Lessons from the evolution of the accounting tool: from the genesis up to the roman period

Christos Tsatsis

Littleton point out in 1933 that “Accounting is relative and progressive. (...) Older methods become less effective under altered conditions; (...) surrounding conditions generate fresh ideas (...) as such ideas and methods prove successful they in turn begin to modify the surrounding conditions” (Littleton 1933, 361). We argue that “accounting crises” - such as the use of the system in a way that was not designed, the voluntary disclosure of wrong information, - are, according to Littleton’s terminology “new problems” that “older methods” don’t fit anymore. The succession of accounting debt crises of the first 21th century is a perfect example of the history which repeat continually.

In order to demonstrate this, the paper aims to identify from the early history of accountings elements linked with economic crises and in response, how the accounting system does evolve. To fulfill this objective, we used a standardize descriptors in the four major periods for analyzing accounting crises.

**Keywords** accounting crises, historical accounting, accounting innovations, accounting changes

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LESSONS FROM THE EVOLUTION OF THE ACCOUNTING TOOL: FROM THE GENESIS UP TO THE ROMAN PERIOD

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Abstract

Littleton point out 1933 that “Accounting is relative and progressive. (…) Older methods become less effective under altered conditions; (…) surrounding conditions generate fresh ideas (…) as such ideas and methods prove successful they in turn begin to modify the surrounding conditions” (Littleton 1933, 361)².

We argue that “accounting crises” - such as the use of the system in a way that was not designed, the voluntary disclosure of wrong information,- are, according to Littleton’s terminology “new problems” that “older methods” don’t fit anymore. The succession of accounting debt crises of the first 21th century is a perfect example of the history which repeat continually.

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² The full statement is reproduced in section 5.
Introduction

Economists and finance specialists pay little attention to the techniques of accounting. Most of the time, they take financial statements for granted and they do not look further. Boyns & Edwards underlined the fact that ignorance of how and why data are compiled in such a way is dangerous. As Boynes and Edwards stated, “while economists make much use of accounting data, a lack of familiarity with the way in which those data have been drawn up or of their limitations can lead to erroneous conclusions”3.

As this paper we would like to explain a few interrelationships between accounting statements and the finance world. To be more precise, how past financial crises and accounting scandals may modify the financial statements disclosures.

To answer this question, I will take a historical approach of accounting. Because accounting has more than 5,000 years of history 4 and according to Walton, “regulations are developed in incremental basis”(Walton 1995) knowing “why,” “where,” “when” and “how” should permit a better understanding of accountancy, its rules and the impact of “real economy”.

We will focus on the evolution of accounting techniques over time from the “first period of accounting” of Sumerian, Egyptian, Greek, and Roman civilizations and finally their legacy on today practices.

To be able to carry out this analysis, we will not only focus to accountancy itself but we must make a broader analysis in order to understand the general context and the technical evolution in which every accounting system is entitled. Then, we will deal with accounting itself by looking at bookkeeping but also at accounting innovations, accounting education, accounting control and audits, and fraud.

We propose four specific patterns which describe the accounting evolution based either accounting pitfalls or scandals, either to technical evolution.

This paper is divided in four periods: Sumerian, Egyptian, Greek, and Roman. All parts have the same pattern and are divided in eight paragraphs. The first paragraph describes the general context.


the second paragraph describes the *technical evolution*, the third paragraph describes the *accounting characteristics*, the fourth paragraph is about the *accounting innovations*, the fifth is the *accounting education*, the sixth the *accounting control and audit*, the seventh the *accounting fraud* and the eighth the *conclusion*.

In that context, two assumptions should be made. First, this paper is not an exhaustive review; for decades, scientists have added their own contribution to history. In our analysis, we tried to consider the most recent contributions with some intrusions into older works. Secondly, this is not a historian’s article; this means that facts we analyze are “the general accepted historical facts”, disregarding controversies that historians have raised.

In this work, we explore how accounting crises can shape the accounting practices using past accounting crisis example and their accounting evolution. Section 1 describes the accounting system and accounting crises in the Sumerian Civilization. Section 2 describes the accounting system and accounting crises in the Egyptian Civilization. Section 3 describes the accounting system and accounting crises in the Greek Civilization. Section 4 describes the accounting system and accounting crises in the Roman Civilization. Section 5 is a small discussion based on the fourth previous sections. Finally, section 6 concludes

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5 The only exception of the Greek period which paragraphs 4 and 6 describe both and the accounting innovations and the accounting control and audit of Athenian accounting. In fact, each paragraph deals with a different accounting system, paragraph 4 deals with *public accounting* while paragraph 6 deals with *banking accounting*. 
1- Sumerian Civilization

As mentioned in the literature, “History Begins at Sumer.” (Kramer 1973) *Sumerian civilization* has prospered in Mesopotamia since 4th millenary BC. The particular spatial situation between the Tigris and the Euphrates rivers allowed agriculture to flourish but to a certain extent. The very poor soil urge Mesopotamians to import almost every raw material. This very particular situation allows the commercial exchanges to grow fast as well as to develop in parallel an efficient systems of exchange to organize trade (Oppenheim 1954).

