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Thinking ahead of the next big crash: Clues from Athens in classical times

by

George C. Bitros

Πατησίων 76, 104 34 Αθήνα. Τηλ.: 210 8203303-5 / Fax: 210 8203499
76, Patission Street, Athens 104 34, Greece.
Tel.: (+30) 210 8203303-5 / Fax: (+30) 210 8203499
E-mail: econ@aueb.gr / www.aueb.gr

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Abstract

Credible analyses and evidence submitted by experts from universities, international organizations and independent think tanks show that the trends which led to the 2008 worldwide financial crisis remain intact. As a result, central for responsible leaderships should be the concern how to forestall the next big one which might prove uncontrollable. Given the world dominance of the U.S. dollar, in a 2015 paper I discussed two paths of possible reforms: One bold but gradual, which would entail altering the present institutional setup of the U.S. Federal Open Market Committee ("the Fed"), provided that it maintains control over the Federal Funds Rate (FFR); and, if not, a radical one, which would entail replacing the Fed with a monetary regime based on free banking. In this paper I go a step further in the latter direction by drawing on the model of free banking that emerged in Athens in classical times and enabled the Athenian "empire" to turn the Attic drachma into the dollar of today, throughout the eastern Mediterranean and beyond, without causing major financial crises for over two centuries. More specifically, I argue that, even if the said model had not proved its potential as a highly successful historical precedent, as banker of the world, the U.S. ought to consider it as a benchmark for reference and adaptation, before an unexpected international financial crisis and/or the revolutionary technological developments in the front of gold-like digital currencies, precipitate a monetary regime change.

Keywords: Classical Athens • Democracy • Central banks • Free banking • Athenian model of money and banking.

JEL Codes: D7, E4, E5, E6, G2, N4

George C. Bitros
Emeritus Professor of Political Economy
Athens University of Economics and Business
76 Patision Street, Athens 104 34, Greece
Tel: +30 210 8203740 E-mail: bitros@aueb.gr
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1. Introduction

In the aftermath of the long recession that followed the 2008 financial crisis, responsible leaderships in the U.S. behaved as if nothing happened. They had an excuse. By the end of 2019 the U.S. economy had returned to growing even above its potential. Unemployment had declined to historical lows. Monetary authorities had even trouble pushing the inflation rate up to their 2% target rate. Asset valuations had resumed their robust upward trend, etc. But many experts from international organizations, universities and independent think tanks offered credible analyses and evidence to the contrary.[1] Not everything is alright, they insisted, because the underlying trends that led to the 2008 crisis remained intact. For an example, consider the global financial imbalances. According to Mohan (2009, 1), then deputy governor of the Reserve Bank of India (RBI):

> The proximate cause of the current financial turbulence is attributed to the sub-prime mortgage sector in the USA.[2] At a fundamental level, however, the crisis could be ascribed to the persistence of large global imbalances, which, in turn, were the outcome of long periods of excessively loose monetary policy in the major advanced economies during the early part of this decade.

Several years later, Bitros (2015, 70-77) assessed the evidence for the U.S. from where the crisis erupted and concluded that culpable for what happened were lax monetary, housing and other primarily systemic bank related policies. Have these anomalies been confronted in the meantime? Not really because, beyond certain superficial macro- and micro-prudential interventions, the U.S. Federal Open Market Committee (henceforth, "the Fed") loosened monetary policy to such an extent that, even before the adverse shocks of the current coronavirus pandemic, it stood prisoner of the dilemma expressed in the following quotation from the *Global Financial Stability Report* of the International Monetary Fund (2018):

> "A more significant tightening in global financial conditions will expose financial vulnerabilities that

[1] See, for example, the most recent assessments by Blinder (2019).

[2] U.S. banks from within and outside the Federal Reserve System have been consistently encouraged to offer to low income households mortgage loans priced at commensurate interest rates. For many years the demand for such loans was brisk, their stock accumulated to several trillion U.S. dollars, and banks faced no debt servicing problems. With the exception of two bank failures in early 2007, the significance of which was missed by the responsible authorities, ominous signals earlier might have been easily construed as regular data blips. However, under the semblance of normalcy some very bad trends were evolving. These amounted to increasing rates of unemployment, accompanied by declining labor force participation, increasing poverty, accompanied by declining labor share, and increasing inequality, accompanied by an extraordinary accumulation of income and wealth in the top 1% of U.S. households. Therefore, one might reasonably assert that it was not the sub-prime interest rate loans or the lax policies that led to the crisis but the declining labor share and the rising poverty which rendered large masses of working people unemployed and unable to service their housing loans. Moreover, as argued by Bitros (2019), the timing and the severity of the crisis might have been instigated by other forces emanating from the real side of the economy, partly independently and partly due to the effects of prior initiatives or lack thereof by monetary and fiscal authorities.

have built over the years and will test the resilience of the global financial system.

By implication, in view of the world dominance of the U.S. dollar, if and when the Fed attempts to return to normalcy, they will risk a new global financial crisis. It is a terrible impasse with the stability of the international financial system hanging on the balance.

Can anything be done to stem another worldwide financial crisis which might become uncontrollable under the new international circumstances? In view of the inertia in the status quo, and since history suggests that proposals like the one presented by the previous Governor of the Bank of England (BOE) are unlikely to materialize,[3] looking forward an alternative reform would be the one considered in Bitros (2015). This would entail the constitutionalization of the Fed, so as it may function in the established system of checks and balances along with the executive, the legislative and the judicial powers of the federal government, in conjunction with a legislated obligation to follow a monetary rule of its choosing, but known well in advance to economic agents. If the Fed retains control over its policy instrument, i.e. the Federal Funds Rate (FFR), this reform might prove effective, even though it is doubtful whether it can pass through the U.S. Congress under normal circumstances. However, if further research continues to ascertain the lack of such control or in the advent of an unexpected worldwide crisis, which might precipitate an urgent shift towards a monetary regime change, the best reform would be to scrap the Fed and opt for an Athenian type model of free banking, which combines a Uniform Official Currency (UOC) unit with private production of commodity-like money in competitive markets along with all other goods and services.[4]

The objectives in this paper are threefold. First, to highlight the structure of the Athenian model of money and banking; second, to assess its properties by reference to the standard of price stability, which has been used traditionally in gauging the effectiveness of monetary arrangements in contemporary market economies;[5] and, lastly, to explain why this model may serve as a benchmark

[3] See Karni (2019). Libra is a digital currency that the giant U.S. company Facebook Inc. plans to introduce and manage as part of its worldwide social media network. However, as of August 2019, its launching continued to remain under consideration.

[4] Scrapping the Fed and central banks in general and replacing them with monetary systems based on commodity currencies and competitive banks all possessing equal rights to trade is not recommended only by the successful historical precedent of Athens in classical times. In addition, it has long been proposed in the voluminous literature in the tradition of Smith (1936/1990). For a review and assessment of this literature see Sechrest (1992/2009),

[5] Aside of the traditional metric of price stability, monetary arrangements in contemporary market economies are tasked to achieve low unemployment, economic growth in line with the economy's productive potential, and moderate long term interest rates. For a comparative assessment of such arrangements in classical Athens and the U.S in the postwar period with regard to the latter three criteria, see Bitros, Economou, Kyriazis (2020, Chapter 7).

for reference and adaptation, should the established central banking order crumble under the burden of its internal inconsistencies and/or an unexpected implosion of the international financial system. After a short digression in the next section to single out a few key rudiments of state governance and money in classical Athens and the United States (U.S.), the organization of the paper follows the above objectives in the same order.

