estimate in specification (1) implies a one standard deviation increase in fiscal capacity in a given region leads to about 33 fewer trials. Specification (2) includes dummies for period effects. The estimated impact of fiscal capacity retains its significance at the 1percent level and increases in economic significance. The period effects are not significantly different from zero.

In columns (3) and (4) we estimate versions of the negative binomial specification that allow for the inclusion of region specific fixed effects.<sup>28</sup> In both the simple fixed effects specification and the specification which includes period dummies, the incident rate ratios imply a one standard deviation increase in tax revenues collected from a region leads to a halving in the number of trials. The period dummies are now significant and imply consecutive decreases in the number of trials during the seventeenth century.

In Panel B of Table 3 we report negative binomial regressions using our fiscal capacity created using the Forbonnais Sample. As the descriptive statistics in Table 1 suggest, the measures of taille collections in the Malet Data and the Forbonnais Data are highly correlated. This is reflected in the regressions in Panel B. In Columns (1) and (2) Log Taxes per capita is negative and highly significant. The incident rate ratios, again, suggest a one standard deviation increase in fiscal capacity leads to about one-quarter as many trials in a region. In the fixed effects specifications reported in Columns (3) and (4) the coefficients on fiscal capacity retain their significance at the 5percent level and the irr's imply a one standard deviation in tax collections in a region is associated with half the number of trials. The period dummies imply a consistent decrease in trials across all regions of France throughout

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<sup>28</sup>To be precise, we implement the Hausman et al. (1984) estimator. This is only a true fixed effects model under the assumption that the model is linear, in which case all constant, within-group, variation is controlled for. However, under negative binomial estimation, the linearity assumption does not generally apply. See Allison and Waterman (2002) for a critique.

the seventeenth century.

### 4.3 Robustness

The witch trial data are uniquely suited towards our desire to identify the effect of increases in state capacity on legal capacity since there are relatively large numbers of observations on trials spread throughout France. That said, our base data set relies on multiple sources and in creating it hard decisions concerning whether or a trial should be included occasionally had to be made. For the base data we erred on the side of caution by only including trials we were relatively confident occurred at the time and place where they were reported. In order to check the robustness of our results, we create a ‘Maximal’ data set which augments the base data with trials from other sources which we were not as certain about. This resulted in an additional five hundred fifty-five trials to give us a total of 2,816 trials.<sup>29</sup> Column (1) of Table 4 shows the regression using the maximal data which includes both period and region dummies (so is comparable to the differences-in-differences regressions contained in Table 3). The coefficient on fiscal capacity is negative and significant at the 10percent level. The incident rate ratio in brackets indicates a one unit increase in fiscal capacity reduces witch trials in a region by a factor of .60.

In Column (2) of Table 4 we drop the Metz-Alsace region from the data set. In Figure 2 the spike in witch trials at the end of the sixteenth century is largely accounted for by the Alsace. Furthermore, tax receipts in the Alsace were about half those of the average region. Thus, we check whether our results are being driven by this potential outlier. The results in column (2) indicate this is not the case. The coefficient on fiscal capacity retains its significance at the 10percent level and the incident rate ratio is comparable to those in Table 3.

Finally, we use witch trials per capita as the dependent variable in the specification reported in Column (3). The results are largely comparable to those reported in Tables 2 and 3. The coefficient on fiscal capacity is negative and significant at the 5percent level. The number in parentheses indicates that a standard deviation increase in fiscal capacity leads to a decrease in the log of witch trials per capita equal to a third of a standard deviation of that variable.

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<sup>29</sup>See Appendix A for details on the sources of the augmented trials data.

	<u>Maximal Count</u>	<u>No Alsace</u>	<u>Per Capita Trials</u>
	(1)	(2)	(3)
Log Taxes Per Capita	-0.51* (0.31) <b>[0.60]</b>	-0.61* (0.36) <b>[0.54]</b>	-0.013** (0.006) <b>[0.37]</b>
1609-1649 (dummy)	-0.66 (0.42)	-0.44 (0.44)	-2.53* (1.38)
1650-1699 (dummy)	-1.23** (0.56)	-1.04* (0.56)	-1.76 (1.35)
Obs	45	42	63
Groups	15	14	21
Region Dummies	x	x	x

