

# **Rabbinical perspectives on money in seventeenth-century Ottoman Egypt**

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1 September 2009*

Episodes of monetary instability in Ottoman Egypt stimulated a discussion of monetary doctrine among Egyptian rabbis. A central issue was the valuation of debts following changes in the value of silver coins. While the leading rabbi of the sixteenth century advocated linkage to gold coins, the rabbis of the seventeenth century adopted valuation by purchasing power and rejected valuation by weight and linkage to gold coins. The rabbis of the seventeenth century differed from their predecessors in two essential respects: they were more critical of traditional Jewish monetary doctrine and they utilized a much more sophisticated form of economic analysis.

**JEL Codes:** B19, E42

**Keywords:** Jewish economic thought; monetary doctrine; monetary history; Ottoman Empire; Egypt

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## 1. Introduction

A small but growing literature examines the history of economic ideas in rabbinic jurisprudence. Until recently, this literature focused primarily on the Babylonian Talmud, which was redacted in the sixth century CE; post-Talmudic developments received little attention (Kleiman, 1997).<sup>1</sup> The seminal works in the history of Talmudic economics were authored by Kleiman (1987a, 1987b) and Ohrenstein and Gordon (1992) on general Talmudic economics and Kleiman (1973) and Liebermann (1979) on Talmudic monetary doctrine.<sup>2</sup>

In recent years, new works have begun to appear on the history of post-Talmudic rabbinic economics. Schiffman (2005) explores the views of medieval rabbis on the valuation of coins. He finds that the Talmud's deviations from valuation of coins by weight were subsequently broadened by the medieval rabbis; some rabbis reinterpreted the Talmud to accommodate valuation by tale. Callen (2008) analyzes the problem of differential asset valuation in the writings of medieval Talmud commentators. He finds that medieval commentators utilized a "mixture of insightful and less insightful economic reasoning" (Callen, 2008, p. 200). Although some commentators had a general understanding of market imperfections, they did not develop an analytical framework that was consistent with modern economics.

This paper explores rabbinical perspectives on money in seventeenth-century Ottoman Egypt. During the Ottoman era (1517–1798), Egypt suffered multiple episodes of monetary instability. Coin values fluctuated by means of debasement, depreciation, and official devaluation. Fluctuations in coin values led to disputes regarding the

valuation of debts; in the Jewish community, many such disputes were settled by the rabbinical courts.

Although the rabbis did not address monetary doctrine as an independent subject, their opinions on debt valuation contain important statements on monetary doctrine, often embedded within layers of complex legal argumentation. The rabbinic literature on debt valuation also contains historical data on exchange rate developments, as well as observations concerning price adjustment, the valuation of coins by merchants, official exchange rate policy with regard to tax collections and disbursements, and general socioeconomic conditions. Although the primary task of the rabbis was to adjudicate the cases before them, some rabbis employed economic analysis in an effort to more fully comprehend the economic processes that were at work in Ottoman Egypt.

This paper undertakes a comprehensive analysis of the legal opinions of three leading rabbis, with an emphasis on doctrinal, historical, and institutional aspects of their rulings. These opinions were selected based on the significance of their contributions to the development of Jewish monetary doctrine.

The presentation of the rabbinical material is accompanied by an account of historical context, drawing on modern research in Ottoman economic history and Jewish history. The analysis demonstrates that the rabbis were confronted with complex questions, which could not be resolved simply by citing the canonical texts of Jewish law. The limitations of the canonical texts – the Babylonian Talmud and the works of its medieval interpreters – forced the rabbis to offer innovative reinterpretations of established concepts and rulings. A major turning point came in the seventeenth century, when the rabbis ruled that coins must be valued according to purchasing power. By

adopting this rule, they rejected the alternatives of valuation by weight and linkage to gold coins. This decision requiring valuation by purchasing power contradicted the views of previous Egyptian rabbis as well as the Islamic conventions that prevailed in Ottoman society. This ruling appears to have been strongly influenced by the methodological approach of the seventeenth-century rabbis, who differed from their predecessors in two important respects: they took a more critical approach towards traditional Jewish monetary doctrines and they employed a much more sophisticated form of economic analysis.

The paper is organized as follows: Sections 2–6 provide essential information on the monetary history of Ottoman Egypt, Jewish law in the post-Talmudic era, Ottoman Jewish legal writings on money, money in the writings of sixteenth-century Egyptian rabbis, and Talmudic monetary law. Section 7, which is the core of the paper, is an in-depth reading of three rabbinical opinions. The latter two opinions are preceded by historical introductions, which provide details that are excluded from the general overview in Section 2. For all three opinions, the legal arguments are elucidated, interspersed with further historical discussion as required. The explanations conclude with a brief summary of legal conclusions and doctrinal significance.

## **2. The monetary history of Ottoman Egypt**

Under the Ottomans, Egypt was a peripheral province, in the sense that it was geographically distant from the Ottoman core (Anatolia and the Balkans, with the capital at Istanbul) and was administered rather loosely. Over time, the Mamluk military class gained power in Egypt at the expense of the official Ottoman administration (see Table 1).

The monetary history of Egypt is best understood within the context of the monetary history of the Ottoman core. Therefore, this section begins with the monetary history of the core (Istanbul) and then integrates the monetary history of Egypt (Cairo). The historical account is drawn primarily from Sevket Pamuk's monetary history of the Ottoman Empire (2000a).

The Ottomans had a mixed record with respect to monetary stability. The major causes of instability were shortages of specie, specie movements associated with international trade, and – after the sixteenth century – the growing economic power of Europe and contemporaneous decline of the Empire. Periodic fiscal crises precipitated major debasements.

Table 2 shows Pamuk's periodization of Ottoman monetary history. The early Ottoman Empire featured a simple silver-based monetary system, which was fully transformed into a gold-silver-copper system by 1625 (for the purposes of this paper, the copper coinage may be ignored). The gold coinage was based on the Venetian ducat, with a uniform standard throughout the Empire. The silver coinage varied by region in accordance with local (pre-Ottoman) conventions; seven major silver zones existed (one of which was Egypt). Istanbul's monetary system (omitting copper) was as follows: The gold sultani (introduced in 1477) was an Ottoman version of the Venetian ducat, with no face value.<sup>3</sup> The silver akce (or asper; introduced ca. 1300) was the unit of account, and was valued by specie content. Generally, the Ottomans allowed the markets to determine the akce/sultani exchange rates; because the gold/silver ratio fluctuated freely, Gresham's law was inoperative.<sup>4</sup>

Ottoman officials understood the inherent difficulty of enforcing economic regulations. They therefore adopted a pragmatic attitude toward monetary regulation, intervening only occasionally to influence specie and coin supplies, prices, and exchange rates. They allowed foreign coins to circulate, and even accepted them at the treasury in the interest of maximizing the supply of coinage and bullion. European coins began to circulate after 1550.

In Egypt, the traditional silver unit was the *medin*, which had been introduced by the Mamluk sultans in the early fifteenth century. The early years of Ottoman rule (1517–24) were plagued by severe monetary instability. In 1524, Grand Vizier Ibrahim Pasha arrived from Istanbul to put down a revolt. He instituted comprehensive reforms (Shaw, 1962, p. 65; Winter, 1992, p. 16), including the restoration of the silver coinage to late Mamluk standards. The Ottoman *medin* minted in 1524 (also known as *para*) had 1.5 times the silver content of Istanbul's *akce*. The *medin* was reestablished as Egypt's unit of account and leading means of payment, and was minted throughout the Empire in the sixteenth and seventeenth centuries.

In the sixteenth century, Cairo was a leading center for gold coinage; the local mint produced both *sultani* and *sherifi*, the Egyptian version of the *sultani*. The *sherifi* replaced the Mamluk *ashrafi*, which was also based on the Venetian ducat. The *sherifi* exchanged at par with the *sultani* and was minted throughout the Empire.

Gold outflows from Cairo to Istanbul played an important role in Ottoman monetary affairs. From the inception of Ottoman rule, Egypt was expected to maintain a budget surplus to be sent to the Sultan in Istanbul as *Irsalliyeye-i-Hazine*, or tribute (Shaw, 1962).<sup>5</sup> During the sixteenth century, the tribute was 400,000 to 600,000 gold pieces per

year. During the sixteenth century and the first half of the seventeenth century, another 50,000–100,000 gold pieces were sent from Cairo each year to support the Holy Cities in the Hijaz and the pilgrimage to Mecca.<sup>6</sup>

In 1585, the Empire experienced a severe fiscal crisis, which caused the authorities to debase the akce by 44% in one step. The decades that followed saw sharp fluctuations in the silver content of the akce and the akce/sultani exchange rate (see Table 5). The akce never recovered its pre-1585 value, and virtually disappeared in the 1640s.

During the sixteenth century, the Egyptian medin fluctuated in weight and fineness. However, the medin was not debased in 1585,<sup>7</sup> and the decline in its silver content was quite moderate compared to the decline in the silver content of the akce (see Tables 4 and 5). After fluctuating for many years, the akce/medin exchange rate settled at 3.0 in 1640. Until the late sixteenth century, the leading foreign coin in Egypt was the gold Venetian ducat; later, the leading foreign coins were the Dutch lion thaler and Spanish eight real, both of which were large silver coins.

In Istanbul, large silver coins were introduced beginning in 1690. The largest was the kurush or piaster (= 40 medin = 120 akce), which was close to the standards of the Dutch lion thaler. The kurush was stable until 1789. Although the (debased) akce continued to circulate, by the 1720s the medin had replaced it as the unit of account for small transactions in Istanbul.

