

The Paradox of Imperial Taxation: How Diversity Shapes Development and Dominant Groups Shoulder the Tax Burdens*

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Abstract

This paper investigates the relationship between diversity and state-building, examining how diversity affects the costs of investing in fiscal capacity. I argue that ethnic and religious diversity make a population less legible to the state, increasing the costs of developing fiscal capacity. These higher costs deter the state from investing in fiscal capacity in more diverse areas, hindering fiscal capacity in these regions. Instead, the state diverts investments to less diverse areas, which are typically populated by the core/dominant groups. This results in core/dominant groups bearing a higher tax burden than minorities who do not experience similar increases in tax burdens. I test these arguments using original data on local-level fiscal revenues in the late Ottoman Empire that I collected using hundreds of archival documents, as well as other qualitative and quantitative data from archival sources. The findings highlight the complex relationship between diversity, state-building, and state capacity.

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1 Introduction

Ethnic and religious diversity are often associated with suboptimal political and economic outcomes (Easterly and Levine 1997). They include lower state capabilities (Blaydes 2018) and lower rates of taxation, implying lower fiscal capacity (Alesina, Baqir, and Easterly 1999). Building on this empirical regularity, the main question I ask in this paper is: What is the mechanism by which diversity constrains state building?

State building entails increases in the amount of taxes the state levies on its populations (Tilly 1992). This leads to a political question about how these tax burdens are distributed, the second question I tackle in this paper: Which groups bear the increasing fiscal burdens of an expanding state during periods of state building?

I argue that the population's diversity impedes state building by increasing the costs of investment in the state's fiscal capacity. 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 invest in localities where these costs are lower and where they can reap a higher return from their investment. For this reason, I argue that the state's investment and increases in the state's fiscal capacity should be more likely to occur in less diverse localities.

To test these arguments, I focus on the late 19th and early 20th century Ottoman Empire 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 that I mainly built on hundreds of original archival documents from the Ottoman Archives. I use other original datasets that I constructed using a multitude of historical and archival sources.

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 were higher in less diverse units. This suggests that diversity hinders fiscal capacity building. In order to show that it is costlier to invest in fiscal capacity in more illegible localities, I utilize another dataset on the local-level expenses of the empire and show that the necessary investment to increase fiscal capacity is higher in more less diverse units.

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. Because the minority groups are illegible and cannot be taxed efficiently, the dominant group has to tax itself to meet the costs of state building. This highlights an interesting paradox. The dominant group in the society, which forms a significant portion of the state elite, ends up more disadvantaged compared to the minorities during periods of state building.

In order to better pin down the causal mechanisms, I rely on additional sources. I first present evidence that that the Ottomans were less successful in administering censuses in more diverse localities, which is in line with the argument that diversity undermines the population's legibility. Next, I examine how diversity is related to the type of the state's investment. Consistent with the logic of the paper's argument, I find evidence that in less diverse localities the state's investment more heavily focused items that can increase capacity in the longer run, such as education and infrastructure. Conversely, in more diverse places, where long-term investments are less likely to pay off, spending more heavily focuses on items that can only help the state achieve control and coerce tax extraction in the short run, such as security forces.

Finally, I provide qualitative evidence from a close reading of letters, telegrams, and reports written by Ottoman administrators in the Ottoman archives where linguistic and religious differences are blamed for the state's failure in counting and taxing the populations. The evidence from these correspondences support my arguments that different languages lie at the root of the illegibility problem as they prevent the bureaucrats' ability to gather

information and monitor the populations, and how the multitude of languages in the empire limited its administrative capacity and tax administration.

In this study I contribute to the literatures on development, distributive politics, and identity politics. First, I provide empirical evidence that the variation in the population's diversity and the ensuing variation in legibility affects the returns to investment in fiscal capacity. Thus, I highlight a new mechanism, higher costs of investment in fiscal capacity, by which ethnic and religious diversity constrain development. Second, I provide a new angle to the issue of distribution of the tax burdens in diverse contexts with 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 existing taxation patterns 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

I define *fiscal capacity* of the state as *the ability of the state to extract taxes when it has the intention to extract*. This definition is analogous to what Michael Mann calls the state's infrastructural power, "the capacity of the state to state actually to penetrate civil society, and to implement logistically political decisions throughout the realm" (1984, p.189).

2.1 Diversity, 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 diversity are two factors regarding the society’s structure that can affect how much the state knows about the society and also its capabilities (Scott 1998; Blaydes 2018). In this paper I consider two different configurations of the population’s ethnic and religious diversity. The first is what I call *dissimilarity*. A *dissimilar* population has a different ethnic or religious identity compared to the core/dominant group in the society.¹ The second configuration of diversity is *heterogeneity*.² Higher heterogeneity implies a higher number of distinct dissimilar groups in a given population.

2.1.1 Diversity and Legibility

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) and hence will be *illegible*.³

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. 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

¹I define the core/dominant group in a population as the group whose language is spoken in the administration and belong to the religious group that is in power. For brevity, I will call it the dominant group from now on.

²The opposite of *dissimilarity* is *similarity*, and the opposite of *heterogeneity* is *homogeneity*.

³*Legibility*, or as it is also called in the literature *informational capacity*, can be briefly defined as the extent and the quality of the state’s knowledge about the society. A state that has rendered a society more legible possesses more and better standardized information about the society, which is more easily understood by any agent of the state (Scott 1998; Zhang and Lee 2020).

that language and are unfamiliar with the culture. Therefore, ethnic dissimilarity and ethnic heterogeneity make the population in a given area and 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 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). Moreover, the state can more easily acquire information about the groups who share the state's dominant religion since the state likely has denser connections with the clerics and leaders of such communities.

2.2 Diversity, Higher Costs of Investment in Capacity, and Taxation

That heterogeneity and mismatch between a population's and the center's ethnic or religious identity (dissimilarity) 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 increasing tax revenues. This is likely to hold especially under regimes of indirect rule—such as empires—where the central authority relies on intermediaries for administration and 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 through which the illegibility of a population undermines fiscal capacity building, we can rely on Levi's (1988) framework, where relative bargaining power of the rulers and transaction costs are two constraints on the state's fiscal capacity. 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, and obtaining other necessary information for taxation are higher. This makes the investments to increase fiscal capacity more costly. Moreover, the high transaction costs increase the premium on local intermediaries, who have better information about the local context and have better connections. This decreases the ruler's bargaining power vis-à-vis local intermediaries. The intermediaries possess critical information and connections that the state agents lack. Consequently, its lower bargaining power makes it more difficult for the state to eliminate these intermediaries, centralize tax collection and hence increase fiscal capacity. This especially is a problem for contexts with indirect rule, such as empires where states initially have little knowledge about its populations, and for rural contexts with agricultural economies, which limit the state's knowledge, reach and control.

The illegibility which made it more difficult for the state to obtain information and rule compelled states to delegate administration and tax collection to intermediaries who possessed local knowledge and networks. Such intermediaries often have informational advantages (Balán et al. 2022). Yet, when the intermediaries are involved in the activities in ruling and taxing, they often use their position to benefit themselves to the detriment of the central state (Doumani 1994).

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 2021).

In order to obtain information about the population and render it legible, states can rely on censuses (Scott 1998; Lee and Zhang 2017; Brambor et al. 2020). With reliable

censuses, any agent of the state can easily obtain information about the population. This information can be critical for tax collection purposes. A census can communicate to the reader 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 the economic activities in different places and who engages in what kind of economic activity. 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 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.

In summary, I expect it to be more expensive to count the populations, to obtain information, and therefore to increase fiscal capacity in dissimilar and heterogeneous areas. The required amount of investment in fiscal capacity should be higher in more dissimilar and heterogeneous areas compared to similar and homogeneous areas.

2.3 How War Changes the Ruler's Calculus

During peacetime there is already an established tax collection system which is optimal given the peacetime revenue needs of the ruler. With the war shock, there is an equilibrium

shift where the ruler needs more revenues. For this reason, wars compel rulers to invest in the state's fiscal capacity (Tilly 1992; Besley and Persson 2010), which can enhance the state's fiscal capacity in the short (Karaman and Pamuk 2013) and in the longer term (Queralt 2019). Although the advent of war does not necessarily affect the cheapness of 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 more resources the ruler can extract from the population, the more they can invest in the war and increase their probability of winning the war.

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, the direct returns from an investment in fiscal capacity may be equal during wartime and peacetime, but the indirect benefits make the overall returns from an investment higher during wartime.

One important aspect of war increasing fiscal capacity, if the legibility problem has been solved, is that it not only causes short-term and temporary increases in fiscal revenues, but 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 issues here and has centralized tax collection, the costs of continuing with this arrangement are lower. 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).

2.4 The Case: The Diverse and Disintegrating Ottoman Empire

At the basis of the problems in tax collection in the Ottoman Empire lay the weakness of the state in the provinces of the empire (Pamuk 2005, p.201). These weaknesses included the inadequate local knowledge of the centrally appointed agents, and resistance of local

⁴A 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).

intermediaries. The illegibility of the society and its economic activities to the state, which increased the transaction costs of tax collection (Özbek 2015), and the indispensable nature of the local intermediaries increased their bargaining power.

Because of its weakness in the provinces, the empire sometimes relied on tax farming. Tax farmers pocketed a substantial portion of the potential revenue that could have ended up at the central treasury (Özbek 2015). Replacing tax farmers with centrally-appointed agents was difficult because of the state's inadequate knowledge of the localities. State agents underperformed compared to the intermediaries due to this lack of knowledge (Pamuk 2005). Replacing tax farmers was difficult also because the empire suffered from a chronic lack of a well-educated workforce (Barkey 2008). It was 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 the different languages, religions, customs, networks and economic activities of different groups in different parts of the country.

As an example of how illegibility can undermine fiscal capacity building and taxation, we can more closely examine the administration of the agricultural tithe (*aşar*) in the Ottoman Empire during this period. Arguably, agricultural taxation is a type of taxes for which legibility was critical. I also expect illegibility undermine the collection of other taxes. However, among all groups the most illegible group to the state were peasants living in remote areas and the most illegible activity for tax purposes was subsistence agriculture.

