

*The Investment Theory of Wars: Belligerent Dictators in the
North/McGuire-Model of Autocracy**

THOMAS WILKE

Department of Economics, University of Duisburg, Lotharstrasse 65, 47048 Duisburg

Abstract. In the early 90s Mancur Olson Jr. and Martin C. McGuire developed an economic explanation of autocracy. The differentiation between roving and stationary bandits is the core of their theory. The authors claim that an "invisible hand" leads to a conversion of roving bandits into stationary bandits. In this respect, stationary bandits are "public goods providing kings" who reign peacefully. Thus, war is hardly a rational political option. However, this result stands in contradiction to the overwhelming evidence for wars in human history. Therefore, war as a political option is introduced. It is shown that the Olson/McGuire results prove to be valid only under certain circumstances.

Keywords: Autocracy, Dictatorship, War

1. Introduction

In the early 90s Mancur Olson Jr. and Martin C. McGuire (Olson 1991; McGuire and Olson 1996) developed a theory of human organization. They analyzed welfare effects of different forms of political organization distinguishing between three general political forms: anarchy, dictatorship, and democracy. Primarily, the innovation of their theory lies in the analysis of autocracy.¹ The essential element of their argument is the differentiation between roving and stationary bandits (Olson 1991: pp. 136; McGuire and Olson 1996). Roving bandits are rulers without a realm of their own who use their armies to maximize their own incomes. In doing so, roving bandits are perpetually mov-

* The author would like to thank Thomas Apolte, Corinne Kaiser, Manfred Tietzel, Dieter Cassel, Katja Bender (all Gerhard Mercator University of Duisburg), Alfred Schipke (Harvard University), Frank

ing around, leaving a place after it is plundered. In this respect they are very similar to nomads. The form of organization that results from this behavior is called anarchy.²

Stationary bandits, on the other hand, are rulers with a long-lasting base. Like roving bandits, they also want to maximize their own incomes. The difference for the inhabitants of their areas - compared with areas "ruled" by roving bandits - is the fact that they have long-term interests in their domain. The rational roving bandit tries to steal everything in the short run: for taxable property a tax rate of almost 100 per cent is income-maximizing. For the stationary bandit, however, it is rational to tax his people moderately

because he will be able to exact a larger total amount of income from his subjects if he leaves them with an incentive to have a high level of production (Olson 1991: 136).

Compared to the inhabitants of the "anarchic" areas, subjects of a stationary dictator enjoy a higher welfare (under identical conditions concerning climatic circumstances, raw materials etc.). They profit in two ways: first, they pay taxes at a much lower rate. Additionally, it is rational for the stationary dictator to use part of his income for financing and providing public goods in order to increase the income of his subjects (McGuire and Olson 1996: 72).

Although from an economic point of view these welfare effects are quite interesting, they do not explain the predominance of stationary dictatorship in human history. In order to do this it is necessary to show that the income of a stationary autocrat is systematically higher than the income of his roving counterpart. Olson and McGuire think that this is the case (McGuire and Olson 1996: 72). Moreover, they claim that an "invisible hand" exists that leads to a "metamorphosis" of roving into stationary bandits:

In short, an "invisible hand" gives a roving bandit an incentive to make himself a public-good providing king (McGuire and Olson 1996: 73).

The predominance of the stationary dictatorship is, as Olson and McGuire state, also in the interest of the population:³

Rothaermel (University of Washington), and Harry Campbell (University of Queensland) for helpful comments.

whenever a rational self-interested actor with unquestioned coercive power has an encompassing and stable interest in the domain over which the power is exercised, that actor is led to act in ways that are, to a surprising degree, *consistent with the interests of society and of those subject to that power* (McGuire and Olson 1996: 73, italics added).

It is argued in this paper that this argument is not correct. The "invisible hand" that leads roving bandits to become peaceful stationary ones does not exist in every case. Furthermore, the reign of stationary bandits does not have to be "consistent with the interests of society and of those subjects to that power". It may be rational for autocrats to become belligerent, which is detrimental for society in almost every case.

Olson and McGuire use the roving bandit as a reference in order to explore the behavior of stationary dictators. From a didactic point of view roving bandits are certainly interesting; historically, however, they are almost completely irrelevant. The basic mistake of Olson and McGuire is to identify the reign of a stationary bandit as a peaceful reign.⁴ By doing so, one type of stationary autocrat is excluded: the belligerent stationary dictator (figure 1).