Despite the introduction of the kurush, the medin remained the leading silver coin in Egypt. The kurush was not minted in Cairo until 1769, despite imperial orders to mint large silver coins. In the first half of the eighteenth century, the standards of Cairo's medin fell below the standards of Istanbul's medin; the discrepancy was as high as 30%.

In the late seventeenth century, the sultani/sherifi was discontinued. Over the years 1697–1728, a series of gold coins was introduced simultaneously in Istanbul and Cairo: the tugrali (or Istanbul), cedit Istanbul, zincirly, findik, and zer-i mahbub. These coins had no face value; with the exception of the zer-i mahbub, the Istanbul versions were initially minted with a gold content close to that of the ducat. The Cairo versions contained less gold and exchanged at a 15%–20% discount against their Istanbul counterparts.<sup>8</sup>

### **3. Post-Talmudic rabbis and the Jewish legal process**

The Babylonian Talmud was the canonical text of rabbinic Judaism. By convention, post-Talmudic rabbis were not permitted to dispute or disregard its rulings. Their prescribed role was (a) to interpret the Talmud; (b) to decide the law in cases in which the Talmudic rabbis disagreed or where the text supported multiple interpretations; and (c) to rule on new realities using Talmudic precedents. Post-Talmudic rabbis authored commentaries on the Talmud, codes of Jewish law, commentaries on codes of Jewish law, and responsa, which are legal opinions written by rabbis in response to contemporary questions.<sup>9</sup>

Given the canonical status of the Talmud, one would expect that post-Talmudic rabbis would be prevented from expounding original ideas. But the ambiguity of many Talmudic passages left room for creative interpretation, establishing a process in which interpretations were at times far removed from the simple meaning of the text. Post-Talmudic interpretations were often influenced by the personal experiences and moral intuition of the interpreters. Through their interpretative activity, the post-Talmudic

rabbis shaped the legal rulings that guided their communities. Some of the rulings were later incorporated into codes of Jewish law as authoritative legal precedents.<sup>10</sup>

#### **4. Rabbinical literature on money in the Ottoman era: General observations**

The rabbis of the Ottoman Empire included monetary matters in their legal deliberations. They did not deal with money from a philosophical perspective or make policy prescriptions,<sup>11</sup> nor did they formulate comprehensive statements of monetary doctrine based on explicitly stated first principles. In this sense, rabbinic writings on money differ significantly from the writings of Islamic thinkers such as Al Ghazali (1058–1111) and Ibn Khaldun (1332–1406) or Christian thinkers such as Oresme (c. 1323–82), Buridan (c. 1300–c. 1358), Copernicus (1473–1543), and Bodin (1530–96).<sup>12</sup> Did the rabbis assimilate ideas from the Islamic thinkers of their time? No direct evidence is available to answer this question. On the one hand, the rabbinic literature on money does not cite any non-rabbinic sources. On the other hand, Islamic jurisprudence did have a certain influence on the Egyptian rabbis.<sup>13</sup>

The responsa of Ottoman rabbis contain a wealth of historical information on social and economic conditions, and are therefore of great value to historians (Lewis, 1984, p. 114). However, the use of the responsa as historical sources is problematic because basic historical details are often missing (e.g., dates, authentic names). Economic data are often limited in scope, and some of the terminology is unfamiliar. Therefore, the identification of historical details (e.g., people, places, goods, prices, and exchange rates) in the Ottoman responsa is a challenging and important task (Shmuelevitz, 1984).

The study of Ottoman responsa presents a number of challenging tasks: (a) the vast majority of responsa are undated, and the historical and institutional context is not

always obvious; (b) the responsa are Hebrew/Aramaic documents that contain complex (and sometimes cryptic) legal argumentation; (c) in responsa on monetary issues, a careful distinction needs to be made between monetary and non-monetary arguments; and (d) multiple responsa that address the same question are generally not available to the researcher, making it difficult to compare rulings.

## **5. Egyptian rabbinical opinions on money in the sixteenth century**

The Jews of Cairo<sup>14</sup> maintained an active rabbinical court in the late fifteenth century (and possibly earlier), but no legal material has survived. The earliest known Egyptian legal material dates from the sixteenth century, when rabbis were asked about repayment of marriage contracts in debased coins.<sup>15</sup> In their response, the rabbis upheld the communal custom of paying marriage contracts nominalistically (in debased coins, without adjustment). They ignored the compromise solution enacted by the rabbis of Safed (early 1580s), under which losses were divided equally between the parties (Schochetman, 1978, 1985).<sup>16</sup> The writings of the sixteenth-century rabbis on monetary matters are less economically sophisticated than the writings of their seventeenth-century successors. Nevertheless, they represent a stage in the development of Jewish monetary doctrine and should be studied separately.

## **6. A synopsis of Talmudic monetary law**

In order to fully comprehend rabbinic writings on money, some background in Talmudic monetary law is required. Here, I introduce one basic concept and two case law rulings from the Talmud.

*Concept: “Coin” vs. “produce.”* In Talmudic law, the physical acceptance of goods (in acts such as lifting or pulling towards oneself) finalizes a transaction; without

physical acceptance by the buyer, the transaction is not final even if money has changed hands. This rule is easy to apply to standard transactions, because the distinction between buyer and seller is obvious. Now consider an exchange of coins. Who is the buyer and who is the seller? Whose physical acceptance finalizes the transaction? The Talmud (BT [Babylonian Talmud] Bava Metzia 44a–45b<sup>17</sup>) states that if two coins of different metals (e.g., gold and silver) are exchanged, one coin is assigned the status of “coin” (i.e., money par excellence) while the other coin is assigned the status of “produce” (i.e., commodity). The individual who receives the “produce” coin is considered to be the buyer; his physical acceptance is what finalizes the transaction. What determines the status of a coin? A coin that is widely accepted is assigned the status of “coin,” while a coin that is relatively less accepted is assigned the status of “produce.” The “produce” category can also include coins that are unstable or continually debased.

The distinction between “coin” and “produce” has another important implication. If prices or exchange rates fluctuate, the Talmud attributes the fluctuations entirely to developments in commodity markets or changes in the value of “produce” – i.e., lesser coins. The value of “coin” is fixed in Jewish legal theory; when valuing debts denominated in “coin,” a nominalistic approach is taken.<sup>18</sup>

*Case (a): Repayment of a loan made in coin following reinforcement/debasement – The 25% rule.* A loan was made in a particular coin, and that coin was subsequently reinforced or debased. How should the borrower repay (BT Bava Kamma 97b–98a)? Theoretically, if the borrower repays in new coin following reinforcement, he will be paying interest (ex post); this type of interest was prohibited by earlier rabbis. If the borrower repays in new coin following debasement, the lender will absorb a loss. To deal

with this situation, the Talmud (BT Bava Kamma 97b–98a) sets down the following rule (as formulated by Maimonides in his legal code, *Mishneh Torah*, Laws of Borrower and Lender 4:11<sup>19</sup>): If produce prices rise or fall due to the change in coin weight, the debt should be adjusted fully. If produce prices did not change, and the new coin differs from the old coin in weight by more than 25%, the debt should be adjusted fully. If produce prices did not change, and the new coin differs from the old coin in weight by 25% or less, the debtor must pay in new coin exactly the number of coins he borrowed, with no adjustment being made (see Table 3 for a tabular representation). This rule, which we shall call the “25% rule,” is perplexing because it combines an element of valuation by weight with an element of valuation by purchasing power; the commentaries on the Talmud struggled to explain it (Schiffman, 2005).

*Case (b): Price fluctuations and repayment of a loan made in kind.* The Talmudic rabbis defined two distinct types of interest: “stipulated interest,” which is directly charged when the loan is made, and “dust of interest,” which is generated in an indirect, ex post manner. The rabbis considered the first type to be biblically prohibited, the second type to be rabbinically prohibited.<sup>20</sup>

The Talmud prohibits (interest-free) commodity loans because they are likely to lead to ex post interest when evaluated in monetary terms. Consider a loan of wheat for wheat. Should the price of wheat increase, the borrower will end up repaying wheat of greater monetary value than the wheat he borrowed. Therefore, the Talmud dictates that such loans should not be made in the first place.<sup>21</sup>

Although commodity loans are prohibited ab initio, the Talmud asks how such loans should be repaid post facto. Suppose a (prohibited) loan of wheat for wheat was

made and the price of wheat changed while the loan was outstanding. How should the borrower repay? The Talmud (BT Bava Metzia 75a) rules that if the price of wheat fell, the borrower must repay the original amount of wheat; the lender bears the monetary loss. If the price of wheat rose, the borrower must repay the original monetary value of the borrowed wheat, thus avoiding payment of ex post interest in monetary terms.

## **7. Rabbinic opinions on money**

### ***7.1 The selection of rabbinical material***

The rabbinical opinions that form the basis for this study were selected from eleven published works, authored by nine leading Egyptian rabbis of the sixteenth to eighteenth centuries. The criterion for selection was the significance of the contents with regards to the historical development of Jewish monetary doctrine. Thus, passages that are essentially straightforward applications of Talmudic dicta have been excluded (see the Appendix for a detailed description of the selection process). The opinions that were chosen for analysis are a passage from the sixteenth-century commentary of Rabbi Jacob Castro, a responsum by Rabbi Mordecai Halevi, and a responsum by Rabbi Abraham Halevi (both of the seventeenth century).

