The Paradox of State Building: How Diversity Constrains Development and Dominant Groups Shoulder the Tax Burdens*

Yusuf Magiya†

April 1, 2021

Abstract

This paper examines how diversity constrains state building through increasing costs of building fiscal capacity and how it forces the dominant groups to shoulder a higher portion of the tax burdens. Diversity makes a population more illegible to the state and its agents. I argue that where populations are more diverse and therefore more illegible, the costs of investing in the state's fiscal capacity are higher. This should make the state invest in the fiscal capacity of localities where these costs are sufficiently low. Introducing an original dataset of local-level fiscal revenues in late Ottoman Empire, I find that wartime increases in fiscal capacity were higher in localities with more homogeneous and similar (to the dominant group) populations. This suggests that diversity impedes state building. In order to provide evidence that the mechanism by which diversity impedes state building is by increasing the costs of building fiscal capacity, I demonstrate that the state's expense-to-revenue ratios were higher in more heterogeneous and dissimilar localities. The state had to invest more to reap a unit revenue in more diverse places. Paradoxically, this made the state put the tax burdens of state building on the members of the dominant group since the returns to the state's investment in fiscal capacity were higher where these groups live, while minorities did not see such increases in their tax burdens. Finally, the finding that wartime increases in fiscal capacity are lower under higher diversity suggests that the 'war makes states' relationship can be conditional on a sufficiently homogeneous population. In this sense, this paper offers one reason why the argument that warfare enhances state capacity is often challenged outside the Western European context; it can be the higher diversity of the populations outside Western Europe that undermines this relationship.

*I appreciate the valuable help and feedback by Alptuğ Güney, Kimuli Kasara, Timur Kuran, Isabela Mares, Nadir Özbek, Didac Queralt, Tara Slough, Jack Snyder, and Aliz Tóth at many different stages of this project.

†Department of Political Science, Columbia University. Email: ym2546@columbia.edu

1 Introduction

Diversity of the population is often associated with worse political and economic outcomes (Easterly and Levine 1997; Alesina and La Ferrara 2005; Montalvo and Reynal-Querol 2005; Blaydes 2018). In this paper, I argue that diversity impedes state building by increasing the costs of investment in the state's fiscal capacity. More diverse populations are more illegible to the state (Scott 1998; Blaydes 2018) and diversity increases the costs of counting, ruling and taxing the populations. When these costs are sufficiently high, the state should not invest in fiscal capacity building since the returns to the investment will be lower than the cost of investment itself. These costs can vary within a single country. In such cases, the state should focus its investment on localities where these costs are lower and where they can reap a higher return to their investment. For this reason, I argue that the state's investment in fiscal capacity and increases in the state's fiscal capacity should be more likely to occur in less diverse localities.[1]

In order to test these arguments, I focus on the Ottoman Empire in the late 19th and early 20th centuries and rely on several original datasets in this context. One is a dataset of local-level fiscal revenues in the Ottoman Empire from the 1860s until 1910, mainly built on hundreds of original archival documents from the Ottoman Archives. On top of this, I use other original datasets that I constructed using a multitude of historical and archival sources.

I start by demonstrating that ethnic and religious composition is critical in shaping the state's information capacity and rendering the population legible to the state. Different languages spoken by different ethnic groups and different religious identities contribute to the illegibility of the populations to the state and its agents (Scott 1998; Blaydes 2018; Charnysh and McElroy 2020). A reliable census is one indication that the state has acquired information about the population and rendered it more legible (Scott 1998; Brambor et al.

[1] In this paper, I examine two different configurations of diversity. One is *similarity*, which denotes if the population is different than the state's dominant ethnic/religious identity and the identity of the state's agents. The other is *heterogeneity*, which implies many different dissimilar groups.

2020). Using whether or not the Ottoman officials were able to successfully complete the censuses after having started it in a given administrative unit, I find that the probability of success is much higher for the similar and homogeneous administrative units.

Next, I examine how the variation in legibility due to the variation in diversity affects fiscal capacity building and distributional outcomes. Ethnic mismatch between the bureaucrat and the population is a problem because a bureaucrat who speaks a different language from the population is less likely to obtain the necessary information and achieve the necessary connections to administer taxation. In a similar manner, an ethnically diverse population is problematic because if there are multiple languages spoken and multiple cultures and networks in any locality, a bureaucrat who speaks a given language would be able to communicate with and extract taxes from those portions of the population who speak the same language with her, but not others. Similar problems apply for religious diversity since a bureaucrat who share the same religious identity with the population can more easily penetrate their networks.

The problem of illegibility makes a higher investment necessary to extract the same amount of tax revenue from a dissimilar or heterogeneous population compared to a similar or homogeneous one. For example, in ethnically heterogeneous places the ruler may need to assign a higher number of bureaucrats each of whom speak one of the different languages, or invest in education that can train bureaucrats with higher skills—in this case who can speak multiple languages—, and/or need pay higher wages to hire such bureaucrats. Especially in a rural and agricultural context like the Ottoman Empire, these are critical issues for taxation since it is necessary for the tax collector to know where the villages are located and where the products are grown, who lives in which village, who grows what, and when is the harvest season. All of these legibility problems, therefore, increase the transaction costs of tax collection, which can be exacerbated without reliable censuses. Furthermore, where local intermediaries are involved in tax collection, these transaction costs increase the bargaining power of the local intermediaries, and help them keep their tax farms and allow

them to undercount the populations, preventing the state from centralizing tax collection and increasing fiscal capacity. In sum, I argue that because the necessary investment is costlier, rulers are less likely to invest in fiscal capacity and if they did, it is less likely to pay off in contexts which are heterogeneous and dissimilar.

I focus on interstate wars as significant periods of the ruler's investment in and the enhancement of the state's fiscal capacity (Hintze 1975 [1906]; Tilly 1992; Besley and Persson 2010). Using the local-level fiscal revenue dataset and applying a difference-in-differences strategy, I find that the wartime increases in fiscal revenues are higher in more similar and more homogeneous administrative units. This suggests that diversity hinders the state's fiscal capacity building. In order to show that it is more expensive to invest in fiscal capacity in more illegible localities, I utilize another dataset on the local-level expenses of the empire and I show that the necessary investment to increase fiscal capacity is lower in ethnoreligiously similar and homogeneous administrative units.

The finding that wartime increase in fiscal capacity is conditional on ethnic composition also indicates that ethnic diversity and the illegibility that emanates from it form a critical constraint on the development of state strength and fiscal capacity. Economists find that diversity is associated with worse economic outcomes (Easterly and Levine 1997; Alesina and La Ferrara 2005). With the findings in this study, I underline legibility as a mechanism which can explain how diversity can constrain economic development in addition to the development of state capabilities.

These results also reveal that the tax burdens of the dominant ethnoreligious group, Sunni Muslim Turks, increases more than the tax burdens of the minority groups during wartime. This points to an interesting paradox. The dominant group in the society, which forms most of the state elite, ends up with worse outcomes compared to the minorities during the period of state building. In this sense, I identify a pattern similar to those in Kuran and Rubin (2018), and Cansunar and Kuran (2019), where the rules and the policies adopted by the elites of the dominant group in the society puts this group at a more disadvantaged

position, or the taxation patterns in Kasara (2007), where groups with co-ethnics in power pay higher taxes.

With the finding that wartime increases in fiscal revenues are conditional on levels of homogeneity and similarity, I offer a new angle to the debates regarding the question whether the argument that 'war makes states' is applicable to contexts outside of Western Europe. One possible explanation why the 'war-makes-states' relationship is often found to be non-existent in contexts other than early modern Western Europe (Herbst 2000; Heydemann 2000; Centeno 2002) can be that early modern Western Europe was much less diverse than many other parts of the world.

In order to better pin down the causal mechanisms that emanate from ethnolinguistic differences and shape distributional outcomes, I rely on additional sources. I provide qualitative evidence from the correspondences between Ottoman administrators where linguistic and religious differences are blamed for the state's failure in counting and taxing the populations. The correspondences support my arguments that language lies at the root of the illegibility problem by preventing the bureaucrats' ability to gather information and monitor the populations, how the multitude of languages in the empire limited its administrative capacity, and how difficult it was for the state's agents to penetrate into the networks of different ethnic and religious groups.

Late Ottoman Empire provides an interesting case to examine the issues of legibility and fiscal capacity building. Sunni Muslim Turkish speakers being the dominant group and Turkish being the language of state administration, the empire was home to a multitude of ethnic and religious groups. Substantial efforts to increase its fiscal capacity and eliminate intermediaries in tax collection during the earlier decades of the 19th century had been only partially successful due to its inability to project its power to its periphery (Pamuk 2005) and the degree of control of the state was uneven across different regions. Even though it managed to increase its fiscal revenues more than fifteen times between the late 18th century and World War I (Karaman and Pamuk 2010, p.594), the empire's tax revenues

were minuscule compared to European powers. The empire was still highly dependent on tax farmers for the collection of some type of taxes because the population's ethnic diversity prevented the empire from acquiring the necessary information about its subjects and a sizable portion of the society stayed illegible to the state.

The within-country variation in the levels of diversity in the Ottoman Empire also presents an ideal opportunity to evaluate the arguments I offer. By focusing on a single country, I can hold constant a multitude of factors and also minimize the measurement errors that affect cross-national studies. Fiscal capacity is usually measured by per capita tax revenues. One especially important factor that renders most cross-national studies of fiscal capacity problematic, when they use this measure, is that it is impossible to know that it is low fiscal capacity that keeps tax revenues low. For instance, another reason why tax revenues are low can be the government's unwillingness to tax or because the state does not need any funds. Unfortunately, however, there is no better alternative measure of fiscal capacity, at least to my knowledge. This is why by focusing on a single country, I can use the same measure of fiscal capacity without worrying about such a problem.

This study is not the first to emphasize the importance of ethnic and religious composition on the ruler's ability to extract taxes, or legibility. Scott (1998) and Blaydes (2018) underline the importance of languages, different customs and different networks in shaping legibility. Tilly (1992) argues that ruling over homogeneous populations can present advantages to the ruler thanks to factors such as population's identification with the ruler, ease of communication and transfer of technology. Gennaioli and Voth (2015) find that rising military pressures after the 16th century is more likely to incline homogeneous countries to invest in fiscal capacity compared to ethnically heterogeneous ones and Kasara (2007) demonstrates that a match between a farmer and the head of state's ethnic identity enables the head of state to impose higher rates of agricultural taxes on the farmer.

My added contribution is to provide empirical evidence that variation in diversity of the populations and the ensuing variation in legibility makes the returns to investment in fiscal

capacity different. With this, I highlight a new mechanism, higher costs of investment in fiscal capacity, by which diversity constrains development. Additionally, I provide a new angle to the issue of distribution of the tax burdens in contexts with relatively weaker informational and fiscal capacity. The high costs of rendering the minorities legible and exerting the state's control over them makes the state put the fiscal burden of the expanding state on the members of the dominant group of the society. I also examine how critical junctures of state building, interstate wars, alter the existing taxation patterns in the society and how the often taken for granted 'war makes states' relationship is conditional on diversity. My final contribution in this study is to introduce an original dataset of local tax revenues in late Ottoman Empire which, to my knowledge, is unique.

2 Literature, Theory and the Case

2.1 Ethnicity, Legibility and Taxation

States critically depend on taxation to perform their functions and to rule the populations. One essential aspect of both taxation and the state's ability to rule is the knowledge that the state possesses about the society and its economic activities (Scott 1998; Mayshar, Moav, and Neeman 2017). The state can effectively tax as long as it knows whom and what there is to be taxed in the society and the economy. It can effectively rule as long as it has sufficient funds and has enough knowledge about its subjects.

The structure of the society affects the state's capabilities (Migdal 1988). Ethnic and religious composition are two factors regarding the society's structure that can affect how much the state knows about the society (Scott 1998; Blaydes 2018). James C. Scott writes that "a unique language represents a formidable obstacle to state knowledge" (1998, p.72). According to him, "the great cultural barrier imposed by a separate language is perhaps the most effective guarantee that a social world, easily accessible to insiders, will remain opaque to outsiders" (p.72). His concept of legibility is the key mechanism in this article's theoretical

framework. The different languages different ethnic groups speak, their different customs, different economic activities different groups specialize in make each one a separate group for which there is unique information not readily available to any outsider.[2] Each group that has a different ethnic identity than the state's dominant ethnic identity forms one "unique language" in Scott's (1998, p.72) terms and higher ethnic heterogeneity increases the number of "unique languages", rendering the populations more illegible to outsiders, who do not speak that language and are unfamiliar with the culture. Therefore, ethnic dissimilarity and ethnic heterogeneity make the population in a given area as well as their economic activity less legible to the state, which makes it more difficult for the state to learn about, monitor and project its power on such populations.

We can expect similar patterns regarding religious diversity. If the bureaucrats are assigned to places where their co-religionists live, they can more easily penetrate their networks since it is easier for them to build trust (Livny 2020). In addition to this, the state can get more information about the groups who share the state's dominant religion since the state likely has better connections with the clerics and leaders of such communities.

That heterogeneity and mismatch between a population's and the center's ethnic or religious identity renders a society more illegible to the state and that these make it more costly to obtain information about these populations, monitor and control them should also prevent the state from achieving fiscal centralization and increase tax revenue. This is likely to hold especially under regimes of indirect rule—such as empires—where the central authority relies on intermediaries for administration, especially tax collection.

States aim to make local practices more legible to its officials (Scott 1998). This is a key aspect of state's control of the periphery and also shapes how much revenue it can extract. In order to think about the mechanism by which the illegibility of a population undermines taxation and state building, we can rely on Levi's (1988) framework, where relative bargaining power of the rulers and transaction costs are two constraints on the

[2]For example, a specific ethnic group can specialize in the production of a specific product, which the outsiders know nothing about.

state's fiscal capacity.[3] These transaction costs can include the costs of monitoring the population's activities (Blaydes 2018); obtaining information about revenue sources and constituent behavior; enforcing compliance (Levi 1988); obtaining information about the type of product to be taxed (Coşgel 2005) or merely the costs of communication and interactions between the taxpayer and the state agent (Zhang and Lee 2020).

In diverse contexts the transaction costs of communicating with the taxpayer, counting, monitoring and controlling a population, as well as of obtaining other necessary information for taxation are higher. This makes the investments to increase fiscal capacity more costly. In addition to this, the high transaction costs increase the premium on local intermediaries, who have better information about the local context and have better connections. This results in a situation where the ruler's bargaining power vis-à-vis local intermediaries is lower. The intermediaries possess critical information and connections that the state agents lack. At the end, their lower bargaining power makes it more difficult for the state to centralize tax collection and hence increase fiscal capacity. This especially is a problem for contexts with indirect rule, such as empires where initially states have little knowledge about its populations, and for rural contexts with agricultural economies, which limit the state's knowledge, reach and control.

To better explain why diversity and the illegibility it causes increase the premium on local intermediaries in rural and agricultural contexts with indirect rule, it might be a good idea to try to understand how governance and taxation in such contexts usually worked. Indirect rule implies that the central state relied on local intermediaries to rule the populations. This was a very common form of rule in the empires in the era before what Tilly (1992) calls nationalization, before empires and city-states converged towards what he calls national states. Empires ruled over a diverse set of populations and territories. They usually were multi-ethnic and multi-confessional. This diversity and illegibility made it more difficult to rule directly from the center, which made indirect rule a better strategy for the

[3]She also discusses discount rates as the third constraint, which I do not consider in my framework.

state. They needed the cooperation of the local forces in order to project their rule. The illegibility which made it more difficult for the state to obtain information and rule over subjects compelled states to delegate administration and tax collection to intermediaries who possessed local knowledge and networks. Yet, when the intermediaries are involved in the activities in ruling and taxing, they can use their position to benefit themselves to the detriment of the central state (Doumani 1994).

Tax farming was a very common way for the rulers to avoid risk and ensure a steady flow of income in many polities, including empires (Levi 1988; Johnson and Koyama 2014). By delegating tax collection to tax farmers, rulers could ensure some income from the initial payment from the tax farmers regardless of the result of the tax collection attempts and did not have to undertake the costs of tax collection. Especially farming those taxes that were administratively complex or those that were more difficult to collect was preferable from the point of view of rulers (Brewer 1989). The downside of tax farming was that a substantial portion of potential revenues ended up in the pockets of these tax farmers (Özbek 2015). In the era of nationalization that Tilly (1992) describes, those states which could manage to converge towards national states were particularly advantaged in warfare. During the transformation from empires to national states, and from indirect to direct rule, states "took over the direct operation of the fiscal apparatus, drastically curtailing the involvement of independent contractors" (Tilly 1992, p.29). Nonetheless, the transformation from indirect rule to direct rule was costly for the state and this cost depended on the bargaining power of local intermediaries (Garfias and Sellars 2020).

In order to obtain information about the population and render it legible, states can rely on censuses (Scott 1998; Lee and Zhang; Brambor et al. 2020). With reliable censuses, any agent of the state, whether looking at the census while sitting at an office desk at the capital or while in the field at the periphery, can learn about the population. This information can be critical for tax collection purposes. They can communicate to the reader certain factors such as how many people live in certain localities and their economic activities.