The Ottoman Economy heavily relied on agriculture in the 19th century, an important portion of its agricultural producers were subsistence farmers and a large portion of the state's revenue came from agricultural tithe.⁵ Agricultural taxation required knowledge of what product is grown where and when it is harvested, which are critical for the collection of agricultural taxes. State agents often lacked adequate knowledge of the geography, which made it difficult for them to navigate. They also often could not speak local languages and had limited information about the local conditions. It was more difficult for an outsider who

⁵For instance, tithe constituted around 31% of the total revenues in the fiscal year of 1860/61 and 44% in 1876 (Özbek 2010, p.55).

does not speak the language, unfamiliar with the geography and the type of the products grown in certain localities to administer and collect this type of tax. 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. Insufficient knowledge and means of communication undermined how efficiently the state's agent could assess and collect these taxes. Any delay in the assessment and collection of such in-kind taxes such often lead to the peasants selling or consuming their product, leaving lower revenues to the state (Doumani 1995, pp. 108-9).

This is why the rulers had to rely on local intermediaries and tax farmers for the taxation of agriculture. Özbek (2015, p.97) notes that those who got the tax farming contracts were the already well-established notables (*eşraf*) in the provinces. With their extensive knowledge about the locality and dense networks among the population the intermediaries did not experience the difficulties that centrally appointed agents faced. Consequently, they could extract more resources compared to any outsider appointed by the center. Nevertheless, such a reliance on them increased their bargaining power and they could use such bargaining power to increase the portion of the revenue they could acquire themselves, thereby decreasing the state's revenues.

2.5 Hypotheses

The state's net profit (its tax revenue minus expenditures to collect these taxes in an administrative unit, such as wages of the bureaucrats and other costs of assessing the taxes) from investing in a unit depends 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. 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 Section 2.3 above). This makes it more likely for the state to mobilize resources to extract resources therefore its ability to extract resources improves. Such a mechanism should hold whether the state collects taxes directly, or delegates tax collection to tax farm-

ers. Under direct administration of taxes, the state can simply invest in fiscal capacity and extract higher revenues. Under tax farming, the state's bargaining power against the tax farmers will change and it can enforce a more expensive tax farming contract, which implies higher revenues.⁶

In summary, I expect increases in fiscal capacity to be higher in more homogeneous administrative units, independent of the level of similarity. I also expect increases in fiscal capacity to be higher in more similar administrative units, independent of the level of homogeneity.⁷ These hypotheses follow:

Hypothesis 1a: *Wartime changes in the levels of fiscal capacity are higher in more homogeneous administrative units.*

Hypothesis 1b: *Wartime changes in the levels of fiscal capacity are higher in more similar administrative units.*

The second set of hypotheses I formulate are about the costs of state building. It is critical to test the argument's implications regarding diversity increasing these costs as it is an important link in the chain from diversity to changes in fiscal capacity. To reemphasize, I expect collecting taxes to be more expensive in more illegible places. More specifically, the state must invest more in more diverse provinces to be able to reap a given amount of revenue. Thus follow these two hypotheses:

Hypothesis 2a: *Costs of investment in fiscal capacity are lower in more homogeneous administrative units.*

⁶In Appendix Section B I discuss in more detail how tax farming arrangements can shift under changes in relative bargaining power.

⁷One worry can be that these two measures are highly correlated with each other. Even though it is theoretically likely, this is not the case in the dataset I use, as I discuss in Appendix Section D.

Hypothesis 2b: *Costs of investment in fiscal capacity are lower in more similar administrative units.*

The rest of the paper is constructed as follows. Section 3 describes the data and the empirical strategy before Section 4 evaluates the hypotheses, presents robustness checks and evaluates alternative explanations. Section 5 tests the causal mechanisms with additional data while Section 6 concludes.

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 the fiscal revenue data lasted more than 18 months. The sources I used are the Provincial Yearbooks (*Vilayet Salnameleri*) published by the Ottoman provincial administrations, and archival sources scattered under different categories in the Ottoman archive. They include 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, several statistical yearbooks published by the Ottoman state and secondary sources by historians. I discuss the sources in more detail in Appendix Section A.1. The data are at the level of first-level administrative units, provinces (*vilayet*) of the empire.

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 Karpát (1985). In addition to these, I also use several other primary and secondary sources. I discuss them in more detail in Appendix Section A.4.

To measure fiscal capacity, I use a common measure in the literature, tax revenue per capita. Using the local-level tax revenue and population data, I calculate the fiscal revenue per capita for each province. Since revenues can change according to prices, adjusting for prices is necessary. Using a historical price index data in the Ottoman Empire (Pamuk n.d.),

I convert the revenues to their equivalent in 1998 US Dollars. Therefore, the dependent variable is Revenue per Capita in 1998 US Dollars.

The two independent variables in the analysis are Ethnolinguistic Fractionalization (ELF) and Ethnic Similarity (ES). For each variable I use the province-level population data I collected. I calculate ELF using the Herfindahl-Hirschman Index. Higher value of ELF indicates higher ethnic heterogeneity. The ES measure is the percentage of the Turkish ethnic population in the province. These measures theoretically range between 0 and 1.⁸

Figure Appendix A.2 presents 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).

Table 1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Median	Max
Tax Revenue	757	50.45	26.39	0.12	48.78	161.20
ELF	757	0.40	0.27	0.02	0.36	0.79
Percent Turkish	757	0.37	0.36	0.00	0.24	0.98

There were two interstate wars in this period. One is the 1877-8 Russo-Turkish war, which lasted almost a year, was fought on multiple fronts, 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 (over a month), fought on a much smaller geographic area and resulted in Ottoman military victory. In the analysis below I consider the effects of each of these wars.

I use a *generalized difference-in-differences* model in order to evaluate Hypotheses 1a and 1b. Both *ELF* and *ES* variables are continuous. Hence, I have a generalized difference-

⁸For sake of brevity and simplicity, I conduct the main analyses only with these ethnic diversity measures in the main text. However, I also conducted analyses with religious diversity measures and present the results of these analyses in Appendix Section D.2.1.

in-differences model with continuous so-called ‘treatments’ (their interactions with the war dummies are also continuous). I estimate an OLS regression model in the following form:

$$\begin{aligned} Revenue_{it} = & \beta_0 + \beta_1 ELF_i + \beta_2 ES_i + \beta_3 D_t^{1877} + \beta_4 D_t^{1897} + \beta_5 D_t^{1877} ELF_i \\ & + \beta_6 D_t^{1897} ELF_i + \beta_7 D_t^{1877} ES_i + \beta_8 D_t^{1897} ES_i + \lambda_t + \gamma_i + \varepsilon_{it} \end{aligned}$$

where $Revenue_{it}$ is tax revenue per capita in province i in year t , ELF_i is the etholinguistic fractionalization measure in province i , ES_i is the ethnic similarity measure (percent Turkish population) in province i , D_t^{1877} and D_t^{1897} are dummies for post-1877 and post-1897 periods respectively. $D_t^{1877} ELF_i$ and $D_t^{1877} ES_i$ are the interactions between the post-1877 dummy and the ethnic composition measures, and $D_t^{1897} ELF_i$ and $D_t^{1897} ES_i$ 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 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 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 as they measure 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 to have higher increases in capacity) and I expect β_7 and β_8 to be positive (since I expect similar provinces to have higher increases in capacity).

To test Hypotheses 2a and 2b on the costs of investment, 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.

For this measure, I use the province-level statistics published by the Ottoman state for the fiscal year 1909/1910 in the Fiscal Statistics Journal (*Ihsaiyat-i Maliye*). I exclude the expenses for the ministries of army and navy because the investments for these ministries and the bureaucrats under them are arguably less relevant for rendering a population legible and tax collection.⁹ The remaining 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 expense such procedures required. The total revenues are those revenues that I used in the original dataset. I evaluate Hypotheses 2a and 2b with OLS Regression. Since one observation (Hejaz Province) is an outlier, I exclude it from the analysis as I discuss in more detail in Appendix Section A.8.

In the analysis of the expense-to-revenue ratio and diversity I include province-level covariates that can confound the relationship between the two. These are the total population of the province, a dummy that indicates whether the province has any sea opening, a railroad dummy measuring whether there are any railroads within the boundaries of the province, the average elevation of the province and a dummy indicating whether the province has any land border to other states or uncontrolled territory. The discussion of these variables is presented in more detail in Appendix Section A.8.

4 Results

4.1 Main Results

Table 2 below reports the results of the generalized difference-in-differences analysis and Figure 1 presents the results visually. I am interested in the interaction effects between the

⁹The results are robust to including them as I demonstrate in Appendix Section D.2.

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 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 capita, and this coefficient is estimated to be statistically significant. With these results, I can confirm Hypothesis 1a, the change in fiscal revenues after war increases as a province is ethnically more homogeneous.

To put these numbers in context, we should consider that the mean per capita tax revenues in this dataset is 51.69 USD. The wartime changes are fairly large for such a baseline. For example, the estimated coefficient for the Post-1877 Dummy in Model 1 is 5.556 is more than 10% of this mean value. This is the estimated change in revenues after 1877 for a country that has the mean ELF (0.39) and ES values (0.38). The coefficient of the interaction between the Post-1877 dummy and ELF being -2.01 suggests that the estimated change after 1877 in a province one standard deviation below mean ELF (of 0.13) is the difference between 5.556 and -2.01 and therefore 7.566 USD per capita. On the other hand, in a province with an ELF measure one standard deviation above the mean (an ELF of 0.65), this change is estimated to be 3.546. Therefore, the change 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 1b, I 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 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 it also is

