

**THE ROLE OF ACCOUNTING IN THE INDUSTRIALIZATION
EFFORTS OF THE OTTOMAN EMPIRE IN THE 19TH
CENTURY¹**

**EL PAPEL DE LA CONTABILIDAD EN LOS ESFUERZOS
INDUSTRIALIZADORES DEL IMPERIO OTOMANO EN EL
SIGLO XIX**

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ABSTRACT

When the need for industrialization surfaced in the 19th century, Ottoman Empire aimed to establish state-led, profit-oriented enterprises after the Imperial Edict of 1839, which is also known as *Tanzimat*. Experienced accountants of the state tried to do the investment calculations of an iron factory in the 1840s (Istanbul) by benefiting from the *merdiban* accounting method, which was initially developed to record the revenues and expenditures of the state. This study contributes to the relevant literature by analyzing the adequacy of this statist-centralist accounting method within a profit-oriented environment and its role in this failed attempt towards industrialization. *Merdiban* allows the separation of investments as actual construction, still projected and shows the payment status of investments in details. As one of the first profit oriented investment project in the history of the Ottoman Empire, accountants mislead critical pieces of information like plans for procurement of raw materials, projected sales, payback time, capacity and depreciation. Findings indicate that neither accountants nor the method were ready to operate in a for-profit organization, eventually resulting diminish of this old accounting method in 1879.*

RESUMEN

Cuando en el siglo XIX surgió la necesidad de la industrialización, el Imperio Otomano se propuso establecer empresas dirigidas por el estado y con fines de lucro después del Edicto Imperial de 1839, también conocido como *Tanzimat*. *Contadores experimentados del estado* intentaron hacer los cálculos de inversión de una fábrica de hierro en la década de 1840 (Estambul) al beneficiarse del *método de contabilidad merdiban*, que se desarrolló inicialmente para registrar los ingresos y los gastos del estado. Este estudio contribuye a la literatura relevante mediante el análisis de la adecuación de este método de contabilidad estatista-centralista dentro de un entorno orientado a los beneficios y su papel en este intento fallido de industrialización. *Merdiban* permite la separación de las inversiones como construcción real, aún se proyecta y muestra el estado de pago de las inversiones en detalles. Como uno

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de los primeros proyectos de inversión con fines de lucro en la historia del Imperio Otomano, los contadores confunden datos críticos como los planes para la adquisición de materias primas, las ventas proyectadas, el tiempo de retorno, la capacidad y la depreciación. Los resultados indican que ni los contadores ni el método estaban listos para operar en una organización con fines de lucro, lo que finalmente disminuyó el uso de este viejo método de contabilidad en 1879.

KEY WORDS:

Industrialization, Ottoman Empire, Merdiban Method, Accounting History.

PALABRAS CLAVE:

Industrialización, Imperio Otomano, Método Merdiban, Historia de la Contabilidad.

1. Introduction

The Ottoman Empire had a statist governing structure (Güvemli, 1998, 2000) (Güvemli *et al.* 2015). Çabuk (2016) states that the centralist framework of the state was a real obstacle for the development of private sector and entrepreneurship. Guilds were influential in the production, and the state determined the prices through suppression rather than competence. The effects of statism towards the economic structure affected the accounting thought as well.

The Ottoman Empire benefited a single sided accounting method called *merdiban* (ladder) for centuries. This accounting method was born to record the revenues and expenditures of the state (Güvemli and Güvemli, 2007). Throughout its lifespan, the method was in constant renewal to reflect changing needs (Elitaş *et al.* 2008). It was written with a non-punctuated Arabic script called *siyaqat*² and never used in the accountancy of for-profit organizations until the 19th century.

The 19th century was a period of significant changes for Turkish administrative, financial and accounting thought. The problems of the Ottoman economy became certainly grave and far-reaching. Fiscal insolvency, monetary instability, and inflationary pressures were among the problems that affected the Ottoman economy and economic policy makers (Akarlı, 2001: 4). As a result, the Ottoman Empire's statist policies began to change with the westernization process starting with the Tanzimat Edict in 1839.

Clarke (1992) states that the 19th century was the greatest hope of the Ottoman Empire towards industrialization. The state tried to establish several factories, and the accountants tried to benefit from the traditional *merdiban* accounting method while producing specific investment cost calculations.

Several studies (Şensoy *et al.* 2015) (Erkan *et al.* 2007) (Güvemli *et al.* 2015) examine the characteristics of the *merdiban* method mainly by analyzing cases related to taxation. This study differs from the rest by reviewing the investment cost

² In the pre-Ottoman era the term *siyaqat* was also used to refer to the accountancy profession. During the Ottoman era it was eventually called “ilm-i siyakat” (literally the science of accounting) (Toraman and Öğreten, 2006: 6). Siyaqat is allegedly used for secrecy in order to prevent state records to be read by everyone (Şensoy, 2008: 2871).

calculations of the largest factory initiative in Ottoman State during the 1840s, the first attempts of the Ottoman State towards capitalism.

The goals of this study are twofold: First, it aims to provide a case study to discuss particular efforts for industrialization in the Ottoman Empire. Even though significant linkages have been found between managerial structures, costing practices and the development of accounting in the 19th century, much of the debate was on the British and USA context (Chandler, 1990; Ezzamel *et al.* 1990; Edwards *et al.* 1995, 1997; Mclean 2006, 2015). There are also several studies in the context of China and France (Boyns *et al.* 1998; Auyeung *et al.* 2003; Fujimura 2012). Several studies (Faroghi 2005; Pamuk and Williamson 2011; Issawi 1980; İnalçık and Quataert 1994; Clark 1974, 1992) have focused towards the industrialization efforts of the Ottoman Empire in the 19th century. However, none of them focuses on the role of accounting within the industrialization efforts of the Ottoman State in the 19th century.

The Ottoman Empire lived an accounting stagnation experience in the 19th century. Similar accounting stagnation experiences occurred in Russia (Sokolov, 1985) and China (Auyeung and Ivory, 2003) as well. There is a gap in the relevant literature concerning the accounting stagnation experiences of the Ottoman Empire. The state failed to transform their thousand years old (770-1879 A.D.) *merdiban* accounting method to the changing conditions of time before it became obsolete (1879) in an industrialized world where challenges of profit based accounting were high.

The previous information links us to the second goal of the study; that is to show how and why the Ottoman State failed to transform their agrarian economy to an industrial one. Even though completely achieving this last goal is very ambitious, and it thus goes beyond this particular article's limited findings, I am still in hope for making a humble contribution to this important, yet largely forgotten subject.