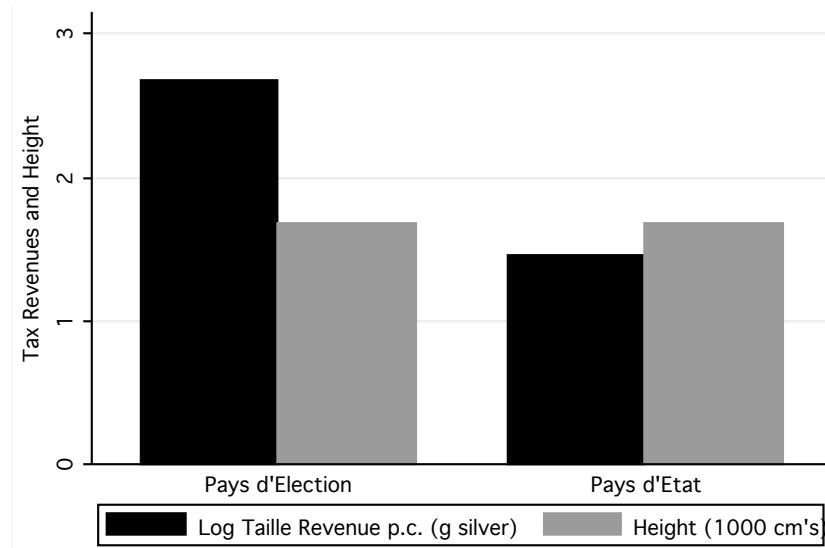
**Table 4:** The Effect of Fiscal Capacity on Witchcraft Trials, 1550-1700. Appendix A describes how the ‘Maximal’ data set was constructed. The ‘No Alsace’ regression drops the Metz-Alsace region from the data set. The ‘Per Capita’ regression uses log trials adjusted for population (per 1,000 inhabitants) around 1700 (from Dupâquier) as the dependent variable. All regressions include time and region dummies. Specifications (1) and (2) estimated using negative binomial regression. Specification (3) estimated using OLS. The numbers in brackets for (1) and (2) are incident rate ratios. The number in brackets for (3) is the percentage of a standard deviation of the dependent variable a one standard deviation change in fiscal capacity induces.

#### 4.4 Instrumental Variables

The data on witchcraft trials and tax collection described above suggest a strong positive correlation between fiscal and legal capacity. However, the direction of causality is far from settled. For example, economic growth may have been higher in regions which had fewer witch-trials and this high growth could also have caused tax collections to be greater.

We instrument fiscal capacity in order to further control for unobserved factors that could be driving the negative correlation we find between fiscal capacity and witch-trials. A good instrument should be highly correlated with taille collections in a region, but uncorrelated with other factors that may influence witch-trials. An obvious candidate is found in the administrative distinction the crown made between généralités that were pays d’états and those that were pays d’élections. The pays d’élections constituted the original territories of what we now consider France and were, more or less, centered around Paris. The pays d’états, by contrast, tended to be later additions to the monarchy’s territories.<sup>30</sup> The most

<sup>30</sup>There was a third regional administrative category known as pays d’imposition which we treat as being in the same category as the pays d’états. For while they had a different name than the pays d’états, for



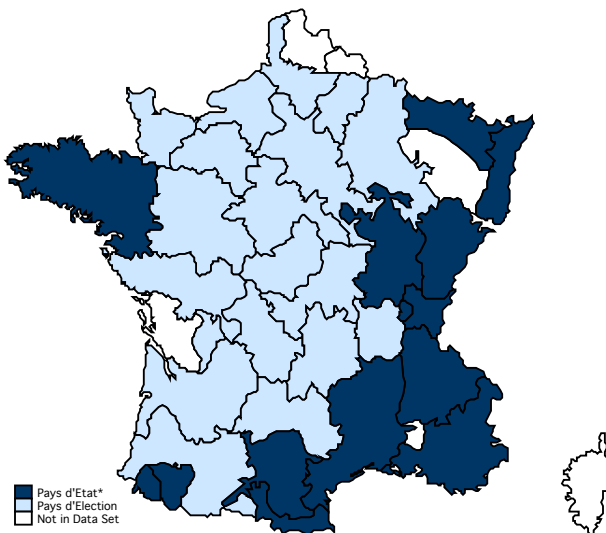
**Figure 7:** Fiscal capacity in the pays d'état and the pays d'élection, 1550–1699. Sources: see Appendix A.

important practical difference between the pays d'états and the pays d'élections is that the pays d'état had more autonomy in setting the amount of the taille that would be collected in their lands each year.

