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Two level reform game problems of Greece

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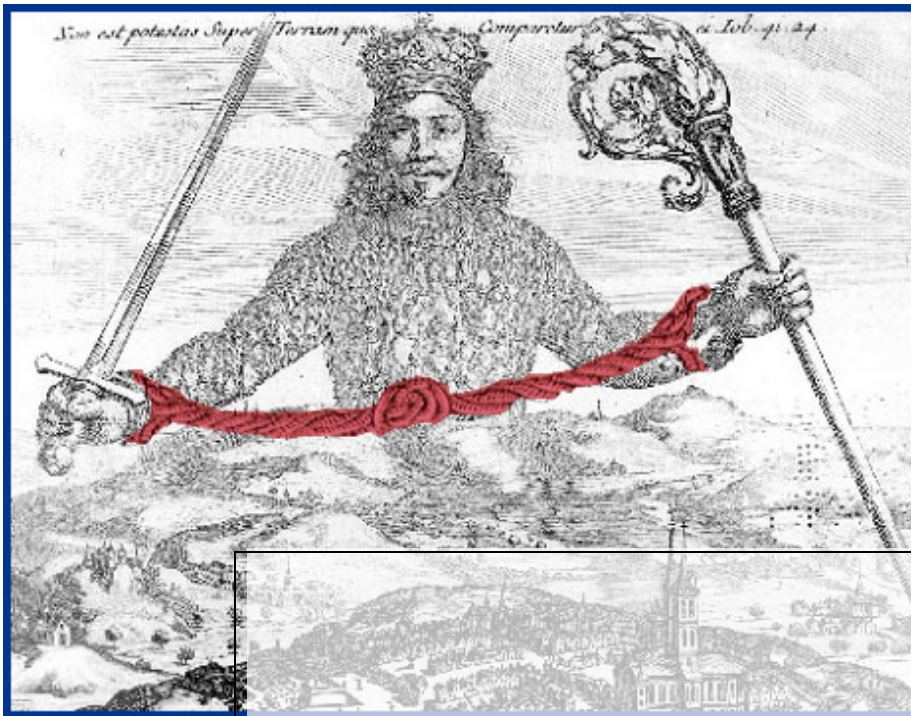
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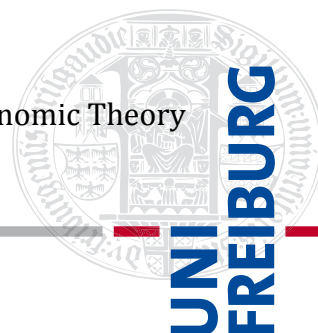
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Two Level Reform Game Problems of Greece

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I. Introduction

Contracts, may they be bilateral or multilateral, are formed with contemporary facts in mind. The contracting parties, aiming to an agreement, and wanting to cover their needs, define rules that define the essence of the relationship that is to be formed. Aiming for maximum utility they cover as many aspects of affiliation and any respective cooperation. Still, no matter how well thought or mapped, a contract may become nuance by the pass of time or an unexpected event. This contingency may lead towards inefficiency of its rules and the need of its reform. The social contract of a nation – otherwise known as its constitution -, being incomplete by nature, will be the first institution to face the need of a reform if the existing variables change. Within the constitutional economics framework, which identifies the social contract rules to have been built under a unanimous agreement, the tools and guidelines for this initial contracts reform are provided by the institution itself. Still, even if the knowledge exists, and the elasticity or inelasticity of a law is predefined, reforms that may be seen, by the impartial observer, as an improvement on the society's welfare are not immediately realized.

The focus of this paper is to map the timing of an already delayed national reform, recognized as publicly beneficial, and how it can be affected by external influence under negotiation. As an external influence we identify the provision of aid coming in the country from the international sector, who by assumption here aims to support the national reform. The actors of this conflict game are heterogeneous social, national and international, groups of power influenced by their respective utilities and the negotiations occurring, simultaneously, by the two sides.

On a theoretical basis this work combines the “war of attrition” model, presented by Alesina/Drazen (1991), with the “two level game problems” theory, presented by Putnam (1998). The Alesina/Drazen model is used as the explanatory base of delayed stabilization occurring from the side of the nation. Putnam's theory is used to show the connecting links between domestic and international sectors, how national problems can become international ones, and how international intervention can influence a national reform procedure.