Table 2: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues

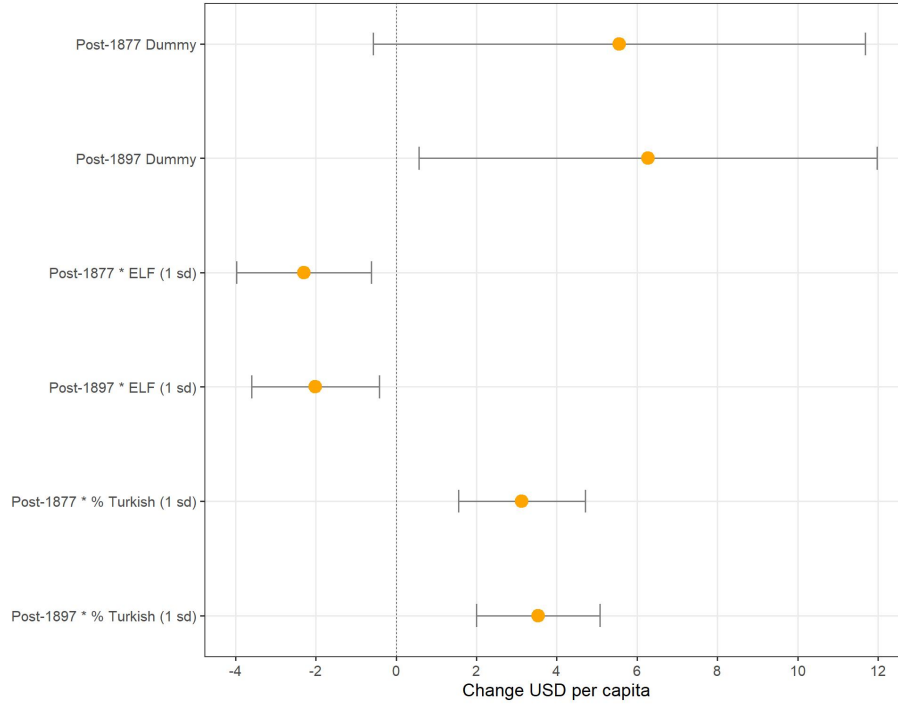
	Dependent Variable:
	Revenue Per Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	22.338*** (1.209)
Percent Turkish	11.029*** (1.162)
Post-1877 Dummy	5.556* (3.124)
Post-1897 Dummy	6.266** (2.910)
ELF * Post-1877 Dummy	-2.010** (0.812)
ELF * Post-1897 Dummy	-2.087*** (0.773)
Percent Turkish * 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. Standard errors in parantheses. *p<0.1; **p<0.05; ***p<0.01

estimated to be significantly different from 0. Hence, the change in the changes in fiscal revenues after 1897 is 3.537 per capita USD higher per one standard deviation increase (0.36) in the percentage of Turks. The results, then are consistent with Hypothesis 1b, which expected the wartime change in fiscal revenues to be higher in more similar units.

One aspect of the results that is worth mentioning is the relationship between diversity and the absolute levels of per capita 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 2 show that overall per capita revenues are higher in provinces that have higher values of the ELF in addition to

Figure 1: Coefficient Plot for the Difference-in-Differences Analysis



higher values of the Percent Turkish measures. These patterns regarding the ELF, I argue, are likely due to 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.

Moving on to testing Hypotheses 2a and 2b on the costs of investment in fiscal capacity, the results in Table 3 using OLS models indicate relationships that are in the expected direction. Model 1 tests the hypotheses without any covariates, while Model 2 includes the covariates. The results in Model 1 indicate that one standard deviation increase in the ELF score increase the Expense-to-revenue ratio by 0.076 (or 7.6 percentage points) and one standard deviation increase in the Percent Turkish variable decreases the Expense-to-revenue ratio by 7 percentage points. Both are estimated to be significantly different than 0.

In Model 2, the estimate for the Percent Turkish variable in this model is larger and significantly estimated to be 10.6 percentage points. However, the estimate for the ELF variable declines to 6.2 percentage points and now it misses the conventional levels of significance by a small margin and is estimated to be significant only at the 0.1 level. This estimate is substantially meaningful, the mean of the Expense-to-revenue ratio variable being 0.93 and its standard deviation being 0.52. Unfortunately, the model lacks power with only 28 valid observations and 7 covariates, making it more difficult to have precise estimates.

Table 3: Analysis of the Expense-to-revenue Ratio by Diversity for the Fiscal Year 1909-10

	Dependent Variable:	
	Expense to Revenue Ratio	
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	0.076** (0.032)	0.062* (0.032)
Percent Turkish	-0.070** (0.031)	-0.106*** (0.036)
Constant	0.420*** (0.030)	0.328*** (0.108)
Province-Level Covariates	No	Yes
Observations	28	28
R ²	0.320	0.545
Adjusted R ²	0.266	0.386

*Note: OLS Regression. Standard errors in parantheses. *p<0.1; **p<0.05; ***p<0.01*

Overall, the results are consistent with the hypotheses. Testing Hypotheses 1a and 1b I found that wartime increases in fiscal revenues are higher in more homogeneous and more similar provinces, and testing Hypotheses 2a and 2b I found that the costs of investment in fiscal capacity are lower where populations are more homogeneous and similar.

4.2 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. In Appendix Section C I test for the existence

of violation of the parallel trends in the fiscal revenues by the ELF and ES measures. As I present in Table A.3, and discuss in more detail in Appendix Section C, I find no evidence that there is any violation of this assumption.

4.3 Robustness Checks

In Appendix Section D 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. The Appendix also includes a more detailed discussion of these robustness checks. The results are robust to all the checks I describe below.

In Section D.1 I address potential endogeneity issues. To check for the possibility that ethnic composition of a province may be shaped 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.

In Section D.2 of the Appendix I report the results of robustness checks with alternative measures. In Section D.2.1 I use Ethnoreligious Fractionalization (ERF) variable instead of the ELF variable. The ERF measure takes into account the religious and sectarian differences among the groups in addition to the linguistic ones. In Section D.2.2, I use the expense-to-revenue ratio where I use all the expenses of the state to replicate the models in Table 3.

I replicated the analysis using an alternative population data source and also alternative revenue data sources. A detailed description and discussion of these alternative data sources and the results of the analyses are in Appendix Section D.3.

I also replicated the analysis using different empirical specifications and excluding certain observations in Appendix Section D.4. These include running two separate models, excluding one explanatory variable from each model in order to account for any possible collinearity between the two explanatory variables; using a within-effects panel regression; excluding the provinces that do not exist in all three periods (pre-1877, 1877-1896 and 1897-

1910) the dataset covers; excluding three provinces that were most affected by a severe famine during 1873-5; and excluding the observations before 1871, when a new Provincial Law reorganized the bureaucratic-administrative structures within the provinces.

4.4 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. In Appendix Section F I evaluate the 'fiscal contract' (i.e., groups paying more in return for receiving more public goods), nationalism and tax compliance, risk of uprising, initial levels of fiscal capacity, urbanization, GDP per capita and technology transfer as potential alternative explanations. I demonstrate that there is no sufficient empirical evidence for these possible explanations and that the main results are robust after accounting for them.

5 Testing the Mechanisms

5.1 Evidence from Censuses: Association Between Diversity and Illegibility

Censuses are important indications of the population's legibility to the state (Lee and Zhang 2017; Brambor et al. 2020). They reflect how much the state and its agents know about the society and the economic activities. I expect it to be more expensive and difficult to conduct censuses in localities with more dissimilar and heterogeneous populations. If diversity is at the root of the problem of illegibility, then the state should be less likely to be successful in conducting censuses in more diverse places.

To evaluate these expectations, I rely on the outcome of the 1881-1893 census in the empire. In the report presenting the census to the Sultan, 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. I conduct this analysis at the sancak level, the second-level administrative unit in the empire, because the measure of the outcome variable can be measured more precisely at the lower-level administrative units compared to the higher-level province (vilayet), where there are substantial levels of within-province variation in the success of the census. Another advantage of an analysis at the sancak level is that it has higher number of observations at this level and therefore has higher statistical power. Nevertheless, in Appendix Section D.5 I present the results where I conducted the analysis at the province level. The results are similar at the vilayet and sancak levels.

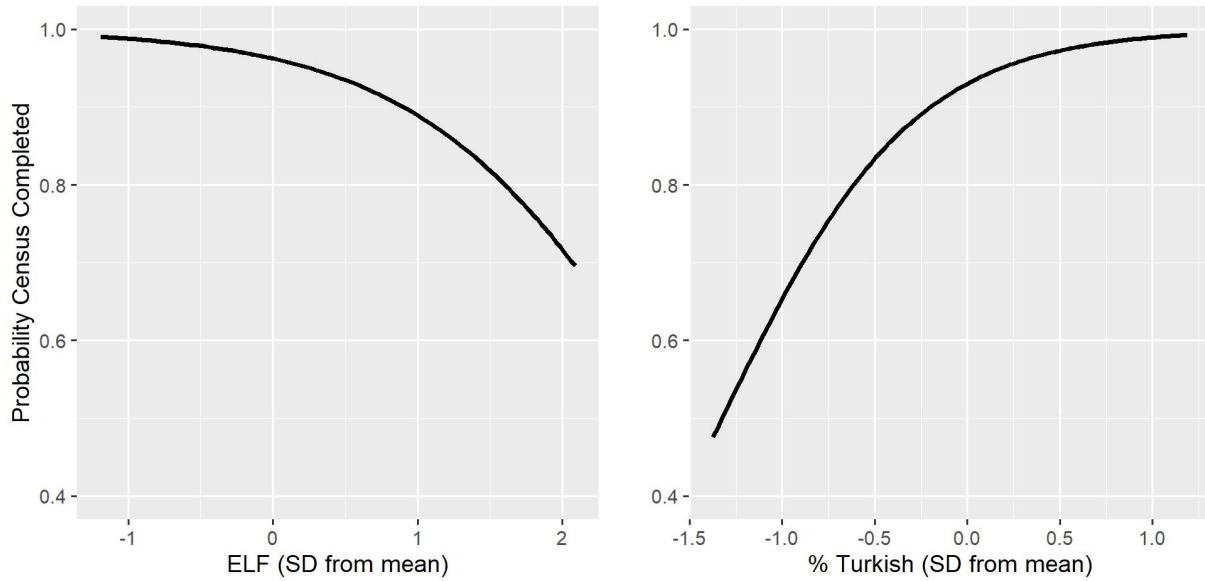
The outcome variable is whether the census was completed in a given sancak. I construct this outcome variable as a dummy, equaling 1 if the census was completed and 0 if not. In Section A.6 of the Appendix I describe the coding of the outcome in a more detailed way and report how each sancak is coded. I use a logistic regression model.

I report the results of the logistic regression analysis in Appendix Table A.16. The results are in line with my expectations. Censuses are significantly less likely to be completed in sancaks with higher ELF measures, and significantly more likely to be completed in sancaks with higher ES scores (higher proportion of Turkish population). In Figure 2, I present the predicted probabilities of census completion by ELF and ES scores.

