Athenian monetary policy and monetary globalization during the Classical period (478-323 BC)

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Abstract In the present essay we analyze monetary policy in Classical Athens during the Classical period (478-323 BC). We focus on the following issues: 1) Which was the procedure of currency issuing in the Athenian city-state? 2) How and why the Athenian drachma became the leading international currency in the Mediterranean world? 3) Is monetary policy without a Central Bank possible? 4) If yes, how and towards what targets? 5) Who was responsible to set the targets of monetary policy and who for its implementation? 6) Was deficit spending possible? Our analysis shows that monetary policy without a central bank was possible and was implemented, with its first aim the stability of the currency (mainly but not only, silver coins) in order to enhance trust in it, and so, make it an international currency being able to outcompete other currencies. It further shows that this was achieved when Athens established an institutional set up, which had as a consequence the operation of an inverse Gresham's law policy in practice. Furthermore, since there was not a Central Bank, like nowadays, monetary policy decisions were taken by the popular Assembly of citizens in the framework of direct democracy procedures, through majority voting. However monetary policy was implemented by specialized administrative bodies chosen by the Assembly. Moreover, deficit spending was possible. When facing financial difficulties, the Athenian state borrowed money from the *Treasuries of the Gods*, paying interest rates. Finally, the essay raises some aspects of monetary policy in Classical Athens that could be relevant for today's monetary policymakers; the non-existence of a state-central bank monopoly, the accountability of financial bodies, and the democratic decision making on monetary issues.

Keywords: Classical Athens • Athenian currency • monetary policy • monetary globalization

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1. Introduction

Athens started coining silver coins at the end of the 7th, beginning of the 6th century BC, showing on the obverse the guardian goddess of the city, Athena and on the reverse

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an owl, the sacred bird of Athena, symbol of wisdom[1]. Athens coined silver coins, while other city states coined silver, electrum (mix of gold and silver content) and few, gold coins. Thus, is general, there existed in the Mediterranean world a three metallic system, where coins emitted by various mints of independent city-states circulated as parallel currencies and in competition to one another.

These coins, with its main denominations of Athenian *tetradrachms* (4 *drachmas*), were commonly named *glauke* (the Greek name for owl) were of excellent craftsmanship, of high value silver content, stable in their silver value for about two centuries, and thus became the main currency of the Eastern Mediterranean world (Kraay 1976; Kroll 2011). As discovered hoards show, they circulated from the Black Sea to the Persian Empire, Egypt and Italy and as far as todays France and Spain as a means of exchange for trade, becoming an international currency like today's dollar (Kleiner, 1975; van Alfen, 2011).

In the following sections we focus on the following issues: In the next section the minting procedure of the Athenian currency is analyzed. Then section 3 analyzes how and why the Athenian drachma become the leading international currency in the Mediterranean. Section 4 describes the mechanisms of implementation of monetary policy without a central bank under direct democratic procedures and under a multi-metallic currency system of parallel currencies. Section 5 further analyzes the establishment of the Athenian drachma as the leading international currency in the Mediterranean which was achieved when Athens managed to establish an institutional set up, which had as a consequence the operation of an inverse Gresham's law policy in practice. Section 6 analyzes the issue of inflation in relation to the implementation of the Athenian monetary policy and currency issue procedures, while section 7 raises the issue of debt financing and describes how the Athenian monetary policy was conducted under detrimental (to the economy) extraordinary measures such as war.

[1] According to a vast bibliography the city-state of Athens established the first ever democratic regime with organized and functional institutions. It was run by two main political bodies, the *Ecclesia of Demos* and the *Boule*. The *Ecclesia of Demos* was the popular *Assembly*, met for 40 times per year where every citizen (over 20 years of age) could vote on any issue under direct democratic-participatory procedures. The *Boule* members, known also as the *Council of the 500* men, were elected by lot. The *Council* was a preparatory body of the issues to be discussed in the popular *Assembly*. Its other main function was that 50 Councilmen from each of the 10 Athenian tribes served as government executives (known as *Prytaneis*) in a rounding basis for the 1/10 period of the year, approximately 36 days. For the political institutions of the Athenian Democracy, see among others, Hansen (1999), Ober (2008) and Tridimas (2019). For the economic organization and institutions of the Athenian Democracy see among others, Bitros and Karayannis (2008), Lyttkens (2010), Bergh and Lyttkens (2014) and Economou and Kyriazis (2017).

Finally, section 8 concludes by providing a comparison between the mechanisms through which the Athenian monetary policy was implemented in relation to modern practices.

2. The minting procedure

Athens extracted silver from the mines of Laurion, in the southern part of Attica. Although mined also during earlier times, mining became intensive and very productive during the 5th and 4th centuries. 2kg of silver were extracted from each metric ton of ore. Gross profit of silver mining in the 4th century has been estimated at about 70 *drachmae* per ton of ore. Expenses (for enriched ore) were about 38 drachmae per ton leaving a net profit of 32 drachmae (Christensen 2003). As a measure of comparison, the usual daily remunerations for a stone mason working on the Acropolis's during the second half of the 5th century was one drachma, and it could have risen to one and a half during the 4th century (Loomis 1998).

