ABSTRACT: This paper examines the consequences of distribution of income on election results in conditions of biased pluralism and a small-scale electorate, when the results of the democratic electoral process are compromised due to electoral corruption. The paper discusses the most important concepts of political economy and political theory connected to achieving electoral victory through distribution and misuse of economic resources, focusing on identifying the conditions under which a democratic political system serves organized interest groups and not the majority; i.e., biased pluralism.

Despite the formal equality of all voters, there are significant differences in their actual impact on election results. The democratic election process is put into question by the fact that the electorate is small and candidates have access to income that can be used to buy off ‘privileged’ voters through discretionary allocation of funds and the economic results generated by such distribution. Faced with the corrupt practice of the incumbent, the opposition candidate is driven to a similar position to gain the support of ‘privileged’ voters and win the election for the opposition. The economic and political result is that the free vote and political competition are compromised, resulting in a political hybrid, the semi-authoritarian regime.

This paper provides a mathematical optimization model in which a hierarchically based organization is used as an approximation of society. In the model, differences in the position of members of the organization are similar to differences between voters in the electorate. The particle swarm optimization (PSO) method is used to calculate the amount of electoral bribes. The paper also uses game theory to provide an example of voting for the person who will manage the organization. The formal game between the incumbent and the opposition candidate is presented with a discussion of the various results of the game.

KEY WORDS: biased pluralism, electoral process, semi-consolidated democracies, particle swarm optimization, game theory

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1. INTRODUCTION

Modern political economy uses neoclassical economics, rational choice theory, and game theory to analyse the connection between economics and politics, while the new political macroeconomics makes economic policy endogenous and assumes that economic policy is used to realize policymakers’ economic and political goals. If policy is generally defined as “deciding who gets what, when and how” (Lasswell 1936), it is clear that it has strong links to the economy, and that the economic success of individual economic agents depends on their impact on politics and political decisions. Political and economic misuse by those in power exists even in countries that are consolidated democracies and have institutional arrangements that restrain such behaviour. However, it is particularly present in economies that are in the process of political transition and have a much weaker institutional framework that facilitates corruption, bribery, various forms of influence on political decisions, and political influence on economic policy.

In a democratic system, election results depend to a great extent on the economic results attributed to the government, the current economic policymakers. This is the essence of the model of political macroeconomics developed since the 1970s, with different assumptions about the motives of politicians – opportunistic or partisan – and different characteristics of voters – naïve or rational. Political macroeconomic models rely on the theoretical tradition of majoritarian electoral democracy, according to which the average citizen determines government policy. The development of the theory of electoral democracy began with Anthony Downs’ book, An Economic Theory of Democracy (1957). More recently it has been based on the theories of rational choice, according to which economic policy is formulated in accordance with the preferences of the average citizen (opportunistic models) or of the average supporters of a certain party (partisan models).

In a parliamentary democracy a key limitation of the electoral process is the possible misuse of economic policy during the pre-election period in order to achieve better economic results for the entire electorate or for particular segments (members or sympathizers of a particular party). Various institutional arrangements have been created that limit these misuses, most of which involve the introduction of monetary and fiscal policy rules to limit political activity focusing on voters, particularly through the misuse of different forms of income redistribution (Drazen 2000), which has crucial consequences for both participants in the electoral process and for the whole society.
The aim of this paper is to analyse how electoral corruption in the form of the incumbent’s misuse of income distribution vis-à-vis privileged voters helps win elections, and how these actions can be limited. The selfish motives of rational voters who are concerned with their own position in distribution of income (the part of the income which they appropriate) make them indifferent to the growth of total income. Thus they prefer to vote for the person who will provide them with a ‘privileged’ position in the distribution of income, regardless of the results achieved in overall income growth. The key attribute that gives certain voters a privileged position in the hierarchy and in the distribution of income is their influence over ‘blackmailed’ voters. These ‘privileged’ voters are often members of well-organized groups, or elites.

For such analysis it is necessary to use theories that can predict differences within the electorate due to the different levels of influence that voters exercise over election results and policymaking. Elite theory is the most relevant, especially economic elite theory, and also interest group theory. According to elite theory, the individuals who constitute an elite (based on social status, economic resources, institutional position, etc.) determine policymaking, including economic policy. Interest group theory offers a similar approach, especially biased pluralism, which, unlike majoritarian pluralism (‘pluralist democracy’ or polyarchy (Dahl 1971)) insists on conflicts between interest groups that generate results that match the preferences of the minority rather than the majority (Gilens and Page 2014).

This paper also demonstrates the strategic calculations of the incumbent and his/her opponent during elections in the form of a strategic antagonistic game in which both players try to win the election by buying off privileged voters. This situation reflects the experience in the many transitional countries that are semi-consolidated democracies or hybrid regimes and are trapped in a specific relationship between the ruling politicians and certain interest groups or elites that is based on mutual economic interests.

The paper is structured as follows. Following this introduction, section 2 discusses important theoretical concepts of political economy and political theory related to the interaction between economics and politics in democratic systems. Section 3 presents a detailed analysis of two theoretical approaches, elite theory and biased pluralism theory. Section 4 provides the key pathology of policymaking in semi-consolidated democracies. Section 5 constructs and presents the model of a hierarchical organization, which is a ‘small organization’ with a limited number of voters who occupy different positions in the hierarchy and in the distribution of income that are connected to their power in the electoral process (as ‘privileged’
or ‘blackmailed’ voters) and are similar to those found in society. Particle swarm optimization (PSO) is applied as the optimization method and the paper provides a numerical example for calculating the amount of income used for discretionary allocation (bribery). In Section 6 the findings from the previous analyses are used to frame the electoral process as an antagonistic bimatrix game between ruling and opposition candidates. Section 7 provides conclusions, highlights the main findings, and proposes further research directions.

2. THE POLITICAL ECONOMY OF REPRESENTATIVE DEMOCRACY: BASIC CONCEPTUAL ARGUMENTS AND LITERATURE OVERVIEW

It is not possible to present here a detailed overview of the theories of democracy, due to their number and complexity. Even the term ‘democracy’ is not uniquely defined, and definitions have changed and evolved into different sub-categories over time. There are not only differences between democratic and authoritarian regimes, but also within each of them. Democracy, whose original meaning was ‘rule of the people (commoners)’, is usually defined by the level of voter participation in political decision-making and their impact on the process of policymaking. In democratic political systems the ‘rule of the people’ is articulated through representative executive power – government and the legislature – in parliament. Thus, the majority of the population or of the electorate is involved in the decision-making process indirectly, through their representatives in parliament.

This understanding of democracy is connected to the concept of liberal democracy as the key context of the modern state. “Liberal democracy is a system of representative government by majority rule in which some individual rights are nonetheless protected from interference by the state and cannot be restricted even by an electoral majority” (Dunleavy and O’Leary 1987, p.5-6). In the 17th and 18th centuries liberalism meant that individuals were independent from the state in the sense that those who governed (the church or absolutist monarchs) could not call into question individual rights and freedoms. In addition to changes related to the scope and structure of the electorate, the development of the democratic system has included changes in voters’ impact on the decision-making process. Today, the electorate’s influence is limited to voting in elections, while the recall of politicians between elections is restricted. This makes the election process even more important.
Nevertheless, the concept of democracy encompasses two very different ideas of the democratic process. The first is electoral democracy, which is a minimal view of democracy which results in semi-consolidated democracies and hybrid regimes. Today, many autocrats hold multiparty elections, in which, however; they have many advantages over their opponents, one of which is the possibility of using public resources for electoral corruption. The second is liberal democracy, which is a maximum view of democracy that results in fully consolidated democracies and holds that all citizens possess political and legal equality, while the actions of state officials are limited by law (Diamond 1999).