### ***7.2 Rabbi Jacob Castro: Linkage to gold coins***

Rabbi Jacob Castro, known as Maharikash (1525?–1612), was the son of Abraham de Castro, who served as master of the Cairo mint in the 1520s (David, 1997). Rabbi Jacob Castro was the spiritual leader of Cairo's Arabic-speaking Jewish community<sup>22</sup> and also an active merchant. One of his leading works is *Erech lechem* (Setting of bread), a gloss on the law code *Shulchan aruch* (Set table) by Rabbi Joseph

Karo (1488–1575, Turkey and Palestine).<sup>23</sup> *Erech lechem* is not a responsa collection; therefore, it contains statements of general principles rather than discussions of specific cases. In general, passages from *Erech lechem* cannot be dated.<sup>24</sup>

In a passage dealing with prohibited interest, Rabbi Castro writes (gloss to *Shulchan aruch, Yoreh deah* 165<sup>25</sup>):

Riaz [Rabbi Isaiah de Trani the Younger, Italy, d. ca. 1280] wrote in [his commentary on the Talmudic] chapter “One Who Steals Wood” [BT Bava Kamma 97b–98a] that if the coin was debased or reinforced, we follow the value of gold [coin].<sup>26</sup> If produce became cheaper due to the sharpness [= desirability<sup>27</sup>] of new coins, not due to the weight, this is nothing [and should be ignored]. If the coins became less or more valuable and the weight did not change [i.e., the exchange rate changed, reflecting a change in the gold-silver ratio], this is nothing [and should be ignored] and he gives him what he lent him or what he obligated himself to pay.... If new coins are more attractive and therefore trade at a premium, this should be ignored.... If the king decreed that whoever lent [money] to his friend, his repayment should be from a second [= different] coin, the law of the land is the law, and there is no interest here because he [the borrower] is not paying it voluntarily.

Rabbi Castro advocates linkage to the gold coin in the case of debasement/reinforcement of the silver coin. Under the special assumption of a constant gold-silver ratio,<sup>28</sup> linkage to the gold coin is equivalent to valuation of the silver coin by weight. This rule is identical to the rule followed by Islamic jurists in Bursa (Gerber, 1982); unfortunately, we lack information concerning the practice of Egyptian Islamic jurists. Rabbi Castro ignores changes in extrinsic value – that is, changes in the gold-silver ratio or changes in purchasing power that are not caused by a change in specie content.

Nevertheless, he is willing to adjust for changes in extrinsic value if they are imposed by the authorities.

### **7.3 Rabbi Mordecai Halevi: Valuation by purchasing power**

In 1631–2, the tribute was set at 30,000,000 medin. However, Egypt failed to meet this target; gradually, remittances fell to 20,000,000 medin in good years and zero in bad years. Over the years 1660–75, a series of governors were sent from Istanbul to reform Egypt's administration and budget with the goal of restoring the remittance to its target value. However, the Mamluk emirs succeeded in reversing the reforms (Shaw, 1962, pp. 283–312).

Rabbi Mordecai Halevi (d. 1684, Cairo and Rosetta), was a scholar, rabbinic judge, and merchant.<sup>29</sup> He made extensive use of economic intuition in his thought process, and did not hesitate to question basic premises of Jewish monetary doctrine on economic grounds. Rabbi Moredecai's responsum on debt valuation (*Responsa Darchei noam* [Paths of pleasantness], Part 2 [*Yoreh deah*] 24<sup>30</sup>) is over 4,500 words long. Therefore, our textual analysis will concentrate on passages of economic interest, omitting those passages that are purely legalistic.

Rabbi Mordecai was asked about repayment of a loan that was made in *gurush Itzalanish* – Dutch lion thaler<sup>31</sup> – with a stipulation of repayment in thaler. The thaler appreciated from 30 to 35 medin during the term of the loan; the borrower failed to repay on time, and the thaler subsequently appreciated to 43 medin. How should repayment be made, while avoiding interest or underpayment? Rabbi Mordecai explains the depreciation of the medin as follows: He reports that some of the medin and akce in

circulation had deteriorated, due to counterfeiting and other (unspecified) reasons. Thus, the depreciation was a market phenomenon, and was not caused by government actions.

This responsum cannot be dated precisely, but an approximate dating can be obtained by comparing Rabbi Mordecai's data with medin/thaler cross rates calculated from Pamuk's data (see Table 6). These data match Rabbi Mordecai's data reasonably well. By interpolation, we can date the original loan to 1660–7. The repayment date specified in the contract must have preceded the year 1676; the responsum must have been written at some point during the years 1673–83.

Rabbi Mordecai begins his reply by citing the code of Rabbi Jacob ben Asher (1270–1343, Germany and Spain), which prohibits loans in gold coins. What is the reason for this prohibition? Under the “coin”/“produce” paradigm, gold coins are “produce” or commodity; their price (their exchange rate vs. “coin”) might increase subsequent to a loan, leading to an ex post interest payment (in terms of “coin”). This implies that silver coins, such as the thaler, have “coin” status in Rabbi ben Asher's view; as such, they may be lent freely, and the borrower must repay exactly what he borrowed, without any adjustment.

Rabbi Mordecai rejects this notion outright: “This is something that the mind cannot tolerate.” In this case, Rabbi Mordecai points out, the designation of the thaler as “coin” implies that the debtor, who had borrowed in thaler at 30 medin, must repay in thaler at 43 medin. Since the unit of account is the medin, and produce prices and wages (of simple laborers and craftsmen) in medin are unchanged, the lender will receive interest of over one third, when measured in terms of purchasing power. Rabbi Mordecai adamantly rejects this outcome. Rabbi Mordecai supports his view by citing Jewish law

on the subject of commodity loans: if a commodity loan was made (despite the prohibition), and the price of the commodity rose, the debt must be adjusted downward. Rabbi Mordecai argues that there is no substantive difference between exchange rate appreciation and a commodity price increase; both lead to transfers of purchasing power. Rabbi Mordecai also asserts that the 25% rule is designed to prevent transfers of purchasing power. Thus, Rabbi Mordecai struggles with a direct contradiction between the implications of the “coin” vs. “produce” paradigm and the 25% rule.

To resolve the contradiction, Rabbi Mordecai suggests a fundamental distinction between changes in intrinsic value (reinforcement) and changes in extrinsic value (exchange rate appreciation). In cases of reinforcement, the 25% rule mandates downward adjustment. The coinage has been altered physically; unadjusted repayment involves a transfer of purchasing power and is unacceptable. In the case of a change in extrinsic value, the “coin”/“produce” paradigm applies. One can, theoretically, regard silver coins as “coin” and gold coins as “produce.” Since there has been no physical change in the silver “coin,” unadjusted repayment is acceptable, even if it involves a transfer of purchasing power. Rabbi Mordecai rejects this proposed resolution, again exclaiming “this is something that the mind cannot tolerate.” Under the proposed resolution, transfers of purchasing power associated with “produce” are prohibited, whether the cause of the transfer is intrinsic or extrinsic; transfers of purchasing power associated with “coin” are prohibited only if the cause of the transfer is intrinsic. For Rabbi Mordecai, such a distinction is economically untenable – all transfers of purchasing power should have the same legal status, regardless of their underlying cause.

Furthermore, Rabbi Mordecai argues that the “coin” vs. “produce” paradigm is inapplicable where inflation is obviously caused by a change in extrinsic value.<sup>32</sup> In this case, the *medin* and *akce* are debased due to counterfeiting or various other reasons. Merchants, he says, avoid *medin* and *akce*, preferring Dutch thaler, Spanish reals, and gold *sherifi*, and have raised *medin* prices in order to discourage *medin* payments. Merchants have avoided even good, heavy, or new *medin*. One can also see, Rabbi Mordecai continues, that the appreciation of the thaler is a market phenomenon, which has never been sanctioned officially by the governor or “officer of the city of Cairo” (probably the *muhtesib*, or chief market inspector, who supervised weights, measures, and prices in the food markets; Shaw, 1962, p. 118). This phenomenon did not occur in the times of the Talmud; the case in question, according to Rabbi Mordecai, is new and unprecedented.

Rabbi Mordecai argues that the “coin”/“produce” paradigm applies only where the coin designated as “produce” is susceptible to debasement. This is not the case here: the thaler, real, and gold *sherifi* in this case are stable and not susceptible to debasement. Rabbi Mordecai’s discomfort with the “coin” vs. “produce” paradigm is obvious. Due to the Talmud’s canonicity, he is unable to abrogate it, so he uses interpretive license to limit its applicability.

After concluding that linkage to the thaler would constitute prohibited interest, Rabbi Mordecai discusses opposing viewpoints. He cites Rabbi Jacob Castro, who rules that one must ignore a change in extrinsic value that is due to the desirability of new coins. To explain the notion of desirability, Rabbi Mordecai gives a practical example. When a buyer comes with new *medin* (Arabic: *kaliye*), the merchant offers a small

discount because the new medin are highly accepted. In other words, the new medin circulate at a premium. But the governor's Divan (treasury) does not differentiate between old and new medin, as long as the weight and purity are identical. Rabbi Castro would have us ignore market conditions and value coins only by weight.

Rather than directly refute Rabbi Castro, Rabbi Mordecai uses a forced reading to radically reinterpret his words. He claims that Rabbi Castro would ignore the premium only where the coin trading at a premium is not the unit of account; if the coin trading at a premium is the unit of account, Rabbi Castro would advocate adjustment for the premium. Rabbi Mordecai's reading is clearly strained; Rabbi Castro never even mentions the notion of a unit of account. Having reinterpreted Rabbi Castro, Rabbi Mordecai applies his new principle as follows: If the thaler appreciated/depreciated but thaler-denominated produce prices remained constant, no adjustment should be made. However, if the medin (the unit of account) appreciated/depreciated and medin-denominated produce prices remained constant, an adjustment is necessary.