5.2 Evidence from Expenditure Types

One implication of the mechanisms I offer in my argument can relate to the types of expenditures by the state. Where the costs of investment in fiscal capacity is lower, the state should be more likely to spend on items which are more likely to sustain the state's control and increase fiscal capacity in the longer term. In more diverse places, the state's expenditures should be more likely to be save the day and sustain control for the shorter term while not having much benefit in the longer term. Using the expenditure data for the 1909/10 fiscal year, I identified two spending items that can help the state to increase its control and

Figure 2: Predicted Probabilities of Logistic Regression Models Predicting Census Completion



Notes: The figure on the left presents the predicted probabilities of completing the census by ELF scores of the sancaks and the figure on the right presents the same by the ES scores (% Turkish population). The logistic regression model used is Model 2 in Appendix Table A.16, which controls for Slope, Land Border, Sea Opening and Area. All covariates kept at their median value.

capacity over the long run, the expenditures on the Ministries of Education (*Maarif*), and Post and Telegraph (*Posta ve Telgraf*). The variable for measuring long term investments is the proportion of the total of these two expenditures items to all the expenditures that the central state made in a given province. With the same data, I also calculate the proportion of the total security-related expenditures to the total expenditures. Security forces were often used to help tax collection in the Ottoman Empire (Anderson 1986; Özbek 2015). Such security expenditures can only help the state control the territory and the populations and enhance tax collection for a very short period of time, and were unlikely to sustain long-run increases in fiscal capacity and fiscal revenues.

I expect that under higher similarity and homogeneity the proportion of the long-term investments should be higher, and the proportion of the security investments should be lower.

The results in Table 4 are consistent with these expectations; all the estimates are in the expected direction although not all are statistically significantly different than 0. In the first

Table 4: Analysis of the Types of Expenditures by Diversity

	Dependent Variable:			
	% Longer-Term Investment		% Security Expenditures	
	(1)	(2)	(3)	(4)
Ethnolinguistic Fractionalization (ELF)	-0.009* (0.005)	-0.014** (0.006)	0.030 (0.026)	0.039 (0.024)
Percent Turkish	0.012** (0.005)	0.010 (0.006)	-0.117*** (0.026)	-0.094*** (0.025)
Constant	0.057*** (0.005)	0.046** (0.020)	0.627*** (0.025)	0.551*** (0.079)
Province-Level Covariates	No	Yes	No	Yes
Observations	28	28	28	28
R ²	0.299	0.376	0.483	0.747
Adjusted R ²	0.243	0.158	0.441	0.658

*Note: OLS Regression. Standard Errors in Parantheses. *p<0.1; **p<0.05; ***p<0.01*

two models I test how the two diversity variables predict the proportion of the investments in public goods that can enhance the state's capacity in the longer term. Model 1 is without any province-level covariates. The estimate for the ELF variable is -0.009, indicating that one standard deviation increase in this variable decreases the proportion of the long-term investments by 0.9 percentage points yet this is significant only at the 0.1 level. When the covariates are added, in Model 2, the estimate for the ELF variable increases to -0.014 and is estimated to be significant at the 0.05 level of significance.

In Model 1, without the covariates, the Percent Turkish variable is significantly estimated to be 0.012, meaning that one standard deviation increase in the Percentage of Turks increases the proportion of long-term investments by 1.2 percentage points. However, in Model 2 the size of the estimate declines to 0.01 and is not significantly estimated anymore, missing the significance level of 0.1 by a slim margin.

These estimates are substantively meaningful, even when they are not statistically significant. The mean of the dependent variable is 0.051 and its standard deviation is 0.039. Hence, even when the estimate for the Percent Turkish variable is not statistically signifi-

cant in Model 2 for example, one standard deviation increase in it predicts 0.26 standard deviations increase in the dependent variable.

Models 3 and 4 test how much the two diversity variables predict the percentage of the security expenditures. Model 3 includes no covariates and Model 4 includes all covariates. The estimate for the ELF variable is 0.03 in Model 3 and 0.039 in Model 4. Neither of these are estimated to be significant at the conventional levels. Still, their sizes are not small. The standard deviation of the dependent variable being 0.192, one standard deviation increase in ELF predicts 0.16 and 0.2 standard deviations increases in Models 3 and 4, respectively. The size of the estimate for the Percent Turkish variable is -0.117 in Model 3 and -0.094 in Model 4. Each of these are estimated to be statistically significant than 0, indicating that one standard deviation in this variable decreases the percentage of security expenditures by 11.7 and 9.4 percentage points respectively.

Overall, all the estimates are in the expected direction but some are not estimated to be significant. This provides some support—albeit not very strong—for the argument that the state should focus its expenditures on items that can increase its control and revenues in the longer term in less diverse contexts while in more diverse contexts the expenditures should be for short-term solutions to the problems of control and tax extraction. The lack of statistical significance for some estimates in some models is very likely due to the very low power, having only 28 observations. Even though the estimates are not always statistically significant, they are substantively significant.

5.3 Evidence from the Correspondences Among Administrators

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 linguistic and religious diversity limited state capacity. I discuss the evidence in this section as additional evidence for the existence of the mechanisms in my argument.

There are many direct complaints from the Ottoman bureaucrats in the periphery regarding how diversity undermines population counts, the state's control, development, or taxation (BOA.DH.MKT. 1542/96; BOA.DH.MKT. 1563/25). I will discuss two examples in this section. First is from the year 1847. The district governor (*müşir*) of Sidon in today's Lebanon writes to the center describing the difficulties he has encountered or expects to encounter during the census he is supposed to conduct (BOA.A.MKT. 66/2). He emphasizes that the 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.

The final example is a report by the governor of Baghdad province, Abdurrahman Paşa in 1880 (BOA.Y.EE. 7/12). He writes that the most urgent problem in Ottoman Iraq was the lack of security and order and he blames the "very different cultures, sects and customs" (Çetinsaya 2006, p.25) of the people in the region for this problem. He adds that that the only way to collect taxes and conscript soldiers was by force, which magnifies the problem of security and order.

Indeed, the Ottomans had to rely on military force to collect taxes in many places, especially where it was weaker. Anderson (1986, p.66) notes that in early 19th century Tunisia the Ottomans had to send a military expedition twice a year to collect taxes from rural populations. Similarly, Özbek (2015, pp.191-2) writes that in parts of the province of Aleppo where the tribal populations lived it was impossible to send tax collectors if one or two soldiers did not accompany them, while in the districts of Najd, Ammara and Muntafiq in Iraq where most of the population were nomadic tribes the helplessness of the state agents responsible for tax collection made it necessary to send a platoon of soldiers for tax collection. Sending military to collect taxes is clearly not ideal for the state and is likely costlier than sending only tax collectors.

One strategy the Ottoman rulers had to adopt when assigning bureaucrats to localities was to narrow the pool of candidates and send those who could speak the local language. Yet, this potentially hurts the state's capacity because it limits the number of people who can have sufficient skills to perform their job efficiently. A particular appointment of a subdistrict governor (*kaimmakam*) for the kaza (third level administrative unit) of Rada'a in Yemen discussed in a telegram is informative of how minority languages could cause problems in administration and hindered administrative capacity in this sense (BOA.DH.MKT.1539/120). The telegram informs the recipient that a correspondence clerk of second-class (*ikinci sınıf tahrirat katibi*) with sufficient knowledge of the Arabic language and customs (*lisan ve mizacı 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 for district governors throughout Yemen where those who failed would be sacked from their position. Many did fail. However, the central government asks the governor to be more tolerant (*müsamahakar*) towards those who could speak the local language, using the very same words that were used in the telegram I discussed above—"with sufficient knowledge of the Arabic language and customs"—and that they should not be dismissed from their position without explicit approval from the center.

These two cases in Yemen exemplify how different languages can constrain state capacity. In Yemen, the vast majority of the population spoke Arabic. In the first example, the center wants to send someone who speaks Arabic and 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. This is striking considering that civil service examinations are often vital for screening more skilled bureaucrats and achieving higher state capacity.

Linguistic diversity posed a similar problem in the Balkans. A letter written to the office of the prime minister (*sadaret*) by the Rumeli Inspectorship (*Rumeli Müfettişliği*) informs them that in the provinces of Monastir, Kosovo and Thessaloniki new district governors to be appointed would be required to speak French in addition to having good command of one local language (BOA.TFR.I.A 36/3546).¹⁰ However, it would still be not ideal if the district governor spoke only one of the local languages. These three provinces were home to communities that spoke different languages including Albanian, Bulgarian, Greek, Serbian, and Turkish. An administrator who spoke only one of these languages cannot be shuffled to districts where other languages are spoken, but can only be shuffled across districts where the most common language was the one he spoke. This is not ideal to improve capacity, because bureaucrats who serve in the same locality for extended periods of time can undermine state capacity by building patronage relationships with the local population (Barkey 2008).

We can see similar problems for tax administrators and collectors. A letter sent to the head treasurer in the province of Manastır from its district 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 Greek in addition to another local language.¹¹ Once again, the multitude of languages require bureaucrats with better language skills even at the village level, at potentially higher costs to the state.

Another case of linguistic diversity creating problems for tax administration and collection is mentioned in Interior Minister Memduh Paşa's letter to the office of the Prime Minister in 1902 (BOA.BEO. 1968/14754). The letter is about hiring new tax collectors in the province of Mediterranean Islands (*Cezayir-i Bahr-i Sefid*). We understand that this

¹⁰The Rumeli Inspectorship aimed to implement reforms in three Balkan provinces, Monastir, Kosovo and Thessaloniki.

¹¹While Greek speakers were the most populous group in this area, there were also substantial numbers of other minorities.

letter responds to a telegram by the prime minister. Apparently in this telegram it was demanded that in the province, which has a Greek-speaking Christian Orthodox majority, tax collectors should not keep their books in Greek, but in Turkish. The telegram also apparently said that assigning other tax collectors to the area by the center was out of question because of high salaries that would need to be paid.

In his letter, Interior Minister explains to the Prime Minister that in some parts of the province it is impossible to hire new tax collectors who speak Turkish because of the low numbers of literate Turkish speakers in the province. He adds that the previous tax collectors who already knew the people in the area and who were skilled in the techniques of collecting taxes should be allowed to resume their work even if they do not speak Turkish and keep their books in Turkish, or among those who speak Turkish, even if they are not well-trained enough for bookkeeping in the new techniques.

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. Local intermediaries had an incentive to undercount populations (Doumani 1994). Many local intermediaries had tax farming contracts or were responsible for administering communal taxes.¹² Undercounting would help them obtain cheaper contracts and decrease 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) summarizes the dilemma of having to rely on local intermediaries.