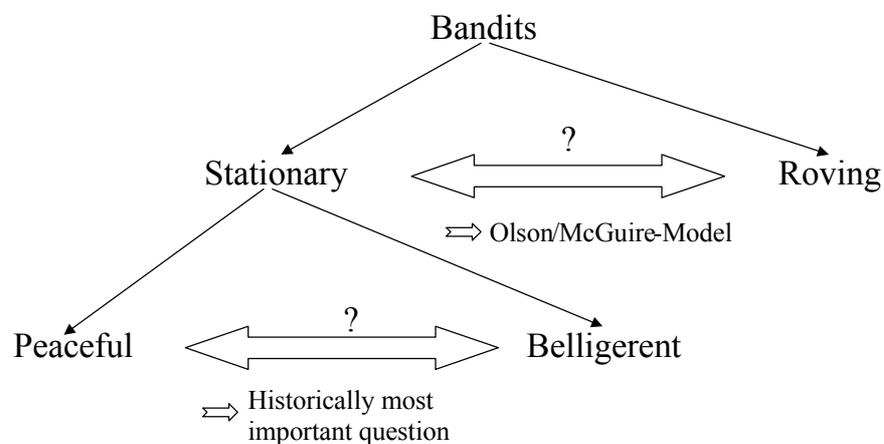


Figure 1. Roving Bandits and Two Types of Stationary Bandits

The reign of a stationary bandit does not have to be peaceful (Tullock 1987). Furthermore, it is quite possible that a belligerent stationary bandit exploits his population more than the stationary bandit in the original Olson/McGuire model does. First, in order to formalize this argument, a slightly different version of this model of autocracy is introduced here. Second, war as a political option is integrated into the model. This in-

tegration shows that the Olson/McGuire-implications only prove to be valid under certain circumstances.

2. The Model

In a simplified model, the economy's gross income depends on the productivity of the citizens. This productivity is decisively influenced by the amount of provided public goods G : $Y = Y(G)$, with $\frac{\partial Y}{\partial G} > 0$. $Y(G)$ is the maximum gross income that can be realized with the given endowment with production factors and a provision of public goods of amount G . There is no private provision of public goods. Finally, no capital taxation is possible.

The net income Y^{net} can be derived by subtracting the costs of public goods G from the gross income $Y(G)$. For simplicity, the price of public goods is normalized to one ($p_G = 1$):

$$Y^{net} = Y(G) - p_G \cdot G = Y(G) - G. \quad (2.1)$$

Assume that the costs of the public good's provision can be financed by a lump-sum tax. The social optimum, as determined by a society of free citizens, can be derived by maximizing (2.1) with respect to G :

$$\frac{\partial Y}{\partial G} = 1. \quad (2.2)$$

The marginal yield from the provision of public goods equals the price of these goods. However, if we assume that not all resources of the state stem from a lump-sum tax but from income taxation as well, we have to take into account the attendant dead-weight losses. In this respect McGuire and Olson define a function $r(ta)$, where ta is the

average income tax rate. This function determines the share of gross income $Y(G)$ that can be realized as net income Y^{net} for any given tax rate ta and any given provision of G (McGuire and Olson 1996: 74):

$$Y^{net} = r(ta) \cdot Y(G) \text{ with } 0 \leq ta \leq 1. \quad (2.3)$$

To make this task more applicable, $r(ta)$ is redefined here in the following way:

$$Y^{net} = r(ta) \cdot Y(G) = \beta \cdot [Y(G)]^{-\alpha \cdot ta} \text{ with } 0 \leq ta \leq 1, \beta > 0, 0 \leq \alpha \leq 1.^5 \quad (2.4)$$

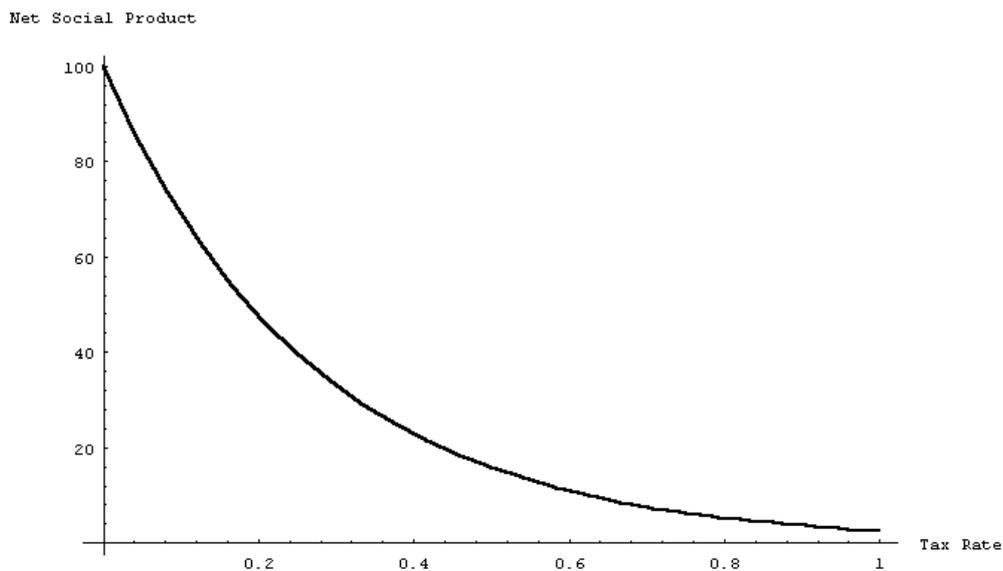


Figure 2. Net Social Product in Relation to ta ($G=\text{const.}$).