What is problematic regarding diversity for the administration of censuses is that dissimilar ethnic and religious identities and heterogeneity increase the costs of administering censuses and therefore the costs of obtaining information. For an outsider who does not speak the language, unfamiliar with local customs and lacking the necessary connections, counting the population and obtaining the relevant information is difficult.

Similar mechanisms are at play regarding tax assessment and collection. Agents who are not familiar with the region do not possess the necessary knowledge of what product is grown where and when it is harvested, which are critical for the collection of agricultural taxes. They also lack adequate knowledge of the geography, which can make it difficult for them to navigate. They neither have the proper means of communication with local figures, nor with the taxpayers and it is more difficult for them to control lower-level local (non-state) actors who can speak the language and know the area, because they have no proper connections with such actors. Establishing connections with lower-level local actors are often key to controlling an area also because they are likely to possess critical knowledge and connections with the local population and have earned some combination of trust and reputation (good or bad) which can make it more likely for them to extract taxes compared to an outsider. Furthermore, these local actors should be likely to stay loyal to already or previously dominant intermediaries because of their already well-established connections.

For all these reasons, I expect it to be more expensive to count the populations and also to centralize tax collection in dissimilar and heterogeneous areas. In order to centralize the collection of a given amount of tax revenue, the required amount of initial investment (both short- and long-term) should be higher in more dissimilar and heterogeneous areas compared to similar and homogeneous areas. In dissimilar areas it should be more expensive because the state will need to send bureaucrats who speak the language of and share a similar identity with the local population where dissimilar people live. State bureaucracies often use the language of the dominant/majority ethnic group and most of the state officials speak the language of this majority group (Zhang and Lee 2020). Finding bureaucrats who can speak

the language of the local populations and establish connections in such places is often more difficult (BOA.BEO. 1968/147542). In heterogeneous areas it should be more expensive because heterogeneity implies multiple dissimilar ethnic and religious groups and the state will need to hire more bureaucrats and therefore has to spend more money to extract a given amount of revenue from a given area (this is a strategy that can be adopted in the shorter term) and invest in education that will contribute to the bureaucrat's skills, including language skills that will help them communicate and extract resources from different ethnic groups (this is a strategy that can work only in a longer term).

A simple hypothetical example in Figure 1 below may help illustrate my point with a visual example. Let us assume three hypothetical contexts, with four districts (consisting of four cells that are demarcated with bolded lines) and four subdistricts (each cell), that are similar in all aspects except that in the population exclusively consists of ethnic group A (example i), in the second example all four districts are homogeneous within each other but the population in each district are from a different ethnic group, which I call groups A, B, C and D (example ii) and in the final example populations in each subdistrict within a given district are from a different ethnic group (example iii). Let us further assume that a given tax collector's performance (i.e. ability to extract taxes) becomes worse if assigned to cover a larger area (which should be obvious since the time and resources this collector can spend on a given area declines if assigned to cover a larger area).

Figure 1: Demonstration of Three Hypothetical Cases of Ethnic Composition

A	A	A	A
A	A	A	A
A	A	A	A
A	A	A	A

i- Homogeneous and Similar

A	A	B	B
A	A	B	B
C	C	D	D
C	C	D	D

ii- Homogeneous within Subdistricts but Mostly Dissimilar within the District

A	B	A	B
C	D	C	D
A	B	A	B
C	D	C	D

iii- Heterogeneous and Mostly Dissimilar

Let us say there are four agents at the state's disposal and each of them will be assigned to collecting the taxes of four subdistricts. Let us also assume that this is a state where the dominant ethnic group is A, and an average agent is from ethnic group A, speaking this group's language. Finally, let us assume that this language is the 'official language' used in public matters. In example i, centralization of tax collection should be the easiest among the three examples. Any four regular agents can be sent to any of these districts and will be responsible for tax collection in all four subdistricts within this district. Example ii is a more difficult hypothetical case from the state's perspective. Here, one agent can be sent to each district and will be responsible for tax collection in all four subdistricts in a district. However, the problem here is that each district has populations of a different ethnic group. This is why ideally the state should send agents that match each district's identity. Unless the state has already invested in the education and hiring of agents who speak languages B, C, and D; effective tac collection in these districts will be more difficult, with most agents speaking language A.

Example iii presents the most challenging hypothetical case from the perspective of the state. Here, each district has populations from each ethnic group. Not only the mismatch between the state's ethnic identity and some of the population's ethnic identity, but also the ethnic heterogeneity within each district is a problem here. Even if the state has already invested in recruiting agents from groups A, B, C and D, tax collection in this case is very difficult unless all of these agents speak all four languages. Comparing the amount of travel an agent who speaks a single language needs to do in this case to the travel the same agent in cases i and ii needs to do should be helpful in understanding this point. While in cases i and ii this agent needs to travel through a much smaller area to cover 4 subdistricts (the agent only needs to travel within a given district), in case iii the same agent will need to travel through a much larger area to cover the same 4 subdistricts. This can undermine the efficiency of the agent's collection, or the state will have to assign more agents. Both of these

possibilities are costlier than tax collection in case ii. The within-district heterogeneity is a problem for all districts in case iii.

This simple example was merely to illustrate how ethnic dissimilarity and ethnic heterogeneity can make it more expensive for the state to centralize tax collection and therefore can compel it to rely on local intermediaries in regions with dissimilar ethnic groups and ethnic heterogeneity. In the next section, I argue how war makes fiscal centralization and fiscal capacity increases more likely in more homogeneous and ethnically similar contexts.

2.2 How War Changes the Ruler's Calculus

By increasing the central treasury's expenditures, wars create fiscal pressures on rulers and therefore compel them to seek strategies to increase their revenue. Many studies find that wars, directly or under some conditions, increase fiscal capacity in the short (Karaman and Pamuk 2013) as well as in the longer term (Queralt 2019). Even though the advent of war does not necessarily affect the cheapness of centralizing tax collection, I argue that war is critical because winning or losing a war determines the ruler's future benefits, and the probability of winning or losing a war often depends on how much a ruler invests in warfare. The ruler's future benefits can be affected by war's result via win or loss of territory and hence win or loss of future revenue from this territory, or via affecting the ruler's survival.[4] Therefore, a given amount of direct return from an investment in fiscal capacity may be equal during wartime and peacetime, but the indirect benefits (or prevention of losses) make the overall returns from an investment higher during wartime.

One important aspect of war resulting in increases in fiscal capacity, if the legibility problem has been solved, is that it not only causes short-term and temporary increases in fiscal revenue, but it can also help keep fiscal revenues higher even after war is over, constituting a 'ratchet effect'. Once the ruler has invested in a given area, solved the legibility

[4] A ruler's survival in office and his literal survival can be affected by war's outcomes due to occupation by the foreign power, but also happen by the economic and political turbulence losing a war creates and the ruler being blamed for this (Croco and Weeks 2016).

issues here and has centralized tax collection, the costs of continuing with this arrangement is lower, and therefore the ruler can collect taxes in these areas without the help of the local intermediaries. In sum, this ratchet effect occurs because, in Tilly's words, the "wartime increase in state power gives officials new capacity to extract resources" (1992, p.89).

2.3 The Problem of Illegibility in the Ottoman Context

An empire with vast territories, the Ottoman Empire ruled over various ethnic and religious groups. These made a great portion of Ottoman subjects highly illegible to the state. We can see an indication of this illegibility in the frequency and the overall quality of the censuses that the empire attempted to conduct. While the first census in the empire was conducted as early as 1831, this was not really a census in the modern sense since it only counted the households, but not individuals and covered only some parts of the empire (Karal 1943, cf. Karpat 1978). Some of the following censuses starting from the late-19th century offered higher quality data on many regions of the empire; however, even well into the 20th century, Ottoman censuses were very unreliable in regions where the state's power was very weak. The local populations could resist attempts to be counted (Yosmaoglu 2006) and the reports of local administrators to the center complain how difficult it was to count minority populations (BOA.A.MKT, 66/2).

I expect it to be more expensive to conduct censuses in localities with more dissimilar and heterogeneous populations. The empire never attempted to systematically count the populations in Hejaz and Yemen provinces in a census. In both provinces, the state's control was very weak, almost no Turkish-speaking population lived and the necessity of good command of Arabic language and knowledge of Arab customs to be an administrator there was explicitly acknowledged (BOA.DH.MKT, 1539/120). It also did not attempt to count the populations in the provinces of Baghdad, Basra and Musul in the 1914 census, the last ever census by the empire. Populations in these provinces are diverse. In light of the discussion in

Section 2.1 and to demonstrate that diversity is one factor that is at the root of the legibility problem, I formulate the first pair of hypotheses:

Hypothesis 1a: *A census is more likely to be successful in more homogeneous administrative units.*

Hypothesis 1b: *A census is more likely to be successful in more similar administrative units.*

2.4 How Diversity Hindered Revenue Extraction in the Ottoman Empire

In the Ottoman context, it was the power struggle between the local intermediaries and the center that hindered fiscal capacity building attempts before the 19th century (Karaman and Pamuk 2010). Local intermediaries often were tax farmers who also had political offices and resisted the central state's centralization attempts; unwilling to lose their tax farming or other privileges. However, with the efforts of the center from early- to mid-19th century, especially during the reign of Mahmut II (r. 1808-1839), the power of the big local intermediaries had significantly eroded. The Imperial edict of 1839, Tanzimat Fermanı, also known as the Gülhane Edict, declared that tax farming would be abolished. The state abolished tax farming in more centralized regions of the empire and appointed certain bureaucrats named muhassıl-ı emval with the task of allocation, assessment and collection of taxes (Pamuk 2016; Özbek 2015, p.48). Yet, the tax revenue of the central state fell drastically after these officials undertook these tasks, due to the problems they encountered in tax collection (Pamuk 2016, p.200-1). At the basis of these problems lay their lack of local knowledge and lack of cooperation from previous tax collectors and previous provincial administrators (Köksal 2002). In other words, at least part of the reason was the illegibility of the society to the state. This institutional innovation having failed, the central government reinstituted

tax farming in 1842.[5] Pamuk argues while resistance from local powerholders was the main obstacle against increasing fiscal capacity before this era, after Mahmut II managed to curtail the power of local notables, the main reason behind the difficulties in tax collection became the weakness of the central state in the provinces of the empire (2005, p.201).

It was due to the illegibility of the Ottoman population in the provinces and their economic activities that the transaction costs of centralizing tax collection were high (Özbek 2015), the Ottoman state failed to centralize tax collection and tax farming survived. Tax farmers and their financiers pocketed a substantial portion of the potential revenue that could have ended up at the central treasury.[6] Replacing the tax farmers was also difficult because the empire suffered from a chronic lack of an adequate number of a well-educated workforce (Akyıldız 2004; Barkey 2008) coupled with the illegibility of its population. It was very costly for the Ottoman state to invest in a workforce that could be appointed from the center to any given region in the Empire with the very different groups across the empire and the different languages, customs, networks and economic actitivies of these different groups. Comparing the Ottoman case with 17th century England can help illuminate how diversity can undermine building a centralized bureaucratic apparatus. Brewer examines how during the reign of James II of England in the 1680s the foundations of a strong tax administration were laid:

> "The link between periphery and centre was tightened. Customs commissioners began regular circuits of inspection, checking officers' performance in the field. Similarly the excise commissioners and subordinate officers with the titles of general riders and general supervisors toured the countryside inspecting the work of their gaugers. The Excise introduced standardized instruction for their employees according to 'the Method'. Officers were brought to London for instruction

[5]Despite other attempts of Ottoman administrators to abolish tax farming, they were never successful during the lifetime of the empire. It was only in the ethnically much more homogeneous nascent Turkish Republic in 1925 that it was completely abolished (Özbek 2010).

[6]Özbek (2015, p.29) notes that late-19th century tax administrators in the Ottoman Empire estimated that around 15-20% of the agricultural tithe revenue was lost to tax farmers.

and, when properly 'Methodized', were sent back to the provinces to teach their fellow-officers the most effective means to gauge and measure taxable goods." (1989, p.94).

While this option worked for the government of James II in the 1680s, it probably was not a viable option for the Ottoman rulers. England at the time was ethnically much more homogeneous than the Ottoman Empire. It was possible to send the customs commissioners to check the officers' performance, 'the excise commissioners and subordinate officers' could tour the countryside and inspect the gaugers, and introducing a standardized instruction and bringing officers to the capital to instruct them before sending them to the provinces, who would then teach other officers was not that difficult. These were possible because England was smaller and most—if not all—officers probably spoke English, which—probably for most—was all the language skill they needed to administer taxation in the field. The multiplicity of the languages in the Ottoman Empire should be much less likely to allow such an increase in administrative capacity and an ensuing increase in fiscal capacity. Indeed, the Ottoman state was often compelled to find officials who could speak the local languages when sending administrators to the provinces. Before the census of 1881-93 in the empire, a debate among high ranking officials regarding the administration of the census can provide some insight on how different languages troubled the state.

"During the debates in the Şura-yı Devlet (council of state), the General Committee suggested that since some non-Muslim community leaders could not speak Turkish and consequently faced difficulty in filing the birth certificates, the population officers sent to these areas should be selected from those who spoke the native languages. In other words, instead of compelling the citizens to learn Turkish, the language of the administration, the Ottoman government sought at this date to teach its own officials the regional languages, a custom long in practice." (Karpat 1985, p.32, fn. 38).

Such language barriers should pose a great disadvantage for the state. It indicates that it had a smaller pool of officials to send to the provinces due to language barriers. What is worse, this could also cause further problems; the state probably could not freely assign a given official to any vacant position, nor could promote a well-performing official to any position where he could serve the state better. Language posed an important barrier against such necessities of better administrative capacity. Consequently, this could also undermine the fiscal capacity of the state.

The Ottoman Economy heavily relied on agriculture in the 19th century and a vast portion of the state's revenue came from agricultural tithe (aşar), for which legibility was a critical phenomenon.[7] Tithe was a very difficult tax to administer and collect because agriculture, by its nature, is mostly a rural economic activity. What is worse, few Ottoman agricultural producers produced for the market, which made their economic activity less legible to the state.[8] What we know about the administration and collection of tithe reveals that it should have been much more difficult for an outsider who does not speak the language, unfamiliar with the geography and the type of the products grown in certain localities. Tithe was often taken in kind (Özbek 2010) and the assessment of the output had to be done right after the harvest, before the product was moved elsewhere. The fact that different types of products were harvested in different times of the year presented a significant obstacle to outsiders, who were less likely to be aware what product was grown where and when in this specific climate a given product's harvest time was. It was even more difficult if the same farmer grew different products that were harvested in different times (Özbek 2010). A safer alternative to output taxes on agricultural produce could be to apply input taxes (Coşgel 2005), where taxes could be assessed based on the input, such as the land area, or number of trees, rather than assessing the amount of output. However, it is more difficult to increase

[7]For instance, tithe income constituted around 31% of the total revenues in the fiscal year of 1860/61 and 44% in 1876 (Özbek 2010, p.55).

[8]I also expect illegibility to decrease the efficiency of other types of tax collection, such as taxes on transactions like trade or taxes that were mostly applied to urban areas. However, among all groups the most illegible group to the state were villagers living in remote areas and the most illegible activity for tax purposes was subsistence agriculture.

tax revenues with input taxes; for example, even if output per unit input increases over time, there is no way to prove this on the part of the tax official and therefore it is less likely for the state to reap the benefits of higher production.

This is why the rulers had to rely on local intermediaries and tax farmers for the taxation of agriculture. These intermediaries had extensive knowledge about the locality, had dense networks among the population and therefore did not experience the difficulties that centrally appointed agents faced. Özbek (2015, p.97) notes that those who got the tax farming contracts were the already well-established notables (eşraf) in the provinces. They were often indispensable due to the illegibility of the society to outsiders, in this case the centrally appointed agents. Most of the intermediaries were insiders with much better knowledge of the(ir) society. They also had much denser connections within these local communities, which enabled them to extract higher resources compared to any outsider appointed by the center.

2.5 Tax Farming in Late Ottoman Empire

As I discussed above, by the beginning of the Tanzimat era, large-scale local intermediaries had been eliminated and most tax farms were at the hands of smaller intermediaries. The rulers had also managed to impose rules that kept the tax farms at the small scale, for example limiting the size of the farms (such as to the village) and not allowing the same person to buy contracts in multiple districts (Özbek 2010, 2018). Yet, several attempts to abolish tax farming and centralize tax collection failed. One large-scale attempt to abolish tax farming and appoint officials to administer tax collection between 1839 and 1842 failed and tax farming was reinstituted (Pamuk 2016). Throughout the 19th century, there were other instances when the state centralized at least portions of agricultural tithe collection in certain regions. This was the case during 1853-1854, during the Crimean war, and also to some extent after 1877, the Russo-Turkish war of 1877-78 (Özbek 2018). However, it would be misleading to seek the causes of increases in the state's fiscal revenues solely via direct

fiscal centralization. I argue that it was also the possibility of fiscal centralization by the state whereby the state's bargaining power against the tax farmers increased and the state could sell the farming contract for a higher price. In order to better explain this mechanism, it may be a good idea to take a look at how tax farming contracts were allocated. Here I will focus on the agricultural tithe, the main source of the state's income the during this period.