However, even in countries that are consolidated democracies the development of the concept of democracy has not been the same, nor has it been trouble-free. In political philosophy the concept of pluralism was developed in opposition to monism and implies sharing power between a number of political parties rather than monolithic state control. Institutional pluralism occurred in this context. Consequently, democracy is defined through the concept of polyarchy, which, according to the American political scientists Dahl and Lindblom, is a set of institutional arrangements that can be considered as an imperfect approximation of the ideal system of democracy (Dahl and Lindblom 1953). This concept insists on the inclusion of a large number of people in ruling and the crucial requirement is that all people in society have the right to vote and to be elected in fair and free elections.

Reaching full democracy, as a system in which the government is responsible to all citizens, is almost impossible, but it is even more approximate if the conditions of polyarchy are contended in order to ensure that the government is responsible to more people and that majority participates in political decision-making processes (Dahl 1971). The polyarchy should limit the importance and influence of elites, small groups of influential people that occupy a superior position in relation to other members of society (‘ordinary people’) and possess economic and political power. The polyarchy should provide competition and agreement between the various elites in the context of representative democracy.

Numerous indices of democracy can be found in politico–economic literature. They become important when determining the relationship between a country’s economic performance (economic growth, equality in income distribution) and its political characteristics (Acemoglu and Robinson 2006; Acemoglu et al. 2008; Acemoglu et al. 2015). One such index by Gasirowski, based on three important dimensions of democracy, competition, participation, and civil and political freedom, groups countries into the following categories: 1) democratic regimes,
2) semi-democratic regimes, 3) authoritarian regimes, and 4) transitional regimes (Gasirowski 1993).

An important feature that determines the nature of the democratic system in modern states relates to the electoral process and competition between the participating political parties. In democratic systems the legal framework guarantees these elements of the electoral process. However, even then economic policymaking can be misused by manipulating the benefits of certain government measures that help to determine voters’ decisions (Downs 1957). This is the essence of opportunistic political models in which, in the pre-election period, the government implements various monetary and fiscal policy instruments to artificially improve macroeconomic results in terms of increasing income or decreasing unemployment (Nordhaus 1975; Lindbeck 1976). Favourable economic conditions before an election increase the chances of re-election, even though the economy might take a turn for the worse immediately after the election (Alesina et al. 1997, Jakšić and Praščević 2010).

These attempts at manipulation are opportunistic, while the actual forms of misuse, as well as their consequences, depend on the characteristics of the voters. If they are ‘naïve’ or ‘short-sighted’, with a poor memory of previous experiences of politically motivated misuse of economic policymaking (corresponding to the macroeconomic concept of adaptive expectations), then its execution will be easy and will mean an increase in aggregate demand, primarily through fiscal expansion.

The inclusion of rational voters who are aware of politicians’ real motives (equivalent to the macroeconomic concept of rational expectations) implies that it will not be easy for politicians to misuse economic policy for political gain and to win elections. However, there remains the possibility of information asymmetry, primarily related to the policymakers’ competence (Cukierman and Meltzer 1986), in which case the authorities must strive harder to deceive rational voters, who are assumed to be fiscally conservative. This is in the essence of the rational opportunistic budget cycle models (Rogoff and Siebert 1988; Rogoff 1990; Shi and Svensson 2002b; Drazen and Eslava 2005, 2006).

However, the electorate does not constitute a homogeneous set of voters. They will have different ideological preferences, but even such differences can be explained in terms of the economic benefits that voters expect from certain political options. When that is the case the government’s economic policymaking follows the preferences of the ruling party membership, as in partisan political
cycle models (Hibbs 1977; Alesina 1987; Persson and Svensson 1989). However, even ideologically oriented politicians relax their partisan economic goals under certain conditions; for instance, dropping the reduction of unemployment and abandoning inflation reduction in a situation of high unemployment (Hibbs 1987, p.253).

Even though it might be possible to engineer favourable economic conditions before an election, immediately after the election they can be easily derailed by macroeconomic trends that produce an emerging budget deficit, increase inflation, and impose the implementation of painful macroeconomic stabilization, resulting in recessionary trends and growing unemployment. Such bad outcomes could be the result if voters are not fully aware of politicians’ true motives and there are no institutions to limit the misuse of macroeconomic policies – for example, an independent and transparent central bank and a transparent and accountable budget process (Shi and Svensson 2002a; Brender and Drazen 2003). This is more often the case in the ‘new’ democracies than in established democracies (Brender and Drazen 2004), and was particularly the case in the first phase of the economic and political transition in the former socialist economies (Hallenberg and Souza 2000; Akhmedov and Zhuravskaya 2004). In these countries, after initial enthusiasm for the processes of economic transition and democratization, strong preferences soon emerged for significant redistribution of income and wealth, expressed particularly by those who had lost out in the transition process (Hellman 1998; Brainerd 1998; Fidrmuc and Noury 2003; Okulicz-Kozaryn 2014; Okulicz-Kozaryn 2015).

In the literature on political cycles these potential ways of misusing economic policy are only related to one concept in the political theory of democracy, majoritarian electoral democracy. However, three other concepts are also important. They differ depending on which group of actors is impacting public policy (Gilens and Page 2014, Table 1).

This paper will focus on two theoretical approaches, economic-elite domination and biased pluralism, because both examine the conditions under which the results of basic democratic processes can be compromised for economic gain, not for the average citizen or mass-based organized groups but for a small and well organized part of society, whether the ruling elite or specific interest groups.
Table 1: Policymaking within four theoretical traditions of political democracy

<table>
<thead>
<tr>
<th>Political theory of democracy</th>
<th>Who influences public policy?</th>
<th>Whose preferences are decisive?</th>
<th>Policy outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Majoritarian Electoral Democracy</strong></td>
<td>Average citizens</td>
<td>Preferences of the ‘median voter’</td>
<td>Possibly in accordance with preferences of society and social welfare (with possible abuse by policymakers in order to stay in power)</td>
</tr>
<tr>
<td><strong>Economic-Elite Domination</strong></td>
<td>Economic elites</td>
<td>Preferences of individuals with substantial economic resources (high level of income and wealth)</td>
<td>In accordance with the welfare of the economic elite (the rich become richer)</td>
</tr>
<tr>
<td><strong>Majoritarian Pluralism (‘polyarchy’ or ‘pluralist democracy’)</strong></td>
<td>Mass-based organized interest groups: political parties, interest groups, business groups, industrial sectors</td>
<td>Preferences of citizenry as a whole – all interests have at least a minimum of influence in group-dominated policy-making</td>
<td>In accordance with agreement (consensus) between the most important groups in society, resulting from interest-group struggle (with possible abuse by policymakers with partisan motives)</td>
</tr>
<tr>
<td><strong>Biased Pluralism</strong></td>
<td>Organized groups (mainly representing business interests, but in semi-consolidated democracies possibly connected to criminal organizations and corruption)</td>
<td>Preferences of the strongest (business-oriented) groups</td>
<td>In accordance with the welfare of the strongest group, whether major investors, powerful finance industry, or large-scale businesses: the result depends on the outcome of conflict between privileged business groups</td>
</tr>
</tbody>
</table>
Strong relationships between government officials and businessmen often result in abuse of public resources for personal benefit. This is made possible by the absence of strong institutions that constitute “the rules of the game in a society” (North 1990, p.3), or “systems of established and prevalent social rules that structure social interactions” (Hodgson 2006, p.2). When there are no rules, discretion dominates, often in the form of power that is concentrated in the hands of the ruler and the privileged minority. This is the case in some transition economies, even though they have significant differences in institution-building. These differences appear to be important determinants of the success of the transition process, for which the social elites have special responsibility in the early stages of transition, when the former socialist elite and the emerging group of business owners (Beck and Laeven 2005, p.3) merge to become the new political class (Agh 1991, p.149). This is particularly important in countries where the economy is based on the exploitation of natural resources, generating significant high rents that certain individuals can appropriate. It is therefore necessary to limit the concentration of political and economic power in the hands of those who want to maintain their ‘quasi-monopoly’ of power and take democratic and economic developments down a blind alley (Agh 1991, p.149).