This function can be used to analyze the short-term reactions of the citizenship to variations in the average income tax rate. The reaction with a constant amount of public goods G can be seen in figure 2.⁶ In the figure, the reaction of Y^{net} to changes of ta is assumed to be quite sensitive because of a relatively high α ($\alpha = 0.8$). With an income

tax rate of one per cent, the net income equals 96.4% of the gross income. If we have an income tax rate of 50%, the net income is only 15.8% of the gross income.

Now the dictator, or the "stationary bandit", enters the game. Due to high transaction costs, people of the country are not able to establish the production of public goods on the basis of a voluntary contractual agreement. The king now fills this gap by providing public goods and financing them by income taxation. If he taxes his people, however, he needs to take into account their reaction, according to (2.4). In terms of our model, the autocrat maximizes his income or "theft" Inc_{Dic} with respect to ta and G :

$$MAX_{ta, G} Inc_{DIC}, \quad (2.5)$$

$$Inc_{Dic} = ta \cdot Y^{net} - G = ta \cdot \beta \cdot [Y(G)]^{-\alpha \cdot ta} - G \text{ with } 0 \leq ta \leq 1, \beta > 0, 0 \leq \alpha \leq 1, G > 0.$$

It is obvious that the stationary bandit will not tax his people as much as possible because a high average income tax rate will reduce the tax base and, hence, the income of the ruler. Furthermore, he has an incentive to invest some of his tax income in the provision of public goods, especially because some of the basic public goods are of a high marginal productivity with respect to Y and can thus raise his tax base considerably.

The income-maximizing tax rate for the dictator ta^* can be derived from the maximization of (2.5) with respect to ta :

$$MAX_{ta} Inc_{DIC} \stackrel{!}{=} 0 = \frac{\beta}{[Y(G)]^{\alpha \cdot ta}} - \frac{\alpha \cdot \beta \cdot ta \cdot Ln[Y(G)]}{[Y(G)]^{\alpha \cdot ta}} \quad (2.6)$$

$$ta^* = \frac{1}{\alpha \cdot Ln[Y(G)]} \text{ with } 0 < \alpha \leq 1, \alpha \cdot Ln[Y(G)] > 1. \quad (2.7)$$

The rule is that his optimal tax rate should be lower if either $Y(G)$ is higher and/or labor supply of the population reacts more elastically with respect to income tax, i.e. the

higher α is. In the above parameter specifications the optimal tax rate is 0.27 or 27%. Given this tax rate, the income of the stationary bandit is 7.98 (figure 3).⁷

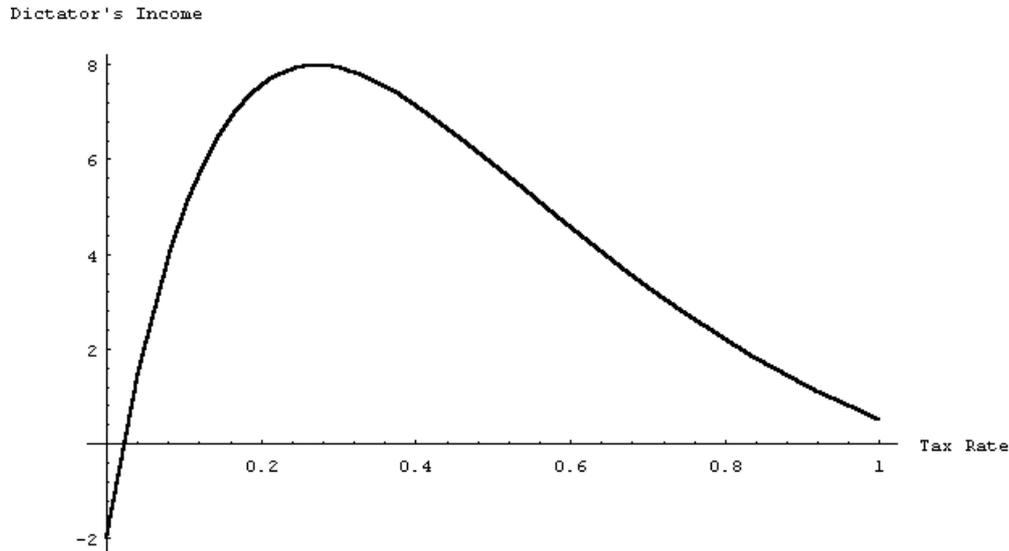


Figure 3. Dictator's Income in relation to ta ($G=\text{const.}$).