Rabbi Mordecai proceeds to issue a final ruling. He writes that in cases of this type, the rabbinic judge must calculate the repayment precisely, in order to avoid loss to the creditor or ex post payment of interest by the debtor. Therefore, if repayment in thaler was expressly stipulated, and thaler-denominated produce prices fell, the judge must adjust the repayment according to the official Divan exchange rate for tax payments, which is 38–39 medin/thaler, not according to the local market rate of 43.

Why use the Divan rate rather than the local market rate? Rabbi Mordecai explains that the medin of the *kitiya* (weight standard<sup>33</sup>) of Dar el Tzarb (the imperial mint of Egypt<sup>34</sup>) now weigh less than they did in the past. Previously, the medin per

thaler exchange rate was 30, and 36 medin were minted from 10 dirhams of silver. At the time of Rabbi Mordecai's writing, the kitiya was 40 medin per 10 dirhams. Converting these coinage standards into metric units<sup>35</sup> yields medin weights of 0.85 grams and 0.77 grams, respectively.<sup>36</sup>

Rabbi Mordecai explains that the rise of the thaler from 30 to 43 medin has two distinct causes: (a) counterfeit medin and other unspecified factors, which are reflected in the rise of the official exchange rate from 30 to 38–39; and (b) the decline in the silver content of the medin (from  $10/36 = 5/18$  dirham to  $10/40 = 1/4$  dirham), which pushed the local exchange rate to 43.<sup>37</sup> The second cause, debasement, did not affect prices and wages and should therefore, in his opinion, be ignored. If the contract specified payment in thaler, repayment should be made (in medin) according to the official exchange rate. However, a loan made in medin should be repaid without adjustment, since the medin's purchasing power is unchanged.

At this point, Rabbi Mordecai adds a cryptic qualification: "However, from the standpoint of other goods whose prices are linked to the thaler...[the rabbinic judge] should be precise in taking account of the debasement." I suggest the following interpretation: Suppose that there are two types of goods in the economy – domestic goods, whose prices are independent of the exchange rate, and foreign goods, whose prices move one for one with the exchange rate. Rabbi Mordecai is saying that repayment should be based on a weighted average of exchange rates:  $39\alpha + 43(1-\alpha)$ . The choice of  $\alpha$  is left to judicial discretion; Rabbi Mordecai does not elaborate.<sup>38</sup>

Rabbi Mordecai concludes his ruling: If the loan contract specified medin, it must be repaid without any adjustment, given that produce prices and wages of workers and

craftsmen have not changed. If the borrower swore to pay in thaler, “whether they [the thaler] rise or fall,” the judge should order a compromise, because the violation of an oath is a severe prohibition. Rabbi Mordecai does not specify the form of the compromise.

In summary, Rabbi Mordecai asserts that the criterion for the valuation of debts must be purchasing power, not weight. He favors repayment according to the official exchange rate if the authorities debased the currency without updating the official exchange rate while the price level remained stable. Rabbi Mordecai argues that transfers of purchasing power must be avoided, whether their underlying cause is intrinsic or extrinsic, and radically reinterprets the words of authorities who disagree rather than openly disputing them.<sup>39</sup> Rabbi Mordecai was the first Egyptian rabbi to mention the possibility of compromise. However, he accepted the compromise solution only in the specific case in which the borrower swore to link to thaler; he did not see compromise as a standard solution to the debt valuation problem.

#### ***7.4 Rabbi Abraham Halevi’s ruling: A textual analysis***

In 1694–7, Egypt experienced a major famine and plague, caused by “the failure of the Nile to water the lands properly” (Shaw, 1962, p. 295; see also Faroqhi, 1994, p. 440). Food prices rose dramatically,<sup>40</sup> the fiscal situation deteriorated, and a general state of anarchy prevailed. In the year 1694–5, the tribute was 21,700,000 medin, well short of its 30,000,000 medin target. Soldiers and pensioners rioted, demanding unpaid wages.

The severity of the crisis is illustrated well by the tragedy of Yasif al Yahudi (“Joseph the Jew”), the Jewish master of the mint, chief tax collector, and financial advisor to governor Ali Pasha (who served during the years 1691–5). In early 1695, Yasif was called to Istanbul for consultations with Sultan Mustafa II. He returned with imperial

edicts to increase taxes on coffee, houses and shops. The edicts were so unpopular with the Egyptian elites that the soldiers demanded Yasif's head. Ali Pasha, himself in danger of being removed from his post, put Yasif in protective custody in the Citadel of Cairo. However, soldiers stormed in and killed Yasif and, on April 27, 1695, his body was dragged through the streets and burned by a mob (Winter, 1992, pp. 204–205).

Following these events, Sultan Mustafa sent Ismail Pasha to Egypt to replace Ali Pasha, and charged him with restoring the tribute as his first priority. Ismail Pasha arrived on September 9, 1695, and, after six months of restoring order, implemented a comprehensive fiscal reform (Shaw, 1962, pp. 295–297). Ismail probably implemented monetary reforms before departing in 1697, but no conclusive evidence on the subject is available.

It is against this backdrop that we must examine the opinion of Rabbi Abraham Halevi (1650–1712, Cairo). The son of Rabbi Mordecai Halevi, Rabbi Abraham was a scholar and merchant. Rabbi Abraham wrote a lengthy and detailed responsum on debt repayment in the complex monetary environment of late seventeenth-century Egypt (Responsa *Ginat veradim* [Garden of roses], Part 4 [*Hoshen mishpat*] IV:1). Surprisingly, Rabbi Abraham does not cite his father's responsum on debt valuation – even though it was he who published his father's responsa.<sup>41</sup> Nevertheless, Rabbi Abraham's methodology closely resembles Rabbi Mordecai's; both examine previous rulings critically and integrate economic analysis into their thought processes. Due to the sophistication of the economic analysis and the overall length of the responsum (over 9,000 words), an extensive textual analysis is required in order to fully understand his

views. The textual analysis below focuses on passages of economic interest and omits purely legalistic passages.

Rabbi Abraham opens on a dramatic note:

I have heard the groaning of this people [the Jews of Egypt]. All spirits have been weakened, hearts melted and hands made feeble.... A man does not know how to make a living...the gates of livelihood are closed...like the gates of Jericho [cf. Joshua 6:1] and their souls have been satiated with evils.

He goes on to describe the way in which the economic crisis, exacerbated by a monetary crisis, is causing great strife within the Jewish community:

And now...disaster upon disaster has been added [to their suffering] through the decline of the coins...men fight against their brethren and friends, and the plague [of strife] has spread between beloved and pleasant brothers...one says, "take what you gave me" but his fellow prevents him [i.e., the creditor rejects the payment offered by the debtor].

Rabbi Abraham begins by stating that he prefers that the two parties in such a case reach a compromise, but agrees to nevertheless formulate a definitive legal opinion, which will be binding on the parties should they fail to compromise. By advocating compromise as a standard solution, Rabbi Abraham breaks with his Egyptian predecessors, including his father Rabbi Mordecai. He offers no explanation for this departure.

In his introductory remarks, Rabbi Abraham gives a basic description of the economic regime of the time: The Divan (treasury) of Egypt collects taxes on land transactions, customs, and other levies. Tax collections are divided into three components: (1) a sum sent to the sultan in Istanbul (this is obviously the tribute); (2) a sum kept for the governor of Egypt (whom the sultan appoints for a fixed term); and (3) a

sum for “necessary expenses, to pay for the armies and guardians of the walls and guardians of the city.” The “guardians” may be identified as the Janissaries, the most powerful of Egypt’s seven military corps; the Janissaries were also known as *Mustahfezan* or guardians (Shaw, 1962, pp. 189–91).<sup>42</sup>

The original coinage of Egypt was the *maidis* (medin). It served as the unit of account for all government transactions. For a number of years, Rabbi Abraham writes, the medin has depreciated. The sultan has been paid in a variety of gold and (presumably foreign) silver coins, but the medin remains the official unit of account. A system of multiple exchange rates has evolved; the gold sherifi is valued at 90 medin for tax liabilities and remittances to the sultan and the governor of Egypt, but is valued at 95 medin for payment of military salaries and municipal expenditures (category 3). This report is corroborated by Pamuk (2000a, p. 144), who states that the Ottomans instituted differential exchange rates for government payments and receipts in 1691.

Rabbi Abraham continues: In Cairo, the merchants trade at 95 medin/sherifi.<sup>43</sup> For some time, he says, the medin has been greatly debased, due to clipping as well as a high percentage of base metal, and is therefore “recognized only with great difficulty.” As a result, the public chose to use other coins for all of their expenditures. The gold sherifi was valued at 95 medin, the Dutch thaler at 45, and the Spanish real at 60. People held small sums in medin for use in very small transactions. One could obtain almost 120 medin per sherifi and then spend those medin “with great difficulty, scattered here and there.” Here, Rabbi Abraham alters the exchange rate without notifying the reader; he appears to be saying that the continued debasement of the medin caused the medin/sherifi exchange rate to rise from 95 to 120. It is important to note that Rabbi Abraham mentions

only one Egyptian gold coin – the sherifi. He does not mention the tugrali, which replaced the sherifi beginning in 1696–7.<sup>44</sup> The mention of differential exchange rates for government payments and receipts and the omission of a mention of the tugrali imply that this responsum should be dated 1691–7. Apparently, the monetary policies described here were an element of Ismail Pasha’s (1695–7) comprehensive reform.