Image 1. An Athenian *tetradrachmm*

Source: http://www.wildwinds.com/coins/greece/attica/athens/sg2526.jpg

The silver resources of Laurion were owned by the city itself. The mint, known as *Argyrocopeion*, belonged to the state. Possibly it was in or near the *Agora*, the main marketplace in the city-state of Athens (Kroll 2011: 239; Van Alfen 2011: 8). Mining operations were privately-run enterprises; individuals or consortia of individuals bid for leases to work particular tracts of the mines offered by the *Board of Poletai* (board of sellers) an administrative body of public magistrates which reported directly to the Assembly, entrusted with this task (van Wees 2013: 42-43). The winners were tested

by the *Council of the 500*, the second administrative body involved, thus receiving a state contract (van Alfen 2011). These consortia were the forerunners of later joint stock companies like the medieval Venetian *colleganza* the Genoese Mahona of the island of Chios and the early modern Dutch and English joint stock companies such as the VOC and the EIC.

Various fixed and recurring fees appear to have been associated with these leases, such as a 4.125% tax on revenue, and rents paid to land owners on whose land iron ores were discovered and mined. The mines yielded in total, on average silver of a value of 700 to 1,000 *talents*[2] per year (Figueira 1998: chapter 7). Total of all taxes and rents on silver revenue was about 10%. The rest belonged to the consortia or individual entrepreneurs, who received their profit in the form of silver ingots (bullion). They were free to dispose this in any way they chose, selling it to the state at a discount of about 10% and receiving coins in exchange. This 10% covered an estimated cost of minting of about 2%, the rest 8% being profit or seigniorage. Alternatively, the entrepreneurs were free to sell it as commodity silver (bullion) to the highest bidder in a free market (van Alfen 2011).

The earnings from mining were variable, depending on "luck". If the investor(s) discovered a rich vein of ore, their profits could be very high. The names of 300 mining entrepreneurs are known, showing a relatively wide participation of persons in this activity (Christensen 2003). Furthermore, due to the realization that there was insufficient money in circulation in small denominations to cope with daily retail transactions of recurrent but small value, as for example buying bread, the Athenian state issued the so-called *obols*, made from silver, which were smaller in weight and size coins. One drachma was equal to 6 obols.

It must be also mentioned that during the late 5th century, even smaller denominations of coins than the *obols* were introduced, so as to facilitate the large volume of small value transactions. These were bronze coins, known as *chalkoi* were issued by the private sector/individuals. Thus, at least for the 5th century, the private sector covered a need not covered by the official mint. One reason that the state did not issue bronze coins, may have been that it did not have the capacity to do so (insufficient qualified personnel for the production of law value coins) and that the cost incurred in

[2] *Talent* was the highest denomination measurement unit in the ancient Greek world. It was equal to 6,000 *drachmas*. According to the Attic standard 1 *talent* was equal to 60 *minae*, 1 *mina* was equal to 100 drachmas and 1 drachma equals 6 *obols* (Ober 2008).

relation to any seigniorage was deemed to be too high to make the production of bronze coins by the state mint worthwhile.

Image 2. An Athenian *obol*

Source: https://commons.wikimedia.org/wiki/File:Athens_465-454_BC_Obol.jpg

Image 3. An Athenian *kollybos* issued between 400-300 BC, probably depicting a horse

Source: http://numismatics.org/collection/1944.100.83604

However, it must be also mentioned that Camp and Kroll (2001) have identified a structure in the Agora as a second state mint, but for bronze coinage, known as *nomismatocopeion*. It started minting coins (probably under state supervision) probably early 4th century. A part of the volume of production of bronze coins, should be attributed to the bronze mint, being under state supervision. Thus, in this case we see a kind of specialization of each sector: silver coins issued by the state, bronze issued mainly by the private sector. This, again, is one of the earliest examples of the issuing and circulation of private coins, which are common in electronic form in the 21th century (bitcoin, ethereal, and more than 1,600 types of electronic coins in total).

The Athenian state was very strict in the control and auditing of officials involved in monetary affairs. The operations of the Athenian silver mint were directed by a *Board of Epistatai* (supervisors) being public magistrates who served for fixed terms and, as with the case of the *Board of Poletai*, they were answerable to the *Council of the 500* and ultimately to the Assembly at the beginning and the end of their tenure in order to discourage embezzlement and fraud, and encourage fiscal responsibility. There were 10 *Epistatai* plus a secretary (Develin 2003: 13, 292-293). This means that auditing procedures and the supervision regarding the production of the quantity of money was the responsibility of the state institutions, and of the citizens themselves (Council of the 500, Assembly). This contradicts with modern practices where money supply is determined by the Central Banks. As will be further explained in section 4, the Assembly voted on the minting of any new series of coins and the reminting or demonetization of old ones. So, monetary policy regarding the production of currency and money supply[3], rested ultimately with the citizens, in a direct democracy procedure of voting.

3. How and why the Athenian drachma became the leading international currency during the Classical period

After the repulse of the second Persian invasion and the victorious for the Greeks battles of Salamis (480 BC) and Plataea (479 BC), the Athenians formed the Athenian Alliance (also known as, the Delian League) to continue the war against the Persians, which lasted till the so called "peace of Kallias" (the Athenian negotiator) of 449 BC. The Alliance gradually changed from a league of independent city-states to an Athenian empire of mainly, subordinated city-states, which at its maximum extend included 316 city-states (Figueira 1998: 52).