2. The institutional background of the model

The Athenian democracy was ruled by three entities: The *Ecclesia of Demos* (congregation of citizens) or *Assembly*; the *Council of 500* or *Boule*; and the *Dikastiria* or *Courts*. The *Assembly* comprised all adult male Athenian citizens, exercised the top decision-making authority, including legislative and select ultimate-degree judicial and auditing powers. It convened four times during each *prytany* (tenth of the conciliar year), which lasted from 36 to 39 days, and at least forty times per year in total. It could be in session only when more than 6,000 citizens were present. One of the four meetings of each *prytaneia* was devoted to discussion and decision-making on issues of governance, defense, foreign policy, provisioning of food and other supplies, including welfare, while the other three dealt with various issues. The *Boule* consisted of ten groups with 50 members each from the 10 tribes of Athens. The 50 members of each tribe served in the *Boule* for one tenth of each year and were replaced by another group at the end of each *prytany*. Thus, in practical terms, each tribe that held this post actually ruled Athens with full executive rights. Among their other duties were to supervise the execution of the state budget, to manage the *treasuries of the gods*, and to oversee the operations of the mint.

From these well-established historical details, it follows that Athens was governed by *direct democracy*. In this system of governance the interests of those who govern coincide with the interests of those who are governed and thus it was to the benefit of all to manage the finances of the state and the currency as prudently as their own. Beyond this fundamental institutional feature, from Bitros, Economou, Kyriazis (2020) it is worth noting that Athens:

- Did not run systematic budget deficits, nor did it borrow from private markets in cases of unexpected revenue shortfalls. Instead, in affluent years they donated part of the budget surplus to the *treasuries of the gods*[6] and these funds together with those from private

[6] These were shrines devoted to gods that served various religious and social purposes and managed particular treasures. For example, the *treasury of Athena* managed the treasures of Parthenon. They functioned as bankers to the state during peacetimes and as lenders of last resort in periods of war. They were run by a group of magistrates

donations to the shrines remained available for the state to borrow on interest in cases of extreme and unexpected circumstances.

- Maintained control over the standards and the organizational safeguards to protect the integrity of its silver currency; pushed for the adoption of Attic drachma among its allies but without ever forbidding explicitly the parallel circulation of currencies within its borders;[7] and operated a mint where the state as well as anybody who had silver bullion might convert it into drachmae at a small fabrication and seigniorage cost.

By contrast to the preceding, the system of governance in the U.S. is *representative democracy*; according to Franklin (2005, 87), the interests of *politicians-agents–representatives* align only rarely with those of the *principals-citizens*; public finances are managed in line with the short-term and expedient interests of those in power at any one time, thus resulting in systematic budget deficits and unsustainable public debts; and hence, as a result, given the dominance of the U.S. dollar in world transactions, monetary policies driven by U.S. national interests may destabilize the international financial system at any time and bring about another worldwide financial crisis, which under the current international circumstances might become uncontrollable.

Finally, before embarking on the main tasks, a clarification is in order regarding the distinction between the terms "coins", "coinage" and "currency", on the one hand, and "money" on the other.[8] Cohen (1990, 2008) has established beyond any doubt that the banks in classical Athens created credit by a multiple of the deposits they received.[9] However, apart from this common feature, those

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called *tamiai* (treasurers). The latter were appointed for one year, operated under the supervision of the *Council*, and they were relieved of responsibility only after strict audit.

[7] Presumably, in the Solonian tradition, whatever was not forbidden explicitly by the laws it was considered legal behavior. Therefore, when Ober (2008, 225) writes that *Nicophon's Law* provides:

> … for the tacit certification of certain silver foreign coins as good, and for the confiscation of bad coins,

in essence, Ober, Rhodes, Osborne (2003, 113), Engen (2005, 370) and others, who hold the same view, agree that it was market forces that determined whether and to what extent coins issued and stamped as Attic by various foreign states circulated in parallel in Athens. Should there be any doubt about this interpretation, here is how Shipton (1997, 408) reinforces it:

> We thus appear to have an open system where 'good' imitation *owls* are free to circulate alongside silver currency from Attica. And since only the tester in the Piraeus is a new appointment, it is clear that at some point between the setting up of the *board of the nomothetai* and the decree itself, Athens had already taken steps *to ensure an open system.*

[8] In addition to "money" circulated in classical Athens many "near money" substitutes.. The latter is defined as anything, tangible or intangible (e.g. promissory or any other form of commitment to a future money payment) that proves itself good enough in value preserving properties as well as in convenience and low transactions cost to outperform barter. Below the focus turns exclusively on "money" in the form of currency, bullion, and bank credits.

banks differed from the ones of more recent decades in the following notable respects: a) the currency they dealt with was silver coins and bullion convertible into coins on demand at the state mint; b) their so-called base money consisted of coins and bullion they themselves owned and/or derived from *primary deposits* by wealthy citizens, *metics*[10] and *treasuries of the gods*; c) *secondary* or *derivative deposits* in the amount of *primary deposits* times the inverse of the *reserve ratio* emanated from advances of bank loans for consumption and production purposes; and d) since there was no central bank to generate for them base money and require that they apply a specific *reserve ratio*, the banks determined it along with all other variables in the monetary system. Does the absence of an exogenously imposed *reserve ratio* imply that the Athenian banks were very prudent and abstained from creating excessive amounts of credit? Not necessarily.[11] Some banks did issue excess credit and from Cohen (1992, 215-224) we know that a number of them failed. But given that depositors had all the incentives to guard against banks which overextended in the quantity and the quality of loans that they advanced, on the whole banks should have practiced restraint from the fear of having to face a run by their depositors.

3. The Athenian model of free banking in classical times

The objective in this section is to explain how, by mediating between savers and borrowers in the fully competitive environment that evolved over time, the Athenian banks determined the quantity and composition of money in the form of silver drachmae, silver bullion, primary bank deposits and bank loans, along with other key variables like the reserve ratio and the interest rate.

3.1 Demand and supply of currency and bullion

In the Athenian economy there functioned two markets for silver, one for silver in the form of currency and another in the form of bullion. Both markets were closely interconnected because, as I

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[9] Research interest in the range of activities of the Athenian banks in classical times antedates Cohen's (1990, 2008) definitive assessment of the available historical evidence by several centuries. For example, from the study by Vernadakis (1881) we learn that the first attempt to put together an account of the evidence was undertaken in a dissertation by Claude de Salmasio in 1740.

[10] This term refers to citizens from other city-states who were residing in Athens for work.

[11] Nor does it imply that the banks were in any discernible ways less avaricious than banks today. The critical difference is that ancient Athenian bankers had no central banker to blame if their business collapsed and they could not shift the costs of their errors on to the taxpayers. On the contrary, today a central bank with its monopoly power on the quantity of fiat money ends up with significant co-responsibility with the so-called systemic banks and this explains why selectively they may bail banks out upon imminent default. In this respect, recall that in the U.S and the U.K in 2008, Lehman Brothers went bankrupt whereas financial behemoths like Merrill Lynch, Freddie Mac, Fannie Mae, Royal Bank of Scotland and Alliance & Leicester all came very close to defaulting and had to be rescued.

indicated earlier, for some relatively small cost bullion could be converted on demand into coins at the Mint. Hence, the supply of currency in every period was equal to the quantity of bullion that was worth holding in the form of coins on the grounds of its purchasing power in terms of goods and services; Or, more accurately, it was equal to the quantity of bullion worth holding in the form of coins on the grounds of its purchasing power in terms of goods and services all over the then known world, because the economy was completely open and local silver markets for currency and bullion coincided with the international ones. In this framework, let the purchasing power of drachma be denoted by a continuum of prices p^c and the quantities of the currency offered in exchange for goods and services at these prices by the symbol S^c.[12] The pairs of (S^c, p^c) define the supply side of the market for currency. Moving next to the other side of the market, assume that at the prices p^c the providers of goods and services offer to purchase D^c quantities of currency, and hence that the pairs (D^c, p^c) describe their demand for currency.[13] In the jargon of contemporary economic analysis the aspect that would attract attention at this point would be the mechanism by which the supply and demand for currency arrived at equilibrium.[14]

Figure 1 in the next page highlights this issue. Graph (i) depicts the above-defined curves of the demand and supply of currency. The supply curve has been drawn in an upward sloping fashion because it is reasonable to assume that, as the price of the currency in term of goods and services increases, e.g. if a plentiful harvest or extraordinary loads of grain from the Euxine came to the market in Athens, bullion holders would be motivated to convert more and more of its quantity into currency.[15] On the contrary, regarding those who demand currency by offering goods

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[12] In the past several renowned economists have insisted that money is as subject to supply and demand as any other good or service. For example Mill (1923, 490) writes:

> …the value or purchasing power of money depends, in the first instance, on demand and supply. But demand and supply, in relation to money, present themselves in a somewhat different shape from the demand and supply of other things…whoever sells corn, or tallow, or cotton, buys money. Whoever buys bread, or wine or clothes, sells money.

