Accounting for Procurement in the Ottoman Empire during the Early 18th Century

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Abstract

In the 18th Century, the transactions of commercial activities were recorded by the *Merdiban* method as part of the Ottoman state accounting system. This study aims to evaluate the *Merdiban* method's ability to meet the requirements for a specific commercial activity and provide a historical background on the state accounting practices of the Ottoman Empire. The accounting records are translated both in the format of the *Merdiban* method and the double entry accounting system. Thus, the study makes a comparison of generally accepted accounting principles and rules with the *Merdiban* method to show its simplicity and effectiveness. The accounting record is related to an eight-month long agreement with certain officials to purchase iron ore from Northern Bulgaria and its delivery to Istanbul to be used in the imperial shipyard and in the imperial arsenal of the Ottoman Empire in the early 18th century.

Keywords: Accounting history, Ottoman Empire, Merdiban method, state accounting system, 18th century.
JEL Classification: M41, M49

Özet

18. yüzyılda, ticari işlemler ile ilgili muhasebe kayıtları Osmanlı devlet muhasebe sisteminin önemli bir parçası olan Merdiven yöntemi ile kaydedilmekteydi. Bu çalışma Merdiven yönteminin belirli bir ticari işlemdeki yeterliliğini ölçmeyi hedeflemektedir. Araştırmaya konu olan muhasebe kayıtları karşılaştırma yapılabilmesi amacıyla, hem Merdiven yöntemi, hem de çift yanlı kayıt yöntemine uygun olacak şekilde tercüme edilmiştir. Ayrıca çalışmada, Merdiven yönteminin basitliği ve etkililiğinin gösterilmesi amacıyla genel kabul görmüş muhasebe kuralları ve prensipleri ile Merdiven yöntemi arasında da karşılaştırma yapılmıştır. Muhasebe kayıtları, 18. yüzyılın ilk yıllarında Kuzey Bulgaristan'dan demir cevheri satın alımını ve bu cevherin İstanbul'daki imparatorluk tersanesine ve imparatorluk tophanesine sevkiyatını konu alan 8 aylık bir anlaşmayı içermektedir.

Anahtar Kelimeler: Muhasebe Tarihi, Osmanlı İmparatorluğu, Merdiven Yöntemi,

devlet muhasebe sistemi, 18. yüzyıl.
JEL Sınıflandırması: M41, M49

1. Introduction

There exist remarkable intellectual and institutional differences between the history of the Middle Eastern accounting and the history of the Western accounting practices. Political, social and economic forces different from the forces found in the western business environment characterize the environment of accounting and bookkeeping systems of the Middle East. In the history of these cultures, there have been a number of accounting methods, which were used for centuries before they took their place in the annals of history. One of these methods is the *Merdiban* (Ladder) method. This state accounting method was born out of the needs of making the tax sources constant and controlling the expenses of the state. It was used for more than a thousand years in the Middle East (Erkan, et al, 2006: p.1).

This accounting system was acquired by the Ottoman Empire (1299–1922) from the Ilkhanate State (1251–1353) in the 14th Century. The Ottomans developed and used this system until the end of 19th Century. By the end of the 19th Century, the state started to use the double entry accounting system for state accounting purposes. The use of the double entry method in the Ottoman Empire was amongst the modernization issues, which was announced in 1839 and commonly known as the *Tanzimat* (Administrative Reforms) Edict. There was a revision and change within the characteristics of the *Merdiban* method especially in the Ottoman era as it had to adapt itself to the developing conditions over time.

This study examines time-space intersection that has been widely neglected in accounting history researches published in international journals; the early 18th Century and the Ottoman Empire. To achieve its goal, the study analyses an historical accounting record.

The accounting record is shown with the *Merdiban* method beginning from Annex 2/1 and the translated accounting record is also shown with the double entry accounting system beginning from Annex 3/1. The study aims to go beyond its archival evidence by making a comparison of generally accepted accounting principles and present day accounting rules with the accounting principles and the accounting rules of the *Merdiban* method in order to understand the archival evidence more clearly.

The accounting record is related to an eight-month long agreement with certain officials to purchase iron ore from Northern Bulgaria and its delivery to Istanbul to be used in the imperial shipyard and in the imperial arsenal of the Ottoman Empire in the early 18th century.

The study begins with a review on the accounting structure of the Ottoman Empire. Then, a comparison is made between the general accepted accounting principles and rules with the *Merdiban* method. Afterwards, historical information regarding the mentioned era is given. Finally, the accounting record is analyzed and the results are evaluated.

2. Brief Review on the Accounting Structure of the Ottoman Empire

Accounting historians attempt to relate the knowledge of the variety of accounting practices at various points of time, and in various places, to wider questions of the role of accounting in reflecting and shaping not only business and management practices, but also economic and social organizations more generally (Macve, 2002: p.453). The Turkish perspective to contemporary accounting history research is no different and its basis relies on merely public sector documents. As a result of the dominance of public economics in this part of the world, the *Merdiban* method was used for keeping the records of state incomes and expenditures as well as for the records of foundations and similar organizations. There were not many examples regarding the use of this method in the private sector because, due to the dominance of public economics, there were not many private companies in the Ottoman Empire. Small-sized private firms were using simple accounting methods for their records. On the other hand, large private firms were in the hands of foreign capital control (Örten and Torun, 2008: p.285). These firms were keeping their records in the native language of the companies' founders and were using the accounting methods which were being used in those native countries. As long as these firms paid their taxes regularly and obeyed the internal laws of the Ottoman Empire, the state never interfered in them (Güvemli and Güvemli, 2006: p.276). Therefore, it is crucial to mention that the accounting and bookkeeping systems practiced by the Ottoman Empire possess the characteristics of a centralized administrative system. Nevertheless, the accounting records of revenues and expenditures were also kept in the locations where they occurred as well (Güvemli, 2000b: p.1).