The system of farming the agricultural tithe was very heterogeneous across time and space in late Ottoman Empire. The allocation methods changed very often and not all changes applied to every region. To give a crude summary, Özbek (2018) identifies two ways of allocating rental tax farming contracts of the agricultural tithe, fixed price (maktu) and ascending price auction (müzayede). In the fixed price system, the government would determine a fixed price for the contract. In the ascending price contract, the bidder with the highest bid would win. Those contracts that no one bought were often administered via wage contracts (emaneten idare), which means that at times they were directly administered via agents assigned from the center and at other times the duty to collect these taxes were given to the village communities (ahali-i kura).[9]

The state's net profit (its tax revenue minus expenditures to collect these taxes in this unit, such as wages paid to the bureaucrats and other costs of assessing the taxes) it could obtain from directly administering the tithe of a given unit should depend on the population's legibility. The more illegible the population in a unit is, less return from a given investment the state should obtain in tax administration. The net profit that the state could obtain from administering the tithe here also forms a baseline revenue for the state. We can assume that the state would farm the tithe in a unit if a tax farmer offered a higher price than the state's baseline revenue. The expenditure of a tax farmer with a better knowledge of the

[9]Although the name suggests that the duty to collect taxes were assigned to the village communities as a whole, in practice it was often the notable members of these communities such as village heads (muhtar) or clerics who undertook this duty (Özbek 2015, p.89). Under low capacity, allocating tax collection duties to members of the communities also created problems. Akyıldız (2004, p.204) notes that many villagers complained to the state that their village heads engaged in corrupt practices during tax collection such as overtaxation, or not giving receipts in return for tax payments. Lacking capacity, the state had no means of learning what was really going on and had to accept the village head's statement regarding the tax revenue.

locality and population should be lower than the expenditure of the state. This is why in many cases the contract should have been sold for a higher price than the state's baseline revenue.

During wartime, when the ruler is in urgent need of increasing revenues, the benefit of a given amount of revenue should be higher for the ruler compared to peacetime (as I have argued in more detail in Section 2.2 above). This makes it more likely for the state to mobilize resources to centralize tithe administration and therefore the potential baseline revenue increases. This can allow the state to ask for a higher price in the fixed price contract system and can also drive the price up in the ascending price auction system. Thus, whether or not a farmer buys the contract and also whether or not the state centralized tax collection in this unit, the income of the state should increase. This mechanism should be more likely to happen in more homogeneous and ethnically similar places and less likely to happen in more heterogeneous and ethnically dissimilar places. Heterogeneity and dissimilar ethnic groups, as I have argued, increase the amount of investment the state has to make in overcoming the barrier of illegibility in this area and therefore the wartime increases the baseline revenue in these places should be lower, it is even likely that the baseline revenue is negative in very heterogeneous places and where ethnic similarity is very low since illegibility can make tax administration very inefficient. Therefore, these hypotheses follow:

Hypothesis 2a: *The wartime change in the levels of fiscal revenues in an administrative unit increases as homogeneity in the unit increases.*

Hypothesis 2b: *The wartime change in the levels of fiscal revenues in an administrative unit increases as the similarity in the unit increases.*

3 Data and Empirical Strategy

To measure the state's fiscal capacity at the local level, I collected historical local-level tax revenue data from hundreds of historical and archival sources mostly in the Ottoman Turkish language. The collection of this data lasted more than 18 months. These sources are the Provincial Yearbooks (Vilayet Salnameleri) that were published by the Ottoman provincial administrations starting from the second half of the 19th century and archival sources scattered under different categories in the Ottoman archives, such as budget reports sent to the center by provincial administrators or reports prepared in the center. Other sources I use are the British Foreign Office reports, some statistical yearbooks published by the Ottoman state and secondary sources by historians. I discuss the sources in more detail in Appendix Section A.1. In case there were data for the same year's revenue by multiple sources, I used the hierarchy I describe in Appendix Section A.2.

The main unit where I collect these data is the first-level administrative units, provinces (vilayet) of the empire. Some of these sources contain tax revenue data for second-level administrative units (sancak), some others contain third (kaza), fourth (nahiye) and a few even contain data for fifth-level (village) administrative units. However, for the purposes of this study, I use the province-level data since lower-level data is much scarce compared to the data for the first-level administrative units and do not adequately cover all the period I am interested in.

For province-level population data I again use multiple sources. The main sources I rely on are the Ottoman censuses in the late 19th and early 20th centuries, Zamir (1981) and Karpat (1985). In addition to these, I also use several other primary and secondary sources. I discuss them in more detail in Appendix Section A.3.

The most commonly used measure for fiscal capacity is tax revenue per capita. This is also the measure that I use, but with one minor difference. As I have mentioned in the previous sections, the Ottoman censuses do not provide very reliable estimates of females. Since the proportion of males to females can change across different province, I use only the

male population to calculate per capita revenue. This should not be inferior to calculating per capita revenue using the entire population because at this time in the Ottoman economy the most dominant economic actors and the vast majority of the taxpayers were males. Women were exempt from certain taxes such as poll taxes (Shaw 1975).

Since revenues can change according to prices, adjusting for prices is also necessary. I adjust the revenues according to Pamuk's index.[10] Using his index, I convert the revenue to its equivalent in 1998 US Dollars. Therefore, the dependent variable in the empirical analysis is Revenue per Male Capita in 1998 US Dollars.

The two independent variables in the analysis are Ethnolinguistic Fractionalization (ELF) and Ethnic Similarity (ES). Following Alesina et al. (2003), I calculate ELF using the Herfindahl-Hirschman Index and the ES measure is the percentage of the Turkish ethnic population in the province. Both of these measures theoretically range between 0 and 1. Higher value of ELF indicates higher ethnic heterogeneity.

I had to exclude some provinces from empirical analysis. Some of them exist for a very short time within the time frame that this study is interested in and therefore they have very few observations. These are Bosnia, where Ottomans lost control after the 1878 Treaty of Berlin, and Prizren, a short-lived province for which there is only one observation in the dataset. Finally, I do not include the independent second-level administrative units (bağımsız sancaklar).[11] Figure 2 below is a presentation for which year in which province the revenue data is available or missing. It also shows whether a province existed in a given year. Table 1 reports the descriptive statistics for the dataset, where the unit of analysis is province-year. In addition to these descriptive statistics, Appendix Table A.2 reports the descriptive statistics at the province level (averaged for each province across all years).

[10]His index can be reached on: `https://ata.boun.edu.tr/sites/ata.boun.edu.tr/files/faculty/sevket.pamuk/database/1.3._tablo_gecmis_yillara_ait_parasal_buyukluklerin_esdegerleri.pdf`

[11]Normally, second-level administrative units, sancaks, are under the jurisdiction of a higher-level administrative unit, province (vilayet). However, several sancaks had special status and were not under the jurisdiction of a province.

Table 1: Descriptive Statistics

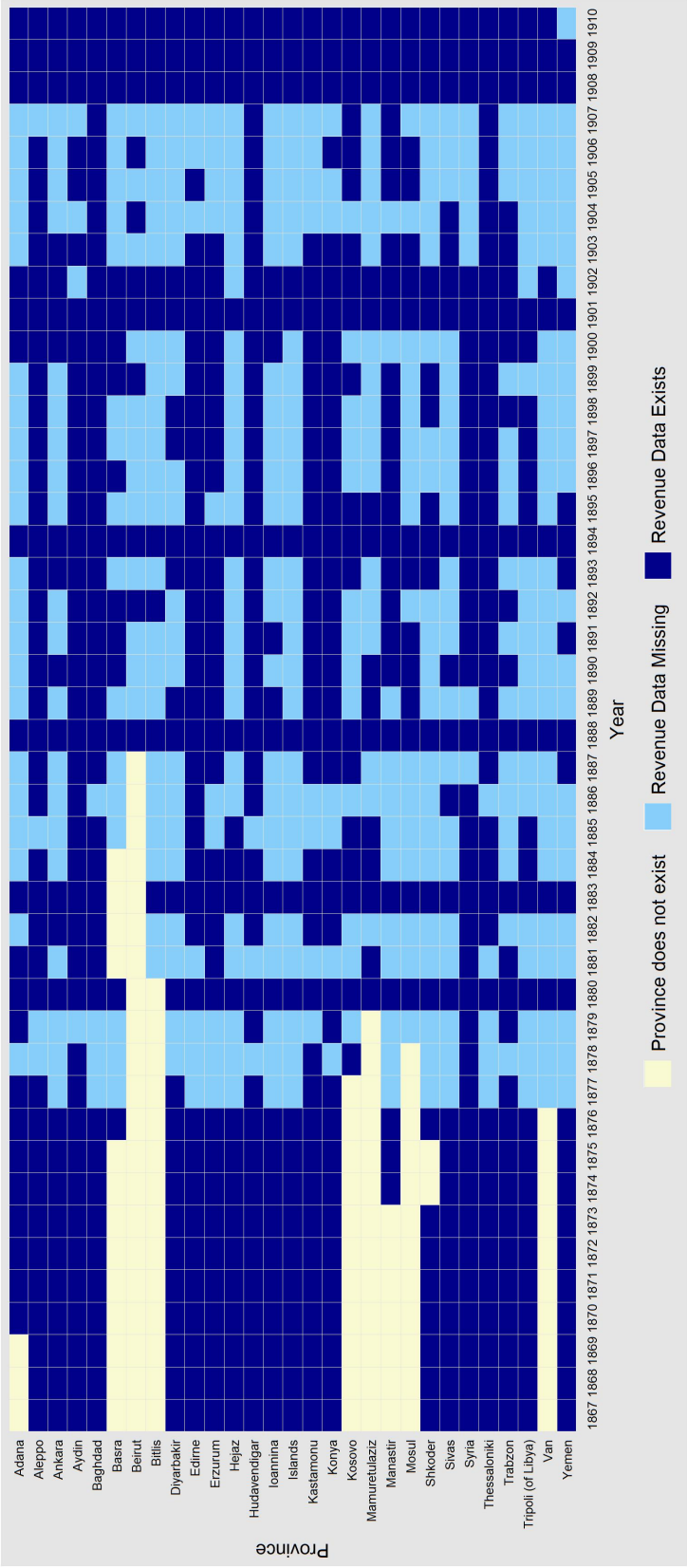
Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Tax Revenue	750	51.69	25.66	0.12	32.47	49.71	71.71	151.74
ELF	750	0.39	0.26	0.00	0.11	0.38	0.66	0.75
Percent Turkish	750	0.38	0.36	0.00	0.01	0.31	0.76	0.97

An advantage of a within-country design over cross-national design is that I can address several problems that cross-national studies cannot.[12] Most importantly, by considering the tax revenue of a single country, I can hold constant an unobservable factor that renders cross-national measurement of fiscal capacity very problematic. The most commonly used measure of fiscal capacity, tax revenue per capita, can be problematic in cross-national designs since the amount of taxes that the state can extract can also be affected by factors other than the state's capacity to tax, such as the willingness of the government to tax. A country can have low tax revenues even though it has the capacity to tax, because the government just does not (want to or need to) tax. Alternatively, it can have low tax revenues even though the government wants to increase tax revenues because it lacks the capacity to tax. It is more difficult to distinguish between these two alternative scenarios in cross-national studies of fiscal capacity. A single-country design helps address this problem.

There are further advantages of restricting the analysis to a single country. It can help control for any other unobservables that can confound the relationship between the variables of interest, can eliminate the commonly criticized measurement errors in cross-national studies and also alleviate the concerns regarding the different effects—even the same— war can create in different cases. Especially considering the critical ingredient here is war, it could have been problematic to examine war's effect on different countries since even the same war can have different effects on different countries. Looking at war's effect on different regions of a single country, and therefore on a single ruler with a single treasury, can help us estimate this effect without worrying about country-level confounders.

[12]See Lieberman (2002) for a discussion of cross-national designs of studies with taxation data.

Figure 2: Existence of Tax Revenue Data by Province and Year



To evaluate Hypotheses 1a and 1b, that homogeneous and similar populations should me more legible to the state, I rely on the outcome of the 1881-1893 census in the empire. In the report presenting the census it is written where the state had been able to complete the census (BOA.Y.PRK.A, 78/8). This is the outcome I am interested in. Fortunately, it is possible to learn this at the sancak level, the second-level administrative unit in the empire, and have a higher number of observations and more variation in both the independent and dependent variables.[13] The outcome variable is whether the census had been completed in a given sancak. I construct this outcome variable as a dummy, equaling 1 if the census has been completed and 0 if not. Section A.4 in the Appendix describes the coding of the outcome in a more detailed way and reports how each sancak is coded. I use a logistic regression model to test Hypotheses 1a and 1b.

There were two interstate wars in the period that I examine. One is the 1877-78 Russo-Turkish war, which lasted close to a year, was fought on multiple fronts in different areas but within Ottoman territory (Balkans and Caucasus), was devastating for the empire, and resulted in utter defeat and significant loss of territories and populations. The other is the 1897 Greco-Turkish war, which was much shorter (just over a month), fought on a much smaller geographic area and partly outside Ottoman territory (mainland Greece and the island of Crete) and resulted in Ottoman military victory. In the analysis below I consider the effects of both of these wars. This way, we can also see if the scales and lengths of these two wars made any difference.

I use a *generalized difference-in-differences* model in order to evaluate Hypotheses 2a and 2b. Both *ELF* and *ES* variables are continuous. This implies that I have a generalized difference-in-differences model with continuous so-called 'treatments' (their interactions with the war dummies are also continuous). I estimate an Ordinary Least Squares regression model in the following form:

[13]There are only 29 provinces in the empire during this period.

$$Revenue_{it} = \beta_0 + \beta_1 ELF_{it} + \beta_2 ES_{it} + \beta_3 D_t^{1877} + \beta_4 D_t^{1897} + \beta_5 D_t^{1877} ELF_{it}$$
$$+\beta_6 D_t^{1897} ELF_{it} + \beta_7 D_t^{1877} ES_{it} + \beta_8 D_t^{1897} ES_{it} + \lambda_t + \gamma_i + \varepsilon_{it}$$

where $Revenue_{it}$ is tax revenue per male capita (in 1998 USD) in province i in year t, ELF_{it} is the etholinguistic fractionalization measure in province i and year t, ES_{it} is the ethnic similarity measure (percent Turkish population) in province i and year t, D_t^{1877} and D_t^{1897} are dummies for post-1877 and post-1897 periods respectively. $D_t^{1877} ELF_{it}$ and $D_t^{1877} ES_{it}$ are the interactions between the post-1877 dummy and the ethnic composition measures, and $D_t^{1897} ELF_{it}$ and $D_t^{1897} ES_{it}$ are the interactions between the post-1897 dummy and the ethnic composition measures. Finally, λ_t is the year fixed effects, γ_i is the province fixed effects and ε_{it} is the error term. The year fixed effects are especially important in this generalized difference-in-differences framework since they can help account for different time trends that happen in different types of units that can cause a difference in the estimated change in per capita revenues before and after the wars, which would constitute a violation of the parallel trends assumption. I discuss this and the parallel trends assumption in general in more detail in Section 4.2 below. The year and unit fixed effects also help account for any year or unit-specific source of heterogeneity and can also account for any secular trends in the levels of fiscal capacity over time.

In this specification, I am interested in the coefficients of the four interaction terms, β_5, β_6, β_7 and β_8 since these give the difference-in-differences estimates according to the ethnic compositions of the provinces. I expect β_5 and β_6 to be negative (since I expect homogeneous provinces—with low ELF scores—to experience higher increases in capacity) and I expect β_7 and β_8 to be positive (since I expect similar provinces to experience higher increases in capacity).

4 Results

4.1 Main Results

I report the results of the logistic regression analysis evaluating hypotheses 1a and 1b in Table 2. Both *Ethnolinguistic Fractionalization* (ELF) and *Percent Turkish* (ES) variables are standardized around the mean so that the odds ratios should be interpreted as the change in odds per one standard deviation increase in the independent variable.

Table 2: Analysis of the Relationship Between Ethnic Composition and Census Quality

	Dependent variable:
	Census Completed Dummy
Ethnolinguistic Fractionalization (ELF)	0.430
	$t = -2.132^{**}$
Percent Turkish	9.600
	$t = 3.348^{***}$
Observations	69
Log Likelihood	−24.594
Akaike Inf. Crit.	55.187
Note: Odds Ratios and t-values Reported.	*p<0.1; **p<0.05; ***p<0.01

The results indicate that the odds ratio of the ELF variable is estimated to be 0.430 and is significantly estimated. This means that one standard deviation increase in the ELF measure makes it more than twice more likely that the census was completed. The odds ratio of the Percent Turkish variable indicates a much stronger association. One standard deviation increase in this variable makes the census 9.6 times more likely to be completed. Thus, the results are consistent with hypotheses 1a and 1b; ethnic homogeneity and similarity make a population more likely to be rendered legible by the state.

