

Financial Development, Institutions, and Growth: Historical Evidence from the Ottoman Empire

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Abstract

The recent empirical research shows that institutions are the fundamental causes of long run development. This paper uses historical data from the Ottoman Empire archives between 1500–1900 to investigate the relation between a specific institution, tax-farming, and development. Under the tax-farming system individuals buy the rights to a production unit during the auctions organized by the government. The protection of property rights evolves within this system from being none (1600s) to owning the tax-farm over the course of one's lifetime (1700s). I show that within the system of tax-farming the areas where the productive farms are located enjoyed higher levels of development both historically and contemporarily. This result only holds for 1700s when the owner had property rights over the tax-farm. Comparing across 88 regions within the Ottoman Empire that span 11 different present-day countries, I show that the regions that were governed with the tax-farming system in 1700s and the regions with the financially decentralized tax-farms in 1600s have higher levels of development today. The key mechanism seems to be that tax-farming led to private capital accumulation and higher levels of financial development. The results are robust to various geographical characteristics and also not driven by unobserved heterogeneity as shown by falsification exercises.

1 Introduction

The recent research shows that institutions are the fundamental causes of long run development.¹ Much of this recent literature based on the idea that the geographic pattern of development that we observe across countries reflects different institutional structures either inherited from colonial past or adopted from leading countries. According to this literature different geographical conditions gave rise to different institutional arrangements which in turn led to development thorough protection of property rights, good governance and political and financial competitiveness.

This paper uses historical data from the Ottoman Empire archives between 1500–1900 to investigate the relation between a specific institution, tax-farming, and development. Under the tax-farming system individuals buy the rights to a production unit during the auctions organized by the government. The protection of property rights evolves within this system from being none (1600s) to owning the tax-farm over the course of one’s lifetime (1700s). I show that within the system of tax-farming the areas where the productive farms are located enjoyed higher levels of development both historically and contemporarily. This result only holds for 1700s when the owner had property rights over the tax-farm. Comparing across 88 regions within the Ottoman Empire that span 11 different present-day countries, I show that the regions that were governed with the tax-farming system in 1700s and the regions with the financially decentralized tax-farms in 1600s have higher levels of development today. Preliminary results show that the key mechanism seems to be that tax-farming led to private capital accumulation and higher levels of financial development.

The main contribution of the paper lies in the unique regional dataset that is ideal for examining *de-facto* institutional differences within a macro-institutional setting since I can exploit variation among regions of the Ottoman Empire controlling for the empire and the country effects. Recently, the literature has begun to argue the need to study institutions in a within country framework. This would be beneficial since it would be easier to deal with

¹See North (1981, 1994, 1995), Engerman and Sokoloff (1997), Hall and Jones (1999), Acemoglu, Johnson, and Robinson (2001, 2002, 2005), Acemoglu and Johnson (2005), and Acemoglu and Robinson (2006).

the omitted variables and unobserved heterogeneity problems in a within country setting. In addition we can identify more specific dimensions of institutions since the data will not be subjective indices or dummy variables as mostly done in a cross-country setting. This paper belongs to this new group of papers that try to tackle the problem of institutional change and differences within a given macro-institutional setting.² This paper's original contribution over these existing papers is based on the nature of the data. The data span 88 historical regions of the Ottoman empire that corresponds to 11 present-day countries, who spent 500 years on average under a single empire and hence same *de-jure* institutional setting.

Ottoman Empire was one of the longest surviving empires. It stood at the crossroads of civilizations, stretching from Balkans to Egypt for 6 centuries prior to WWI. Pamuk (2004) argues that there is a lot to learn from the Ottoman experience since Ottomans had a different set of institutions. Ottomans were pragmatic and flexible and hence their institutions can adopt to the changing economic environment. While their contemporaries disintegrated in 17th, and 18th centuries, Ottomans managed to undertake institutional change in certain areas, which allowed them to survive into the 19th century. Pamuk (2004) also argues that there were some key aspects of the economic and political structure that this institutional change did not alter, such as permanent state ownership of land, urban guilds, and restrictions on private capital accumulation. Hence the "European" style mercantalism did not develop enough, which—according to some historians—why the empire disintegrated at the end.³ Hence the Ottoman experience can help us to answer the key question: which institution do matter for the long-run development.⁴

²See Iyer (2003), Banerjee and Iyer (2004), Mitchener and McLean (2003), Berkowitz and Clay (2004), Banerjee, Iyer, and Somanathan (2004), Acemoglu et al. (2007), and Soares (2007).

³See also Gran (1987) who argues that the reason why merchant capitalism did not lead to modern capitalism in Egypt under Ottoman rule (in spite of the very active merchants of Egypt) is partly due to the export ban of Ottomans had some impact too.

⁴See the recent model of Acemoglu and Robinson (2006) that shows the change and persistence of institutions can coexists.

2 Background Literature and Tax-Farming

The literature on institutions and long-run development is very extensive. One strand of the literature is trying to understand what caused the Industrial Revolution and why it happened in Britain. Pomeranz (2000) challenges various theories that Europe had an economic edge before 1800 which was generated internally. He argues that China (Yangzi Delta) and Western Europe (England) were at similar levels of development and had markets working equally efficiently before the Industrial Revolution. Thus Europe had no freer markets. There was no technological, institutional and human capital advantage in Europe. And finally the demand for luxury good were no higher in Europe than other places. Pomeranz (2000) argues that the reason why Western Europe had achieved sustained growth was due to colonization and resources provided by the new world. For England in particular conveniently located coal reserves helped to escape the energy constraint that others facing and due to the aggressive colonization England had a source of land-intensive goods (cotton and grain) and a market for its manufactured goods. Allen (2006) argues along similar lines and claims that mercantilism and imperialism give unique opportunities (high wage, cheap energy) to British scientists. Pomeranz (2000) claims that China did not have the coal and also did not pursue a colonization policy. Without the two England would have followed a labor-intensive path like China. He does not answer, however, why China did not have an aggressive colonization policy at the first place.⁵

Genc (1987, 2000) approaches to the same question that Pomeranz asked from the perspective of the Ottoman Empire. Why did capitalism not developed in the Ottoman Empire?