[3] To this point, we have to clarify that in ancient Greece, the monetary base consisted of currency in the form of coins. A monetary base regime is appropriate when it can deliver stability and the three functions of money can be performed without difficulty. The usual categorization of kinds of money is based on the distinction between a) "commodity money", when no inflationary nominal value is presented and b) "fiat money'", when market values of this currency exhibit large deviations from fundamental values. Commodity money bases its value on its scarcity due to special characteristics. This is the case e.g. with silver and gold coins. On the other hand, fiat money is tightly connected to the credibility of the issuer and requires large levels of trust in order to provide confidence to users and the "legal tender'". While commodity money is costly to produce due to large intrinsic value, fiat money could multiply its nominal value at almost no cost, thereby providing a boost to inflation and triggering higher GDP. This is why fiat money is considered to lead to expansionary policies, which are very popular especially in developing countries with no orientation to future economic stability.

During the same period, gradually the allies went over to payment of money to cover the cost of war, instead of providing ships, crews and soldiers, with a few exceptions like the islands of Chios and Samos which continued to provide ships. This development had important monetary consequences. Gradually within the Alliance, a parallel circulation of silver coins from various state's mints started to emerge (Athens, Aegina, Chios, Samos, Rhodes, etc.), leading to currency competition, but also to the introduction of common measures (for weight) and silver content. This facilitated the payment of tribute by the allies, but also trade.

Free movement of an extended variety of goods and services, based on market economy principles and property rights protection environment was established between Athens and its allies, with Piraeus being the international entrepôt of the antiquity mainly due to the huge volume of the commercial transactions that were taking place in it (Cohen 1992: 141; Woolmer 2016; Economou and Kyriazis 2017). The Athenian products had easy access in a huge unified economic area. The territory of Attica was rich in a great variety of products such as cheese, honey, hides, wool and charcoal and Athens had an expertise in various sectors of production, such as olive, honey, ceramics etc. Athenian exports comprised olive oil, Hymettus honey, a little wine from the agricultural sector, but more significantly, handicraft and "industrial" products, like pottery, furniture, silver plate, arts products like marble and bronze statues, iron and bronze domestic utensils, arms and jewelry (Halkos and Kyriazis 2010).

Thus, the Athenian Alliance was the forerunner of later customs and monetary unions. Interstate trade between Athens and its more than 300 allied city-states (as well as with other non-Alliance member city-states) developed in such a magnitude that according to Hansen (2006: 92) in the 402/1 BC Athens' import and export trade, including transit trade, must have sum more than 1,800 talents, which is equal to 10.8 million drachmas since one talent was equal to 6,000 drachmas and when one drachma was a day's wage for an unskilled worker. Thus, 1,800 talents were a very large sum and it is a proof of the commercial dynamics that were developed between Athens and its allies. Currency competition within the Alliance, but also and even more, outside it, favored currencies emitted by larger economies, because this was related to their economies size (what we call today, GDP) and trade and this lowered information and transaction costs in general for its users, since these coins were more easily recognized and the users had a clear perception as to their silver content and thus as to their value.

Currency competition evicted gradually electrum coins by silver coins, because the monometallic content of silver coins could be more easily evaluated than the bimetallic of electrum coins, thus making easer the calculation of their value, and thus again lowering information-transaction costs. In addition, the die (stamp) of a state mint was a guarantee of value and this justified a degree of seigniorage.

A key factor for the establishment, the evolution and the success of such a beneficial environment for interstate trade is related to the so-called *Coinage Decree* of Athens which made the acceptance of the Athenian drachmae mandatory within the Alliance (legal tender) but did not prohibit the minting and circulation of local currencies. The *Coinage Decree* was found on two separate stone inscriptions and since then has fueled continuous discussions among historians. Some historians have interpreted it as prohibiting the use and circulation of other currencies within the empire, but we are convinced by Figueira's (1998: 310-411) interpretation that it introduced common weights and standards and made Attic drachmae the leading international currency but did not prohibit minting of coins by other mints and parallel circulation of their coins. Figueira (1998: 176) argues after the Decree, there were at least 11 and possibly as much as 24 mints of allied city-states still in operation, which proves that the Decree did not forbid the minting of coins by non-Athenian mints.

Furthermore, continued currency competition kept seigniorage at relatively low levels. A bit later, in 375/4 BC, the Athenian Assembly voted the so-called *Nicophon's Law* which mandated that counterfeit or fraudulent coins were to be sized, withdrawn from circulation and demonetized, guaranteeing again the value of the coins and trust of users in them. Under this law, the parallel circulation and acceptance of good foreign coins was permitted in Athens. To implement the law, two public slaves were introduced, known as the "testers" (*dokimastai*) who had a bench in the *Agora* of Athens and at the harbor of Piraeus and examined foreign currencies against fraud. If one of the private contracting parties had doubts regarding the purity of the foreign coins, he could bring them to the "tester" who examined their purity. If found impure (e.g. in the case of fraud) the coins were confiscated, then cut through immediately and then became sacred property of the treasury-temple of the *Mother of the Gods*, which was one of the Athenian treasuries-temples[4]. If found to be authentic imitations of the Athenian drachma, (meaning that they were of the proper silver content) they were

[4] For the *Treasuries of Athena and the Other Gods* see section 7.

returned to their owners, who then had the right to use them legally in order to perform commercial transactions in the market (Rhodes and Osborne 2003: 115). The parallel circulation of currencies was a measure to reduce transaction costs and thus increased trade coming to Piraeus (Ober 2008: 222-225, 237).