Central state accounting system is connected to the *Hazine-i Amire* (Ministry of Finance/Treasury). In this organization, accountants are trained in a master-apprentice relationship. *Başdefterdar* was the head of the central accounting system. The post occupied by this person would be equivalent to Secretary/Minister of Finance in form and function by today's standards. He was charged with protection of the state treasury, keeping records of state revenues and expenditures and fiscal management of state assets and affairs. He had a large bureaucracy (Güvemli, 2000a).

The Ottomans used the *Merdiban* method in state accounting in various parts of the Middle East. Throughout its lifespan the system was in constant renewal to reflect changing needs (Güvemli et al, 2008). The bookkeeping system utilized by the Ottomans from the 16th century until the end of the 18th century was the improved version of the *Merdiban* method. During the mentioned period the basic principles of the system were not altered but they were improved (Güvemli, 2000b: p.22). *Merdiban* is a Persian originated word-meaning ladder. The method was named as such because it records the main amount on top and items making up the main account are written below one another in a manner similar to rungs of a ladder. The Ottomans used Arabic script. Arabic is written from right to left so the *Merdiban* method was developed for right to left writing. Conversely double-entry bookkeeping was developed for left to right writing (Toraman et al, 2006: p.123).

In the Ottoman implementation of the *Merdiban* method a special non-punctuated Arabic script called *Siyakat* was used. It was developed especially for the official and financial affairs of the state. It is fast to write and occupies little space because it is written in thin, intricate, and straight letters. Apart from easy legibility, it has some features, which can only be read by experts (Erkan et al, 2007: p.760). *Siyakat* is allegedly used for secrecy in order to prevent state records to be read by everyone (Şensoy, 2008: p.2871).

3. Comparison of the Present Day Accounting Principles and Rules with the Merdiban Method

In this section, generally accepted accounting principles and rules are presented and a comparison is made with the *Merdiban* method. The aim is to show the simplicity and the sufficiency of the method before examining the accounting record briefly.

Table 1: *Comparison of present day accounting rules with the accounting rules of the Merdiban method (Elitaş et al, 2008: p.621)*

Present day accounting rules and some physical features	**Presence in the Merdiban method**
Making accounting records without delay within 10 days	*Present.* The Ottomans as 15 days applied this rule.
Ratification of compulsory ledgers to the notary	*Present.* Accounting books were ratified by the *Kadi*, the head of finance, vizier and sometimes by the signature of the Sultan.

Keeping ledgers by certified public accountants	*Present.* The individuals who learned the profession in a master-apprentice relationship, kept ledgers.
Entry line in records	*Present.* Generally, an expression showing the type of the record is written at the beginning of the entry and the last letter of this expression is elongated with a line. Thus, there was a line between the expression and the last letter. The record was written under it.
Writing the date in records	*Present.* Writing the date was a common practice in the Ottoman Empire.
Explanation of entries in records	*Present.* Explanations of entries sometimes cover half of the page. The Ottomans made explanations under the entry.
Practice of sub totaling	*Present.* The subtotals were different like a bunch of grapes where they were written downwards like a flow of a bunch of side by side if they were too long to be written downwards.
Recording debts to left and receivables to right	*Not present.* There was no such structure. Incomes and expenditures were written on the same line.
Calculating end of page sums	*Partially.* The entrant to crosscheck the calculations used this practice for the large sums. The most common practice was to write the half part of the real numbers over them to check totaling mistakes. Thus, the half part of the real sums could be checked from the totals of these numbers. In other words, if the half of the real numbers proved the half of the sum, the calculation was correct. Another practice was to provide a general total and prove its credibility.
Correction of mistakes without erasing or scratching and by crossing through the record and writing the correct statement over it	*Present.*
Giving an entry number to every accounting record	*Present.*

Table 2: *Comparison of present day accounting principles with the accounting principles of the Merdiban method (Application Areas of the Stairs Method, 2010: p.17,18,19)*

Generally accepted accounting principles	**It's place in the Merdiban method**
The concept of social responsibility	Since the *Merdiban* method was used for the state accounting purposes, the good of the society, without doubt, it was taken into consideration. Because when the state and its properties were the topic, both the influence of the religion and the traditions of the time made the approaches to the subject more vulnerable.
The concept of business entity	*Merdiban* method was used for state accounting purposes, so no such representative of the business entity was found.
The concept of continuity	The continuity concept was a necessity, which can be observed within the *Merdiban* method. No state suddenly vanishes, and for such a state like the Ottoman Empire, this is an observable reality.
The concept of periodicity	Apart from meaning the fulfillment of some responsibilities, the concept of periodicity was used for making the budgets and following the difference between the accruement and realization of incomes. It is observed either as in the form of keeping the records in yearly periods or in records kept until the end of a fulfillment of a task.
The concept of money measuring unit	Although quantities of goods were used in some instances, records with the monetary unit of that state were generally made. The Ottomans kept records in *akçe* and/or *guruş* form.
The concept of cost principle	This principle is effective in purchase of goods.
The concept of neutrality and documentation	Although there are not much proof of neutrality and documentation, while keeping records signature of an authority is used to confirm the reliability of the record and sometimes the expression of "controlled by another authority" shows the truth and validity of the record.

The concept of consistency	There were line numbers on every entry. They have assigned dates, and gave detailed information about the entries.
The concept of full and fair disclosure	Third parties were not allowed to see accounting records. Also, *Siyakat* writing system was used for the secrecy of the accounting records.
The concept of prudence	While preparing the budget, the income of the previous nine months and revenue projections for the remaining three months were used for preparation of the next year's budget. These projections were made similar to the accruement principle. If the projections were wrong, the damage was compensated from the treasury.
The concept of materiality	The Ottoman Empire kept money for possible military campaigns, but their explanation in account books was rare. Certainly, concepts like financial tables and endnotes were not possible for those times.
The concept of substance over form	No practice of the substance over form was found.

It can be seen that the Merdiban method has differences and similarities from today's general accepted accounting principles and rules. A crucial difference is that the *Merdiban* method had record books only for incomes or only for expenditures or for both of them. Record books used for keeping both incomes and expenditures even have classifications among themselves in physical terms.