The literature on the political economy of reform has studied deeply the subject of delayed stabilization. Alesina/Drazen (1991) and Drazen/Grilli (1993) approached the concept of delayed reforms as a distributional conflict. Fernandez/Rodrik (1991) and Rodrik (1993) explained the stabilization delay on the basis of information uncertainty, and Drazen (1998) combined these works into a single framework coming to the conclusion that “inherited conflict of interests in allocating the net benefit or cost of reform is a crucial factor in the failure of countries to enact reform” (Drazen, 1998). International help is considered as an effective reform delaying factor, especially by Casella/Eichengreen (1994), Orphanides (1996) and Hsieh (2000) who, respectively,

make the point that international help can be a factor that increases the time period of resistance to reform. In the aforementioned theories, the provision of an international help comes exogenously pre-defined – by the international sector – in time and proportion. This paper has a different view. Here, through negotiation, the international players become active in the stabilization game played by the national sector which has the possibility to bargain on the levels of the provision provided.

The motivation of this paper is derived from the recent Greek economic crisis. A European mass wave of negative reactions rose when on the 23rd of April 2010 the Greek Prime Minister G. Papandreou asked for international help in national economics, in order to avoid the country's bankruptcy. Apart from the huge amounts of money that had to be contributed in order for the country to stabilize, Greece had been already one of the main receivers of economic support from the European institutions in order to upgrade its national institutions and economy to the European standards. Therefore, it was hard to grasp the level and need of the international support in order for the country's economics to be stabilized. This study provides, as an applied example of its theory, an analysis of the game played by the Greek social groups, the Greek government and the international community during the time of Greece's economic convergence towards EU and the recent crisis. In specific it focuses on the State Owned Enterprises (S.O.E.s) and their long unsustainable path, maintained through public funding and the European support programs. The model highlights the hidden reasons for failures in the past and shows why the negotiations and the timing of the help offered by the international side influenced, negatively, successful stabilization.

Section 2 is a literature review on delayed reform and international aid. In section 3, the theoretical models that built the heart of the paper are presented whilst section 4 contains this paper's expansion of the model. Section 5 considers policy implications and section 6 concludes.

II. Literature Review

Tactic dilemmas, well orchestrated moves and information holding power are few of the problems recognized by literature as negative factors on the timing of a reform, whilst the actors vary among social groups, elected governments and individual policy makers.

The most interesting examples by the social groups literature are Fernandez/Rodrik's (1991) status quo bias, Rodrik's (1993) power of individual uncertainty to distort aggregate preferences when it comes to reform, Perottis's (1992) cooperative game of two out of three classes (rich, middle and poor), with the objective to allocate the burden of the reform on the middle class, and Hsieh's (2000) bargaining game occurring among cost-benefit calculating socioeconomic groups that utilize each other's delay as a screening device on each groups willingness to reform. Rodrik's (1993) static model was later extended into a dynamic one by Laban/Sturzenegger (1994 a, b)

where they confirmed once more that the longer the delay of stabilizing is, the less demanding will be the conditions under which some groups will accept to stabilize.

Moving to government as a main player we run onto Orphanides's (1996) "optimal inflation plan" model, where the reform problem rises from the choices of a government aiming to minimize the total cost of eliminating inflation, to Chang's (2001) government, which builds reputation by delaying reforms, followed by Dornbusch's (1991) critique on commitment and his evaluation on credibility, pointing that the lack of the individuals' predictive power can negatively parallel successful and unsuccessful programs and influence its actions, to Velasco's (1997) dynamic model of how an exogenous adverse shock to the governments' income can lead in debt to amass faster than it was expected and actually lead to a faster reform.

Turning, lastly, to the policy maker as an influencing actor of the game two are the most interesting models developed, Sargents' (1982) reputational model, where even a successful reform plan of a "strong" policy maker will be negated by the public's uncertainty to his fiscal responsibility, and Freytag/Renaud's (2007) model on the learning processes, pathological or active, and information bias of the actor, who can be dependent on his preferences and abilities.

A combination of the former comes forward by Alesina/Drazen's (1991) model on the "war of attrition". There, the decision or inaction of heterogeneous social groups can provoke government intervention. The most interesting part in their study is that after analyzing the conflict that occurs between the social groups, and mapping their motivating utilities, they derive an endogenous result in the optimal stabilization timing for each group, which can be defined by a governmental decision, if and when it deems necessary. Drazen/Grilli (1993) expand on the mentioned model, utilizing the crises effect on delivering welfare gains by accelerating the timing of the reforms, and involving the government even more actively in the stabilization game. In specific their suggestion is that crises, and the exogenous increase of inflation which succeeds them, pressure the government toward drastic reforms, whilst under this pressure, social groups accept reforms that they before rejected because of the high welfare gain this option presents to them. Finally, Carre (2000) presents an expansion of the "war of attrition" model, including an exogenous deadline and a penalty to be deducted by all the groups if no stabilization has taken place in the deadline.