The development of writing and laws permit trade to grow. A very interesting example is the code of Hammurabi (2000 BC) in which, according to Vlaemming we can already find passages which prove the existence of book-keeping. Nevertheless according to Robson, “*there were almost no significant changes in these (accounting) records*”.

“Ancient Mesopotamians were obsessive bookkeepers.” (Garbutt 1981, 11). The use of receipt tablets, debt records, purchase tablets, allowance tablets, pay list tables and inventory records were very common(Keister 1963). Mesopotamians also used to make summary disclosures (Degos 1998). All those tablets seemed to be used as proof and the need of control was permanent. Vlaemming (Vlaemminck 1956) wrote that some tablets were authentic and in some others we found very often marks as checks. The developed by the scribes was very accurate. Accounts had all the elements

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6 The region between the Tiger and Efra river, closely to the actual Irak.

7 As stated by (Carmona et Ezzamel 2007, 181) “*In both civilizations (Mesopotamia and Egypt), some of the key elements suggested by Polanyi were present; well-defined market locales!, buyers and sellers exchanging commodities at agreed prices but without coinage mediating the exchange, and markets that satisfied local needs.*”

8 Original text in French is « *Déjà dans le monument juridique d’Hammourabi, on trouve des textes qui attestent la tenue des comptes, tel celui qui est relatif au contrat de commission et qui semble bien constituer l’obligation légale, sinon de la tenue d’une véritable comptabilité, tout au moins, de l’enregistrement en forme de comptes de certaines transactions*.» (Vlaemminck 1956, 15).


10 “*According to Rivero Menendez (2000, p. 283), it was customary to call the scribe to the temple, palace, or private domain to record commercial transactions, irrespective of their volume. Written accounts of transactions were signed by the transaction parties, witnesses and the scribe (Keister, 1963, p. 371; Chatfield, 1977, p. 5)*” (Carmona et Ezzamel 2007, 185)
of today’s actual account (Vlaemminck 1956), accounts were made on a daily basis and annual disclosures permit to establish the physical balance sheet\(^{11}\).

But tablets appear only in 4\(^{th}\) millennium BC (Schmandt-Besserat 1982, 875). Before that, as technology was not available, Sumerians used tokens in order to record commercial transactions (Garbutt 1981). According to Carmona & Ezzamel, Mattessich’s work shows that “each token shape as a type of account, and the number of tokens contained in a clay envelope or on a string indicates the quantity of specific items”\(^{12}\). Later, those tokens were sealed inside a clay envelope which, according to Mattessich, was the correspondence of contents\(^{13}\) which permits a tautological and physical control.

As Carmona & Ezzamel wrote, “Scribes who were carefully trained to acquire the necessary literary and arithmetic skills and were held responsible for documenting commercial transactions” (Carmona et Ezzamel 2007, 183).

Last but not least, we should point out that Sumerians used an early system of cost accounting and budgeting procedures applying the notion of “standard costs”\(^{14}\). We should also underline the belated role of temples which, with time, became both a market place and an early bank relay\(^{15}\).

Furthermore, writing on clay was an “irreversible process” (Vlaemminck 1956) and “the fragility of the writing support material was a warranty of its own authenticity since attempting to falsify it would probably destroy (the tablet)”\(^{16}\).

Soon, this civilization built on clay would collapse-- eroded by external invasions and by a decline of their supplying system. It will let the place to another growing empire (Egypt). Sumer leged to

\(^{11}\) (Cossu 1996) quoted by (Degos 1998, 18)

\(^{12}\) (Mattessich 1998, 76) quoted by (Carmona et Ezzamel 2007, 185)

\(^{13}\) “The symmetry between the tokens on the inside and the impressions on the surface of the envelope confirms the correspondence to modern double-entry where most physical manifestations are recorded on the debit side while social relations appear on the credit side” (Mattessich 1998, 3-4)


\(^{15}\) Vlaemminck, Histoire et doctrines de la comptabilité; Cossu, “Les pratiques comptables en Mésopotamie, après l’invention de l’écriture.”

\(^{16}\) Translated from French is : « La fragilité même du matériau était une garantie de sa sécurité puisqu’une tentative de falsification avait des grandes chances d’entrainer sa destruction ». (Degos 1998, 11)
modern historians the very first evidence of an organized system based on commerce which evidence is found in an advanced system of recordings based in tokens and clay tablets.
2 - Egyptian Civilization

As Ezzamel said, Egyptians also have an “obsession with bureaucratic details” (Ezzamel 1997, 564). Unlike Sumerians, commerce is not the issue but a centralized power system highly influenced by the temples and the royal palace\(^\text{17}\). A very strong centralized system, which controls many activities, needs a very strong internal control and auditing system (Wilkinson 1999; Ezzamel 1997; Stone 1969; Ezzamel 2005). “Although the state and temples dominated the economic landscape of ancient Egypt, a significant private sphere also exited [sic]” (Carmona et Ezzamel 2007, 184)\(^\text{18}\).