Before examining the mentioned accounting record, it is important to have brief knowledge on the economic and even politic conditions of the time. Therefore, the next section gives necessary historical information regarding the era of the accounting record.

4. Historical Information Regarding the Era of the Accounting Record

The Ottoman Empire is usually examined by dividing its six centuries of existence into four independent time periods. These are: rise (1299-1453), growth (1453-1683), stagnation and reform (1683-1827), decline and dissolution (1828-1922) (İnalcık and Quataert, 1996: p.1). At the height of its

power (16th and 17th centuries) it spanned three continents, controlling much of Eastern Europe, Western Asia and North Africa.

In the middle of the 16th century, the Empire reached its final boarders and the income attained through wars came to a halt. At the same time, war technology changed and the Ottoman army lost its former striking force. Soon, victory gave its place to defeat; in the 17th century and especially during the 18th century serious losses occurred (Barkan, 1970: p.602). The Ottoman Empire's financial and economic system was not flexible. It could not rejoin the developments and improvements caused by inner and outer sources. In this process, especially after the 16th century, the depression, which occurred in the centralized administrative system, not only affected financial events, but also brought political and social disorder (Demircan, 2008: p.1571). A reason for the depression was the "price revolution" which occurred in Europe in the 16th century. Precious minerals, which came to Western Europe from America and Africa, helped the economies of these countries to overwhelm the Mediterranean trade lines. These newly provided opportunities affected the financial and political balance of the world (İnalcık, 1996: p.163). Because of the "price revolution's" negative effect on the Ottoman Empire, the guilds in the Empire became importers rather than manufacturers. Consequently, accounting was developed only for governmental purposes in the following centuries.

Pamuk (2004: p.454) analyzed a detailed price index of Istanbul. In his indexes, it is clearly seen that there was a significant wave of inflation from the late 16th to the middle 17th century, when prices increased fivefold. However, there was a stronger wave of inflation that occurred, beginning in the late 18th century and lasting into the 1850s, when the prices increased 12-15 times. In contrast, the overall price level was relatively stable from 1650 to 1780.

The 17th and 18th centuries were also known as an era of vital commercial activity in the Ottoman Empire, with foreign trade of the empire concentrated on Eastern Europe and Eastern Mediterranean regions. In the 17th century, when commercial relations between Western Europe and Southeastern Asia gained momentum, via the Atlantic Ocean, caravan trade in Syria and Anatolia was affected negatively and the importance of Egypt in transit trade declined. On the other hand, the status of the Black Sea remained high for the Ottoman Empire until the end of the 18th century. The Ottomans controlled all the trade on this sea. The entrance of ships to the Black Sea through the straits was dependent on gaining the permission of the Ottoman Empire. The Ottomans attached great importance to trade routes that ran from the Black Sea to the inner parts of Europe via the Danube River, and with

Russia and Poland through the Crimea (Elitaş et al, 2008: p.412).

5. Accounting for Procurement and Transportation of Iron Ore in the 18th Century

Accounting records for transportation accounting purposes were also kept with the *Merdiban* method. In the beginning of the 18th century, the period of the accounting record, transportation was carried out with horses and mules and with two or four wheeled wagons pulled by horses, mules and oxen. Sail powered boats and oar boats called *sefine* were used at sea and on the waterways (Güvemli and Toraman, 2004: p.6).

The transaction presented in this study took place over 8 months between the 5th month of 1718 A.D. to the first weeks of 1719 A.D. It concerns the extraction of iron ore from Demirköy which is a part of modern city of Kırklareli in Thrace, in an area called Samakocuk at the time and its delivery to, first İğneada, on the Black Sea shore and from there to Istanbul by ship. The example covers the advance payment for the ore and its transportation.

The accounting record being examined in this study is located in the Turkish Republic Prime Ministry General Directorate of State Archives Department of Ottoman Archives. It is filed under item number MAD d 01287.

At the beginning of the 18th Century iron smelting was done at two places in Istanbul. One of these was the Imperial Shipyard (Tersane-i Amire) (Toraman *et al*, 2010) which was the largest shipyard in the Empire. Here, anchors, iron and other iron material for the navy were produced. The Imperial Shipyard is located in the Golden Horn (Haliç) district and still serves as a state-owned shipyard. The other location of iron smelting was at Kağıthane[1], which is located where the Golden Horn ends and that district is still called by that name (Dünden Bugüne İstanbul Ansiklopedisi, 1994). Kağıthane was responsible for casting iron cannon balls and producing military hardware such as bayonets, rifles, swords and mortar shells.[2] Both these places used iron ore as a raw material and smelted iron to produce the items mentioned above. For this purpose, both the Imperial Shipyard and Kağıthane had iron foundries (Turkiye Diyanet Vakfı İslam Ansiklopedisi, 1998). Cannons were cast at Tophane-i Amire[3] (Tophane), which was located near the Galata Tower. Since cannons and mortars were cast mainly from bronze, little iron ore was used at Tophane.

The Ottoman Empire procured the iron ore it needed from domestic sources within the Empire. The procurement process was in the form of placing an order and paying an advance for the ore and its transport to the person who was given the order. The person undertaking this duty of procurement was titled *Emin.*[4] When the *Emin* received the advance payment

for the procurement order he would go to the place where he was to get the iron ore from. There, he would extract the iron ore and deliver this ore to the smelting operations at the Imperial Shipyard at Kağıthane in Istanbul (Güvemli, 2000b). It is quite possible that the ship owner received a receipt at the time of delivery in Istanbul and collected the shipment fee from the *Emin* with this receipt. In return, *Emin* would close the advance payment from the state with these receipts. The ship's captain would deliver the iron ore to the person in charge of the Imperial Shipyard and Kağıthane smelting operations, who was called *Topçubaşı* (Güvemli and Toraman, 2004).

When the *Emin* received the advance payment for the procurement order he would undertake a contract with the state and sign a promissory document. This document would contain information regarding the amount of the advance payment, where the goods ordered would be sourced from, and where they would be delivered and the cost of the goods and cost of shipping. The state would give the promissory document and sign it with the explanation "given to". The real signatory of the document and the one making the promise was the *Emin*.