Table 3 below reports the results of the generalized difference-in-differences regression and Figure 3 presents the results visually. I am interested in the interaction effects between the period dummies and the ethnic composition variables. The size of the coefficient of *ELF * Post-1877 Dummy* interaction is -2.010 and is significantly estimated. This suggests that per

one standard deviation (0.26) increase in the province's ELF measure, the estimated decrease in the change that 1877-78 war causes is 2.01 US Dollars per male per capita. Next, I check the coefficient of the *ELF * Post-1897 Dummy*. This coefficient is again estimated to be negative at -2.087, which suggests that one standard deviation increase in ELF decreases the change caused by the 1897 war by 2.087 US Dollars per male per capita, and this coefficient is estimated to be statistically significant. With these results, I can confirm hypothesis 2a, the change in fiscal revenues after war increases as a province is ethnically more homogeneous.

To put these numbers in context, we can compare the changes across different values of the ELF measure before and after wars happen. For example, the estimated coefficient for the Post-1877 Dummy in model 1 is 5.556. This is the estimated increase that happens after 1877 for a country that has the mean ELF value (0.39). The coefficient of the interaction between this dummy and ELF being -2.01 suggests that the estimated change after 1877 in a province one standard deviation below mean ELF (which has an ELF of 0.13) is the difference between 5.556 and -2.01 and therefore 7.566 USD per male capita. On the other hand, in a province with an ELF measure one standard deviation above the mean (with an ELF of 0.65), this change is estimated to be 3.546. Therefore, the change that happens after 1877 is estimated to be almost 2.1 times as large in a province that has an ELF value one standard deviation above the mean compared to a province with an ELF one standard deviation below the mean.

To evaluate hypothesis 2b, we can check the coefficients of the *Percent Turkish * Post-1877 Dummy* and *Percent Turkish * Post-1897 Dummy* interactions. The coefficient for the Percent Turkish * Post-1877 Dummy interaction is 3.129 and is significantly estimated. This suggests that there is a 3.129 per male capita USD increase in the changes in fiscal revenues per one standard deviation increase (0.36) in the percentage of Turks, after 1877. Finally, the coefficient for the Percent Turkish * Post-1897 Dummy interaction is 3.765 and this coefficient also is estimated to be significantly different from 0. Hence, the change in the changes in fiscal revenues after 1897 is 3.537 per male capita USD higher per one standard

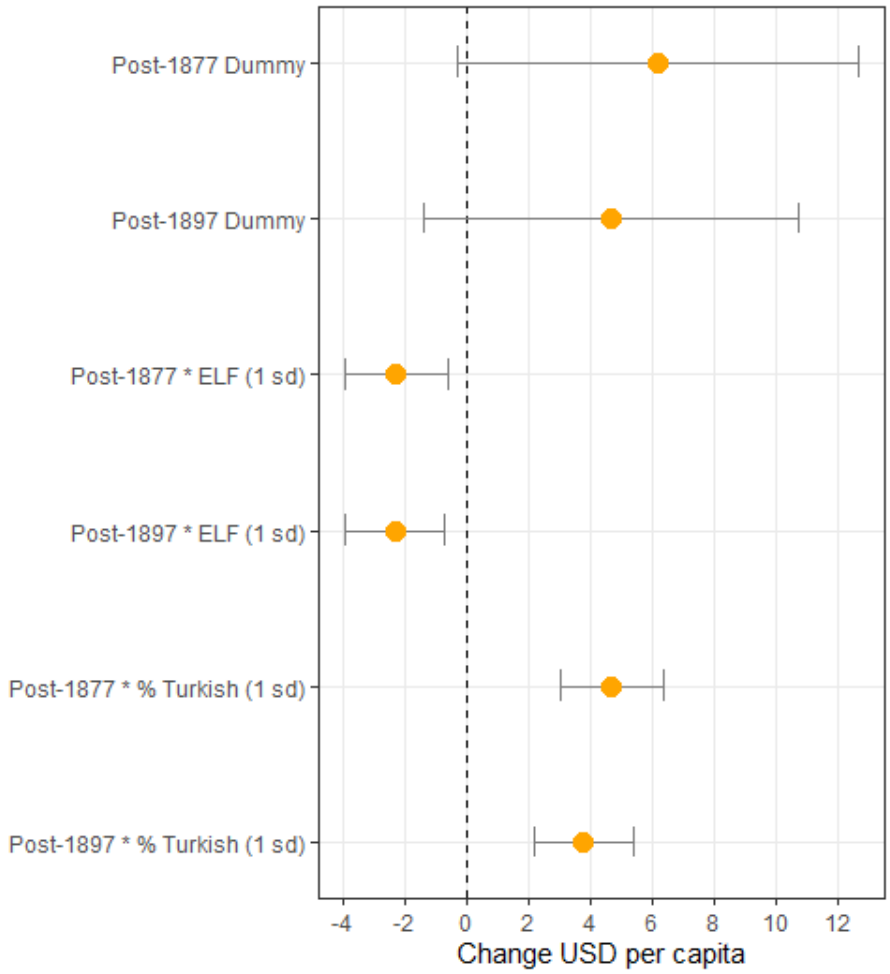
Table 3: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	22.338***
	(1.209)
Percent Turkish	11.029***
	(1.162)
Post-1877 Dummy	5.556*
	(3.124)
Post-1897 Dummy	6.266**
	(2.910)
ELF * Post-1877 Dummy	−2.010**
	(0.812)
ELF * Post-1897 Dummy	−2.087***
	(0.773)
Percent Turkish * Post-1877 Dummy	3.129***
	(0.805)
Percent Turkish * Post-1897 Dummy	3.537***
	(0.784)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	747
R^2	0.904
Adjusted R^2	0.893
Note: OLS Regression	*p<0.1; **p<0.05; ***p<0.01

deviation increase (0.36) in the percentage of Turks. The results, then, allow me to confirm hypothesis 2b, which expected the wartime change in fiscal revenues to be higher in more ethnically similar administrative units.

Overall, the results confirm all four hypotheses. Testing hypotheses 1a and 1b I found that homogeneity and similarity make it more likely that a census is completed. Testing

Figure 3: Coefficient Plots for the Difference-in-Differences Analysis



hypotheses 2a and 2b I found that wartime increases in fiscal revenues are higher in more homogeneous and more similar provinces, for each of the interstate wars.

One aspect of the results that are worth discussing is the relationship between diversity and the absolute levels of per capita fiscal revenues. I do not discuss these relationships in evaluating the hypotheses because the hypotheses apply to the wartime changes in per capita revenues, but not to the overall per capita revenues. The findings in table 3 show that overall per capita revenues are higher in provinces that have higher values of the ELF and Percent Turkish measures. These patterns, I argue, are likely due to other factors that explain per capita revenues in general, those I do not expect to affect ethnic composition's effect on the wartime changes in fiscal capacity via legibility. These factors can be the high volume of

trade, proximity to Europe or existence of ports with high volume of exports. These likely render Balkans, home to many heterogeneous provinces have higher per capita tax revenues and render some Arab and Central Anatolian provinces, which are very homogeneous, have lower per capita tax revenues.

4.2 Discussion of the Parallel Trends Assumption

One worry about the validity of the results on wartime increases in fiscal capacity can be the violation of the parallel trends assumption. A certain type of non-parallel trends in this case could be driving the results. This would look like a case where, for example, the per capita revenues in more homogeneous and more similar provinces were already rising at a higher pace compared to the less homogeneous and less similar ones before the two wars happened and kept rising at a higher pace after the war so that the wartime increases look higher in the more homogeneous and similar provinces.

I argue that there are no reasons to worry about this in this study. Year fixed effects account for any such trend. Other types of violations of the assumption can also be concerning. Even though it is not formally entirely possible to test the parallel trends assumption, I conducted an analysis which aim to show that the annual changes in the dependent variable before each of the wars are not correlated with any of the two explanatory variables. I simply interacted a year count variable with each of the explanatory variables. If the coefficients of these interaction terms are estimated to be statistically significant, this can be an indication that the pre-war trends in the per capita revenues across different values of the explanatory variables can jeopardize the parallel trends assumption.

I present the results in Table 4. Model 1 tests the trends for the years leading up to the war of 1877-78 from the starting point of the dataset, 1867 and Model 2 tests the trends for the years after the 1877-78 war and before the 1897 war. The results indicate that there is no pre-war trend that is correlated with either of the explanatory variables that can cause

Table 4: Pre-War Trends in the Revenues by ELF and ES Variables

	Dependent Variable:	
	Revenue Per Male Capita (in 1998 USD)	
	Pre-1877	Pre-1897
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	24.957***	19.606***
	(1.760)	(2.672)
Percent Turkish	10.753***	9.151***
	(1.821)	(2.490)
Year Count	−0.152	−0.056
	(0.188)	(0.088)
ELF * Year Count	−0.239	0.003
	(0.188)	(0.088)
Percent Turkish * Year Count	0.097	0.050
	(0.178)	(0.088)
Province Fixed Effects	Yes	Yes
Observations	218	297
R^2	0.929	0.899
Adjusted R^2	0.920	0.887
Note: OLS Regression.		*p<0.1; **p<0.05; ***p<0.01

any concern. The coefficients of the interactions of the explanatory variables with the Year Count variable are neither substantively, nor statistically significant.

4.3 Robustness Checks

In Appendix Section B I present the results of several robustness checks to ensure that the results are similar across different empirical specifications and also empirical analyses that use different data or measures. In Section B.1 I address potential endogeneity issues. To address the possibility that ethnic composition of a province may be driven by previous exposure to armed conflict, more specifically that provinces on which more wars are fought may be more likely to be more homogeneous due to the homogenization attempts of the state, I control for the total number of battles that occurred within the boundaries of a

province between 1600 and 1866 (the year before fiscal revenue dataset starts). I report the results in Appendix Table A.3, which indicate that the findings are robust to the inclusion of this variable.

In Section B.2 of the Appendix I report the results of the difference-in-differences analysis where I test whether the results are similar when I use Ethnoreligious Fractionalization (ERF) variable instead of the Ethnolinguistic Fractionalization variable. The ERF measure takes into account the religious and sectarian differences among the groups in addition to the linguistic ones. This should be checked since diversity in religious and sectarian identities can also undermine legibility (Blaydes 2018). This allows me to take into account important sectarian differences such as the Shi'i and Sunni Muslims especially in the province of Baghdad or the presence of Christian Arabs in the Levant, who are all coded as Arabic speakers in the ELF measure. Hence, I can take into account the greater challenges posed to the state by the different customs and networks that each religious group possesses. The results in Table A.4 indicate that higher ethnoreligious fractionalization also hinders war from increasing fiscal capacity during wartime. I discuss the measure and the empirical strategy in more detail in Appendix Section B.2.

I replicated the analysis using an alternative population data source and also alternative revenue data sources. The results in Tables A.5 and A.6 of the Appendix indicate that the findings are robust to each of these changes. A detailed description and discussion of these alternative data sources are in Appendix Section B.3.

Even though the ELF and Percent Turkish variables are not highly correlated (Pearson $r = -0.058$), in order to take into account any possible collinearity issue, I replicated the analysis in two separate models, excluding one explanatory variable from each model. In model 1, I remove the Percent Turkish variable and in model 2 I remove the ELF variable. The results remain robust. I report them in Table A.8 of the Appendix.

In order to check whether results are similar if I use a different statistical model, I replicated the analysis using a within-effects panel regression. The results I report in Appendix Table A.9 are similar to the original model and still support the main findings.

Next, I remove those provinces that were not yet established in the pre-1877 period (Beirut, Bitlis, Kosovo, Mamüretülaziz, Mosul and Van) and replicate the analysis with the subset of the provinces that exist for all three periods (pre-1877, 1877-1896 and 1897-1910). The results in Appendix Table A.10 reveal that the findings are still the same.

I also remove the three provinces that were most affected by the severe famine that happened in central Anatolia between 1873 and 1875 since the tax revenues of the state can be lower for these provinces during the course of the famine and these provinces have higher percentages of Turkish population than most other provinces. These three provinces are Kastamonu, Ankara and Konya (Quataert 1968). The results I report in Appendix Table A.11 are robust to the exclusion of these three provinces.

Finally, I restrict the analysis to the observations that exist after 1871, which is the date when the second Provincial Law by the empire reorganized the bureaucratic-administrative structures within the provinces (Kirmizi 2010). I report the results of this analysis in Appendix Table A.12, which are still robust.

In sum, the empirical analysis with the fiscal revenue data is consistent with the arguments which expect illegibility to hinder fiscal capacity building, and also expect illegibility to be higher in contexts with higher heterogeneity and lower similarity. The results are also robust to employing alternative measures, using alternative data sources and alternative empirical specifications. In the next two sections I evaluate the empirical implications of the mechanisms I suggest that drive these results and alternative explanations which can explain these empirical findings.

5 Testing the Mechanisms

5.1 Quantitative Evidence for the Mechanisms

The previous section demonstrated that wartime increases in fiscal capacity and also legibility are higher in ethnically homogeneous and similar provinces. In order to better test the theory I propose in this paper and its implications, it is necessary to check the empirical implications of the causal mechanisms I argue that link ethnic composition to wartime changes in fiscal capacity. One critical implication of the argument I can check with the data is the relationship between ethnic composition and the necessary cost of investment to increase fiscal capacity.

I expect collecting taxes to be more expensive in more illegible places. More specifically, the state should be investing more and spending more in the provinces where heterogeneity is higher and similarity is lower. With this, I formulate Hypotheses 3a and 3b:

Hypothesis 3a: *The costs of invesment in fiscal capacity are lower in more homogeneous administrative units.*

Hypothesis 3a: *The costs of invesment in fiscal capacity are lower in more similar administrative units.*

I construct a simple measure of expense-to-revenue ratio by dividing the total expenses the state made in a province to the revenues it collected in the same province. This measure indicates how much the state has to invest in a province to extract a unit revenue.

Unfortunately, I do not have sancak-level data for this variable, but have to use province-level ones, meaning that I have only 29 observations. I use the province-level fiscal statistics published by the Ottoman state for the fiscal year 1325 (1909/1910) in the Fiscal Statistics Journal (Ihsaiyat-i Maliye). These expenses include all the wages paid to the local-level bureaucrats working under various ministries or other departments under the

direct control of the government, the local-level expenses of these ministries and departments, and the expenses made for the collection of direct and indirect taxes, such as the wages for those bureaucrats who were responsible for counting and assessing taxes and any other form expenses such procedures cost. The total revenues are those revenues that I used in the original dataset.

In the analysis I control for province-level covariates that can confound the relationship between legibility and the expense-to-revenue-ratio. These are the total male population of the province since more populous provinces can be more difficult to administer, a dummy that indicates whether the province has any sea opening, since this can indicate higher trade and export opportunities and therefore more commercialized and monetized agricultural transactions with increased taxation opportunities, a railroad dummy since this can make the control of the state easier and tax collection cheaper, the average elevation of the province since it can be more difficult to control territories with difficult geographies, a dummy indicating whether the state has any land border to other polities or uncontrolled territory to account for the possibility of increased exports but also that an increased risk of losing a border province may make the state less likely to invest here. Due to the high collinearity caused by other three geographic variables, the distance from the capital (Istanbul), average slope and the total area that the province covers, I had to exclude them from the analysis.

The results in Table 5 using OLS models indicate relationships that are in the expected direction. Model 1 indicates that one standard deviation increase in the ELF score increase the expense-to-revenue ratio by 0.209 while one standard deviation increase in the percentage of the Turkish population in the province decreases this ratio by 0.441. These are substantively large, even though the coefficient of the ELF variable is not significant at the 0.05 level, but misses this conventional level of significance by a very slight margin. The mean of the expense-to-ratio variable is 1.16 and its standard deviation is 1.298. Hence, one standard deviation increase in ELF increases the expense-to-revenue ratio by 0.16 standard

deviations and one standard deviation increase in the Percent Turkish variable decreases the expense-to-revenue ratio by 0.34 standard deviations.

A brief examination of the data reveals that the Hejaz Province (roughly today's Southern Jordan and Western Saudi Arabia) is a very distinct outlier, with an ELF score of 0 but an expense-to-revenue ratio of 7.37, which means that per each unit tax revenue in this province the state had to spend 7.37 units of money. This is a result of this province containing the Muslim holy cities of Mecca and Medina. Its value to the empire was mostly the prestige that it could endow the Ottoman rulers with, thanks to ruling over these holy cities, even though it had little agricultural or commercial activities compared to other Ottoman provinces. The Ottoman state heavily subsidized this province (Ochsenwald 1975).