¹²In communal taxation, 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).

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, p.6). Lacking knowledge of diverse areas, the state had to rely on local intermediaries to rule these territories and tax the populations. Yet, the very same reliance on the intermediaries made it difficult for the state to exert a higher degree of control and extract more revenues. This was another reason why focusing state building efforts on less diverse provinces should have been the ideal strategy for the state.

6 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 diversity shape the patterns of state building and taxation. Using an original dataset of local-level fiscal revenues in the Ottoman Empire, I found that the wartime increases in fiscal capacity were 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. First, 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. In a similar vein, Charnysh (2022) finds that the higher costs of governing minority groups discourages the state's investment in these groups which leads to the state extracting lower taxes from them.

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. I found that wartime increases in fiscal revenues are higher in places with higher proportions of Sunni Muslim Turks. This presents a 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 wartime mobilization, 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, 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 Blaydes (2018), and Charnysh (2022).

6.1 Normative and Policy Implications

Given the previous discussion on how states struggled to rule and tax diverse populations, the implications of the findings in this study may raise normative concerns. Is it necessary to have non-diverse populations with no cultural, linguistic, and religious differences to achieve stronger states that are more efficient in raising taxes, and providing better public goods?

The answer to this question is no, because of two reasons. First, raising taxes does not always mean those revenues will be used for public good provision, where each individual and each group in the society will equally benefit. The assumption that higher taxes would return as public goods to the taxpayers would be a strong one. The benefits can as well go to the ruling elites, while certain groups are deprived of even the most basic necessities.

Stronger states do not always turn out to be beneficial for all groups in the society, and can even deteriorate the welfare conditions of societies in general, or some already worse-off groups (Scott 1976, 1998).

Second, diversity can have other economic benefits. Existence of different ethnic groups can increase the volume of trade and economic growth due to interethnic trade if the different groups live in the same geographical area (Montalvo and Reynal-Querol 2021). It can also boost trade through trade with co-ethnics or co-religionists in far-away places. This was very common in the Ottoman Empire as well as other contexts where different groups' advantages were "complementary and nonreplicable" (Jha 2013, p.807). Many minorities in the Ottoman Empire, such as Armenians, Greeks and Jews traded with their co-ethnics in other regions of the empire or their co-ethnics in other countries thanks to linguistic advantages and networks. Finally, there is also empirical evidence that diversity of populations can be favorable for economic growth thanks to human capital accumulation (Arbatli and Gokmen 2018).

If there is one policy implication we can derive from this study, it is that the potential problems against efficient governance in diverse states can be and should be overcome by more pluralism and democracy, and hence increasing diversity at the ruling elite level. It is more likely that at the root of the problem is having too little diversity among the ruling class, rather than too much diversity among the population.

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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, Hüdavendigâr, 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 on the total fiscal revenues at the province level. However, in some of them the information is incomplete (for example, they report revenues from only certain types of taxes) and some report duplicate information with other 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 ad-

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

ministrators 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.

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

The image shows two pages of a handwritten Ottoman budget report. The text is in Ottoman Turkish, with some words in Arabic script. The document is organized into several columns, likely representing different administrative units or types of revenue and spending. The left page has a header section with some text and a large table of numbers. The right page continues the table with more columns and rows of data. The handwriting is dense and consistent throughout the document.

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 observations, the British Foreign Office documents (**gillard`report`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 the 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 Excluded Units

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).²

A.4 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. 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 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

²Normally, 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.

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 (Karpas 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).

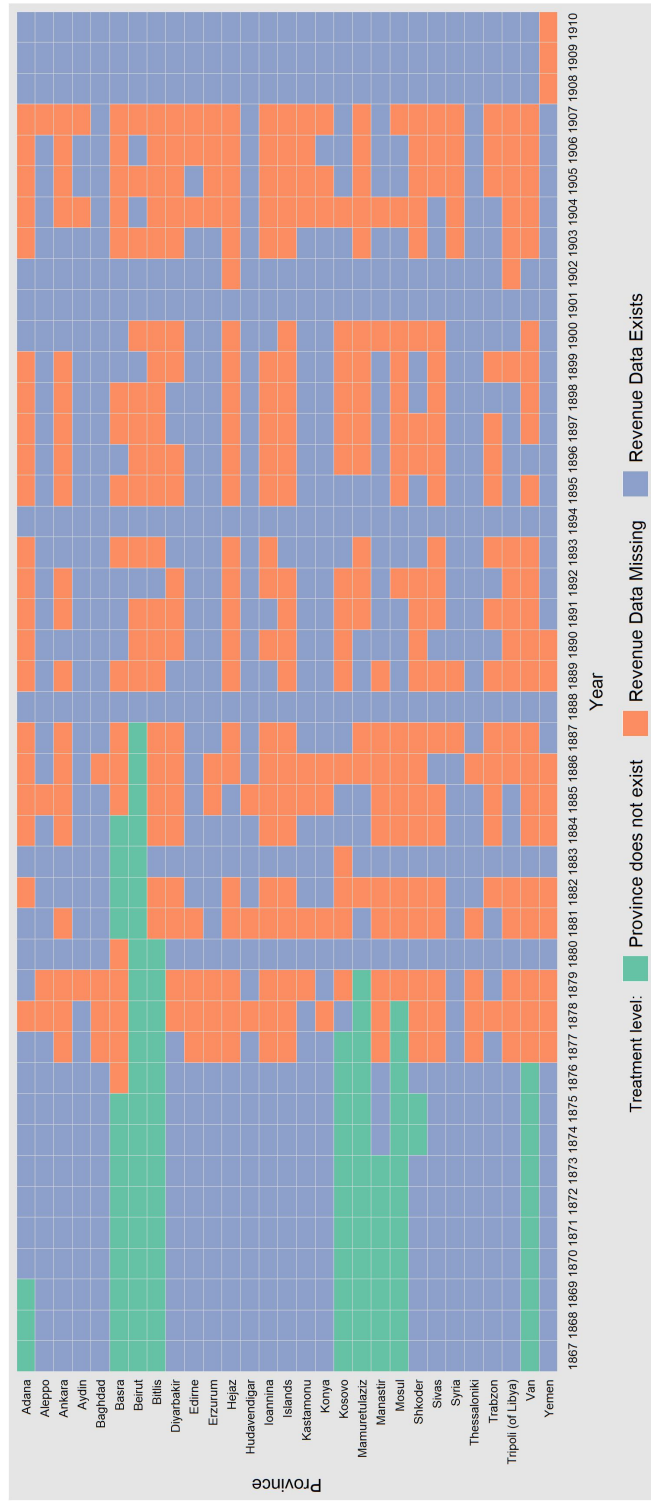
It was far more complicated with the Muslim groups. Since the censuses provided no clues about the ethnic identities of the Muslims, I had to turn to secondary sources. For the number of Kurds, Turks and Armenians in the six provinces in Eastern Turkey³ I used the population estimates in Marashlian (1991) 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, Basra, Beirut, Hejaz, Syria, Tripoli of Libya (Trablusgarp) and Yemen.⁴ For Mosul and Aleppo, 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 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).

³These provinces are also known as *Vilayat-ı Sitte* (the Six Provinces). They had large Armenian populations and were political hotspots. They are Bitlis, Erzurum, Diyarbakir, Mamuretülaziz, Sivas and Van.

⁴In a report to the Sultan, it is reported that all the Muslim tribes in the Arabian Peninsula speak Arabic (Y.PRK.AZJ.44/68).

A.5 Revenue Data by Year and Province

Figure A.2: Tax Revenue Data by Province and Year



*Note: Produced using panelView package in R (Mou, Liu, and Xu 2022).

A.6 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 Dedeoğlu) 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	Hüdavendigâr	Bursa	Complete
Adana	İçel	Complete	Hüdavendigâr	Ertuğrul	Complete
Aleppo	Aleppo	Incomplete	Hüdavendigâr	Karahisar	Complete
Aleppo	Urfa	Incomplete	Hüdavendigâr	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.7 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

A.8 Discussion of the Expense-to-revenue Ratio Variable and the Control Variables

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, while the mean for the remaining observations is 0.93. 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). Since this observation is an outlier which is likely to affect the results in a dataset with very small number of observations (N=29 including this observation), I exclude it from the analysis.

The control variables include the total 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 railroads 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 high altitudes, a dummy indicating whether the province 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.

B Discussion of Revenue Increases Under Tax Farming

The state's wartime fiscal revenues may have increased in several ways. For the taxes that were directly administered, via the state's own agents, the problem was the transaction costs of tax collection. When it was in need of funds and as long as the costs were not high enough, the state could invest in fiscal capacity by spending to learn more about the population and its economic activities, and hiring more competent agents. In these cases, I expect the costs of necessary investment increase as diversity increases. Hence, the state is more likely to invest in fiscal capacity under more homogeneity and similarity.

For the taxes that were farmed, the problem was both transaction costs of tax collection and the higher bargaining power of the intermediaries due to the inherent advantages they possessed in local knowledge and networks. Where intermediaries were involved in tax collection, the revenues could have increased via two paths. First, with the urgency of the resource extraction and the higher value of the future flow of taxes, the ruler could eliminate the intermediary from the process and start collecting the taxes directly, a process I call fiscal centralization. Having eliminated the intermediary, the state could lay claim on all the money that could be collected, not having to share a portion of it with the intermediary. As long as the necessary costs of the investment were low enough, the state could choose this path. However, the elimination of the intermediaries was not always necessary to increase the state's fiscal revenues for the taxes that were farmed. I argue that the second path that could increase the state's fiscal revenues was the *possibility* of fiscal centralization by the state; when the state's bargaining power against the tax farmers increased and the state could sell the farming contract for a higher price.

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 taxes in a unit if a tax farmer offered a higher price than its baseline revenue. The expenditure of a tax farmer with a better knowledge of the 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.

C 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 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 wars happened and kept rising at a higher pace after the wars so that the wartime increases end up to be higher in the more homogeneous and similar provinces. Plotting the trends before each of the wars that happened in order to check if the trends are parallel is not a viable option in this case because each of the two explanatory variables are continuous.

