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Social Contract, public choice and fiscal repercussions in classical Athens

Nicholas Kyriazis, Emmanouil Marios L. Economou and Loukas Zachilas*

Abstract: In the present essay, by utilizing game theory we present a model of choice by actors to explain how change comes about. Then by using ancient and modern sources of literature, we analyse the theory of the social contract as a historical phenomenon that first appeared during the classical period of Athens (510-323 BC.). Then we utilize our findings to explain how public choice was practiced under a direct democracy regime in ancient Athens, by focusing on two historical cases: Eubulus and Lycurgus fiscal policy programs in the second half of the 4th century. We found that these policies can be explained as an implementation of a social contract, through which the Athenian citizens were taking decisions based on rational choice according to a wider economic prospective.

Keywords: model of choice, social contract, 4th century BC Athens

1. Introduction

In the present paper we argue that during the second half of the fourth century BC., a form of a social contract was first practiced in ancient Athens, a major Greek city-state, before taking its modern conceptual shape, which is based on the writings of the 17th and 18th Enlightenment philosophers like J. Locke, Montesquieu and J.J Rousseau. What we purport to show is that the expansionary fiscal policy programs that were introduced by Eubulus and Lycurgus in the 4th century Athens, can be defined as the implementation of an actual social contract. To achieve this, we first provide a model of choice by actors to explain how change in the structure of societies comes about, an issue which is of major importance in the areas of modern social sciences. An attempt to estimate how change in society's ideas and options

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takes place preoccupied many scientists and philosophers in various fields of research such as Karl Marx and his followers who examined the changing material conditions (mode of production), or Toynbee (1946) with his theory of External challenge and successful response, which leads to an outcome of two choices: survival and adaptation or collapse. The issue of estimating social change is still pivotal in research fields such as the *New Institutional Economics* school initiated by North (1978, 1981, 1990) to more recently, the analysis of the emergence of specific macrocultures that are favourable to the creation of democratic forms of government (Kyriazis and Economou, 2012)

Our analysis is organized as follows: Firstly, we provide a function which presents the choices that the warriors had during battle in order to maximize their probability of survival. Then, in order to show the variety of options that direct democracy was offering to the Athenian citizens, we present a choice set like those that were being discussed in each gathering of the Athenian assembly. Next, by examining the issue of the selection between peace or war strategy, we utilize game theory in order to show that the adoption of new proposals by the Athenian deme (the citizens) was actually a compromise between the different social groups and was based on rational choice. Then, based on ancient sources we provide all the evidence about the idea of a social contract being developed as a theoretical paradigm among a series of philosophers.

Finally, we apply our model of choice in order to analyse how the conceptual framework of a social contract was actually found a practical implementation through the expansionary fiscal policies that were introduced by Eubulus and Lycurgus in the 4th century BC.

2. A model of choice

As many scholars argue, among others (Cartledge, 1977; Raauflaub, et al. 2007; Fuller, 2008; Kyriazis, 2012) during the Archaic period and more intensively by the middle of the 7th century BC., a new battle formation, the *phalanx*, dominated Greek battlefields. The phalanx formation was based on the *hoplites*, a new type of heavy infantryman. Krentz (1985) and Hanson (2009) provide a detailed analysis about how the phalanx was being deployed during battle and what tactics the hoplites were following. The practical way of testing the pros and cons of the phalanx formation was during battle, by trial and error. The adoption of any new kind of military formation was mainly based on the maximization of survivability

criterion for individual participants (the hoplites) as well as collective gain, eg. victory for the city-states soldiers.

Each hoplite's purpose was to maximize his individual survival probability out of a set of given choices. These choices linked to different battle formations. Based on the existing knowledge about how battles were taking place in antiquity, function (1) presents the three choices that the hoplites had to decide upon.

$$\max f\{(ev(PF), ev(LF), ev(MF))\} \quad (1)$$

The expected value of survival for each battle formation being adopted is described by ev . PF describes the phalanx formation, LF a linear battle formation and MF a mixing (or melee) type of battle, like those mentioned in the Iliad during Mycenaean times. Through a series of battles during the last period of the Archaic times as well as during the Classical era, surviving warriors would find out that the most efficient tactical formation of the three in terms of maximizing their survival, was the phalanx. That's why the phalanx formation was gradually adopted by the majority of the Greek city-states of the classical era when being engaged in war. But by choosing the best military formation in order to maximize the possibility of individual survival, hoplites could also achieve another important element: To choose the best strategy that guaranteed collective welfare eg. a common aim at city-state level, which was victory.

Thus, under this point of view, the adoption of the phalanx would at the same time maximize individual and collective welfare. It is also obvious that the functioning and performance of the phalanx during battle made necessary the effective cooperation and coordination among its members. In order to achieve this, phalanx members needed to have excellent physical strength, to keep the right pace while walking and to achieve perfect synchronization during maneuvering in battlefield. In order to succeed in all these elements, continuous training and military exercises were required (Cartledge, 1977). The introduction of the phalanx and in some cases, such as Athens, of a fleet of triremes, is linked with the emergence of a particular set of values in the military field, such as cohesion, discipline, trust, courage, self-consciousness, equality, coordination and cooperation. This set of values that seem to have been emerged from the phalanx formation is also underpinned by (Roisman, 2005) and Kyriazis and Economou (2012).