Techniques also evolved since Sumer. The abundance of Papyrus permits a large control system to be installed\(^\text{19}\), a more complex form of writing called hieratic (a simplified version of hieroglyphs) and a decimal counting system giving the ability to master the four basic operations allow them to master the record-keeping activities\(^\text{20}\). As shown by Ezzamel’s work\(^\text{21}\), accounting in Egypt did evolve during the 4000 years of Egyptian era\(^\text{22}\). However, we can say that during this period, the major change was the Greek influence in Egypt\(^\text{23}\). We will thus first discuss the Egypt accounting system and then analyze later the Greek influence in this country.

Accounting in Egypt was broadly used in public and private spheres\(^\text{24}\). Accounting documents include “journals, ledgers, lists and tables with multiple columns” (Ezzamel 1994, 237). Like for

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\(^\text{17}\) (Stone 1969) quoted by (Carmona and Ezzamel 2007, 189).

\(^\text{18}\) More discussion about this topic could be found at (Ezzamel 1994, 197).

\(^\text{19}\) “Record keeping was facilitated by the abundance of cheap writing material.” (Hain 1966, 701).

\(^\text{20}\) (Ezzamel 1994, 234) quoting (Hayes 1961) “Numerous sample problems in arithmetic, worked out and explained in this papyrus, show that the Egyptian of the Middle Kingdom was well acquainted with the four arithmetical operations-addition, subtraction, multiplication, and division could handle fractions, and possessed a well-defined system of decimal notations”


\(^\text{22}\) We should point out that, according to Ezzamel during Egyptian era, the power of a centralized system was very strong at the Old Kingdom 2700-2200 BC, declined during the Middle Kingdom (2080-1780 BC) “reaching its most extreme form during parts of that period when tax commission became the only real link between central government and the provinces” (Ezzamel 1997, 570) and regain its centralized power at New Kingdom (1552 BC).

\(^\text{23}\) Even if, according to historians the Greek period of Egypt officially starts at 332 BC with the invasion of Alexander the Great.

\(^\text{24}\) Ezzamel note that “As numerous sources (...) make clear, detailed accounting records were kept not only for taxation purposes but also to document daily income for temples, lists of inventory for equipment and personal
Sumerians, those documents served to record transactions as a proof (Ezzamel 1997). As explained by Carmona and Ezzamel, “accounts were kept on a daily basis, with separate columns for each type of commodity, and they matched daily supplies and provisions” (Carmona et Ezzamel 2007, 190).

Accounting innovations such as specific terminology (Ezzamel 2005, 29) or the use of alternative ink (red and black) allowed to improve visibility (Ezzamel 2005, 39; Carmona et Ezzamel 2007, 190). The use of columns helps to note on the same line and follow and clear debts and duties. Like Sumerians Egypt was a “non-monetary economy”; but this seems not to be a problem since Egyptians introduced a standardized unit of measurement “the shat” (Degos 1998, 24; Vlaemminck 1956, 22) later on replaced by the Deben which is a multiplier of the Shat (Daumas 1977, 427-28).

The scribe had a central role in this system. His duty -- according to Stone (Stone 1969) -- was to record, audit, and forecast activities. A very long training of 15 years (from 5-6 years old to 20-21) permitted him to master fields such as writing, counting and measuring. Ezzamel suggests that organized scribe schools were common from the Middle Kingdom (Ezzamel 1994). Ancient teachers probably used standardized manuals such as the “Rhind Mathematical Papyrus” (Degos 1998, 22-23; Vlaemminck 1956, 21).

Greek influence in Egypt is visible since 500 BC. Greeks imported into Egypt tools and techniques they used in Greece (as we will discuss in the next chapter). Those are a new language (the demotic), probably a new numerical system, a monetary system (coins), and a modern banking system with the use of bank transfers. It is also during this period, in Egypt, that we find the first clear evidence of

wealth, wages of workers on the necropolis sites, barter transactions in village markets, and detailed activities in other state institutions such as dockyards, workshops and breweries” (Ezzamel 1997, 564).

25 “Accounting was [also] called upon to facilitate the quantification, documentation and reporting of the performance of subordinates.” (Ezzamel 1997, 573)

26 The shat equals 7.5 g of gold while the deben equals 12 shats which is 90 grams of gold (Daumas 1977, 427-28).

27 “A developed bureaucratic system reveals and actively promotes a specific human trait: a deep satisfaction in devising routines for measuring, inspecting, checking, and thus as far as possible controlling other people's activities. (...) It draws upon a particular aptitude, as distinctive and important for a society as the genius of its artisans and architects, or the bravura of military men. We call a member of this class a "scribe"” (Kemp 1989, 111).

28 “At debit of Appolonios, 700 drachms he owes to Ariston, son of Antipatros
At the credit of Ariston, son of Antiparotros, 700 drachms”
(Vlaemminck 1956, 23; Cossu 1996, 26)
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accounting manipulation. The Zenon Papyri\textsuperscript{29} demonstrate a perfect task division. Accounts were made on a daily basis, and a new balance appeared after every operation. Evidence from auditing is found as dots in fronts of counts remind us modern “auditing ticks” and there were often corrections and marginal notes, this audit was also made for track fraud\textsuperscript{30}.

But audit also existed in the middle kingdom, royal scribes used to also audit physical systems\textsuperscript{31} and monitor expenses. Scribes had to implement a very strong “internal control system”\textsuperscript{32}. Fraud was very severely punished\textsuperscript{33}.