Table A.3: Pre-War Trends in the Revenues by ELF and ES Variables

	Dependent Variable:	
	Revenue Per Capita (in 1998 USD)	
	Pre-1877	Pre-1897
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	24.957*** (1.760)	19.606*** (2.672)
Percent Turkish	10.753*** (1.821)	9.151*** (2.490)
Year Count	-0.152 (0.188)	-0.056 (0.088)
ELF * Year Count	-0.239 (0.188)	0.003 (0.088)
Percent Turkish * Year Count	0.097 (0.178)	0.050 (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. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

Even though it may not be possible to test the assumption formally, I conducted an analysis which aims 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 of a violation of the parallel trends assumption.

I present the results in Table A.3. 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 any concern. The coefficients of the interactions of the explanatory variables with the Year Count variable are neither substantively, nor statistically significant.

D Robustness Checks

D.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 an interactive control variable to the generalized difference-in-differences model. The results I report in table A.4 indicate that the findings are robust to the inclusion of this variable.

Table A.4: 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 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: OLS Regression. Standard Errors in Parantheses

*p<0.1; **p<0.05; ***p<0.01

D.2 Alternative Measures

D.2.1 Ethnoreligious Fractionalization (ERF)

Religious and sectarian diversity can also undermine legibility (Blaydes 2018). Constructing an ERF measure allows me to take into account important religious and 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. The results in Table A.5 indicate that higher ERF also hinders war from increasing fiscal capacity during wartime.

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.5, 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.5 are consistent with the hypotheses. The wartime increases in fiscal revenues are lower in provinces where ethnoreligious fractionalization is higher.

Table A.5: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues with Ethnoreligious Fractionalization as the Explanatory Variable

	Dependent Variable:	
	Revenue Per Capita (in 1998 USD)	
	(1)	(2)
Ethnoreligious Fractionalization (ERF)	-73.802*** (4.257)	-115.561*** (4.669)
Post-1877 Dummy	6.704* (3.522)	4.217 (3.978)
Post-1897 Dummy	4.014 (3.283)	-0.491 (3.740)
ERF * Post-1877 Dummy	-1.993** (0.899)	-3.429*** (0.968)
ERF * Post-1897 Dummy	-2.847*** (0.874)	-2.482*** (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: OLS Regression. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

D.2.2 Expense-to-Revenue Ratio with all Expense Items

In Table A.6 I report the analysis for the Expense-to-revenue ratio with the total of all the expense items. The results in Table A.6 reveal similar patterns to the results in the original analysis in Table 3.

Table A.6: Expense-to-revenue Ratio for All Expense Items for the Fiscal Year 1909-10

	Dependent Variable:	
	Expense to Revenue Ratio	
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	0.111 (0.081)	0.159** (0.073)
Percent Turkish	-0.312*** (0.079)	-0.356*** (0.081)
Population (1000)		0.001** (0.0002)
Sea Opening Dummy		0.253 (0.163)
Railroad Dummy		-0.118 (0.151)
Average Elevation (km)		0.268 (0.183)
Land Border Dummy		0.130 (0.152)
Constant	0.944*** (0.077)	0.220 (0.248)
Observations	28	28
R ²	0.427	0.692
Adjusted R ²	0.382	0.584

Note: OLS Regression. Standard Errors in Parantheses. *p<0.1; **p<0.05; ***p<0.01

D.3 Alternative Data Sources

In order to evaluate the results with alternative source of population data, I calculated all the revenue per 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.7 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.8 indicate that the results are also robust to these changes.

Table A.7: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues with Alternative Population Data

	Dependent Variable: Revenue Per 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: OLS Regression. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

Table A.8: Generalized Difference-in-Differences Analysis of the Wartime Increases in Fiscal Revenues with Alternative Revenue Data

	Dependent Variable: Revenue Per 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: OLS Regression. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

D.4 Alternative Empirical Specifications

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, I replicated the analysis in two separate models, excluding one of the explanatory variable from each model.⁵ The results remain robust. I report them in Table A.9.

In order to check whether results are similar if I use a different statistical method, I replicated the analysis using a within-effects panel regression. The results I report in Table A.10 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 Table A.11 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 proportions of Turkish population than most other provinces. These three provinces are Kastamonu, Ankara and Konya (Quataert 1968). The results I report in Table A.12 are robust to the exclusion of these three provinces.

Finally, I exclude the observations before the year 1871, which is the date when the second Provincial Law by the empire reorganized the bureaucratic-administrative structures within the provinces (Kırmızı 2010). I report the results of this analysis in Table A.13, which are still robust.

⁵It is not possible to have a province that is very similar and also very heterogeneous.

Table A.9: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues in Two Separate Models

	Dependent Variable:	
	Revenue Per Capita (in 1998 USD)	
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	48.157*** (2.647)	
Percent Turkish		21.187*** (1.401)
Post-1877 Dummy	6.729* (3.517)	6.496* (3.367)
Post-1897 Dummy	4.286 (3.278)	4.639 (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: OLS Regression. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

Table A.10: Panel Data Analysis of Wartime Changes in Fiscal Revenues

	Dependent Variable: Revenue Per 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: Within-Effects Model. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

Table A.11: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues for only Provinces that Exist in all Three Periods

	Dependent Variable: Revenue Per 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: OLS Regression. Standard Errors in Parantheses. *p<0.1; **p<0.05; ***p<0.01

Table A.12: 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 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: OLS Regression. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

Table A.13: Difference-in-Differences Analysis of Wartime Changes in Fiscal Revenues for the Post-1871 Sample

	Dependent Variable: Revenue Per 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
<i>Note: OLS Regression. Standard Errors in Parantheses.</i>	
	*p<0.1; **p<0.05; ***p<0.01

D.5 Census Outcome Analysis with Province-Level Data

Using the same report from which I constructed the sancak-level data (BOA.Y.PRK.A, 78/8), I constructed the success of the outcome of the census at the province (vilayet) level. I coded the census quality as an ordinal variable for the province-level data, lowest quality being 0, intermediate quality being 1, and highest quality being 2. Table A.14 lists how the outcome variable is coded for each province.

Table A.14: List of Provinces and the Census Quality at the end of the Census of 1881-93

Province	Census Quality (From 0 to 2)
Adana	Higher (2)
Aleppo (Halep)	Intermediate (1)
Ankara	Higher (2)
Aydın	Higher (2)
Baghdad (Bağdat)	Lower (0)
Basra	Lower (0)
Beirut (Beyrut)	Higher (2)
Bitlis	Lower (0)
Crete (Girit)	Did not start
Diyarbakir	Higher (2)
Edirne	Intermediate (1)
Erzurum	Intermediate (1)
Hejaz (Hicaz)	Did not start
Hüdavendigâr	Higher (2)
Ioannina (Yanya)	Higher (2)
Kastamonu	Higher (2)
Konya	Higher (2)
Kosovo (Kosova)	Intermediate (1)
Mamûretülaziz	Intermediate (1)
Mediterranean Islands (Cezayir-i Bahr-i Sefid)	Intermediate (1)
Monastir (Manastır)	Lower (0)
Mosul (Musul)	Lower (0)
Shkoder (İşkodra)	Lower (0)
Sivas	Higher (2)
Syria (Suriye)	Intermediate (1)
Thessaloniki (Selanik)	Higher (2)
Trabzon	Higher (2)
Tripoli of Libya (Trablusgarp)	Did not start
Van	Lower (0)
Yemen	Did not start

The results are similar to the sancak-level analysis and are in line with the expectations that diversity undermines conducting censuses, rendering a population less legible to the

state and its agents, as the censuses are more likely to be completed or to be of higher quality in administrative units with higher proportions of Turks and in more homogeneous administrative units.

Table A.15: Analysis of the Relationship Between Ethnic Composition and Census Quality at the Province Level

	<i>Dependent variable:</i>	
	Census Quality (0: Lowest, 2: Highest)	
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	0.621	0.436
	t = -0.993	t = -1.250
Percent Turkish	6.835	8.831
	t = 2.904***	t = 2.005**
Population (1000)		0.999
		t = -0.116
Sea Opening Dummy		1.765
		t = 0.427
Railroad Dummy		6.049
		t = 1.068
Average Elevation (km)		0.860
		t = -0.117
Land Border Dummy		0.393
		t = -0.939
Observations	26	26

Notes: Ordinal logistic regression. Odds ratios and t-values reported. *p<0.1; **p<0.05; ***p<0.01.

For the province-level analysis I use an ordinal logistic regression model as the dependent variable is ordinal. With four provinces excluded from the analysis because the census never started in these provinces, there are only 26 observations and we have very low statistical power. Nonetheless, there is support for the expectation that diversity makes it more difficult to count populations, as I report in Table A.15.

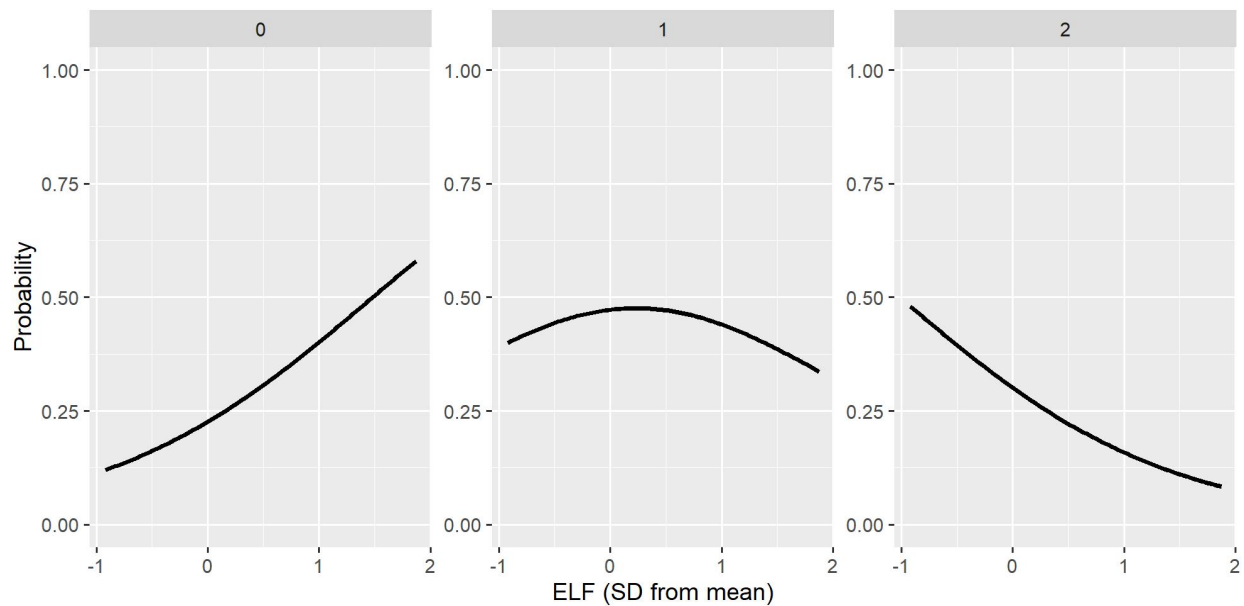
In Model 1, I conduct the ordinal regression analysis without any covariates. Each diversity measure is standardized around their means. The odds ratio of the ELF variable is 0.621, indicating more homogeneous administrative units have lower quality censuses,

although it is not estimated to be statistically significant. The odds ratio for the Percent Turkish variable is 6.685 and is significantly estimated, which suggests that for one standard increase in this variable, the census quality is more than 6.6 times more likely to be one level higher.