The *Coinage Decree* and Nicophon's Law significantly strengthened the position of the Athenian as the universally accepted currency in the Eastern Mediterranean. Through the establishment of the Athenian drachma as the legal tender among its allies and other states the Athenians achieved the establishment of a unified economic area of commercial transactions which was beneficial to their strong economy.

4. Money without a central bank: Introducing monetary policy under direct democracy

Bearing the above into account, then, an important issue arises: How was money supply regulated in Athens? Money supply was driven by money demand out of two sources: the state and the private sector. The city-state of Athens, through its "budget", had to pay for the armed forces, navy (construction of ships and payment for crew) cavalry and infantry, construction and maintenance of fortifications, the public buildings like temples and the administration, which included the remuneration of the participants of the Assembly which required a quorum of 6,000[5], payment of members of the Council of the 500, other administrators, approximately 700 public magistrates who worked in various government agencies such as street cleanliness, policing, water supply, maintenance of the city's walls, maintenance of the city's temples etc., the members of the *Heliaia* popular courts, the citizens who participated in the popular *Assembly*, the cost of education of the orphans whose fathers were lost in the war, the foreign embassies etc. (Hansen 1999; Kyriazis 2009). All these payments were in silver currency, so that money supply of coins should be sufficient to cover expenditure.

The second source of demand was the private sector in order to cover daily exchanges in the market, for trade, for citizens to be able to pay the costs of *liturgies*[6],

[5] The Athenians had introduced a reimbursement of 3 obols (half a drachma) when attending the assembly meetings, so as to increase citizen's participation in the assembly. Later increased to one drachma (Hansen 1999).

[6] *Liturgies* were a special type of taxation through which a wealthy man, and later a group of them, undertook to finance the provision of a public service, such the maintenance of a warship, known as the process of *trierarchy* (Lyttkens 2013).

taxes, custom duties etc. Money supply could be further increased by the monetization of bullion held by privates, war booty, which was melted and monetized, and by the issuing of small value bronze coins by private persons. The monetization of bullion, shows a good intuitive understanding of economics since the Athenians knew that they could influence money supply by altering the terms under which the state mint accepted old (worn out) coins and bullion held by privates, for restriking, by lowering the cost if they wished to increase supply and vice versa. Anybody who had silver bullion might convert it into drachmae at a small fabrication and seigniorage cost. Thus, the mint undertook a function of modem Central Banks of influencing liquidity through their interest rate (discounting) for the acceptance of bonds.

Having the above in mind, the Athenian citizens had to decide in the popular Assembly as to the proper quantity of money supply that should be produced by the silver mint so as to cover the state needs (Figueira 1998). Thus, issues of monetary policy were introduced to and decided by the Assembly. This is a major difference with today's situation in which monetary policy is entrusted to non-elected "experts" and "nonpolitical" bodies like the Central Banks which (in principle) are independent of political manipulation.[7] And since the Athenian drachma became a universal coin in the Eastern Mediterranean, Athenian citizens showed remarkable forbearance against the temptation to adulterate its silver content, when even a minor debasement would have reaped appreciable benefits, given the size of coins in circulation. Athenians were conscious of the long-term benefits of trust and reputation in their currency, as against short term benefits from debasement. They were proud of the purity of their coins and understood that their wide acceptance and circulation enhanced the prestige and standing of their city.

This is perhaps an intertemporal historical phenomenon. For example, various authors such as Piketty (2014) express clearly the benefits for the US economy from the privilege enjoyed over time by the dollar. For example, after the US financial crisis during the 2007/2008 due to the subprime mortgage market failures in the United States, which lead to the devaluation of the dollar there were many who argued that this

[7] But even today, there are in some states exceptions, where citizens may take directly monetary policy decisions. In 2017 Switzerland undertook, after a *citizen's initiative*, a referendum on the following issue: The Central Bank should buy back (or not) gold reserves it had previously sold. The referendum rejected the initiative, vindicating the Central Bank, but if the vote was contrary, the Swiss Central Bank would have been obliged to buy back the gold. In another more recent referendum known as the *Vollgeld*, on June 10, 2018, Swiss citizens, decided that they do not wish to give the Swiss National Bank the sole authority to create money (75.7% of the voters as against only 24.28% who voted to grant that authority).

situation, if not being inhibited in the long term, could seriously jeopardize the position of the dollar as the main international reserve currency. Just a small proof of this, is that after a short-term period after the 2007/2008 financial crisis, during the second quarter of 2009, central banks worldwide had almost stopped accumulating dollars for a period of time[8]. Thus, by establishing drachma as the international legal tender of the time, Athens enjoyed a series of benefits:

4.1. Socioeconomic cohesion

Athenians were proud of the parity of their coins and understood that their wide acceptance and circulation enhanced the prestige and standing of the city, and also, within the city borders, reinforced social cohesion, since nobody could manipulate the content of the coins in their favor, as a dictator, king, emperor or tyrant could have done. The citizens decision-makers had a strong personal incentive to keep the value of their currency stable. Since a large portion of citizens were paid by the state budget for services rendered to the state, or even to participate in the running of the state, such as military service for example as rowers in the fleet, or being jurors, or public magistates, or for work in the public works, introduced by politicians such as Pericles, Eubulus and Lycurgus[9], they would not accept payment in undervalued-debased coins[10].