[13] It was mentioned earlier that in various periods there circulated in Athens privately fabricated and monitored but state backed small change coins made of bronze whose metallic value was far less than its nominal worth. These constituted in essence a form of fiat currency. However, by all historical accounts, their amount was insignificant relative to that of the silver currency in circulation and on this ground in the analysis that follows I ignore it altogether. For further documentation on this issue, see Cohen (2008, 68-69).

[14] It should be clear that at the microeconomic level there are as many supply and demand pairs for currency as there are goods and services. But here I shall conduct the analysis as if all goods and services have been aggregated into a single homogeneous commodity.

[15] Notice that this constitutes a significant departure from the textbook assumption of a fixed or central bank determined supply of currency. To follow on the example, the elastic supply of currency from the stock of bullion that

and services, it is reasonable to assume that, as its price rises they will reduce the quantities that they are willing to purchase. This explains why the curve of the demand for currency has been drawn as downward sloping. But the interests of buyers and sellers of currency are opposite, because those who sell currency for goods and services wish to buy low, whereas those who sell goods and services for currency wish to sell high. Consequently, repeated exchanges among them are bound to lead to a position where everybody is satisfied with the results. Economists call this position equilibrium. In the Graph (i) this situation is shown at point A where the quanti-

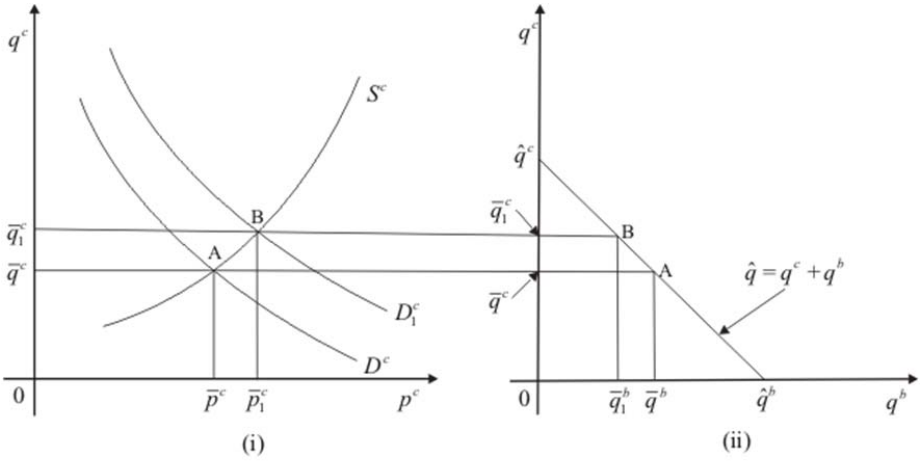


Figure 1: Allocation of available silver between currency and bullion

ty of currency and price that prevail are marked by the symbols $(\bar{q}^c, \bar{p}^c)$. At that price of the currency, Graph (ii) shows that from the total available quantity of bullion $\hat{q}$, quantity $\bar{q}^c$ would be converted into currency and the remaining $\hat{q} - \bar{q}^c$ would be traded in the form of bullion and other wares from this precious metal.

Next, suppose that while the production of goods and services increases, the overall quantity of the available silver bullion remains fixed at $\hat{q}$. How would this change affect the allocation of bullion between currency and commodity uses? Since silver in the form of currency would become dearer in terms of goods and services, more of the silver in the form of bullion would be expected to be converted into currency and a new equilibrium would be established at point B in which the equilibrium values would be $(\bar{q}_1^c, \bar{p}_1^c, \bar{q}_1^b)$. Using the same analytical apparatus, the op-

Athenians held for no other reason than speculation provided the means to accommodate endogenously the shock of the increased supply of goods. In Athens therefore relative prices changed to cushion any shocks on the demand or the supply side of the markets, whereas nowadays shocks must be identified by central banks before they are able to prevent, if at all, the possible destabilization of the economy.

posite case could be examined also in which the production of goods and services remains fixed and the overall quantity of bullion increases, as happened in the case of the discovery of the Laurion mines in 483 BC. In that event, goods and services became dearer in terms of silver bullion and certainly some of its available quantity was converted into currency. But how much currency was necessary each time to carry out efficiently the transactions on the goods and services that were produced was determined in the two markets through the mechanism of relative prices and the competition between the opposing interests of currency buyers and sellers in terms of goods and services. So, in effect, one function of a modern central bank was performed by the stock of bullion that cushioned the shocks in the goods and services markets. Except that the stock was not held monopolistically by one organization, but by many individual and uncoordinated speculators who stood to make a profit or suffer a loss depending on the particular nature of the shocks.

The preceding analysis is partial in a very important respect. This has to do with the following considerations. The stocks of currency and bullion in the economy bore no interest. By implication those who held purchasing power in the forms of highly liquid currency and slightly less liquid bullion lost the opportunity to make a deposit in a bank and earn interest. Economists would say that they absorbed an opportunity cost. This cost motivated the holders of wealth in these forms to try and allocate it among currency, bullion and bank deposits so as to maximize their benefits. Hence, in addition to the markets in Figure 1, certainly there was one more, i.e. that for bank deposits, which needs to be integrated into the analysis. This issue is taken up next.

3.2 Demand and supply of bank deposits

As indicated earlier, Athenian banks provided a range of services much like contemporary banks. One of these services was that they accepted deposits and paid interest on them. By virtue of the voluminous empirical evidence in this regard, particularly in the 4th century BCE, it is credible to assume that there was a banking market where, on the demand side, bankers were competing to attract deposits by paying the lowest possible interest rate, whereas on the supply side households, enterprises and *treasuries of the gods*,[16] searched around to make deposits at the highest possible interest rates, but considering also the reputation and the riskiness of the bankers whom they would trust with their money. Figure 2 expands on Figure 1 in several ways. The first is the

[16] In the financial markets the *treasuries of the gods* acted also like banks lending money at interest. For example, based on a *stele* from the Athenian *demos* of Rhamnous, Davies (2001, 117–128) reports that accounting records pertaining to the management of the monies of their goddess Nemesis show that the treasury lent about 4 talents at about 7 percent and earned about 1.7 talents of interest in seven years.

introduction in Graph (ii) of an additional axis which measures the quantity of deposits that become available in the economy through a process by means of which economic agents strive to reallocate their current holdings of silver currency, $\hat{q}^c$, bullion, $\hat{q}^b$, and deposits, $\hat{q}^d$, so as to reap the highest possible benefits. The reallocation is achieved with the help of the relative price