⁵O'Rourke and Williamson (2005) and Shiue and Keller (2006) provide empirical evidence for some parts of Pomeranz's argument. O'Rourke and Williamson (2005) argue that the expansion of European trade after 1500 and the discovery of the new world have brought important advantages. On the other hand using relative price correlations for species, they also argue that world markets were not truly integrated before 1800. Shiue and Keller (2004) compare China and Europe and show that markets in each function the same way before the 18th century. They use price correlations and show that Britain was ahead of West Europe in the late 18th century and hence it could not have been a gradual institutional change that favored Britain. Shiue (2002) shows evidence on substantial interregional and intertemporal market integration within China in the 18th century. Hence markets in pre-industrial societies may have been more developed than originally thought.

He offers a cultural perspective that highlights the economic worldview of the Ottoman Empire that lies underneath the empire's development policies from 14th to 19th centuries. He lays out his argument in a similar manner to that of Pomeranz's and asks three main questions: 1) How could it be possible for the Ottoman Empire to control 10% of Europe for a very long time, despite its disadvantages in technology, physical capital and resources compared to Europe? 2) Ottoman expansion in Europe slowed down with the siege of Vienna in 1683 and ceased completely around 1700. How come Ottoman presence in Europe continued an extra 200 years in spite of the Europe economic superiority and political power at the time? 3) Most importantly, why did the Ottoman Empire not learn the modern economic processes from Europe during these 200 years while it had a presence there with extensive trade with Europe and went on a similar path of industrialization? Genc (2000) deals with the last question extensively and tries to explain why the Ottoman Empire did not make it.

According to Genc (1987, 2000) there were three underlying principles for the Ottoman's development policies, which can answer the above questions. These are provisionism, fiscalism and traditionalism. Provisionism is very important, especially from 16th to 19th century since during this period maintaining a large and consistent supply of goods in the urban economy and feeding the army was the priority.⁶ Provisionism determined state's production and trade policies and its relations with merchants. For example, imports were always good and exports were bad; foreign merchants favored over domestic ones; there were rigid price controls especially for the grain products.

The second principle, fiscalism, aimed at increasing state's revenue given the wars and expenses of keeping a huge empire as a piece (reoccurring rebellions for example). Thus state collected a lot of taxes from a wide range of economic activities. Genc (2000) argues that state was viewing every economic activity as a source of tax.

The third principle, traditionalism, served at keeping the existing relationships between the different groups at the society and between these groups and the state stable. Pamuk

⁶Inalcik (1997) argues that most of the defeats in the 16th and 17th century are due to the deterioration of the economy. The result is not taking care of the army and hence the defeat.

(2004) extends this view and argues that the rapid capital accumulation by merchants or any other groups such as urban guilds were never seen as a favorable thing given that this would destroy the existing order. Genc (2000) concludes that these principles are the key why Ottomans did not make it since they were against the industrialization. He does not answer the question though how these cultural factors interacted with the economic ones to prevent the development of capitalism.

Inalcik (1997) combines these and argues that there were mainly two groups of reasons why capitalism did not develop in the Ottoman empire. The first group is composed of factors that are endogenous to the Ottoman system, mainly the distribution of the political power. According to Inalcik (1997) the second group was composed of factors that are external to the empire, mainly the competition from Europe for markets and raw materials which ended up destroying the Ottoman craft industry. For the first group of reasons the relationship between merchants and the state and the hypothesis that the merchants were “weak” and did not have much information for the international markets were generally underlined by other historians. Why were the merchants less powerful in Ottoman Empire than in Europe? One answer as provided by Genc (2000) among many others is that the power of the central authority and the institutional changes that are designed to serve the traditional order did not allow them to be powerful.

Acemoglu and Robinson (2006) state that institutions determine the incentives and the constraints on individuals. They are social choices. Because different groups benefit from different institutions, there is a conflict over these social choices, ultimately resolved in favor of groups with greater political power. The distribution of political power in a society is in turn determined by political institutions and the distribution of resources. Political institutions allocate *de jure* political power, but groups who control the resources have *de facto* political power. Thus, Acemoglu and Robinson (2006) prefer a dynamic theoretical framework, where political institutions and the distribution of resources both change over time. They argue that we still do not know the mechanisms through which institutions persist over time and through which they change. Thus, studying Ottoman institutions can

give us a better understanding of these issues.

As a start we can check whether the proxies for the level of productivity for the Ottoman empire since 1500s show a similar level of development to those of European countries. Cosgel (2004) provides agricultural productivity estimates for 47 towns between 1500-1600. He aggregates these to provinces and regions and compares them to the estimates of Clark (1999) for Europe for the same period and shows that the empire was at a similar productivity level with Europe in general. In fact some districts of the Ottoman empire in the 15th and 16th centuries had higher output per worker than most European countries circa 1850. These estimates are shown in table 1.⁷ The wage estimates from Ozmucur and Pamuk (2002) show that there was an increase in the standard of living before the Industrial Revolution. They also compare wages from Istanbul to other major European cities from Allen's study and find similar trends. They argue that the increase in growth during the 18th century (after a decline in the 17th) might be because of the increased integration with Europe. Ozmucur and Pamuk (2002) also show that there was a declining trend in real wages during the sixteenth century in Istanbul, a trend which was also observed for European cities.⁸ They also show that skill premium only started to rise in late 19th century. This is similar to what is found by Clark (2005). Clark (2005) shows that real wages and skill premium only increased after 1860. He argues that evidence from wages and population of Britain rules out human capital accumulation and technology explanations of Industrial Revolution.