However, the dictator has to solve another problem simultaneously. He has to find the "optimal" amount of public goods from his point of view. The variable Y^* is defined as the net income that will be realized with a given optimal tax rate ta^* . With a tax rate of 27%, for example, the realized net income share Y^* equals 36,79% with a gross income of 100.⁸ Finally, Y^* can be substituted into (2.5). Hence, the "optimal" provision of public goods from the king's point of view can be derived as:

$$\text{Max}_{G} \text{Inc}_{DIC} = 0 = ta^* \cdot \frac{\partial Y^*}{\partial G} - 1, \quad (2.8)$$

$$\text{with } \text{Inc}_{DIC} = ta^* \cdot \beta \cdot [Y(G)]^{-\alpha \cdot ta^*} - G = ta^* \cdot Y^*(G) - G$$

$$\frac{\partial Y^*}{\partial G} = \frac{1}{ta^*} \text{ with } ta^* \neq 0. \quad (2.9)$$

This means that the autocrat provides G until the marginal increase in society's actual realized income is equal to the reciprocal value of his share of national product (McGuire and Olson: 77). From (2.7) and (2.9) the optimal rule for the ruler concerning the income tax rate and the provision of public goods can be derived:

$$\frac{\partial Y^*}{\partial G} = \alpha \cdot Ln[Y(G)] = \frac{1}{ta^*} \text{ or} \quad (2.10)$$

$$Y(G) = e^{\frac{\partial Y^*}{\partial G} \cdot \alpha} .^9 \quad (2.11)$$

The dictator plans, for example, the provision of a certain amount of public goods. A certain gross income can then be derived, which implies a certain marginal productivity $\frac{\partial Y}{\partial G}$. With information about $Y(G)$ and α the optimal income tax rate (equation 2.7) can be derived. Most likely, however, the rule (2.9) will not be fulfilled. Thus, G and ta^* have to be modified. If, for example, the left-hand side of (2.9) is higher (lower) than the right-hand side, this indicates that the marginal productivity $\frac{\partial Y^*}{\partial G}$ is too high (low). Therefore, more (less) G has to be provided. Given that the production function is well behaved, this will decrease (increase) the marginal productivity of G . At the same time, $Y(G)$ increases (decreases). This means that the optimal tax rate will decrease (increase). Consequently, the ruler will get closer to his optimal solution by altering both sides of equation (2.9) in opposite directions.

3. War as a Rational Political Option

Under which circumstances is a rational stationary autocrat interested in becoming belligerent?¹⁰ If he wins the war he will - in light of the model above - gain an additional source of revenue. By conquering new territories, he broadens his tax base. Suppose that a dictator expects this positive income from war Inc^{War} , which is defined as:

$$Inc^{War} = p_{Vic} \cdot E_{Vic}. \quad (3.1)$$

Inc^{War} is the product of the expected income abroad E_{Vic} , which is assumed to be known exactly by the autocrat, and the (subjective) probability of winning the war p_{Vic} (Wittman 1979).

However, the war also causes costs C^{War} . These costs represent income deductions for the ruler.¹¹ Consequently, rational dictators will become belligerent only when the condition:

$$Inc^{War} > C^{War} \text{ holds.}^{12} \quad (3.2)$$

Welfare of society does not change as long as the dictator finances the war with his own resources (without altering the provision of public goods). Unfortunately, wars are often very costly. What about a dictator who plans war with an expected gain exceeding the costs, but these costs are higher than the resources the ruler possesses?¹³ Will the ruler refrain from declaring war leaving the welfare of society unchanged? Obviously not if he is able to use further instruments for financing the war. In deciding to use these instruments, the self-interested ruler does not take into account the effect on the welfare of people. He is interested only in the income effects of these instruments. Consequently, a rational dictator with a time horizon of n periods always becomes belligerent when the condition:

$$\sum_{t=1}^n Inc_t^{War} > \sum_{t=1}^n C_t^{War} \text{ holds,} \quad (3.3)$$

and, in addition, he is able to realize extra resources (compared to the “optimal” income in the Olson/McGuire model) for warfare at least in the short run. Rational autocrats accept temporary income losses if they expect net income gains. Temporary income losses are in this respect "investments." Hence, this point will be called the "investment theory" of wars.