At the beginning of 1718, the state undertook a contract with *Emin* Hacı Mustafa Aga. According to this contract Mustafa Aga would extract 579,230 *kiyye*[5] of iron ore from Thrace, at a place called Samakocuk (Tuzla) and transport this iron ore to Istanbul from İğneada on the Black Sea coast to be delivered to the Tersane-i Amire and Kağıthane. He was issued an advance payment of 19,836 *guruş* 6 *para* by the state (Develioglu, 1998). Part of this payment was for the iron ore and the rest was for its transportation to Istanbul. The cost of ore and its transportation was also calculated separately as unit cost and this was also included in the contract.

By the beginning of 1719, *Emin - Mustafa Aga*'s failure to perform his contractual obligations was observed. As a result the *Sadrazam* (prime minister in today's terms) requested a report from the accounting department to determine whether *Emin Mustafa Aga* has accomplished his contractual obligations or not. Since the contract covered procurement and transportation of the ore, it was naturally requested that the report should include a distinction between the cost of the ore and transportation costs.

Following the said request a special report was prepared under the supervision of the *Başdefterdar*, who was the head of state accountancy. The report was prepared and signed by the accounting caliph (in the Ottoman bureaucracy this meant chief official) Abdullah during the 10th month of 1719. The report was prepared with the *Merdiban* method. At the end of the report, the *Başdefterdar* had included an addendum and signed it. The presentation by the *Başdefterdar* at the end of the report is directed towards the *Sadrazam*.

The Prime Ministry approved the report on 27.10.1719 and sent it back to the accounting department. The report contains the *Sadrazam*'s seal and signature.

A photocopy of the report pertaining to the accounting records is presented at Annex 1 of this study. A translation of the report is presented at Annex 2. Reproduction of the information presented in the report with the double-entry method is presented at Annex 3.

Account records presented in Annex 1 were produced by the *Merdiban* method. It is however not in the *Siyakat* script, probably because it was a special account report.

Annex. 3 present the same records in double-entry format. According to the report *Emin* - Mustafa Aga's account is as follows:

Table 3: *Emin - Mustafa Aga's Account Summary*

	Guruş	**Para**	**Guruş**	**Para**
Advance paid to *Emin* - Mustafa Aga	19, 836	6		
Delivered by *Emin* - Mustafa Aga				
Price of 280,738 *kiyye* iron ore			11, 697	17
Price of transporting 280,738 *kiyye* iron ore			467	35
Total			**12, 164**	12
Owed by *Emin* - Mustafa Aga			7, 670	34
Total			**19, 834**	6

Emin - Mustafa Aga paid some of the money he owed from the advance issued during the time when the report was requested, beginning of 1719, to mid 1719 when the report was prepared but still he had not completely settled his advance.

Table 4: *Emin - Mustafa Aga's Debt*[6]

	Guruş	Para
Emin - Mustafa Aga's debt according to account summary	7, 670	34
Amount paid mid 1719	7, 571	34
Remainder of Emin - Mustafa Aga's Debt	99	-

Emin - Mustafa Aga employed 10 ships to transport the ore he was charged with procuring. These 10 ships made many voyages during the last 8 months of the year 1718. According to the specifications of the ships of the era each ship was able to carry on average 7,000 *kiyye* (8,981 kg) of iron ore.

Annex 3/5 presents detailed information for the transportation of ore. The same information is summarized below.

Table 5: *Amount of Iron Ore Carried by Each of the 10 Ships*

Name of the Ship	Imperial Shipyard	Kağıthane	Total
Keçecizade's ship	14,402	8, 834	23, 236
Odelioğlu Mantuva's ship	15,636	15, 604	31, 240
Captain Istefan's ship	19,140	19, 082	38, 222
Captain Yorgi's	7,590	7, 297	14, 887
Hacı Mehmet's ship	22,271	22, 261	44, 532
Captain Mavridi's ship	14,200	15, 302	29, 502
Captain Istapan's ship	20,147	19, 885	40, 032
Yorgaki's ship	21,169	18, 958	40, 127
Yorgi's ship	17,002	17, 257	34, 259
Yamandi's ship	11,794	11, 306	23, 100
Total	**163,351**	**155, 787**	**319, 138**

Amount of iron ore financed by means other than the advance given to
Emin Mustafa Aga (*Jizya* Tax) 38,400

Iron ore purchased through
The advance given to *Emin* Mustafa Aga 280,738

Unit transportation price for iron ore is given as 0.2 *akçe* per *kiyye* (Annex 3/2). Accordingly the amount deducted from the advance paid to *Emin* - Mustafa Aga for transportation will be as below:

Table 6: *Transportation Cost of Iron Ore*

Amount of ore transported	280,738 *kiyye*
Unit transportation cost for per *kiyye*	0.2 *akçe*
Transportation cost of 280,738 *kiyye* ore (Since 1 *guruş* is 120 akçe or 40 *para*)	
Cost of transporting the ore	467 *guruş* and 35 *para*

The 10 ships, which were mentioned above, performed transportation of the ore and the task took place over 8 months. Since the average payload

per ship is 7,000 *kiyye*, transportation of 280,738 *kiyye* of ore would have been made by 40 shipments. Accordingly, each of the 10 ships would have made about 4 voyages each within 8 months. In other words, each ship would have made one voyage every 2 months between Northern Bulgaria and Istanbul. This can be considered a normal frequency for a sailing vessel.

Private ships were used to transport the ore. In other words state-owned goods were transported by private enterprise. These ships were made from oak or beech, were about 10 meters long and 3-3.5 meters wide. They were single mast sail ships with a pair of oars to be used when necessary and with a crew of 3-4 persons (Annex 4).