Cizakca (1993, 1996) underlines the importance of private finance and financial decentralization in the process of institutional change. To understand this we first have to understand the land tenure system that governs the empire and the special institution of tax-farming. During 14th to 16th centuries peasants were not directly involved in the markets under the Ottoman empire but rather the revenue holders (or the "timar holders" who had rights to farm the taxes of the land) were involved. Hence capital accumulation were in the hands of

⁷Also see Hoffman (1996) for TFP estimates for Paris during the same period. Pamuk's (2000) GDP estimates for early 1800s also show a similar pattern, i.e. similar productivity levels for Ottoman empire to that of Europe. See also Pamuk's estimates on government debt and foreign trade, and foreign investment in late 1800s.

⁸Cosgel (2004) productivity estimates shows a similar pattern.

revenue holders instead of the peasants.⁹

Ottomans installed a cohesive system of taxes and administration but at the same time it was a loose collection of provinces (eyalet), vassal states (salyaneli eyalet), districts (sancak) and towns (kaza) that are subject to the central administration but not necessarily had strong ties to Istanbul. Tax systems are oldest and one of the most fundamental form of institutions. How governments collect their revenue has important effects on the production structure of the economy and also the tax system affects the decisions of private agents.¹⁰ Cizakca (1996) argues that with growing state expenditures, the amounts collected reached tremendous proportions and since the state must have incorporated larger assets with the growing expenditures within the framework of tax-farming system, this lead to the evolution of complex partnerships and different forms of entrepreneurships among tax-farmers in order to attract savings of more people. Indeed as early as 1527, 80% of the state's revenue was collected by tax-farming as noted by Barkan (1953). Due to the survival of Ottoman archives that are in excellent condition, it is possible to study this system in an empirical framework.

Under the tax-farming system individuals with capital assets lend to government in return for the right to farm the taxes of a given region or a fiscal or a trade unit for a fixed amount of time. The system converted from "timar" (where tax revenues collected in-kind by local "sipahis" to support the army) to full-fledged tax-farming (iltizam) in 16th century due to need for increased revenue by the state. However due to the limited tenure time, over-exploitation of the tax source and lack of long term investment were the inevitable undesirable effects of this system of iltizam. Hence the system further evolved to what is called "malikane" in the 1600s, where the purchased tax-farming rights can last over the purchaser's lifetime and also can be transferred to future generations. Then the system further evolved into "esham" in the late 1700s to incorporate small and medium size lenders. Timing of these changes depends on the extra need for fiscal revenues because of wars and finance needs for long-distance trade. However the nature of these changes shows the constant

⁹However, Inalcik and Quataert (1994) argues that in the 18th century there was an extensive peasant involvement in domestic trade, which led the expansion of the regional trade.

¹⁰See Sokoloff and Zolt (2006) for the evolution of taxation institutions for the Latin America.

struggle and the shifts in the balance of power between the landed aristocracy, power groups such as urban guilds, and the central authority. After 1860 central authority was strong again (via reforms) to eliminate the “malikane” system.¹¹

3 Data

The data on population at provincial (vilayet), district (sancak), and town (kaza) level come from the Ottoman Empire archives. Other variables come from the historical series of State Institute of Statistics (SIS) that are prepared using data from the archives. The data on tax-farming comes from the work of Genc and Cizakca. I calculated the population density for different administrative units such as provinces, districts and towns and also for different years using population and land data of those years, which is a difficult task given the frequent changes in the territorial land and administrative system of the empire (the details described in the data section).¹²

The data on tax-farming come from Genc (1987) and Cizakca (1993), who in turn get the data from the archives. Using the tax-farm registers (most of them survived till today), Cizakca (1993) reports the auction prices of the tax-farm and the length and the transfer

¹¹Tax-farming was also widely used in France. White (2004) argues that it was a key fiscal institutions of “ancien regime” and used much longer compared to other European countries. He argues that the adoption of the system initially reflected the risk aversion of the Crown and its limited access to capital markets. The Crown moved to revenue sharing and then a complete elimination of the system once it had full access to capital markets in the 1770s. Hoffman (2000) argues that credit markets were well developed before the Industrial revolution in Paris. Financial intermediaries such as notaries and bankers were very active. See Hoffman et al. (2003) for evidence on notaries. Similar intermediaries, the so-called Galata bankers, were also very active in Istanbul during the same 18th century period. According to Hoffman (2000) financial markets can prosper under a wide variety of institutions and one thing that can hamper these markets is tampering with currency as happened in France in early century. Ottoman empire also had a big debasement in 1844. The Ottoman experience with international capital markets during the 19th century is very important in this context. Due to the increased integration with Europe, Ottomans undertook many reforms to attract more foreign capital. They switched to a new monetary system after the big inflation of 1844. They borrowed heavily from Europe starting in 1854 to modernize the economy and finance the Russian wars together with the long-distance trade. Trade increased 15 fold between 1820–1914 and current account deficit widened, culminating into a financial crisis during 1875–1881. They defaulted on their debt in 1876, when they had an external debt of 220 million pounds and when debt servicing was taking up half of their budget. In 1881, Ottoman Public Debt Administration (OPDA) was set up, where foreign powers control the state revenue to manage the debt payments.

¹²Provinces might turn into districts and vice versa between 1500-1900, keeping their same name.

of the tenure. Cizakca (1993) focuses mostly on the period between 1550–1695 where the tax-farming system (iltizam) works as follows: As a result of the competitive bid, the highest bidder (multezim) in the government auction obtains the right to collect taxes. If the owner manages to collect more revenue than his total cost (auction price plus the operational expenses) he enjoys a profit. The risks are high since if the owner fails to pay the promised price to the state, he risks imprisonment or death.