In the majority of the presented models, the international provision of support in order for a successful reform to happen is discussed as an exogenous factor. Drazen/Grilli (1993) and Orphanides (1996) identify the fact that international aid influences, mostly negatively, the timing of the reform. Hsieh (2000) clearly states that the international aid increases the delay of reaching an agreement and reforming and Casella/Eichengreen (1994) distinguish even three possible reactions of the social groups on the timing of stabilization depending on the timing of the aid

provision before the reform is initiated. In the aforementioned theories, the provision of international aid comes exogenously defined – by the international sector – in time and proportion.

Acknowledging the former literature, and to our knowledge, this paper constitutes the first approach to unite the model of the “war of attrition” with the “two level game theory”, by modeling one of Putnam’s elements, the soon to be presented win sets, and to deliver an aspect of the game where the international sector is active through negotiation, managing to directly influence the national stabilization game. Within our frame the international conflict game is played simultaneously with the national dynamic “chicken” game influencing the reform, the so called “war of attrition”.

III. The Theoretical Background

This paper utilizes two theories in order to explain how the international support provided to Greece in accordance to its integration in the European Economic Union helped to delay stabilization actions within the country. On the one hand the Alesina/Drazen (1991) model of the “war of attrition” is utilized to explain the national conflict of sustaining the sub-optimal regulations of the S.O.E.s. On the other hand, Putnam’s (1998) theory on the “two level game problems” is employed to explain the reasons and ways the international sector managed to become part of this domestic conflict and how its participation influenced the turn of the game. The importance of the S.O.E.s for the Greek society and governments does not lie only in the fact that they provided the citizens’ common wealth benefits (Law of 2005). Their size and number is such that it can still influence the direct macroscopic elements of the Greek economy. The fact that these companies have been supported in an unstable path during the whole convergence period of Greece to the Maastricht criteria and real actions took place only when the austerity measures were voted in, was what motivated us to seek for the interweaving of the latter mentioned theories.

Delayed reforms: The Alesina/Drazen model of the “war of attrition”.

The theory and model developed by Alesina/Drazen (1991) deviates from the usual literature since the key actor of the economic game are socioeconomic groups and not the usual policymaker. The groups are heterogeneous, with different levels of lobbying power, different welfare losses when remaining in an un-stabilized economy and conflicting distributional objectives.

The background condition for a “war of attrition” to emerge is an unexpected economic shock that hits a national economy. The governmental income collected through taxation is reduced because of the shock and this forces the government to use inefficient methods of public finance, i.e. debt and distortionary taxation, in an attempt to cover the developing deficit. The groups recognize the necessity to reform after the shock but still do not do it on time.

In the original model, this reform is a levy in taxation that will eliminate the deficit produced and stabilize the debt. The nature of the reform is that of a public good and bears costs, economical, political or both, for the stabilizer, i.e., the group that stabilizes. The other group(s) which operate within the society and are not the initiator(s) of the reform (but still pay a small share of the reform costs) are the non-stabilizer(s). When deciding to reform all groups stand in front of a trade-off. From the one side lay their losses, in capital or power, if stabilizing, and on the other side their gains of remaining in an un-stabilized economy. Then, under information uncertainty for the other groups' power, they calculate their costs if they are the stabilizers or not. Using their groups time path of consumption, they derive a concession time when they will have to reform and undertake the share (α) of taxes if no other group has committed already. This share (α) is an exogenously given parameter that depicts the degree of polarization in the society. In a highly polarized country the more unequal the distribution of the burden will be and thus the longer the concession time of the groups. A group will stabilize when the costs of delaying even more the reform are more than the benefits of not stabilizing. The stabilizer is considered to be the loser of the game, since he is to be the one who will carry a disproportionate share of the tax increase necessary to stabilize. The non-stabilizer, or winner, will assume a smaller burden.

In the "war of attrition" model the debt before stabilization increases linearly and stops increasing thereafter, whilst the taxes after the stabilization are non-distortionary. The groups have their own lifetime utility functions which are calculated according to their given conditions and expectations in the future. In order to obtain an endogenous timing of the reform, Alesina/Drazen (1991) derive the optimal utility paths of each group and their independently decided concession time optimizing the following trade-off function between the group's gains and losses:

$$\left[\frac{f(\theta)}{F(\theta)} \frac{1}{T'(\theta)} \right] \frac{2\alpha - 1}{r} = \gamma \left(\theta + \frac{1}{2} - \alpha \right)$$

Here, θ shows the losses of remaining in an un-stabilized economy, α the share of the stabilization burden the stabilizer will have to assume, r the international constant interest rate and γ the fraction of the deficit of the economy covered by distortionary taxation. When the above function equalizes the optimal time of stabilization, $T'(\theta)$, is decided for each group according to its group specific losses, ω_i . The game is finite when it is assumed that at least one group exists in the society for which the costs of reforming are, at some point, less than the costs of remaining in an un-stabilized economy. If there exists no group with such features then the groups will continue to play infinitely or until the point that an exogenous actor such as the government will intervene and stabilize.