The cargo carried by one ship on each voyage and its revenue would be as below:

Table 7: *Earnings by a single ship*[8]

Total amount of ore carried	280,738 *kiyye*
Average cargo of one ship	7,000 *kiyye*
Number of voyages for the total cargo	40
Average number of voyages per ship	4
Average length of each return voyage	2 months
Revenue of one ship on each voyage	
(7,000 *kiyye* 0.2 *akçe/kiyye*)	1,400 *akçe*

6. Evaluation of the Accounting Records

The account summary report, presented in Annex 2, is prepared with the *Merdiban* method and includes both monetary and quantitative information. The report can be described as follows:

The report begins with an explanation about the event being reviewed and the purpose of the report. It is followed by the amount paid as an advance to *Emin - Mustafa Aga* and the partial source of where this payment was provided. This is followed by the amount of iron ore this corresponds with. Besides this information, the record of the procurement financed by tax revenue, beside the advance payment, is recorded. The 38,400 *kiyye* of ore in this record is later deducted from the total amount of ore purchased. It is not clear why another 25,314 *kiyye* of ore is recorded. Quantity records follow this with the *Merdiban* method and the amount of ore transported by 10 ships during 8 months is calculated to be 319,138 *kiyye*. 38,400 *kiyye* of ore that was financed separately by tax revenue and was not included in the advance payment is deducted from this to determine the quantity of iron ore

received in return for the advance payment. This amount is calculated as 280,738 *kiyye* of iron ore. The following records are related to determine the price of iron ore and its transport in return for the advance payment. The last records show Mustafa Aga's debt from the advance payment and calculations about the repayment of this debt. The caliph Abdullah signed the summary of the accounting report. *Başdefterdar* added his brief note to the report and the office of *Sadrazam* (Prime Minister) evaluated the report and returned it to the accounting department (Annex 2).

It can be seen from the study that accounting records give all necessary information about the transactions. It can be observed that the *Merdiban* method can be used to record both monetary amount and quantity (Annex 2, Annex 3/5). Quantity records were produced by the *Merdiban* method (Annex 2), quantity explanations were given by using simple single-entry records rather than double-entry (Annex 3/5). The name of each ship, the amount of cargo carried and where the cargo was delivered can be followed with the quantity records (Nicolle and McBride. 1998). It is also noteworthy to mention that records are based on delivery documents signed by the *Topçubaşı.*[9]

Records kept with the *Merdiban* method also show revenue sources for the money that was paid in advance. The method allows for the quantity of goods financed by means other than the advance payment to be determined. Also the amount of goods delivered by *Emin - Mustafa Aga* in provision to the advance payment can be determined. This type of transaction necessitates accrual accounting. Accrual accounting was an integral part of the *Merdiban* method from its inception.

Cost of goods delivered and cost of transportation could be calculated separately from the records kept with the *Merdiban* method. Using unit prices of the records made this calculation.

The explanations illustrate the *Merdiban* method's ability to meet the demands and requirements of the time. Although some points are still worth mentioning when transportation is considered.

Transportation is important for a number of reasons. First of all it can clearly be seen that maritime transportation had developed to a certain extent in the Ottoman Empire. It is also clear that the state met its transportation requirements not only through its own fleet but also through ships owned by private enterprise. These ships could be used for transportation from any point of the empire with access to the sea. Transportation operations and accounting were the most important parts of the *Emin*'s task. The example under consideration shows that the ships had to carry a certain amount of ore in a certain time period. The example also shows that there was some disruption either in the extraction of the ore or in its transportation. This is

clear because the contracted quantity of material was not procured. There is no information about the nature of the disruption faced by the *Emin*. But it is clear that the ships were able to sail back and forth between Istanbul and Thrace with regularity. This suggests the possibility that the disruption arose not from transportation but from the extraction of ore. It can be seen that transportation fees were paid by the *Emin* in accordance with the contract.

7. Conclusion

The above explanations show that commercial goods could be transported by private ships on the Ottoman seas with regularity and that the state could use these ships to meet its requirements and that there was an adequate system of accounting to record these transactions. But, the *Merdiban* method had certain deficiencies especially in meeting the needs of cost accounting and was abandoned at the end of the 19th century. Since then it has taken its place in the annals of accounting history. It should be noted that the era under consideration in this study, the beginning of the 18th century, was a period when the method had reached maturity and its advancement was at its peak.

The pivotal role of the state in providing the circumstances in which individuals have the freedom and security to pursue their own interests and the diverse activities in which governments are involved establishes the importance of public sector history research (Funnell, 2007: p.279). Indeed, public sector accounting and its historical traces preserved in public records such as the Turkish Republic Prime Ministry General Directorate of State Archives Department of Ottoman Archives present accounting historians with significant opportunities to extend the impressive achievements of the past decades. There are roughly 50 million documents and 360,000 account ledgers. Over half of the accounting material has been classified and made available for accounting researchers. The rest of the material is expected to be classified and made available in a short time.

There are certain limitations of the study, which would be subject to criticism. The first limitation is that only one specific activity field – transportation accounting - is examined. The second limitation of the study is that the mentioned accounting example covers only an 8-month long period between the 5th month of 1718 to the first weeks of 1719. Therefore, further research might extend the scale of analysis by examining accounting records in different activity fields and periods of time.

Continuity of archival researches can increase the publicity of the *Merdiban* method's specific features through time. Certainly, these researches will guide us to throw light on the evolution of the accounting practices in the

Middle East.

Notes

1. The valley which begins where the Golden Horn ends was not only a place for casting iron but also produced gunpowder. It is recorded that there were approximately 400 people employed there.

2. Mortar shells used at the time were called “humbara”, which was derived from Persian. The person in charge of “humbara” production was called “Humbaracı başı”. The person in charge of iron-made military material at Kağıthane was called “Cebeci”. Cebeci was a word derived from Mongolian “cebe” which meant weapon or armament.

3. Tophane-i Amire was the name of the place where cannons and other artillery pieces were produced. *Tophane* means place of cannon production while Amire means belonging to the state, or empire. This place was established during the 1470s by Sultan Mehmed the Conqueror.

4. A person who undertook a task for a certain fee without undertaking the risk associated with the specific task. Here risk refers to the possibility of making a loss in the specific transaction. The price for the transaction is set forth initially, the actual price may be higher or lower, that risk is undertaken by the state. Emin specifically means trustworthy person.