Auyeung and Ivory (2003:5) describe that significant changes in accounting practices are inter-connected with political, economic and sociocultural changes. The accounting thought of the Ottoman Empire changed significantly in the 19th century. That is why the first part of this study begins with the socio-economic conditions of the Ottoman Empire in the 19th century. The second part deals with the Ottoman State's attempts to establish for-profit organizations. The paper closes with some conclusions about the analysis of the investment project.

2. Socio-Economic Conditions that led to the Establishment of Profit Based Enterprises

One of the major developments in Ottoman statecraft during the 19th century was the dissemination of new ideas concerning governance. Many of these different political philosophies envisioned and advocated a more modern and efficient state (Evered, 2012: 12). The period between 1839 and 1876 is known as the Tanzimat (reorganization) period. The Ottoman State abandoned the Anatolian accounting culture within forty years, and integration with Western European accounting culture

started. Tanzimat decrees pressured toward realizing a bureaucratic state, many within the Ottoman ruling elite gradually changed their perceptions of the nation. The reasons behind this transition are as follows.

Meeting with the Mediterranean culture that started in the Seljuk era was completed in the 16th century with Mediterranean domination (Celnarova, 2002). Meanwhile, the Silk Road that passed through Anatolia helped to develop relationships with Europe as well.

During the second half of the 18th century, two political events took place. The first was the burning of the Ottoman fleet in Çeşme, Izmir in 1773 by the Russian navy. The second one was the invasion of Crimea by the Russian navy in 1783. After these two events, which showed that the Russians had taken hold of military weapon superiority, the desire to improve the technical training level of the soldiers came to the agenda by benefiting from the technical superiority of Western Europe. By taking advantage of a closer relationship with France that started during the Ottoman Sultan Suleiman the Magnificent era (1520-1566), the state established two military schools in 1773. These were *Mühendishane-i Bahri-i Humayun* (Naval Forces Engineering School) and *Mühendishane-i Berri-i Humayun* (Land Forces Engineering School). These schools aimed to train artillery officers (Güvemli, 1998: 471-472).

The desire to adapt to the advanced Persian and Arab cultures during the arrival of Turks in Anatolia resurfaced during the integration with Western Europe. The social structure creating this trend allowed the acceptance of socio-economic conditions that were put forward by the western opportunities. The usage of steam engines both for industrial and military purposes in the first half of the 19th century was a development reinforcing this approach. This approach turned into collaboration as the industrial revolution speeded up in Western Europe. Western European countries also desired this convergence because Ottoman agriculture and animal production became the source of raw materials for Europe. During the 19th century, the westernization process started to pick up irreversible momentum.

Tanzimat was the turning point of the speeding up of this adaptation process because the state made legal arrangements to speed up this inclination and its natural changes. Then, the changes started, and the state financial organization turned out to be the area where the first change attempts experienced. Imperial Treasury was the center of accountancy, and accountants were responsible for financial issues. A change occurred with the establishment of the Ministry of Finance. The state's accounting organization had a new title, *Muhasebe-i Umumiye* (General Accountancy). This institution was established within the ministry structure. This shift started to be applied one by one in other state institutions as well.

The Tanzimat, which made up a chain of financial and administrative reforms, was a westernization movement. More precisely, it was an integration process with the Western European industrialization and bookkeeping method. This shift, which ended Anatolian accounting culture and brought in European accounting culture in its place, is the point in question. It is worth mentioning that the Ottoman State did not put

serious effort into this sharp transition on the matters of revision of the former order and attempted to adapt the current system to the changing conditions.

Western capitalism already existed, and the private sector showed significant progress when the Ottoman Empire initiated the westernization movement in the 19th century. Mendels (1972) explained that domestic handicraft industries had a substantial effect for the factory-based industrial revolution in Britain during late 18th century. John Lombe's silk throwing mill in 1717 near Derby is expressed as one of the first proper factory (Edwards, 1995). Thus, costing practices could be traced back to 1690 in the charcoal iron-making enterprises of Sheffield, England. Edwards (1995) also mentions that costing and managerial thought evolved over the period 1690-1900.

Catalan industrialization is considered as an early follower of British industrial revolution. According to Gallaraga and Prat (2015), Barcelona was the principal printed textile city in Europe during the late 18th century. There was a process of social evolution/revolution that created the modern industrial world out of the agrarian society of medieval Europe (Auyeung and Ivory, 2003).

However, an industrialization movement occurred with the efforts of the state in the 19th century despite the Ottoman State's statist structure regarding the economy and its underdeveloped private sector. Quatert (1994) suggests that wars, religion and population density can be recognized as the primary reasons for the lack of capital-intensive industrialization in the Ottoman State. During the Tanzimat era, the Ottoman State aimed to merge with the profit-based understanding of the West.

During the 1840s, two hundred students were sent to France to receive business administration education in Les Ecoles de Haute Commerce in Paris (Duran, 2012). Upon their return, they attempted to modernize the administration infrastructure by translating the two books of Napoleon's Code de Commerce (1807) and published it under the title *Kanunname-i Ticaret* (Code of Commerce) in 1850. This legal action pioneered a way for a westernized accounting understanding and trade law. Today, this influence continued to evolve with the commercial codes of 1926, 1957 and 2011. *Kanunname-i Ticaret* (1850) introduced two reforms towards modernization. The first one was the principles regarding the establishment of modern commercial companies. However, the existence of the Sharia law restrained local entrepreneurs from adopting western companies' business approaches. Only the enterprises with foreign capital utilized the new commercial code.

The second reform was the inclusion of the double-entry bookkeeping method. *Kanunname-i Ticaret* introduced the daily ledger, inventory register and detailed knowledge about notarization requirements. It was the first encounter of accountants in the Ottoman Empire with the double-entry bookkeeping. Business environment was not suitable for the enforcement of this law. State organization never used the method in the 1840s. However, that modern commercial law stayed in effect and gave way to the establishment of a vast number of foreign-capital companies along with the Ottoman Bank, which served the Turkish Banking system for many years (Apak *et al.*

2012). The Ottoman Bank was a successful organization that applied the double-entry method and took the leading role in this matter.

As mentioned in the first section, accounting stagnation experiences of Russia, China, and the Ottoman Empire in the 19th century have similarities. Auyeung and Ivory (2003) explained why China lived an accounting stagnation between the year 1840 and 1911, in an environment where significant political, economic and socio-cultural changes created pressures towards new managerial and commercial thoughts. They used Weber's socio-historical model for understanding accountings transformation failure in the 19th century. According to Sokolov (1985), Russia's final accounting transformation took place at the end of the 19th century. He states that double-entry bookkeeping method was mainly used in trade rather than manufacturing because the latter was owned by the state and didn't operate on the principle of financial accountability, although they were well controlled just like the ones in the Ottoman Empire.