Rabbi Abraham’s narrative continues: In reaction to the aforementioned developments, the governor decreed a monetary reform “to correct this distortion.” The majority of medin in circulation were old, debased medin. The governor demonetized the debased medin and replaced them with new medin that met the weight and purity standards of the Divan. These new medin were expensive due to the scarcity of silver, and were valued at 90 per sherifi. Soldiers and citizens refused to accept the sherifi at 95 medin, because when they exchanged sherifi for medin (for use in small transactions) they received only 90 medin per sherifi – moneychangers did not value the new medin at a premium. The governor responded by decreeing a new set of exchange rates: sherifi = 90 medin, thaler = 40 medin, real = 50 medin. In addition, he devalued the thaler excessively in order to induce the public to melt the thalers down and mint new medin from the bullion; thus, enough new medin would be minted to drive the old medin out of circulation.<sup>45</sup>

Rabbi Abraham, having finished presenting the question and its institutional background, begins his response by citing and analyzing the 25% rule. He then asks the following question: How should repayment be made if the new coin is up to 25% heavier than the old, but prices fall by only half of the reinforcement? What if the new coin is at least 25% heavier than the old, and prices fall by more than the reinforcement? Rabbi

Abraham opines that the adjustment should equal the percentage of reinforcement, regardless of the behavior of prices: “In the end, the citizens of the country will make a correct and true assessment of all things, and assess the price decline exactly opposite the reinforcement, since they have already concerned themselves with the reinforcement.” In other words, Rabbi Abraham is saying that a process of gradual price adjustment is underway. Eventually, prices will adjust one for one; the public, he writes, understands this. Jewish law, in his opinion, should be guided by the long run equilibrium, not by short run disequilibrium dynamics.<sup>46</sup> This short-run / long-run distinction is not found in previous rabbinic writings.

Rabbi Abraham’s theories are corroborated by modern historians. Faroqhi (1994, p. 547) writes that prices tended to overshoot following devaluations and undershoot following revaluations.<sup>47</sup> Ozmcour and Pamuk (2002, Appendix 2) perform an econometric analysis of the effects of changes in the silver content of coins on prices and wages in the Ottoman Empire during the years 1469–1914. They find that wages and prices both adjusted with a lag. For prices, they find that at long-run equilibrium, a 1% fall in the silver content increased the CPI by 1.088%. Almost half of this effect was felt in the year of the debasement and the year following; the mean time for full price adjustment was 3.59 years, with a median of 4 years.

Rabbi Abraham continues by analyzing the words of Rabbi Isaac Alfasi (1013–1103, North Africa and Spain, known as Rif) on the 25% rule. In his compendium of the legal portions of the Talmud,<sup>48</sup> Rabbi Alfasi writes, “And the law is the same in a place where they transact business in moneys of weight, and [the government] reduced the amount of silver in [the coins] or added [to the amount of silver in the coins]; all [such

cases are] one [identical] matter” (Rif, Bava Kamma 35a, commenting on BT Bava Kamma 97b–98a). Rabbi Abraham points out the cryptic nature of this passage, and offers the following explanation of Rabbi Alfasi’s words:

For example, the medin have an official weight; however, when people transact with them, they do not pay attention to the scale at all. Even if a person were to receive medin that are missing a little bit from the official weight, he does not mind. But there are silver coins such as the [Spanish] real whose official weights are known, and whenever a person receives even one real he immediately brings it to a moneychanger to weigh it. If even an issar of copper [a small coin in Talmudic times] is missing, he is exacting concerning this discrepancy and demands it from the one who gave him the coin. One would think that for this coin, with which people are very exacting concerning its weight, [the law] should take into account any reinforcement [even] less than 25%, and also if they debased it. Therefore, Rif comes to tell us [contrary to what we would have thought], that we should not make a distinction for such a coin, and since the reinforcement or debasement is up to 25%, we [rabbinic judges] should ignore it.

However, if the king reinforced or debased the coin from its original weight, but in business people are not exacting regarding the number of coins, and are exacting with regard to weight only, such as [a situation] where they always calculate the calculation of “matikal” [= mithqal, a weight standard; probably the mithqal of Tebriz = 4.608 grams<sup>49</sup>], then one should be precise about the addition or reduction of weight, even if it is minimal, and there is no consideration of 25% at all.

Medieval authorities recognized two possible regimes: coins circulated either by weight or by tale.<sup>50</sup> Here, Rabbi Abraham defines three regimes: circulation by tale (realistic for transactions in medin), imperfect circulation by weight with concern for the number of coins (weighing is done immediately after receiving the coins; realistic for transactions in Spanish real), and perfect circulation by weight with no concern for the

number of coins (weighing is an integral part of the transaction). The notion of two distinct regimes of circulation by weight is unprecedented in rabbinical literature. Rabbi Abraham's concept of imperfect circulation by weight is identical to the medieval concept of circulation by weight; Rabbi Abraham's concept of perfect circulation by weight is his own invention. Apparently, Rabbi Abraham invented perfect circulation by weight to deal with a reality in which coins of the same denomination had widely variable weights. Such coins were always weighed.<sup>51</sup> This hypothesis cannot be confirmed, however, due to a lack of academic studies on the metrology of Ottoman Egypt.<sup>52</sup>

Rabbi Abraham argues further that if rabbis rule in a way that imposes exchange rate losses on lenders, denial of credit will result. Such an outcome would run counter to the spirit of the Talmud, which stresses the importance of not "locking the door in the face of borrowers."<sup>53</sup>

In a subsequent passage, Rabbi Abraham grants a special status to the local unit of account (as we have seen, this doctrine appears in the responsum of his father Rabbi Mordecai). He cites the passage from Rabbi Isaiah de Trani the Younger that was previously cited by Rabbi Castro. Rabbi Abraham argues that while in Rabbi de Trani's Italy the unit of account was gold, in Egypt the unit of account is the silver *medin*. Therefore, rabbinic judges must consider the purchasing power of *medin* and not other coins, even though the *medin* does not function as the medium of exchange.

Rabbi Abraham then raises a question that is not found in other rabbinic sources: when adjusting debts for changes in purchasing power, which prices should be considered in calculating the adjustment? He answers that only domestic produce prices

should be considered, not import prices. After all, foreign exporters are not concerned with the value of their currencies in Egypt. For example, he says, imported silk and coffee have become much more expensive in Egypt due to the thaler's appreciation, but thaler prices in the exporting countries remain fixed. In modern terminology, Rabbi Abraham reports that exchange rate pass-through is complete; in other words, exporters to Egypt do not engage in pricing to market.<sup>54</sup> He continues by ruling that if some domestic prices change but others do not the judge should divide the loss between lender and borrower. Rabbi Abraham does not specify exactly how the loss should be divided; presumably, the settlement would be based on some average of food prices.<sup>55</sup>

Rabbi Abraham prescribes practical rulings for three types of loan contracts: (a) loan contracts denominated in sherifis or thaler without mentioning the number of medin; (b) loan contracts denominated in sherifis or thaler, specifying the equivalent in medin; and (c) loan contracts denominated in medin. He observes that the thaler has been devalued more than the sherifi. For some goods, the devaluations of the sherifi and thaler affected prices, but for others there was no effect. For example, one who purchased food and produce for 100 medin used to pay 1 sherifi (at 95 medin) plus 5 medin. Now, Rabbi Abraham states, that person must pay 1 sherifi (at 90 medin) plus 10 medin. Still, in his opinion, nothing has changed in terms of "good" medin; these have always been valued at 90 per sherifi. The difference in purchasing power between new and old medin, he says, is readily apparent when one enters a shop. If the customer brings good medin, the shopkeeper gives him the greatest choice, the best merchandise, and a large measure (i.e., is generous with the measure). But if the customer brings bad medin, the shopkeeper displays the worst merchandise, uses a small measure, and tries to avoid making a sale

altogether. Therefore, Rabbi Abraham rules that for all three types of contracts, the parties should compute the value of the medin in sherifi and divide the loss equally. Here he reverts to the compromise solution, which he strongly favors.<sup>56</sup> The sherifi, Rabbi Abraham says, is considered the primary coin; one can easily collect 100 sherifi, assay them with a moneychanger, and hide them in one's bosom, where they will go unnoticed (especially by dishonest people). The thaler, on the other hand, requires much effort to count and weigh with the moneychanger, and is therefore highly noticeable.

Next, Rabbi Abraham proposes a communal ordinance to exempt administrators of charitable funds from sharing in exchange rate-related losses: all such losses should be borne by the charity itself. While these administrators are willing to accept low profits, especially in the times of adversity in which he writes, Rabbi Abraham notes that they would likely resign if they lost money. This must be avoided, in his opinion, as it is difficult to recruit new administrators for charities. Rabbi Abraham values this exemption at 2.5%, which is the opportunity cost of idle charitable funds over two or three months; the annual equivalent is 16% or 10% per year.<sup>57</sup> Thus, the exemption generates a positive expected profit for charities as long as the expected exchange rate loss is below 16% or 10%; Rabbi Abraham implicitly assumes that this is the case.

Having reached a conclusion, Rabbi Abraham turns to critiquing the rulings of his predecessors. Surprisingly, he does not cite Rabbi Castro, who advocated linkage to gold coins; instead, he cites non-Egyptian Ottoman rabbis who were Rabbi Castro's contemporaries. Rabbi Abraham's refutation of Rabbi Samuel Hayyun of Salonika<sup>58</sup> is of special interest, because it is primarily based upon economic arguments.