The burden of the taille was set each year in the pays d'élections by the local élus who, as the name implied, was elected during the national representative assembly known as the Estates General. After 1614, the Estates General did not meet again until the Revolution and during this hiatus the King's agents, the Intendants, held sole authority in setting the amount of the taille to be collected in each of their domaines. Thus, in the pays d'élections, it was always a national agent, either elected or appointed, who set the burden of the taille. The pays d'états, by contrast, retained control of their regional representative bodies (the provincial estates). And it was through these local institutions that negotiations with the crown's agent (usually an intendant) over the burden of the taille took place. In pays d'état, like Brittany or Burgundy, the provincial nobility retained discretion over the allocation of the tax burden and they resisted increases in direct taxation because they sought to extract taxes from the peasantry themselves.<sup>31</sup> The revenues that went to the state were consequently lower in the

practical purposes they were treated the same fiscally. They just happened to be even more recent additions (Mousnier, 1984).

<sup>31</sup>As Collins writes: '[e]veryone wanted access to peasant stocks of cash: the king obtained the cash through the direct taxes, the landlords through higher entry fees for leases or in higher rents. Higher direct taxes meant less liquid capital for paying entry fees, rents, and perhaps most critically of all, for investment. The military nobles and the civil administration (legal men), although paid by expanded royal revenue, stood



**Figure 8:** Distribution of the pays d'état and the pays d'élection in our sample.

pays d'états because less was collected and more funds were retained at the local level.

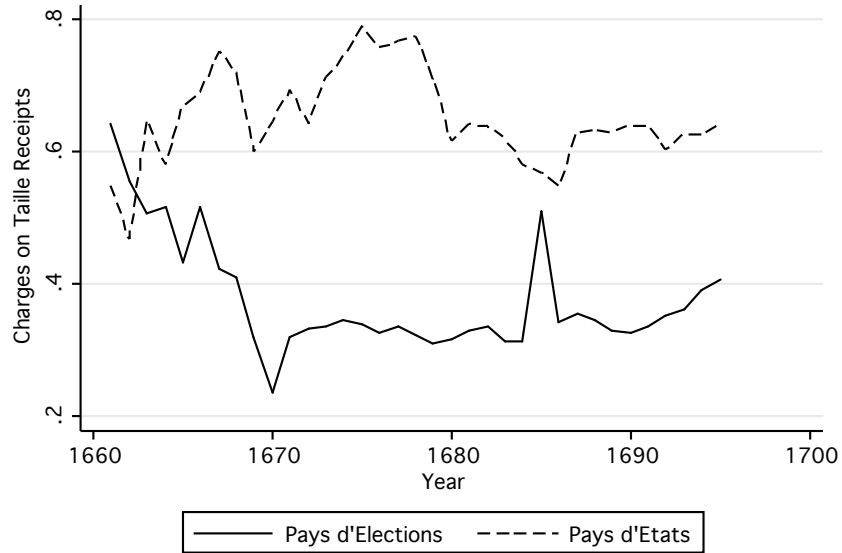
Figure 7 highlights the difference in tailles receipts collected in the pay d'états and the pays d'élection. The height of the dark shaded bars show log per capita taille revenues in grams of silver. The pays d'élection contributed an average of 15 grams of silver in taxes per year between 1550 and 1700. The pays d'états gave only 4.5 grams of silver over the same period.

One obvious possible source for this difference is that economic conditions could have varied between the two types of regions. Perhaps economic development was higher in the pays d'élections? Measuring regional economic welfare is very difficult for seventeenth century France. Nonetheless, one rough measure comes from the heights of soldiers from the various regions. These data exist for the eighteenth century (Komlos, 2003). We also know these soldier's ages when their heights were recorded. Thus, we can restrict our attention to just those recruits who reached adulthood (18 years of age) in their respective regions during the second half of the seventeenth century. This results in a sample of 1,448 individuals. 1,030 of these are from the pays d'élection and 418 are from the pays d'état. In Figure 7 we show the average heights of these two groups of soldiers in thousands of centimeters as the light shaded bars. The two groups are almost of exactly the same stature.<sup>32</sup> This is strong

to lose financially if their tenants could not pay their rents due to overtaxation (Collins, 1994, 13)'.  


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<sup>32</sup>The average height for the pays d'élection is 1,686 with a standard deviation of 46. The average height for the pays d'état is 1,686 with a standard deviation of 47. The shortest and tallest regions in the pays d'élection were Béarn (1,648 cm) and Nivernais (1,726 cm) respectively. The shortest and tallest pays d'états were Hainault (1,679 cm) and Alsace (1,701 cm).