5. *Kiyye* is a measure of weight used in the Ottoman Empire which is equal to 1283 grams.

6. One *guruş* equaled 40 *para*, or 120 *akçe*. During the time being examined *guruş*, *para* and *akçe* were used as monetary units in the Ottoman Empire. *Guruş* is derived from the Dutch groshem.

7. Since 7,571.5 *guruş* and 14 *para* can also be expressed as 7,571 *guruş* and 34 *para,* the amount paid was expressed in Table 2. *Başdefterdar* expressed the dept as 99 *guruş*.

8. 1,400 *akçe* calculated in Table 5 is the revenue of a sail ship with a crew of 3-4 people over a two month period.

9. Head gunner, chief of the artillery corps.

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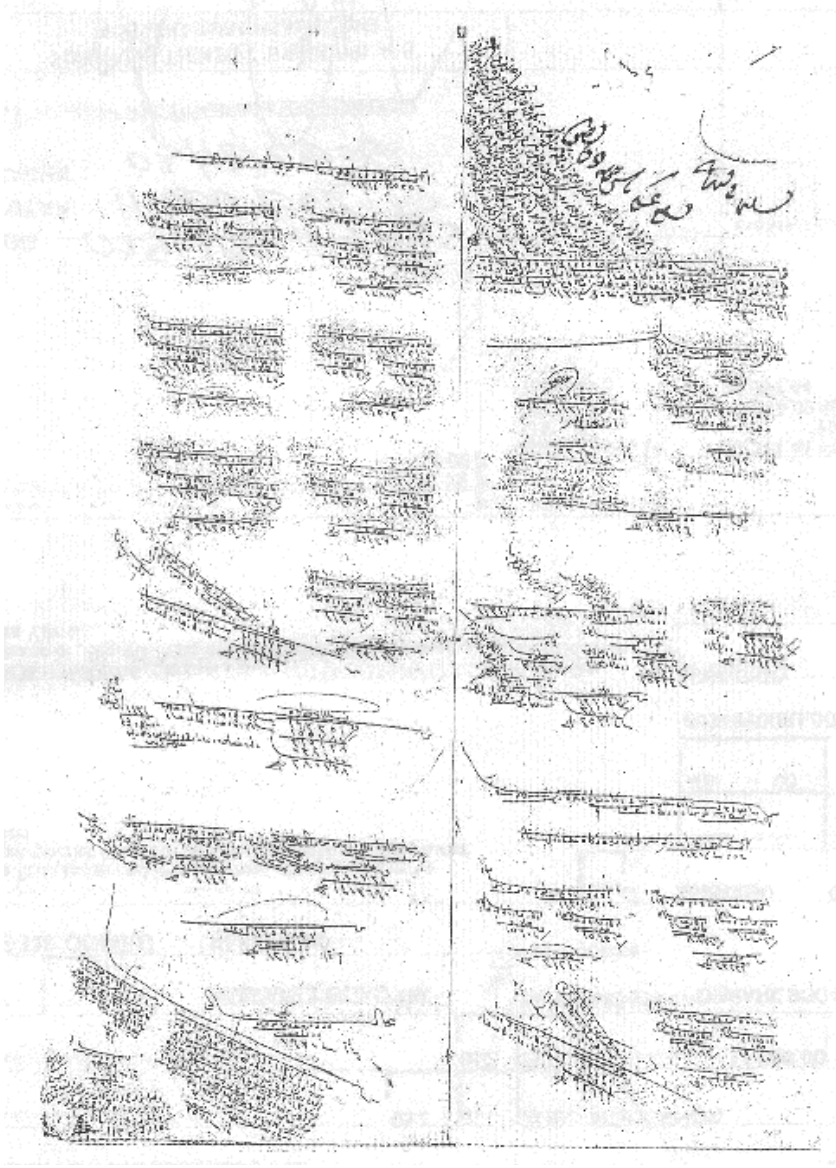
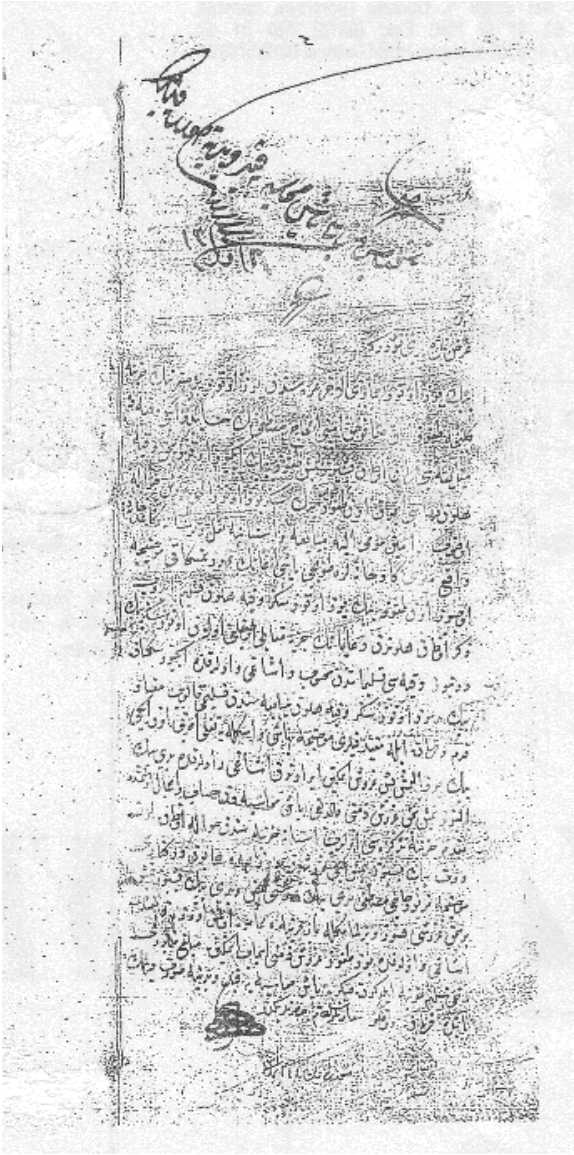
Annex 1

Original View of the Accounting Records



Source: The Directorate of Ottoman Archives of the Prime Ministry, MAD 966



Annex 2/1

Translation of Accounting Records

Book_____

Iron ore registries sent and delivered by Samakocak (North Bulgaria) Emin-Hagi Mustafa Aga between 02 May 1718 and 02 January 1719 for casting cannonball and military supplies in Imperial shipyard in Istanbul and facilities in Kagithane.