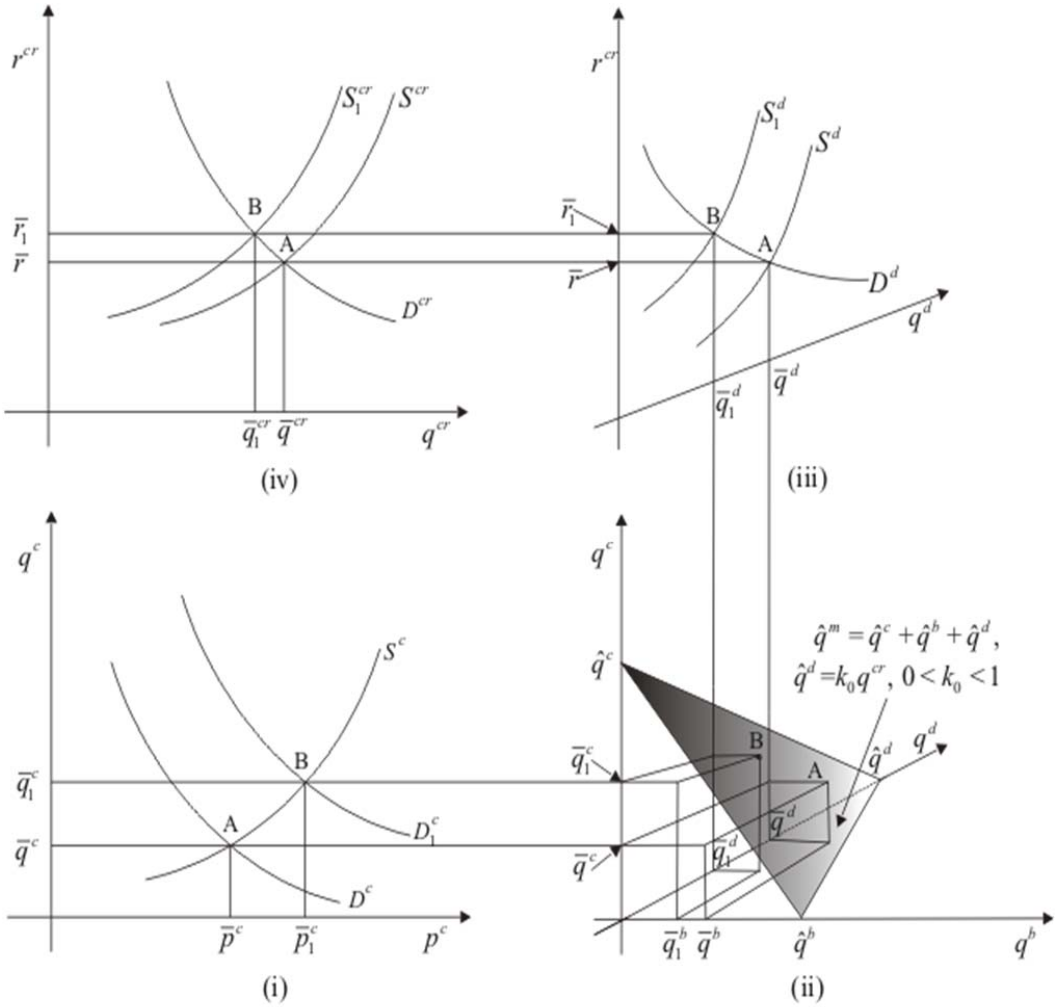


Figure 2: Equilibrium in the money market

of the currency p^c, the implicit relative price of bullion $p^c(1-e)$, e being a percentage rate of cost for converting bullion into currency, the reserve ratio k, the inverse of which banks multiply primary deposits, and the interest rate r, which indexes the relative benefit of giving up present or future liquidity. Points marked by an A in Graphs (i)-(iii) show an initial allocation among

these three components of money $\hat{q}^m$, for $\hat{q}^d = kq^{cr}$, $0 < k < 1, k = k_0$ and $e = 0$.[17] So let us trace through the changes which would take effect in the previous example of an increase in the production of goods and services in the economy, holding the available quantity of bullion constant. The change would shift curve D^c in Graph (i) to the position D_1^c. In turn, the equilibrium price of currency in terms of goods and services would rise from $\overline{p}^c$ to $\overline{p}_1^c$, and as a result the equilibrium quantity of currency would increase from $\overline{q}^c$ to $\overline{q}_1^c$.

Looking next at Graph (ii), observe that the rise in the use of currency would come about partly from a reduction in the form of money held in bullion, the quantity of which would decline from $\overline{q}^b$ to $\overline{q}_1^b$, and partly from a reduction in the deposits held by bankers. What would happen in the market for deposits is shown in Graph (iii). As deposits would decline with the shift from S^d to S_1^d, the equilibrium interest rate and quantity of deposits would shift from point A to B. In particular, at the latter point the equilibrium interest rate would increase from $\overline{r}$ to $\overline{r}_1$, whereas the equilibrium quantity of deposits would decline from $\overline{q}^d$ to $\overline{q}_1^d$.[18] This analysis explains the chain of changes in response to an isolated increase in the production of goods and services. But it remains mute regarding the nature of the interest rate $\overline{r}$ and it is in need of some further explanation.

Graph (iii) represents the segment of the money market that has to do with the demand and supply of primary deposits. Keeping with the preceding analysis I ought to have symbolized the equilibrium interest rate for deposits as $\overline{r}^d$, because this would represent the interest rate that the banks offer to depositors in order to secure the quantity of deposits $\overline{q}^d$. Instead I used the symbol $\overline{r}$ so that I may have the opportunity to elucidate this important issue. Recall that when a certain amount of currency or bullion is deposited with the banks, they use it to extend interest bearing loans by the multiple of the inverse of their reserve-ratio k; To attract the equilibrium quantity of base money $\overline{q}^d$ (see Graph (iii)), assume that Athenians banks offered to depositors the interest

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[17] Notice that in the definition of money, denoted by $\hat{q}^m$, I have included the so-called *high-power* or *primary* deposits. For the Athenian model of fully decentralized regime of money and banking analyzed here this may be considered a narrow definition of money. A broader definition should include also *secondary* or *derivative* deposits in the amount of $(\hat{q}^{cr} - \hat{q}^d)$, $\hat{q}^{cr}$ being the total amount of credit that the banking system generated at the reserve ratio k.

[18] So, a plentiful harvest in Attica or abundant supplies of grain shipped from abroad meant that the interest rate also rose. Except that the rise was moderated by the stock of bullion that was serving the same purpose in smoothing real economic shocks as is served today by financial market speculators.

rate $\bar{r}^d$. In a competitive business environment, the interest rate on loans $\bar{r}$ (see Graph (iv)), and hence on credit, has to be consistently aligned with the interest rate the banks pay to depositors, because in general $\bar{r} > \bar{r}^d$.[19] How might this be achieved? The simplest conceptualization is to postulate that the demand curve for deposits D^d in Graph (iii) includes an interest rate for the attraction of deposits from households and enterprises. With this issue settled, let me now address the equilibrium in the credit market.

3.3 Demand and supply of bank credit[20]

In Figure 2 relevant to the analysis of the market for credit or loans is Graph (iv). Let us concentrate first on the determinants of the curve labeled S^{cr} which stands for the supply of credit. Active on this side of the market were financial and non-financial intermediaries, including individual Athenians not necessarily rich. For example, aside from the *treasuries of the gods*, which acted like banks, Harris (2002, 81) reports several cases of small loans advanced by non-professional lenders. Also, in order to facilitate the selling of their goods and services, enterprises offered credit to buyers. From a legal point of view selling on credit was forbidden. But *de facto* in everyday commercial relations such transactions were quite widespread (see for example Cohen (1992, 14)) and affected the overall supply of credit by expanding or contracting the outstanding stock of "trade credit". These written debt claims could be transferred to third parties (Cohen *ibid*., 14-18). Yet as is the case today, advances of such credit as well as loans offered by isolated individuals should have been limited in scale relative to the total, so they are assumed not to have played a decisive role in the determination of the equilibrium in the credit market. For this reason I shall concentrate on the role of financial intermediaries, i.e. banks.