These values were then transferred into the political field and were transformed into

the values of *isonomia* (equality in front of the law), *isegoria* (equality of the right to speak), *homomoia* (unanimity, consensus), shaping thus a particular democratic macroculture.¹

The analysis now focuses to a model of choice under direct democracy. Under a direct democracy regime every citizen has the right to vote in favour or against on any proposal brought by any citizen in front of the supreme body of governance of the city-state, the Assembly. We postulate that citizens are rational in the sense of maximizing their individual welfare. In this case welfare could include not just economic values (measured for example in monetary terms) but “intangibles”, values such as religion, freedom, a particular way of life etc. When each citizen votes on particular proposals, he chooses the proposal that he expects it will maximize his individual welfare. Thus, the following function is maximized:

$$\max (S_1, S_2, \dots, S_n) \quad (2)$$

where S_1, S_2, \dots, S_n , are the various strategies in his choice “set”, that he expects to maximize his welfare. Since in a direct democracy every vote counts as one, the strategy that is finally selected, depends on the possibility that it has finally received the majority of votes, eg.

$$\sum_n S_1 > \sum_n S_2 > \dots > \sum_n S_n \quad (3)$$

where \sum_n is the total number of votes received for each strategy.

The introduction, selection and adoption of new strategies through the procedure described above, means that new laws, institutions and policies are adopted through time, sometimes changing or abolishing old ones. This again shapes political development and its rate of change, as illustrated in the following decision tree diagram:

¹ In this section we introduce the concept of macroculture, for the first time as far as we know, (taken over and adapted from organization theory) into institutional economics in order to analyse structural change. A “macroculture” encompasses the common values, norms and beliefs shared among the members of a society or a state. The adaptation of the term in economics and politics has also a dynamic time characteristic, that of long term periods. As it will be shown in our case study, Classical Athens, the elements of macroculture take shape over time periods of decades to centuries. Through these values, norms and beliefs, a macroculture guides actions and creates typical behaviour among independent entities, so that it coordinates their activities so that complex tasks may be completed (Abrahamson and Fombrun, 1992, 1994; Jones, Hesterly, and Borgatti, 1997). The relation between military and political values and the emergence of macrocultures has been analysed by a series of authors (Kyriazis and Paparrigopoulos, 2011; Kyriazis, 2012; Kyriazis and Economou, 2012).

Diagram 1: Decision tree probabilities and the adoption of new strategies

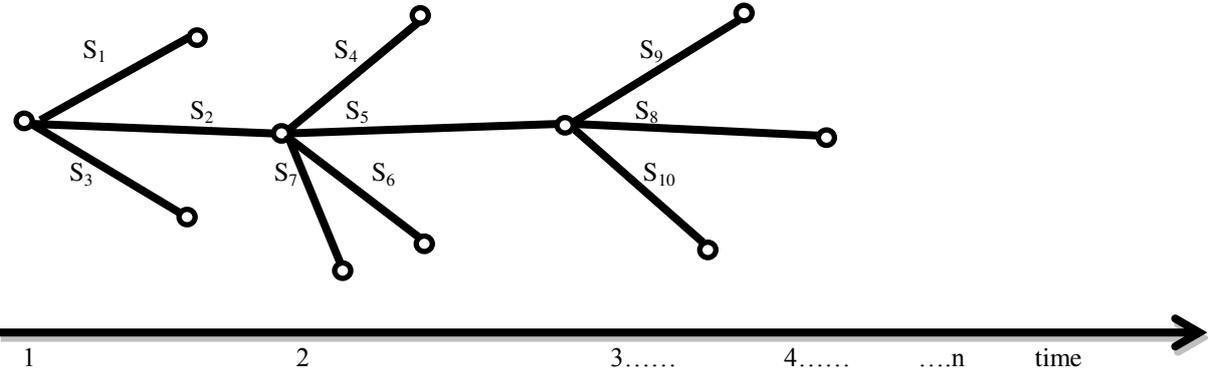


Diagram 1 shows that if strategy S_2 is chosen at time period 1 (to the exclusion of strategies S_1 and S_3), then at time period 2 the strategies S_4 , S_5 , S_6 and S_7 are given as options, and if S_5 is chosen, then at time period 3 strategies S_8 to S_{10} are available, etc. Thus, the rate of change of the political framework depends on two factors: i) How many strategies are introduced into the choice set of the Assembly to be decided upon at each time period, and ii) How often new strategies are being adopted. Thus, in theory these may be two extremes: In the first case, it is possible that many new strategies can be introduced. New ones can be adopted with high frequency and older ones may be discarded.

This could lead to a political system that is very adaptable, but also too fickle and variable, with a high degree of uncertainty, and low predictability. In the second case, the system seems to be characterized by great stability and predictability, like the strategies S_1 and S_3 with very few new strategies being introduced, and even fewer being adopted, no breaks, low adaptability in new ideas, being unable to successfully face new challenges, a system that tends to be “ossified”. Such a political system resembles to a deterministic model with perfect predictability in future steps.

The two words written above, uncertainty and predictability are keywords of the sciences that are involved into modeling of systems, including physics, philosophy, statistics, economics, sociology and economic history. Uncertainty is the lack of certainty, a state of having limited knowledge, where it is impossible to exactly describe the existing state a future outcome, or more than one possible outcome. Predictability is the degree to which a correct prediction or forecast of a system’s state can be made either quantitatively or qualitatively.

The equilibrium state is always aimed and investigated in all models of all sciences mentioned above. A system may or may not evolve to an equilibrium state, but there exists no general rule to predict the time evolution of systems far from equilibrium. The most known example of such systems is the chaotic ones. Their predictability usually deteriorates with time. To quantify predictability, the rate of divergence of system trajectories in phase space can be measured (Kolmogorov-Sinai entropy, Lyapunov exponents). The main characteristic of a chaotic system is the sensitivity to initial conditions.