Fraud examples could be found in the Heronimos archives. Bigen’s work (Bigen 1951) reported by Vlaemming revealed us how Egyptians were able to record fictitious operations. For instance, Vlaemming reports that damaged goods continued to be kept in stocks until the day that an inspector discovered the “disaster” (Vlaemminck 1956, 26-27). Other examples demonstrate that some sales were fictitious operations. Indeed, workers were paid with wine; Heronimos wrote in his books, on the one hand, that wages were paid in drachms, and, on the other hand, that wine was sold.

Egyptians released book-keeping, accounts were not only used to record information but also in order to track performance, make forecasting and improve productivity. In this centralized economy, audits were frequent and negligence was severely reprimanded. Greek influence bought major changes in Egyptian civilization. We will see in the next chapter the role of Athens which put the public accountancy a step forward.

\textsuperscript{29} “A collection of more than one thousand documents, are mainly concerned with the private estate of Apollonios, who was the chief financial minister of Ptolemy Philadelphos” (Hain 1966, 699)

\textsuperscript{30} An example is reported by Hain which “the supervisor who detected the fraud promptly reports it to Zenon and asks him to make sure that a similar situation does not arise again”. (Hain 1966, 701)

\textsuperscript{31} An example is the bakery belongs to the palace of Seti I show how scribes could control work control by setting up “input-output matrices”, standard cost units, allowed losses, … (Ezzamel 1997)

\textsuperscript{32} “Lines were drawn by the inspectors to indicate that inspection took place” (Carmona et Ezzamel 2007, 190)

\textsuperscript{33} (Ezzamel 1997, 585) quoting (Wilson 1951) “This was not a code of law, but rather a series of police regulations directed against specific malpractices and also a reorganization of the administrative machinery in the land, in order to control future abuses... The punishments meted out are very harsh for minor cases of plundering or corruption. The alarming spread of official dishonesty must have called forth an extreme severity of penalties.”
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3 - Greek Civilization

Ancient Greece covers a period from the first civilization of Mycenae in the 17th century BC until the Roman period to the 1st century BC. We will focus on the accounts of Athens during the 5th century BC. Athens at this time was the first democracy in the world; the activities of the citizens consisted of “public affairs”, arts and crafts industry, and farming. The central position of Athens in Greece (and the development of Piraeus Harbor) helped commerce to flourish. This was facilitated by the probably very first “coined economy” and a very strong coin, the silver drachma. We see in this chapter that, on the one hand, democracy influenced public accounting and, on the other hand, the coined money played a major role in the development of banking in Greece.

Greeks used not only papyrus but also ostraca (which are fragments of pottery), stones and marble. We should not forget the millions of pages written by Greek philosophers, thinkers, poets and public personalities. The development of mathematics also played an important role in the Greek economy since mathematics allow banks to make basic financial computations. Since that time until 330 BC and Alexander the Great, every city was a different state; differences existed not only across time but also space. For our analysis we only focus on the most elaborate ancient Greek accounting technique in the 5th century BC in Athens.

Accounting in ancient Greece was dual; there was a public accounting relating to the city accounts and a private accounting related to the bank accounts. Public accounting documents included paradosis, accounts of public works, money-lending records, records of income and records of

[34] “42. And further, since the territory possessed by the several states was not in every case self-sufficing, but was defective in some products and bore more than was sufficient of others, and much embarrassment arose where to dispose of the latter, and from whence to import the former, she provided a remedy for these troubles also; for she established the Piraeus as a market in the centre of Hellas, of such superlative excellence that articles, which it is difficult for the several states to supply to each other one by one, can all be easily procured from Athens”. trans. (Isocrates 1894) Original text can be found in appendix 1.1

[35] We argue that radical changes made at the 6th and 5th century BC would influence accounting techniques and, for this particular reason we state that accounting in Mycenae in the 16th century BC (writing in Linear B) was not the same type of accounting that in Athens at 5 century BC; accounting in space seems to be quite homogeneous, for instance, inscriptions found in marble in many temples like Delphi and Parthenon, do not vary much from Parthenon.

[36] Paradosis (“given” in Greek) was a particularity of Athens. Public accounts were kept by Athenian citizens. Those citizens were chosen randomly and where on the duty for one year. At the end of this year they hand over the accounts to
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Expenditure (Davies 1994, 207). Private banking accounting documents include the *ephimerides* and *trapezitika gramateia*\(^{37}\). Although commerce and handiest were very developed in ancient Athens, we have very little information concerning their “books”. As Athens was dug during the last two centuries in search of evidences, the lack of information could mean that even if there was an organized form of private accounting or accounting practices, they did not survive so far.

Public accounting was based on democratic principles\(^{38}\). Harris pointed out that during the tyranny period in Athens, public accounting was canceled. Public accounts recordings on papyrus and tablets were numerous\(^{39}\) while information disclosed on marble concerned exclusively sacred accounts. The city was administered by ten public treasurers which were chosen by lot within Athenian citizens; they had the duty to preserve and to increase the national treasure, they could also levy taxes and pay the city expenditures. Most of the time, accounting documents are inventories which facilitate the audit. Audit was also a privilege of democracy as citizens randomly chosen are on duty to control Accounts. Moreover, the final word belongs to citizens who can raise any question to the treasurers in front of the assembly\(^{40}\). This random control seems to be the first historical evidence of a regular control by a revenue court “the *Logistai Court*” complemented, in second place by an audit organization “the *Euptymes College*”. We should also add that the Athens society was one of the first civilizations to set up control of the market place in order to protect customers, maybe another heritage of democracy\(^{41}\).