Since they accepted deposits and extended loans, it does not take much theorizing to establish that banks affected the supply of credit through three channels.[21] The first and very likely the most important was the well-known multiplier mechanism. In particular, drawing on the realization that only a limited proportion of the deposits they kept was withdrawn each period, banks

[19] Credit-money generated through bank loans is less liquid than bank deposits; So, these forms of money have an important difference, which is reflected in an interest rate differential. How larger is the average interest rate on loans in comparison to the average interest rate offered on deposits depends on factors like the operating costs of the banks, the pricing of default risks on their loans, the robustness of competition in the money market, etc.

[20] Unless otherwise specified, henceforth the terms "credit" and "loans" will be used interchangeably.

[21] It should be noted that this is the first instance in the analysis that I refer to credit creation by banks. As it will become apparent shortly my conceptualization is that in classical Athens money consisted of the currency, i.e. the Attic drachma, silver bullion readily convertible into currency at a small minting cost, and bank credit.

felt confident about their liquidity to lend out the rest in the form of business and consumer loans. But some part of the latter returned to banks as new deposits. So they continued lending up to a limit which corresponded to so many times the initial deposit as it was warranted by the inverse of the reserve-ratio k that they applied at the time. The explanation of this process and its documentation by Cohen (2008, 76-83) leaves no doubt that the Athenian banks did create credit in the same way systemic banks do in present day democracies. More specifically, looking at the Graphs (iii)-(iv) in Figure 2, it is unlikely to miss that the money market determined not only the equilibrium interest rate $\bar{r}$ but the equilibrium reserve-ratio $\bar{k} = k_0$ as well. For, the latter can be computed readily by dividing the volume of the equilibrium credit $\bar{q}^{cr}$ (see Graph (iv)) by the equilibrium rate of deposits $\bar{q}^{d}$ (see Graph (iii)).

The second channel was the amount of base money, which consisted of the amounts of currency held by banks in the form of coins and coins-equivalent of bullion, i.e. $\hat{q}^{c} + (p-e)\hat{q}^{b}$. If the price of the currency in terms of goods and services increased above the price of the bullion plus the charges for the latter's monetization, i.e. a fixed unit cost e for seigniorage and operating costs of the mint, the banks would be motivated to convert into currency silver bullion they owned and possibly even from the quantities they held for safekeeping purposes for their customers. Perhaps because they found no evidence of such episodes or they construed them to be insignificant relatively to the mass of coins in circulation, neither Cohen (1992, 2008) nor Amemiya (2007) make any reference to such endogenously induced conversions of bullion into coins, and vice versa. But given that the mint was open to such business, the hypothesis that the banks were guided by the price mechanism to the optimal allocation between currency and silver bullion is credible.

Finally, regarding the third channel, it is helpful to recall from the earlier discussion that, with the exception of state intervention in the determination of the prices of cereals, foodstuffs like oil and fish, and charcoal, markets were totally free and the same held true for the parallel circulation of domestic and foreign currencies.[22] Hence, technically speaking, the position of the S^{cr} curve in Graph (iv) would be subject to the arbitrage that economic agents might be motivated to undertake depending on the differences in the relative prices including the interest rate r. For if,

[22] The issue of price controls in classical Athens is a mute one. Migeotte (2009, 143-152) has looked into the nature of the influences of the state on the prices of the aforementioned commodities and in page 149 he concludes that:

> …It thus seems that, in practice, the fixing of wholesale and retail prices depended primarily on negotiations between the merchants and the magistrates, and on the magistrates' power of persuasion.

for example, the rise in the productivity of the economy or the discovery of new trade routes shifted curve S^{cr} to the position S_1^{cr}, thus raising the equilibrium interest rate from $\bar{r}$ to $\bar{r}_1$, and this rise was considered undue in the light of the financial conditions that prevailed abroad, other things remaining equal, importing of coins and bullion would shift the curve S_1^{cr} to the right and the amount of equilibrium credit would shift from $\bar{q}^{cr}$ to $\bar{q}_1^{cr}$.

Turning next to curve D^{cr} in Graph (iv), the demand for loans stemmed from domestic and foreign borrowers and aimed mostly for productive purposes.[23] In general the loans were secured by property collaterals worth at least double the value of the loans and the interest rate they carried varied depending on the risk of the venture for which the loans were advanced and other considerations.[24] Examples abound. Amemiya (2007, 86-87) for instance describes in detail the terms and the interest rates lenders charged for bottomry loans. They varied on account of the risks of the journey and the season that it took place, since ship losses during winter times were higher than similar journeys during summers. The view that emerges from the evidence is that much like today there prevailed a whole structure of interest rates which moved up or down depending on the direction in which the conditions in the credit market moved the equilibrium interest rate. In other words, assuming that the credit market determined a basic relatively riskless interest rate, the structure of interest rates guided lenders on how to adjust it in order to reflect the circumstances that applied to the particular borrowers, the intended uses of the loans, the quality of the property offered for security, etc.[25]

[23] In the relevant literature there is a lengthy debate regarding the nature of the loans that were advanced by Athenian bankers. Before the 1980s the dominant position was that the loans were mostly for consumption. However, when the evidence was revisited by Cohen (1990) it became apparent that the methods by which researchers had selected and assessed the evidence were subjective and biased towards the hypothesis that they wished to confirm. Since then the balance of opinion has changed and now most of economic historians side with the view that the loans were advanced predominantly for productive purposes. In the analysis I adopt the latter view and extend it to include loans for trading as well as pure speculation. But it should be clear that the consistency of the analysis and the conclusions derived from it do not depend on the nature of the loans. Even though I am fully aware of the significant implications of this issue, whether Athenians borrowed for consumptive or productive purposes, the market for loans would determine an equilibrium interest rate and this is sufficient in the present research endeavor.

[24] It should be clear that the volume of acceptable "bankable" collateral would be a strongly limiting factor restraining credit growth and enhancing stability in the economy. But at the same time it would retard economic growth by curtailing the expansion of the money supply.

[25] Presumably a "relatively riskless" interest rate would reflect only the rate of time preference. As such it would have to be positive, and hence the whole structure of the interest rates in the economy would be positive. Now compare this stylized feature of the Athenian economy to the negative interest rates that have emerged in recent years in contemporary market economics. This is another distinct difference between an economy without a central bank and commodity-based money produced in competitive markets as every other good and service and an economy with a central bank and fiat money, which may carry a negative price, even in the absence of inflation.

Drawing on the above, let us return again to the question that was posed earlier regarding the equalization of the equilibrium interest rates in the markets for deposits and loans. Consider an equilibrium interest rate $\%$ in the credit market which is higher than $\bar{r}$. The margin of the former interest rate over the latter would signify that the bankers are able to make a pure profit rate [26] on the deposits they manage to attract. However, in a competitive market with uninhibited circulation of information this situation cannot last for long. The reason is that the pure profit on the part of bankers will motivate enough depositors to withdraw deposits and instead become themselves direct lenders. As a result, while the curve S^d in Graph (iii) would start moving slowly rightwards, thus leading to a downward pressure on the equilibrium rate for deposits, the curve S^{cr} in Graph (iv) would move rightwards more violently as bankers lose deposits. Hence, eventually, as the interest rate $\%$ in the loans market declines faster than the interest rate in the market for deposits, the two interest rates would come to rest in the same lower equilibrium interest rate, which allows the bankers to earn only the normal net rate of profit, which by assumption is included in curve D^d of Graph (iii).

3.4 Equilibrium in the money market

Figure 2 depicts in graphical terms the fundamental blocks which constituted the monetary module of the Athenian economy in classical times, and particularly in the 4th century BC. It can be expanded by adding modules so as to integrate it with the production of output, the generation of labor and capital incomes, the tax and expenditure operations of the government, etc. Then the model would reflect more realistically the details of how the real and the monetary sectors of the economy functioned. I shall push the analysis a bit further in this direction later on. But what I wish to do here is to summarize the findings regarding the process of convergence to and the properties of the equilibrium in the money market.