A political system that has many strategies to choose from resembles to a mathematical model which is close to a chaotic state. In such a state the predictability of the next step or the choice of the new strategy is rather impossible. Limitations on predictability could be caused by factors such as a lack in information or excessive complexity. Two close strategies, in a chaotic system, may lead to two totally different results, two totally different political decisions (Fig.1). The one can be peace, but the other can be warfare.

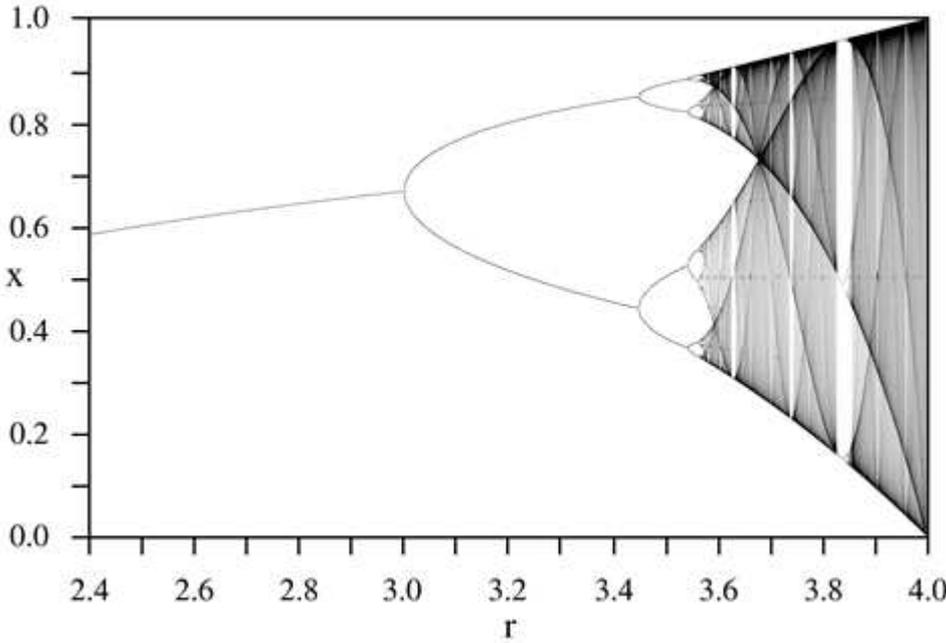


Fig. 1 The famous logistic map bifurcation diagram.

On Fig. 1 the famous logistic map bifurcation diagram is presented. Parameter r is varied in the interval $[2.4, 4.0]$. In the beginning (for $r < 3$) there is only one equilibrium state (i.e. only one strategy). As r is getting bigger (towards the right), there exist 2, 4, 8, 16,... equilibrium states (strategies). For $r = 4$, there is an infinity of possible states (strategies), thus

the political system has high degree of uncertainty and low predictability. On the other hand, a political system that has few strategies as alternative solutions, resembles to a deterministic model with perfect predictability in future steps, i.e. a non-chaotic system. This, is a central issue of all democracies old and new, to find an optimal rate of change, not too sudden and fast, not too slow and inadaptable. A system of check and balances, in modern terminology, would thus be considered as successful, if it comes close to the ideal benchmark of an optimal rate of change.

A way to find an optimal rate of change, not too sudden and fast, not too slow and inadaptable is a central issue of all democracies, old and new because of its difficulty to be specified in actual terms, thus we mention it as a theoretical benchmark, inspired by neoclassical growth theory. A system of checks and balances, in modern terminology, would thus be considered as successful, if it comes close to the ideal benchmark of an optimal rate of change.

In economics an optimal rate of growth is proposed as equilibrium, (steady-state) where the interest rate equals the growth rate (Meade, 1961, ch. 4; Solow, 1970, pp. 71-97). On the other hand, the problem of fine-tuning change and stability is very real in modern democracies, as for example in the USA, where the existing system of checks and balances and the diffusion of decision making and power among too many bodies (eg. President, two legislatures, Supreme Court, Federal Reserve- FED, Federal System of sharing power, direct and representative lawmaking), makes change in many cases extremely slow and difficult.

Going back to Ancient Greece, the two extremes are Sparta and Athens. Sparta, had in modern terminology, a political system of very strong checks and balances, with political power and decision making diffused among the two kings, the five *ephors*, (a leading group that provided balance between the two kings), *the gerousia* (the 30 elders -including the two kings) and the assembly which consisted by the Spartan deme (excluding women) called *Apella*. The Spartan system of governance guaranteed political stability for about three centuries. However, it was ill adapted to facilitate necessary change and external challenges, with the result of not being able to face the crisis of the 4th century, after which Sparta became a backwater and second rate power. Because the Spartan system did not permit adaptability and change, the two reforming kings of the 3rd century, Agis IV (without success) and Clemonenes III (successfully) had to overthrow it forcefully in order to implement reforms. Cartledge (1987) offers us an in depth analysis of the actual working of Sparta's political system

By contrast, Athens during the fifth century was characterized by fast political change and institutional innovation. A series of capable Athenian leaders such as Themistocles, Ephialtes and Pericles, introduced, i) election by lot, ii) extension of the right to be elected and to vote to all citizens, iii) changes in the judicial system- “popular” courts by jurors elected by lot, iv) redistribution of wealth through the introduction of *liturgies* (among which the *trierarchy* was the most costly), a series of public services being financed by the richest Athenian citizens through their personal wealth, v) introduction of pay for *eklesiastika* (public offices) and for attending the theatrical plays-contests, the *theorika*² etc. (Kyriazis, 2009).