Table 5: Analysis of the Expense-to-Revenue Ratio for the Fiscal Year 1909-10

	Dependent Variable:	
	Expense-to-Revenue Ratio	
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	0.209^{*}	0.159^{**}
	(0.102)	(0.073)
Percent Turkish	-0.441^{***}	-0.356^{***}
	(0.112)	(0.081)
Constant	-0.074	0.220
	(0.339)	(0.248)
Controls	Yes	Yes
Observations	29	28
R^2	0.900	0.692
Adjusted R^2	0.867	0.584
Note: OLS Regression	*p<0.1; **p<0.05; ***p<0.01	

In order to account for this special status of Hejaz province, in the second model I rerun the analysis excluding Hejaz. The magnitude of the coefficients for the ELF and Percent Turkish variables decline, but so do their standard errors. In model 2, the coefficient of the ELF variable, in addition to the Percent Turkish variable, is estimated to be significantly different than 0 at the conventional levels of 0.05. The magnitude of the coefficients may

be better understood in terms of how many standard deviation changes they correspond to. Upon excluding Hejaz the mean of the expense-to-ratio variable declines to 0.939 and its standard deviation declines to 0.519. This means that one standard deviation increase in ELF is estimated to increase the expense-to-revenue ratio by 0.31 standard deviations and one standard deviation increase in the Percent Turkish is estimated to decrease the expense-to-revenue ratio by 0.69 standard deviations. These results confirm hypotheses 3a and 3b. The cost of investment in fiscal capacity is higher in more diverse places.

In Appendix Table A.7 I replicate this analysis only for those items of expenses that are–arguably–more relevant for purposes of increasing legibility and tax collection rather than the total expenses.[14] Overall, the results are still consistent with the expectation that ethnic dissimilarity and ethnic heterogeneity should increase the expense-to-revenue ratio.

5.2 Qualitative Evidence from the Correspondences Between the Center and the Bureaucrats in the Periphery

There are a myriad of documents in the Ottoman archives regarding the attempts of the state to count, rule and tax its subjects. In many of these documents we can find instances exemplifying how little the state's agents knew about the people and how the problems regarding language and legibility limited the state's projection of its power to the periphery and especially where minority populations lived. An important note of caution for this subsection is that it does not intend to present any systematic evidence, nor can it systematically evaluate any of the hypotheses. I have already done these in the preceding sections. Here, I present additional evidence from the archival sources, which can at best interpreted as *additional support* for the quantitative analyses I conducted. Obviously it would be ideal to discuss the archival evidence in a more systematic fashion. However, unfortunately the "data generating process" has prompted me to choose this path. The documents in the Ottoman archives are searched by keyword and after searching for the documents with the relevant

[14]See Appendix Section B.3 for these items.

keywords I could reach these documents. This means that I reached these documents after a specific selection process based on the keywords I am already interested in and the existence of phenomena such as the difficulties in counting the populations and problems in the administration due to diversity of languages in these documents led me to them.

I start with an example from the year 1847 which illuminates how the state administrators had trouble counting the minority populations. The müşir (district governor) of Sayda (Sidon) in today's Lebanon writes a letter to the center where he describes the difficulties he has encountered or expects to encounter during the census he is supposed to conduct (BOA.A.MKT. 66/2). Here, he puts a lot of emphasis on the fact that this census is necessary to start military conscription and direct tax collection in the area. While he reports that he expects the census to proceed smoothly in some areas, he discusses potential problems that can arise due to the existence of large Christian populations and also because the populations are very mixed in this region. He notes that the notables of the communities in these regions should be summoned and that they should be informed about the benefits of a census since otherwise the spreading rumors (about the census) among the Christian communities here could generate resistance.

The difficulties posed by local languages gave the Ottoman administration several choices. One was to teach its bureaucrats the local languages (Karpat 1985, p.32, fn. 38). However, this is only a strategy that the administration could rely on in the long term. This requires significant investment in opening schools and educating students at these schools. Another long-term strategy was to open schools in the provinces and educate bureaucrats among the populations who already speak the local language, or to send students from other regions there to be instructed in the local language. The state opened schools in the provinces, providing education in administration and law, to invest in future administrators and judges with a command of local language (i.e., BOA.BEO. 4185/313863). Nevertheless, this is still not ideal to achieve a high-capacity state. These bureaucrats could only be assigned to regions where the language they learn is spoken, but not anywhere else. This

and the fact many of them were already from these local populations risk the possibility that they will build local patronage relationships undermine the state's control and capacity.

A third strategy, was to narrow the pool of candidates for the job and send those who could speak the local language. Yet, I argue that such a strategy also jeopardizes the state's capacity. A particular appointment of a kaimmakam (district governor) for the kaza (third level administrative unit) of Rada (Rada'a) in Yemen is informative of how minority languages could cause problems in administration and hindered administrative capacity (BOA.TFR.I.A. 28/2756). In this telegram, it is noted that the governor of this district has left for Istanbul and resigned his post. The main aim of this telegram is to inform the recipient that a correspondence clerk of second-class (ikinci sınıf tahrirat katibi) named Mustafa Fehmi Efendi with sufficient knowledge of the Arabic language and customs (lisan ve mizac-ı Arab'a vakıf) has been assigned as the district governor here since no assistant district governors with a command of the Arabic language and customs accepted this post.

Another telegram sent from the center to the Yemen governorate (BOA.DH.MKT. 1838/16) mentions a civil service examination of the district governors and many other bureaucrats throughout the Yemen province where those who failed would not be able to keep their jobs. Apparently, many did fail. However, the central government asks the governor to be more tolerant (müsamahakar) towards those who could speak the local language and that they should not be dismissed from their position without explicit approval from the center.

I believe that these two cases in Yemen present some evidence how different languages can constrain administrative capacity. In Yemen, the local population speaks Arabic. In the first example, the central state wants to send someone who speaks Arabic and also someone who is familiar with the Arab customs. However, this severely narrows the number of potential candidates for the job. When all of the potential candidates who are even by then assistant governors refuse the job, they have to pick someone from even the lower ranks of the administration, likely someone who has less experience and less competence for the

job. In the second case, those bureaucrats who were not competent enough for their jobs, those who failed the examination, would keep their job because they speak Arabic.

Language posed a similar problem in the Balkans, a very diverse region. In a letter written to the sadaret (office of the prime minister) by the Rumeli Müfettişliği (Rumeli Inspectorship) informs them that in the provinces of Manastır, Kosova and Selanik the new district governors to be appointed would be required to speak French in addition to have good command of a local language (BOA.TFR.I..A 36/3546).[15] However, it would still be not ideal if the district governor speaks only one of the local languages. A brief look at the demographic structure in these three provinces reveals that they are home to large communities who speak Albanian, Bulgarian, Greek and Serbian, in addition to Turkish. Any administrator who speaks only one of these languages cannot be shuffled to districts where other languages are spoken, but can only be shuffled across districts where the dominant language is the one he speaks. This, as I argued above, is not great news to improve capacity.

We can also see how language problems affected those in positions of tax administration and collection. A letter sent to the head treasurer in the province of Manastir from its district Kozan (Kozani) in today's Greece complains that the clerk who was assigned here did not speak Greek (BOA.TFR.I..MN. 138/13707). Outlining that this is a problem, the letter goes on to ask that all the officials who are assigned to different townships and villages should speak the local language in addition to Greek. Once again, the multitude of languages require bureaucrats with better language skills even at the village level, which is more costly to the state.

The fact that where it lacked sufficient control the state had to rely on local intermediaries in counting, ruling and taxing the populations presented a dilemma. The local intermediaries often had an incentive to undercount the populations (Doumani 1994). Their incentives to undercount were due to the following reasons: Many local intermediaries had

[15]This inspectorship aimed to implement reforms in three Balkan provinces, Manastır, Kosova and Selanik.

tax farming contracts (Pamuk 2014) or were responsible to administer communal taxes.[16] Undercounting the population would help them obtain cheaper tax farming contracts and lower the amount of communal taxation demanded by the state. They could increase their profits by pocketing the difference, or if they eased the tax burdens on the local people their position as local notables could be more secure thanks to their popularity by providing better patronage to their clients (Doumani 1994). Finally, where the local notables were landowners, undercounting meant fewer military conscripts and more peasants continuing to work on the land. In short, undercounting brought less tax revenues and fewer military conscripts for the state.

In his discussion of an Ottoman attempt to count the population of Nablus in the year 1849, Doumani (1994) perfectly summarizes the dilemma of having to rely on local intermediaries. Noting that the advisory council of Nablus and the census bureau that had recently been created were the two most important agencies through which the control of the central government could be consolidated, he remarks that to be efficient, these institutions had to be staffed by "local leaders" who had a certain degree of knowledge of and influence in the area. However, when these institutions were staffed by them, "...the very social elements who stood to lose from the extension of central control manned the official bureaucratic posts charged with implementing these reforms" (Doumani 1994). Lacking sufficient knowledge of diverse areas, in this specific case Nablus, relying on local intermediaries was necessary to project their rule over these territories and tax them. However, the very same reliance on the intermediaries made it very difficult for the state to exert a higher degree of control and extract more revenues. Because of this, focusing state building efforts on less diverse provinces should have been the ideal strategy for the state.

[16] In communal taxation (ancemaatin vergi), community leaders who were often local notables were responsible to collect a designated amount of revenue from their communities. They were responsible for the allocation of the tax among their own communities, collecting the allocated amount from each individual and delivering the taxes to the government (Özbek 2015).

6 Testing Alternative Explanations

Several factors that the literature points out as determinants of the state's decision to invest in the fiscal capacity of some regions or why it can successfully increase fiscal capacity during wartime can pose threats to the validity of my arguments as rival explanations. Such explanations will pose threats if they are correlated with diversity. One can be nationalism. Even though nationalism cannot explain why we see higher increase in more homogeneous places, it can be a rival mechanism to explain the higher wartime increases fiscal capacity where percentage of Turks were higher. However, this is unlikely to be true because Turkish nationalism is an ideology that first emerged among the elite and later diffused in a top-down manner to the larger population in a nation-building project during the Turkish Republic (Bayar 2014). It was not a prevalent ideology neither among the elite nor among the masses during the period that this study focuses on and it is extremely unlikely that the common people even had any ethnic consciousness. In fact, observers of the period write that even the meaning of the word 'Turk' was unclear and was sometimes used as an insult (Creasy 1854, p.7; see also Kushner 1977, pp.20-21).

The lack of ethnic consciousness among Turkish speaking Muslims in the empire also seems to be confirmed by a British officer who had travelled to the Ottoman Empire and wrote in 1908: "But if you say to a Mohammedan in Turkey 'are you a Turk?' he is offended, and probably answers, I am 'Osmanli' [Ottoman], or the Turkish equivalent of these words. An Osmanli Turk, if he says a man is a Turk, would mean that he is a lout or clodhopper" (Woods 1908, p.163; cf. Kushner 1977).

We can also see that this phenomenon had its repercussions in Turkish literature. Famous author, intellectual and politician in the early Turkish Republic, Yakup Kadri Karaosmanoğlu criticizes the Anatolian villagers of Turkish ethnicity for their lack of support for the Turkish War of Independence (1918-1923) and their ignorance of Turkish nationalism (Karaömerlioğlu 2002) and the following dialogue between a nationalist former army officer and a villager from his famous novel Stranger (Yaban) offers an important clue to how the

concept of ethnicity and the ideology of nationalism were alien to an ordinary Ottoman citizen of Turkish ethnicity even as late as the Turkish War of Independence:

> Villager (V): "I know sir, you are one of them."
>
> Officer (O): "Who are they?"
>
> V: "Those who are on the side of Kemal Pasha."[17]
>
> O: "How can someone be Turkish and not be on the side of Kemal Pasha?"
>
> V: "We are not Turkish, sir."
>
> O: "What are you then?"
>
> V: "We are Muslims, praise to God... Those live in Haymana." (Karaosmanoğlu 2003 [1932], pp. 152-3. Own translation).[18]

In sum, nationalism is unlikely to be responsible for the higher wartime increase in fiscal capacity because Turkish nationalism was almost nonexistent, or at best was just flourishing among the more educated elite during the period of this study and ethnic consciousness was far from prevalent among the masses who spoke Turkish.

Another alternative mechanism to worry about can be levels of urbanization since it may have determined the levels of state strength (Tilly 1992; Abramson 2017). Regarding fiscal capacity, higher rates of urbanization is expected to influence tax revenues overall because it is easier to monitor and assess urban tax bases compared to rural and agricultural tax bases and urban economic transactions are more monetized (Karaman and Pamuk 2013) or because urban populations have preferences that are more acceptant of taxation (Andersson 2018).

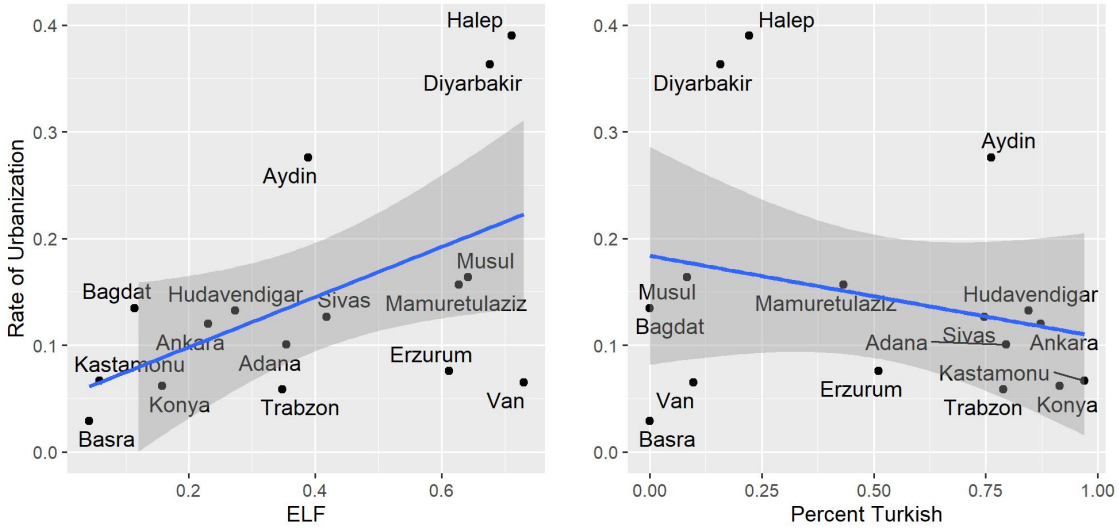
[17] Refers to Mustafa Kemal Atatürk, who was leading the Turkish War of Independence.

[18] The original text in Turkish is:

> "Biliyorum beyim, sen de onlardansın, emme."
> "Onlar kim?"
> "Aha, Kemal Paşa'dan yana olanlar..."
> "İnsan Türk olur da nasıl Kemal Paşa'dan yana olmaz?"
> "Biz Türk değiliz ki beyim."
> "Ya nesiniz?"
> "Biz Islam'iz Elhamdülillah... O senin dediklerin Haymana'da yaşarlar."

Urbanization should not be a factor to be worried about in the context of this study unless it is negatively correlated with the ELF and positively correlated with the ES measures. Using Cuinet's (1890-95) work that reports the population of certain Ottoman urban centers, I constructed urbanization measures for each province for which Cuinet provides data. There is positive correlation (Pearson $r = 0.57$) between the ELF measure and the urbanization, while a slight negative correlation (Pearson $r = -0.18$) between the ES measure and urbanization. Neither of these relationships indicate that urbanization is correlated with ELF and ES in a way that can explain the results. The scatterplots in Figure 4 plot the relationships between these variables.

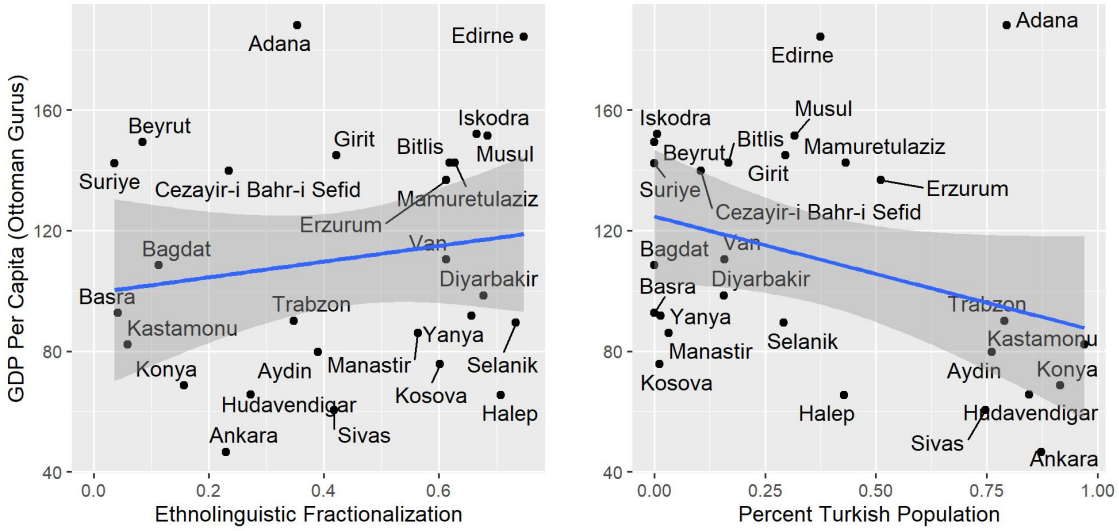
Figure 4: Urbanization and Ethnic Composition



GDP per capita can be another alternative explanation worth considering since there has been evidence in the literature that higher GDP per capita enables higher tax revenue per capita (Besley and Persson 2011). The concern here can be that wartime increases happen in provinces with higher GDP per capita since there is more to tax in these provinces, with higher economic output. However, GDP per capita should not be a problem unless it is negatively correlated with ELF and positively correlated with ES measures. Province-level GDP estimates are available in the 1897 Statistics Book published by the Ottoman State

(Güran 1997). Using the province-level GDP estimates and the population estimates in my dataset I calculated the GDP per capita estimates for each province.[19] The scatterplots I present in Figure 5 below indicate that GDP per capita has a slight positive correlation with ELF at the province level, and is negatively correlated with ES. Neither of these factors, at least in the year 1897, correlate in a way with GDP per capita to indicate that GDP per capita can be the factor that can cause the outcome.