Cizakca (1993) puts great emphasis on the competitiveness of the tax-farms. Due to the meticulous care of the Ottoman bureaucrats we know the date on which the tax-farms is taken over, the intended length of his tenure and also the actual duration of the tenure. Based on this information Cizakca (1993) argues that an actual/intended duration ratio that is less than one indicates intense competition since the tax-farm is being lost to a rival before the tenure matured. Of course this ratio must be used together with the auction price due to the possibility of death or illness being reflected as competition. An increasing auction price also indicates competitiveness.¹³ As argued by Inalcik (1977) competitiveness of the farms is related to financial decentralization since the competitive farms are centralized by the state within the “esham” system later in the 18th century given their profitable nature. This is important for the evolution of financial institutions since if a tax-farm in a certain region is financially decentralized for a long enough period then a separate process of financial evolution particular to that region might follow.

The system evolved into what is called “malikane” in 1695. By a special decree in this year, the tax-farm started to being farmed-out to the tax-farmer (malikaneci) on a life-time basis. But now there are two distinct payments to the state: a lump sum payment at the auction (muaccele) and an annual payment to the treasury (mal). The auction price was still based on competitive bids but the annual payments were fixed by the state. Also the auction price cannot go below the minimum amounts that were calculated as two to ten times of the estimated profits of the farm. These minimum amounts were displayed at the doors of Finance Ministry in Istanbul. “Muaccele”, is basically the present discounted value of

¹³Note that price alone is not sufficient either since it can be increasing due to inflation.

financial benefits to the buyer by owning the the tax-farm over his lifetime. Potential buyers had all the information and help from the financial authorities to come up with answers to the basic questions, such as the annual revenue yielded by the tax-farm, the portion that goes to the Treasury and the remaining net surplus, and decide on their bid. Thus the stability of the amount that goes to the Treasury helps tremendously to the purchaser to determine his bid, which in turn is in the best interest of the Treasury. Sale was made to the highest bidder who can manage the farm and even can sell it. No government official can interfere after this point except the local judge (kadi). The new system offered more security and stability given that within the old system (“iltizam”) there was neither selling nor lifetime owning rights and any a highest bidder can take away the tax-farm from the original purchaser at anytime. Hence the Ottoman authorities thought the new system would increase the productivity overall. In seventy years after 1695, this system of “malikane” dominated the Ottoman financial system; the number of malikanes assigned increased 347% and the annual total revenue (price plus annual payments) increased by 1400%, a bigger number since larger farms were farmed-out towards the end of the 18th century.¹⁴

Concerning the property rights, although in the event of a death the inheritors of the deceased could not claim the tax-farm, in practice they were given preferential rights in the bidding as argued by Inalcik (1980). Also the tax-farmer can sell his farm as he wish. State put a tax of 10% on these sales after 1735. In fact the reason why tax-farmer decided to bear more risks is that for the first time in Ottoman history something akin to private property can be enjoyed during one’s lifetime. The tax-farmer is a risk taking entrepreneur where if his stream of earnings exceed payments to state he enjoyed a profit. Hence the incentives for him were such that it was beneficial to undertake long term investment. Cizakca argues that malikane system paved the way for the emergence of private property in the Ottoman realms. The other achievements of this system was the drastic increase in the revenue of state and the protection and investment in the tax source.

¹⁴Increasingly the system is being financed by an increased number of shareholders and a decreasing size of average shares.

Genc (1987) using data from tax registers from the Ottoman empire archives finds that the revenues delivered to treasury during the 18th century by tax-farmers did not change that much in spite of the fact that some of these tax-farms were known to be expanded their activity considerably during the same period such as ports of Kavala, Izmir, and Salonica. He also finds out the real tax revenue from the farms that goes to the owners of the tax-farms increased considerably although the amount entered to the treasury remained fixed. He explains these finding with an important characteristic of the “malikane” system during the course of the 18th century, that is taxes were being farmed out not for a specified length of time but rather for the lifetime of the owner. Hence the incentives for the tax-farms owners were to undertake investment, which will lead to smooth consumption.

By studying 20 tax-farms, Genc (1987, 2000) shows that there was a increasing trend for the annual profit to the owner of the tax-farm from 1700 to 1810. Then using the data on the amount that was delivered to Treasury, he estimates the gross annual income of the owner of the tax-farm. Genc (1987, 2000) argues that these serve as a proxy for the change in the annual economic activity.

I use data on 20 tax-farms (malikane) from Genc (1987) that cover the period 1700–1850. These 20 farms cover 11 historical Ottoman provinces and 13 districts. They belong to 3 different present-day countries (Turkey, Greece, Bulgaria) and 16 present-day cities. I also use data on 57 tax-farms from Cizakca (1993) that cover 25 historical Ottoman provinces and 50 districts for the period 1550–1695, where some identified as “frozen”, i.e., not competitive. The regions where these farms are located belong to 11 different present-day countries (Turkey, Syria, Iraq, Bulgaria, Croatia, Yemen, Lebanon, Ukraine, Greece, Serbia, Romania) and 50 present-day cities. I also have historical population data on 88 Ottoman regions where I know if they are governed by tax-farming system or not. Other variables are from 1897 historical statistics as detailed out in appendix.

4 Identification Strategy and the Empirical Analysis

My regional dataset is ideal for examining *de-facto* versus *de-jure* institutions within the historical Ottoman Empire. I solely exploit variation among the regions, controlling for country fixed effects.

I estimate the relation using both historical and contemporary data

$$(\text{Output/Population})_i = \mu_c + \alpha_c(\text{ProductivityTaxfarm})_i + \mathbf{X}'_i\theta + \varepsilon_i \quad (1)$$

where μ_c is a present-day country specific constant. I allow the coefficient to “Productivity-Taxfarm” vary across present-day countries and I will also test if the statistical hypothesis $\alpha_c = \alpha$ (i.e., that the slope coefficients are identical) can be accepted. This will be a proxy test for institutional persistence in the case of finding the same coefficient for the different present-day countries.