All these institutional innovations made the system very adaptable and changeable, but also very fickle and unpredictable. Especially after the death of Pericles and his moderating influence, the system became perhaps too volatile, more specifically concerning foreign policy and geopolitics, leading thus to wrong decisions (such as the Sicilian campaign and the recall of Alcibiades) which finally led Athenian democracy to a strategic defeat in the Peloponnesian war (431-404 BC.). After the reinstatement of democracy in 403 BC, the Athenian Assembly seemed to understand this shortcoming and introduced a moderating check in the system in the form of *graphe paranomon*, which led to a security of every new proposal before its adoption or rejection.

The rate of change can be written as:

$$\frac{\Delta r}{\Delta t} = r_t = f(S_1, S_2, \dots, S_n, a_t) \quad (4)$$

where $a_t = \frac{\Delta a}{\Delta t}$ is the rate of political change during period t, S_{it} are the new strategies introduced into the choice set during the same period, and r_t is the rate of adoption of new strategies.

Table 1 presents a game theory matrix that estimates the payoffs of three Athenian citizens: Two poor *thetes* who serve as rowers in the navy and a rich one, a *trierarch* a rich one, say a commander of a trireme warship. There are two options in the game: war (w) and

² Theorika payments, introduced probably in 350 BC by Eubulus, were a compensatory tax imposed to the well-off citizens in order to finance the four days theatrical festivals that the poor Athenians could attend if they wish so. See Kyriazis (2009). Theorika also used for various other purposes such as offering public service in the dockyards of Piraeus or in the public arsenal etc. During wartimes the financial surplus by the theorika payments could be used for military purposes, after an approval of the assembly (Pomeroy, et al. 1999).

peace (p) strategy. Each of the three players chooses the one that maximizes his welfare in the game calculated for simplicity as material payoffs. Let us assume (which will be explained in the section on the Social Contract) that for the two poor citizens (who have the same preferences) the war strategy maximizes their payoffs, while for the rich one, the peace strategy does so. Since every citizen has one vote, the war strategy which is selected by the two poor ones is finally chosen.

The outcome of the game is given by table 1 below. Since the payoff for each of the two poor players under the war strategy is 4, which under the peace strategy is 2, they choose the war strategy, even though this brings about a pure loss for the rich. The “value” of the game is 6 in the case of the war strategy (adding up the payoffs of the three players) which is lower than the “value” of the game under the peace strategy, which is 12. What we purport to show in this very simple game is that inferior outcomes (strategies) may be chosen under democratic voting, if no compensatory payments -“logrolling” or balancing out of interests Buchanan and Tullock (2004) can be offered as an alternative option.

Table 1: Game matrix for a choice without compensatory payments

		Strategies	
		Peace	War
Players	1 (poor)	2	4
	2 (poor)	2	4
	3 (rich)	8	-2
“Value” of the outcome:		12	6

The situation for the two poor citizens in the first game, which provides the outcome without compensatory payments was:

$$\text{payoff (war)} > \text{payoff (peace)} \tag{5a}$$

and for the rich:

$$\text{payoff (war)} < \text{payoff (peace)} \tag{5b}$$

Let us now introduce the possibility of compensatory payments by the rich to the two poor players. In the second game which is described below, the rich citizen offers

compensation to the two poor voters, if they vote for peace instead of war. In the new game matrix, the peace strategy can be adopted, if the following conditions are met:

For the poor:

$$\text{payoff (peace, with compensation)} \geq \text{payoff (war)} \quad (6a)$$

and for the rich:

$$\text{payoff (peace, subtracting compensation)} > \text{payoff (war)} \quad (6b)$$

In game matrix 2 compensatory accounts are given within the parenthesis in each row of the peace strategy: Each poor voter receives (+2) from the rich one, so that he is as well off from a payoff situation point under the peace strategy as he was under the war strategy (condition 6a). The rich voter offers a total of 4 as compensation to the two poor voters to vote for peace, out of his total payoffs of 8. As table 2 presents, the “value” of the game is now again 12.

Table 2: Game matrix for a choice with compensation payments

		Strategies	
		Peace	War
Players	1 (poor)	2 (+2)= 4	4
	2 (poor)	2 (+2)= 4	4
	3 (rich)	8+ (-4)= 4	-2
“Value” of the outcome:		12	6

But the important point of the second game is that once compensatory payments are introduced, the possibility of achieving Pareto improving situation is given. In the outcome of the second game, the rich player has improved his situation (from -2 to 4) so that he is Pareto efficient, while the two poor ones are no worse. Of course, through bargaining, the two poor voters could convince the rich one to give them a somewhat higher compensation, (say 2,5 to each). In this case, they would also be better off. Condition (6a) is thus a minimal condition.

It is also clear, that the second game is not a zero outcome game (where the gains of one equal the losses of the other(s) players) but a positive sum game. Everyone gains, since the total “value” of the game is higher than in the previous game matrix 1. As we will show, Eubulus and Lycurgus fiscal policy programs can be analysed as practical social contracts

with compensatory payments by the rich to the poor in order to bring about a change of strategy, from war to peace.