Figure 5: GDP per Male Capita and Ethnic Composition



A final alternative mechanism to consider can be the easier transferability of technology and innovations in places with homogeneous populations and across places with groups of similar ethnic identity. According to Tilly, "In a homogeneous, connected population, an administrative innovation installed and tested in one region had a reasonable chance of working elsewhere, and officials could easily transfer their knowledge from one locality to another" (1992, p.100). Nevertheless, I do not think that we can think of this mechanism as separate from legibility. First and foremost, it is impossible for the state to know the ethnic composition of the population in certain regions without rendering these populations legible.

[19]The book also provides the GDP per capita estimates; however, some population numbers they provide are highly unreliable. Therefore, I decided to use the population estimates I myself compiled for the provinces.

Only after this it can decide what technology to transfer here, according to the technologies that were successful under similar ethnic compositions. Furthermore, merely learning about the ethnic composition is not the only problem. The state would also need to learn about the economic activities, such as the types of products that are grown so that it can transfer new taxation technology here. This, again, requires that the legibility problem be solved.

7 Conclusion

This paper contributes to the literatures on distributive politics and the development of the state by examining how the problems of legibility resulting from ethnic composition shape the patterns of state building and taxation. Empirically it focuses on the final years of the Ottoman Empire, an empire that was struggling to enhance its capacities and collect revenues, which I argue was at least partly due to the diversity of its population.

I argued that where populations are more diverse, it should increase the illegibility of the populations to the state. I expected illegibility to increase the costs of investment in fiscal capacity building. Because the costs of this investment are cheaper in more homogeneous and more similar localities, I expected the state to invest in the fiscal capacities of more homogeneous and more similar localities during wartime, when they need to increase revenues.

Using an original dataset of local-level fiscal revenues in the Ottoman Empire, I found that the wartime increases in fiscal capacity were indeed higher where populations were more homogeneous and similar. To demonstrate that the mechanism operates through increasing the costs of investment in more diverse places, I showed that the ratio of the state's expenses to its revenues are higher in more diverse localities.

With these two findings come the two main contributions of this study. Firstly, it provides empirical evidence that diversity impedes state building by increasing the costs of investment in fiscal capacity. This is in line with the findings in Blaydes (2018) who argues

that diversity was a main reason of the Iraqi state's weakness and Gennaioli and Voth (2015) who find cross-national evidence that heterogeneity was detrimental to the state's fiscal capacity. Both of these studies argue that diversity increases the cost of investment in the state's capacity.

This finding can also speak to the literature on the link between economic development and diversity. High state capacity paves the way for economic development (Besley and Persson 2010; Dincecco 2017). The finding that diversity constrains the state's capacity building due to legibility problems can also have implications for economic development. It suggests legibility can be an alternative mechanism why diversity is associated with worse economic outcomes (Easterly and Levine 1997; Alesina and La Ferrara 2005). Where they cannot and are unlikely to enjoy high tax revenues, states may be less likely to invest in public goods and create economic growth.

The second main contribution of this study is about the distributional consequences of the variation in legibility and the cost of investment. I found that wartime increases in fiscal revenues are higher in places with a higher percentage of Sunni Muslim Turks. This underlines an interesting paradox where the members of the dominant group in the society have to shoulder an increasingly higher share of the tax burdens during periods of state building. The mobilization in wartime, when the state invests in fiscal capacity to extract higher revenues put more burden on Turkish populations than minorities. This is an analogous situation to that Kasara (2007) finds in Africa, where co-ethnics of the leader of a country were taxed at a higher rate. The difference between the two is that in Kasara's story co-ethnics bear heavier burdens because they cannot escape the ruler's grasp. Here, it is because the state knows and can learn more about them with lower investment. This paradox is also reminiscent of the findings by Kuran and Rubin (2018) and Cansunar and Kuran (2019), where the groups the law was biased in favor of ended up being harmed due to this bias.

In addition to these two main contributions, this study speaks to other debates on state building. The finding that wartime increases in fiscal revenues are higher in more homogeneous and similar places suggests that the 'war makes states' relationship is likely to be conditional on sufficient ethnic homogeneity and similarity. This can offer an explanation why war is often found to be not creating stronger states in contexts other than early modern Western Europe (Herbst 2000; Heydemann 2000; Centeno 2002). It also joins several other studies that found war's effect on fiscal capacity to be conditional on different factors such as urbanization and regime type (Karaman and Pamuk 2013), access to international credit markets (Queralt 2019), and executive constraints (Lee and Paine 2020), in addition to Tilly's (1992) emphasis on a certain combination of urbanization and commercialization, bringing about what he calls 'national states', that made war strengthen states.

Finally, demonstrating that the state was more likely to achieve to complete censuses in places where the populations were more homogeneous and more similar, this study adds to a burgeoning literature on the origins of the state's informational capacity and the population's legibility to the state (Lee and Zhang 2017; Brambor et al. 2020). This indicates that diversity can be responsible for instances of low legibility of the society to the state and lower informational capacity of the state, resonating with the arguments by Scott (1998), Blaydes (2018), and Charnysh and McElroy (2020).

Although I evaluate the arguments in this paper within the context of a single country to minimize potential empirical problems in cross-national research, especially the problems in comparing fiscal capacity across different countries, the argument I develop in this article can also be applied to other contexts and at the national level. The higher costs of obtaining information about the population and rendering it legible should also be reflected at the country level. The more heterogeneity and dissimilarity there is at the local level, the more heterogeneity and dissimilarity at the country level there will be and it should be more costly to enhance fiscal capacity in more heterogeneous and dissimilar countries, which should make investments and therefore increases in fiscal capacity less likely. Indeed, Gennaioli and Voth

(2015), who argue that homogeneity makes investment in fiscal capacity cheaper, provide cross-country evidence that homogeneity is beneficial for building fiscal capacity.

Following Johnson and Koyama (2017) we can consider a few countries to assess how ethnic heterogeneity might have stifled state capacity building efforts. The fact that more homogeneous countries like England and Netherlands were very successful in earlier periods in increasing their fiscal capacity while more heterogeneous countries like France, Habsburg Empire, Ottoman Empire, Russia and Spain lagged behind these two countries (Karaman and Pamuk 2013) can be worth thinking about in this sense. While a given war was more likely to have inclined the former group to invest in fiscal capacity, for the latter this investment was much more expensive. This is why the investment and the ensuing increases in fiscal capacity may have happened later in the latter group, when technology was more developed (for instance with better transportation and communication networks) and also when they started homogenizing their populations, both of which decrease the costs of investment to exert control over their wider territory and increase fiscal capacity.

Homogenization of populations and building nations constitute a significant step in modernization and state building (Tilly 1975, 1992). An important aspect of these processes of modernization and state building was a unified language (Weber 1976; Anderson 1983; Gellner 1983). Taking a step back and trying to grasp a bigger picture of the process of state building, the findings in this paper support the view that the top-down nation building and ethnic homogenization projects during times of modernization and state building were probably followed since heterogeneous populations hampered state building. It also supports the view that the ethnic, linguistic and cultural homogenization policies that the elite in the Ottoman Empire and the Turkish Republic pursued from the 1910s on were a response to the difficulties in developing state capacity under a homogeneous society. By the 1910s, the empire was still home to a highly diverse population. So was the early Turkish Republic, even though to a lesser extent.[20] The developing Turkish republic followed a

[20]See the 1927 Census of Turkey.

policy of assimilation and ethnic homogenization (Üngör 2011; Bayar 2014). This involved forcing non-Turkish speakers to start speaking Turkish (Bayar 2011), the Turkification of the economy by transferring wealth from minorities to Turks (Aktar 2001) and a population exchange between Greece and Turkey (Aktar 2003; Shields 2013). This episode of homogenization of the population in the Ottoman Empire and Turkey also includes acts of violent ethnic cleansing such as the Armenian Genocide (Suny 2015).

It is possible to interpret the phenomenon of states homogenizing their populations during state building within Tilly's framework where empires and city states converged towards a new form, the national state (1992).[21] Empires are by definition home to diverse populations while the end product, the national state, is much more homogeneous. The trajectory from empire to national state Tilly describes, then, may involve an endogenous process where more homogeneity enabled development (during mobilization for war), and to achieve development the states may have resorted to homogenizing their populations, often by assimilation and committing atrocities.

[21] One note of caution is that Tilly does not use this term to refer specifically to 'nation states' or states based on ethnic nationalism.

References

Abramson, Scott F. (2017). "The Economic Origins of the Territorial State". In: *International Organization* 71.1, pp. 97–130.

Aktar, Ayhan (2001). *Varlık vergisi ve "Türkleştirme" politikaları*. 5th ed. İletişim Yayınları. Cağaloğlu, İstanbul: İletişim Yayınları.

— (2003). "Homogenizing the Nation, Turkifying the Economy: The Turkish Experience of Population Exchange Reconsidered". In: *Crossing the Aegean: An Appraisal of the 1923 Compulsory Population Exchange between Greece and Turkey*. Ed. by Renée Hirschon. New York; Oxford: Berghahn Books, pp. 79–96.

Akyıldız, Ali (2004). *Osmanlı bürokrasisi ve modernleşme*. Cağaloğlu, İstanbul: İletişim.

Alesina, Alberto, Arnaud Devleeschauwer, et al. (2003). "Fractionalization". In: *Journal of Economic Growth* 8.2, pp. 155–194.

Alesina, Alberto and Eliana La Ferrara (2005). "Ethnic Diversity and Economic Performance". In: *Journal of Economic Literature* 43.3, pp. 762–800.

Anderson, Benedict R. O'G (Benedict Richard O'Gorman) (1983). *Imagined communities : reflections on the origin and spread of nationalism*. London: Verso.

Andersson, Per F. (2018). "Democracy, Urbanization, and Tax Revenue". In: *Studies in Comparative International Development* 53.1, pp. 111–150.

Antonean, Aram (1975). *Balkan harbi tarihi*. İstanbul: Sander Yayınları.

Arpee, Leon (1936). "A Century of Armenian Protestantism". In: *Church History* 5.2, pp. 150–167.

Barkey, Karen (2008). *Empire of difference : the Ottomans in comparative perspective*. New York: Cambridge University Press.

Bayar, Yeşim (2011). "The trajectory of nation-building through language policies: the case of Turkey during the early Republic (1920–38)". In: *Nations and Nationalism* 17.1, pp. 108–128.

— (2014). *Formation of the Turkish nation-state, 1920-1938*. New York, NY: Palgrave Macmillan.

Besley, Timothy and Torsten Persson (2010). "State Capacity, Conflict, and Development". In: *Econometrica* 78.1, pp. 1–34.

— (2011). *Pillars of prosperity: the political economics of development clusters*. Princeton, N.J.: Princeton University Press.

Blaydes, Lisa (2018). *State of repression: Iraq under Saddam Hussein*. Princeton, New Jersey: Princeton University Press.

Brambor, Thomas et al. (2020). "The Lay of the Land: Information Capacity and the Modern State". In: *Comparative Political Studies* 53.2, pp. 175–213.

Brewer, John (1989). *The sinews of power : war, money, and the English state, 1688-1783*. Boston: Unwin Hyman.

Cansunar, Asli and Timur Kuran (2019). "Economic Harbingers of Political Modernization: Peaceful Explosion of Rights in Ottoman Istanbul". Working Paper.

Centeno, Miguel Angel (2002). *Blood and debt : war and the nation-state in Latin America*. University Park, Pa: Pennsylvania State University Press.

Charnysh, Volha and Brendan McElroy (2020). "Explaining outgroup bias in weak states: religion and legibility in the 1891-92 Russian famine". Working Paper.

Clodfelter, Micheal (2008). *Warfare and armed conflicts: a statistical encyclopedia of casualty and other figures, 1494-2007*. Jefferson, N.C.: McFarland.

Coşgel, Metin M. (2005). "Efficiency and Continuity in Public Finance: The Ottoman System of Taxation". In: *International Journal of Middle East Studies* 37.4, pp. 567–586.

Creasy, Edward Shepherd (1854). *History of Ottoman Turks; from the beginning of their empire to the present time*. Vol. 1. London: R. Bentley.

Croco, Sarah E. and Jessica L. P. Weeks (2016). "War Outcomes and Leader Tenure". In: *World Politics* 68.4, pp. 577–607.

Dincecco, Mark (2017). *State capacity and economic development : present and past*. Cambridge: Cambridge University Press.

Doumani, Beshara B. (1994). "The Political Economy of Population Counts in Ottoman Palestine: Nablus, circa 1850". In: *International Journal of Middle East Studies* 26.1, pp. 1–17.

Easterly, William and Ross Levine (1997). "Africa's Growth Tragedy: Policies and Ethnic Divisions". In: *The Quarterly Journal of Economics* 112.4, pp. 1203–1250.

Garfias, Francisco and Emily A. Sellars (2020). "From Conquest to Centralization: Domestic Conflict and the Transition to Direct Rule". In: *The Journal of Politics*.

Gellner, Ernest (1983). *Nations and nationalism*. New perspectives on the past. Oxford, England: Blackwell.

Gennaioli, Nicola and Hans-Joachim Voth (2015). "State Capacity and Military Conflict". In: *The Review of Economic Studies* 82.4, pp. 1409–1448.

Güran, Tevfik, ed. (1997). *Osmanlı Devleti'nin ilk istatistik yıllığı 1897*. Ankara: T.C. Başbakanlık Devlet İstatistik Enstitüsü.

Harrison, E. F. (1984). "Report by Mr. E. F. Harrison on the Finances of Turkey". In: *British documents on foreign affairs: reports and papers from the Foreign Office confidential print. Part I, Series B: From the mid-nineteenth century to the First World War. The Near and Middle East, 1856-1914*. Ed. by David Gillard et al. Vol. 7. Frederick, MD: University Publications of America.

Herbst, Jeffrey I. (2000). *States and power in Africa : comparative lessons in authority and control*. Princeton, New Jersey: Princeton University Press.

Heydemann, Steven, ed. (2000). *War, institutions, and social change in the Middle East*. Berkeley: University of California Press.

Hintze, Otto (1975). *The Historical Essays of Otto Hintze*. Edited with an Introduction. by Felix Gilbert, with the Assistance of Robert M. Berdahl. New York: Oxford University Press.

Johnson, Noel D. and Mark Koyama (2014). "Tax farming and the origins of state capacity in England and France". In: *Explorations in Economic History* 51, pp. 1–20.

— (2017). "States and economic growth: Capacity and constraints". In: *Explorations in Economic History* 64, pp. 1–20.

Karal, Enver Ziya (1943). *Osmanlı Imparatorluğunda ilk nüfus sayımı, 1831*. Ankara: Ankara Basım ve Ciltevi.

Karaman, K. Kivanç and Şevket Pamuk (2010). "Ottoman State Finances in European Perspective, 1500–1914". In: *The Journal of Economic History* 70.3, pp. 593–629.

Karaman, K. Kivanç and Şevket Pamuk (2013). "Different Paths to the Modern State in Europe: The Interaction Between Warfare, Economic Structure, and Political Regime". In: *American Political Science Review* 107.3, pp. 603–626.

Karaomerlioglu, Asım (2002). "The peasants in early Turkish literature". In: *East European Quarterly* 36.2, pp. 127–153.

Karaosmanoğlu, Yakup Kadri (2003). *Yaban*. 44-45th ed. İstanbul: İletişim Yayınları.

Karpat, Kemal H. (1978). "Ottoman Population Records and the Census of 1881/82-1893". In: *International Journal of Middle East Studies* 9.3, pp. 237–274.

— (1985). *Ottoman population, 1830-1914 : demographic and social characteristics*. Madison, WI: University of Wisconsin Press.

Kasara, Kimuli (2007). "Tax Me If You Can: Ethnic Geography, Democracy, and the Taxation of Agriculture in Africa". In: *American Political Science Review* 101.1, pp. 159–172.

Kirmizi, Abdulhamit (2010). "Taming the Governors: The Swinging Pendulum of Power over the Ottoman Provinces in the Nineteenth Century". In: *The International Journal of Regional and Local Studies* 6.1, pp. 4–23.

Köksal, Yonca (2002). "Local intermediaries and Ottoman state centralization : a comparison of the Tanzimat reforms in the provinces of Ankara and Edirne, 1839-1878". PhD thesis. Columbia University.