Consequently, the development of manufacturing gave power to the practice of double-entry bookkeeping at the end of the 19th century.

3. Attempts of the Ottoman Empire to Establish Profit Based Enterprises

Quatert (1994) states that the mechanized factory output of the Ottoman Empire was insignificant in the 19th century when compared with the domestic handicraft production. Ottoman State's traditional domestic handicraft production was organized as guilds. Their hierarchical structure was based on the master-apprentice relationship. The guild system determined the number of artisans and shops to control supply, demand, prices, and quality. At the end of the 18th century, Ottoman Empire became a major raw material exporter, and in the 1800s, foreign trade in the Middle East grew significantly (Karaoğlu, 1994:15). As the state directed the agricultural production to export, development of industrial facilities crumbled (Pamuk, 2008: 39). Domestic handicraft production failed to transform themselves in opposition to import products. Cotton weaving import increased five times between 1825-1830 and increased 65 times in 1860 (Karaoğlu, 1994: 18). Ottoman cotton weaving market was absorbed by Britain in 19th century definitely with the effects of the Anglo-Ottoman Treaty of 1838, which abolished all monopolies and allowed access for British and other merchants to all Ottoman markets.

Textile industry began operating within the Ottoman Empire in the 19th century mainly because of international private sector investments. The private sector of the Ottoman Empire established 8 – 10 textile mills in Istanbul, Western Anatolia, Izmir and Denizli regions (Quataert, 2002). It is important to mention that those few private sector accounting records are lost in the annals of history. Textile industry had serious manufacturing power. Thus, silk texture industry had led to huge improvements in Bursa. All those industrial enterprises were carried out by the private sector. Private sector started to establish major industrial facilities for broad markets as early as the 1840s. There are pioneer facilities like Dimitri Efendi's approach for establishing

sugar factory in 1840 in Istanbul – Arnavutköy (Atalık, 2011); Ohannes and Bogod Dadyan brother's silk and cotton textile mill at Izmit – Hereke. Meanwhile, the Ottoman State established the organization titled Fabrika-i Humayun (State Factories Administration) in the 1840s just like a conglomerate of today. This development, which started in the 19th century, lies at the foundation of the desire for Turkey to be integrated with the globalization process of the 21st century.

Öztürk (2011) indicates that at the beginning of 1840's 1/8 of the state's revenues, and between the years 1847 and 1848, 1/6 of the state revenues were allocated for industrial purposes. In the first half of the 1840s, the State had laid down the foundations of 140 factories and started to invest in them (Güvemli *et al.* 2015: 16-17). According to İnalçık and Quatatert (1994: 905), the contribution of Ottoman factories to total industrial output cannot be determined because of unreliable statistics. However, they mention that the state initiated 56 factories were before 1880, and 51 factories were opened between the years 1880 and 1890. In 1847, the state sent students to Europe to understand modern managerial understanding and technologies (Karaoğlu, 1994:25). The following table displays the extent of the Ottoman State's factory investments in 1847-48.

Table 1. List of factories and large-scale investments of the Ottoman State in 1847-48.

Name of the Factory	Kuruş ³	(%)
Zeytinburnu iron factory	50.722.833	51,4
Veliefendi printing factory	4.815.353	4,8
İzmit drapery factory	29.546.955	29
Hereke cloth factory	5.751.869	5,8
Mihaliç state farm	3.411.608	3,4
Büyükada iron mine	1.273.375	1,2
Ziraat training camp	3.333.810	3,3

³ *Kuruş* was the standard unit of currency in the Ottoman Empire. It was introduced in late 17th century as a large silver coin. In 1834, a silver *kuruş* was weighting 2,138 grams and in 1844, it was weighting 1,203 grams. The year 1844 is considered as the turning point in modernization of monetary system. State formally announced the introduction of bimetallism with a fixed gold-silver ratio, and the long history of raising revenues through debasements came to an end. The gold *lira*, the silver *kuruş* and the copper *para* were declared to be legal tender, freely convertible to each other at the fixed rate of 40 *para* for one *kuruş* and 100 *kuruş* for one gold *lira*. (Tuncer and Pamuk, 2014: 172-173).

TOTAL	98.665.803	100
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Source: Karaoğlu, 1994: 76.

As one of the largest industrial investment of the Ottoman Empire, the investment project records of Zeytinburnu iron factory is analyzed in the following section to understand the mentioned accounting methods adequacy in a profit-oriented environment.

4. Investment Project of an Iron Factory in 1840s

Large-scale industrial investments were initiated with Sultan Mahmud the 2nd and accelerated with Tanzimat. The fundamental aim was to meet the needs of the army and to recover from external dependence. The largest investment during the 1840s was the Zeytinburnu iron factory, and it was initiated in 1843 (Yıldırım, 2015:219).

The establishment of the plant was delegated to a British industrialist and engineer called William Ferrin along with Barutçubaşı Ohannes Dadyan (Tuğlacı, 1993), who had been working within the Ottoman State for years. Technical instruments were brought from England (Annex 7). Engineers and supervisors were from England, Austria, and Prussia (Yıldırım, 2015:223). The factory became operational in 1846. Historical records indicate that the numbers of workers reached to almost 300 in October 1849. The factory was producing steel rail, iron pipe, cannon, sword, garden tools, scales, keys, bedstead, safe box, water pumps, lantern shafts and bayonets (Karaoğlu, 1994). Due to its level of production in its first years, Kurt (2016:251) calls this factory as an industrial park. The factory was initially managed by an imperial organization called Hazine-i Hassa⁴ but transferred to Tophane-i Amire (Imperial Arsenal) in 1848. The report indicates that Hazine-i Hassa's receivables of 56.445 kese⁵ (around 28.200.000 Kuruş) will be collected once the factory became profitable (Yıldırım, 2015:225). Production decreased over the years, but the factory was operational until the establishment of the Republic in 1923.

A report regarding the investment cost calculations was produced in September 1848 (Kulaksız, 2006). This report indicates that the investment was largely finished and it will be completed around November 1848. Estimations within the report include component costs and inventory for the labor period.

Copies of the investment report are shown in Annex 1, 2, 3, 4, 5, 6. Documents are rewritten in today's language and presented in Tables 2, 3, 4, and 5. Payments are made from the state treasury.

⁴ *Hazine-i Hassa* was an imperial organization responsible for overseeing personal incomes and expenditures of Ottoman Sultans.