In Model 2, I include five covariates in the model, province’s population (in 1000), whether the province has any sea opening, whether there are any railroads in the province, the average elevation of the province, and whether the province has any land borders to another state.

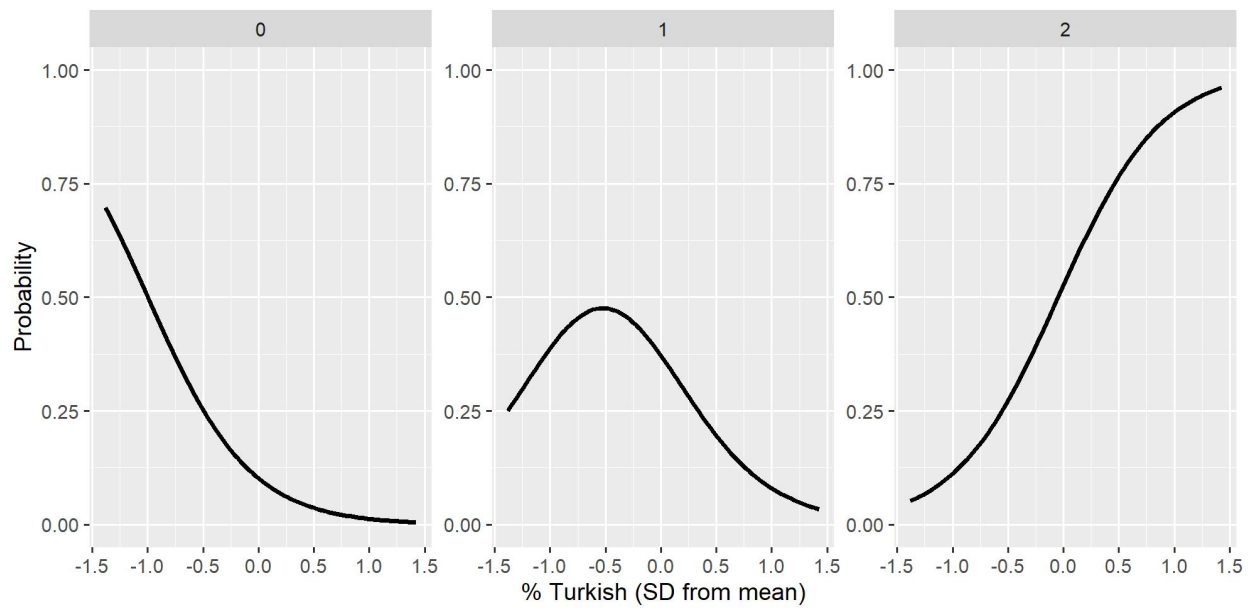
Figure A.3 presents the predicted probabilities for census quality scores according to the ELF measure, and Figure A.4 presents the predicted probabilities according to the Percent Turkish measure, according to Model 2 in Table A.15.

Figure A.3: Predicted Probabilities of Logistic Regression Models Predicting Census Quality at the Province Level by ELF Score



Notes: The figures present the predicted probabilities of census quality score by ELF score for a province, based on the ordinal logistic regression model used is Model 2 in Table A.15, which controls for Percentage of Turks, Population size, Elevation, Land Border, Sea Opening and presence of Railroads. The plot on the left presents the predicted probabilities that the outcome variable is 0, the plot in the middle for the outcome variable being 1, and the plot on the right for the outcome variable being 2. All the covariates, including Percent Turkish, are kept at their median value.

Figure A.4: Predicted Probabilities of Logistic Regression Models Predicting Census Quality at the Province Level by Percent Turkish Score



Notes: The figures present the predicted probabilities of census quality score by Percent Turkish score for a province, based on the ordinal logistic regression model used is Model 2 in Table A.15, which controls for Fractionalization, Population size, Elevation, Land Border, Sea Opening and presence of Railroads. The plot on the left presents the predicted probabilities that the outcome variable is 0, the plot in the middle for the outcome variable being 1, and the plot on the right for the outcome variable being 2. All the covariates, including ELF, are kept at their median value.

E Other Tables

Table A.16: Analysis of the Relationship Between Ethnic Composition and Census Quality

	<i>Dependent variable:</i>	
	Census Completed	Dummy
	(1)	(2)
Ethnolinguistic Fractionalization (ELF)	0.448 t = -2.044**	0.331 t = -2.034**
Percent Turkish	9.959 t = 3.407***	7.171 t = 2.383**
Average Slope		1.048 t = 0.312
Land Border Dummy		0.315 t = -0.949
Sea Opening Dummy		7.126 t = 1.659*
Area (km sq.)		1.000 t = -0.772
Observations	70	64
Log Likelihood	-25.248	-17.424
Akaike Inf. Crit.	56.496	48.849

Note: Odds Ratios and t-values Reported. *p<0.1; **p<0.05; ***p<0.01

F Evaluating Alternative Explanations

F.1 The Fiscal Contract

One reason why groups may be willing to pay more taxes can be what is called the “fiscal contract” where a given group can get more from the state in return for paying taxes and can be more willing to pay taxes if it gets more public goods and services (Timmons 2005). I argue that fiscal contract is unlikely to explain the taxation patterns in this case for two reasons.

The first reason is that the largest portion of Ottoman State’s expenses during this period is on the military, which provides a non-excludable public good in the form of national security. The share of public goods that can target certain groups in the Ottoman Empire are minimal (Güran 2003). The Ottoman State was not very active in provision of non-security public goods, which were often provided by waqfs (Kuran 2001; Cansunar 2022). In the fiscal year 1887-8, for example, the Ottoman State’s share of military expenses were 50.9% of its total spending and 25.0% of the expenses went to debt repayment. By contrast, only 0.4% of the expenses were on health, 0.5% were on education and 0.9% were on social security (Güran 2003, p.15). Almost 20 years later, during the fiscal year 1905-6, things had not changed, but not significantly. The share of military expenditures were 36.2%, and the share of debt repayments were 32.6% of the total expenses of the central state. The shares allocated to public goods were still minimal. Health expenditures amounted to a 0.4%, education to a 0.1%, and social security to a 3.4%.

The second reason is that there is no evidence that the ones who are more burdened by the tax payments are receiving more public goods in return. A simple regression analysis of per capita spending on the Ministries of Education (*Maarif*) and Posts and Telegraphs (*Posta ve Telgraf*) from expenditures for the 1909/10 fiscal year suggest that there is no

significant association between spending on these items and a province’s diversity.⁶ The results I report in Table A.17 reveal that there is no meaningful relationship between a province’s diversity and how much the state spends on public goods.

Table A.17: Analysis of Public Good Expenditures per Capita by Diversity

	Dependent Variable:
	Public Good Expenditure per Capita (in guruş)
Ethnolinguistic Fractionalization (ELF)	144.6 (468.6)
Percent Turkish	-521.2 (544.3)
Sea Opening Dummy	58.528 (1,069.6)
Railroad Dummy	3,342.7*** (1,019.2)
Average Elevation (km)	355.0 (1,194.1)
Land Border Dummy	709.9 (1,007.3)
Constant	1,950.1 (1,648.0)
Observations	28
R ²	0.378
Adjusted R ²	0.201

*Note: OLS regression. Standard errors in parentheses. *p<0.1; **p<0.05; ***p<0.01.*

F.2 Ethnic Nationalism

One alternative explanation and rival mechanism one can worry about is ethnic nationalism. Those of Turkish ethnicity might have been more likely to comply with taxation during war out of nationalist feelings and minorities may not have been willing to fund the state for such purposes for the lack of such feelings, or negative feelings. Even though ethnic nationalism

⁶I use only the spending on the Ministry of Education and the Ministry of Posts and Telegraphs, similar to the analysis I reported in Table 4 of the main text, because these are the only two spending items that are on non-security public goods.

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. I argue that this is unlikely to be true because it is difficult to assert that ethnic nationalism existed during this period among the Turks and some other minorities in the empire. Nevertheless, I check for the most likely case when ethnic nationalism can prevent tax extraction from a certain group, the Greek minority during the 1897 Greco-Ottoman war. I demonstrate that the main results hold even after controlling for the proportion of the Greek minorities in each province.

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.”⁷

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).⁸

In addition to this, in many diverse provinces in the Ottoman Empire, many minority populations had not yet embraced any nationalist ideology and minority nationalisms were yet nonexistent in the Arab and Albanian-populated regions, in addition to most populations that lived in today’s Turkey (Haddad 1994; Özoğlu 2001; Reinkowski 2017). This is especially important once we consider that Albanian, Arab and Kurdish minorities comprised either a majority, or almost all of the population in the provinces of Aleppo, Baghdad, Basra, Beirut, Hejaz, Kosovo, Monastir, Shkoder, Syria, Tripoli of Libya and Yemen. Moreover, they formed a significant portion of the populations in the provinces of Bitlis, Diyarbakır, Erzurum, Ioannina, Mamüretülaziz and Van. With substantial populations of these three ethnic groups in so many provinces and lack of ethnic/nationalist consciousness or nationalism among

⁷Refers to Mustafa Kemal Atatürk, who was leading the Turkish War of Independence.

⁸The 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 İslam’iz Elhamdülillah... O senin dediklerin Haymana’da yaşarlar.”

them, it is unlikely that the results rely on these groups not complying with taxation during wartime because of their nationalist ideologies or feelings.