3. POLICYMAKING ACCORDING TO ELITIST AND INTEREST-GROUP THEORIES OF DEMOCRACY

Although voting rights in democratic systems (‘one person, one vote’) are guaranteed by the state legislature, differences between voters in economic power and other characteristics can significantly affect their influence on election results. The actions of economic, political, and social elites and various interest groups can significantly affect election results and policymaking more generally. Even in consolidated democracies with strong political institutions this influence can obstruct the democratic process. It is even more significant in unconsolidated democracies, in which the elites and numerous interest groups have a strong incentive to oppose and halt further democratization in order to maintain their privileged position and determine policy. When this is the case, the authorities harmonize their policy preferences with those of a small segment of the electorate, whose actions and influence on the ordinary voter can have a decisive influence on the election result.
3.1 The role of elites in policymaking

Although democracy can be defined as rule by the majority of citizens, and non-democracy as rule by the elite (Acemoglu and Robinson 2006), from the beginning of social philosophy, democracy as a political regime has been explained by ‘elite’ theories. Elites were not always connected to economic power; rather they were certain segments of society that excelled in something. In pre-modern times, decision-making and ruling were entrusted to a small segment of society and were related to the division of labour and political affairs at the level of the whole society.

Elitism, which has existed since political systems were developed (see Plato and Aristotle), claims that it is socially desirable that society is managed by a small segment of society, its elite, which have a higher status than the rest of society. In pre-industrial societies this was the aristocracy, whether military, religious, or commercial. Today, ruling elites and non-governing elites are different entities. One of the key characteristics of the ruling elite is its attempt to maintain a privileged position in society. As a result, social thought has been dominated by the idea that revolutions occur whenever peaceful replacement of the ruling elite with a new elite appears to be impossible. Thus, replacement of the ruling elite, which happens occasionally, does not involve changes in the division of society between those who govern and those who are governed. According to elitist theory, the abolition of such separation is utopian idea, just as the Marxist concept of a classless society is.

However, just as during the 20th century the democratic political system changed so as to involve the whole society in decision-making, with voting rights for everyone, regardless of gender, wealth, or education, the elitist approach to ruling has also changed. Ordinary citizens got the right to vote and became politically significant. Therefore, as elite theory holds that society consists of two classes, those who govern and those who are governed, it had to find ways of changing the mechanisms of government and the way of forming elites. Thus elites became more heterogeneous, and easier to enter than was formerly the case. However, the ruling class remains essentially oligarchic.

In capitalism the ruling elite remains associated with the economic power of a certain segment of society, or, as Karl Marx pointed out in Das Kapital, the owners of the means of production (the bourgeoisie) determine the economic policy of the state by ensuring that policy contributes to their material interests (Marx 1867). Today, the methods and principles have changed, but conflict persists in
the distribution of income between collective actors like Marx’s social classes. As industrial society developed, the division between the ruling class and the masses did not change. However, the ruling elite now includes not only the owners of the means of production but also high-ranking managers that represent large-scale businesses and impose their economic interests on society, as explained in the concept of biased pluralism.

At the same time, a new political actor has become important, the bureaucracy. The bureaucracy occupies a place between the elite that governs and ordinary citizens, limiting the power and influence of both. However, despite the intense bureaucratization of modern democratic societies, the bureaucracy cannot be equated with the ruling elite because the increased importance of ordinary citizens requires clearer and stronger government and administrative procedures, which results in bureaucratization. Good bureaucrats are like middle management in an organization rather than top management: their role is to effectively enforce and implement the decisions of others rather than their own. They appeared to be “bad generals” (Dunleavy and O’Leary 1987, p.142) as they do not have a general approach to social problems.

3.2 The specifics of interest-group democracy

In addition to an elitist approach, 20th century patterns of democratization brought the theory of the interest group. The original concept of mass-based groups associated with the notion of polyarchy (‘majoritarian’ interest-group pluralism) is very different to the concept of biased pluralism. The initial distinction between these two approaches refers to the acceptance or rejection of the notion that a political system and policies based on the action of interest groups can achieve the goals and preferences of the whole society.

According to the earlier concept of majoritarian pluralism, collective decision-making based on the division of society into groups and on conflict between them will represent the preferences of the whole society. In contrast to this approach, biased pluralism makes a clear distinction between social groups according to their strength and power (Table 2). It concludes that interest groups impose their interests on society so that policy is created in accordance with their interests rather than the public interest. In order to fulfil their goals, the interest groups must be well organized. In highly developed industrial economies and democracies, well-organized interest groups are connected to powerful corporations and professional associations that represent capital, while the declining influence of workers’ unions and the crisis of the modern political left
have reduced the power of labour and of workers, who do not have influential interest groups to speak out on their behalf.

**Table 2:** Pluralism v. biased pluralism (Dunleavy 1991)

<table>
<thead>
<tr>
<th>Characteristics of interest groups</th>
<th>Pluralism</th>
<th>Biased Pluralism</th>
</tr>
</thead>
<tbody>
<tr>
<td>- multi-member organizations</td>
<td>- interest groups class-based</td>
<td></td>
</tr>
<tr>
<td>(various types of actor</td>
<td>- control over resources</td>
<td></td>
</tr>
<tr>
<td>undertake collective action)</td>
<td>- groups ideologically</td>
<td></td>
</tr>
<tr>
<td>- voluntary membership</td>
<td>distinct</td>
<td></td>
</tr>
<tr>
<td>- dependent on member involvement</td>
<td>- solidaristic group</td>
<td></td>
</tr>
<tr>
<td>- narrow focus of concern</td>
<td>loyalties</td>
<td></td>
</tr>
<tr>
<td>(mobilized around restricted areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of social life)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal organization of groups</th>
<th>Pluralism</th>
<th>Biased Pluralism</th>
</tr>
</thead>
<tbody>
<tr>
<td>- internally organized on a</td>
<td>- not internally organized</td>
<td></td>
</tr>
<tr>
<td>pluralist basis</td>
<td>on a pluralist basis</td>
<td></td>
</tr>
<tr>
<td>- members maintain control</td>
<td>- leaders are not</td>
<td></td>
</tr>
<tr>
<td>over the group leadership in</td>
<td>constantly controled by</td>
<td></td>
</tr>
<tr>
<td>order to get the necessary</td>
<td>members</td>
<td></td>
</tr>
<tr>
<td>information, cover group costs</td>
<td>- leaders and important</td>
<td></td>
</tr>
<tr>
<td>(financial and time), have exit</td>
<td>group members are</td>
<td></td>
</tr>
<tr>
<td>options if they are unsatisfied</td>
<td>in a power-dependent</td>
<td></td>
</tr>
<tr>
<td>with group policies, have internal</td>
<td>relationship</td>
<td></td>
</tr>
<tr>
<td>democratic procedures, provide</td>
<td>- limited exit options for</td>
<td></td>
</tr>
<tr>
<td>legitimacy for the group leader</td>
<td>members</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies of interest groups</th>
<th>Pluralism</th>
<th>Biased Pluralism</th>
</tr>
</thead>
<tbody>
<tr>
<td>- one-way flow of representation/</td>
<td>- two-way flows of</td>
<td></td>
</tr>
<tr>
<td>control from interest groups to</td>
<td>representation/control</td>
<td></td>
</tr>
<tr>
<td>government</td>
<td>between interest group</td>
<td></td>
</tr>
<tr>
<td>leaders and government</td>
<td>leaders and government</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The group universe</th>
<th>Pluralism</th>
<th>Biased Pluralism</th>
</tr>
</thead>
<tbody>
<tr>
<td>- operates up to the middle</td>
<td>- operates at all levels</td>
<td></td>
</tr>
<tr>
<td>levels of power</td>
<td>of power, including decisions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>involving strategic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>social and economic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>issues such as inflation,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>unemployment, national</td>
<td></td>
</tr>
<tr>
<td></td>
<td>economic competitiveness</td>
<td></td>
</tr>
</tbody>
</table>
The essence of interest group theory is the thesis that individuals become members of an interest group to obtain their own individual benefits by achieving the collective benefit of the whole group. If there is strong connection between collective and individual benefits and it is not possible to achieve individual benefits without participating in the group, individuals will prefer to take part in the group.