4.2. Equal treatment of citizens regarding economic/commercial matters

Related to the above, in a wider sense, the purity of the coins and their control by the Assembly was seen as another element of *isonomia* (equality in front of the law), one of the main pillars of democracy. Athenians had understood that protecting the value of their currency was the best guarantee of sound money.

4.3. Significant seigniorage and trade benefits

Athenian currency leadership brings with it *seignorage*, small in percentage in Athens, but overall not negligible as a source of revenue for the state, due to the important

[8] See among others the views of Kenneth Rogoff and Nouriel Roubini on this:
https://scholar.harvard.edu/files/rogoff/files/was_quantitative_easing_best.pdf
https://www.ft.com/content/9a5b3216-c70b-11de-bb6f-00144feab49a
https://www.project-syndicate.org/commentary/unconventional-monetary-policies-and-fiscal-stimulus-by-nouriel-roubini-2015-02?barrier=accesspaylog

[9] For the Eubulus and Lycurgus fiscal expansionary public work programs see Economou and Kyriazis (2016).

[10] On this issue we come back in the next section.

amounts of bullion converted into coins. Bullion would be converted into coins instead as, for example being exported as such, only if the coins exchanged for it were good. In Athens, we had an example of free trade and free movement of capital in the sense that there were no prohibitions for exporting it, or keeping it as such. Thus, the revenue from seignorage was an incentive to keep the currency good, in order not to lose "customers", who in the opposite case could offer their bullion to foreign mints, to be converted into foreign good currencies. In a longer sense, this would correspond to a case of tax (seignorage) competition.

4.3. Covering the grain shortages of the city

Historically Athens had major shortages in terms of domestic grain production, and therefore relied on imports in large quantities so as to meet the needs of its population. It was imperative that Athens' commercial transactions with foreign traders were made with good currency since if those traders who were selling cereals to Athens knew that were to be paid in debased currency, they would not have undertaken this kind of trade with the city.

4.4. Geopolitical gains

This unified economic area between Athens and its allies went hand in hand with political and "military" unification, with Athens being the leader. Athens was the most influential member and, if needed, it could even impose its will on them. Athens achieved to become a "hegemon" among its allies, due to its superiority in some qualitative factors such as: military strength, economic might, introduction of the drachma as the leading international currency, being the cultural center in the Eastern Mediterranean etc.

5. The operation of an inverse Gresham's law

Gresham's law of bad (undervalued in metal content) currencies driving out good ones if bad and good currencies are exchanged on parity per decision of the ruler-state, is well known. The crucial point here is that Gresham's law operates only under a government state's monopoly that obliges market participants to accept undervalued currency as the only legal trader. In Athens, two operating dictions were different, and these led to what we call an inverse Gresham's law, good currency driving out the bad.

These conditions were i) that Athens was a direct democracy and not an authoritarian central state ii) there was currency competition.

In the previous sections we argued that Athenians were conscious of the long-term benefits of trust and reputation of their currency. Since a large portion of the citizens were paid by the state budget for services rendered to the state, or even to participate in the running of the state, such as military service for example as rowers in the fleet, they would not accept payment in undervalued-debased coins. Under currency competition and a free market, no participant had an incentive or obligation to accept a bad currency for market transactions. Citizens who would be paid for their services to the state with the debased currency would realize that the debased currency with which they were paid, exchanged on the market at a discount.

Thus, they would face a loss in real purchasing power. Then, since they had the decision-making power in the Assembly, they would vote against the debasement, reestablishing the real value of the currency, as did happen after the end of the Peloponnesian war with the withdrawal of the debased silver-plated coins. Thus, again, the interplay of market forces and incentives with direct democracy would work as an inverse Gresham's law good currency driving out the bad. Since currency circulation in Athens was in part driven by demand (through the possibility to convert bullion into coins) no private person would convert his silver bullion into debased coins, which could lead to a shortage of Athenian currency, forcing the state to change its policy and reestablishing good value coins.

Furthermore, Athenian currency leadership brings with it *seignorage*, small in percentage in Athens, but overall not negligible as a source of revenue for the state, due to the important amounts of bullion converted into coins. Bullion would be converted into coins instead as, for example being exported as such, only if the coins exchanged for it were good. In Athens, we had an example of free trade and free movement of capital in the sense that there were no prohibitions for exporting it, or keeping it as such. Thus, the revenue from seignorage was an incentive to keep the currency good, in order not to lose "customers", who in the opposite case could offer their bullion to foreign mints, to be converted into foreign good currencies. In a longer sense, this would correspond to a case of tax (seignorage) competition.

Good currency was linked to trade predominance of Athens and Piraeus as the main Mediterranean *entrepôt*. The Athenians understood that in order to attract trade and increase the budget's revenue out of the 2% import and export customs duty (Economou

and Kyriazis 2017) they had to have a good and internationally accepted currency. Linked to this, was Athens necessity to attract grain imports, since Athens had a deficit in cereals. Obviously, traders would not bring cereals into Athens, if they were to be paid in debased currency. Athenian coins were furthermore one of the main export items of Athens (covering, in today's terminology, a trade deficit) and again this would not have been possible with a debased currency.

Last but not least, the political and strategic context. During times of war, along site the citizens hoplites, cavalrymen, rowers and sailors, specialized troops had to be attracted. These were mercenaries, like Aetolian and Thracian *peltasts* (javelin throwers) Balearic slingers and Cretan archers. In order to attract them (and deny them to the enemy) in an international competitive market, Athens had to offer them payment in good currency. The more attractive the currency, the higher the supply of mercenaries, this being another aspect of currency competition.