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37 According (Vlaemminck 1956, 31; Cossu 1996, 28); literally first word means “journals” and second terms “words book of banks”; it was, for the first, ephemera and for the second bank accounts.

38 “Publication was a prerequisite for democracy.” (Hansen 1991)

39 “Master lists of the registry of citizens, tax incomes and expense accounts, city religious calendars and priest lists. and more documents for housekeeping purposes of administration must have been written records” (Harris 1994, 216)

40 “The ten Treasurers sent their records to a board of ten accountants and ten advocates both groups selected by lot for review. A finding of maladministration would result in a trial before a jury for theft. If the financial records proved accurate, the ten Treasurers then appeared before the Boule. Any citizen could voice a complaint at this public hearing.” (Harris 1994, 214)

41 “§ 1 Market Commissioners (Agoranomi) are elected by lot, five for Piraeus, five for the city. Their statutory duty is to see that all articles offered for sale in the market are pure and unadulterated. §2 Commissioners of Weights and Measures (Metronomi) are elected by lot, five for the city, and five for Piraeus. They see that sellers use fair weights and measures. § 3 Formerly there were ten Corn Commissioners (Sitophylaces), elected by lot, five for Piraeus, and five for the city; but now there are twenty for the city and fifteen for Piraeus. Their duties are, first, to see that the unprepared corn
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Harris raised here a major controversy in Athens economy court decisions and other administrative acts were published, “there is no indication that the Athenian democracy valued or promoted mass literacy: above all, there was no state subsidized education” (Hedrick Jr. 1994, 164). But why could a system which chooses their public managers randomly afford not to educate them? A selection existed since candidates were chosen according to their background.42

Unlike Sumer and Egypt where bankers were priests; in Greece they were metics.43 Banking in ancient Greece was first created to fulfill the need of exchange. From that time, until the late 5th century BC, every city state pressed its own silver coins (Flament 2007). The little information we have about accounting in ancient Greek Banks suggests that bookkeeping was meticulous, accurate and honest, which was very often quoted as proof of tribunals (Cossu 1996; Migeotte 2007; Vlaemminck 1956). Greek bankers recorded in their register all amounts they handled with entry and exit dates; every customer also had an account opened to his name with one page for assets and one page for liabilities;44 Demosthenes, in one of his defense speeches, shows us how banks operate.45 Greek banks used bank transfers and checks while deposits, borrowing, activities were promoted by the absence of regulation in interest rates.

in the market is offered for sale at reasonable prices, and secondly, to see that the millers sell barley meal at a price proportionate to that of barley, and that the bakers sell their loaves at a price proportionate to that of wheat, and of such weight as the Commissioners may appoint; for the law requires them to fix the standard weight. § 4 There are ten Superintendents of the Mart, elected by lot, whose duty is to superintend the Mart, and to compel merchants to bring up into the city two-thirds of the corn which is brought by sea to the Corn Mart.” (Aristotle 1891) Original text can be found in the appendix 1.2

42 “Were drawn from the wealthiest class of citizens which ensured that they had some experience in dealing with money and finance” from (Harris 1994, 218)

43 Free men which were non-citizens of Athens.

44 Even if Sumerians and Babylonian also recorded operations for “third party”, it was the first time in history that we have evidences of a personal account (in comparison to general accounts). (Vlaemminck 1956, 32)

45 “He instructed Archebiades and Phrasias to point him out and introduce him to my father, when he should return from his journey. It is the custom of all bankers, when a private person deposits money and directs that it be paid to a given person, to write down first the name of the person making the deposit and the amount deposited, and then to write on the margin “to be paid to so-and-so”; and if they know the face of the person to whom payment is to be made, they do merely this, write down whom they are to pay; but, if they do not know it, it is their custom to write on the margin the name also of him who is to introduce and point out the person who is to receive the money. For a grievous misfortune befell this Lycon”. Translation of (Demosthenes 1949) original text can be found in appendix 1.3
Evidence of accounting manipulations appeared in the writer’s work. Manipulations occur both in the private and public life. In public life, an example of Timotheus shows us how he introduced copper coins pretending it has the same value as silver\textsuperscript{46}. In private accounting, we have an example of Agyrrhius trying to avoid taxation\textsuperscript{47}.

Athens was the only city to date where almost any information was freely available in the public place. From this city full of paradoxes, we retain that democracy brings public disclosure and public control. Athens was also the first full monetary economy. This permits Athenian banks to bloom by creating some basic practices. This development was also the result of politics which helped commerce grow up without any barrier while state institutions were created to protect citizens and keep an eye on abuses and frauds.