3.1. *Investment Theory of Wars - First Case: Financing by Ideology*

Ideology is a classical instrument of despotic rulers in order to legitimate their reigns. War is an exceptional situation from an ideological point of view: if a dictator is able to argue that the war is necessary for defending the country, additional resources for the ruler can be deducted in the McGuire/Olson model.¹⁴ There are two ways to integrate this aspect into the model:

- First, an ideology could be responsible for an increased appreciation of public goods by the citizens. In terms of the model, this means that for any given G the marginal productivity of public goods (equation 2.9) increases.
- Second, an ideology could decrease the price elasticity of labor supply. People may think that it is in their own interest to fight for the ruler or to pay him more taxes. Consequently, the net social product is larger for any ta . This means that α is smaller than before. The dictator gains from this ideology because his personal income is larger than before. A decrease of α from 0.8 to 0.7 leads, other variables being equal, to an increase in the "optimal" tax rate ta from 0.27 to approximately 0.31; the income of the autocrat is then 9.412 compared to 7.98 without ideological help (figure 4).¹⁵

Before α was changed by ideological influences, income of society Inc^{People} was:

$$Inc^{People} = (1 - ta^*) \cdot Y^* = 26.86 \text{ money units.} \quad (3.4)$$

The "new" social income after this kind of ideological influence is reduced to 25.4 units. The population pays for the war with welfare/income losses. Thus, the reign of a stationary bandit is not in every case "*consistent with the interests of society and of those subject to that power* (McGuire and Olson 1996: 73, italics added)."

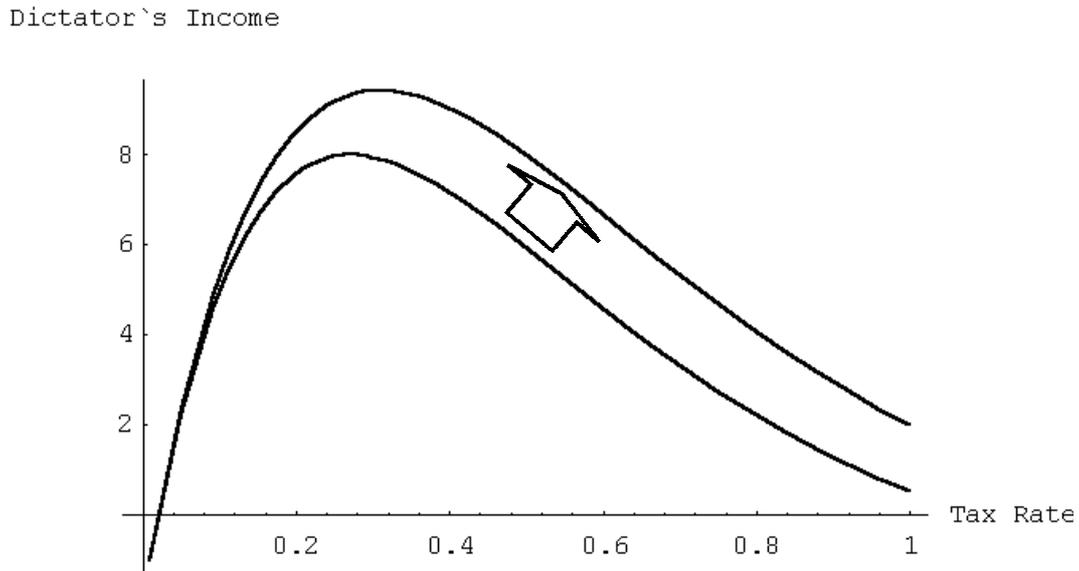


Figure 4. Dictator's Income in relation to ta ($G=\text{const.}$, $\alpha = 0.8$; $\alpha = 0,7$).

3.2. Investment Theory of Wars - Second Case: Financing by Using Time Lags

What about a dictator who cannot - despite his sophisticated ideological influence - generate the necessary resources for warfare?¹⁶ What could he do if - within the Olson/McGuire model - the following condition holds:

$$Inc^{Dic}(ta^*, G^*) < C^{War} ? \quad (3.5)$$

In line with the investment theory of wars, the ruler could accept temporary income losses if these losses would help him to cover C^{War} . For instance, he could try to raise

the tax rate ta above the optimal tax rate ta^* . Such strategy would be rational for him under the following two conditions:

1. Revenues increase in the short run.
2. Long-run revenue losses are lower than additional revenues from war (Inc^{War}).¹⁷

The second criterion requires the following condition to hold for a certain number of periods (for example n):¹⁸

$$\sum_{t=1}^n Inc_t^{Dic}(ta^*, G^*) - \sum_{t=1}^n Inc_t^{Dic}(ta^t > ta^*, G^*) < \sum_{t=1}^n Inc_t^{War}. \quad (3.6)$$