6. How Athens managed deficit spending under extraordinary times

After the so-called Social War of 357-355 BC, (the secession of its allies out of the second Athenian Alliance) Athens experienced financial difficulties, state revenue having plunged to 130 talents per year, Eubulus, the leading politician and *tamias* (finance minister) undertook extraordinary measures to increase revenue. Among them, a decree ordered the recoinage of older coins and the issue of new ones to replace them. (Economou and Kyriazis 2016).

Thus, as it has already been argued, during periods of financial difficulties and deficit spending due to extraordinary situations, as by the end of the Peloponnesian and Social Wars, money supply could be further increased by issuing electrum coins (which were phased out during the first half of the 5th century), gold, bronze, and silver-plated (with a bronze core) coins[11]. A characteristic example is the melting down of public holdings of gold, especially that of the God's treasuries. The first gold coins were minted in 407 BC, by the melting, among others, of gold covering 7 *Nikai* (Victory) statues. Private individuals sold their silver and gold plate to procure *tetradrachms* in order to pay taxes

[11] During this period, the Peloponnesians occupied permanently and fortified Dekelia, on mount Parnes, on Attic soil. This was an inducement for slaves working in the Laurion mines, to escape, according to Thucydides (*Hist*. 7.27) as many as 20,000 from 413 until the close of the Peloponnesian War in 404 BC. The Laurion mines thus diminished production of silver or even stopped producing during that period.

and subsidize their military service. Inflow of gold pushed its relation (exchange rate) to silver down. Supply of gold increased also due to the Persian subsidies (in gold Daric coins) given to the Peloponnesians. The exchange rate of silver to gold fluctuated according to demand and supply, as demand for coins, bullion and for private use (jewelry, etc.) varied. The exchange rate fluctuated between at least during the 434-397 BC period (Figueira 1998: 511-521).

Thus, by the end of the 5th century, in Athens and the Alliance there was a four elements metallic system in operation: silver, silver plated, gold and bronze coins. However, what is important is that the Athenians were conscious of the necessity of keeping the reputation in their currency, and the trust of both the Athenian and the foreign public to it. Thus, they undertook deliberate efforts to avoid an incremental debasement at the main series of drachms and tetradrachms. A further indication of the Athenians consciousness was that very soon after the end of the war and the restoration of democracy, the silver plated and the gold coins were retrieved from circulation and demonetized. Athens reverted to the silver coins as their legal tender (Figueira 1998: 510-511).

During extraordinary situations that forced the Athenian authorities on deficit spending, the Athenian state had also a second important available, policy to get out of the crisis; it could resort to borrowing. Lenders were: i) the so-called *Public Fund* (*Demosion*) which collected fines, rents, and remittances from public property leases to private individuals, and it was mainly the fund that earned significant revenues from the Laurion mines. The staff of the fund that was responsible for the collection of these money remittances was called *kolakretai* (Samons 2000: 55-69; Blamire 2011: 106-107) ii) the *Delos Fund* or *Allied Fund*. It was created in 478 BC. Its main purpose was to collect the taxes from the allied cities that were necessary in order to apply the deterrence grand strategy against the Persian threat, with Athens being the leader. The staff of the fund were called *hellenotamiai* (Samons 2000: 70-83) iii) the so-called *Treasures of the temples of Athena and the other Gods*.

The majority of their revenues came from state "donations" to the god (or goddess) thus becoming the guardian of the state's money, and probably, up to the beginning of the Peloponnesian War, also for a part of the allies' contribution. These treasuries-temples also collected money from the payment of fines, rent of property owned by the state and even private donations. The treasures included sacred vessels used in processions (like the Panathenaea) and other festivities, Persian spoils and other

valuable objects of a total value of no less than 500 talents. Treasuries of the gods invested part of their money in interest bearing deposits with private banks. Part of this money was used to maintain and repair public buildings. Then the proceeds created by the temples-treasuries, could be given as remittances to the state when in need of borrowing. Due to this, the treasuries gave the loans to the Athenian state at interest rates from 1,2 % to 6% (Blamire 2001; Van Alfen 2011).Thus, the *Treasures of Athena and the other Gods* were very substantial, that of goddess Athena in 431 BC (beginning of the Peloponnesian War) was valued at 6,000 talents half of it in Attic silver coins and the rest in foreign silver, electrum and gold coins. These treasuries were united into one in 406/5, in 384 they separated, but in 346 they reunited permanently[12].

When the state "borrowed" from the treasuries, it actually put back into circulation money which the state had left before to the safeguard of the gods, thus increasing the money supply in the economy. If so, the treasuries functioned as a kind of lender of last resort, or a quasi-Central Bank. This again could explain the very low interest rate, which was presumably set by the Council of the 500 or the *tamias* (finance minister), compared to other types of loans provided by private banks to individual entrepreneurs with interest rates for "landed" loans of about 12% and for maritime loans even as high as up to 100%).[13]

Here we must mention that after the defeat for Athens, in the Peloponnesian War, and the restoration of democracy, the Assembly decided in 403/2 BC to write off outstanding debt to the treasury of Athena. This is the oldest instance of a PSI (private sector involvement) ever recorded! The Athenians, understanding the necessity of trust and reputation did not repeat these extraordinary measures, and, anyway, as we analyzed above, the majority of the money borrowed belonged to the Athenian state which donated it for safekeeping to Athena's treasury.