Entangled domestic and international policies: Putnam's two-level-game model

Putnam (1998) developed the “two level game” theory in order to explain when and how the international sector will find an “opening to intervene in the domestic politics and influence regulations and rules formation, [and] when from the other side the national sector will find a stepping stone which can help them develop policies that were beforehand beyond its possibilities” (Putnam 1998) depicting in that respect how “the domestic politics of several countries became entangled via an international negotiation” (Putnam, 1998). Using the Bonn summit conference of 1978 as his starting point, he researched similar cases and found general patterns that develop similarly in most of the cases.

In Putnam's framework there are three main categories of actors present. On the national level there are domestic groups, such as political parties or lobbying groups, and each of them pursues own interests and policies. On the international level there are national governments, seeking to maximize own gains by international co-operation and satisfy domestic pressures. The third actor is the “chief negotiator”, an individual player, who operates in both tableaux, and whose aim is to help the two levels reach a mutually attractive agreement. The former actors operate in two levels. In Level I, the bargaining stage, the international negotiations occur between the national and international actors. In Level II, the ratification stage, the domestic groups decide on whether to ratify the international treaty emerging through the negotiations or not.

Putnam's underlying assumptions are the following: A nation exists where the necessity of policy actions arises, and they turn to the international arena to seek support. The links that connect the different actors with each other increase the higher their economic interdependence is. Through negotiation the different parties try to reach a feasible agreement on a policy by forming a mutual “win set”. A “win set” according to Putnam is the set of “all possible Level I agreements that would “win” the necessary majority among the Level II constituents when simply voted up or down” (Putnam, 1998). During this period each side makes different attempts to alter coalitions, perceptions of costs or gains of an agreement. The treaty that is to emerge after this game of negotiation will be applied only after ratification at the national level. The chief negotiator, rising from each side, national and international, is the connecting link that controls the flow and the distribution of information among the negotiating parties and can support the sides in order to reach an agreement or not. Once the sides have formed a plausible “win set”, the game moves from Level I to Level II, in other words from the bargaining phase to the ratification phase. Here each side has to ratify the agreement on the national level, if it is a country, and by a binding contract, if it is an institution.

This paper utilizes four key ideas from Putnam's theory in order to explain the game played for the initiation or hindering of a feasible reform. The bargaining phase, the ratification phase, the chief negotiator, here as a mere "honest" information broker without a personal utility aiming for an optimal solution, and the "win sets", as "any set of potential international agreements that could be simply voted up or down" (Putnam, 1998) when the time for ratification comes. It is very important to note that the size of the win sets may differ and can define the course of negotiations and plausible agreements. A big win set offers more possibilities to come to an agreement but reduces the negotiation power of the party who holds it. Respectively, a small win set provides high negotiation power but less agreement possibilities. Additionally, strategic reasons may lead the parties act to understate the size of their win sets in order to pursue a better deal, or even more present them as "kinky" win sets. A "kinky" win set, according to Putnam (1998), is one that can be presented as a feasible one, but that with a slight difference towards its opponent's interest would not be likely to be ratified. In Level I the size of the win set may vary according to the strategies taken and information shared by the chief negotiator. In Level II the size of the win set may vary according to the social groups' preferences and coalitions or according to domestic institutions' coercive power. Reverberation can be positive, expanding the domestic win sets and aiding agreement on the international level, or negative, shrinking the win sets and hindering agreement.

IV. Reform Delay in the Two Level Game

The presented models are combined in order to illustrate how international aid affects national stabilization and public debt reduction. The war of attrition in this setting occurs simultaneously with the Level I negotiations. The national and international negotiators in Level I act in accordance with their win sets which are clearly defined by their utility paths, and they reach out to find the point at which they intersect. When the common point of the stabilization time is found, the international aid is provided. The chief negotiator is assumed to be an information broker for reasons of simplification. Thus, no explicit utility function is modeled for him and there are no transaction costs.¹ The national and international sides eventually reach an agreement that needs to be ratified in Level II. If this agreement is ratified, the game ends, but if not, it starts again, until an end solution to the game is found.

The nation's state of nature and initial assumption of the following model is the need of a change in the existing status quo. The necessity of the reform is recognized and accepted by the national social groups, the domestic government as well as the international sector entities that the nation at hand cooperates with.

¹ In the case of the Greek crisis, the European Commission could be in the position of a chief negotiator.