In the confines of the markets in Figure 2, money consisted of three components: Bullion, currency and bank deposits. On this basis, it has been shown that their equilibrium quantities were fully determined and indeed in a manner that households, non-financial enterprises and bankers should have been pleased with the results, because they achieved the best realization of their plans. These results did not come about easily for them. For, they had to compete fiercely even for mar-

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Hence, given that in the latter economy citizens are forced to succumb to the monopoly power of an unelected authority, benevolent or not, the institutional setup lacks democratic legitimacy

[26] I call this profit rate "pure" to signify that it is over and above a "normal" profit rate required by banks to stay in the business of banking. By assumption the latter is included in the curve D^d in Graph (iii).

ginal gains. But in this process they were guided effectively in the process of adjusting their plans by three relative prices. The implicit price of silver bullion $\overline{p}^c - e$; the price of the currency in terms of goods and services $\overline{p}^c$ (see Graph (i)); and the price of credit in the form of the additional consumption in some future date, if one is willing to part with one's present consumption, which is indexed by equilibrium interest rate for bank loans $\overline{r}$ (see Graph (iv)).

Moreover, aside from the above *first best* results for all participants who persevered to the equilibrium point, the results turned out to be also *first best* for the economy as a whole, because the money market allocated the available quantity of bullion into currency, deposits and bank loans in the most efficient manner. To establish this proposition, assume that in Athens existed at the time a central bank which, in order to stimulate investment and economic growth, imposed an upper limit to the interest rate below its equilibrium level $\overline{r}$. In this administratively set interest rate the demand for loans would be higher than the supply and the loans market shown in Graph (iv) would split into official and unofficial. If one were able at all to obtain loans in the unofficial market, one would have to pay interest rates even higher than the equilibrium interest rate which would have prevailed in the absence of the said constraint. To keep the analysis brief, the new allocation of the available bullion would be *second best* for the economy, because it would involve fewer deposits, fewer loans, and more hoarding, thus defeating the intended results of the central bank policy.

Could a central bank under any circumstances improve on the results of the money market in a monetary system like the one depicted in Figure 2? Definitely not, because the central bank, first, ought to have better information about the actual conditions that prevail in the markets than the market participants themselves, and, second, it ought to be able to simulate the preferences of market participants in advance. But this is an impossible problem to solve, because the central bank cannot know the preferences of market participants before they are revealed by their choices.[27]

Hidden in the above analysis is the following serious social problem which cannot be ignored. Regarding the market process in Figure 2, there is no doubt anymore that the great majority of participants as well as the state come out winners in terms of both freedoms and material wellbeing.

[27] It is likely that some readers aware of advanced economic theory may remind us of Samuelson's (1948) theorem of revealed preferences. I hasten to add that, even if the central bank were able to predict precisely the preferences of market participants, it would still need to have an automatic feedback mechanism to continuously adjust its policies to the changing circumstances in the markets, and indeed not alone in the money markets. But the design and implementation of such a mechanism lie in the domain of wishful thinking.

But there are also people who take part in various stages of the process and, for reasons that are not of the present to explain, they are left behind or pushed aside. Athenians were very mindful of the social imperative to control income and wealth inequality between certain socially optimal bounds as the latter were understood by the majority of the citizens who participated in the *Assembly*.[28] Between equality of the ends and equality of the means, they placed in actuality the emphasis on the equality of the means, i.e. education and the enlargement of opportunities for all to thrive through commerce and open markets. Yet, at the same time, the state provided for a social net, sufficiently safe to cover those who failed despite their earnest efforts to succeed, but also limited enough to discourage corruption and abuses. In retrospect, it was an experiment in search of economic efficiency within an environment of social cohesion, which was met with remarkable success.

3.5 Sum up

Money in classical Athens consisted of three components. The base money in the form of silver coins; silver held in the form of bullion readily convertible into coins at a small fabrication and seigniorage charge at the state mint; and loans advanced by banks to their customers for consumption and production purposes. The stock of the base money that circulated in the economy at any given time was determined by economic agents interacting in the money market. If in terms of goods and services the value of the drachma was higher than its silver content plus the conversion cost, bullion holders would sense the opportunity for profit and, by turning enough silver into coins at the state mint, equilibrium would be established in the demand and supply for coins. On the contrary, whenever the opposite happened and in terms of goods and services the value of drachma fell below that of its silver content, equilibrium between demand and supply for coins was established by melting enough of them for their silver content. One does not find instances of such events, but that was certainly a possibility. This key result, that is, that the stock of coins was determined endogenously in the economy, emanated from the fundamental institutional arrangement that the state mint stood ready at some cost to turn bullion into coins on demand.

Presumably part of the base money (coins and billion) was stashed away in response to the demand for hoarding;[29] a second part, multiplied by the so called “velocity of circulation”

[28] Admittedly, given the instability of Athenian political life in comparison with the glacial stagnation of, say, Sparta, those social bounds must not have been too stable.

[29] Quite certainly wealthy Athenians did keep a part of their riches in Attic drachmae, either at home or in bank vaults. To the extend they did, they practiced hoarding which implies that the amount of currency involved was eliminated from circulation.

was used to carry out the volume of transactions that took place each year, and still a third part was deposited with the banks to earn extra income in the form of interest. Since coins in hand, coins in hoarding vaults, and bullion returned no interest, how households and enterprises allocated their holdings in means of payment among currency, bullion, deposits and loans, was determined by the price mechanism in the framework of the markets exhibited in Figure 2. In particular, with the intermediation of banks, household and enterprises were brought into impersonal contact with households and enterprises possessing portfolios of $(\text{currency} = q^c, \text{bullion} = q^b, \text{deposits} = q^d, \text{loans} = q^{cr})$, which, under appropriate market conditions, stood ready to restructure into $(\text{currency} = \bar{q}^c, \text{bullion} = \bar{q}^b, \text{deposits} = \bar{q}^d, \text{loans} = \bar{q}^{cr})$, given for example a change in the demand for loans from q^{cr} to $\bar{q}^{cr}$. Depending on the direction of this change, the prevailing interest r would increase (decrease), say to $\bar{r}$, the deposits at the banks would rise (decline) to $\bar{q}^d$, and the latter would respond by expanding (shrinking) credit at the multiple of the inverse of their reserve-ratio. These adjustments would bring about equilibrium in the markets for bank loans and deposits. But in the process, the change in bank deposits would force the prices in the markets for currency and bullion to change in the directions $p^c \to \bar{p}^c$ and $p^b \to \bar{p}^b$. Finally, as these price changes would take effect, the desired quantities of currency and bullion would change as follows: $q^c \to \bar{q}^c$ and $q^b \to \bar{q}^b$. In short, all financial markets adjusted optimally to accommodate in this case the change in the demand for loans, but the same would happen given any other change like for instance an influx of specie into the economy, a shift in the seigniorage margin at the mint, or even changes in psychological factors that might influence the propensity to hoarding and hence the velocity of circulation.

Central to the aforementioned sequence of adjustments from the one equilibrium position to the other was the determination by financial markets of the equilibrium reserve-ratio in the banking sector. What percentage of each deposit banks retained in order to safeguard their ability to cover withdrawals at any given time was then as paramount as it is today in the prevailing "fractional-reserve" monetary systems. But in classical Athens there was no lender of last resort and the banks were obliged to hedge against risks on their own by balancing their urge for profit against the trust and the loyalty of their depositors.[30] Some banks, like the one run by Passion,

[30] There definitely existed a stock of bullion that could be struck quickly and cheaply into coins and lent out at some "penalty rates". The *treasuries of the gods* were also, most likely, not fully invested as manifested by the calls on

managed the inherent risks with success and became famous, whereas others failed and vanished into historical oblivion together with the deposits of their customers.