7. The issue of inflation

A related aspect to the implementation of an expansionary monetary policy by the Athenian policymakers, for a variety of reasons, such as extraordinary situations (f.e.,

[12] The analysis of the institutional organization of the Treasures of Athena and the other Gods exceed the purpose of this paper. But an extensive analysis on the is provided by Samons (2000), Blamire (2001) and Van Alfen (2011).

[13] Due to the great uncertainty that was related to maritime trade and the safeguard of the cargos. See among others Cohen (1992) and Schefold (2011).

the Peloponnesian and the Social wars mentioned above) is the issue of inflation. Tentatively, some prices and wages were rising, but not only as a result of increased money supply. Gradually, since Athens was transformed into a prosperous market type of economy based on maritime trade, protection of property rights and commercial contracts[14] and by establishing a series of advanced (for the era) market economy type of institutions[15], it achieved economic growth (Morris 2004; Ober 2015) although relatively slow by some modern standards, so that increased wages (and prices) seem to be an indication of increased real incomes and in part, inflation. According to the extant evidence, we cannot separate the two issues (Figueira 1998: 472, 493-4; Loomis 1998, especially chapter 15 240-250).

Some indicative prices are extant. A *medimnos*[16] of barley costed 2 drachmae in 422 and the same in 329 BC. A *medimnos* of wheat costed 3 drachmae in 422, 5 to 6.5 between 414 to the beginning of the 4th century (a period of uncertainty and difficulties with supply due to the close of Peloponnesian war, 431-404 BC), falling to 3 drachmae in 393 and 5-6 between 330-324 BC. Shoes costed 8 drachmae in 388 BC and about 6 drachmae in 330 BC. An auction of slaves in 414 BC gives prices from 60 to 360 drachmae (360 for a skilled artisan jeweler), while prices during the fourth century fluctuated between 50 to 150 for unskilled, and 180 to 600 for skilled, (metal workers etc.). Remuneration followed price trends, daily wage of unskilled workers for the greater part of the 5th century being around two obols (1 drachma equals 6 obols) and 3 obols for rowers in the fleet. Rowers wage had increased to 1 drachma during the Peloponnesian War and the same rate applied for *hoplites* (heavy infantrymen) and their attendant. 1 drachma was the wage paid to skilled stonemasons for the Erechteion building project on the Acropolis in 409, the same wage being paid equal for Athenian citizens, *metics* (alien residents) and slaves, while by the end of the next century we have wages of 1.5 drachmae for unskilled, and 2 to 2.5 for skilled workmen.

Thus, extant evidence does not give a clear trend for inflation. Prices did fluctuate, wages did rise, but we cannot establish a purchasing power parity that would indicate either that wages or prices followed the same trend. (eg. real wages remained constant)

[14] For the importance of establishing an institutional environment that protects property rights and commercial contracts (Hodgson 2015a, b, c).

[15] As a proof of this, see again, among others, Cohen (1992) and the citations of ftn. 1 and the further references they provide therein.

[16] *Medimnos* was a pot which operated as a unit of measurement mainly of agricultural products. Its capacity was 52-59 liters. Wheat or barley etc. was stored in it. At the time of Solon, a *medimnos* had a value equivalent to one drachma.

or there was a faster growth of wages than prices, or vice versa. The few comparative prices we have for cereals show fluctuations, but no clear trend, since for example the 5 to 6.5 of 414-399 BC is about the same with the 5 to 6 for 330-324 (Loomis 1998, especially 32-62, 88-96, 104-106, 166-185).

8. Conclusion

Column 2 in table 1 in summarizes all the evidence regarding how the monetary institutions functioned in ancient Athens in relation to today's international practice (column 3).

Table 1: Monetary policy and institutions in ancient Athens and nowadays

Monetary policy institutional arrangements	**Athenian monetary system**	**Monetary system in a modern free-market economy**
Type of money:	Intrinsic value currency: mainly silver (but also bronze, and in some instances, also silver-plated or gold)	Fiat money (paper money supply) and M1, M2, M3
The authority entitled to issue currency:	The State (*Argyrocopeion* & *Nomismatocopeion*) • It had to be approved by the Council of the 500 and the Assembly • A direct democratic procedure related to the will of the people	Central Bank: A jurisdiction entrusted to (the independent by state supervision) Central Bank
Monetary Policy	• Determine the money supply in the market • Determine the interest rate	Central Banks implement various policies such as determine the money supply in the market, interest rate policies, purchasing bonds in international markets, regulation of foreign exchange, ensuring equal treatment of financial institutions regardless of their size and location etc.
Further means of affecting money supply	• Altering the terms under which the state mint accepted old (worn out) coins and bullion • Issuing of silver-plated, gold and bronze coins in exceptional circumstances such as war • War booty • Purchasing bullion by private investors or consortia • *Borrowing from the Treasuries of the Gods*: Functioning as a kind of lender of last resort, or a quasi-Central Bank.	• *Cryptocurrencies* (Digital Currencies) such as Bitcoin, Ethereum etc.) • *Zero interest rate policy* • *Quantitative Easing* (QE) policies • *Qualitative Easing* • *Credit Easing* • *Helicopter Money Drops* policies