The actors of the two level reform game problems are the following. On the national side are the domestic social groups and the government. The national social groups can be civic society organizations, lobbying groups, political parties or any other kind of group that could coordinate aggregate behavior. These actors can be plenty. For simplification reasons this paper complies to Alesina/Drazen's (1991) assumption of only two groups or two political parties operating in the domestic level. The second actor rising from the national side is the chief negotiator. This paper assumes him to be acting as a mere broker of information between the two sides. On the international side, we find entities connected with the nation through multilateral or bilateral agreements. These could be other nations, international institutions whose welfare and gains are connected and influenced by the nations' respective domestic problems, or even unions of nations with which the nation at hand has some connection.

The type of the reform may vary. It could be economical, e.g., change in the taxation system or redistribution, or political, e.g., change in the voting system or decision making mechanisms, or both, as it was the case in the working regulations in the S.O.E.s. However, the nature of the reform is the same for any case: It is a public good. This means that once the change is made, it bears both the characteristics of jointness of supply and non excludability by its provision (see, e.g., Mueller 2003).

According to their utility levels, the groups calculate an optimal time of stabilization. In their setting the groups derive the optimal stabilization under a trade-off between the gains of remaining in an un-stabilized economy and the gains of waiting one more moment to concede. Until here the framework follows the simple model of the "war of attrition" at the national level. This game would veritably end with one of the groups conceding and bearing a disproportionate share of the reform.

The twist of this paper is that a further step is introduced before concession. This is active international participation in order for a solution to be found. Now the international actors become active within the national problem solving arena and can negotiate with the national actors their share of the reform burden. This point is important, because the failure of one country to implement the necessary changes could create disproportionate welfare problems to the other countries connected with it and we need to model the ways nations would try to hinder this from happening. Putnam classifies the economic interdependence between countries under the term of "synergistic linkages". This describes the cases where the "economic interdependence derived through the current globalised world can multiply the opportunities for altering domestic coalitions by expanding the set of feasible alternatives in this way - in effect, creating political entanglements across national boundaries" (Putnam, 1998). Synergistic linkages allow the international side actors to intervene in an arena which before was beyond their reach. Evidently, the increasing economic

relations among countries raise the economic interdependence. From an international perspective, they stand to gain by taking on part of the economic burden rather than leaving the country in its economic stalemate. From the national perspective, this means that “policy possibilities rise that beforehand were beyond domestic control and that the national groups will not have to change their preferences when deciding on a reform since they are offered a greater span of policy possibilities” (Putnam, 1998). When the international sector enters the game described above, a change in dynamics occurs. The two levels are introduced in accordance with Putnam’s ideas.

The starting point $t_1 = 0$ of this game is the moment the national actors enter the bargaining phase, or Level I. At this moment the state of the country is a “nation in need of a reform”, with heterogeneous social groups suffering different losses from not reforming, and a fixed level of polarization α which will affect the distribution of the national burden. The international actors enter the game interested in carrying, under negotiation, a share of the burden of the national reform in order for this reform to happen. Their motivation stems from their economic interdependence with the respective nation. At point t_1 each group, indexed by the letter i , has already calculated its own losses and gains from not reforming and has optimized in a point in time to reform $T_i = T(\omega_i)$ (Alesina/Drazen 1991). The chief negotiator distributes the information provided to him by the two national and the international sides and has no personal utility function. The win set of the national side is (T_i, ω_i, α) and it includes the optimal time of the stabilization according to each group (T_i), its respective costs of not stabilizing (ω_i), and the fixed share of the stabilization burden the stabilizer will have to assume which is common knowledge (α). As mentioned, the costs of not reforming and the gains of remaining in an un-stabilized economy form a trade-off.

On the other hand, the win set of the international sector (T_{intern}, ζ) includes the optimal stabilization time according to their optimal utility path (T_{intern}) and the share of the national burden they will agree to carry at that point in time, shown by ζ . This share can effectively be defined as the optimal amount of burden the international society will bear upon the possibility of reform taking place. The international sector decides on the level of ζ under a trade off. This trade off constitutes the gains of providing a public good in their respective countries as opposed to the gains from promoting a reform in another country. This means that the gains coming from ζ being distributed on supporting the other country have to be higher than their gains of providing this ζ to their own public good. This paper assumes that ζ has been calculated by the international sector within its respective utility functions and holds under the optimality condition mentioned above. The goal of the chief negotiator in this phase is to find the group with θ_i that would agree to stabilize at time $T_i = T_{intern}$ while the international sector will assume a share of the burden equal to ζ .

When a plausible international agreement is reached the game enters the ratification phase or Level II. In this phase, the agreed in the international level treaty is voted in or out. If the agreement is ratified, the clauses of it come into effect at the national level with the national institutions monitoring its implementation. If, on the other side, the treaty is voted out, the agreement is broken and negotiations start from the beginning. The international game can be repeated as long as it is necessary to come to an acceptable agreement. This paper focuses on the point in time that an agreement will be ratified and applied by the national sector. Under the games observed here the aid offered by the international sector may either postpone further or force it to happen faster. This paper identifies the two main ways how this will happen.