3. The emergence of a theory of a social contract in ancient Athens

The main idea of a “social contract” is that the society’s individual members are reaching an agreement to bestow some of their freedoms to a political authority (eg. a magistrate or an elected government) in exchange for protection of their “natural and civic” individual rights. What we purport to show here, is that the idea of individual “human” and “civic” rights and a social contract was explicitly proposed in ancient Athens during the 5th century BC., before being reemerged by the 17th and 18th century Enlightenment philosophers.

The nucleus of an idea of social contract, although not explicitly stated, is inherent already in Solon's reforms of 594 BC (Forrest, 1994; Hansen, 1999). By implementing *seisachtheia* Solon abolished the ability of a lender to claim the conversion of a free citizen into slave due to its failure to repay its debts. Solon’s reforms released the peasants from serfdom, restored their farms and redeemed those who had been sold into slavery (Thompson, 1978). He believed that his reforms would balance out the various and conflicting interests of different property classes (mainly rich land owning aristocrats, “middle class”, farmers and artisans and in many cases, landless poor), thus bringing about *homonoia* (same-mindedness) and avoid *stasis* (revolt) by creating a community of interests, a version of a social contract, as far as possible. His opinion of his reform was “all people will win”, which is not far from a modern interpretation of his reforms as a Pareto improving situation, but also a social contract to guarantee the states’ stability.

The first assertive formulation of a theory of social contract can be found in the mid-5th century BC writings of the orator Antiphon. In *On Concord*, which is one of his works found in a fragment on a papyrus during the 19th century, the idea of natural rights and a social contract is clearly specified (Tsatsos, 1972, pp. 548-565). Antiphon's work contains a declaration on a natural law, as against the conventional man-made law. He, a member of the sophist movement, posed a strong criticism on the ways of implementing justice regarding them as ineffective (Moulton, 1972). By making a distinction between *physis* (what is natural and unchangeable) and *nomos* (the man-made law), Antiphon argued that people create laws which are the result of a human consent or agreement between societies and thus they may be affected by human’s self-interest motives. Thus, Antiphon explained why human laws are

“artificial” while the laws of nature are compulsory (Gagarin, 1997). This deduction made him also believe that human laws may be violated by people in case they will not avoid punishment.

Protagoras, another pre-Socratic philosopher (circa 490-420 BC.) also expressed some ideas compatible with the theory of a social contract. In his essay *On Truth*, he also uses the antithesis of law versus nature to claim, in accordance to Antiphon, that human laws are superficially imposed on citizens while those arising from *physis*, (nature) are unavoidable (Farenga, 2006). In his *Great Speech*, (Plato, *Protagoras* 320c-324c) he clearly specifies his views on a social contract: He believed that the main motivations of each person to enter a political community and become one of its citizens by “obeying” on certain regulations, was self-preservation and the need for survival of himself and the other members of his community (Nill, 1985). In other words, Protagoras believed that obeying the laws can be seen mainly as a compromise among people and less as a good itself in ethical terms (Mulgan, 1979; Kerferd, 1981, p. 147).

Similarly, in Plato’s *Republic* Glaucon, Plato’s older brother, and like him, amongst the inner circle of Socrates’ young affluent students, believed that men found it beneficial to become members of an organized community: “*in order not to suffer injuries and injustice*” (Nill, 1985, p. 26). Furthermore, Xenophon’s *Memorabilia* provides similar views to those of Plato’s *Republic* as far as a version of a social contract is concerned. In *Memorabilia* (IV.4), in a dialogue between Socrates and the sophist Hippias, the latter asks for Socrates to interpret the meaning of justice and Socrates responds by connecting justice with obedience to the laws as well as to *homonoia* (concord/same-mindedness) among the citizens (Marchant, and Todd, 1997).

In addition, Plato, in his *Kriton* clearly described a picture of a society where every young Athenian, who was at the age of citizenship (only males more than 18 years old) had the right to “choose” to accept and conform to the laws and the customs of his city-state, (and thus signing and accepting a social contract of values, ethics and rules of behavior), or otherwise, to reject them. If he finally decided to reject them, he could keep his belongings, but he should abandon the city and search for an alternative settlement in an Athenian colony or in another Greek city-state of his preference. De Romilly (1992) believes that the terms of acceptance or not of a contract are clearly specified here.

Another Greek philosopher that proposed ideas that more or less could be interpreted as a social contract, is Epicurus. He believed that the purpose of a man was to live a happy and tranquil life, characterized by *ataraxia* (peace and freedom), *aponia* (absence of pain) and

self-sufficiency. Epicurus believed that individuals must abstain from mutual wrong doing because this will help their own security and tranquility (Mulgan, 1979). This thesis is by itself a version of a social contract as it proposes a mutually accepted agreement by citizens not to act in a way that may harm each other (*blaptein*). Epicurus believed that in case of an acceptance of set of values that conform to his proposals, the society could increase its prosperity as a whole. Thus, it seems that Epicurus had understood the concept of achieving a Pareto better situation before the full expression of his theory in 1906 through the *Manual of Political Economy*, which is a central issue and within the core of the modern *Welfare Economics*³.

Finally, Popper (1966, ch. 3) believed that Lycophron, a pupil of Gorgias, a pro-Socratic philosopher had used the theory of the social contract under a liberal view if we interpret his ideas in terms of today. Popper argues that Lycophron considered the state laws as a “*covenant by which men assure one another of justice*”. Popper believed that Lycophron looked upon the state as “*an instrument for the protection of its citizens against acts of injustice*”, demanding that the state should be a “*cooperative association for the prevention of crime*”. By interpreting Lycophron, Popper argued that Lycophron’s aim was to find a way to “*protect the weak from being bullied by the strong*” as well as to define the rights of an institutionalized government to act only in the limited role of the physical protection of its citizens. It is obvious that this final thesis is undeniably a belief of today’s liberal doctrines.