Kuran, Timur and Jared Rubin (2018). "The Financial Power of the Powerless: Socio-Economic Status and Interest Rates Under Partial Rule of Law". In: *The Economic Journal* 128.609, pp. 758–796.

Kushner, David (1977). *The rise of Turkish nationalism, 1876-1908*. Totowa, N.J.: Cass.

Lee, Alexander and Jack Paine (2020). "The Great Revenue Divergence." Working Paper.

Lee, Melissa M. and Nan Zhang (2017). "Legibility and the Informational Foundations of State Capacity". In: *The Journal of Politics* 79.1, pp. 118–132.

Levi, Margaret (1988). *Of rule and revenue*. Berkeley: University of California Press.

Lieberman, Evan S. (2002). "Taxation data as indicators of state-society relations: Possibilities and pitfalls in cross-national research". In: *Studies in Comparative International Development* 36.4, pp. 89–115.

Livny, Avital (2020). *Trust and the Islamic advantage: religious-based movements in Turkey and the Muslim world*. Cambridge: Cambridge University Press.

Marashlian, Levon (1991). *Politics and demography : Armenians, Turks, and Kurds in the Ottoman Empire*. Cambridge, Mass: Zoryan Institute.

Mayshar, Joram, Omer Moav, and Zvika Neeman (2017). "Geography, Transparency, and Institutions". In: *American Political Science Review* 111.3, pp. 622–636.

McCarthy, Justin and J. Dennis Hyde (1979). "Ottoman Imperial and Provincial Salnames". In: *Review of Middle East Studies* 13.2, pp. 10–20.

Migdal, Joel S. (1988). *Strong societies and weak states: state-society relations and state capabilities in the Third World*. Princeton, N.J: Princeton University Press.

Montalvo, Jose G. and Marta Reynal-Querol (2005). "Ethnic diversity and economic development". In: *Journal of Development Economics* 76.2, pp. 293–323.

Ochsenwald, William L. (1975). "Ottoman Subsidies to the Hijaz, 1877-1886". In: *International Journal of Middle East Studies* 6.3, pp. 300–307.

Ons Volk Ontwaakt (1912). *Ons Volk Ontwaakt: De Godsdiensten op den Balkan.* URL: https://web.archive.org/web/20120831151609/http://users.skynet.be/ovo/GodsdBalkan.html (visited on 05/21/2020).

Özbek, Nadir (2010). "Osmanlı İmparatorluğu'nda Gelir Vergisi: 1903-1907 Tarihli Vergi-i Şahsi Uygulaması". In: *Tarih ve Toplum Yeni Yaklaşımlar* 10, pp. 43–80.

— (2015). *İmparatorluğun bedeli : Osmanlı'da vergi, siyaset ve toplumsal adalet (1839-1908)*. İstanbul: Boğaziçi Üniversitesi Yayınevi.

— (2018). "Tax Farming in the Nineteenth-Century Ottoman Empire: Institutional Backwardness or the Emergence of Modern Public Finance?" In: *The Journal of Interdisciplinary History* 49.2, pp. 219–245.

Pamuk, Şevket (2005). *Osmanlı-Türkiye iktisadi tarihi 1500-1914*. İstanbul: İletişim.

— (2014). "Fiscal Centralisation and the Rise of the Modern State in the Ottoman Empire". In: *The Medieval History Journal* 17.1, pp. 1–26.

— (2016). *Türkiye'nin 200 yıllık iktisadi tarihi: büyüme, kurumlar ve bölüşüm*. İstanbul: Türkiye İş Bankası Kültür Yayınları.

Quataert, Donald (1968). "Famine in Turkey, 1873–1875". In: *Regional Studies* 201, pp. 1–54.

Queralt, Didac (2019). "War, International Finance, and Fiscal Capacity in the Long Run". In: *International Organization* 73.4, pp. 713–753.

Sarkees, Meredith Reid and Frank Wayman (2010). *Resort to War: 1816 - 2007*. Washington DC: CQ Press.

Scott, James C. (1998). *Seeing like a state : how certain schemes to improve the human condition have failed*. New Haven: Yale University Press.

Sezen, Tahir (2017). *Osmanlı yer adları*. Ankara: T.C. Başbakanlık Devlet Arşivleri Genel Müdürlüğü.

Shaw, Stanford J. (1975). "The Nineteenth-Century Ottoman Tax Reforms and Revenue System". In: *International Journal of Middle East Studies* 6.4, pp. 421–459.

— (1978). "The Ottoman Census System and Population, 1831-1914". In: *International Journal of Middle East Studies* 9.3, pp. 325–338.

Shields, Sarah (2013). "The Greek-Turkish Population Exchange: Internationally Administered Ethnic Cleansing". In: *Middle East Report* 267, pp. 2–6.

Suny, Ronald Grigor (2015). *"They can live in the desert but nowhere else" : a history of the Armenian genocide*. Princeton, New Jersey: Princeton University Press.

Tilly, Charles (1975). "Reflections on the History of European State-Making". In: *The Formation of National States in Western Europe*. Ed. by Charles Tilly. Princeton, N.J: Princeton University Press.

— (1992). *Coercion, capital, and European states, AD 990-1992*. Cambridge, MA: Blackwell.

Üngör, Ugur Ümit (2011). *The making of modern Turkey : nation and state in Eastern Anatolia, 1913-1950*. Oxford: Oxford University Press.

Weber, Eugen (1976). *Peasants into Frenchmen: the modernization of rural France, 1870-1914*. Stanford, CA: Stanford University Press.

Woods, Henry Charles (1908). *Washed by four seas : an English officer's travels in the Near East*. London: T. Fisher Unwin.

Yosmaoglu, Ipek K. (2006). "Counting Bodies, Shaping Souls: The 1903 Census and National Identity in Ottoman Macedonia". In: *International Journal of Middle East Studies* 38.1, pp. 55–77.
Zamir, Meir (1981). "Population statistics of the Ottoman Empire in 1914 and 1919". In: *Middle Eastern Studies* 17.1, pp. 85–106.
Zhang, Nan and Melissa M. Lee (2020). "Literacy and State–Society Interactions in Nineteenth-Century France". In: *American Journal of Political Science* 64.4, pp. 1001–1016.

Archival Sources

Cumhurbaşkanlığı Devlet Arşivleri

BOA, A.MKT, 66/2, H. 22/02/1263 (January 29, 1848)
BOA, BEO, 4185/31386, H. 18/07/1331 (June 23, 1913)
BOA, BEO, 1968/147542, H. 27/09/1320 (December 18, 1902)
BOA, DH.MKT, 1539/120, H. 29/12/1305 (September 6, 1888)
BOA, DH.MKT, 1838/16, H. 23/10/1308 (June 1, 1891)
BOA, TFR.I.A, 36/3546, H. 09/10/1325 (November 15, 1907)
BOA, TFR.I.MN, 138/13707, H. 21/07/1325 (August 30, 1907)
BOA, Y.PRK.A, 78/8, H. 05/02/1311 (August 18, 1893)

Appendix

A Data

A.1 Collection of Revenue Data

I collected the revenue data from hundreds of different sources, including provincial yearbooks, budget reports in the Ottoman archives, statistical yearbooks that the Ottoman state published, British Foreign Office reports and secondary sources. I discuss each of these category of sources below.

The first known provincial yearbook is published for the Ottoman fiscal year (Rumi year) of 1283 (1867/1868 in Gregorian calendar) by Bosnia Province (McCarthy and Hyde 1979). The yearbooks were not published very consistently by all provinces. While in some provinces they were more frequently published (for example in Aleppo (Halep), Edirne, Hüdavendigar, Konya or Syria (Suriye) provinces), some other provinces published very few yearbooks (Ioannina (Yanya), Shkoder (İşkodra) or Van provinces). The frequency of the publication of the provincial yearbooks seems to decrease in early 20th century, and they disappear with some exceptions in the 1910s.[1]

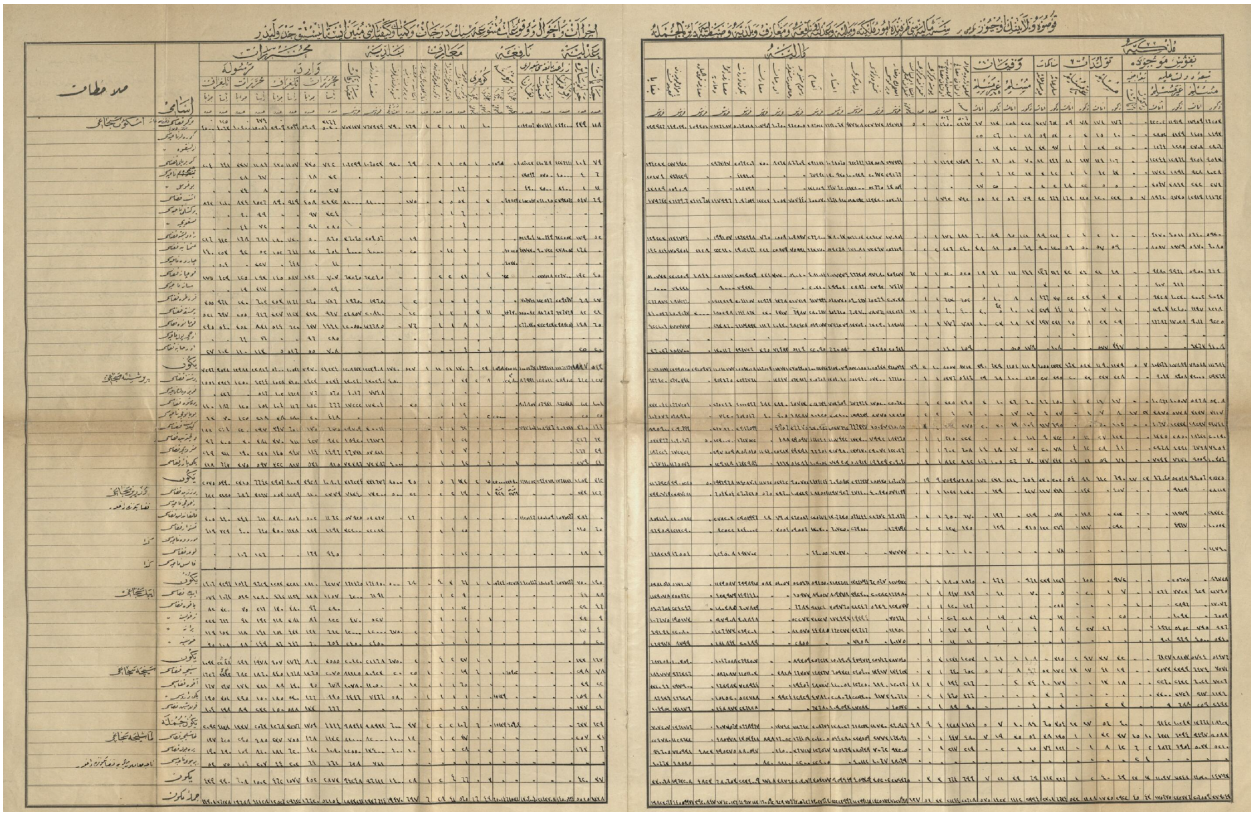
I have been able to identify around 550 provincial yearbooks and have reached around 500 of them. An average yearbook consists of a few hundred pages. Most of the yearbooks contain data about the total fiscal revenues at the province level. However, in some of them the information is incomplete (for example, they report only revenues from certain types of taxes) and some report duplicate information from previous years. Many yearbooks also contain very detailed information about different type of taxes and report tax revenues at lower-level administrative districts.

I also collected tax revenue data from several archival documents I could identify in the Ottoman Archives in Istanbul. Such sources include budget reports prepared by the administrators in the provinces and sent to the center while others are budget reports prepared by the center. These documents were scattered among different categories in the Ottoman archives. I provide an example of such documents in figure A.1. It is a report that provides the detailed revenue and spending items in the Kosovo province of the empire, for the fiscal year of 1320 (1904/1905 in the Gregorian calendar), for second-level (sancak) and third-level (kaza) administrative units.

In addition to these, I also relied on several other sources that provide a compilation of province-level tax revenues for certain years. One is the statistical yearbook published by the Ottoman state in the year 1897 (Güran 1997). It provides information regarding tax revenues in all Ottoman provinces for the fiscal year 1310 (in Gregorian calendar 1894/1895). The second source is the Fiscal Statistics Journal (İhsaiyat-ı Maliye) published by the Ottoman Finance Ministry in fiscal year 1327 (Gregorian 1911/1912) which provides province-level tax revenues for the fiscal years 1324 and 1325 (Gregorian 1908/1909 and 1909/1910). Another compiled source I use is the General Fiscal Statistics (Hazine Hesab-ı Umumisi) document published by the state in the Hijri year 1330 (Gregorian 1911/1912) which provides province-level tax revenues for the fiscal year 1326 (Gregorian 1910/1911). For the pre-1877

[1] McCarthy and Hyde (1979) provide a list of published yearbooks they could identify.

Figure A.1: BOA.TFR.KV.84/8377



observations, the British Foreign Office documents (Harrison 1984) provide a compilation of the revenues of all provinces. For some missing observations I used data from numerous secondary sources such as dissertations and published articles.

A.2 Hierarchy of Revenue Data

Since I used many different sources, for certain units in certain years there were two or more sources which provided fiscal revenue data. For the cases this happened, I constructed the following hierarchy to decide which source to use: If this is a compilation of all the provinces in a published source (i.e. a journal) by the Ottoman state I used this. Next come compilations of all the provinces in other state documents (i.e. reports in the Ottoman archives) and foreign sources (i.e. the British Foreign Office documents). The third in the hierarchy is the data that reports each revenue item rather than only reporting the total revenue. Fourth is those that I found in the Provincial yearbooks. Fifth is the documents I found in the Ottoman Archives that report the data for at most three provinces. Finally, at the bottom of the hierarchy is the data reported in other published sources.

A.3 Collection of Population Data

The main source I used for the total population in a province are Ottoman censuses. Unless a province's censuses were unavailable, or unreliable, I used the population data from the

Ottoman censuses to measure the total population in a province. One thing to pay attention to in this period is the Balkan provinces of the empire. The empire lost territories during this period in the Balkans and many lower-level administrative units were shuffled in the Balkans across different provinces in the 1870s and 1880s. Fortunately, Akarlı (1972) provides population estimates for the Balkan provinces for several different years during this period. For the total populations of the Edirne, Selanik, Manastır, Yanya and Kosova and Cezayir-i Bahr-i Sefid provinces I used Akarlı's estimates. For the other provinces, when they had no census or it was unreliable, I used the estimates provided by Karpat (1985). In order to calculate annual population changes in these provinces, I calculated the average of the percentage of annual changes in the whole empire's population according to the annual population estimates in Shaw (1978) and I assumed that this average percentage change was equal to the annual percentage change in each province in each year. To deal with jurisdictional boundary changes that would have changed the total population of the province, I referred to the list of all jurisdictional boundary changes in the Ottoman Empire in Sezen (2017) and adjusted the population estimates of each province according to the changes in jurisdictional boundaries.

It was trickier to estimate the measures of ethnic heterogeneity and ethnic similarity of the populations within each province. Ottoman censuses do not report any information about ethnicity, but only religious denomination. It is relatively easier to identify ethnicity for non-Muslim populations because religious denomination indicates ethnicity for most major non-Muslim groups in the empire (such as Greeks, Armenians and Jews). There were only minor issues to take into account regarding the ethnicity of non-Muslims. One issue was in the Arab regions of the empire. Christian Arabs were reported according to their sect, for instance Arabs in the Greek Orthodox faith were reported as Greeks (Karpat 1985). For this reason, in the Arab regions, I assumed that those reported to be of Greek Orthodox or Latin Catholic faith were Christian Arabs and therefore coded these groups as ethnic Arabs. Another issue was the Protestant groups in Middle and Eastern Anatolia. I assumed that the Protestants in Middle and Eastern Anatolia were Armenians since there was significant Protestant missionary activity in Anatolia and many Armenians had converted to Protestantism throughout the nineteenth century (Arpee 1936).

It was far more complicated with the Muslim groups. Since the censuses provided no clues about the ethnic identities of the Muslims, I had to turn to secondary sources. For the number of Kurds, Turks and Armenians in Eastern Turkey[2] I used the population estimates in Marashlian (1991) and based on his estimates and the census data I extrapolated the size of each ethnic group. For some Arab provinces of the empire, I assumed that all those reported as Muslims were Arabs. These provinces are Baghdad (Bağdat), Basra, Beirut (Beyrut), Hejaz (Hicaz), Syria (Suriye), Tripoli of Libya (Trablusgarp) and Yemen. For Mosul (Musul), Aleppo (Halep) and Van, I estimated the proportion of Turks, Kurds and Arabs based on the British statistics (Zamir 1981). Since parts of Trabzon and Erzurum vilayets were Russian territories after the war of 1877-8, I used the official Russian population statistics of 1897 in estimating the pre-1877 ethnic composition. For Trabzon, another extra

[2]These provinces are also known as Vilayat-ı Sitte (the Six Provinces). They had significant Armenian populations and were political hotspots. They are Bitlis, Erzurum, Diyarbekir, Mamuretülaziz, Sivas and Van.

step was to use the 1927 and 1965 censuses by the Turkish Republic in order to estimate the statistics for Muslim groups of different ethnicities. Finally, for the Balkan provinces, I relied on the estimates provided by Belgian magazine Ons Volk Ontwaakt 1912 and by Antonean (1975).