V. International Aid before Stabilization Policies

In this approach the burden share ζ by the international sector is distributed in the nation in need of a reform before the reform has happened in order to accelerate it. Therefore, international support is calculated as a share of the total burden falling to the non-stabilized economy. This means that aid received from the international side will be deducted equally from the total burden of the economy, affecting the utilities of all the groups operating under the un-stabilized economy.

The utility function of operating under an un-stabilized economy and sharing an equal part of the burden is adopted from the Alesina/Drazen model:

$$u^D(t) = -\gamma r \left(\frac{1}{2} + \omega_i \right) \bar{b} e^{(1-\gamma)rt}$$

The notation follows their own. Here, u^D is the utility any national group will have under an un-stabilized economy, γ is the fraction of the deficit of the economy covered by distortionary taxation, r is the international constant interest rate and \bar{b} the share of the deficit covered by debt. Furthermore, ω_i are the group specific costs and $\frac{1}{2}$ is the assumption that if only two groups exist in the economy. They will have to equally pay the burden of the reform not happening in equal shares.

Introducing ζ to the former utility function yields

$$u_{\text{new}}^D(t) = -\gamma r \left(\frac{1}{2} + \omega_i - \zeta \right) \bar{b} e^{(1-\gamma)rt}.$$

ζ enters negatively the utility function because it is subtracted from the losses the groups have to suffer when operating under the un-stabilized economy. Its subtraction leads to a positive

effect in the utility function before stabilization. The levels of utility under the un-stabilized economy rise. The international sector delivers ζ with the expectation that the reform will be realized at a point equal to T_{intern} . The problem with the implementation of the reform is that it will have to occur through the national instruments which the international sector cannot officially control or influence. On the other side, with their utilities increasing, the groups will recalculate their expected utilities and the optimal time of concession according to the level of ζ . This means that their span of life in the “war of attrition” will expand.

The expected utility function $EU(T_i)$ in this model is drawn by Alesina/Drazen (1991) where $1 - H(T_i)$ is the probability that a group will be the stabilizer, $h(x)$ the probability that it will be the non-stabilizer, u^D the utility of the group living under an un-stabilized economy, $V^L(T) = -\alpha \bar{b} e^{(1-\gamma)rT}$ the utility of the loser, $V^W(T) = -(1-\alpha)\bar{b} e^{(1-\gamma)rT}$ the utility of the winner and T_i the optimal time of stabilization of the group i . Again, α is the share of the burden the stabilizer will assume, $1-\alpha$ the share of the non-stabilizer, \bar{b} the share of the economic deficit covered by issuing debt and $e^{(1-\gamma)rT}$ the discounted constant interest rate to the stabilization date, so that expected utility is

$$EU(T_i) = [1 - H(T_i)] \left[\int_0^{T_i} u^D(x) e^{-rx} dx + V^L(T_i) e^{-rT_i} \right] + \int_{x=0}^{x=T_i} \left[\int_0^x u^D(z) e^{-rz} dz + V^W(x) e^{-rx} \right] h(x) dx .$$

Substituting in this function the condition $T_i = T(\omega_i)$ means that each group will choose its optimal concession time according to its individual losses. Deriving with respect to ω , equalizing to zero and solving for the optimal $T'(\omega)$ we receive

$$T'(\omega_{\text{new}}) = \frac{f(\omega)}{F(\omega)} \frac{2a-1}{\gamma r(\omega_{\text{old}} - \zeta + \frac{1}{2} - \alpha)} ,$$

where $\omega_{\text{old}} > \omega_{\text{new}} = \omega_{\text{old}} - \zeta$ and $T_{i \text{ new}} = T(\omega_{i \text{ new}})$ such that $T_{i \text{ new}} > T_{i \text{ old}}$. This means that the optimal time of stabilization will be postponed in time for each group with the $T_{i \text{ new}}$ being their adjusted optimal concession time. Thus the social groups will not stabilize so fast because it becomes cheaper for them to remain in an un-stabilized economy. This seems to be a dynamic version of the well known moral hazard effect of aid.