Supervision and auditing regarding the production process of currency:	The State: Through the *Council of the 500* and the *Assembly*	Central Bank: A jurisdiction entrusted to (the independent by state supervision) Central Bank
market economy principles:	• Free movement of an extended variety of goods, services and people • Establishment of financial institutions such as banking services and insurance • Property rights and commercial contracts protection	• Free movement of an extended variety of goods, services and people • Establishment of financial institutions such as banking services, insurance • Property rights and commercial contracts protection
Customs and monetary unions:	Athenian Alliance	Such as in the current European Union (EU) and the European Monetary Union (EMU)
Parallel circulation of currency	Silver currency circulation and competition with the Athenian drachma being the main "universal coin" among other strong currencies circulated within the Alliance, such as those of Aegina, Chios, Samos, Rhodes, etc.	Currency circulation and competition with the dollar, being the global "universal coin" among other strong currencies such as the Euro, the British Pound, the Swiss Franc, the Japanese Yen etc.
Unadulterated/ non-depreciation of the value of currency	• A basic part of the Athenian international monetary policy • The best guarantee of sound money	• A key international US monetary policy for the success of the dollar as the universal legal tender • The best guarantee of sound money
State borrowing (when in need)	State Funds, being: • *Public Fund (Demosion)* • *Delos Fund* • *Treasuries of the Gods*	• International Organizations (such as IMF, World Bank) • Multinational investment banks (such as Goldman Sachs, Morgan Stanley etc.)

The Athenian currency well established and recognized as an international means of exchange was strong enough to dominate the Athenian and to a great extend the Mediterranean market without official support in the form of extensive regulation. The Athenians had faith in their currency and understood that the best way to safeguard its reputation and international acceptability was not through restrictions ("capital controls" in today's terminology) but in generating trust. This was achieved by keeping the value of silver of the coins unadulterated even under harsh circumstances such as the Peloponnesian war. They understood further that parallel circulation of currencies was not a threat but an opportunity to facilitate exchange and trade, and attract more trade and production capacity in Attica.

Under such a "globalized" environment in the Eastern Mediterranean during the Classical period, was Athens attracting substantial sums of, in today's terminology,

Foreign Direct Investment (FDI), and did the stand of monetary measures, parallel circulation of currencies, facilitate this? Our first tentative answer is yes, based on the operations of Athenian banks and the attraction of free foreign residents, *metics*. We know that Athenian banks attracted foreign "capital", offering services such as accepting deposits, providing loans, keeping bank deposits, providing insurance to commerce such as cargo ships, providing sums as loans for establishing primitive versions of joint-stock companies (which were further developed during the Hellenistic period), and even something similar to today's offshore services (Cohen 1992: 203-204). Part of this capital was invested, through loans in production and services, agriculture, manufacturing mining and shipping. Also, metics were numerous (estimates varying, but approximating a very high of about 30% of the citizens population) and involved in all sectors of economy activity, from banking to mining. Some metics, like the Syracusan Kephalos, or the orator's Lysias father were among the richest residents of Attica. We presume that metics settling in Athens, would not only bring with them their skills, but also some capital (FDI) from their cities of origin. The parallel circulation of currencies would thus facilitate the inflow of FDI, and this is an interesting area for future research.

Even more important and challenging is the issue of the procedures for the adoption and implementation of monetary policy measures. Here, there is a great difference between Athenian and modern practices. As we have analyzed, under the Athenian direct democracy, the citizens through their vote in the Assembly were the ultimate decision makers also for monetary policy, the safeguard of the currency's reputation and, at a last instance, for the auditing and control of officials who would be accused in front of the citizen's courts if they did not fulfill correctly their functions. These were "experts", introducing proposals for monetary issues, like Nicophon, and "experts" like the fourth century *tamiai* who administrated economic issues, both monetary and financial, that were interlinked. But the "experts" had to convince the Assembly and were controlled by it, through a democratic process. Athens did not have a central Bank, although it had a "national" silver mint. The private sector's banks were not controlled by any state body. So, there was no Central Bank monopoly, in the earliest known example of *free banking*[17].

[17] There is a large literature regarding *free banking*. One can see among others, Friedman and Schwartz (1986), Selgin (1987), Selgin and White (1994) and Neldner (2003).

With very few exceptions like the Swiss case mentioned above, in modern states, authority for monetary policy is delegated to "experts", the Central Bank, which has the monopoly of decision making on monetary issues. These "experts" are not elected, and are not accountable to the citizens[18] (or even to the governments, in cases of strongly independent Central Banks like the Fed and the ECB).

This again raises a general problem of modern democracies, in which Independent Regulatory Bodies (as for example for telecommunication, energy etc.) seem to proliferate. Do we entrust policies to such bodies because we do not trust elected politicians, but also the citizens themselves, who are not involved at all in the selections of persons to staff these bodies? The answer to this question is a fundamental one for the working of modern democracies and its answer goes beyond the scope of the present essay, but needless to say, an Athenian citizen would be astonished if he could study the present institutional set up. If he could also read Lincoln's definition of Democracy as "*government of the people, by the people, for the people*", he would probably ask, how does the "*by the people*" fit with the existence of not elected and not accountable bodies to the people? We hope to address some of these issues in future work.

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[18] For such a critique see, among others, de Haan and Amtenbrink (2000) and Stasavage (2003).

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