Given interest groups strategy, government policymaking can provide a strong link between certain interest groups and the government. The influence goes in both directions, because the government considers its position depending on the support received from particular groups, while the specific groups owe their collective and individual interests and economic benefits to a particular political position of the government, or even to the personal position of the prime minister/president. Especially in unconsolidated democracies, the sphere of interest group activity is very broad and includes influence over the highest level of decision-making, including strategic issues related to development of the economy and society. This is the focus of the next chapter, and the mathematical optimization model in the paper is based on some of the characteristics of privileged interest group members.

4. POLICY-MAKING PATHOLOGIES IN UNCONSOLIDATED DEMOCRACIES

Due to the large number of limiting factors that affect the process of democratization, especially if the process is happening in parallel to the development of a market economy (economic transition), many ‘pathological’ phenomena in both processes become significant (Cerović and Nojković 2009; Jakšić and Praščević 2011; Cerović 2012). Among the many factors that are considered to be important determinants of success in the implementation of the transition process and democratization – the initial conditions under which the reforms begin (past development of the market and political institutions) and the speed of reform implementation (gradual or ‘shock therapy’) – factors connected to a country’s political competition are very important.

The specifics of biased pluralism that can be found in transitioning countries can lead to processes that will restrict political competition and thus prevent both consolidation of the democratic system and successful completion of economic and political transition. This leads to frustration in the population and disappointment in the democratic system and market economy, because people’s influence over policy decisions has not significantly improved. It is the
same with their economic position: instead of the social welfare of the majority of the population increasing it becomes apparent that the wellbeing is increasing of certain interest groups or the elite that constitute the newly created ruling class: those who have come into possession of significant economic resources and those who have certain institutional positions, such as high-ranking company managers and political party and state officials. These people constitute elite that is far from the original meaning of the elite as the ‘crème de la crème’, i.e., those who are the best. Often such a ruling elite comes into conflict with non-governing elites, such as scientific or cultural elites.

Another even more important consequence of such developments in an unconsolidated democratic political system and unfinished economic transition is the significant involvement of ordinary citizens in political decision-making, which is not always positive due to limitations regarding rationality, knowledge, and awareness, so that they are unable to articulate their own interests. In the process of democratization, populist political forces gain ground when the majority is frustrated and disappointed in the economic and political elite and in market economy-building. These forces offer utopian ideas as easy solutions, and their strength is based on demagoguery and the frustration of the population.

Taking into account that the mass needs the leader in order to keep them organized and articulate their interests because they cannot do it themselves, leaders appear who homogenize the population and articulate their interests in the simplest way, often through political extremism. The extremism may be nationalistic, or resort to other forms of homogenization by designating certain segments of society the perpetrators of the social and economic problems. In the past there have been cases where the involvement of the masses in the political process has led to the opposite effect – instead of fostering democratization societies have slip into authoritarian system of ruling (for example some Latin American countries) or anarchy with failed states and civil wars as in the Arab world after the Arab spring.

In order to avoid such developments, the ruling elite must take into account the different interests of society, not just the interest of one segment. This would prevent the sudden entry of the masses into the political system, which could lead to the demolition of democratic institutions, since the average citizen may be characterised by irrationality or anti-democratic preferences that are driven by authoritarian political forces (Walker 1966, p.292), and would make the ruling elite more accountable and important. It is also necessary to establish
the institutional capacity of influence of the various interest groups (or elites) through lobbying and funding political parties.

In those transition economies that are characterized by a mix of democratic and autocratic features, the lack of an institutional framework for the relationship between private and public interests has resulted in certain well-organized interest groups having a significant impact on political decisions. In the former Soviet Republics, for example, these interest groups have used the lack of transparency in the privatization process to gain control of natural resources by criminal and corrupt means, leading to the creation of a new political class, the business and political oligarchy. At the same time, most people in former socialist economies face high unemployment, low incomes, impoverishment, and poor social status. In such circumstances (which correspond to the state of primitive accumulation of capital) employment and a salary become a privilege, creating an opportunity for blackmailing voters in the pre-election period. In these economies Acemoglu and Robinson’s thesis is proving to be true: authoritarian regimes are characterized by the rule of a rich elite, while the process of consolidating democracy fails precisely because of the extreme social inequality that has appeared since the beginning of democratization because the new elites prevent redistribution of wealth and thus greater equality (Acemoglu and Robinson 2001, p.938).

Paradoxically, in a situation in which state institutions are weak, the majority could choose that the economic system should depend on state intervention. Therefore, it is reasonable to question whether the state is able to decide on, plan, and implement growth and poverty-reducing reforms, since these reforms should be treated as endogenous, arising from the policy-making process. This process involves a large number of factors and social actors (economic entities) with different interests, preferences, and motives, which change over time. The government should make policy decisions that result in social, not private benefit. That is problematic due to the fundamental equation of political economy (Plott 1991):

\[ \text{Preferences} \times \text{Institutions} \rightarrow \text{Outcomes} \]

In these countries, economic and political conditions change preferences by inducing the degeneration of the preferences of both policymakers and voters. The preferences of privileged interest groups are particularly important, but they are operating in a weak institutional framework, which is why the results are so bad.
In such circumstances, interest groups are primarily concerned with maintaining their privileged position, which allows them to appropriate additional income (privileged participation in income distribution). They not only participate in income distribution according to certain rules, but also in distribution of that part of income based on the discretionary decisions of those who manage the economy; for example, the government. Only the privileged have this opportunity. Privileged members of society who are also members of certain interest groups are connected to certain individual policymakers. Their participation in an interest group gives them power over those voters that are not involved in discretionary income distribution and whose precarious economic position means that their free choice is reduced to merely a formal right because poverty makes them vulnerable to blackmail; for instance, in the case of a worker who can be blackmailed with loss of their job.

Government’s political power to appropriate income and resources for certain interest groups from whom they expect political support causes electoral competition to be questioned. This appropriation can take various forms, from directing state interventions that involve government expenditure to particular interest groups, tax breaks, and different forms of rent that can be made available to certain interest groups, to more tangible forms of transferring funds. It is important to point out that these abuses are easier to effect when the electorate is small and a relatively small amount of money is necessary to buy it. Voters’ motives are changed by these ‘pathological’ phenomena of abuse. They might decide to try to join the privileged interest group rather than change the pathological political system and the policymakers who created it (‘if you can’t beat them, join them’). This would create an ‘insider–outsider’ problem, as the interests of the existing members of the group are to maintain their position and the collective profit as well as their personal gain.

This could have devastating long-term consequences for political, economic, and social development, since there will no longer be a critical mass of voters to change the situation. Although conflict between the privileged and ordinary citizens might well increase over time and the dominant interest groups or elites might change, this will not necessarily lead to a more democratic political system in which the institutions stop such abuses.