\textsuperscript{46} “Timotheus of Athens during his campaign against Olynthus was short of silver, and issued to his men a copper coinage instead. On their complaining, he told them that all the merchants and retailers would accept it in lieu of silver. But the merchants he instructed to buy in turn with the copper they received such produce of the land as was for sale, as well as any booty brought to them; such copper as remained on their hands he would exchange for silver.” Translated by (Aristotle 1933), original text could be found in appendix 1.4

\textsuperscript{47} “[133] I will tell you the reason for this change of front. Last year and the year before our honest Agyrrhius here was chief contractor for the two per cent customs duties. I He farmed them for thirty talents, and the friends he meets under the poplar\textsuperscript{2} all took shares with him. You know what they are like; it is my belief that they meet there for a double purpose: to be paid for not raising the bidding, and to take shares in taxes which have been knocked down cheap. [134] After making a profit of six talents, they saw what a gold-mine the business was; so they combined, gave rival bidders a percentage, and again offered thirty talents. There was no competition; so I went before the Council and outbid them, until I purchased the rights for thirty-six talents. I had ousted them. I then furnished you with sureties, collected the tax, and settled with the state. I did not lose by it, as my partners and I actually made a small profit. At the same time I stopped Agyrrhius and his friends from sharing six talents which belonged to you.” Translated from (Antiphon et Andocides 1941) original text could be found in appendix 1.5
4 - Roman Civilization

The Roman era stands from 753 BC (the birth of Rome) to 476 AD (the fall of the Roman Empire of Occident). The Roman legacy includes numerous archives such as law texts, accounting documents\textsuperscript{48}, defense/accusation speeches (mostly from Cicero). Roman documents describe themselves a nation where details and meticulousness were the basic characteristics of their accounting.

Technical evolution includes abacus which facilitates the computation tasks (Minaud 2005, 188), but also the roman numbers themselves were a major revolution since “on hard surfaces they render falsification work more difficult”\textsuperscript{49}. Evidence pointed out by Minaud’s work reveals that there are almost no changes in accounting principles during the Roman period.

Accounting books of Rome were the “aduersaria” and the “codex accepti et expensi”. Cicero in Pro Q. Roscio-Comedeto trial describes us how Roman accounting was working\textsuperscript{50}. Purser sums up accounting in Rome with those words: “Each Roman citizen had at least two accounts books. Aduersaria: a kind of waste book, or a day-book, the Italian Memoriale, in which he entered day by day, according as they occurred, the several transactions in which he took part (…) The codex accepti et expensi, also called tabulae, codices, domestic ratio, into which, the entries of aduersaria were carefully posted each month”(Purser 1887, 209).

Romans had set the details in accounting very thoroughly; they already used classifications by nature, third-party accounts, and double entry accounts (but not double entry bookkeeping). 600 years later, all those factors will contribute to the rise of double-entry book-keeping in Italy while some other features such as qualitative budgeting will be “rediscovered” in the 20\textsuperscript{th} century (Minaud 2005).

\textsuperscript{48} But any accounting textbook. (Minaud 2005, 25)

\textsuperscript{49} Free translation from the author, original text is « le système des chiffres romains (…) rend les falsifications plus difficiles sur les matériaux durs. » (Cossu 1996, 30)

\textsuperscript{50} “II. (…) Why is it that we write down memoranda carelessly, that we make up account-books carefully? For what reason? Because the one is to last a month, the other for ever; these are immediately expunged, those are religiously preserved; these embrace the recollection of a short time, those pledge the good faith and honesty of a man for ever; these are thrown away, those are arranged in order. Therefore, no one ever produced memoranda at a trial; men do produce accounts, and read entries in books.” Translation from (Cicero 1903) Original text could be found in appendix 1.6
There is no evidence of specialized education in accounting (Minaud 2005, 25). However, Roman elementary school education was teaching basic mathematics which, according to Cicero, was enough for computing\(^5\).

The Roman paterfamilias (head of the family) was the only one who had, by law, the obligation to hold a codex\(^2\); this document was so important that in the case of trial, codex was used as a proof\(^3\).

Accounting manipulations were also present in Roman economy; Cicero's orations give us several examples; we will take two of them. The first is about Fonteius a quaestor who abused a law permitting Roman citizens to pay only the \(\frac{1}{4}\) of old tax debts. Fonteius managed to “record” new debts he received as old ones and keep the \(\frac{3}{4}\) for himself(Minaud 2005, 45; Vlaemminck 1956, 36). The other example quoted by Minaud relates the case of Longinus, who was on duty in Spain. He taxed the citizens heavily but he allowed the amounts to be transferred to his own account as a loan instead of a tax levy(Minaud 2005, 140-41).

Roman civilization was probably the only one which imposes citizens to keep a very specific set of accounts\(^4\). The meticulousness and the detail that Romans applied to their books probably made the Roman Empire the precursor of medieval Italian accounting (which gave birth to the double-entry bookkeeping). But, between those periods, in the dark ages we have no evidence of any elaborate accounting systems in Western Europe.

\(^{51}\) “[5] in summo apud illos honore geometria fuit, itaque nihil mathematicis industriis; at I nos metiendi ratiocinandique utile huius artis terminavinus modum.” Translation of Cicero “Geometry was in high esteem with them, therefore none were more honorable than mathematicians. But we have confined this art to bare measuring and calculating” by speaking of Greeks Charles Duke Yonge, Cicero’s Tusculan Disputations: Also Treatises On The Nature Of The Gods And On The Commonwealth (New York: Harper & Brothers, Publishers, 1877).