I use various proxies for the “ProductivityTaxfarm” variable. For 1600s, the iltizam system, I use the value of the farm proxied by annual price and the ratio of actual duration to intended duration of tenure that reflects the competitiveness of the farm. Both of these measures will indicate the productivity of the farm. For 1700s, the malikane system, I use the profits of the owner and gross yearly revenue of the farm. All the nominal values that are in Akces (Ottoman Currency) converted into real prices using the indices in Ozmucur and Pamuk (2002). The proxies for the productivity of the farm will be used as averaged over time since there might be noise surrounding the yearly estimates. I will also use various measures to control for the size of the regions. I use population density as a proxy for output per capita for the historical period following Acemoglu et al. (2002). X matrix represents various geographical controls.

4.1 Property Rights and Development

Table 2 presents regressions of historical and contemporary population density (a proxy for development, see Acemoglu, Johnson, and Robinson, 2002) and contemporary GDP per

capita on various geographic characteristics and the value of the tax-farm proxied by the annual price, which is price adjusted by the length of the tenure.¹⁵ The sample consists of only the tax-farming regions. All the regressions have country fixed effects and hence we only use the regional variation within a given present-day country. It is clear that controlling for the geographic characteristics of being a landlocked region and being far away from Istanbul (a proxy for the transportation costs)¹⁶, there is a positive effect of between value of the farm on development, only in the early historical period. The other proxy for the productivity of the farm yields similar results. In the later periods, 1897 and 1990–2000, there is no relationship between the productivity of the farm and the region’s (in which the farm was located) development. Recall that under the system of *Iltizam* there was no property right protection.

Table 3 shows regressions of historical and contemporary population density and contemporary GDP per capita on various geographic characteristics and the profit of the tax-farm.¹⁷ The sample consists of only the tax-farming regions. All the regressions have country fixed effects and hence we only use the regional variation within a given present-day country. It is clear that controlling for the negative effects of being a landlocked region and being far away from Istanbul there is a positive effect of being a profitable tax-farm on both historical and contemporary development. Figure 1 plots the associated partial correlation plot that clearly shows the relation is not driven by outliers.

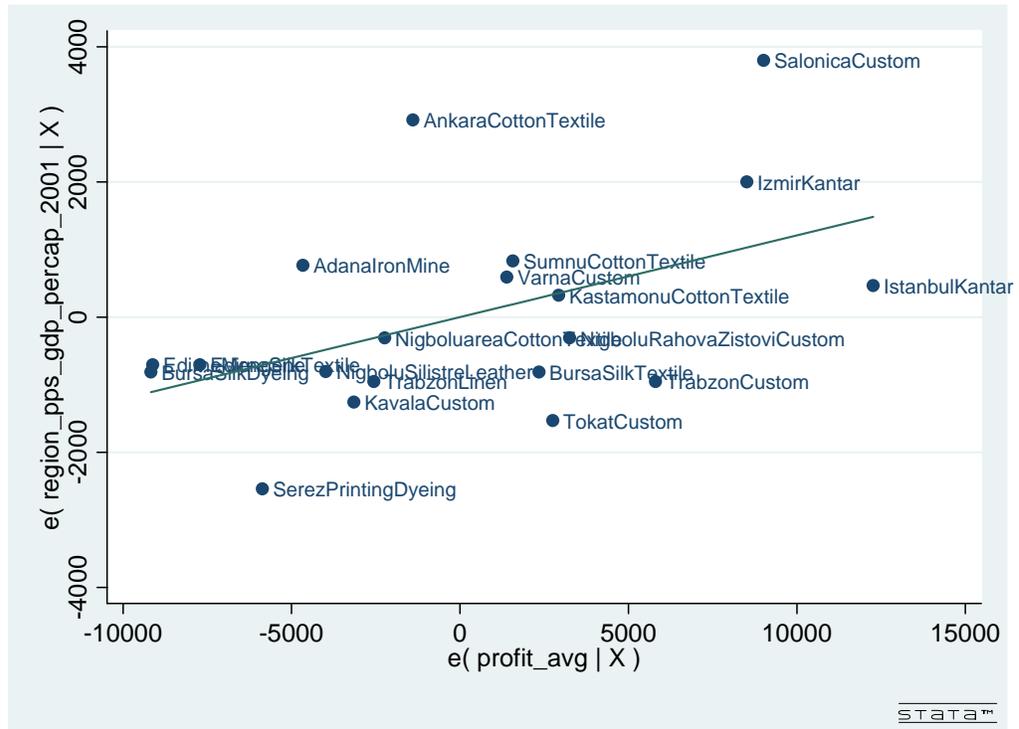
Table 4 uses a sample of all regions and show that the regions that are governed by tax-farming (*malikane*) in 1700s are more developed today. This result is robust to controlling country effects, and geographic characteristics. The regions with financially decentralized tax-farms in 1600s also have higher levels of development.

¹⁵The correlation between historical and contemporary population density is over 50 percent.

¹⁶Hoffman (1996) also finds a negative relationship between distance to Paris and the level of his agricultural TFP estimates.

¹⁷The other proxy for the productivity of the farm yields similar results.

Figure 1: Tax Farming and Development



4.2 Are the results driven by unobserved heterogeneity?

What if the results are driven by some unobserved heterogeneity/geographic characteristic? Table 5 undertakes a falsification exercise to show that this is not the case. If we find a positive significant relation between regions that are governed by tax-farming and their population density both before and after the tax-farming period then we would be concerned that the results might be driven by unobserved heterogeneity. Table 4 shows that there is clearly no statistically significant relationship between the regions that are governed by tax-farming and their population density before the tax-farming system was under operation. Hence the results are not due to omitted unobserved variables.