Thus, the most important ‘pathology’ appears to be compromising the electoral process. Democracy is based on fair competition between individuals, often members of the elite, for the leading positions in the system. Therefore, if income distribution policy (including public resources) is used to limit competition
between political opponents to secure the privileged position of certain sections of society, it is questionable whether democracy actually exists. This is how political hybrids arise in many countries, with semi-authoritarian features such as restricted competition between political parties, formal democratic institutions with limited capacities, and restricted media and political freedoms. Such regimes do not tend to further democratize but remain hybrids, in which a rhetorical acceptance of liberal democracy is combined with authoritarian government in practice.

Given this approach, it is not surprising that decades after the beginning of the process of economic transition and democratization a significant number of former socialist countries still have partially or fully authoritarian regimes. According to Freedom House ranking, this applies especially to many of the states that emerged from the fragmentation of the USSR. Seven of them, Russia, Belarus, Kazakhstan, Tajikistan, Uzbekistan, Turkmenistan, and Azerbaijan, with a population of over 224 million people or roughly 77% of the total population of the former Soviet Union, have consolidated authoritarian regimes, with dictatorships becoming dynasties with rulers that have been in power for over ten years. Apart from the Baltic States, which joined the European Union, other Soviet successors are also problematic. The theory of the Asiatic mode of production (AMP) is a methodological framework that can help to understand the undemocratic and slow economic development of these countries by explaining the specifics of their political and economic circumstances (McFarlane, Cooper, and Jaksic 2005).

A similar situation can be found in the Balkans, with the EU accession process acting as a key factor fostering democratization. However, in many Western Balkan countries unfavourable economic and political conditions are jeopardizing the consolidation of democracy and their democratic and European future. In these countries the achievement of a durable peace convinced EU officials to overlook the bad behaviour of political strongmen in Serbia, Montenegro, and Macedonia, as there was no other choice. As result, weak democratic institutions, huge economic problems such as unemployment and poverty, and ethnic and religious conflicts all persist, but with the addition of political tensions and protests by the opposition, which is challenging governments and ruling elites. These protests are primarily motivated by socioeconomic goals, but also by demands for democratization (free and fair electoral process, independent media, rule of law, and anticorruption efforts). At the same time, nationalist forces are growing in defence of the ruling structures and the political opponents are frequently designated as traitors who are serving foreign interests, making the return of nationalism a significant threat to these countries’ economic and political
development, as well as to their integration in the EU. These developments are reflected in the fact that by 2016 the average democratic score of the Balkan region had returned to its 2004 level (Freedom House 2017).

However, not only the Balkan countries recently faced a decline in their democratic scores and a rise in illiberal leaders. Many politicians play on nationalism to advance their political goals, using populism to promise solutions to political and economic problems. Since 2010 this has been especially apparent in Hungary, the Czech Republic, Slovakia, and Poland. These countries’ answers to the economic and political frustrations that followed the global economic recession of 2007–2009, and especially to the threat of a ‘refugee invasion’ from Muslim countries, are deeply xenophobic.

5. THE CASE OF MISUSING DISCRETIONARY INCOME DISTRIBUTION TO INFLUENCE ELECTION RESULTS

5.1 Description of the model

The model is based on the concepts of elitism and biased pluralism, according to which there is a clear distinction between the power and influence of different voters to influence election results. The hierarchical structure and division of society, which are significant in the vote, are incorporated in the model. Thus, the model consists of a hierarchically structured organization in which democratic elections for the leader are organized to approximate the social structure and election process. It is assumed that there is a small electorate that can be controlled through buying off part of the electorate, the so-called ‘privileged voters’ who have the power to influence the other part of the electorate – the ‘blackmailed voters’. The model determines the amount of the income that will be used as bribes through discretionary allocation, decided by the incumbent. It is also assumed that only the ruling person or incumbent is in a position to bribe part of the electorate, because their opponent does not poses the finances to do the same. Therefore, for now the election is not analysed as a game between two players, the incumbent and challenger. However, in the next section of the paper assumptions will be made to transform the problem into a game theory framework.

In the model the electorate chooses between two candidates, the incumbent and the opposition candidate. The incumbent has at their disposal the income that can be used to influence the election results. Through the discretionary allocation of income they can increase the individual incomes that the privileged voters receive. These voters are identified as the elite or members of certain powerful
interest groups. They have the ability to exert pressure on the part of the electorate called ‘blackmailed voters’. The goal of the privileged voters is to maintain their privileged status in the distribution of income, i.e., to continue receiving part of the discretionary income \(y_d\). Whether they will succeed depends on whether their candidate wins the election.

Having identified these preferences, the ingredients are as follows:

**The goal**: maximizing electoral support (the number of votes) in the election
**The instrument**: income distribution.
**The constraint**: the part of the income that can be utilized in order to buy off part of the electorate (the privileged voters) – \(Y_d\).

There are three categories of voter:

1. **Privileged voters** participate in the redistribution of discretionary income and have power over the ‘common’ or ‘blackmailed’ voters.
2. **Common and blackmailed voters** do not participate in distribution of discretionary income but are blackmailed in some way.
3. **Common, but not blackmailed voters** do not participate in the distribution of discretionary income but can vote freely, since they are not blackmailed.

**Figure 1**: Politico-economic model of income distribution misuse to compromise the electoral process
The assumption is that motives are opportunistic and not ideological: to remain in power. Therefore, policy is not used to realize ideological aims, even in income distribution. Instead, policy can be used in the pre-electoral period for discretionary income distribution as determined by the elected government, solely in an attempt to increase the chances of winning the election, as is evident in the politico-economic circular flow model (Figure 1).

Although the formal conditions of the elections are in accordance with democratic procedures, the election process and the equal chances of participating candidates are compromised. The compromised result is the direct result of distributing part of the income on the basis of discretionary decisions (\( y_d \) – used as a way to bribe part of the electorate). This calls into question a key element of democracy, free competition between candidates for the ruling position.

### 5.2 Mathematical optimization model

The three categories of voter listed above constitute the three groups of agents in the model, and form three subsets:

- **Subset A** – privileged voters who participate in discretionary income distribution,
- **Subset B** – blackmailed voters who do not participate in the privileged distribution of income and cannot make free decisions in the election because privileged voters determine their preference, and
- **Subset C** – ordinary voters who do not participate in the discretionary distribution of income, have freedom of choice, and do not depend on members of subsets A and B.

The number of voters in subset A is \( n_a \), the number in subset B is \( n_b \), and in subset C is \( n_c \). The total number is \( n_u \); the set of total voters has \( u \) elements:

\[
n_a + n_b + n_c = n_u. \tag{1}
\]

The total numbers of the electorate \( n_u \) and of subset A \( (n_a) \) are known but the number of subset B \( (n_b) \) has to be determined.

In order to win the election, the number of positive votes must be greater than or equal to half plus one of the total number of members. Since it is assumed that these voters will be from subsets A and B it follows that:

\[
n_a + n_b \geq \frac{n_u}{2} + 1. \tag{2}
\]
The total income that is going to be allocated \( (Y) \) is approximately known and is divided into two parts, \( Y_r \), income that is distributed on the basis of rules, and \( Y_d \), income that is distributed according to the discretion of the person in charge:

\[
Y = Y_r + Y_d,
\]

The amount \( Y_r \) is distributed to all members of the three subsets according to a certain rule which should be identified and applied. The average amount of \( Y_r \) is \( y_r \), while \( Y_d \) is only appropriated by members of subset A (privileged voters) to the average amount \( y_d \) (discretionary income) so that:

\[
Y_r = (n_a + n_b + n_c)y_r \quad \text{and} \quad Y_d = n_a y_d,
\]

and:

\[
Y = (n_a + n_b + n_c)y_r + n_a y_d \quad (3)
\]

The amounts \( y_r \) and \( y_d \) are unknown and their optimal values should be determined.