4. Assessments regarding the stability of the general price level

Presently, when we refer to prices, we think either about the changes in the *general price level* and talk about the issues of inflation-deflation, or about the changes in the *relative prices* and talk about the flexibility of markets to adjust to endogenous shifts and exogenous shocks. From Loomis (1998, 240-250), but not only, we know that for Athens in classical times the relevant evidence is extant and that it relates to changes not in the general price level, but in the prices of select sectors of goods and services, and indeed in a limited range of them. So, it is impossible to assess the performance of the economy in these regards with certainty. However, this does not preclude arriving at some credible guesses by drawing on what information is available and indirect ways of thinking.

In the period 480-430 BC, the silver from the Laurion mines and the allied tributes[31] would have increased the supply of money by shifting rightwards the surface $\hat{q}^m$ in Graph (ii) of Figure 2. Could it have generated a persistent rise in the general price level or just inflation? In the absence of hard evidence, Figueira (1998, 493) rates the likelihood of inflation quite high. He suggests that the working hypothesis should be that Athenians experienced "significant" inflation in the 5th century because it is unlikely that the supply of "goods and services" increased in proportion to the increase in the money supply. Let us concentrate first on the silver flows from Laurion.

Before they appeared in the markets in the form of currency, bullion and bank deposits, the mining and processing of silver ore expanded employment and incomes, and hence GDP. By implication, aggregate demand for "goods and services", should have increased pretty much in proportion with their aggregate supply because silver was a tradeable commodity that could be exported freely in the form of currency and bullion. If the prices for foodstuffs and other household and enterprise implements increased in the short-run due to supply of silver induced excess demand, profit margins and the exchange rate of the Attic drachma would have tended to increase and by stimulating

their funds in cases of fiscal emergency. In risk management, the larger the emergency pool, the more stable the system. Hence, the argument for not each bank managing its risks alone made good sense. However, there is no evidence of any scheme on the part of the Athenian financial institutions to manage collectively the risks involved in their business.

[31] Contributions, mainly in currency but also some in kind, that Athens received from its allies in the context of the Delian League (478-454 BCE) and the First Athenian Alliance (454-404 BCE) for the purpose of leading their defense against the threat of Persian invasion.

imports in the medium run prices would have returned to equilibrium. So with regard to the increased money flows from this source I fail to see how the abundant production of an internationally tradeable commodity like silver may lead to "significant" inflation in an open economy. Quite likely it led to some transitory inflation, raising particularly the prices of necessities, but over the longer run it would leave the general price level unchanged.

To corroborate this inference, consider an economy with two goods, say, bread and silver. Denote the unit price of bread in terms of silver as p_b^s, i.e. 2 obols of silver per weight unit of bread, and the unit price of silver in terms of bread as p_s^b, i.e. half the weight unit of bread per obol of silver. By implication, we have $p_s^b = 1/p_b^s$. Next assume that the available quantity of silver doubles, while the available quantity of bread remains constant. Since double the quantity of silver will buy the same quantity of bread, p_b^s will increase to $2p_b^s$ whereas p_s^b will decline to $p_s^b / 2$, and hence it will continue to hold that $p_s^b = 1/p_b^s$. This proves that, while the increase in the quantity of silver changes the *relative prices*, the general price level remains unchanged because, whatever percentage of value silver loses in terms of bread, the latter gains exactly in terms of silver. Does this proof generalize to an economy based on so-called "commodity money" with many goods and services? It should, provided that the commodity money maintains its integrity and that it is not debased, since then it acquires qualities nearly similar to fiat money.[32] Does this proof apply to Athens in classical times? It does because Athens did not mingle up with money supply and guarded strenuously against adulteration of its currency.

However, the case with respect to the large allied tributes in the period 480-430 BC and the spoils from Persian treasures donated by Alexander the Great after 330 BC is different. Let us see why with reference to the allied tributes. The revenues from this source entered into the coffers of the Athenian state and by authority of the *Ecclesia of Demos* they were employed to finance all sorts of public expenditures. Year by year in the said period, the state raised the wages of public magistrates, soldiers and sailors across the board; it spent lavishly in the construction of luxurious public buildings and city beautifications; it established programs of social welfare, festivals and other cultural activities, etc. As a result, in conjunction with the slower rising supply of labor, the increasing amount and circulation of the allied money raised the wages throughout the economy. Clearly, what we had then

[32] Sussman, Zeira (2003) have shown that commodity money can lead to inflation proper through debasements, which act like devaluations.

and there was the first ever case of the so-called *Dutch disease*.[33] Wealth in the form of silver coins and bullion coming from abroad was spent by the state raising the wages of public servants and expanding the production of non-tradeable goods and services; in turn, faster rising prices in the public sector raised the wages and the cost of materials in the private sector; as the latter entered into a phase of cost-push inflation, it lost international competitiveness; the exports of tradables slowed down, the deficit in the balance of trade widened and had to be covered by increased exports of Attic drachmae and bullion, thus leading to losses in the currency's exchange rate; and as a result the economy should have experienced a period of inflation , accompanied by a contraction of the tradables sector.[34] Figueira's (1998, 493) hunch that in the 5th century BC the Athenians experienced "significant" inflation may be right. But the culprit was not the large quantities of silver from the Laurion mines. The upward spiral in the general price level should have started and persisted from the way in which the state spent the wealth from the allied tributes.

To conclude, the silver from Laurion must have left the general price level unaffected, because the Attic drachma was never debased. Excluding the period of the Peloponnesian War (430-400 BC), over 150 years of relative peace in the two centuries under consideration, the indications are that the economy wide inflation ranged around 1.5% due to the large quantities of silver and bullion that poured into Athens from abroad, an particularly because of the way it was spent by the state. Hence, while by today's definition of price stability the general price level in Athens remained stable (1.5%<2%), in the U.S. over the period 1960-2015 prices increased at the rate of 3.8% per annum, i.e. almost double the rate of 2% for price stability.[35] With regard then to the general level of prices, economies with money based on a commodity standard have a fundamental advantage over economies with fiat money, which is issued and systematically devalued by the Fed, either in the course of

[33] More specifically, in the case of Holland heavy income transfers from abroad due to the sale of gas or oil increased domestic spending. This, in turn, drove up the prices of the non-traded goods and services, for which the price levels are formed in the home market. Finally, as the higher prices of non-tradables translated into wage increases via inflation indexation, collective bargaining or other processes, manufacturing, the competitive product prices of which cannot deviate from world market prices, lost competitiveness and contracted substantially. In the case of Great Britain, which had a flexible exchange rate system, exchange rate appreciation due to the oil revenue inflows had the same effect, i.e. a major contraction of the manufacturing sector. This explains why the term *Dutch Disease* is sometimes referred to as *de-industrialization*.

[34] One could link also the inflationary process to the Dutch type disease that plagued Athens in this period by following the analysis suggested by Imai (2002). However, as the arguments would have taken the presentation far afield, I adopted the much simpler approach in the text.

[35] This rate was computed using the Consumer Price Index (CPI), given as series CPALTT01USA661S in the data base of the Federal Reserve Bank of St' Louis (Link: https://fred.stlouisfed.org).

trying to achieve high employment or in complacency and acquiescence to U.S. governments.[36]

5. Decentralized money with innocuous government involvement in the U.S.

While assessing the model of free banking, as framed originally by White (1984/1995), Selgin (1988), Selgin, White (1994), and others, Friedman, Schwartz (1986, 8, 11) concluded that:

> History suggests both that any privately generated unit of account will be linked to a commodity and that government will not long keep aloof….If free private competitive enterprise can produce a viable money without government, it has yet to do so.

If one scanned the relevant literature at the time they were writing, one would find few details about money and banking in classical Athens from which to piece together a model. Hence they were justified in invoking the lack of a historical precedent as a condition for the possibility to ever emerge "privately produced viable money without government".[37] But since then highly intensive research by economic historians, numismatists, sociologists, political scientists, etc., compactly summarized in Bitros, Kyriazis, Economou (2020), has rendered it feasible to make a strong case for such a historical precedent that did transpired then and there.