4.3 Alternative Stories

What if the results are driven by the growing city size? Table 6 shows that the results are robust to controlling for population density (see column (1)). Trade also cannot be an explanation since all the regressions control for transportation costs by using distance to Istanbul. In columns (2) and (3) the positive effect of the productivity of the tax-farm in 1700s on today's development disappears though once we control for today's regional financial development.¹⁸ These results imply that profitable tax-farms promoted private capital accumulation and investment as envisioned. Column (4) provides very preliminary evidence for this. Bank Deposits per population in 1897 is positively related to the productivity of the tax-farm in 1700s.

5 Conclusion

The recent empirical research shows that institutions are the fundamental causes of long run development. There is still a need to study institutions in a within country framework since it would be easier to deal with the omitted variables and unobserved heterogeneity

¹⁸Column (2) uses bank deposits per GDP and column (3) uses bank credit per GDP

problems in a within country setting. In addition we can identify more specific dimensions of institutions since the data will not be subjective indices or dummy variables as mostly done in a cross-country setting. This paper belongs to a new group of papers that try to tackle the problem of institutional change and differences within a given macro-institutional setting.

I use regional data from the Ottoman empire for 88 regions that correspond to 11 different present day countries, who spent 500 years on average under a single empire and hence same *de-jure* institutional setting. By using historical data from the Ottoman Empire archives between 1500–1900, I investigate the relation between a specific institution, tax-farming, and development. Under the tax-farming system individuals buy the rights to a production unit during the auctions organized by the government. The protection of property rights evolves within this system from being none to owning the tax-farm over the course of one’s lifetime. I show that within the system of tax-farming the areas where the profitable farms are located enjoyed higher levels of development both historically and contemporarily. The results are not driven by unobserved heterogeneity. The key mechanism is that tax-farming led to capital accumulation and hence higher levels of financial development. Comparing across all the regions within the Ottoman Empire that span ten different present-day countries, I show that the regions that were governed with the tax-farming system in 1500s, 1600s and 1700s had higher levels of private capital accumulation in late 1800s and higher levels of development today.

6 Appendix

6.1 The Administrative System

The administrative system of the Ottoman Empire can be divided into two as the system during the classical period (1300–1600) and the system after the “Tanzimat” Reforms of 1839. During these periods and between 1600–1839 there were also changes due to conquests and lost territory. See the appendix table for the administrative division based on various sources

such as Pitcher (1972), Kilic (1997), and Akbayar (2001).

The Anadolu Eyaleti (the Province of Anatolia) is the second most important province after the Rumeli Eyaleti (the Province of Rumeli) among the provinces being the largest administrative unit of the Ottoman State. After the establishment (1362) of the Rumeli Beylerbeyliği (province of Rumeli ruled by the governor general), the Anadolu Beylerbeyliği (province of Anatolia ruled by the governor-general) was established in 1393 in East Anatolia.¹⁹ The center of the province was previously Ankara but it has been moved to Kutahya in 1451. The to Ankara again in 1530 and in 1566 to Kutahya. During the rule of Sultan Suleyman the Magnificent the borders of the province sometimes expanded and sometimes constricted with the establishment of new provinces. The Anadolu Eyaleti stretched out to the Black Sea in the north, the Marmara and the Aegean coast in the west, the Mediterranean coast in the south, and the provinces of Karaman and Rum (Sivas, Samsun, etc) in the east. The Anadolu Eyaleti included the following 17 provincial subdivisions in 1530 according to the published registration book number 438: Kutahya, Hudavendigâr (Bursa), Karesi (Balıkesir), Biga, Saruhan (Manisa), Aydın, Mentese (Muğla), Teke (Antalya), Alaiye, Hamid (Isparta), Kara-hisar-i Sahib (Afyonkarahisar), Ankara, Kangiri (Çankiri), Kastamonu, Bolu, Koca-eli ve Sultan-onu (Eskişehir). This distribution has changed in the subsequent periods.²⁰

6.2 Ottoman Tax Registers (Tahrir Defterleri)

The Ottoman Archives is an invaluable treasury of records.²¹ The data in the archives reveal the traditions, the customs, the social structure, the institutions and their relations during the period they belong to as first-hand sources. The most important material among these are the “Tapu Tahrir Defterleri” or the “Defter-i Hakani, (Land Survey Registration Books)” which are deeds testifying the land of conquered countries and show the system of property,

¹⁹During the reign of Orhan there were only 4 sancaks: Sultanonu, Hudavendigâr, Kocaeli, Karesi.

²⁰The other provinces as of 1530 are Arab, Cukurabad, Diyarbakir with center Hamid, Karaman with center Kayseri, Rum that is established on 1413 with center Amasya, and Zulkadiriyye with center Maras.

²¹This section is based on the foreword of the number 438 Defter-i Hakani.

possession and the rate of taxes and are called so because they are the essential records of the land in a state.²² Cosgel (2004) describes in detail the nature of these books and the related research. The land survey registration books in which there are recordings of the social and economical situation, the structure of the population, and well-organized, detailed statistics relating to the territorial structure of the Ottoman State are the unique first-hand sources assisting the researchers who carry out studies in this field. These books were survived from as early as 15th century and books for regions ranging from Anatolia and the Balkans to Syria and Palestine in the south, Georgia in the east, and Hungary and Poland in the north. The data in these books can be best used to study population and production.²³

The Ottoman State granted revenues as a living which were called *has*, *zeamet*, and *timar* (fiefs with a different yearly income each). Land survey registration books were kept in order to determine efficiently both the system and the tax revenues of the state and also to follow the occurring changes. After conquering new lands, Ottoman officers surveyed all taxable sources and recorded information in the registers. Equivalent to this application of the Ottoman State, the contemporary European states had only recordings consisting of simple lists for military affairs and taxes. There is not any other state on the world having the same organized land survey system as that of the Ottoman State. Procedures of land survey were carried out under the supervision and control of the “*Nisanci*” who was also called “*Tevkii*” (an official whose duty was to know the law well, to give opinion on matters of law, to prepare draft copies of titles of privileges or royal patents of rank, office, etc. and to draw the Sultans’s signature) who was a member of the *Divan-ı Humayun* (Imperial Chancery of State).