**Figure 9:** Charges on taille receipts in the pays d'état and the pays d'élections.

support for our assertion that, while fiscal capacity varied between the pays d'élection and the pays d'état for random historical reasons, there is no evidence that this was driven by economic development.

As further evidence for the validity of our instrument, we calculate the proportion of taille revenues that were retained by local authorities as *charges* relative to receipts going to the Crown in the pay d'états and the pays d'élection . When the burden of the taille was negotiated, there was always a certain amount subtracted from the revenues agreed to go to the central state known as *charges*. These *charges* included costs of collection, payments on loans, and taxes retained by the region for local public goods. Beginning in 1661, the Crown started recording the amount of *charges* along with net taille receipts in its accounts. Figure 9 shows the size of *charges* relative to net receipts for both the pay d'états and the pays d'élection. The point is that the pay d'états retained much more of the taxes they collected than the pays d'élection for most of the period from 1661-1696.<sup>33</sup> To the extent that these retained tax revenues were for public goods, then this is also evidence for the stronger bargaining position of the pay d'états vis à vis the government's tax agents.

In Table 3 we report the results of our instrumental variables regressions using the administrative status of the généralité as either a pay d'états or pays d'élection as the instrument.

<sup>33</sup>During the early years of the period the pays d'élections had relatively high charges because they had made significant loans to the Crown hypothecated on future tax revenues during the period of political instability known as the Fronde when the traditional tax system was dysfunctional.

Since the administrative status of the region was time invariant, we are forced to focus on only the between variation in fiscal capacity and witch-trials by collapsing the data into a single cross-section. In Panel A we use our fiscal capacity variable created using the Malet Sample. Column (1) shows the first stage coefficient on administrative status. The number in brackets is the percentage change in a standard deviation of log taxes per capita induced by being a pays d'état rather than a pays d'élection. The coefficient is both highly statistically and economically significant. The F-statistic of 25.40 and R-squared of 0.57 also attest to the strength of the instrument. We report the second stage coefficient on log taxes per capita in Column (2). It is significant at the 5percent level. According to the economic significance reported in brackets, a one standard deviation increase in log taxes per capita is associated with a 53percent decrease in witch-trials in a region.<sup>34</sup>

The two stage least squares results reported in Columns (1) and (2) of Panel A do not control for the count nature of the data. There is no readily available procedure for negative binomial IV regression, so we settle instead on assuming the distribution of the data are poisson and implement a generalized methods of moments IV estimator in Column (3). The coefficient estimate on log taxes per capita is negative and significant at the 1percent level. The incident rate ratio reported in brackets suggests a one unit increase in fiscal capacity (about one standard deviation) is associated with a factor of 0.18 witch-trials relative to the average region. In Panel B we replicate the analysis using the Forbonnais sample to create our fiscal capacity variable. The results are almost identical to those in Panel A. Administrative status is a strong instrument and the effect of fiscal capacity on witch-trials is supported.

## 5 FURTHER HISTORICAL EVIDENCE

We have found strong empirical evidence that increases in fiscal capacity in seventeenth century France was correlated with a decline in the number of witch trials. In this section we present further historical evidence that supports our hypothesis that this decline in the number of trials was driven by legal centralization.

The example of Pierre de Lancre, a magistrate from Bordeaux, sent to investigate witchcraft in the Basque region of south-west France illustrates our argument. It was the local autonomy given to Lancre that led to a mass witchhunt in 1609 in which 70 were executed in less than a

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<sup>34</sup>As a further test of the instrument's validity, we included it in an OLS regression of fiscal capacity on witch trials. This resulted in the instrument being insignificant whereas fiscal capacity was highly significant.

<b>Panel A: Malet Sample</b>			
<u>Regression Model</u>	<u>1st Stage Log Taxes p.c.</u>	<u>2nd Stage Count of Witch Trials</u>	<u>Count of Witch Trials</u>
	(1)	(2)	(3)
Pays d'Election = 0 Pays d'Etat = 1	-1.25*** (0.25) [-1.56]		
Log Taxes per capita		-171.75** (81.05) [-0.53]	-1.71*** (0.49) [0.18]
Years	1550-1699	1550-1699	1550-1699
Estimation Method	2SLS	2SLS	GMM Poisson (IV)
Observations	21	21	21
R Square	0.57	0.26	-
F Statistic	25.40	4.06	-
<b>Panel B: Forbonnais Sample</b>			
<u>Regression Model</u>	<u>1st Stage Log Taxes p.c.</u>	<u>2nd Stage Count of Witch Trials</u>	<u>Count of Witch Trials</u>
	(1)	(2)	(3)
Pays d'Election = 0 Pays d'Etat = 1	-1.32*** (0.26) [-1.57]		
Log Taxes per capita		-162.22** (76.01) [-0.52]	-1.63*** (0.46) [0.20]
Years	1550-1699	1550-1699	1550-1699
Estimator	2SLS	2SLS	GMM Poisson (IV)
Observations	21	21	21
R Square	0.58	0.27	-
F Statistic	26.02	4.12	-