If the minimal \( (Y_{\text{min}}) \) and maximal \( (Y_{\text{max}}) \) amounts are known, then:

\[
Y_{\text{min}} \leq Y \leq Y_{\text{max}},
\]

According to (2):

\[
Y = (n_a + n_b + n_c)y_r + n_a y_d \geq Y_{\text{min}}, \quad (4)
\]

\[
Y = (n_a + n_b + n_c)y_r + n_a y_d \leq Y_{\text{max}}. \quad (5)
\]

The minimum value of \( y_r \) can be defined or foreseen as the income which belongs to each voter (member of the organization):

\[
y_r \geq \min y_r. \quad (6)
\]

The relation between the additional income which members of subset A receive \( (y_d) \) and their regular income \( (y_r) \) is:

\[
y_d = \theta(y_r + y_d), \quad 0 \leq \theta \leq 1,
\]
where the $\theta$ is an unknown parameter whose value should be found. The last equation can be written in the following form:

$$-\theta y_r + (1 - \theta) y_d = 0.$$  \hfill (7)

Equations (1) and (7) and inequalities (2), (4), (5), and (6) constitute the limiting conditions for this optimization problem.

As in other studies in political economy, the utility is defined over consumption so the consumption level of an individual is equal to the income level: $c' = y'$ (Acemoglu and Robinson 2006).

The objective function or the function of the criteria is the utility that is realized by winning the election, which depends on the unknown amounts $y_r$ and $y_d$ and on the unknown number of members of subset B, $n_b$.

The utility function to be maximized in the model is created according to the Cobb–Douglas function (Cobb and Douglas 1928, Intriligator 1971):

$$f = \max U = \max[y_r^\alpha y_d^\beta n_b^\gamma], \quad \alpha \geq 0, \beta \geq 0, \gamma \geq 0,$$

where the values $a$, $b$ and $g$ are estimated in advance as the elasticities of the utility function in response to changes in $y_r$, $y_d$ and $n_b$ respectively.

For clarity of the mathematical optimization model the following codes for unknowns are introduced:

$$x_1 = y_r, \quad x_2 = y_d, \quad x_3 = n_b, \quad x_4 = \theta.$$  \hfill (9)

Along with these, the utility function is:

$$f = \max U = \max[x_1^\alpha x_2^\beta x_3^\gamma], \quad \alpha \geq 0, \beta \geq 0, \gamma \geq 0.$$

The conditions of limitation are:

$$x_3 \geq \frac{n_u}{2} + 1 - n_a,$$  \hfill (11)

$$n_u x_1 + n_a x_2 \geq Y_{\min},$$  \hfill (12)
The mathematical model of the problem consists of the presented objective function and constraints. The model is formulated as a task of mathematical programming (MP). Since the objective function (10) is nonlinear and the constraint (15) is also a nonlinear equation, this is a mathematical nonlinear programming (MNP) task. By solving this task we should obtain the required optimal value of the unknown values \( x_i (i=1,2,3,4) \), or the value of \( y_r, y_d, n_b, \theta \).

When we determine how many elements subset B optimally has, \( n_b \) (i.e., variable \( x_3 \)), the optimal number of members in subset C, \( n_c \), is determined by formula (1). The variable \( x_3 \) and \( n_b \) are integers, as is the number of members of subset B, while the other variables are real numbers.

Several numerical methods could be used to solve the MNP problem, including various classical methods of nonlinear programming based on Korusha-Kuhn-Tucker theory (Backović and Popović 2012), the new method of genetic algorithms (GO), or swarm intelligence (SI) methods. The method of particle swarm optimization (PSO) has been chosen and used in the paper, which belongs to the group of swarm intelligence methods and was suggested by J. Kennedy and R.C. Eberhat (Kennedy and Eberhat 1995). In mathematical and numerical terms the method is simpler than many other methods for solving the problem. First the area of permissible solutions is simulated using the Monte Carlo procedure, which is determined by the conditions arranged in constraints (11) – (15). A large number of possible solutions to the problem can be found by applying uniform distribution in accordance with the formulas:

\[
x_i^s = \min x_i + (\max x_i - \min x_i) r_u^s; \quad 0 < r_u < 1; \quad i = 1,2,3,4; \quad s = 1,2,\ldots, nsim.
\]  

Here the \( x_i^s \) are simulated values of the variable \( x_i \), \( \min x_i \) and \( \max x_i \) are its possible minimum and maximum values in relation to the limitation, \( r_u \) is the simulated random number of uniform distribution, while \( nsim \) is the selected number of simulations.
For these solutions the value of the objective function (10) is to determine. In subsequent iterations simulated solutions should be improved under the relevant method rules until the optimum solution or a solution that is very close to the optimum has been found.

5.3 Numerical example of buying off privileged voters

Consider a simple numerical example in which the organization has 100 members that have the right to vote \( n_u = 100 \). However, there are differences between voters regarding their participation in the distribution of income. Some of them have not only the income that they appropriate according to a certain rule, but also the income which they appropriate according to the discretion of the person who is in power. They form subset A, which has 10 members. Although they are not the majority they can impose their economic and political objectives on others. In the case of the whole society this subset might be the governing or economic elite, a certain interest group, or just rich people who are not the majority.

Another group of voters are those who only participate in income distribution on the basis of a certain rule, do not have the privilege of participating in the discretionary distribution, and do not have full freedom of choice, as for different reasons they are blackmailed by privileged voters (for example, they could loose their jobs and consequently their wages). They form subset B, and their position corresponds to that of the poor people in a society. The number of members in subset B, \( n_b = x_3 \), is assumed to be in the interval \( [\min n_b, \max n_b] = [40, 50] \), and by using the PSO optimization method the exact number of members in subset B can be calculated. Again, it is assumed that they are not the majority in the organization, just as at the level of the whole society the poor are not the majority.

It is also assumed that the minimum amount of income which is available for distribution is \( Y_{\min} = \€9,000 \), and the maximum is \( Y_{\max} = \€10,000 \). The income which is going to be distributed on the basis of the rule and given to each member of all three subsets, \( y_r = x_1 \), is in the interval \( [\€80, \€150] \). The amount of income that is distributed according to discretionary decisions is \( y_d = x_2 \), which belongs only to members of subset A (the privileged voters) and is in the interval \( [\€170, \€220] \). According to these assumptions, the fraction of income distributed to all members of the organization \( (Y_r) \) is greater than that which will be allocated only to privileged voters.
It is assumed that the sum of the parameters of the utility function (10) is\(^1\) 
\[ \alpha + \beta + \gamma = 1, \]
where \( \alpha = 0.40, \beta = 0.45, \gamma = 0.15. \)

In the numerical example several answers should be given:

1) The optimal amount of income that belongs to each member of the organization according to specific rules of distribution, \( y_r \), and the amount that belongs only to the privileged voters, \( y_d \).
2) The total amount of income used for discretionary allocation \( Y_d \) required for optimum distribution
3) The optimal numbers \( n_b \) and \( n_c \) as members of subsets B and C respectively.

The following optimal results are obtained\(^2\):

1. The amount of income that all members of the organization receive is 
   \[ x_1 = y_r = €80.12 \] (the income to which they are entitled on the basis of allocation rules).
2. The additional amount of income that members of subset A receive is 
   \[ x_2 = y_d = €198.27 \] (discretionary income that belongs only to privileged members of the organization).
3. The total amount of income that is distributed is 
   \[ Y_{\text{del}} = €9\,993.59. \]
4. The total unallocated income is 
   \[ Y_{\text{und}} = Y_{\text{max}} - Y_{\text{del}} = €6.41. \]
5. Subset B has \( n_b = x_3 = 48 \) members and subset C has \( n_c = 42 \) members (the total number is \( n_a + n_b + n_c = 100 \)).

