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Electoral Competition
under Media Influence

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Abstract

We suggest a model of electoral competition between two parties which is extended by a third player: mass media. The classical one-dimensional competition model is changed by introducing an issue-specific sensibility-coefficient and by allowing for non-voting. The winner is selected by majority rule. The voter potentials of the parties are determined by their current policy choice. Deviating from (exogenous) traditional party policy reduces the credibility of a party in the eyes of potential voters. The number of non-voters increases with the sensibility of individuals to the issue and with the deviation distance. By reporting with political bias, mass media has selective influence on the sensibility-coefficient of potential voters of both parties. They get either desensitised or over-sensitised in respect to party credibility which alters the number of non-voters. Parties being able to successfully communicate with mass media can manage to turn an unfavourable situation before election campaigning into an electoral victory.

Non-technical summary

It is commonly accepted that mass media influences the outcome of elections. Certainly, the electoral victories of Bill Clinton and Tony Blair were partly based on successful communication with mass media. The objective of this paper is to analyse whether and under which conditions mass media is able to decide upon the winner of an election. Public choice theory is dealing with the issue of electoral outcomes. In this paper we suggest a model that incorporates mass media as an actor on the political scene. We look at two parties competing for victory in elections. Mass media is devised in two parts each favouring one of the political parties. Further we assume that it is important for voters that the parties they want to elect are credible. In the model credibility is reduced if parties deviate from the political positions that they are traditionally known for. If they lose credibility some of the potential voters get disappointed and do not cast their votes. Credibility loss creates a high number of non-voters if the topics of the election are very important for the individuals (e.g. security, employment etc.), i.e. the intrinsic sensibility of the voters towards these topics is very high. This sensibility is the edge in which mass media influence comes in. We assume that the individuals' sensibility is correlated with the intensity of reporting about important political issues. If mass media reports independently and consumer oriented it will meet the information demand of the individuals. However, media is supposed to have political interests as well. By reporting with lower/higher intensity about credibility losses of parties mass media is able to decrease/increase the number of disappointed non-voters. We suppose that parties take this reporting bias into account when deciding on their political platform.

We found that under these assumptions a party has the more a favourable pre-electoral position the closer its traditional policy is to the political middle. However, if the traditional positions are not too extreme and if sensibility is not too high, mass media is able to make a winner even out of an unfavourable pre-electoral position. This, however, requires a good relationship between the pre-electoral loser and its affiliated part of mass media.

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Keywords:

Public choice, electoral competition, mass media, reputation, credibility

1 Introduction

It is commonly accepted that mass media is an important player in the political landscape. Nevertheless, there is only little literature on the influence of media in public choice especially in respect to models of electoral competition. JENÖFFY-LOCHAU (1997) tries to build a spatial model based on the work of CHAPPELL and KEECH (1986). He emphasises the power of mass media to change voters' preferences and formulates hypotheses on that issue. Media as actor, however, is not explicitly modelled. This study tries to fill this gap assuming that mass media is able to mobilise or demobilise potential voters under constant preferences.

Although mass media has been dealt with only to little extends in public choice literature there are some directions in research that touch the issue. There is quite a bit of literature on political propaganda, political advertising, and campaigning most of which is either dealing with aspects of rent-seeking by interest-groups and/or with reduction of voter uncertainty in probabilistic voting models.¹ GERSBACH (1997: 6) distinguishes service-induced and position-induced approaches to modelling campaign contributions. The first focuses on the aspect that donators want to receive services from the winning candidate while the second deals with improving the electoral prospects of a favoured candidate/party. This study can be associated with the latter in a deterministic-voting approach. Similar to URSPRUNG (1994) the aspect of how information is perceived by the individual is comparably prominent in this study. In contrast to this paper, we explicitly model mass media as market oriented information distributor trying to support the candidate/party it is historically dedicated to.²

In a two party electoral competition model we introduce mass media as an actor who, by maximising his utility, is taking direct influence on individuals' utility and indirectly on policy choice of the parties. Therefore, we introduce an issue specific sensibility-coefficient for individuals which can be influenced by mass media. The value of the coefficient partly decides upon how many voters have a positive utility

¹ E.g. JENÖFFY-LOCHAU (1997), MUELLER and STRATMANN (1994), AUSTEN-SMITH (1987), CONGLETON (1986 and 1989), MORTON and CAMERON (1992), CLARK and THOMAS (1995).