Figure 10: IV Analysis of Fiscal Capacity on Witchcraft Trials, 1550-1699



year. His book, *Tableau de l'Inconstance des Mauvais Anges et Demons*, was 'an explanation of, and an apologia for, his relentless—and, judging by the many appeals to the French crown made against him—questionable legal practices exercised in governing the prosecutions of the Labourt witches and their priestly coconspirators' (Williams, 1995, 94). Lancre relied on child witnesses and subverted proper legal procedure because he feared that if he stopped 'the witch menace might engulf the whole of France' (Williams, 1995, 107).

Legal centralization, on the other hand, led to fewer witch-trials. Lancre was recalled when the archbishop of Bayonne, Bernard d'Eschaux, 'realized that the consequence of Lancre's crusade was a mounting witch panic among the people' and appealed to the parlement of Bordeaux and to the king (Williams, 1995, 93). The highest court in France known as the Parlement of Paris, only approved 74 out of 249 death sentences that were sent to them before 1600. Between 1611 and 1640, they only approved 4.7percent of the death sentences brought before them (Soman, 1992, 34). By contrast, in the north of France approximately 50percent of those accused were executed and in Jura region about 46percent were executed. One can readily follow the different standards of proof adopted by the Parlement during the late sixteenth and early seventeenth century. A decree of January 1588 banned all further trials by water. In March 1588 the magistrates proposed to make all witchcraft cases subject to appeal. The Catholic League intervened however and Paris was under siege for five years. By 1594 the issue was again being considered. In 1596-1602, 1600-1604, and in 1624, the Parlement succeeded in preventing several marchause from declaring witchcraft to be a *crimen exemptum* and thus not subject to the jurisdiction of the Parlement (Soman, 1992, 5).

As a final example of the differences in the behavior of local and central authorities when it came to prosecuting witches, consider the case of the apprentice weaver Bacqué. In 1670 this young man visited up to thirty villages in south west France along with two of the counsellors from the regional Parlement of Pau. In each village, Bacqué would stand in the town square while the members of the village would file before him, one by one, so that he could declare whether or not they were witches. In this way he 'identified' 6,210 witches (Mandrou, 1979, 236). The local counsellors who accompanied him had started judicial proceedings against these accused when Henri Pussort, uncle of the Finance Minister Jean-Baptiste Colbert, intervened. Pussort's efforts to stop these trials, however, met with resistance from the very seat of intellectual and political power at the time, Versailles. Several nobles based in Versailles had an inquiry initiated against Pussort for his efforts to intervene against the

local judges. It was at this time that Colbert had Bacqué transferred out of Gascony and to the Bastille in Paris. Colbert halted the proceedings in the regional court and annulled all prosecutions that had already been passed through an edict of the Crown which, ‘... prevents the courts and averts the disorders that would be caused by a procedure so irregular that it would envelop the majority of the inhabitants of the aforementioned province, trouble the repose of families and violate the *rules of justice*... (Mandrou, 1979, 241).

This incident illustrates, again, the willingness of local magistrates to listen to charges inspired by popular fears, and how these prosecutions could spread well beyond a single person or village. Finally, the emphasis of the central government, as enunciated through the words and actions of Colbert, shows that it was ‘rules of justice’ that had to be recognized and ‘disorder’ that was to be avoided, especially disorder of the type that could spread throughout an entire region.

### 5.1 *Alternative hypotheses?*

One alternative hypothesis is that central courts were more skeptical and less likely to believe in the existence of witches. However, there is little evidence to support this view. The view that the decline in the European witch trials was caused by changing mentalities has been largely rejected (see Levack, 1999; Bostridge, 1996; Bever, 2008).<sup>35</sup> Educated elites continued to *believe* in witchcraft. As one historian observes, ‘[f]rom the viewpoint of 1700, the possibility of another bout of witchcraft prosecution was not safely dead and buried as those with hindsight may assume’ (Bostridge, 1996, 310). As late as 1769, the celebrated jurist William Blackstone could, while deploring the legal abuses that took place when witches were prosecuted, still assert that “to deny the possibility, nay the actual existence of witchcraft and soecry is at once to contradict the revealed word of God” (quoted in Bever, 2009, 279).