⁵ *Kese* means pouch and it is also a term used to define a specific amount of coin. In order to count *kuruş* more efficiently, the Ottoman State used pouches (*kese*). One *kese* was equal to 500 *kuruş* in 19th century.

The following table shows the list of machinery and other fixed assets.

Table 2. (Translation of Annex 1) - List of machinery and other fixed assets

Investment	Kuruş	Para
Imported machinery and hardware	5.986.750	-
Domestic machinery and hardware	-	-
Manufactured	1.073.674	30
Assembly costs	1.390.500	-
Melting oven	1.388.405	08
Hardware outside the factory	310.059	20
Sorts of machinery and hardware	1.357.480	10
TOTAL	11.506.869	28

The sum of 11.506.869 kuruş and 28 para is paid from the treasury. This is most of the hardware needed for successful completion of the factory. The main elements of the machinery were imported from Europe. The useful life of the hardware is not mentioned.

The next record is about the cost of factory building and the cost of labor.

Table 3. (Translation of Annex 2) – Cost of factory building and labor

Investment	Kuruş
Factory Building	4.075.350
Labor (paid)	2.121.576
Construction Supplies (unpaid)	3.757.000
Sub Total	5.878.576

Annex 2 is composed of two parts. The first part indicates an arrangement with the contractor Karabet Kalfa for the rest of the uncompleted parts of the factory. Karabet Kalfa received the payments in shares. Rest of the projected costs is not shown. Still, state accountants failed to demonstrate the capacity levels of the factory.

Payment status of wages is shown, but there is no indication of the number of workers and the projected wage amount to complete the investment. The second part of the table shows the wages that were paid from the beginning of the factory construction until March 1848. The cost of supplies is shown in the table. Factory

construction is almost completed as of March 1848. Melting oven, some machinery and some parts of the plant are in progress of completion; therefore manufacturing has not yet begun.

Annex 3 shows the cost of other imported hardware and machinery, and then the total cost of all machinery once again.

Table 4/a. (Translation of Annex 3) – Cost of machinery, assembly, coal

Investment	Kuruş
Imported machinery and hardware	231.000
Cost of assembly	1.128.788
Coal to be imported	1.124.000
Sub Total	2.483.788

	Kuruş
Sum of the two totals mentioned above	8.362.364

The cost of assembly, the cost of coal and its procurement places are shown in the report. However, accountants mislead critical information like the energy demand to operate the factory for years.

Annex 3 consists of more information like the actual construction cost of the factory building until February 1848 and its projected costs until August 1848.

Table 4/b. (Translation of Annex 3) – Actual and projected cost of factory

Investment	Kuruş
Factory Building (actual construction costs)	24.278.250
Factory Building (projected costs)	2.000.000
Total	26.278.250

The accountants assumed that the factory would be operational within nine months. The contractor Karabet Kalfa wrote the report. However, he did not mention how he calculated the needed two million kuruş. According to Çabuk (2016: 461), Ottoman State accountancy applied advanced audit procedures and gave importance to internal control. Therefore, the auditing report of this investment would provide us detailed information about the accuracy of the calculations, and it is not found in the Ottoman archives yet.

Annex 3 continues with the total cost of investments in one table and one projected fixed asset.

Table 4/c. (Translation of Annex 3) – Actual and projected cost of factory

Sort of Investment	Kuruş	Para
Machinery and hardware	10.300.424	30
Factory building	36.248.464	-
Wages	2.006.405	08
Fixed assets outside factory	310.059	20
Sorts of machinery	1.357.480	10
Sub Total	50.222.833	28
Steel oven (projected)	500.000	-
Total	50.722.833	28

There is no clear information regarding the details of these expensive fixed assets. The next section (Annex 4) of the report shows the expenditures made by the contractor, Karabet Kalfa.

Table 5/a. (Translation of Annex 4) – Payment status to contractor

	Kuruş
Total construction expenditure of Karabet	26.278.250
Payments made to Karabet	15.913.829
Remaining amount (sum)	10.364.421
Details for the remaining amount	Kuruş
Actual construction - completed	8.364.421
Projected parts of the construction	2.000.000
Sub Total	10.364.421
Paid for the factory building	4.046.350
Paid for the construction supplies	28.436
Total	4.075.350

Karabet Kalfa spent around twenty-six million kuruş for the investment. Treasury has paid most of it but there is still a payment to be made to Karabet Kalfa. The detailed information regarding the completed parts and repetition for the projection parts are given in the following table.

Annex 4 continues with more tables.

Table 5/b. (Translation of Annex 4) – Payment status for the projected parts

	Kuruş	Para
Total	19.869.233	28
Paid	11.506.869	28
Remaining	8.362.364	-

	Kuruş	Para
Assets that will be used in the factory	1.357.480	10

Assets that will be used in the factory	7.004.883	30
Total	8.362.364	-

Table 5/b is connected to table 5/a and shows how much payment will be given to Karabet Kalfa in exchange for the projected sections of the investment. The amount of 2.121.576 kuruş is paid for labor cost and the final table is prepared according to this information.

There is an explanation section on the original document (Annex 6). The explanations are shortened and shown below.

Actual construction and projected parts are held in the factory. Some parts (310.059,5 kuruş) are held in the farm place of the Sultan, and in the Agriculture School.

Treasury has paid a significant amount. The factory will be operational in November 1848. Tophane-i Amire has been informed that its subsection, Baruthane-i Amire will be in charge once it is operational.

Raw materials will be procured from the iron ore quarries of Büyük Ada and coal mines of Lapseki.

It is assumed that the amount of investment will be recovered once the factory is operational.

Fabrika-i Humayun manages the investments. The projected parts of the investment will be managed by this organization. Once the investments are operational, Tophane-i Amire will manage them.

This report is signed and sealed.

September 1848

The report is composed of three main sections. The first two sections are about the cost calculations and payments. The last section gives information regarding the completion stage of the investment. Procurement information for raw materials is provided in this chapter as well. The distinction between the first and the second sections are not clear. For instance, payment status is referred in the cost calculations section.

There is no significant insight for the classification of investment elements. The costs of the valuable fixed assets are not shown in details. A different classification is preferred in that table.

Sometimes investment's realization status and sometimes payment status is taken as a basis. This situation is observed in the buildings. State's construction and the

construction of the other party's (Karabet Kalfa's) are analyzed separately. This discrimination is made according to the payment status. Information about realization and payment status is always given in the explanations of investment elements.

Investment's capacity, production performance, estimated sale and profit calculations are not mentioned. Obviously, the calculation's purpose could be explained as to determine the investment cost and the deadline of the investment. Until then, accountants of the state had not worked in a profit-oriented enterprise. In other words, state's administrators and accountants had no sufficient experience or insight for managing a for-profit organization and generating pro forma income tables in the 1840s.