Rabbi Samuel Hayyun was an advocate of valuation by weight. He ruled that if new coins were minted at a weight identical to that of old coins, and the new coins have greater purchasing power, debts incurred in the old coins should be repaid in new coins without any adjustment (*Responsa Bnei Shmuel* 49, published 1613). His source for this ruling is the German scholar Rabbi Eliezer ben Nathan (1090–1170, known as Raavan),<sup>59</sup> who states unequivocally that “sharpness” (desirability) of the new coin should be ignored. Nevertheless, Rabbi Abraham rejects Rabbi Hayyun’s proof, arguing that Rabbi Eliezer’s opinion refers to an entirely different case.

According to Rabbi Abraham, Rabbi Eliezer’s case is the following: The authorities demonetize a coin and replace it with a new coin of identical weight. The new coin is universally accepted; assaying is unnecessary, since it is certain that there are no debased alloys or counterfeits. Consequently, shopkeepers value the new coin more highly. This is what happened with the new Egyptian *medin* (Arabic: *kaliyeh*) – sellers agreed to reduce their prices somewhat if the buyer offered to pay in new *medin*.

Rabbi Abraham claims that the case under discussion is completely different. Here, the new coin has greater purchasing power due to a governmental exchange rate decree. This is more significant than Rabbi Eliezer’s case for two reasons: (a) in reality, large merchants do not accept new coins at a premium simply because they are new – only small storekeepers and “those who sell meager amounts” are willing to do so, and (b) the new coin premium is temporary – it disappears as coins age – but the effect of an exchange rate decree is permanent, or “it is a pole that shall not wobble.” Like his father Rabbi Mordecai, Rabbi Abraham grants a great deal of credence to official exchange

rates. This credence seems unwarranted; in the Ottoman Empire, the market often ignored official exchange rates.<sup>60</sup>

Rabbi Abraham continues to dispute Rabbi Hayyun's argument. Rabbi Hayyun's original case deals with an official decree that reduced the exchange rate of the thaler from 100 akce to 80 akce. He rules that even if the lender stipulated repayment in thaler, the borrower should repay at 80 akce per thaler. Rabbi Abraham dissents, using the following line of argument: The lender chose to specify thaler because thaler are universally accepted as payment. Why did the lender not allow for payment in other coins, which he would later exchange for thaler? Obviously, he prefers to avoid the inconvenience of going to a moneychanger. If the lender is unwilling to accept this inconvenience, he is certainly unwilling to absorb exchange rate-related losses.

Rabbi Hayyun argued that the official devaluation of the thaler means that instead of 1 thaler for a certain measure of produce, 1.25 is now required. Since produce prices have not changed (in medin/akce), the 25% rule applies – no adjustment should be made; one who borrowed thaler must repay the same number of thaler. Rabbi Abraham rejects this analogy, on the grounds that the Talmud refers to a case where the unit of account was reinforced/debased. Here, the unit of account (akce/medin) is stable, and therefore the 25% rule does not apply.

Rabbi Abraham's assertion that the 25% rule does not apply to the unit of account is a major innovation. It is difficult to accept his attempt to read it into the words of the Talmud, because the Talmud did not allow for a distinction between the unit of account and the means of exchange. However, it should be kept in mind that the reinterpretation of canonical texts to deal with new situations is one of the major mechanisms by which

Jewish law develops. Even a radical reinterpretation can attain general acceptance, provided that its proponent possesses sufficient stature and that the reinterpretation can somehow be grounded in the text.

In the end, Rabbi Abraham rejects both valuation by weight and linkage to gold coins, not so much because these alternatives lack textual support, but because they imply an unwarranted transfer of purchasing power to the borrower. Rabbi Abraham's ruling is based on the following principles: preference for compromise (unlike his predecessors); valuation by purchasing power; and limitation of the 25% rule to cases of imperfect valuation by weight that do not involve the unit of account.

## **8. Conclusion**

This paper analyzed the opinions of three leading Egyptian rabbis regarding the repayment of debts following changes in the value of a coin. The method of analysis was a close, in-depth reading of rabbinic legal texts, which facilitated the identification of important statements of monetary doctrine within the legal argumentation. Historical and institutional aspects were examined carefully in light of recent research on Ottoman monetary history.

The major findings are as follows: The seventeenth century saw an important shift in the monetary doctrine of Egyptian rabbis. First, the seventeenth-century rabbis adopted valuation by purchasing power and rejected the alternatives of valuation by weight or linkage to gold coins; later, they broke with their Egyptian predecessors by accepting the solution of compromise, in which exchange rate losses were split between the parties. The seventeenth-century rabbis limited the applicability of Talmudic case law and reinterpreted texts that supported valuation by weight or linkage to gold coins. They

made increasingly sophisticated economic arguments to support their viewpoint. Some of these arguments have been confirmed by modern historical research.

I conclude with some suggestions for further research. This methodology of this paper can be applied fruitfully to rabbinic writings from other times and places. For example, nineteenth century European rabbis debated the legal status of banknotes, a monetary instrument that was inconceivable to the Talmudic rabbis and their medieval interpreters. As in Ottoman Egypt, the new economic realities of the nineteenth century opened up opportunities for creative interpretation by the rabbis.

From 1973 to 1985, Israel experienced rapid inflation, which peaked in 1984 at 445% per annum . The rabbis were asked whether loans may be indexed to the US dollar or to the CPI. The rabbinic literature can be searched for answers to the following questions: Did rabbinic attitudes towards indexation change over time, as inflation increased? Which Talmudic cases were cited, and how were they interpreted? How did post-Talmudic precedents influence the discussion?

In the course of the twentieth century, the compromise solution of the Ottoman rabbis was applied on more than one occasion. In 1924–5, Polish rabbis invoked the compromise solution in an environment of rapid inflation. Some Israeli rabbis did the same in 1973–85. In 2008, the New Israeli Shekel (NIS) appreciated sharply against the US dollar. In response, Israeli ultra-Orthodox rabbis adopted a policy that is very reminiscent of the compromise solution.

During June 2007-June 2008, the dollar fell from NIS 4.25 to NIS 3.37. In light of Israel's monetary history, this development was unanticipated. At that time, many domestic transactions were priced in dollars – a legacy of the inflationary era of 1973–85.

In addition, the ultra-Orthodox economy is highly dollarized. Ultra-Orthodox nonprofit organizations receive much of their financial support from the US, and therefore link their disbursements to the dollar. The unexpected appreciation of the NIS caused severe hardship, both for businesses that set their prices in dollars and for recipients of payments from ultra-Orthodox nonprofits . In order to alleviate this hardship, ultra-Orthodox rabbis fixed the exchange rate at 4 NIS for intracommunal transactions. This policy, which was never explained in detail, appears to have been inspired by the compromise solution of the Ottoman rabbis.

### **Acknowledgements**

I thank Hamid Hosseini, Spencer Pack, Adrian Tschoegl, and two anonymous referees for comments and suggestions and Yaron ben Naeh and Warren Schultz for sharing their expertise. I also thank Ram Grinshpun for excellent research assistance. Earlier versions of this paper were presented at the History of Economics Society meetings (Toronto), the World Congress of Jewish Studies (Jerusalem) and the European Social Science History Conference (Amsterdam).

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\*Electronic text included in the Responsa Project database, published by Bar Ilan University.

**Table 1. The political history of Ottoman Egypt**

Period	Political Conditions
1517 (Ottoman Conquest)–ca. 1617	Virtually complete Ottoman control
Ca. 1617–1671	Gradual shift of power from the Ottomans to the Mamluks (the local military class)
1671–1798 (French Conquest)	Complete Mamluk control

Source: Shaw (1962, pp. 4–5)

**Table 2. The monetary history of Egypt**

Period	Monetary Conditions
1300–1477	Stable silver-only monetary system
1477–1585	Gold-silver-copper system, with distinct silver zones; the Empire was strong politically, economically, and fiscally.
1585–1690	Chronic monetary instability, caused by political, economic, and fiscal crises combined with intercontinental specie movements; increased circulation of foreign silver coins, in both good and debased versions.
1690–1844	New silver unit, stable until the 1780s; monetary linkages between the center and the periphery were strengthened.

Source: Pamuk (2000a, p. 20)

**Table 3. The Talmudic 25% rule for repayment of a loan following reinforcement/debasement**

Original Debt	Percentage Change in Weight	Percentage Change in Produce Prices	⇒	Current Debt
D	x	–x	⇒	$D/(1+x)$
D	$ x  \leq 0.25$	0	⇒	D
D	$ x  > 0.25$	0	⇒	$D/(1+x)$

Note: This table is based on Maimonides' formulation in *Mishneh Torah*, Laws of Borrower and Lender 4:11.