The land survey registrations were kept by persons who were called “*Tahrir Emni*,” “*Muharrir-i memalik*” or “*Il yazici*.” They were accompanied by writers, regional judges

²²There are also the “*Muhimme Defterleri*” which are records of orders, titles of privileges and correspondence explaining the administrative structure of the Ottomans; the “*Ruus Defterleri*” which are records revealing honors, ranks, appointments to posts, and promotions given to civil servants; the “*Seri Siciller*” which are records listing the judicial decisions of the *Kadi* (judge) working in the local courts of various districts; and the “*Vakfiyeler*” which are records listing donation rules.

²³See the publication by State Institute of Statistics (SIS) on Data and Statistics in the Ottoman Empire for pros and cons of the data to use for demographic and productivity studies.

and soldiers (sipahi) responsible for the preservation of the books. The “il yazici” was charged with very important work requiring very high responsibility, therefore these were chosen among people who had a good knowledge of law and legislation, who had given successful services on their post as “kadiasker” (chief military judge), “kadi” (judge), “muderris” (university professor), “sancakbeyi” (governor of a sancak) and “defterdar” (high official of finance), and who were skilled, honest and reliable. As a result of land surveys, detailed registration books were prepared in which recordings were written relating to revenue sources, administrative organizations and places of settlement, the names of taxpayers in these organizations and places, agricultural fields, raised products and the taxes taken for these. Revenue sources were determined at their place and distributed among the authorities after which the “İcmal Defter” and “Mufassal Defter” (a detailed land survey registration book for keeping accounts of administrative organizations, names of villages and amounts of yearly product) were prepared.

It is known that since the first centuries of the Ottoman State, land surveys were being kept. The oldest land survey registration book is dating from 1431-1432 and belongs to Albania region.²⁴ Land surveys have been prepared according to districts until the 18th century; however, since the 16th century wide land surveys concerning the whole state have not been prepared except for the new conquered land. The reason for this is the decline in the importance of the timar system. There are two registration books belonging to the first years of the reign of Sultan Suleyman the Magnificent, being the most brilliant period of the Ottoman State, relating to the Anadolu Eyaleti (books numbered as 166 and 438). These are the first and only series of registration books showing the population, tax revenues, has, timar, zeamet, pious foundations and real estates of the provincial subdivisions and including land survey results of the whole country.

The registration books constitutes the main source for the population statistics from 15th to 18th centuries. However since the purpose of the data collection for the books is mainly for tax responsibilities only the household/family is counted. So for the population statistics

²⁴See Inalcik (1954)

historians used the multiplier number 5, following Barkan (1941). Since “timar” system was declined in 17 and 18 centuries, registration books were also no longer kept. After 1830 we have better population statistics since these are collected for the purpose of data collection with the start of first official empire wide census in 1831.

Omer Lutfu Barkan is the first researcher who used the tax registers in 1940s. Cosgel (2004) explains in detail the economic and historical research that has been done so far using the tax registers from the Ottoman archives. Almost all of this research is focused on one town or district in a historical context. The only comparative study is done by McGowan (1969), who estimates some measures of productivity and standard of living using the data from registers for 4 districts of Middle Danube. Cosgel (2004) provides estimates of labor productivity for 45-50 regions of Ottoman Empire for few years from the 15th and the 16th centuries. He estimates grain output per worker using data from the tax registers.

6.3 Historical Statistics

Some of the variables used in the analysis presented above come from the State institute of Statistics (SIS). SIS published a series of historical statistics using the data from the archives.

These are:

1. Ottoman Foreign Trade in the 19th century, Historical Statistics Series Volume 1, by Sevket Pamuk
2. The Population of the Ottoman Empire and Turkey, 1500 - 1927, Historical Statistics Series Volume 2, by Cem Behar
3. Agricultural Statistics of Turkey during the Ottoman Period, 1909, 1912, 1914, Historical Statistics Series Volume 3, by Tevfik Guran
4. Ottoman Industry, Industrial Census of 1913, 1915, Historical Statistics Series Volume 4, by Gunduz Okcun

5. The first Statistical Yearbook of the Ottoman Empire, 1897, Historical Statistics Series Volume 5, by Sevket Pamuk and Halil Inalcik.
6. Education Statistics in Modernization, From the Tanzimat to the Republic, 1839-1924, Historical Statistics Series Volume 6, by Mehmet Alkan
7. 500 Years of Prices and Wages in Istanbul and Other Cities, 1469-1998, by Sevket Pamuk
8. Data and Statistics in the Ottoman EMpire, by Halil Inalcik and Sevket Pamuk

6.4 Variables

The variables used in the analysis from these SIS series are:

Population, Human Capital Investment, Financial development variables, Public Investment variables (new roads). Land: Ottoman Empire territorial maps were obtained from Pitcher (1972). These scalable maps provided the boundaries for the provinces, districts, and towns. By using the scales provided in each map and utilizing a digitizer which is commonly used by architects and engineers, I digitized the maps and calculated the land areas. Distance to Istanbul: calculated using maps and ARCVIEW software.

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Table 1: Comparative Productivity in Ottoman Empire and Europe

Dependent variable is Population Density

Region	Date (circa)	Output per worker (England 1851=100)
Anatolia	1490	58
Anatolia	1520–1540	64
Anatolia	1560–1575	40
Fertile Crescent	1540	76
Fertile Crescent	1590	68
Southeastern Europe	1450–1475	39
Hungary-Serbia	1545–1580	53
Britain	1851	100
Netherlands	1850	54
Belgium	1850	37
Ireland	1851	47
France	1850	44
Germany	1850	42
Romania	1870	40
Austria	1854	32
Sweden	1850	37
Hungary	1854	30
Russia	1870	29

Notes: Fertile Crescent refers to East Mediterranean. Data is from Cosgel (2004) and Clark (1999). All estimates are in 272 bushels of wheat equivalent.