Pamuk and Williamson (2011) explain that the Ottoman industrialization experience suffered from great inefficiencies including the lack of fuel, raw materials and the absence of skilled labor. The lack of experience is easily observed in this particular example.

The last section of the report state that the *Hazine-Hassa's* receivables (28 million kuruş) would be paid back once the factory is operational. This poor judgment is not supported by projected sales. Also, the archive documents show no information regarding the amount of iron to be produced in years.

There is no information regarding depreciation. Archival documents used in this study and previous research (Toraman and Öğreten, 2006; Güvemli, 1998) suggests that the Ottoman Empire was unaware of the term depreciation until the 20th century. On the other hand, Mclean (2006: 108) states that company directors in Britain exercised considerable discretion in the area of capital accounting and depreciation in the latter part of the 19th century. Also, when contracts were completed, heads of departments routinely presented to the board comparisons of estimated and actual cost together with appropriate explanations of cost differences (Mclean, 2006: 112). There is no estimated, actual cost comparison in this particular Ottoman example.

The accounting records of Staveley coal and iron factory in 1847 provide interesting features of British cost accounting thought. These are the computation of charges for depreciation and imputed interest on the capital invested in fixed assets used by each profit center (Edwards *et al.* 1995: 14). These were deducted from the balances of each profit center showing both the decline in value of fixed assets and the opportunity cost of investing at the factory.

Boyns and Edwards (1997:41) state that the businesses operating in British iron industry around mid 19th century had developed into multiunit enterprises. Departmentalization might have occurred because of geographical regions or different products. Zeytinburnu iron factory had a huge production scale ranging from steel rail, iron pipe, cannon, sword, garden tools, scales, keys, bedstead, safe box, to water pumps, lantern shafts, bayonets, etc. However, there is no indication of any multi-divisional structure or a definitive costing system to help the management make a range of decisions.

The limited findings of this particular case point that the accounting thoughts of Western and Middle Eastern cultures were very diverse in the 19th century and the *merdiban* accounting method lacks to fulfill the needs of an industrial enterprise.

5. Conclusion

The Tanzimat edict (1839) symbolized the administrative and financial changes. It is linked to the socio-economic setting originating from the constant orientation of Turks towards the West. It was the essence of the westernization movement and expressed reforms in fiscal and administrative areas (Güvemli and Kaya, 2015). Two main purposes were set forward with its declaration in 1839. The first purpose was restructuring the governmental institutions according to principals practiced in European countries. The second goal was establishing profit-based enterprises by supporting the private sector.

After the declaration of the Tanzimat, priority was given to the first purpose and it was substantially accomplished. Ottoman State's industrialization efforts were postponed between the years 1840-1850 because of the Crimean War and financial crisis. Pamuk and Williamson (2011) explain the rapid growth of factories as in two waves. The first wave is state-owned factories, and this research focused on that era. The second wave was carried out after the 1870s with privately funded factories. It is important to mention that the double-entry method was adopted and an institution of higher education was established during the second wave. Institutions established under this project gained recognition over time, and they experienced a significant improvement process in the long run, especially after the establishment of the Republic in the 20th Century (Kaya *et al.* 2016: 76). Industrialization efforts are considered as valuable experiences and were benefited by state administrators and accountants for a long time.

Kurt (2016) indicates that the Ottoman State was observing the European States through their state officials in 1840s, and the factory complex in Zeytinburnu was established by taking Manchester, Leeds, Sheffield, and Birmingham as a role model. Thus, the industrialization efforts had great density through the century but lack basic infrastructure. The Ottoman State transferred foreign intellectual capital mainly from England. Their aim was to run the factory with western managerial and technical know-how. However, despite the rapid growth of factories in the 19th century, only a few of them remained. The remaining few were handicraft factories. Pamuk and Williamson (2011:170) state that the second wave looks like supply response to a much favorable world price environment. According to Issawi (1980:472), these factories employed 5000 men, but due to their inefficiency, most of them were abandoned by 1849. The iron factory in Zeytinburnu, Istanbul was operational until the establishment of the Republic in 1923. Its capacity decreased over the years, and it failed to procure for the industrial demands of the State. Yıldırım (2016:225) states that the Ottoman State assumed that the mentioned factory would be profitable once it is completed. The finding indicates that it could never be profitable and the *merdiban* accounting method had a significant role. The investment records show that *merdiban*

method lacks to fulfill the needs of a commercial or in this case, an industrial enterprise.

Due to the usage of the *merdiban* method for centuries, accountants could not develop sufficient knowledge on cost accounting and profit evaluation methods in the Middle East. In other words, there were neither publications nor accountants with the knowledge of the double-entry method. Also, the number of engineers with enough technical knowledge to set up factories was limited; thus a profit-based enterprises approach was not developed. The method had no sufficient experience in 1840's. Until that time, the state had no interest in establishing a profit-oriented industrial enterprise. Consequently, the state could not use this method for an extended period at industrial enterprises. *Merdiban* method was abrogated in 1879 before it had the chance to gain sufficient experience on profit-oriented enterprises.

Capital accumulation and managerial understanding in Europe and the Ottoman Empire were completely different until Tanzimat. Perhaps, the main motivation of the industrialization efforts is to transfer Western manufacturing and managerial system. However, this should have been followed with proper accounting understanding.

Further comparative research could permit probes into the nature of the function studied, and provide correct interpretations and evaluations of the performance of several different initiatives in that activity (Chandler, 1990: 1). It could indicate more clearly how Ottoman State and Ottoman entrepreneurs have handled that activity over the years. Also, examining the audit reports of other for-profit organizations during the Tanzimat period and the contemporary differences in diverse cultures could yield some significant findings.

This iron factory initiative is one of the many stories of state-let for-profit industrial enterprises, and it is one of the first capitalism experiences in the history of the Ottoman Empire. Thus, it is appropriate to say that Turkish industrialization efforts took hold in the 1930s with relative experience gained from the usage of double-entry bookkeeping method.