Louis XIV pursued and burned over a hundred members of the aristocracy as witches between 1677 and 1682 for political reasons, but then issued an edict the following year banning the prosecution of anyone as a witch throughout his realm. Similarly, the actions of the ‘enlightened’ nobles in Versailles who attempted to prosecute Pussort for attempting to stop the prosecutions is further evidence that belief in witchcraft itself, was alive and well during

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<sup>35</sup>Historians of witchcraft now reverse the traditional assumption and see the decline of witch beliefs as—at least in Western and Central Europe—an important cause, not an effect, of the change in elite mentalities’ (Bever, 2009, 264).

the second half of the seventeenth century. As the examples, of D'Argenson, Pussort and Colbert given above suggest, this was driven by a concern with social order rather than skepticism of the supernatural. Among the less educated, belief in witchcraft persisted well into the nineteenth century. In the countryside of Cambrésis, for example, an observer noted, 'The doctor is rarely called to Fressies to treat burns, sprains, or fractures. People prefer to call on a woman who blows on the injury, recites some fragments of the Gospel, makes the cross and asks for ten francs for her services (Muchembled, 1979, 99)'.<sup>36</sup> Similarly, 'In Viller-en-Cauchies, every year... the young people go out... in the night to burn trusses of straw in the countryside in order to chase away bad spirits and call on the influence of witches (Muchembled, 1979, 99)'.<sup>37</sup>

## 5.2 Additional evidence of legal centralization

The attitude of the Parlement of Paris to regional witch trials mirrors the attitude of the French Crown to many common legal abuses that were common in other parts of the country. The signing of the Code Michau in 1529 announced the Crown's intention to centralize and standardize many aspects of administrative law. After the civil disturbance known as the Fronde (1648-1653) had been put down, Colbert embarked on judicial reforms in collaboration with the Parlement of Paris that aimed at standardizing legal procedures and reducing the discretion available to local magistrates and courts. In 1665 a specially commissioned court was sent into south eastern France to investigate local judicial abuses (Hamscher, 1976, 168). Two great codifying edicts: L'Ordonnance Civile and l'Ordonnance Criminelle were passed in 1669 and 1670, unifying many aspect of civil and criminal law (Colyar, 1912).<sup>38</sup>

The number of government officials increased from 4,041 in 1515 to at least 46,047 in 1665. A change that was, in the words of one historian, 'staggering' (Kwass, 2000, 29). The *intendants*, first sent out into the countryside on an ad hoc basis in the 1630s, and then systematically from the 1660s onwards were empowered to supervise and overrule local notables. They were drawn from a new elite known as the 'nobility of the robe' which was

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<sup>36</sup>Le médecin est rarement appelé à Fressies pour panser les brûlures, les entorses, ou les fractures. On préfère s'adresser à une femme qui souffle sur le mal, récite plusieurs fragments d'Evangile, fait force croix et demande dix francs pour ses honoraires. . . .

<sup>37</sup>'A Viller-en-Cauchies, tous les ans... les jeunes gens vont... dans le soirée brûler des bottes de paille dans les champs afin de chasser les mauvais esprits et conjurer l'influence des sorciers.'

<sup>38</sup>Heckscher observed that here 'Louis XIV's monarchy attained an important goal in codifying the law. Colbert's programme on this matter had been largely put into practice, although there remained a good deal more to be done even here' (Heckscher, 1955, 126). In particular, Colbert's plan to centralize all of the ordinances of France into a signal legal code did not come to fruition (Colyar, 1912, 67).

quite separate from the provincial ‘nobility of the sword’ and, as commissioned employees of the king, they lowered the costs to the state of enforcing its laws at the expense of existing local rules (Moote, 1971; Hurt, 2002). Unlike other venal officials, the intendants did not buy their positions, instead, the king paid them a stipend and could dismiss them at will (Collins, 1988, 54). As a result, their interests were solidly aligned with the central government, not the provinces. Indeed, they can be seen as a ‘quasi-bureaucracy’ that was connected into a central, Paris-based system of clientelism and patronage and largely independent of the local nobility (Kettering, 1986)