4. The implementation of a social contract in the 4th century BC Athens

Since Kleisthenes reforms, Athens gradually developed the most advanced system of direct democracy in antiquity under which any citizen, called “*ho voulomenos*” (he, who wishes to make a proposal) could introduce in front of the Assembly of citizens, (requiring a quorum of 6000 present) proposals on any subject, such as external policy, (war or peace), public choice such as, the famous naval law of Themistocles (Kyriazis and Zouboulakis, 2004; Halkos and Kyriazis, 2010) or monetary currency policy, eg. Nicophon’s monetary law of 376 BC., on the parallel circulation of all good coins and the state's guarantee for their acceptance (Ober, 2008). A detailed analysis of this working of direct democracy, and the initiator (“*ho voulomenos*”) as enriching the exiting choice set of strategies, is offered by Kyriazis and Karayannis (2011).

³ Cirillo (1979) offers a detailed analysis of the economic ideas of Vilfredo Pareto.

At the beginning of the 4th century BC., Athens attempted to reconstruct the Athenian League which it had been abolished after Athens' defeat in the Peloponnesian War. This second Delian League was successful for some years, so long as some city-states felt threatened by Spartan power and thus needed Athens' protection. However, since the sudden decline of Sparta after its army defeated in two decisive battles by the Thebans (at Leuctra in 371 and at Mantinea in 362 BC), many allies considered Athenian protection not necessary anymore and wanted to get rid of the burden of payments to the Athenian war treasury linked to this.

This reluctance of the allies of Athens to contribute to the war treasury led to the so called *Social War* (circa 357-355 BC), as Athens tried to prevent them to break away but finally, without success.⁴ However, due to the war, Athenian public revenues were falling to 140 talents per year (due in part to much lower custom duties from trade, since war inhibited trade) whereas expenditure soared. Despite that the state was in a situation of an economic recession, the majority of the poor Athenian citizens still voted for the continuation of the war, because many of them had found a stable and not very dangerous employment as rowers in the fleet, which during wartimes comprised between 50 to 100 ships, giving employment from 8.500 to 15.000 rowers. In other words, employment as a rower in the triremes could mean that at least the one fourth to half of the active population of Athens could find a job in the navy, as the total population of Athens is estimated to have been approximately 30.000 people in the 4th century BC. (Hansen, 1999). The fact that employment in the Athenian navy even during wartime was relatively safe may sound strange, but during the 4th century, it was so. After the victorious battle of Naxos in 376 BC., the Athenian navy had reestablished its supremacy for the next half century, till its final defeat in the battle of Amorgos in 322 BC. During this period the Athenian navy fought a series of skirmishes but no major losses and human casualties, in comparison to those of the Peloponnesian War.⁵

What is important to mention here is the fact that the intervention of Athens in a series of war campaigns during the 5th and 4th centuries BC had gradually unveiled a situation of opposing interests between low income class *thetes* on the one side, and middle-class *hoplite* Athenians who could not cultivate their farms when being absent in foreign expedition as well

⁴ In a similar situation United States found themselves before and after the end of the Cold war era (1947-1991) due the trend of the global disarmament that followed the dismantle of the Soviet Union . Their European Union NATO allies drastically cut down their defence expenditures, making the US being obliged to bear the highest proportion of defence outlays within the transatlantic alliance. See Metaxas and Economou (2012).

⁵ For estimates of the cost of war see Pritchard (to be published) and Arvanitides and Kyriazis (2012).

as rich Athenians, who were losing revenues from a reduction of trade, banking, exports and being burdened by *trierarchies* and *eisphora* on the other side. To solve this detrimental situation Eubulus, the leading orator and politician of the 350's proposed a compromise between the different interest groups which can be regarded as a social contract, implemented by voting in the Assembly.

Instead of continuing the war strategy, poor citizens (of which a large proportion comprised by the *thetes*) could choose for peace (to the benefit of the rich and the middle classes). In this case they would receive *theorika* payments as a compensation for their loss of wages as rowers and being employed in an extensive public works program held by the state in order to beautify the city, as a part of Eubulus project of rebuilding Athens strength through internal means (Allen, 2010). Eubulus also introduced a law making it difficult to use the surplus of the public finances for military operations, which ensured that it would be available for the public works. Those works included among others, a newly made network of roads, water supply of the city, new waterfronts and shipyards. The $\frac{3}{4}$ of the warships were redeployed in new ports in Zea and Mounichia so that more space would become available in the central port of Piraeus. Eubulus also improved the legislation when it comes to the commercial law (Sakellariou, 1972, pp. 40-41).

Financing increased *theorika* payments became feasible: i) after the implementation of the *pentekoste*, through which 2% of the sums on the value of exports and imports were collected as custom duty by the state ii) due to an increase in trade, iii) due to more intensive exploitation of the state's property such as the Laureion silver mines. Eubulus also proposed that the *eisphora*, a tax on property paid by the rich during wartime should become permanent including the peaceful era, as an additional source of revenue for the state's budget, out of which *eklesiastika* (payment for the poor so that they would attend the Assembly), *theorika*, and the public building program could be financed (Kyriazis, 2009).