**Table 4. The para or medin of Egypt, 1524–1720**

Year	Average weight of coins grams	Approximate fineness percent	Silver content grams	Silver content para/akce	Exchange rate against Venetian ducat	Exchange rate against akce based on rates vs. Venetian ducat
1524	1.22	84	1.05	1.6	40	1.5
1552		70				
1564	1.05	70	0.73	1.1	41	1.5
1582					43	1.5
1605	0.95					
1618	0.93					
1622	0.85					
1630	0.85					
1641	0.85	70?	0.6	2.1	80?	2.0 (official)
1650	0.85	70?	0.6	2.6		
1670	0.85	70?	0.6	2.9	90	2.8
1680	0.77	75	0.58	2.8		
1685	0.77	70	0.54	2.6	105	2.9
1688	0.74	70	0.52	2.5	105	2.9
1690	0.54	70	0.41	3.1	105	2.9
1698	0.69	60	0.41	3.1	120	2.5
1705	0.63	60	0.38	2.8	130	2.6
1720	0.63	60	0.38	2.9	120	3.2

Source: Pamuk, 2000a, pp. 94, 175

Note: The silver content listed here is the legal standard. Coins in circulation often contained less silver; from 1690, the discrepancy in silver content was 20–30%.

**Table 5. Market exchange rates of the sultani and selected foreign coins (in akce): Istanbul, 1584–1725**

Year	Weight of Silver Akce (Grams)	Weight of Gold Sultani (Grams)	Akces per Gold Sultani	Akces Per Venetian Gold Ducat	Akces Per Spanish Silver Eight-Real (Riyal Gurush)	Akces Per Dutch Silver Lion Thaler (Esedi Gurush)
1584	0.68	3.517	65–70	65–70		
1586	0.38	3.517	120			
1588				120	80	70
1596			220–230			

1600	0.32	3.517	125	125	78	68
1612	0.32	3.517	125			
1618	0.31	3.517	150	150	100	
1621	0.31		150			
1622			200–230	180–210	120–150	
1623			230–300			
1624			360–460	330–420	170–320	
1625	0.31	3.517	140	120	80	70
1628			210	190	100–110	
1632				220	110	100
1634			250			
1636			260			
1640			300	270	125	
1641	0.31	3.517	140	168	80	70
1646				170	80	80
1650			180	175	90	80
1655				175	90	90
1659	0.26	3.490	210	190	88	78
1668				250	110	100
1669	0.23	3.490	270			
1672	0.23	3.490	270	300	110	100
1676				300	125	120
1683				300	130	120
1689	0.23	3.490	270			
1691				300–400	120–160	120-160
1698				300–400	120–160	
1708				360		
1725				375	181	144

Source: Pamuk, 2000a, pp. 136, 144.

Notes: The Venetian ducat weighed 3.559 grams with a fineness of 0.997. The akce was minted from pure silver until the debasement of 1585–86. Thereafter, it contained unknown amounts of copper. Coins of different silver contents (including counterfeit coins) circulated simultaneously.

**Table 6. Medin/thaler cross rates, late seventeenth century**

<b>Year</b>	<b>Medin/Thaler Cross Rate</b>
1659	27.9
1668	35.7
1672	35.7
1676	42.9
1683	42.9

Note: Medin/thaler cross rates were computed by the author from Tables 4 and 5. Due to gaps in the data, it is assumed that over 1659–1683, the akce/medin exchange rate remained constant at its 1670 value of 2.8.

## **Appendix – The Selection of Rabbinic Legal Material**

Eleven works by nine leading sixteenth–eighteenth-century Egyptian rabbis were searched, using a combination of computerized and manual searches. The computerized searches were conducted using Bar Ilan University's Responsa Project database, which contains over 90,000 responsa dating from the Middle Ages to the twentieth century. The search term was “coin” (Hebrew: *matbea*); the search was run for responsa from the sixteenth and seventeenth–nineteenth centuries (the database uses the following periodization: medieval, sixteenth century, seventeenth–nineteenth centuries, and twentieth century).

The works that were studied are as follows:

### ***Sixteenth Century***

- (1) Responsa of Rabbi David ibn Abi Zimra
- (2) Responsa of Rabbi Betzalel Ashkenazi
- (3) Responsa *Oholei Yaakov\** and *Erech lechem\** (on the *Shulchan aruch* law code) by Jacob Castro
- (4) Responsa of Rabbi Jacob Gavizon\*

### ***Seventeenth–Nineteenth Centuries***

- (1) Responsa *Darchei noam* by Rabbi Mordecai Halevi
- (2) Responsa *Ginat veradim* by Rabbi Abraham Halevi
- (3) Responsa *Perach shoshan*, a critique of *Ginat veradim* by Rabbi Yeshua Shababu Yedia Zayyan

(4) Responsa of Maharif by Rabbi Jacob Feraji Mahmah

(5) Responsa *Machaneh Yisrael* and Responsa *Ugat Eliyahu* by Rabbi Elijah Israel

\*These works are not included in the Responsa Project database.

After obtaining the search results, I excluded (a) texts that do not address money/debt valuation; (b) texts that are essentially straightforward applications of Talmudic law, without further development on the part of the author; and (c) a responsum by Rabbi Zayyan, which disputes Rabbi Abraham Halevi's textual interpretations, but does not develop new ideas in the realm of monetary doctrine. After these exclusions, three opinions remained: a passage from Rabbi Jacob Castro's *Erech lechem* and two seventeenth-century responsa, authored by Rabbi Mordecai Halevi and Rabbi Abraham Halevi.

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## Notes

1. The sole exception is Liebermann (1989), which is a Hebrew language work.
2. A related literature on economic analysis of Talmudic law exists. The most well-known work in this genre is Aumann and Maschler's (1985) game-theoretic analysis of the Talmudic bankruptcy problem.
3. For most of the sixteenth century, the sultani traded at par with the ducat; in the seventeenth century, the ducat traded at a premium of up to 10%.
4. This contrasts with nineteenth-century bimetallism, in which the gold/silver ratio was officially fixed.
5. Shaw renders *Irsalliyye-i-Hazine* as "remittance treasure."
6. In the seventeenth century, the tribute was sent mainly in silver.
7. Some historians believe that the medin was debased, but the debasement was rapidly reversed due to pressure from soldiers.
8. Originally, the new gold pieces of Cairo and Istanbul traded at par in Istanbul. After the Cairo pieces drove the Istanbul pieces out of circulation (an example of Gresham's law), the authorities prohibited the minting of lower-quality coins and reduced minting costs in Istanbul. When these measures proved ineffective, the authorities announced lower rates of exchange for the Egyptian gold coins, which solved the problem.
9. There are over 1 million known responsa, dating from the seventh century to the present.
10. The reverence of the post-Talmudic rabbis towards the Talmudic rabbis is reminiscent of the medieval scholastics' reverence for Aristotle, as described by Odd Langholm: "The men of the Middle Ages were convinced that antiquity was a purer and wiser time than theirs. The Fathers of the Church were the best interpreters of scripture; Aristotle possessed unsurpassed understanding of the natural world. Much of scholastic reasoning, therefore, was reasoning *from* these authorities. So also in the area of economics. Fortunately, in some ancient authors, notably in Aristotle, strange and obscure bits of text also proved to provide highly fruitful analytical schemata by which the scholastic interpreters could order their own thoughts. Reasoning from Aristotle, they would also reason *with the aid* of Aristotle, or believe that they did so. For while assimilating old learning, they also transformed it" (Langholm, 1998, p. 443; emphasis in original).
11. During the period of Ottoman rule, several Egyptian Jews are known to have held the position of master of the mint. Others served as chief tax collector and financial advisor to the governor (Winter, 1992; David, 1997). However, these Jewish officials did not leave any literature on economic policy.
12. See Ghazanfar (2000) on Al Ghazali, Soofi (1995) on Ibn Khaldun, Lapidus (1997) on Buridan and Oresme, Reiss and Hinderliter (1979) on Copernicus, and O'Brien (2000) on Bodin.
13. In the Ottoman Empire, it was fairly common for Jews to go to Islamic courts, despite the strong opposition of the rabbis. The rabbis adapted to this reality by making certain concessions to Islamic law (see Shmuelevitz, 1984, p. 42).
14. Ben Naeh (2007, pp. 2–3) estimates the Jewish population of seventeenth-century Cairo as "possibly greater than 5,000." Istanbul, Salonika, and Edirne were the three largest Jewish population centers; Cairo most probably ranked fourth. In Egypt, the sixteenth century was a period of rapid demographic growth, driven by an influx of Spanish Jews following the expulsion of 1492.
15. In Jewish law, the wife receives payment under the marriage contract (a) if the couple divorces or (b) if the husband predeceases the wife.
16. The Safed enactment was adopted in Istanbul and Salonika, ignored in Cairo and explicitly rejected in Damascus.
17. The Babylonian Talmud is referenced by tractate, folio, and side (Bava Metzia 44b is the second side of folio 44 in Tractate Bava Metzia). This system of referencing has been in place since the publication of the Venice edition (1520–23). Most volumes of Talmud in use today are reproductions of the Vilnius edition (1880s), which maintained the pagination of the Venice edition.
18. The "coin" vs. "produce" dichotomy is also found in Roman law; the Roman terminology is "price" vs. "wares." See Sargent and Velde (2002, chap. 5).