Actual amount_____
given to Emin Mustafa Aga

Order for payment_____
For iron ore with Treasury Note
dated 16 May 1718

guruş	para
14,572	14

Order for payment_____
For iron ore with Note
dated 30 November 1718

guruş	para
5,263.5	12

Sources_____

2,000 guruş	from Corlu's advance tax of year 1918.
1,200 guruş	from payments of Rum (Greek/Rhoméic) (post - Byzantine) Patriarchate in 1717-1718
2,000 guruş	from revenues of Istanbul Customs in 1918
63.5 guruş	from revenues of Bozuluc Turkmens Landholding
5,263.5 guruş	

.

Total_____

guruş	para
19.836	6

Annex 2/2

Imperial Edict_____(1)
for purchasing iron ore

In consideration of tax revenues_____
of Samakucuk and Tuzla areas in 1719

Iron ore _____ in consideration of Avariz tax Kiyye	Iron ore _____ in consideration of Jizya Tax Kiyye
20,234.5 from Samakocuk	38,400
5,080 from Tuzla	
25,314.5	

Total amount_____
of iron ore

kiyye

63,714.5
38,400 deducted from
_____ Hagi Mustafa's deliveries
25,314.5

Delivered to_____
Tersane-i Amire and Kagithane (Imperial Arsenal) in Istanbul in 1718
in accordance with delivery documents signed by the Topçubaşı Ali Aga

with Kececizade's_____
ship in 1718

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
14,402	8,834

Total amount_____
of iron ore
kiyye
23,236

with Odelioglu Mantuva's _____
ship in 1718

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
15,636	15,604

Total amount_____
of iron ore
kiyye
31,340

(1) One kiyye equaled 1,283 gr.

Annex 2/3

with Kececizade's_____
ship in 1718

Iron ore delivered to shipyard	Iron ore delivered to Kagithane	
kiyye	kiyye	In accordance with_____
14,402	8,834	Topcubasi Ali Aga's
		three delivery receipt form in 1718

Total amount_____ of iron ore
kiyye
23,236

Total amount of_____(2)
of iron ore
kiyye
49,178 to Shipyard
43,521 to Kagithane
92,699

Delivered to_____
Imperial arsenal (Tersane-i Amire) and Kagithane in Istanbul in 1719
in accordance with delivery documents signed by the Topçubaşı Ibrahim Aga

with Captain Yangi's _____
ship in 1719

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
7,590	7,297

Total amount_____ of iron ore
kiyye
14,887

with Hagi Mehmet's _____
ship in 1719

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
22,271	22,261

Total amount_____ of iron ore
kiyye
44,532

Annex 2/4

(1) Total amount is written as 43,520 kiyye, but it should be 43,521 kiyye.

with Captain Mavridi's _____ ship in 1719

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
14,200	15,302

Total amount_____ of iron ore
kiyye
29,502

with Captain Istefan's_____ ship in 1719

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
20,147	19,885

Total amount_____ of iron ore
kiyye
40,032

with Captain Yangi's_____ ship in 1719

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
21,169	18,958

Total amount_____ of iron ore
kiyye
40,127

with Captain Yangi's_____ ship in 1719

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
17,002	17,257

Total amount_____ of iron ore
kiyye
34,259

Annex 2/5

with Captain Yamandi's_____
ship in 1719

Iron ore delivered to shipyard	Iron ore delivered to Kagithane
kiyye	kiyye
11,794	11,306

In accordance with_____
Topcubasi Ibrahim Aga's
sealed document in 1718

Document number	Ship number
1	7

Total amount_____
of iron ore
kiyye

23,100

Total amount of_____(2)
of iron ore
kiyye

114, 173 to Shipyard
112, 2266 to Kagithane
226, 439

Total amount _____
of delivered iron ore

kiyye

163,351 to Tersane-i Amire
155,787 to Kagithane
319,138
38,400 Carried from Samakocuk and Tuzla jizya taxes in 1719
280,738

Annex 2/6

Cost_____
Purchasing iron ore
by Emin Mustafa Aga

Iron ore		
kiyye		
280,738 kiyye	1 kiyye/5 akçe	
akçe		
1,403,690		

Transportation cost _____
of iron ore came from Samakocuk and Tuzla

Iron ore	
kiyye	
280,738 kiyye	0.2 akçe/kiyye
akçe	
56,147	

Total amount_____(3)

akçe
1,459,837

Since 1 guruş is 120 akçe or 40 para

guruş	akçe	para
12,165	12	1

Remaining debt from_____
Emin Mustafa Aga's
advance account

guruş	para
7,670	14

(3) One guruş equaled 40 para, or 120 akçe

Annex 2/7

Payment_____

Imperial treasury was reported to
Emin Mustafa Aga and his amount due was
7,670 guruş and 14 para at 02.01.1719.
Above named person paid 7,571.5 guruş
and 14 para as part of his total debt amount.

guruş	para
7,571.5	14

Emin Mustafa Aga's debt
appeared when made accounting records
for nine months (between 02.05.1718 and
02.01.1719) at 23.10.1719

guruş	para
7,670.5	14

As mentioned above, his remaining
debt is 99 guruş

Muhasebe Halifesi
(Accountant Assistant)
Abdullah
23.10.1719
Signed and sealed

Annex 2/8

According to the Sublime Porte's order,
Registered with the Office of Head Accountant (Başmuhasebe),

27.10.1719

Signed and sealed

The Sublime Porte
(Sadaret)