It is obvious that all these institutional settlements played the compensatory role which it has already been described by the second game matrix above. The compensatory measures under a peace situation made the poor at least as well off, as during the war period. The compromise between rich and poor was successful. *Thetes* were less in favour of war having in mind that extra war expenses would absorb the surplus of the *theorika*, intended otherwise for them as compensation. On the other hand, the rich would not anymore be overburdened with war expenses.

Also, through the compensatory system of *theorika* the danger of a possible social unrest that it may have been caused by the dissatisfied lower income classes and may have

turned into a revolt against the rich and their wealth, was gradually fading away. The fact that the theorika payments safeguarded the cohesion of the Athenian society and the survival of the political regime, made the Athenian orator and politician Demades, an important figure of that period to characterize all these compensatory system from the rich to the poor citizens, as “the glue of Democracy” (Sakellariou, 1972, pp. 40-41).

The expansionary fiscal policy program that introduced by Eubulus lasted up to 340 BC. During the 355-340 BC period state revenue increased from 130 talents to 400 talents, almost four times higher than the year 340. The grand strategy of the Athenian state which was based on reaping the rewards of peace, through the impressive increase in international trade and social reconciliation was abandoned only when the geopolitical expansionism of Macedonia under king Philip become extremely difficult to be ignored while in the meantime the belligerent passionate speeches of Demosthenes were “adding fuel to the fire” in favour of the war.⁶

After the battle of Chaeronea that took place in 338 BC., were the coalition of armies from Athens, Thebes and their allies defeated by the Macedonians, Lycurgus, another Athenian statesman and orator implemented another similar compromise-social contract to that of Eubulus (who probably had died before 340 BC). The new contract-agreement which adopted by the Assembly was based on the same institutional framework as its predecessor. Lycurgus plan brought the brightest period of peace in the history of the Athenian democracy, which lasted to 322 BC. (Lycurgus died in 323 BC, the same year as Alexander the Great). By the mid of 330’s BC. public revenue had been increased to 1200 talents per year (Ober, 2008).

Lycurgus political program was highly successful for a variety of reasons: Firstly, Lycurgus program guaranteed stable employment and revenues for the majority of the poorer Athenians in a series of public work programs. Being inspired by his mentor Eubulus, Lycurgus launched a vast public works program, second only to that of Pericles, which it may be interpreted, in modern terms, as an expansionary fiscal policy program of Keynesian inspiration. The public works program included the new sewage system for Piraeus, monuments such as the theatre of Dionysius beneath the Acropolis, and the extension of the Pnyx. (Hansen, 1999; Kyriazis, 2009). Other monuments also built including a prominent

⁶ That the Macedonian threat was real was realized by almost every Athenian, when king Philip seized in a surprise move, a fleet of 240 Athenian merchant ships carrying grain. Athenian population was dependent on the imports of cereals, since it was not self-sufficient in grain products. See Green (1998).

water clock, the Lyceum, the Telesterion at Eleusis⁷, as well as the construction of local theaters in some demes. The agora (the “centre” of the city where the most financial transactions were taking place) was provided with new temples and law court facilities. In addition, new shipsheds for warships and an arsenal for naval stores were constructed at Piraeus. City walls were modernized and enhanced. Finally, a new Panathenaic stadium intended for sport activities was constructed (Ober, 2008, pp. 68-69).

Secondly, Lycurgus followed his predecessor Eubulus' doctrine to focus on “international” trade as a means of increasing public revenues. Thus, Lycurgus passed a *commercial law*, which allowed metics and perhaps even slaves to litigate over contracts on equal terms with citizens. Through *enkteseis* he also offered special grants to non-citizens to own real estate whereas some foreigners that were accustomed to overseas trade were granted full citizenship by special decrees of the assembly. The efficient exploitation of trade transactions was also guaranteed by the use of the navy so as to suppress piracy. For this purpose, a naval station was also established on the Adriatic sea (*ibid.*, pp. 68-69). This necessary prerequisite to safeguard trade transactions approves that trade activity, if manipulated smoothly and with insight, it could also have some positive feedbacks on the economy, in our case here, by increasing employment on the navy in order to exterminate piracy and by performing public works to create a naval base to keep the seas open and safe.

Thirdly, another way of increasing public revenues it seems to have come from an increase of the sacred revenues. Revenues from temples are estimated to have been analogous to more than 2% of the annual state income (Papazarkadas, 2011). Finally, in 354/3 BC. Lycurgus introduced more aggressive measures to safeguard the soundness of the highly-esteemed Athenian coins, the so called “Athenian owls”. In parallel he drastically took measures to face coin forgery. In the meantime, he introduced a massive new issue of money in the market (Ober, 2008, pp. 68-69). This may seem that except from an extensive expansionary fiscal policy, Lycurgus also introduced for some period a monetary expansionary policy too in parallel.

⁷ Lyceum like the Academy and the Kynosarges were extensive athletic facilities where every citizen, without socioeconomic discriminations, including *ephiboi* (young men over 18) could receive training and exercise themselves in all kinds of sports. This institution was financed by the state and gradually expanded during the fifth century providing they were not slaves. See Fisher (1998) and Kyriazis and Economou (2012). The Telesterion of Eleusis was a sanctuary, one of the primary centers of the *Eleusinian Mysteries* devoted to the goddesses Demeter and Persephone (Wilson, 2005).

The result of all these policies was that the economy in its totality prospered, trade, exports and GDP grew. The Athenian 4th century economy showed modern characteristics in the sense of being probably the first economy ever in which the second and third sectors of the production (manufacture and services) contributed more to the total Gross Domestic Product and employment than the primary one (agriculture). Thus, the period 338-322 BC must be regarded as a second Golden Age for Athens. A detailed estimation of sectorial GDP and employment contributions is offered by Halkos and Kyriazis (2010).