\(^{52}\) “Tabulas qui in patris potestate est nullas conficit ». Traduction of (Cicero 1903) “In the first place, he, who is still under the power of his father, keeps no accounts.”

\(^{53}\) “[175] And that these things were done in this manner, you may know, O judges, both from the public documents of the cities, and from their public testimonies; in all which you will find nothing false, nothing invented as suited to the times. Everything which we speak of is entered in the returns and made up in a regular manner, without any interpolations or irregularities being foisted into the people’s accounts, but while they are all made up with deliberation and accuracy” (Cicero 1903) Original text could be found in appendix 1.7

\(^{54}\) Later those obligations will be only for private companies and for public sector
5 -Discussion

Based on the Littelton statement which is our “fil rouge” we can argue that accounting techniques are influenced (1) by the political and economic environment (2) and by technology available. Those evidences appeared also by the early history described in the past sections.

The environment shape accounting. We saw that factors such as laws, economy and central power tend to shift the emphasis of accounting. The brightest example is the Greek democracy which required that public information were publicly disclosed. This “simple requirement” had a dramatic effect on the way that accountancy was recorded as it led to basic requirements such as what type of information to disclose, how to disclose it, in which periodicity, who will be in charge, how to control the accuracy of given information…

Technology also plays a major role in accountancy. The term technology should be understood here in a broad sense. This includes the writing and numerical system, the writing support, any helping devices, science development, commerce development, and the layout of books … Technology determines accounting characteristics. Let’s take again our Athenian example: even if there were institutions in Sumer and Egypt that lent and borrowed resources⁵⁵, banks actually developed in Greece due to environmental and technological facts such as (1) coined economy (2) advances in mathematics (3) regulations. Coins (and monetary economy) enhance commerce since there is no need to find a deal to exchange two goods but also because coins can be carried easily; advances in mathematics with free regulations allow bankers to assess their risk and offer the appropriate interest rates. This allowed banks to raise funds from deposits (that) they can borrow. This situation forced bankers to “setup” a new way to keep their accounts by which they can check the status of every customer (personal accounts).

The next table n° 1, summarizes the descriptors we selected in the introduction by periods. For a better visibility we divided the general environment in the first hand at the general environment and in the other hand writing and counting system while we did proceed in the same way for accounting evolutions by splitting the accounting and the commercial evolutions:

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⁵⁵ Since Egyptian and Sumerian civilization were a civilization « without coins » we rather prefer to use the word resources instead of money.
Table 1: Accounting evolution over the past period

<table>
<thead>
<tr>
<th>Country</th>
<th>Time</th>
<th>General Environment</th>
<th>Technical Evolutions</th>
<th>Accounting Characteristics</th>
<th>Accounting Evolutions</th>
<th>Commercial Evolutions</th>
<th>Education</th>
<th>Control/Audit</th>
<th>Fraud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesopotamia</td>
<td>4000 - 538 BC</td>
<td>Commerce, Market of exchange physical goods</td>
<td>Tokens, Clay tablets, cuneiform writing, 60-based counting system</td>
<td>Tablets used as proof, accounts, balances, recapitulations, ...</td>
<td>Unifying norms of performance. First cost accounting and budgeting techniques</td>
<td>Credit Letter, Borrowing system.</td>
<td>Careful training of scribes for literary and arithmetic skills</td>
<td>The &quot;first auditors : physical control, checks, copies of counts for control. Writing was an irreversible process.</td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>3100 - 332 BC</td>
<td>Mostly religious (importance of temples); mainly exchange of goods but coins were introduced by Greeks</td>
<td>Mostly papyrus hieratic (demotic in Greek period) writing 10-based counting system. Four basic operations were used.</td>
<td>Accounting was broadly used, mostly lists counting several columns.</td>
<td>Standardized unit of measurement (shekel), visual improvements through the use of different inks</td>
<td>In Greek period the bank transfer, and checks</td>
<td>Organized education of scribes (high studies)</td>
<td>Very developed since it was a way for central administration to control economic activities</td>
<td>Writing tricks was already known (Heroninos accounts) but a severe system of control and sanctions existed</td>
</tr>
<tr>
<td>Rome</td>
<td>753 BC – 476 AD</td>
<td>Civilization ruled by laws, with a powerful centralized system which shapes citizen behavior, No monetary unicity</td>
<td>Roman alphabet and writing system, no decimal system, same writing support as Greece</td>
<td>Abacus, Roman numbers permitted to avoid falsification.</td>
<td>Citizens were obliged to keep books. Two books were held one as a memorandum and one as a general book.</td>
<td>Nature classification, third-party accounts, double entry accounts, auxiliary books</td>
<td>Accounting books were (almost) an irrefutable proof of justice.</td>
<td>No training in accounting but a basic mathematics for computation tasks.</td>
<td>From Cicero we can argue that law and courts were on the watch for frauds.</td>
</tr>
</tbody>
</table>
Drivers for changes:

But accounting systems, just like the society they reflect, are not perfect. They may no longer reflect the actual environment or else be challenged by people who try (legally or not) to overcome the system.