Accounting result as follow_____

This report is generated as *Emin Mustafa Aga*'s account summary for nine months from 02 May 1718 to 02 May 1719. 19.836 *guruş* and 6 *para* were transferred to the above mentioned *Emin* for two purchases totaling 579,230.5 *kiyye* of iron ore. The above mentioned person delivered 319,138 *kiyye* iron ore to the Imperial Shipyard and arsenal in accordance with delivery documents sealed by the *Topçubaşı Aga*. This iron ore amount includes 38,400 *kiyye* iron ore in consideration of *jizya* taxes of the area. When this amount is deducted, the purchased iron ore amount with *Emin Mustafa Aga*'s advance payment is 280,738 *kiyye*. When the advance is paid, his own debt amount is calculated as 7,650 *guruş* by the accounting office in accordance with the commanded calculations and price determinations. He made his payments from this amount and he stood indebted at 99 *guruş*. When this remaining debt is paid, the document stating that all debts have been paid off will be given.

Chief Accountant
23.10.1719

Signed and sealed

Annex 3/1

Appearance of Translated Records in Annex 2

with Double-Entry Bookkeeping System

Accounting Records in Daily Ledger
(Records about given Advance)

1_____ / _____	guruş	para	guruş	para
Cash	5,263.5	12		
Avariz Taxes (from Corlu)			2,000	__
Payment of the Rum Patriarchate in 1718			1,200	__
Istanbul Custom Revenues in 1718			2,000	__
Bozuluc Turkmens Tax-farming Revenues in 1718			63.5	12

Collections for purchasing Iron Ore

2_____ / _____				
Emin Mustafa Aga			19,836	6
From Imperial Treasury (Cash)			14,572	14
Cash			5,263.5	12

Given advance to Emin Mustafa Aga for purchasing iron ore
_____ / _____

Annex 3/2

Daily Ledger
(Records about cost and freight of iron ore delivered by Emin - Mustafa Aga)

1_____ / _____	akçe	akçe
Cost of iron ore (280,738 kiyye x 5 akçe/kiyye)	1,403,690	
Freight of iron ore	56,147	
Emin - Mustafa Aga		1,459,837

(unit prices of cost and freight based on specified prices when given advance)
(One guruş equaled 40 para, or 120 akçe
Cost of iron ore: 11,697 guruş 17 para
Freight of iron ore: 467 guruş, 35 para
Total: 12,165 guruş 12 para)

2_____ / _____	guruş	para	guruş	para
Imperial Treasury (Cash)	7,571.5	14		
Emin - Mustafa Aga			7,571.5	14

(Amount paid by Emin - Mustafa Aga for 7,670.5 guruş 14 para
debt amount as remaining part of given advance)
_____ / _____

Annex 3/3

Sub. Ledgers

Sub. Ledger registries of Daily Ledgers Records in Annex 3/1 and 3/2

Imperial Treasury (Cash)

(Annex. 3/1-1) 5,263.5-12 (Annex. 3/2-2) 7,571.5-11	14,572 -14 (Annex. 3/1-2) 5,263.5 -12 (Annex. 3/1-2)
12.835 -6	19.836-6

Miscellaneous Taxes

	5,263.5-12 (Annex. 3/1-1)

Emin Mustafa Aga

(Annex. 3/1-2) 19.836-6	12,165- 12(Annex. 3/2-1) 7,571.5- 14(Annex. 3/2-2)
	19.737-6

Iron Ore-Purchasing Cost

(Annex. 3/2-1) 11,697-15	

Iron Ore-Freight

(Annex. 3/2-1) 467-35	

- 14,572 guruş 14 para written as 14,572-14
- Amounts summed since one guruş equaled 40 para.

Annex 3/4

Trial balance of Sub-Ledgers Records

Trial Balance

Account Titles	AMOUNT				BALANCE			
	Debit		Credit		Debit		Credit	
	guruş	para	guruş	para	guruş	para	guruş	para
Imperial Treasury (Cash)	12,835.5	6	19,836	6	-	-	7,000.5	-
Miscellaneous Taxes	-	-	5,263.5	12	-	-	5,263.5	12
Emin Mustafa Aga	19,836	6	19,737	6	99	-	-	-
Iron Ore (Purchasing Cost)	11,697	17	-	-	11,697	17	-	-
Iron Ore (Freight Cost)	467	35	-	-	467	35	-	-
TOTALS	**44,837**	**04**	**44,837**	**04**	**12,264**	**12**	**12,264**	**12**

- One guruş equaled 40 para

Annex 3/5

Iron Ore Amount Registries

		Kiyye
Iron ore amount will be delivered by Emin - Mustafa Aga		
	for 1718	336,285.5
	for 1719	242,945
		579,230.5
Delivered Iron Ore Amounts		
with Kececizade's ship		
to Imperial Shipyard	14,402	
to Kagithane	8,834	
with Odelioglu Mantuva's ship		
to Imperial Shipyard	15,636	
to Kagithane	15,604	
with Captain Istefan's ship		
to Imperial Shipyard	19,140	
to Kagithane	19,082	
with Captain Yorgi's ship		
to Imperial Shipyard	7,590	
to Kagithane	7,297	
with Hagi Mehmed's ship		
to Imperial Shipyard	22,271	
to Kagithane	22,261	
with Captain Mavridi's ship		
to Imperial Shipyard	14,200	
to Kagithane	15,302	
with Captain Istefan's ship		
to Imperial Shipyard	20,147	
to Kagithane	19,885	
Sub Total	**221,651**	

with Captain Yorgaki's ship		
to Imperial Shipyard	21,169	
to Kagithane	18,958	
with Captain Yorgi's ship		
to Imperial Shipyard	17,002	
to Kagithane	17,257	
with Captain Yamandi's ship		
to Imperial Shipyard	11,794	
to Kagithane	11,306	
Total	**319,138**	
Purchased with *Jizya* Tax (Deducted amount for calculation of purchased iron ore in return for given advance)	(38,400)	
Remainder	**280,738**	**(280,738)**
Undelivered Iron Ore Amount		**298,492.5**