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19. The medieval commentators disagreed concerning the interpretation of this Talmud passage. I cite the formulation of Maimonides (1135–1204) because his *Mishneh Torah* (completed 1177) was regarded as canonical by later Egyptian rabbis.
20. The distinction between biblical mandates and rabbinical mandates is fundamental to Jewish law. With regard to the interest prohibition, the practical implications (as formulated by Maimonides) are as follows: (1) Rabbinical courts have the power to enforce restitution of biblically prohibited interest, but not rabbinically prohibited interest (*Mishneh Torah*, Laws of Borrower and Lender 4:3, 4:6). (2) When there is a dispute between rabbis, one should rule stringently in cases involving biblically prohibited interest and leniently in cases involving rabbinically prohibited interest (based on *Mishneh Torah*, Laws of Rebels 1:5).
21. However, commodity loans are permitted if a monetary value is specified at the time of the loan based on a stable market price (BT Bava Metzia 62b–64b).
22. Following the expulsion of the Jews from Spain in 1492, Cairo’s Jewish community split into three distinct congregations: Arabic-speaking (*Musta’ arab*), North African, and Spanish.
23. Since its publication in 1565, the *Shulchan aruch* (Set table) has been regarded as the authoritative code of Jewish law; numerous commentaries have been written on it. *Shulchan aruch* is a synopsis of *Bet Yosef*, Rabbi Karo’s comprehensive commentary on the *Arbaah turim* (Four columns) code of Rabbi Jacob ben Asher (1270–1343, Germany and Spain). Rabbi Castro corresponded regularly with Rabbi Karo and visited him in Safed in 1570.
24. Over a period of at least 11 years, Rabbi Castro made marginal notes in his personal copy of *Shulchan aruch*; these notes circulated in a manuscript among Egyptian and Palestinian rabbis and were published posthumously as *Erech lechem* in 1718 (Spiegel, 1990). Thus, a passage may date from as early as 1565 or as late as 1612.
25. Rabbi Karo adopted Rabbi Jacob ben Asher’s organizational scheme, which divides Jewish law into four “columns” or sections: *Orach chaim* (Way of life) – prayer, Sabbath, and holidays; *Yoreh deah* (He shall teach knowledge) – various ritual laws including laws of kosher food and laws of interest; *Even haezer* (Rock of support) – marriage and divorce; and *Hoshen mishpat* (Breastplate of justice) – judicial procedure and civil law.
26. Rabbi Castro’s interpretation seems to be inconsistent with the actual intent of Rabbi de Trani. The original passage can be found in Rabbi de Trani’s “Rulings of Riaz” (Bava Kamma, Chapter “One Who Steals Wood” 3:22). Rabbi de Trani discusses a case in which the monarch demonetized an unnamed coin (possibly a copper coin) that had been valued at 300 per gold coin, and replaced it with a new coin valued at 24 per gold coin. He concludes that a loan of 300 old coins may be repaid with 24 new coins, since the main coin of the realm is gold. Rabbi De Trani refers the reader to his “Notebook of Proofs” for further explanation; unfortunately, most of this work has not survived.
27. Aramaic *charifuta*, literally, sharpness or pungency. In this context, *charifuta* means the desirability of holding new coins simply because they are in mint condition.
28. It is not clear whether Rabbi Castro assumes a constant gold-silver ratio in the first sentence of the passage. The third sentence can only be understood under the assumption of a variable gold-silver ratio.
29. Rabbi Mordecai served for over 40 years as chief rabbinic judge in Cairo and Rosetta. He moved to Jerusalem in 1684 and died that same year. To avoid confusion, Rabbi Mordecai Halevi and Rabbi Abraham Halevi will be referred to by their first names.
30. Many rabbis organized their responsa according to Rabbi Jacob ben Asher’s four sections.
31. I thank Yaron ben Naeh for identifying this term. In the Ottoman Empire, the Dutch lion thaler was variously known as *asedi gurush*, *aslani*, or *arsalani*.
32. Rabbi Mordecai explores the implications of designating thaler as “coin” and *medin* as “produce,” or alternatively, classifying *medin* as “coin” and thaler as “produce.” He rejects both alternatives on logical grounds.
33. The Arabic word *qi’ta* means “piece,” and was used to refer to the *para/medin* (Pamuk, 2000a, p. 95). However, in this context, Rabbi Mordecai uses the word *kitiya* (= *qi’ta*) in the sense of a weight standard.
34. Rabbi Mordecai uses the terms *Dar el Tzarb* and *Divan* interchangeably. The mint (also known as *Darbhone*) and the treasury were both housed in the Citadel of Cairo (Shaw, 1962).
35. Because the actual weight of the dirham varied according to time and place, Rabbi Mordecai’s dirham cannot be identified with absolute certainty. It is most likely that Rabbi Mordecai’s dirham is the dirham of Tebriz (= 3.072 grams), which the Ottoman silver coins were based on until the late seventeenth century

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- (Pamuk, 2000a, p. 32). Using 1 dirham = 3.072 grams, 10/36 dirhams = 0.85 grams, and 10/40 dirhams = 0.77 grams.
36. These are identical to the weights reported by Pamuk for 1622, 1630, 1641, 1650, 1670, 1680, and 1685 (see Table 4).
37. The market exchange rate reflected a debasement of one ninth (from 36 to 40 medin per 10 dirhams); the official exchange rate was based on the old weight standard and ignored the debasement. Given these data, a market exchange rate of 43 implies an official exchange rate of  $43/1.111 = 38.7$ .
38. For the modern economist, it is obvious that  $\alpha$  should be set equal to the share of domestic goods in total consumption expenditures.
39. His reluctance to directly dispute the Talmud is understandable; his reluctance to dispute Rabbi Castro is more puzzling.
40. Wheat prices rose from 36 paras per ardeb (a unit of volume for dry goods, which ranged from 75 to 184 liters) in 1694 to 108 in 1695 and 181 in 1696; rice prices rose from 313 paras per ardeb in 1695 to 672 in 1696 (Pamuk, 2000b, p. 184). These prices are expressed in 1690 paras; thus, they are adjusted for changes in the para's silver content.
41. In *Ginat veradim*, Part 3 (*Even haezer*) IV:24, Rabbi Abraham repeats much of the argument found here, and once again he makes no mention of his father.
42. For further details on the Janissaries, see Faroqhi (1994, chap. 20).
43. This appears to contradict Pamuk's assertion that "the rates at which the coins were accepted by the government reflected the market rates more closely" (2000a, p. 144).
44. Rabbi Abraham mentions the tugrali in an unrelated responsum (*Ginat veradim*, Part 4 [*Hoshen mishpat*] III:40).
45. It is implicit in Rabbi Abraham's narrative that the real was also deliberately undervalued by the governor's decree.
46. Rabbi Abraham argues that this view is implicit in the Talmud and in the writings of Rabbi Isaac Alfasi (1013–1103, North Africa and Spain).
47. Merchants used the existence of substandard coins to justify higher prices and profits; the authorities attempted to thwart this behavior by publishing official price lists.
48. Rif compiled all of the legal material in the Talmud. His compilation consists of Talmudic passages, interspersed with his own legal conclusions.
49. The standards for Ottoman gold coins were based on the mithqal of Tebriz. This mithqal was equivalent to 1.5 Tebriz dirhams (Pamuk, 2000a, p. 63).
50. See Maimonides, *Mishneh Torah*, Laws of Sales 12:10, and the *Tosafot* commentary on BT Bava Metzia 51b. *Tosafot* is the collective work of a group of twelfth–thirteenth-century French rabbis.
51. Coins of this type were issued in the Mamluk era. During 1260–1399, the Mamluk sultans of Egypt minted silver dirhams without a weight standard, their weight ranging from less than 1 to 5 grams. There is little doubt that these dirhams were weighed in transactions (Schultz, 1998, pp. 334–335).
52. Warren Schultz, personal correspondence.
53. Based on BT Gittin 50a and Bava Kamma 8a.
54. See Goldberg and Knetter (1997) for a survey of the literature on exchange rate pass-through.
55. Price indices had not yet been invented. The fixed-basket approach to price index measurement was invented in 1707 by the British clergyman William Fleetwood, and refined by Joseph Lowe in 1823 (Diewert, 1993).
56. Rabbi Abraham expresses his satisfaction that "finally, all [Jewish] courts have agreed" to the compromise solution advocated by Rabbi Eliyahu ben Haim (c. 1530–1610), chief rabbi of Istanbul from 1575. It is not clear how Egyptian rabbis came to accept the compromise solution in the seventeenth century after their sixteenth century predecessors had rejected it.
57. Jewish charities presumably charged the same interest rates as Islamic cash waqfs (endowments which funded religious and social causes by means of interest income). Baer (1997) reports that during the sixteenth to twentieth centuries, the normal waqf rate was 10–15%; this is consistent with the rates cited by Rabbi Abraham.
58. Rabbi Samuel Hayyun (birth and death dates unknown, though he died before the responsa's publication in 1613) was the maternal grandson of Rabbi Samuel de Medena (1506–1589), an outstanding rabbi who lived in Salonika and left over 1,000 responsa.

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59. Rabbi Hayyun cites Rabbi Eliezer indirectly, through Rabbi Eliezer's descendant, the Austrian scholar Rabbi Mordecai ben Hillel (d. 1298). Rabbi Moredecai's ben Hillel's Talmud commentary is known simply as *Mordecai*, after his first name. The relevant passage is found in Mordecai, Bava Kamma 110–111, commenting on BT Bava Kamma 98a.

60. It might be suggested that both Rabbi Halevis were afraid to question the regime's credibility in writing. However, this explanation must be rejected. The responsa were accessible only to learned Jews, and thus the authors were free to criticize Islamic judges and Ottoman officials. Rabbi Castro, Rabbi Mordecai, and Rabbi Abraham wrote that the Islamic courts were corrupt (*Oholei Yaakov* 131; *Darchei noam*, Part 3 [*Even haezer*] 35, 58; *Ginat veradim*, Part 3 [*Even haezer*] I:1, III:35). Rabbi Abraham documented a case in which an Ottoman official ordered the murder of a Jew, then bribed the Islamic courts to cover up his crime (*Ginat veradim*, Part 3 [*Even haezer*] III:10); the official was clearly identified by his title.