VI. When International Aid is Provided upon Stabilization

Here, the support coming from the international actors is to be provided directly to the stabilizer. The actors come into negotiations in order to decide the share of the stabilizers' burden that will be carried by the international side. The government plays the role of the chief negotiator reaching out for the common optimal share of the burden/time of stabilization win sets proposed. In this case, the share of the burden to be covered by the international sector is to be deducted after the initiation of the reform. Therefore, this share's size varies between the fixed level of the burden the stabilizer will have to assume and zero, i.e., $\alpha \geq \zeta > 0$. In order for the reform to happen relatively fast, the share that the international sector will carry will need to be relatively large, compared to that of the stabilizer. During the negotiations, the groups now calculate their optimal time of stabilization incorporating the share proposed by the international sector in their expected utilities. The utility function of the stabilizer described above is applied again. Thus, in the national "chicken" game an international coordination game is introduced. If the national groups manage to negotiate effectively, they can happen to be the stabilizer and still paying a smaller amount of the burden than the non stabilizer.

Under this premise, the share subtracted by the international sector will be deducted by the expected utility of the stabilizer $V^L(T) = -(\alpha - \zeta)\bar{b}e^{(1-\gamma)rT}$. Consequently, deriving again their optimal utility paths incorporating the international support in their probability of being the stabilizer themselves they recalculate their optimal timing of stabilization under their costs of remaining in an un-stabilized economy. This would yield

$$T'_{\text{new}}(\omega_{\text{old}}) = \frac{f(\omega)}{F(\omega)} \frac{2\alpha - 1 - \zeta}{\gamma r(\omega + \zeta + \frac{1}{2} - \alpha)},$$

where $T'_{\text{new}} > T(\omega_{\text{old}})$. This means that with the same costs and a given help, once they are the stabilizers, their costs of waiting one more time to concede, $\gamma r(\omega + \zeta + \frac{1}{2} - \alpha)$, increase and their gains of waiting one more time to concede, $2\alpha - 1 - \zeta$, decrease. This makes $T'_{\text{new}} < T_{\text{old}}$ and the timing of the reform closer.

In this case, the groups aim to find the best agreement under which complying would mean that they are having gains from this agreement, or not losses of the same size. Thus, the group stabilizing will try to negotiate a position where most of the share it will have to carry would be the share that the international sector will carry in the end. In order for a reform to happen under these conditions, ratification of the treaty has to occur. After the agreement is ratified, the international side will assume the set share of the burden while the other social groups operating in the nation

will have to bear a smaller share of the burden equal to $1 - \alpha$, similar to the “winner” in the Alesina/Drazen model.

VII. Stabilizing the Greek S.O.E.s

Following the logic of the two different approaches two main consequences may be derived. First, the international aid provided to a nation creates the tendency for the groups to postpone even more stabilization. Second, the international sector could implement an efficient change at the domestic level only under effective negotiations and directed contracting.

The S.O.E.s were part of Greek economy’s negative growth (Pettrakis 2011) for the last quarter of the 20th century. Their power in the Greek economy is vast and that is because their investments’ influence the growth rate of the economy, as well as the inflation, through their pricing policies, the government deficit through their operating results, the policy implications on the government debt through their funding and finally the terms and conditions of the respective industry where they operate through their business strategies (Law of 2005). These companies operated for almost thirty years producing debt, under the national funding and international support, before effective policy changes and reforms were made in their operating regulations. The change of the S.O.E.s working regulations and establishment of accountability rules would influence their efficiency and productivity levels. The nature of the companies, their size and number of employees, as well as the fact that they utilized state funding to operate whilst being in debt would make any reform applied on them to have a public good effect. It also would not only affect the deficit levels of the Greek economy but the power of the political party that would try to enforce it and the distribution of the capital injected into the Greek economy through the Community Support Framework. Utilizing the former presented framework we will identify how their regulatory reform game was played and ended.

On the national side we find the political parties of Greece, as the main actors, and as the chief negotiator each government’s respective Prime Minister. The reason of choosing the political parties as the main actors is the fact that in Greece the parties are the main source of influence and decision making within the different operating sectors of the nation, as well as the hard core of any societal organization (Pettrakis 2011). On the other side, the international sector includes all actors that are united through agreements or coalition formations with Greece and their international interests are influenced by the Greek domestic problems such as the European Union and its constituting countries.

From the explanatory statement of the law 3429/2005 it emerges that the former governments and the Greek parties supported the fact that the S.O.E.s operating regulations needed to be changed in order for them to function efficiently and not produce further deficit in the Greek

economy. Any political party could promote the change of the S.O.E.s regulations. However, the political costs of reforming were considered higher than the economic ones when remaining in the un-stabilized economy. The government of 1993, which wanted to sell the then state owned telecommunications company, was thrown out of power and the party that had proposed this operational reform was stigmatized under the label of “extreme market liberalization”.

A clear and recent example of how the game is played can be found in the S.O.E.s’ activities in the last years before the crisis. In 2003 the borrowing of the S.O.E.s by the Greek state was raised to the level of 2,3 billion Euros, when at the same time their revenue fell by 43% (Voultepsi 2013). From 2003 to 2004, their deficits rose by about 20%, with the outstanding loans reaching 30% and in 2005, only for the debts of the 13 ailing S.O.E.s, the state paid about 4.5 billion, or half the Olympics (Voultepsi 2013).