A.4 Coding of Census Outcomes

The binary variable that indicates whether the census has been completed in any given sancak is coded according to the following criteria: If the census is reported to be incomplete in the document, I code it as incomplete. When they did not explicitly report incomplete censuses in specific sancaks but refer to the whole province, I had to check each sancak's total population and compare it to the sancak's total population (as estimated by others or counted much later, for example by the British). If the numbers are widely different, then I code the census as incomplete.

I exclude the provinces of Hejaz, Yemen and Tripoli (of Libya) from the analysis since they were not included in the census and it is impossible to know whether or not they would have been completed if they attempted to conduct surveys here. In addition to these, I had to drop some of the sancaks of the empire in the Balkans and Eastern Anatolia from the analysis since sancak-level ethnicity data for the Muslims for them are impossible to reconstruct. I exclude all the sanjaks of Kosovo, Manastır, Mosul, Thessaloniki, Ioannina, Diyarbakir and Bitlis provinces. I was able to reconstruct the ethnicity data for three sancaks of Edirne province (Tekfurdağı, Kırkkilise and Gelibolu) from the censuses of the Turkish Republic but had to exclude the remaining 2 sancaks of this province (Gümülcine and Dedeağaç) that was not included within the borders of the Turkish Republic and therefore where Turkish censuses are not available. Table A.1 shows each sancak that is included and how they are coded.

Table A.1: List of Sancaks and the Census Completion Status at the end of the Census of 1881-93

Province	Sancak	Census Status	Province	Sancak	Census Status
Adana	Adana	Complete	Hejaz	Mecca	Did not start
Adana	Mersin	Complete	Hejaz	Madina	Did not start
Adana	Cebel-i Bereket	Complete	Hejaz	Jeddah	Did not start
Adana	Kozan	Complete	Hüdavendigar	Bursa	Complete
Adana	İçel	Complete	Hüdavendigar	Ertuğrul	Complete
Aleppo	Aleppo	Incomplete	Hüdavendigar	Karahisar	Complete
Aleppo	Urfa	Incomplete	Hüdavendigar	Karesi	Complete
Aleppo	Maraş	Incomplete	Kastamonu	Kastamonu	Complete
Ankara	Ankara	Complete	Kastamonu	Bolu	Complete
Ankara	Yozgat	Complete	Kastamonu	Kangırı	Complete
Ankara	Kayseri	Complete	Kastamonu	Sinop	Complete
Ankara	Kırşehir	Complete	Konya	Konya	Complete
Ankara	Çorum	Complete	Konya	Niğde	Complete
Aydın	İzmir	Complete	Konya	Burdur	Complete
Aydın	Saruhan	Complete	Konya	Hamid	Complete
Aydın	Aydın	Complete	Konya	Teke	Complete
Aydın	Denizli	Complete	Mamuretülaziz	Mamuretülaziz	Complete
Aydın	Menteşe	Complete	Mamuretülaziz	Malatya	Complete
Ankara	Yozgat	Complete	Mamuretülaziz	Dersim	Incomplete
Ankara	Kayseri	Complete	Med. Islands	Rhodes	Incomplete
Ankara	Kırşehir	Complete	Med. Islands	Lesbos	Incomplete
Ankara	Çorum	Complete	Med. Islands	Chios	Incomplete
Baghdad	Baghdad	Complete	Med. Islands	Lemnos	Incomplete
Baghdad	Diwaniyah	Incomplete	Sivas	Sivas	Complete
Baghdad	Karbala	Incomplete	Sivas	Amasya	Complete
Basra	Basra	Incomplete	Sivas	Karahisar-ı Şarki	Complete
Basra	Muntafiq	Incomplete	Sivas	Tokat	Complete
Basra	Ammara	Incomplete	Syria	Damascus	Complete
Basra	Najd	Did not start	Syria	Hama	Complete
Beirut	Beirut	Complete	Syria	Hawran	Incomplete
Beirut	Acre	Complete	Syria	Kerak	Incomplete
Beirut	Tripoli	Complete	Trabzon	Trabzon	Complete
Beirut	Latakia	Complete	Trabzon	Canik	Complete
Beirut	Balqa	Complete	Trabzon	Lazistan	Complete
Edirne	Kırkkilise	Complete	Trabzon	Gümüşhane	Complete
Edirne	Gelibolu	Complete	Tripoli (of Libya)	Tripoli	Did not start
Edirne	Tekfurdağı	Complete	Tripoli (of Libya)	Homs	Did not start
Erzurum	Erzurum	Incomplete	Tripoli (of Libya)	Cebel-i Garbi	Did not start
Erzurum	Erzincan	Incomplete	Tripoli (of Libya)	Fezan	Did not start
Erzurum	Bayazıt	Incomplete	Van	Van	Complete
			Van	Hakkari	Incomplete

A.5 Further Descriptive Statistics

Table A.2: Descriptive Statistics at the Province Level

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Tax Revenue	29	48.51	24.14	0.54	31.43	40.97	69.01	87.80
ELF	29	0.33	0.35	0.00	0.01	0.16	0.75	0.97
Percent Turkish	29	0.39	0.27	0.00	0.11	0.39	0.63	0.75

B Robustness Checks

B.1 Endogeneity Issues

In order to take into account any endogeneity that can drive the results, such as ethnic composition being affected by and ethnic homogeneity having been achieved via violence during the armed conflicts, I added number of wars that happened in a province as a control variable. In order to construct this variable, I compiled a list of all the interstate conflicts that the Ottoman Empire participated between 1600 and 1868 (the year when the analysis with the revenue data starts) from Clodfelter (2008) and the Correlates of War dataset (Sarkees and Wayman 2010). From the description of these wars in Clodfelter (2008) I determined whether each war was fought on any soil within the boundaries of the Ottoman provinces. I constructed this variable as one that counts the total number of wars fought within the boundaries of a province. I added this variable as a control variable to the generalized difference-in-differences model and also interacted it with each of the post-war dummies. The results I report in table A.3 indicate that the findings are robust to the inclusion of this variable.

Table A.3: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues, Controlling for Number of Wars that Occurred in Each Province in the Previous Centuries

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	22.311***
	(1.220)
Percent Turkish	11.086***
	(1.167)
Number of Wars in Province	−32.022***
	(2.541)
Post-1877 Dummy	5.787*
	(3.241)
Post-1897 Dummy	6.853**
	(2.988)
ELF * Post-1877 Dummy	−2.030**
	(0.817)
ELF * Post-1897 Dummy	−2.316***
	(0.797)
Percent Turkish * Post-1877 Dummy	3.052***
	(0.817)
Percent Turkish * Post-1897 Dummy	3.364***
	(0.803)
Number of Wars * Post-1877 Dummy	−0.384
	(0.537)
Number of Wars * Post-1897 Dummy	−0.505
	(0.525)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	745
R^2	0.904
Adjusted R^2	0.893
Note:	*p<0.1; **p<0.05; ***p<0.01

B.2 Alternative Measures

In order to check whether the results are robust to using Ethnoreligious Fractionalization (ERF), I constructed an ERF measure, again from the Herfindahl–Hirschman Index. I build this measure based on the Ottoman censuses, which report ethnoreligious affiliation. An extra source I utilized for the Sunni and Shia populations in the Baghdad, Basra and Mosul provinces is the British censuses, as reported in Zamir 1981.

One important issue regarding this index is the existence of Alevis in Anatolia and Alawites in the Levant. They are not Sunni Muslims, so they should be included in a separate category while calculating the ERF measure. However, I could find no census or estimate regarding the populations of these two sizable groups. This is why while I estimated the model with all the provinces in the dataset in model 1 of table A.4, in model 2 I removed the provinces that have substantial populations of these two groups. These are Adana, Aleppo and Syria provinces for the Alawite population and Ankara, Erzurum, Mamüretülaziz and Sivas provinces for the Alevi population.

Unfortunately, the ERF measure turned out to create problems of collinearity since it is highly correlated with the Percent Turkish variable (Pearson $r = 0.388$ for the whole sample and 0.423 for the sample when the abovementioned provinces are removed). This is why I had to estimate the models without the Percent Turkish variable and its interactions with the dummies.

The results in table A.4 are consistent with the hypotheses. The wartime increases in fiscal revenues are lower in provinces where ethnoreligious fractionalization is higher.

Table A.4: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues with Ethnoreligious Fractionalization as the Explanatory Variable

	Dependent Variable:	
	Revenue Per Male Capita (in 1998 USD)	
	(1)	(2)
Ethnoreligious Fractionalization (ERF)	-73.802^{***}	-115.561^{***}
	(4.257)	(4.669)
Post-1877 Dummy	6.704^{*}	4.217
	(3.522)	(3.978)
Post-1897 Dummy	4.014	-0.491
	(3.283)	(3.740)
ERF * Post-1877 Dummy	-1.993^{**}	-3.429^{***}
	(0.899)	(0.968)
ERF * Post-1897 Dummy	-2.847^{***}	-2.482^{***}
	(0.874)	(0.940)
Province Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	748	556
R^2	0.871	0.895
Adjusted R^2	0.857	0.881
Note:		*p<0.1; **p<0.05; ***p<0.01

B.3 Alternative Data Sources

In order to evaluate the results with alternative source of population data, I calculated all the revenue per male capita, using the population statistics provided by British officials in 1919, as reported in Zamir (1981), which consists of the provinces that the empire had not lost by the onset of World War I (with the exception of Hejaz and Yemen). For the rest of the provinces, I rely on the same estimates I used in the original analysis. The results of this analysis, reported in table A.5 are not different than the results of the original analysis. There are only small changes in the coefficients.

I also relied on some alternative revenue data and replicated the analyses with these data. For the pre-1877 observations, where I use the revenue data from the British Foreign Office sources, I substituted each observation with an alternative source (either from a provincial yearbook or a report in the Ottoman archives, whichever was available). The results in table A.6 indicate that the results are also robust to these changes.

In table A.7 I report the analysis for the expense-to-revenue ratio with the limited subset of expense items. I exclude the expenses for the ministry of army and the ministry of navy since one can argue that the investments for these ministries and the bureaucrats under them are less relevant for rendering a population legible and tax collection. The results in table A.7 reveal similar patterns to the results of the original analysis in table 5. One important note is that in the first model, without Hejaz province being excluded, the coefficient for the ELF variable is not significantly estimated to be different from zero. In any event, the magnitude of the coefficient is still sizable, in model 1 the coefficient of the ELF being 0.098 indicates that one standard deviation in the ELF score increases the expense-to-revenue ratio by 0.19 standard deviations, while in model 2 the coefficient of 0.062 indicates that one standard deviation increase in ELF increases the expense-to-revenue ratio by 0.33 standard deviations.[3] The very low number of observations (29) and the province of Hejaz being an outlier does not allow precision and a statistically significant coefficient in the first model.

[3]The standard deviation of expense-to-revenue ratio declines from 0.51 to 0.18 when the province of Hejaz is excluded.

Table A.5: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues with Alternative Population Data

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	26.910^{***}
	(1.317)
Percent Turkish	6.536^{***}
	(1.264)
Post-1877 Dummy	5.093
	(3.508)
Post-1897 Dummy	6.440^{*}
	(3.339)
ELF * Post-1877 Dummy	-2.140^{**}
	(0.900)
ELF * Post-1897 Dummy	-1.921^{**}
	(0.853)
Percent Turkish * Post-1877 Dummy	4.226^{***}
	(0.884)
Percent Turkish * Post-1897 Dummy	4.842^{***}
	(0.864)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	734
R^2	0.869
Adjusted R^2	0.855
Note:	*p<0.1; **p<0.05; ***p<0.01

Table A.6: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues with Alternative Revenue Data

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	28.918***
	(1.250)
Percent Turkish	7.357***
	(1.200)
Post-1877 Dummy	4.098
	(3.329)
Post-1897 Dummy	6.291**
	(3.130)
ELF * Post-1877 Dummy	−3.059***
	(0.855)
ELF * Post-1897 Dummy	−2.504***
	(0.806)
Percent Turkish * Post-1877 Dummy	3.937***
	(0.839)
Percent Turkish * Post-1897 Dummy	3.906***
	(0.817)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	736
R^2	0.891
Adjusted R^2	0.879
Note:	*p<0.1; **p<0.05; ***p<0.01

Table A.7: Expense-to-Revenue Ratio for a Limited Subset of Expense Items for the Fiscal Year 1909-10

	Dependent Variable:	
	Expense to Revenue Ratio	
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	0.098	0.062*
	(0.061)	(0.032)
Percent Turkish	−0.166**	−0.106***
	(0.067)	(0.036)
Population (1000)	0.001***	−0.0001
	(0.0001)	(0.0001)
Sea Opening Dummy	0.032	0.128*
	(0.135)	(0.071)
Railroad Dummy	−0.068	−0.110
	(0.127)	(0.066)
Average Elevation (km)	0.077	0.163*
	(0.152)	(0.080)
Land Border Dummy	−0.155	−0.103
	(0.128)	(0.067)
Constant	0.119	0.328***
	(0.202)	(0.108)
Observations	29	28
R^2	0.776	0.545
Adjusted R^2	0.701	0.386
Note: OLS Regression	*p<0.1; **p<0.05; ***p<0.01	

B.4 Alternative Empirical Specifications

Table A.8: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues in Two Separate Models

	Dependent Variable:	
	Revenue Per Male Capita (in 1998 USD)	
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	48.157***	
	(2.647)	
Percent Turkish		21.187***
		(1.401)
Post-1877 Dummy	6.729*	6.496*
	(3.517)	(3.367)
Post-1897 Dummy	4.286	4.639
	(3.278)	(3.140)
ELF * Post-1877 Dummy	−2.242**	
	(0.909)	
ELF * Post-1897 Dummy	−2.865***	
	(0.862)	
Percent Turkish * Post-1877 Dummy		4.638***
		(0.868)
Percent Turkish * Post-1897 Dummy		4.057***
		(0.838)
Province Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	748	748
R^2	0.871	0.882
Adjusted R^2	0.857	0.869
Note:		*p<0.1; **p<0.05; ***p<0.01

Table A.9: Panel Data Analysis of Wartime Changes in Fiscal Revenues

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Post-1877 Dummy	1.792^{**}
	(0.859)
Post-1897 Dummy	5.574^{***}
	(0.796)
ELF * Post-1877 Dummy	-2.681^{***}
	(0.850)
ELF * Post-1897 Dummy	-1.888^{**}
	(0.803)
Percent Turkish * Post-1877 Dummy	2.467^{***}
	(0.835)
Percent Turkish * Post-1897 Dummy	3.312^{***}
	(0.810)
Observations	736
R^2	0.190
Adjusted R^2	0.151
Note:	*p<0.1; **p<0.05; ***p<0.01

Table A.10: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues for only Provinces that Exist in all Three Periods

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	30.707***
	(1.322)
Percent Turkish	6.068***
	(1.290)
Post-1877 Dummy	6.421*
	(3.410)
Post-1897 Dummy	5.559*
	(3.278)
ELF * Post-1877 Dummy	−2.232**
	(0.897)
ELF * Post-1897 Dummy	−1.864**
	(0.893)
Percent Turkish * Post-1877 Dummy	4.152***
	(0.899)
Percent Turkish * Post-1897 Dummy	4.352***
	(0.900)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	683
R^2	0.881
Adjusted R^2	0.867
Note:	*p<0.1; **p<0.05; ***p<0.01

Table A.11: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues Excluding the Three Middle Anatolian Provinces Affected by the Famine of mid-1870s

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	23.978***
	(1.329)
Percent Turkish	9.487***
	(1.280)
Post-1877 Dummy	5.998*
	(3.564)
Post-1897 Dummy	7.325**
	(3.301)
ELF * Post-1877 Dummy	−3.119***
	(0.944)
ELF * Post-1897 Dummy	−2.574***
	(0.885)
Percent Turkish * Post-1877 Dummy	4.574***
	(1.086)
Percent Turkish * Post-1897 Dummy	4.347***
	(1.032)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	639
R^2	0.908
Adjusted R^2	0.897
Note:	*p<0.1; **p<0.05; ***p<0.01

Table A.12: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues for the Post-1871 Sample

	Dependent Variable:
	Revenue Per Male Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	14.575***
	(3.880)
Percent Turkish	9.903**
	(4.692)
Post-1877 Dummy	6.863**
	(2.836)
Post-1897 Dummy	5.957**
	(2.680)
ELF * Post-1877 Dummy	−1.903**
	(0.930)
ELF * Post-1897 Dummy	−2.279***
	(0.709)
Percent Turkish * Post-1877 Dummy	2.495***
	(0.924)
Percent Turkish * Post-1897 Dummy	3.346***
	(0.719)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	646
R^2	0.915
Adjusted R^2	0.904
Note:	*p<0.1; **p<0.05; ***p<0.01