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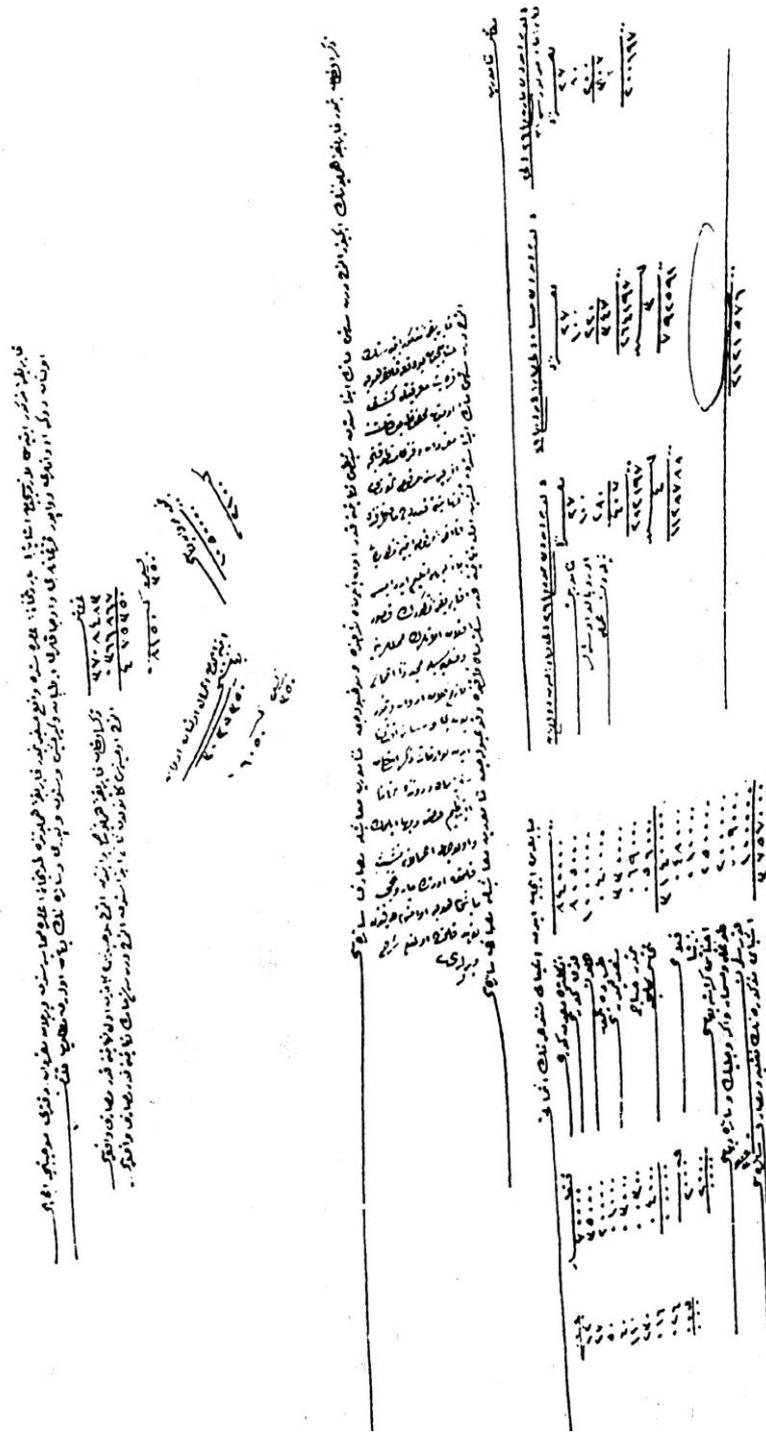
Annex 1

Investment Project Report of Zeytinburnu Iron Factory in 1848

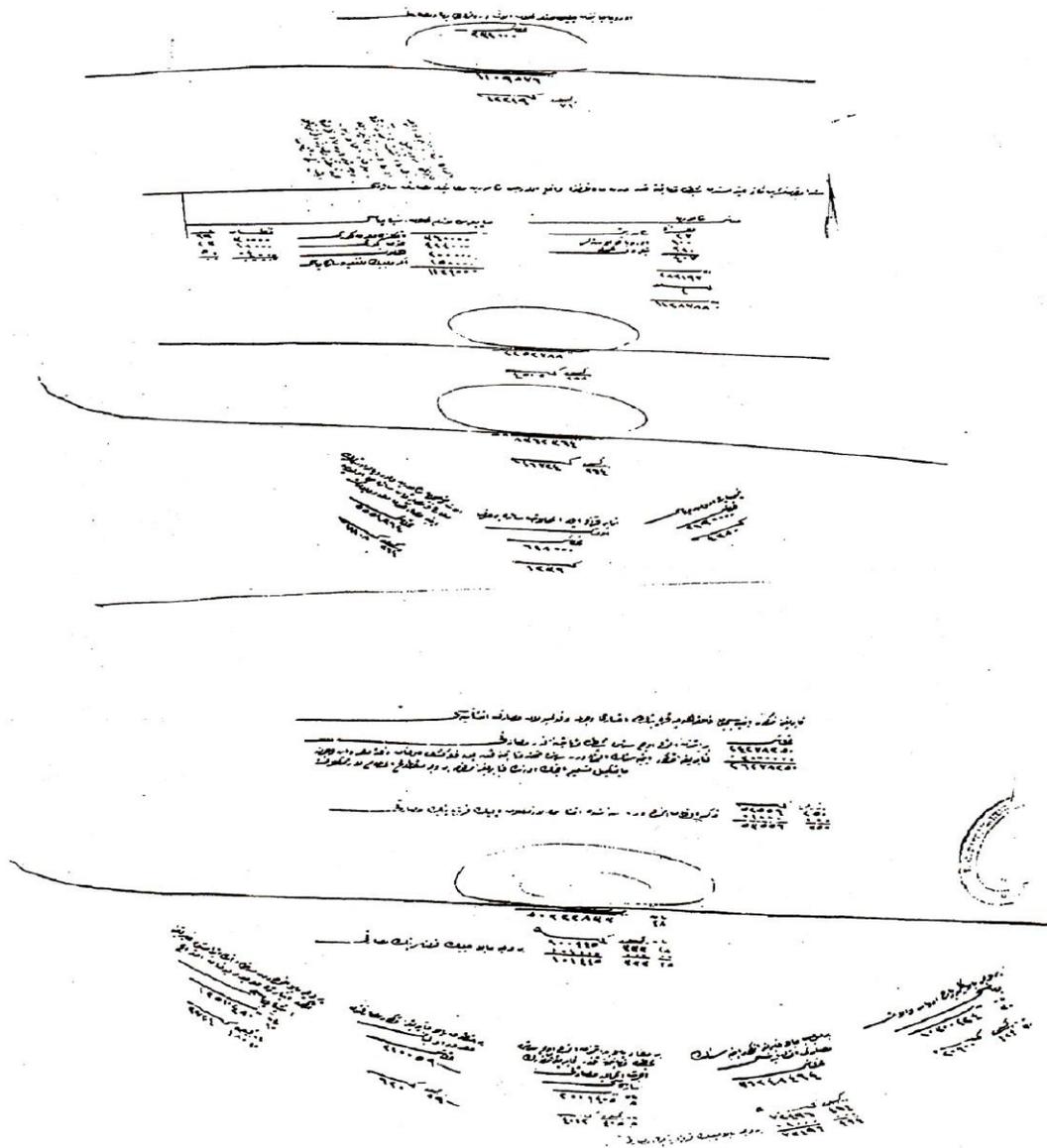
The image shows a handwritten Ottoman accounting document. It features several tables with columns of numbers and descriptive text in Arabic script. The document is oriented vertically on the page. The text includes various entries, likely representing financial transactions or inventory counts, with some numbers underlined or circled. The handwriting is in a cursive style typical of the Ottoman era.