The electoral process that the hierarchical organisation simulates should approximate the elections in one country. The total amount of income in the organisation is similar to the income in an economy that is available for distribution. The presumption in the model is that this income is allocated first to all on the basis of certain rules and then part of the income is distributed on the basis of discretionary decisions by the government (or by the person who manages the organization). The part of the income that is used for discretionary allocation is crucial because the election results depend on it as it can be used to bribe voters. At the level of the whole economy such a bribe could refer to various forms

---

1 If the sum is \( \alpha + \beta + \gamma = 1 = 1\), then the utility function proportionally changes with \( y_r, y_d \) and \( n_b \).
If the sum is \( \alpha + \beta + \gamma < 1\), then the utility function decreases in relation to the proportional changes of \( y_r, y_d \) and \( n_b \), and if the sum is \( \alpha + \beta + \gamma > 1\), then the utility function grows in relation to the proportional changes of \( y_r, y_d \) and \( n_b \).
2 A numerical example of the problem is calculated using a special computer program written in MATLAB (Praščević and Praščević 2008)
of money transfer (tax breaks, subsidies, various forms of rent, or explicit forms of bribery). The model assumes that bribery is directed at privileged members of the organization, who at the level of the economy as a whole may be members of the ruling elite or of a special interest group. Although they do not represent the majority, they have the power to influence the ‘blackmailed’ ordinary voters who are not involved in appropriating discretionary income and are afraid to be left without any of the income that is appropriated according to certain rules (e.g., they could lose their jobs and become unemployed). At the level of the economy as a whole, this refers to the specific circumstances found in unconsolidated democracies that are characterized by underdeveloped economies, lack economic and political institutions, and in which free elections are compromised.

6. ELECTIONS AS A STRATEGIC GAME

The research presented in this section of the paper assumes that not only does the incumbent have funds that can be used to bribe the privileged voters (in the form of part of the income) but the opposition candidate does as well. Consequently, the two election candidates can be considered as two players in a game. Therefore, in this section the theory of bimatrix antagonistic games is applied. The incumbent and the opposition candidate can apply one of two pure strategies. The first uses corruptive, discretionary methods of income distribution, which are in accordance with the previous analysis of the different voters’ influence on electoral results. The second strategy is related to rule-based distribution of income. A game tree and normal form of this antagonistic bimatrix game can be formulated. The mathematical model to determine a Nash equilibrium solution as a quadratic programming problem (QPP) is formulated by applying the Nash equilibrium theorem. It is then solved using the Particle Swarm Optimization (PSO) method in order to find the players’ strategies and expected probabilities of electoral success in the Nash equilibrium situation. At the equilibrium solution, which is the most acceptable, none of the players has any reason to change his/her strategy, even if the strategies of other players are mutually known.

6.1 The solution to the problem

Two political options, an autocratic ruling person and a challenger, compete in an election. The decision-making problem of choosing the optimal strategy is formulated as a bimatrix game with two players. Player 1, denoted as R, is the autocrat who represents ‘government’ (the incumbent). Player 2, denoted as O,
is the challenger and represents the opposition. The players choose between two strategies: strategy 1, denoted as ‘Discretion’, and strategy 2, denoted as ‘Rules’.

Player 1 has a significant advantage over Player 2, since he can asymmetrically use public resources for electoral corruption through discretionary distribution of income, as described in Section 5. In addition, the incumbent has a much better access to the mass media regarding pre-election propaganda (which is not the subject of analysis in the paper).

The Discretion strategy consists of the use of income described in the previous section of the paper \( (Y = Y_r + Y_d) \), while strategy 2 strictly follows the rules of income distribution \( (Y = Y_r) \). It is assumed that player O also has certain financial funds that can be distributed to voters. Consequently, player O also faces the question of how to distribute the available funds among the voters in order to improve the chances of winning, and whether to bribe all the electorate or just the privileged. According to the assumption, player O can use rules of distribution that treat voters equally, or he/she can follow the Discretion strategy and use the funds to bribe just the ‘privileged’ voters, as player R does.

The game is presented as a game tree (Figure 2) and in its normal form (Table 3).

**Figure 2:** Game tree of the election

![Game tree](image)

**Table 3:** Normal form of the game

<table>
<thead>
<tr>
<th>Player R</th>
<th>Player O</th>
<th>Discretion</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discretion</td>
<td>((a_{11}, b_{11}))</td>
<td>((a_{12}, b_{12}))</td>
<td></td>
</tr>
<tr>
<td>Rules</td>
<td>((a_{21}, b_{21}))</td>
<td>((a_{22}, b_{22}))</td>
<td></td>
</tr>
</tbody>
</table>
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The Discretion and Rules strategies are pure strategies for both players, since “a pure strategy is a prior comprehensive statement of the choice to be made at each decision point the decision maker might possibly meet” (Jones 1980).

Players sometimes select pure strategies and randomly assign a probability to each of them. This combination of pure strategies is called a mixed strategy. They are denoted as vectors $x$, $y$, $z$, etc. Elements of the vectors $x_i$, $y_i$, $z_i$ are probabilities assigned to the pure strategy $S_i$, so that the mixed strategy $x$ can be presented in transposed form:

$$x^* = [x_1, x_2, ..., x_n], \quad 0 \leq x_i \leq 1, \quad \sum_{i=1}^{n} x_i = 1, \quad i = 1, 2, ..., n.$$ (18)

$n$ is the number of pure strategies $S_i$

If $x_k = 1$, and $x_i = 0$, $i \neq k$, mixed strategy $x$ becomes pure strategy $S_i$.

In this non-cooperative game, player R chooses one of two pure strategies, Discretion or Rules, and assesses the measure of success depending on the chosen strategy and the strategy that might be chosen by player O. Player O, without knowing which strategy has been chosen by player R, selects one of two pure strategies and estimates the measure of success depending on the strategy which player R might have chosen. These measures are elements of pay-off matrices $A$ and $B$. In this case the elements of matrices $A$ and $B$ that are assessed by player R are taken into account.

Matrices $A$ and $B$ are

$$A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}, \quad B = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}. \quad (19)$$

Element $a_{ij}$, $(i = 1, 2; j = 1, 2)$ of matrix $A$ represents the measure of success of player R if s/he chooses strategy $S_i$ and player O chooses strategy $S_j$. Element $b_{ij}$, $(i = 1, 2; j = 1, 2)$ of matrix $B$ represents the measure of success of player O if s/he chooses strategy $S_j$ and player R chooses strategy $S_i$.

A game between two people in the normal form is called an antagonistic or zero sum game if it is:

$$a_{ij} + b_{ij} = 0 (i = 1, 2, ..., m; j = 1, 2, ..., n), \quad (20)$$

$m$ is number of strategies of player R, and $n$ the number of strategies of player O.
To solve this bimatrix non-cooperative game, one of the fundamental concepts in game theory, the Nash equilibrium concept (Nash 1950, 1951), is applied. The Nash equilibrium consists of a current set of strategy choices and the corresponding pay-offs. If each player has chosen a strategy, none of them can benefit by changing strategies while the other players keep their strategies unchanged. If all the strategies of the players are revealed, no player has any reason for complaining. Nash proved that every game with a finite number of players in which each player can choose from a finite number of pure strategies has one Nash equilibrium.