Table 2: Tax Farming (Iltizam) and Development, 1600–1700: Only Regions with tax farming

Dependent Variable:	Pop. Dens 1500–1550	Pop. Dens 1897	GDP per cap 1990–2000
	(1)	(2)	(4)
Annual Price 1600–1700	0.01** (0.003)	0.01 (0.01)	0.05 (0.05)
Landlocked	−0.92 (0.88)	−0.11 (0.69)	−0.12 (0.10)
Distance to Istanbul	−0.12*** (0.04)	−0.01 (0.01)	−5.41*** (0.53)
Country effects	Yes	Yes	Yes
R ²	0.75	0.65	0.88
N	50	42	32

Notes: Heteroscedasticity consistent (White correction) standard errors are in parentheses. All regressions include a constant and are estimated by OLS. Population density is population divided by land area in square miles averaged over the years in the given period. Annual price is the auction price normalized by length of tenure, averaged over the given years in Cizakca (1993). GDP per capita is GDP divided by population in PPP thousand dollars, averaged over the years in the given period. Landlocked is a dummy variable that takes a value of 1 if the district is near the sea or two major rives: Tigris and Euphrates. Distance to Istanbul is measured as the distance in kms from center/capital of the district to Istanbul. Asterisks denote significance levels (*=.10, **=.05, ***=.01).

Table 3: Tax Farming (Malikane) and Development, 1700–1800: Only Regions with tax farming

Dependent Variable:	Population Dens. 1897	Population Dens. 2001	GDP percap 1990–2000
	(1)	(2)	(3)
Profit to the Owner 1700–1800	0.01*** (0.004)	0.15* (0.09)	0.12*** (0.05)
Landlocked	−1.47 (1.26)	−9.64 (9.50)	−13.3 (9.1)
Distance to Istanbul	−0.01 (0.06)	−1.10 (1.39)	−2.50* (1.38)
Country effects	Yes	Yes	Yes
R ²	0.46	0.53	0.88
N	18	20	20

Notes: Heteroscedasticity consistent (White correction) standard errors are in parentheses. All regressions include a constant and are estimated by OLS. Population density is population divided by land area in square miles averaged over the years in the given period. Profit to the Owner is the profit of the owner of the tax farm averaged over the years as given in Genc (1987). GDP per capita is GDP divided by population in PPP thousand dollars, averaged over the years in the given period. Landlocked is a dummy variable that takes a value of 1 if the district is near the sea or two major rives: Tigris and Euphrates. Distance to Istanbul is measured as the distance in kms from center/capital of the district to Istanbul. Asterisks denote significance levels (*=.10, **=.05, ***=.01).

Table 4: Tax Farming and Development: All Regions

Dependent Variable:	GDP percap 1990–2000	GDP percap 1990–2000
	(1)	(2)
Financially Decentralized Tax Farms, 1600s	0.60** (0.28)	– –
Tax Farming, 1700s	– –	0.45*** (0.17)
Landlocked	–5.3 (6.0)	–7.8 (6.2)
Distance to Istanbul	–3.92*** (0.78)	–3.85*** (0.95)
Country effects	Yes	Yes
R ²	0.58	0.62
N	88	88

Notes: Heteroscedasticity consistent (White correction) standard errors are in parentheses. All regressions include a constant and are estimated by OLS. GDP per capita is GDP divided by population in PPP thousand dollars. Population density is population divided by land area in square miles. Financially Decentralized (a dummy) Tax Farms are those that are identified by Cizakca (1993) as explained in detail in the text. Tax Farming 1700s is a dummy variable that takes a value of 1 if the district is governed by the system of malikane. Landlocked is a dummy variable that takes a value of 1 if the district is near the sea or two major rives: Tigris and Euphrates. Distance to Istanbul is measured as the distance in kms from center/capital of the district to Istanbul. Asterisks denote significance levels (*=.10, **=.05, ***=.01).

Table 5: Falsification

Dependent variable is Population Density (in a given period)

	(1)	(2)	(3)
Year	1500–1550	1550–1590	1835–1875
Tax farming, 1700s	2.02 (2.42)	1.23 (1.69)	7.2*** (2.7)
Geographic Controls	Yes	Yes	Yes
Country Effects	Yes	Yes	Yes
R ²	0.34	0.18	0.10
N	26	26	26

Notes: Heteroscedasticity consistent (White correction) standard errors are in parentheses. All regressions include a constant and are estimated by OLS. Tax farming is a dummy variable that takes a value of 1 if the district is governed by the system of malikane.

Table 6: Tax Farming and Development: Channels

Dependent Variable:	GDP percap 1990–2000	GDP percap 1990–2000	GDP percap 1990–2000	Bank Dep./Pop 1897
	(1)	(2)	(3)	(4)
Tax Farming, 1700s	0.33** (0.12)	– –	– –	– –
Population Density 1990–2000	3.63** (1.81)	– –	– –	– –
Profit to the Owner 1700–1800	– –	0.01 (0.06)	0.03 (0.04)	0.07** (0.03)
Financial Development 2001	– –	32.32*** (9.23)	59.08*** (11.75)	– –
Landlocked	–19.9 (18.2)	–17.2*** (6.0)	–16.1*** (6.1)	–0.08** (0.03)
Distance to Istanbul	3.89** (1.92)	–2.86*** (1.02)	–2.06*** (0.83)	–0.05** (–0.02)
Country effects	Yes	Yes	Yes	Yes
R ²	0.75	0.71	0.71	0.68
N	88	20	20	10

Notes: Heteroscedasticity consistent (White correction) standard errors are in parentheses. All regressions include a constant and are estimated by OLS. Column (2) and (3) uses bank savings and credit per GDP as measures of financial development. See the previous tables for the definition of variables. Asterisks denote significance levels (*=.10, **=.05, ***=.01).