More specifically, the model of free banking presented in the preceding section stands on historical grounds solid enough to claim that the Athenian currency functioned in an institutional environment in which: a) the state defined a unit of account (Attic drachma), linked it to a commodity (silver), and used it in its domestic and foreign transactions; b) drawing on its share of silver from the Laurion mines, as well as on its fiscal operations, the state acted as a major but not sole provider of the said currency; c) the state enacted and enforced rules and regulations that aimed at safeguarding the integrity of its currency, leaving money and banking markets to operate freely under the laws that applied in all markets and the Attic drachma circulated in parallel with all other foreign currencies; d) the supply of the currency, silver bullion and credit, i.e. money, and hence the latter's price in terms of goods and services, was determined by competitive forces in the markets of the economy; and e) all equilibrium level and rate variables like, for example, the prices and

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[36] This claim is consistent with the results which have been reported by Rolnick, Weber (1998, 14) who find that:

> …on average, inflation rates are also higher under fiat standards. The average inflation rate for the fiat standard observations is 9.17 percent per year; the average inflation rate for the commodity standard observations is 1.75 percent per year. And, once again, every country in our sample experienced a higher rate of inflation in the period during which it was operating under a fiat standard than in the period during which it was operating under a commodity standard.

[37] Certainly these world renowned monetary experts have not held anarchist views. So I do not think that by using the terms "without government" they meant the absence of government even from its general institutional and regulatory tasks in the economy.

quantities of silver in the forms of currency and bullion, the amount of bank credit and the reserve ratio, and the interest rate were determined by uninhibited supply and demand conditions.

Was money in classical Athens viable? There is no doubt that it was, since the Attic drachma became over three centuries equivalent to today's U.S. dollar in the Eastern Mediterranean and beyond. Was money in classical Athens produced by private agents operating in competitive markets? Again, there is no doubt that it was, since as explained by reference to Figure 2 all critical equilibrium values in the monetary system were determined in open domestic and international financial markets free of direct administrative controls. Was money in classical Athens produced without government? All available evidence indicates that it was, since the state respected the standards it set for the integrity of its currency; by enacting and enforcing rules and regulations, it made sure that private agents would not undermine the currency's integrity and world status; and, last but not least, it managed its public finances following Adam Smith's dictum that "what is prudence in the conduct of every private family can scarce be folly in that of a great kingdom". On account then of these merits, it is reasonable to ask: Is the Athenian model a viable alternative for decentralized money in the U.S., if and when the circumstances become ripe for such a reform? Considering that a) it stands on a distinctively successful historical precedent, b) money was produced by private agents acting in competitive markets and the government remained aloof but not indifferent, since it set up and enforced effective institutions for safeguarding the integrity of the currency, and c) the monetary arrangements provided for a system of checks and balances between government and free markets that served the best interests of citizens, and hence of democracy, the answer should be in the positive. The Athenian model of free banking does offer a viable framework for decentralized money and it can be easily implemented by adopting the following norms and procedures:

- The government would define the unit of a Uniform Official Currency (UOC), known in the U.S. as the dollar and denoted by the symbol $.
- The value of $ would be linked to the Implicit Price Index (IPI) of GDP in a base year, say 2017, by setting $\mathrm{IPI}_{2017} = 1$.
- The federal and the state governments, as well as all sorts of public agencies, would be obligated by law to conduct their accounting and transactions in this unit. Therefore, in view of the scale of the public sector in the U.S., this requirement would create strong incentives in financial and non-financial private parties to adopt the $ in their dealings.

- Financial institutions would be free to issue their own banknotes to serve as medium of exchange without any government imposed obligation to convert them into equivalent value carrying commodities, like gold or silver, or value carrying assets like stocks, bonds and now digital money. However, to render their banknotes acceptable, competition would compel banknote issuing financial institutions to provide their customers with conversion rights, say into silver, at its price relative to the IPI of GDP. To explain this conversion, assume that in 2017 the price of silver (S) was 0.5 $ per gram and that its index was set at $S_{2017} = 1$. By implication, 1 gram of silver bought 0.5 $ worth of GDP. Now let the prices of silver in 2018 increase to $S_{2018} = 1.1$ and of GDP to $IPI_{2018} = 1.05$. If in 2018 a bank were asked to convert its banknotes into silver, the bank would have to give out 1.048 (=1.1/1.05) grams of silver for every $ of converted banknotes.[38]
- Banknotes denominated in $ would circulate in the U.S. in competition with every other domestic and foreign currency.
- There would be no "lender of last resort" and hence all public and private parties, financial and non-financial, would carry the certainty equivalent cost of the particular banknotes and the assets held in their portfolios.
- Suppose the economy in 2018 experienced inflation of 5%, because ceteris paribus financial institutions issued an excessive amount of banknotes relative to the available supply of goods and services. Would this be a persistent or a transitory equilibrium? It would be transitory, because soon the banknote issuing institutions would discover that their demand to cover the required silver reserves would raise its price, thus cutting into their profit margins. So they would find it profit maximizing in 2019 to start shrinking the supply of banknotes until eventually the economy would return to price stability.
- Instead, suppose that due to technological advancements productivity in 2018 increased the supply of goods and services and deflation in the economy reduced the price of GDP to $IPI_{2018} = 0.98$, leaving that of silver unchanged at $S_{2018} = 1$. Would deflation of 2% mark a new permanent equilibrium? Rather not, because banknote issuing financial institutions

[38] Since various commodities offered for conversion would provide different degrees of security, one may even think of significant differentiation among banknote issuing institutions along this basis. For example, one bank might offer conversion rights in silver, another in gold and still another in shares to a portfolio of stocks from a wide range of well-known corporations.

would find it to their interest in 2019 to start increasing the supply of banknotes somewhat faster than the supply of goods and services, thus pushing the economy back to price stability.

Additionally the federal government would retain all its prerogatives on behalf of the citizens to enact and enforce rules and regulations for protecting the integrity of the U.S. dollar, keeping all markets open to potential and observed competition, combating fraud and tax evasion, and making sure that through the courts the contracts are respected and the property rights are safeguarded as best as institutionally possible.

6. Summary of findings and conclusions

To control the financial crisis that erupted unexpectedly in 2008, the Fed applied an assortment of bold policies. They called them “unconventional” and they proved successful owing to some significant extent to the cooperation of the U.S. allies and other major trading partners. But if another crisis of similar or worse severity erupts, its destructive force may turn out to be uncontrollable because now the post-war trust of the world in the U.S. leadership has been lost and the Fed by all indications has run out of sustainable “bazookas and ammunitions”. Therefore, it is high time that the U.S., as issuer of the world’s preeminent currency, prepares ahead of the next major crisis that may wreck its economy and create havoc in the international financial system.

In this context, outstanding proposals for decisive overhauling of the Fed that have long been considered “academic” are gaining considerable respectability and attention. Given that the established monetary regime in the U.S. has reached its limits and another major crisis would endanger gravely the U.S. economy and the international financial order, the increasing interest in decentralized monetary regimes like, for example, free banking is natural. To these proposals this paper has added the model that evolved in Athens in classical times, i.e. a period during which Athens reached the apex of its military, economic, political, cultural, and scientific influence in the history of the world. Having explained how it might have functioned in an institutional environment in which the government took great interest in the integrity of its silver based currency, i.e. the Attic drachma, but without mingling up directly in the operations of the money and banking industry, this model stands out because, first, it provides a system of checks and balances between government and free markets that serves the best interests of citizens, and hence of democracy; second, it is characterized by superior structural properties, since all key variables are de-

termined in decentralized competitive markets by demand and supply forces and the general price level remains stable; and, thirdly, it more than meets the demanding standard of the historical precedent that Friedman, Schwartz (1986, 8, 11) set in the above mentioned quotation.

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