This program of centralization was, of course, only partially successful. As one historian has observed, the ‘modern characteristics of Louis XIV’s government should not be exaggerated—it was an early modern state that was only quasi-bureaucratic and, although formally centralized and hierarchical, it was also cumbersome, incoherent, and fragmented by special interest groups. But it provided stronger, more stable government than its predecessors had, and clientism contributed to its development’ (Kettering, 1986, 224). The decline in witch trials are a reflection of this improvement in legal capacity.<sup>39</sup>

## 6 CONCLUSIONS

This paper provides novel evidence that fiscal and legal capacity are strategic complements as theorized by Besley and Persson (2009, 2011). Fiscal fragmentation in early modern France precluded the establishment of a strictly enforced common legal code and this, in turn, set the stage for thousands of witch trials between 1550 and 1650. The increased demands placed on the state during a period of intensified military competition required fiscal and legal centralization and led the centralized state to play an increasingly prominent role in coordinating the behavior of local jurisdictions so that they internalized the externalities stemming from the tolerance of local custom and superstition to influence legal procedure. One, particularly visible, measure of this shift was the decline in the number of witchcraft trials. This story is consistent with Olson (2000) who argued that rent seeking by centralized elites may be less damaging than decentralized rent-seeking because, in the absence of democratic checks on authority, rulers with broader interests will tend to erect laws which internalize externalities.

A number of further conclusions can be drawn. First, using witch trials as a particularly

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<sup>39</sup>See Johnson et al. (2011) for a more in depth discussion of this point.

salient example, we have argued that it was all but impossible to impose a common legal standard without fiscal consolidation. In early modern France legal and fiscal fragmentation were bound together in an equilibrating relationship because fiscal weakness led to the creation of new offices and the creation of new offices led to ‘perennial jurisdictional conflicts among the courts’ (Hamscher, 1976, 160). Fiscal consolidation led to legal centralization because it broke this equilibrating relationship. These developments were of lasting significance. Colbert’s reform of the tax system in the 1660’s led ineluctably to the code of civil procedure, a legal reforms that substituted ‘standardized procedures for regional variations’ and thus ‘constituted a “first step” toward the Napoleonic procedural code for civil law’ (Trout, 1978, 119).

Second, the decline of superstition in early modern France was driven less by changing mentalitiés than by a process of fiscal and legal centralization. Fear of witchcraft continued throughout this period. However, by properly enforcing the rule of law, courts in France and elsewhere were able to control these fears, and to prevent them from resulting in large-scale witch-panics.<sup>40</sup> During the eighteenth century, witch-trials were only common in weakly governed states on the edge of Europe such as Poland and Hungary (Levack, 1999, 68–73).<sup>41</sup>

Finally, our findings suggest that the transition to the modern state began in the seventeenth century. There were important institutional improvements across western Europe before the industrial revolution (North et al., 2009; Bogart and Richardson, 2009, Forthcoming). Our argument is thus consistent with Alexis de Tocqueville’s observation that the centralizing policies of the French state before the 1789 Revolution paved the way for much that would come after it (Tocqueville, 1998). The decline in witch-trials was one instance of this improvement in institutions in the period prior to the onset of modern economic growth.

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<sup>40</sup>This finding is also consistent with accounts of the decline of witch-trials in Scotland, Spain, and the Netherlands and elsewhere (see Levack, 1999). The Netherlands was ‘first modern economy’ and had the highest per capita taxes in Europe and witch-trials ended there in the early seventeenth century, soon after they started (Ankarloo, 2002, 80–81). Scotland, by contrast, was a weakly governed state in which witch-trials and periodic witch-panics flourished. Trials only came to an end under English dominion in the late seventeenth century (Levack, 2008).

<sup>41</sup>Witchcraft trials came to an end in the Habsburg territories as a consequence of Maria Theresa’s *Article on Sorcery, Witchcraft, Divination, and Similar Activities* in 1766. This did not deny the existence of witchcraft, but it did make it all but impossible to prosecute someone for witchcraft. It forbade practices such as pricking suspects, subjecting them to cold water ordeals or searching for marks of the devil, restricted the ability of magistrates to respond to local fears, and permitted torture only when it was authorized by higher authorities or there was evidence that real harm had been caused by non-magical means (Kern, 1999).