Let $x$ and $y$ be mixed strategies, $x^*$ and $y^*$ the corresponding mixed strategies in the equilibrium situation; $A$ and $B$ pay-off matrices of player R and player O respectively. According to Nash, the following equilibrium conditions for the situation pertain:

$$x^*^T A y^* \geq x A y^*, \quad x^*^T B y^* \geq y^* B y.$$  (21)

Although Nash did not show how to determine vectors $x^*$ and $y^*$, later several methods to determine these vectors were proposed (Parthasarathy and Raghavan 1971). Mangasarian and Stone (1964) formulated and proved the following theorem. A necessary and sufficient condition for $(x^*, y^*)$ to be an equilibrium solution to the bimatrix game is that it is a solution to the following quadratic programming problem (QPP) (Parthasarathy and Raghavan 1971; Vidyottama and Chandra 2004):

$$\max x^T (A + B) y - \alpha - \beta,$$  (22)

$$Ay \leq \alpha e_x, \quad B^T x \leq \beta e_y, \quad xe_x = 1, \quad ye_y = 1.$$  (23)

Vector $e_x$ contains $m$ ‘ones’ and vector $e_y$ contains $n$ ‘ones’.

$\alpha$ and $\beta$ are unknown real numbers.

If $(x^*, y^*, \alpha^*, \beta^*)$ is a solution to this quadratic programming problem, then the following expressions are valid for the equilibrium situation:

$$\alpha^* = x^*^T A y^*, \quad \beta^* = x^*^T B y^*, \quad x^* (A + B) y^* - \alpha^* - \beta^* = 0.$$  (24)

In this paper a solution to this quadratic programming problem is found using the Particle Swarm Optimization method, as in Section 5.
situation the values $\alpha'$ and $\beta'$ are equal to the expected pay-offs to Player R and Player O respectively (Mangasarian and Stone 1964).

6.2 A numerical example of the game

Let measures of success $a_{ij}$ and $b_{ij}$ of both players represent probabilities expressed in percentages, $0 \leq a_{ij} \leq 100$ and $0 \leq b_{ij} \leq 100$. In the following numerical example the probabilities of success are hypothetical, but their values are in accordance with the previous analysis, fitting the assumptions concerning the possibility of the incumbent (player R) misusing income distribution in order to buy off the privileged voters, who will in turn provide him/her with votes from the blackmailed voters, as explained in Section 5 (non-democratic and corruptive environment with significant biased pluralism approach). This is called the Discretion strategy. However, in contrast to the assumptions made in the previous analysis about the opposition candidate, it is now assumed that player O has similar alternatives to influence the electorate as player R has. Player O has funds that can be used in two ways. S/he can direct those funds to privileged voters, just as player R does with the Discretion strategy, or s/he can introduce a distribution rule based on the equity of all voters in the electorate (Rules strategy).

The electorate is stratified in accordance with the example in Section 5 – privileged voters, common and blackmailed voters, and common but not blackmailed voters – where the motives of the privileged voters are to retain their privileged position and gain extra revenue. These motives determine both players’ probability of winning the election by selecting a particular strategy (given in Table 4). For example, if player R chooses to implement Discretion, when player O chooses the same strategy the probability that player R is going to win the election is 60% (element $a_{11}$).

Table 4: Percentages of the success of both players

<table>
<thead>
<tr>
<th>Player R</th>
<th>Player O</th>
<th>Discretion</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discretion</td>
<td>$(a_{11} = 60, b_{11} = 40)$</td>
<td>$(a_{12} = 80, b_{12} = 20)$</td>
<td></td>
</tr>
<tr>
<td>Rules</td>
<td>$(a_{21} = 30, b_{21} = 70)$</td>
<td>$(a_{22} = 55, b_{22} = 45)$</td>
<td></td>
</tr>
</tbody>
</table>

Matrices A and B are: $A = \begin{bmatrix} 60 & 80 \\ 30 & 55 \end{bmatrix}$, $B = \begin{bmatrix} 40 & 20 \\ 70 & 45 \end{bmatrix}$. 
The equilibrium solution can be presented in the following way.

The mixed strategy of player R is $x^* = [1, 0]$ and of player O is $y^* = [1, 0]$.

Since the components of these vectors are $x^*_1 = 1$ and $y^*_1 = 1$, these are pure strategies.

The expected probabilities of the players’ success in the equilibrium are:

$\alpha^* = 60\%, \ \beta^* = 40\%$.

Both players R and O choose the Discretion strategy. Player R has a 60% probability of success in the election, while player O has a 40% probability of success.

According to these results, electoral success in a non-democratic and corruptive environment cannot be achieved without illegal methods (electoral corruption). At the same time, taking into account the prospects of winning the election, it is unlikely that those in power will tie their hands by imposing strict rules on the distribution of income. However, the opposition candidate will act similarly, following the behaviour of the incumbent. This behaviour creates the dilemma of how the opposition candidate will act if s/he wins the election, and whether the opposition candidate will accept the rules. Consequently, even if the opposition wins the election it is unlikely that the procedure of income distribution and electoral corruption will change.

7. CONCLUSIONS

The paper considers the misuse of distribution of income for electoral purposes – winning elections – under the specific conditions of biased pluralism and a small-scale electorate. These conditions make it possible to corrupt part of the electorate in order to ensure the support of the privileged voters in the election. Although the privileged voters do not constitute a majority they can provide the support of blackmailed voters, which is crucial for winning the election. The paper demonstrates that the existence of electoral rights (electoral democracy) does not guarantee fair and free results unless other important elements of the democratic process are in place, especially strong institutions that ensure free electoral competition between political rivals. On the contrary, an electoral democracy can lead to significant obstruction of electoral competition because
the opportunity to use income for buying off part of the electorate places the incumbent in a stronger position than the opposition candidate.

The paper suggests that the most important feature of this situation is the different participation of voters in the distribution of income, which is the consequence of decisions made by the incumbent. Therefore, hierarchical differences between voters are presented in the model of the organization that is used in the paper as an approximation of society. Instead of a democratic regime providing economic benefits for the majority or the ‘average’ citizen, the influence of a small section of the electorate is increased (biased pluralism approach). This results in a solution similar to that in undemocratic regimes in which state officials behave as predators by appropriating part of the income and economic resources of society.

In further analysis within the game theory framework, the paper focuses on how the opposition candidate reacts when confronted with electoral corruption by the incumbent. Even with the assumption that the opposition candidate has certain financial funds to distribute the results will not be substantially different. Instead of using the rules covering the distribution of funds, the opposition candidate prefers to act in the same way as the incumbent, using discretion to buy off certain voters and improve the chances of winning the election. Finally, whether or not the incumbent will behave in a corrupt manner depends on the expected behaviour of the opposition candidate. If the incumbent expects the opposition to buy off part of the electorate he/she will do the same in order to avoid losing the election. However, there is a substantial difference between the two candidates, as the ruling candidate can use state resources for corruption, which is not an option for the opposition candidate.

Therefore, the players’ strategic calculations are influenced by structural factors, including the opposition’s access to economic resources, state capacity to enforce electoral corruption, and especially the institutional framework which should prevent the use of public resources and distribution of income for political gains – including winning elections – primarily by imposing strict rules.

The paper demonstrates that this could be a good framework for explaining the specifics of semi-consolidated democracies, in which there is often a specific connection between those in power who make the decisions about distribution of income and ‘privileged’ voters who are often members of specific interest groups connected to the political and business establishment. Since they benefit from such distribution they are interested in the incumbent politician staying in power so that they continue to be privileged in the future. When there is a lack of
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political and economic institutions to maintain the ‘rules of the game’ in a society, the government has significant discretionary powers to distribute income. At the level of the whole economy, tax rebates, subsidies, rents, and explicit bribes can all be the subject of misuse of discretionary income distribution. This is often the case in ‘new’ democracies in which the process of economic transition has not resulted in a fully democratic outcome but rather in semi-democratic or semi-authoritarian regimes with significant economic problems. These countries are often ‘trapped’ in a situation of economic decline and poverty, in a vicious circle in which the elites and interest groups impose their economic and political interests on society, while a sudden and significant involvement of the masses in political decision-making could have catastrophic consequences for economic and political development.

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