If people react to tax rate changes immediately, i.e. if the first condition does not hold, tax rate increases cannot work:

$$Inc_t^{Dic} = ta_t \cdot [Y(G^*)]^{-\alpha ta_t} - G^*. \quad (3.7)$$

If an autocrat increases the tax rate, people will immediately react according to equation (2.4). Tax revenues decrease and the resources for warfare will even be lower (equation 3.7). There is hence no incentive for the ruler to alter his strategy according to (2.7) and (2.9), even if he could win a war. This is central to the McGuire/Olson argument. However, their model has a basic weakness: it does not take into account that citizens may react with a certain time lag. Public goods often increase $Y(G)$ only in the long run. Furthermore, people and enterprises need time for reactions to tax rate changes. Because of the resulting time lags the following difference equations might better describe the behavior of citizens:

$$Y_t^{net} = \gamma \cdot [Y(G^*)]^{-\alpha \cdot ta_t} + (1 - \gamma) \cdot Y_{t-1}^{net} \quad (3.8)$$

$$Y_{t-1}^{net} = \gamma \cdot [Y(G^*)]^{-\alpha \cdot ta_{t-1}} + (1 - \gamma) \cdot Y_{t-2}^{net} \text{ etc.}^{19}$$

Under the assumption that these difference equations describe the reaction of society to tax rate changes better than the original Olson/McGuire model, the dictator's usable resources for warfare are:

$$Inc_t^{Dic} = ta_t \cdot Y_t^{net} - G^* . \quad (3.9)$$

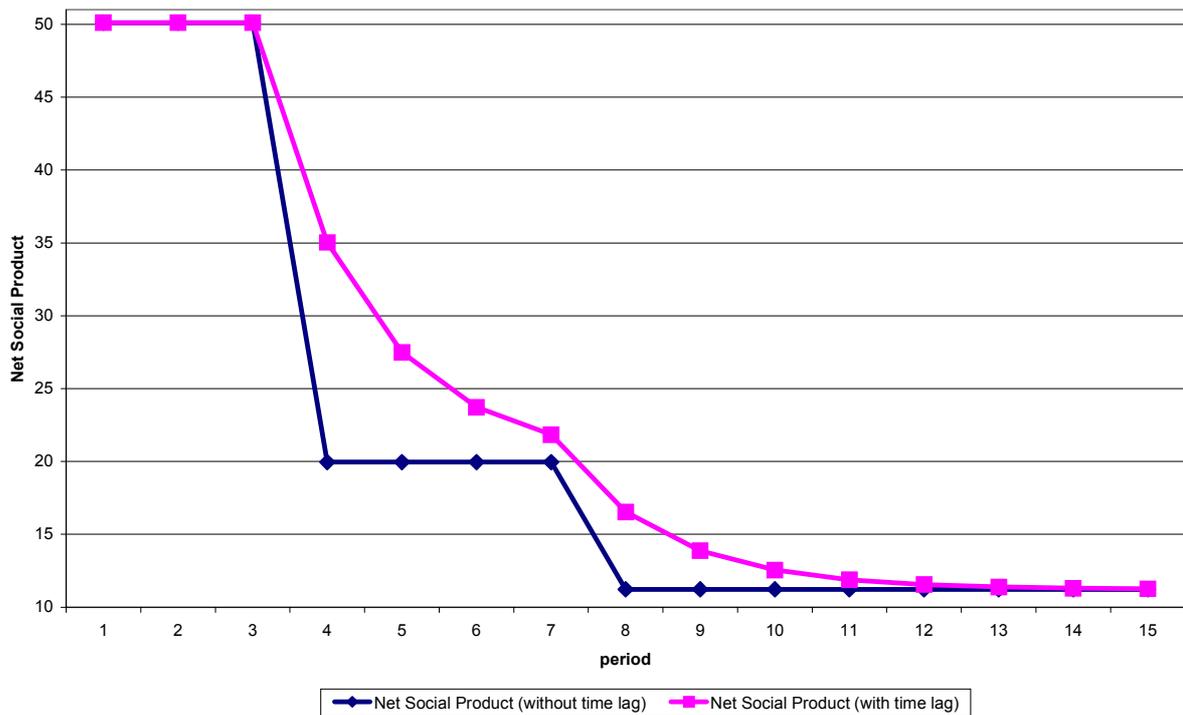


Figure 5. Reaction of Net Social Product to a Rise in the Average Income Tax Rate.

The task is even easier if we assume a steady-state equilibrium in pre-war time or before war is planned. In this steady state, income of the ruler is optimal with respect to

his personal interests. By planning warfare the king tries to increase his income temporarily by an increase in the tax rate ($ta > ta^*$). This is shown in figures (5) and (6).²⁰

These figures show the reactions of the net social product and the dictator's income (only from resources of his "old" country) as a result of an increase in tax rates in periods 3 (from 0.3 to 0.7) and 8 (from 0.7 to 0.95). If the citizens react without delay the net social product Y^{net} will decrease toward its new steady state level immediately; the same is true for dictator's income Inc^{Dic} (figure 6).