The total of 1200 talents revenue for the period of Lycurgus is impressive since it came from Athenian own sources, without contributions by allies. Athens did no more have an empire. This revenue was higher than the 1000 talent revenue of Athens during the 440's BC. in absolute terms, and roughly comparable in relative terms, taking into account a possible inflation.⁸

5. Conclusion

It has already been posed above the question of an optimal rate of change in a democratic system, being fine-tuned between stability and volatility. Modern representative democracies with their checks and balances seem to enhance stability to the detriment of often necessary change and adaptation to new conditions. Bowles and Gintis (1986, p. 186) put the ideal functioning of a “democratic dynamic”: *“The problem of building a democratic society is.....one of a dynamic interaction of rules and actors, with the actors rendering the rules more democratic, and the increasingly democratic rules rendering the actors more firmly committed to and skilled at democratic participation and decision making”*, something which we call “learning by voting” (Kyriazis and Karayannis, 2011).

The Athenian democracy had achieved a good balance between these two extremes, combining during the fourth century sufficient institutional change (both political and economic) with increased stability, avoiding thus cases of extreme change that rendered the system sometimes too volatile and unpredictable, especially during the period of the Peloponnesian War. Table 3 illustrates a few important institutional changes. It presents a

⁸ While for example a stonemason received a wage of one drachma per day for the working on the Acropolis building program, which it was equal to the daily wage of a rower during the 5th century, he would receive one and a half drachma during the second half of the 4th century. For prices, wages etc. Loomis (1988) offers a detailed analysis as Burke (1985) and Humphreys (1985) for Lycurgus project.

series of key decisions that decided by the Athenian deme (the people), for example the Naval Decree of 482-481 BC, its initiator Themistocles and the positive feedbacks that that these decisions had on introducing new institutions and political change.

Table 3: Institutional and political change in ancient Athens

Political Decision	Year(s) of introduction	Initiator	New Institutions and policies	Political change
Naval Law	(482/481)	Themistocles ("politician")	<i>Trierarchy</i> Public Private Partnerships (PPP)	Full political rights to all citizens
<i>theorika</i>	(460-450 approximately)	Pericles ("politician")	Payment for public service and for theatre plays	
<i>graphe paranomon</i>	(415-403)	?	Less radical democracy	Constitutional legal procedure
Nicophon's monetary law	(476)	Nicophon ("businessman")	Monetary law: Parallel circulation of all good coins	
1.) Expansionary fiscal policy		Eubulus ("politician")	Increased <i>theorika</i> payments	Peace strategy
2.) Trade increase policy	(354)		Extensive public works program Nicophon's law is improved	Social contract
1.) Expansionary fiscal policy			<i>Eisphora</i> also in peacetime Extensive public works program	Peace strategy
2.) Trade increase policy		Lycurgus ("politician")	Trade increase policy	Social contract
3.) Nicophon's law is improved	(338)		(commesial law, Enkteiseis)	

This article has firstly presented a model of choice by individual rational actors-citizens in a direct democracy setting, showing the possibility of Pareto improving solutions if compensatory payments were allowed. Then, the model of choice was applied to the fiscal expansionary policy programs of Eubulus and Lycurgus showing that they may be interpreted as the implementation of a social contract between different groups of citizens: the poorer *thetes* who were in favour of the war strategy and on the other side, the better-off middle class

(*hoplite* farmers, artisans etc) and the rich (bankers, ship-owners, entrepreneurs) who were in favour of the peace strategy.

The programs of Eubulus and Lycurgus can be seen as a social contract i) in the sense of balancing out the various contradictory interests through the introduction of compensatory payments by the rich to the poor to convince them to change preferences, thus bringing about a Pareto better outcome for the state-society as a whole and ii) in the sense that the real preferences of the majority of the voters were revealed and then adopted through the voting process by the Athenian Assembly. The vote in favour of the peace strategy revealed the actual preferences of the majority of people “sealing” thus the contract and giving it legitimacy and validity.

We think that Eubulus and Lycurgus social contracts amplified citizens’ trust in the Athenian political regime and democratic institutions. By participating in a political system that it was taking into account their individual preferences, the Athenian citizens had the will and the motives to defend it from any possible future collapse. Our idea that a political system survives when citizens as individuals wish as a total to defend it can also be found within the pivotal core of the findings of Weingast (1997) who examined the political foundations of democracy in the seventeenth-century England, after the Glorious Revolution of 1688.

The social contracts implemented by Eubulus and Lycurgus disclose also another diastasis when comparing ancient to modern democracies: In a direct democracy the problem of revealing the actual preferences of citizens on particular issues can be efficiently managed under certain circumstances whereas in a representative democracy fails to do so, because under it, citizens-voters have to decide upon a “bundle” of all-encompassing proposals made by each political party, without having the possibility to decide upon separate issues.

Also, apart from the problem of possibly too many checks and balances, a second problem that it may reduce the rate of change in representative democracies has to do with the time factor. Under representative democracies, voters have the opportunity to express preferences only periodically, every four or five years at the elections. This can be unproductive in case of pressing issues that they may have become acute in the meantime and may need an immediate arrangement. Thus, we finally tend to consider that the implementation of a social contract in practical terms under representative democracy is almost impossible.

This article may give a stimulus to the further research on the theoretical aspects of democracy and on the actual conditions under which social contracts may be implemented in practice in modern democracies.

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