The reports of the European Court of Auditors in 2002-2003 testified as well great mismanagements in the S.O.E.s. More specifically they recorded: Overtime that exceeded weekdays. Payments of graduate benefits to employees before even taking the title and payment of bonus to employees for performance while on holiday. Hiring contractors to fill positions of employees who were on leave and then keeping them in position when the latter returned. The debt created in the economy by the S.O.E.s support was un-sustainable after time.

The social groups did not promote reforms earlier because of the economic support flowing into the Greek economy from the international side. If the international sector was out of the game, the reforms necessary would have happened at time $t_x = T'(\omega_i)$, where ω_i would have been the losses of a group that could not remain in the un-stabilized economy and support the capital flow anymore. If no group would undertake the reform the government would have to intervene and distribute the shares of the burden. The funding coming to the public budget through the international support sustained the operation of these companies until recently. The economic support flowing by the European Union equal to ζ helped the groups update their utility levels and optimal stabilization time. The new optimal time of stabilization was further in time than the one the groups would have if the international sector was out of the game. This provided the different groups in the Greek society with the opportunity to pass the “hot plate” of reforming the S.O.E.s operating regulations for almost 30 years.

The "new governance" model with "permanent control administrations" was applied in supervised S.O.E.s (Voultepsi 2013) and stable budget schedules were made, when the international support was directly provided to the stabilizer. In the Greek case Prime Minister Papandreou was the first chief negotiator and the political group implementing the reform PASOK. On the international side the main actor was the Troika of lenders constituted by the European Central Bank, International Monetary Fund and European Commission. Under the direct

negotiations with the groups that were to vote on implementing the reforms, Troika imposed on Greece the integration of the S.O.E.s finances to the general government data (Galiatsatou 2010). In 2010 Troika set, for the first time of the operation of the S.O.E.s, a plan on downsizing them. This was a move that carried a huge economical and political cost. This cost the domestic parties were able to renounce by pointing out that it was “the Troika that was pushing them to do these changes” and they did not choose to. The Troika support was provided under directed contracting and the regulations on efficiency controls, permanency and non accountability of the S.O.E.’s employees were finally reformed.

IX. Policy Implications and Conclusions

The investigation of the model results corroborates that the direct intervention of the international sector can lead to an immediate application of a reform through international help. Otherwise the money introduced to the economy will further delay stabilization. This arises from the fact that the incentives presented to the loser, instead to all of the interest groups, can promote the kind of the bilateral contract between the domestic social group and the international sector which will exhilarate the time of the reform. Information uncertainty problems that may rise can be overridden by the liability ties created by this type of a contract.

Following this line of argumentation we suggest that a reform can be effectively applied with the support of international aid when this aid is directed to the social group that will promote it, and after its provision, and not to all the groups operating in the society. A statement as such could raise ethical dilemmas based on lobbying activities of the groups and their power to information holding. This result would not infringe any legal rules or personal freedom but may be frowned for its explicit favoritism towards the group that would be the stabilizer. Also unintended consequences may rise from the fact that the stabilizer may improve its social position relative to the other social groups. Following utilitarian argumentation the main counterargument would be that if the aggregate society’s welfare rises by this reform which is considered to be a public good, directing the help to the stabilizer will indirectly support the whole society’s welfare.

Altogether, we discussed the question of how the provision of international aid influences national reforms. In this respect, the timing of the international aid and the negotiation processes followed appear to have a great influence when deciding on the implementation of a reform. The main topic investigated was the ways that Greek reforms in the S.O.E.s were influenced the last years by the European stabilization support. The timing of the international aid as well as the contracting between the players could both exhilarate and postpone stabilization plans. This research comes to the conclusion that international support may exhilarate the timing of reform only when it is provided under a contract with the stabilizer group and upon its application. Aid

that is intended to enable stabilization and is provided before any stabilization actions to have taken place is proved mainly to provide the opposite results. The importance of the results stems from the fact that they can guide the international player to apply more effective help when its intentions are actually to efficiently help and enable stabilization.

The limitation of the paper is that on the international level it focuses only on the implications produced by one country. It is not only the problems coming from Greece that influence the game. There are other domestic policies that have the same connectivity with the international game played. Also entities exist within the international side that will try to implement their own private or domestic policy on the international game in order to delay or to transfer the burden of the reforms to the other countries. Interesting expansions of this model would be the modeling of the self-interest of the chief negotiator, the modeling of the reformers' burden in the national level as negotiable among the social groups, the mathematical derivation of the international utility functions defining the levels of the share ζ and the international sectors utility path.

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