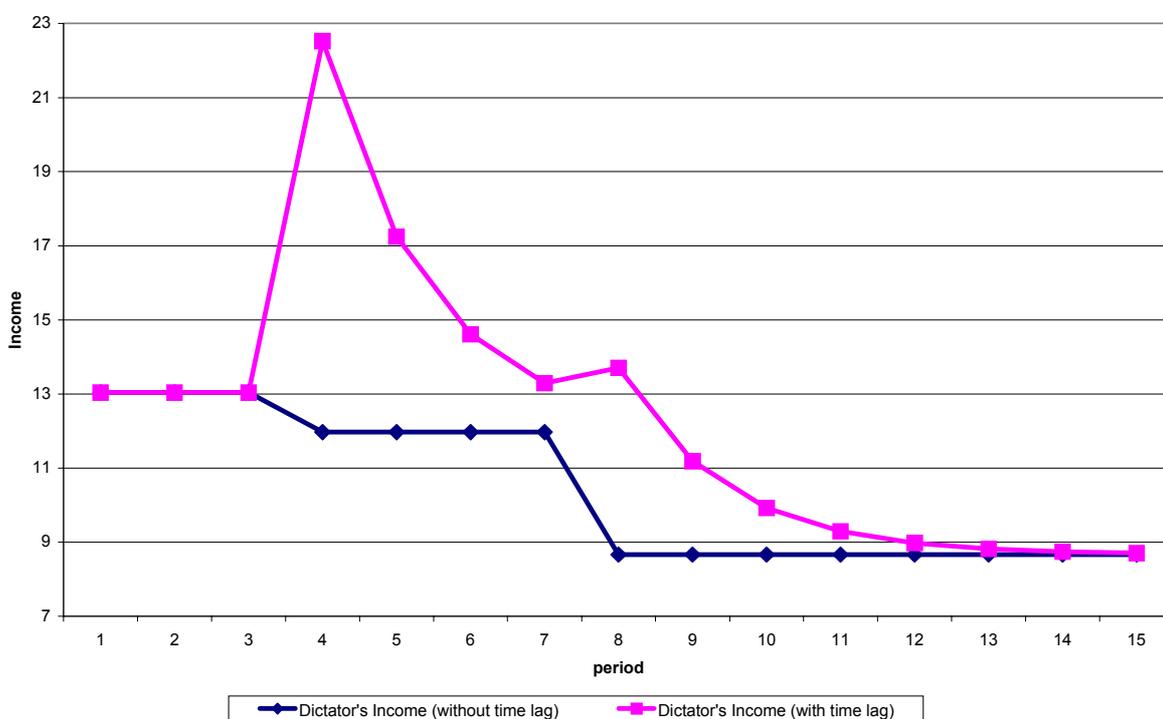


Figure 6. . Reaction of Dictator's Income to a Rise in the Average Income Tax Rate.²¹

However, if people react to tax-rate changes with a time lag the picture differs. The net social product decreases, but not immediately. It takes approximately 7 periods until the new steady-state level is reached. If this net social product Y^{net} is multiplied with the new tax rate, the dictator's income from his "old" country increases temporarily (with the chosen parameters in the figures between periods 4-8). It decreases to the old level in the eighth period. If the ruler has not won his war, he could try to increase the tax rate again. The figures show the effect of a tax rate change to 95% in the eighth pe-

riod. Dictator's income increases in reaction to this decision again above the original "optimal" level for one period.

Nevertheless, after this increase, his income Inc^{Dic} will decrease below its prior level. It can not be increased in the short run by the king because the time lag is effective in both directions. Hence, the ruler has to win his war within a certain period of time. Given that he wins his war, it is rational for him to accept the lower income from taxes within his own country. These income deductions are "investments" in the long run because the income from the conquest exceeds these tax losses.

Even if it is rational for the dictator to accept these losses, his people's income will definitely be lower than before. Thus, they have to bear the burden of warfare by providing their ruler with additional resources. In the best case, Y^{net} reaches its old level after the war. However, no one compensates the people for their temporary income losses. The situation will be even worse for them when the autocrat and his closest confidants have wrong expectations concerning the probability of winning the war p_{Vic} .²² If there are permanent tax rate increases during a long war it is not implausible that society gets into a vicious circle: people receive an income that is much more close to that under anarchy than Olson and McGuire believed. This implies that the theoretical results of their model of the stationary bandit cannot be fully correct. The results depend instead on the variables p_{Vic} , E_{Vic} , and C^{War} .