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## Appendix A: Creation of the Data Set

The *généralité* was the core fiscal unit of the old regime monarchy since the fifteenth century and we use it as the basis for the creation of our panel variable which we refer to as a ‘region’. We create our regions as follows:

In 1542 Francis I issued an edict creating sixteen *généralités*. In 1700 there were a total of thirty-one. They were: Paris, Soissons, Orléans, Amiens, Châlons, Bourges, Rouen, Caen, Tours, Bourgogne, Moulins, Poitiers, Bretagne, Nantes, Riom, Limoges, Metz, Lyon, Grenoble, Montaubon, Bordeaux, Toulouse, Montpellier, Provence, La Rochelle, Alençon, Navarre, Franche Comté, Valenciennes, Strasbourg (Alsace), and Lille.

We drop La Rochelle from the data set because we have only one year of data (1695). In addition, in the north-east, Lille and Valenciennes were conquests of Louis XIV that were added to France in 1691 and 1678 respectively. Thus, we drop these two *généralités* as well.

We also unify several of the *généralités* either because their borders changed between 1550 and 1700, they were unified with another *généralité*, or, because it was difficult to explicitly identify whether a number of witchcraft trials occurred in it or its neighbor. We create a region called ‘Normandy’ which includes the *généralités* of Rouen, Caen, and Alençon. Similarly, ‘Gascony’ includes Montaubon, Bourdeaux, Navarre, and Toulouse. Finally, ‘Metz-Alsace’ combines the tax receipts from Metz and Alsace.

We are left with the twenty-one regions which are listed in Table A1.

The witch trial data were compiled from various primary and secondary sources by Marc Carlson.<sup>42</sup> These data and their sources may be viewed in a non-machine readable format at:

<http://www.personal.utulsa.edu/~marc-carlson/witchtrial/na.html>

We used Carlson’s list to identify in which *généralité* each witch trial occurred. In cases where a number of trials were reported over several years, we distributed them equally over the time period. If there was no location data provided, the trial was dropped. We coded what the outcome of the trial was when the information was available, but we do not incorporate this in our analysis since there were relatively few cases when this could be done. We also

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<sup>42</sup>Copyright I. Marc Carlson, 1998, 2000, 2009

dropped 530 trials Carlson incorrectly attribute to Gascony in 1609.

We also create a ‘Maximal’ data set in which we add five hundred fifty-five trials from other sources to Carlson’s data. We add 202 trials reported for Franch-Comté by Monter (1976). We add 202 trials for Normandy which are reported in Monter (1997). Finally, we include 167 trials in the ‘Champagne’ region reported by Soman (1992) that we allocate to our region Chalons.<sup>43</sup>

Table A1 lists the twenty-one regions we look at as well as the total number of witch-trials in the Base data and in the Maximal data along with tax revenues (in grams of silver) collected per person.<sup>44</sup>

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<sup>43</sup>Soman (1992) reports aggregate numbers on other witch trials within the region of the Parlement of Paris, but he does not indicate where they occurred. Soman’s hypothesis is also *highly* consistent with ours. He argues convincingly that by the beginning of the seventeenth century, within the jurisdiction of the Parlement of Paris, witch prosecutions dramatically decreased both in their frequency and in the severity of punishments due to the increasing influence of the centralized state over that of local authority. He finds that between 1611 and 1640 the Parlement of Paris only approved sentences of executions in 4.7percent of cases (Soman, 1992, 2).

<sup>44</sup>The regional population data are from 1700 and were compiled by Dupâquier (1988).

Region	Witch Trials (Base)	Witch Trials (Max)	Tailles (Malet)	Tailles (Forbonnais)	Pop. (1700)
Paris	124	124	14.5	14.2	1426
Soissons	1	1	15.7	15.7	322
Orleans	18	18	18.9	19.7	607
Amiens	0	0	7.8	7.6	520
Chalons	0	167	10.9	10.6	693
Bourges	0	0	14.9	16.0	290
Normandy	13	202	6.8	7.3	1890
Tours	16	16	16.7	16.8	1069
Bourgogne	81	81	3.3	3.6	806
Moulins	0	0	21.1	21.7	324
Poitiers	5	5	23.6	24.8	612
Bretagne	1	1	2.5	2.6	1655
Franche-Comte	4	203	4.4	3.8	340
Riom	2	2	24.0	23.9	560
Limoges	0	0	20.3	21.4	585
Metz-Alsace	1043	1043	5.0	4.5	425
Lyon	0	0	24.2	24.6	363
Grenoble	0	0	10.9	9.8	544
Gascony	272	272	4.1	4.1	2512
Montpellier	679	679	2.2	2.3	1520
Provence	2	2	1.8	2.3	640

**Table 5:** Charges on taille receipts in the pays d'état and the pays d'élections.