Source: Prime Ministry Ottoman Archives, Hazine-i Hassa Journals, No.1 (Hegira. 19.03.1265)

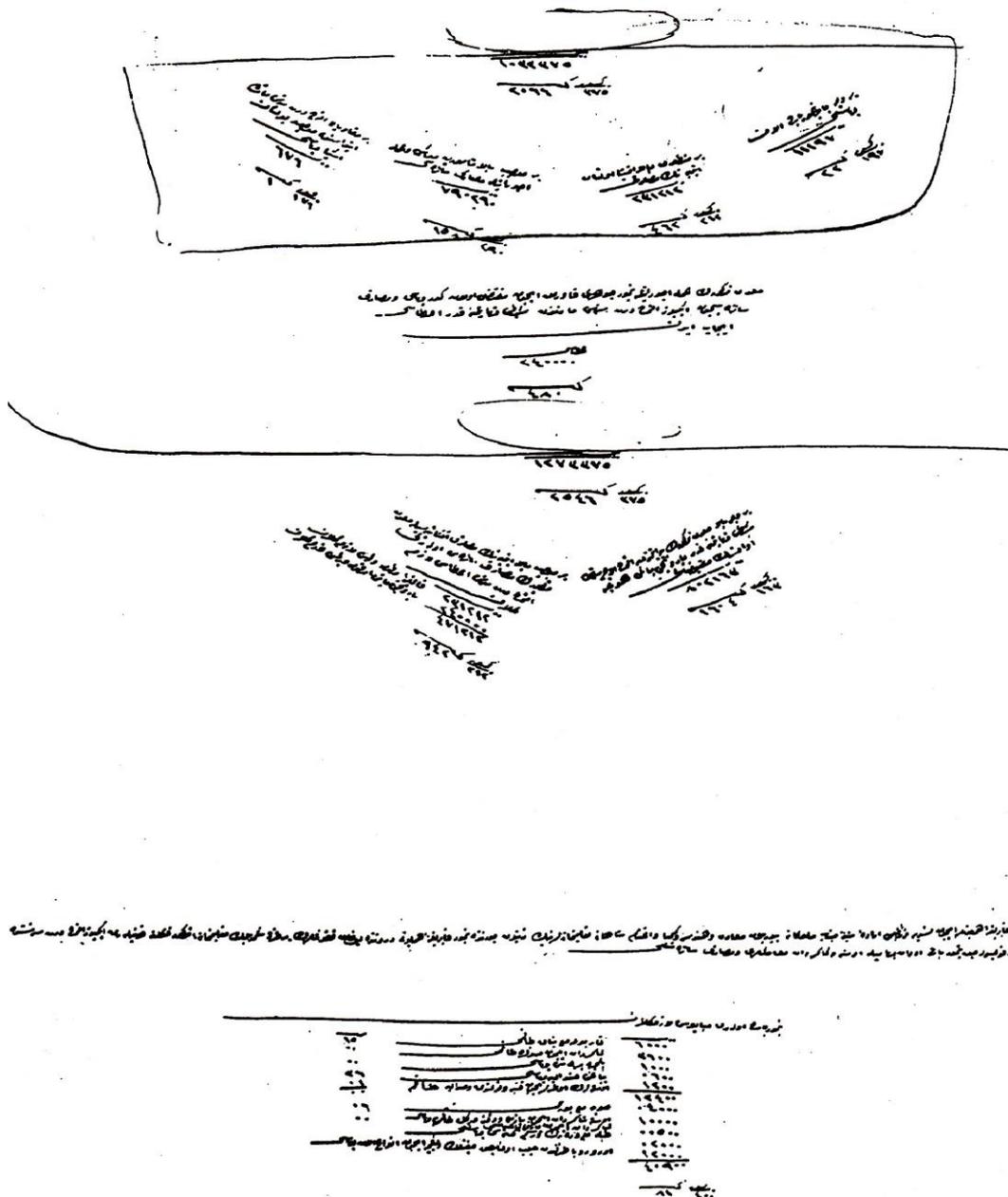
Annex 2



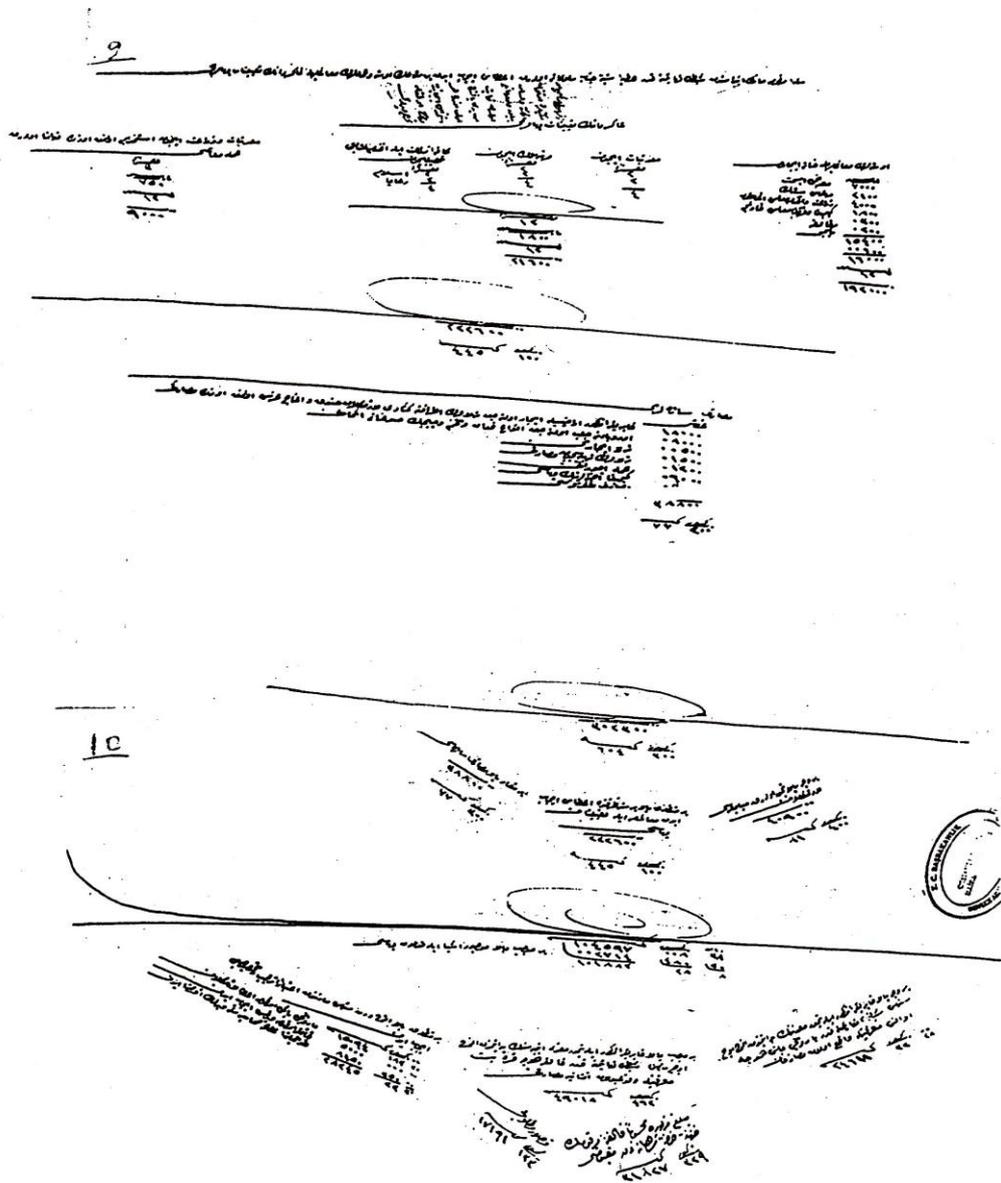
Annex 3



Annex 4

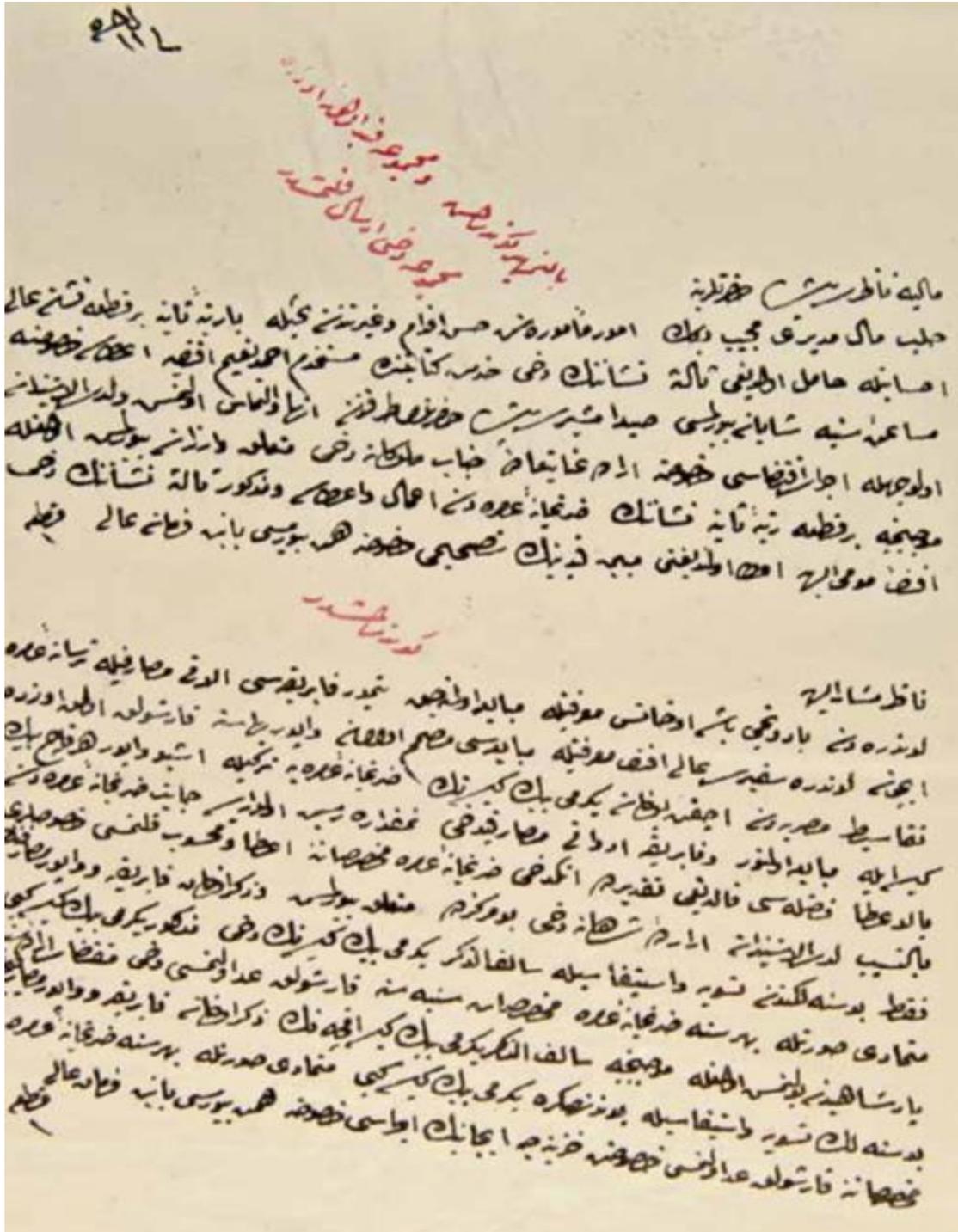


Annex 5



Annex 6

Edict of Sultan Abdulmecit to the Minister of Finance for the procurement of necessary materials from England to establish the Zeytinburnu iron factory. November 1842.



Source: Prime Ministry Ottoman Archives. BOA, A.MKT, nr. 5/53.

Annex 8

Zeytinburnu iron factory



Source: Yıldırım, M (2015) A Heavy Industrial Investment in Istanbul, Zeytinburnu Iron Factory. *Büyük İstanbul Tarihi (Grand History of Istanbul)*. Center for Islamic Studies, 6:225.

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