4. Conclusion

Olson and McGuire show within their model of dictatorship that the reign of a stationary bandit (compared to a roving bandit) may be advantageous for the population of a region. Moreover, the authors can derive an even higher level of social welfare under a democratic system.²³ The introduction of war into the dictatorship-model shows a further major advantage of democracy: people are protected from subjective and often biased assumptions of autocratic rulers concerning the probability of winning "their" war. Therefore, welfare losses resulting from wars are less probable in democracy.

The challenge for future research is to define and quantify conditions under which dictators become belligerent or stay peaceful. In this respect, the variable p_{Vic} seems to be very important.²⁴ When dictators are very optimistic concerning p_{Vic} , it is quite probable that they exploit their population much more than in the Olson/McGuire model. If, for example, two dictators with almost the same military and financial power are fighting against each other, the population has to pay a large price.

Notes

¹ Autocracy is understood as a society where one person or clique is above the law. See for this definition McGuire and Olson 1996: p. 93. See also Wintrobe 1998; Tullock 1987.

² This is somewhat dubious when anarchy is defined as a completely lawless situation.

³ Olson and McGuire state rightly that welfare of people is highest in a democratic society.

⁴ Olson, for example, states that the "*peace* (italics added) of a rational self-interested dictator is better than anarchy (Olson 1991: 138)."

⁵ The magnitude of α depends on how strongly the people react to variations in the tax rate, i.e. how large the supply elasticity of labor is with respect to its price. The parameter β represents external influences such as climatic conditions, etc.

⁶ The figure was drawn with following parameter specifications: $Y(G)=100$, $\alpha=0.8$, $\beta=100$.

⁷ The parameters for this figure are: $Y(G)=100$, $\alpha=0.8$, $\beta=100$, $G=2$. The figure does not show the simultaneous problem of determining the optimal amounts of G and ta^* . It focuses only on the problem of deriving an optimal income tax rate with a given amount of G .

⁸ The corresponding gross income Y is "utopian" because it does not allow for financing public goods.

⁹ For a parametric solution of the model a production function for Y with the input of the production factor G has to be defined. However, for simplification this has not been done in this context.

¹⁰ The following analysis focuses on the decision to attack another region. For the opposite case and the role of the army see Tullock 1987: pp. 35.

¹¹ Even human losses are income losses for the autocrat because these losses reduce his own tax base.

¹² For a similar formulation see Wittman 1979.

¹³ It is assumed that the dictator is not able to save resources.

¹⁴ Ideological influence is always based on informational advantages of the ruler in this interpretation.

¹⁵ Costs for ideological influence are neglected here. Rationally, a ruler would "produce" ideology to the point where the marginal costs of ideological influence equate the marginal returns in the form of additional income. See for instance Wintrobe 1998.

¹⁶ It is still assumed that C^{War} is lower than Inc^{War} .

- ¹⁷ In the long run, there are certainly revenue losses for the dictator because the actual tax rate ta^* is already the income-maximizing tax rate.
- ¹⁸ It is assumed that the provision of public goods G^* stays (ceteris paribus) constant at its old level.
- ¹⁹ The parameter γ is the time-lag operator; the lower it is, the less people are able to react to tax rate changes immediately.
- ²⁰ The parameters are: $Y(G^*) = 10$, $\gamma = 0.5$, $ta = 0.3$ (periods 1-3), $ta = 0.7$ (periods 4-7), $ta = 0.95$ (periods 8-15), $\beta = 100$, $\alpha = 1$, and $G = 2$.
- ²¹ The income of the dictator does not contain possible incomes from war.
- ²² A classical example for such a case is Kroesus, king of Lydia.
- ²³ That democracy was not able to dominate as a political form of organisation in human history could be explained with high informational costs of decision-finding. See for this argument Olson 1991.
- ²⁴ The authors discuss one exception from the "invisible-hand-rule" (Olson 1991: 152; McGuire and Olson 1996: pp. 93): If rulers only have a short time horizon, it is plausible that they re-convert to roving bandits. However, historical facts show the contrary: wars were often led by young rulers whereas the leadership of older dictators often became peaceful. This supports the investment theory of wars proposed in this paper.

References

- McGuire, M. C. and Olson, M. (1996). The Economics of Autocracy and Majority Rule: The Invisible Hand and the Use of Force. *Journal of Economic Literature* 34: 72-96.
- Olson, M. (1991). Autocracy, Democracy, and Prosperity. In R. J. Zeckhauser, (Ed.), *Strategy and Choice*, second edition, 131-157. Cambridge: MIT Press.
- Tullock, G. (1987), *Autocracy*. Dordrecht: Kluwer Academic Publishers.
- Wintrobe, R. (1998). *The Political Economy of Dictatorship*, Cambridge: Cambridge University Press.
- Wittman, D. (1979). How a War Ends. A Rational Model Approach. *Journal of Conflict Resolution* 23: 743-763.