Napier stated that “accounting methods become obsolescent partly because of changes in the available technologies for accounting – methods developed in the manual or punch card era can be refined greatly in the computer era – but also because of changes in the nature of the problem for which accounting is the proposed solution” (Napier 2001, 18). During this early period, we have the example of Sumer which changed from a token accounting for a writing accounting after the invention of writing (and probably the invention of clay tablets). Those changes are traditionally slow to operate but usually create “major improvements” in accounting techniques.

The second type of change is driven by the fact that the accounting system, even if it fits perfectly the environment and the nature of the problem, has pitfalls that people will use (legally or not) in order to make an unexpected profit. This was the case with the introduction of copper money in Greece. In such situations, the accounting system will both integrate the practice as legal and create the appropriate checks and balances – in the case of Greece, copper money was introduced little after Timotheus but it represents a smaller quantity than silver coins (Flament 2007) - or it will reinforce law and controls in order to avoid the practice. This was one of the consequences of 2007-2009 IAS/IFRS crises with fair-value notions. Those changes are usually fast but do not change (only improve) the current accounting system.

The third type of change is initiated by frauds. It concerns people who will deliberately disclose false information in order to “fool” third parties. Heronimos archives and Longinus way to levy tax are some examples we exposed in this paper. Usually this kind of situation will require a very quick response but will not change at all the accounting system since it is neither obsolete, nor challenged. Only improvement will be a reinforcement of internal and external control, besides both examples were discovered during an external control.

In this work, we explore how accounting crises can shape the accounting practices using past accounting crisis example and their accounting evolution.

56 In the abstract we called those pitfall as « accounting crises »
The following table n°2 *accounting pitfalls and their response of accounting techniques* summarizes the different pitfalls that could occur in the accounting system:

**Table n° 2 accounting pitfalls and the response of accounting techniques**

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Practices don’t reflect the actual environment.</th>
<th>Pitfalls occurring in the common practices but they are legal.</th>
<th>Pitfalls occurring in the common practices and they are illegal.</th>
<th>Frauds are discovered.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solution</strong></td>
<td>New techniques needed to be implemented in order to consider the new parameters.</td>
<td>Regulators decide to incorporate the pitfall as legal by making minor adaptations to the common legal system.</td>
<td>Regulators decide that pitfall is not legal and decided to reinforce regulation to (1) avoid those pitfalls and (2) increase control.</td>
<td>The accounting system is not challenged; the only solution is to increase control.</td>
</tr>
<tr>
<td><strong>Adoption time/speed</strong></td>
<td>Slow or very slow.</td>
<td>Since the pitfall is discovered, it can take time to decide if it is legal or not. Then legislate could be done very quickly.</td>
<td></td>
<td>Usually very fast.</td>
</tr>
<tr>
<td><strong>Accounting change</strong></td>
<td>Major improvement leading to radical changes.</td>
<td>Improvement of common practices.</td>
<td>Improvement of common practices leading to a greater legal control.</td>
<td>Small improvement observed except a major reinforcement of legal control.</td>
</tr>
</tbody>
</table>

We should point out that the whole paper is based on historical facts. Those facts highlight habits of ancient societies. This means that our knowledge is based on facts that (1) we found and (2) we could decode. History should have been seen as an actual interpretation of testimonies found by archeologists and interpreted by specialists. Our interpretation is, therefore, a reconstructed reality of ancient times based on previous works.
Conclusion

Based on the Littleton statement which is our “fil rouge” of this study we have seen than accounting, political and economic environment and technology influence each other. Like this, accounting is really relative and progressive.

We have seen that altered conditions in the accounting practice such as pitfalls, frauds or new technics have all different level of threads in accounting practice. This leads either to the embracement in this new tool, to the improvement of the actual technic or either to the avoidance of such practice by an enforcement of the rule or the law.

Accounting crises are not all the same. They should be analyzed in order to discover their main roots. Are they a brutal evolution of technical, political or economic environment, are they a loophole discover in the accounting practice or related to a misleading information given by mistake or in purpose by others.

All those roots proof us that accounting is not, and probably never be, a frozen technique for all the seasons. Accounting did change by the past and will continue to evolve. Accounting crises are just the big eruption in the continuous flow of evolution. Results provided by accounting technics are given thought the prism of this particular science which is bounded by the economic, political technical and social boundaries which by themselves change.

To extend the debate, further discussion of the social role of accounting could be done and especially in light of the huge accounting literature review done by Walker (Walker 2016) but it would exceed the scope of this contribution.

Finally, the final conclusion of this paper was written almost 90 years ago:

“Accounting is relative and progressive. The phenomena which form its subject matter are constantly changing. Older methods become less effective under altered conditions; earlier ideas become irrelevant in the face of new problems. Thus surrounding conditions generate fresh ideas and stimulate the ingenious to devise new methods. And as such ideas and methods prove successful they in turn begin to modify the surrounding conditions” (Littleton 1933, 361)
Bibliography


Littleton, A.C., Ph. D. 1933. *Accounting Evolution To 1900*. American Institute Publishing Co., Inc.