In order to systematically account for ethnic nationalism in the empirical analyses, I calculated the proportion of Greeks in each province and add it as a control variable to see if it changes the results for the 1897 Greco-Ottoman War. This is the ideal case to study ethnic nationalism as an alternative mechanism because the Ottoman state fought against the Greek nation state in this case and substantial numbers of the members of the Greek minority lived in many Ottoman provinces. I interact the percent of the Greek population in each province with the post-1897 dummy. The results I report in Table A.18 reveal that controlling for the percentage of the Greek population does not change the results for the effect of diversity on the changes in fiscal revenue during the 1897 war.

F.3 Risk of Uprising

The discussion of the second alternative mechanism can build on the first one, ethnic nationalism. If in more diverse areas higher taxes are more likely to trigger the minorities' nationalist feelings and make the minorities more likely to start or participate in an uprising, especially if this could create a risk of secession, then the state may have preferred to increase the tax burden on less diverse areas.

Again, this logic cannot explain why there are higher increases in fiscal revenues in more homogeneous provinces. In fact, the risk of uprising should be higher in more homogeneous provinces because the collective action problem can be more easily overcome in homogeneous groups. Still, it is worth discussing this alternative mechanism as a potential rival for the Ethnic Similarity variable.

In order for this mechanism to work, the Ottomans should have been aware of the potential of nationalist uprisings among certain minority populations and adapted their fiscal capacity building strategies accordingly. However, the literature on the Ottoman responses

Table A.18: Generalized Difference-in-Differences Analysis of Wartime Increases in Fiscal Revenues, Controlling for the Proportion of the Greek Population

	Dependent Variable: Revenue Per Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	21.900*** (1.252)
Percent Turkish	10.522*** (1.188)
Post-1877 Dummy	6.917** (3.181)
Post-1897 Dummy	6.820** (2.992)
Percent Greek * Post-1897 Dummy	-2.073** (0.858)
ELF * Post-1877 Dummy	-2.023** (0.831)
ELF * Post-1897 Dummy	-2.411*** (0.794)
Percent Turkish * Post-1877 Dummy	2.854*** (0.823)
Percent Turkish * Post-1897 Dummy	4.158*** (0.809)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	761
R ²	0.897
Adjusted R ²	0.886

Note: OLS Regression. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

to minority uprisings argues that the Ottomans had failed to understand the nationalist character of some of the uprisings during the 19th century (Davison 1977).

In addition to this, there is also not much evidence that tax-related uprisings were more likely to happen among the minority populations. In fact, discussing the tax revolts that took place before the 1908 revolution, Aytekin (2013, p.323) argues that there were more

tax-related uprisings in Central and Eastern Anatolia than other regions in the empire and that most rebels were Muslims. Central Anatolia is predominantly Sunni Muslim Turkish.

One straightforward explanation for this pattern can be that there were more uprising among the Muslim populations because their tax burdens increased heavily while minorities were less likely rebel because their tax burdens did not increase. However, such a perspective cannot explain why we see uprisings in both Central Anatolia, where Sunni Muslim Turks formed a vast majority of the populations and Eastern Anatolia, where they were a minority. In addition to this, this perspective cannot explain why in other regions with Sunni Muslim Turkish majorities such as Western Anatolia (the provinces of Aydın and Hüdavendigâr), two of the provinces with the highest increases in per capita revenues during the two wars that I examine, the extent of uprisings were behind Central and Eastern Anatolia.

F.4 Initial Fiscal Capacity

Another alternative explanation can be about scales. It might be easier to achieve higher increases in regions where the per capita fiscal revenues were lower to start with and in places where the per capita revenues are already high it might be more difficult to increase them because they are already very high.

This mechanism is unlikely to be the reason why we see higher increases in fiscal revenues in less diverse regions because in the Ottoman empire the per capita fiscal revenues were very low compared to many other contexts (Karaman and Pamuk 2010). This was true for all the provinces in the empire. Therefore, there was substantial room for improvement of the state's fiscal revenues regardless of the initial levels.

F.5 Urbanization

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).

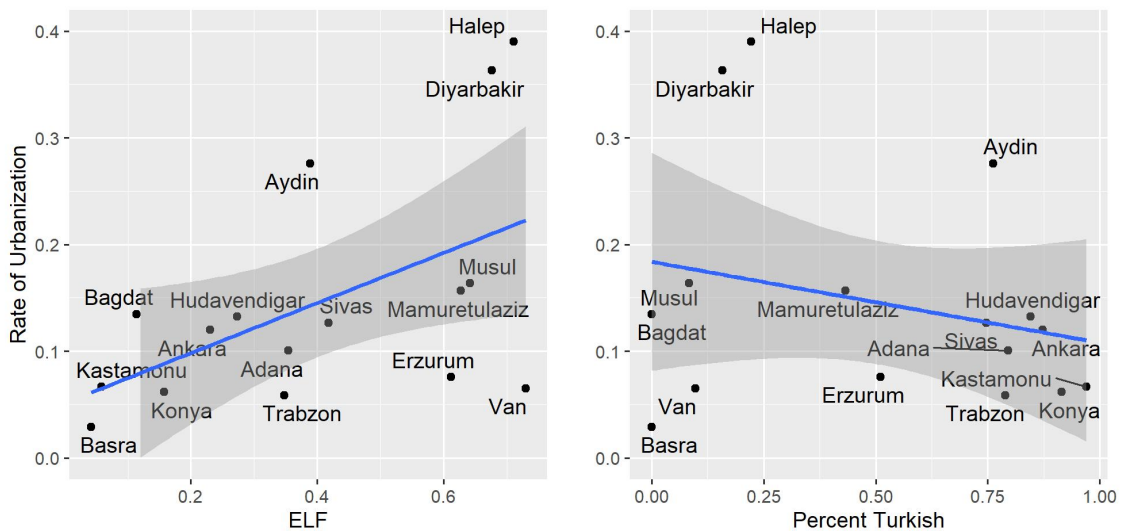
The ideal way to test this alternative mechanism would be to collect time-variant data on the urbanization rates in each province and control for this covariate in the analysis. Unfortunately, I have not been able to identify temporal data for this variable and the data I identified so far does not include measures for many of the provinces (there is data for only 16 provinces out of 30), which forces me to evaluate this alternative mechanism in a descriptive way with the data I have.

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 A.5 plot the relationships between these variables.

F.6 Economic Output/GDP

GDP can be another alternative explanation worth considering since there has been evidence in the literature that higher GDP enables higher tax revenue per capita (Besley and Persson 2011). The concern here can be that wartime increases happen in provinces with higher GDP since there is more to tax in these provinces, with higher economic output. However, GDP 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

Figure A.5: Urbanization and Ethnic Composition



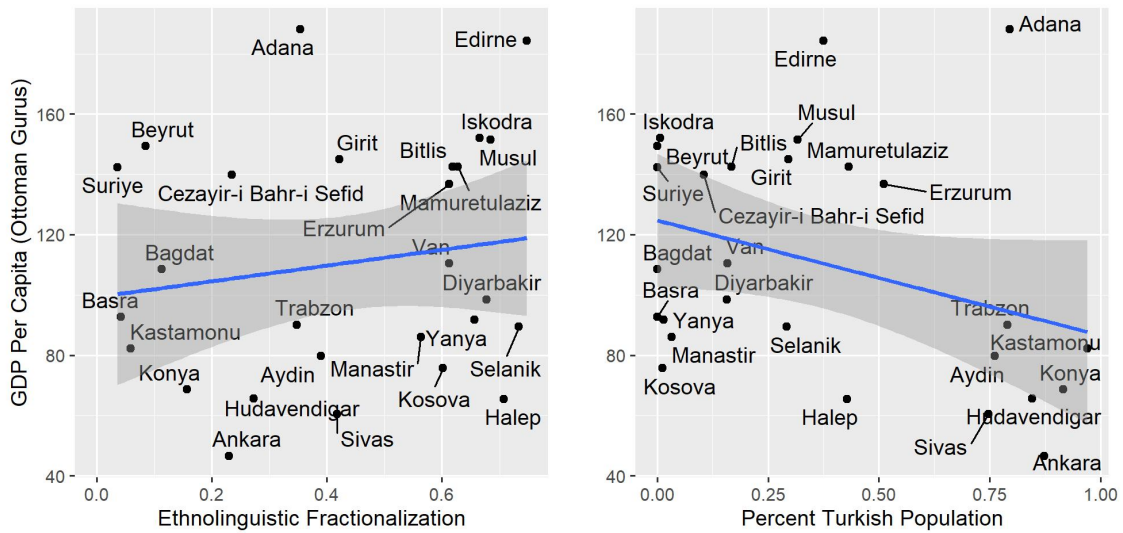
published by the Ottoman State (Güran 1997). The scatterplots I present in Figure A.6 below indicate that GDP per capita has a slight positive correlation with ELF at the province level, and is negatively correlated with ES. Neither of these factors, at least in the year 1897, correlate in a way with GDP per capita to indicate that GDP per capita can be the factor that can cause the outcome.

Even though a time-variant GDP variable would be ideal to control for GDP levels in the analysis, due to the lack of such data I add the time-invariant GDP measure interactive control in the generalized difference-in-differences model. The results in Table A.19 demonstrate that the main results are robust to controlling for the GDP. Note that the model drops the main effect for the GDP variable because it is time-invariant.

F.7 Technology Transfer

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

Figure A.6: GDP per Capita and Ethnic Composition



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 consider 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. 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.

Table A.19: Generalized Difference-in-Differences Analysis of Wartime Increases in Fiscal Revenues, Controlling for the GDP Levels

	Dependent Variable: Revenue Per Capita (in 1998 USD)
Ethnolinguistic Fractionalization (ELF)	22.320*** (1.361)
Percent Turkish	10.708*** (1.221)
Post-1877 Dummy	3.605 (4.161)
Post-1897 Dummy	6.595 (4.126)
ELF * Post-1877 Dummy	-1.796** (0.881)
ELF * Post-1897 Dummy	-2.792*** (0.839)
Percent Turkish * Post-1877 Dummy	3.007*** (0.874)
Percent Turkish * Post-1897 Dummy	3.566*** (0.869)
GDP (million gurus) * Post-1877 Dummy	0.035 (0.031)
GDP (million gurus) * Post-1897 Dummy	0.021 (0.035)
Province Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	736
R ²	0.893
Adjusted R ²	0.880

Note: OLS Regression. Standard Errors in Parantheses.

*p<0.1; **p<0.05; ***p<0.01

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