² Similar to the assumption that parties have a record mass media blocks are supposed to have a party specific record as well.

and thus cast their votes. The other determinant of an individual's utility is the deviation of the parties from their record. Both sensibility and record are exogenous.

The paper is organised as follows. First we introduce the basic model by describing the individual's choice considering party credibility and deduce the policy choice of the parties (Chapter 2). Based on that model we will introduce mass media with its utility functions and control variables as a player in the strategic electoral competition model (Chapter 3). In Chapter 4 we analyse if and under which conditions mass media is able to turn a party's unfavourable pre-electoral situation into a victory. Chapter 5 summarises the basic results and gives an outlook for further work.

2 General framework

The analytical framework introduces considerable changes to the DOWNSIAN one-dimensional (one issue) policy model (Downs 1957). The most significant changes are that we allow for non-voting and introduce an issue-specific sensibility-coefficient. The winner out of two parties is selected by majority voting. The election game is characterised by the following sequence of actions:

- 1 □ Parties choose their positions considering the individuals' sensibility to the issue.
- 2 □ Individuals decide upon which party potentially to vote and mass media blocks decide over reporting in a biased manner or independently.
- 3 □ Potential voters get influenced by mass media and decide whether to cast their votes.

This sequence of actions can be observed in basically each democracy. The successes of Tony Blair in Great Britain, Bill Clinton in the United States and the selection of Gerhard Schröder as challenger against the German Chancellor Helmut Kohl have been regarded as being substantially driven by the ability of those candidates to successfully communicate with mass media or anticipate mass media's behaviour.

Before we go into mathematics section 2.1 will describe the relationship between the major players of the model and the basic assumptions concerning their behaviour.

2.1 The key-players

The model that we suggest features three major kinds of players: the political parties, mass media blocks, and the individuals (voters and non-voters). There are mutual behavioural dependencies between all of them.

2.1.1 The parties and the voters

We assume that parties are known for traditional positions (records) on the political spectrum. This is due to the history of the parties which in the model is exogenous. Further we assume that party leaders do not explicitly want to implement traditional policies. Their utility is solely determined by the number of votes that they obtain in elections, i.e. they try to gain as many voters as possible by choosing their platforms.

The individuals' preferences are supposed to be equally distributed across the political spectrum. We assume that they make their electoral decision in two steps: At first, an individual decides to potentially vote the party with the platform closest to his position in the policy space (one-peaked party utility). After having made this decision we call him a potential voter of that party.³ Loyalty with parties in the sense of the Michigan model of voter behaviour (ENELOW and HINICH 1984: 4 and CAMPBELL et al. 1960) becomes apparent in those cases where both parties choose identical positions. Only in those rare cases the potential voters are split into left wing voters and right wing voters, no matter where on the policy spectrum the parties choose their identical positions. In the second step, the potential voter decides upon whether to vote. This decision depends on the costs of voting which we assume to be determined by the respective party's credibility and the electoral prospective of the party platform. Since we are looking at mass elections, individuals contribute only marginally to the electoral outcome and, therefore, do not want to

³ Note that the individual is modelled to see the party position as a point on the spectrum which differs from the models given by ENELOW and HINICH (1981), INGBERMANN (1989), and ENELOW and MUNGER (1993) who let the individual speculate upon the differences of pre-electoral party platforms and post-electoral policies. Accordingly the individual perceives party positions not as points in a policy space but rather as distributions (ENELOW and MUNGER 1993: 758). Our assumption corresponds to the assumption that party leaders do not care about reputation in the first place but try to maximise votes by arbitrarily defining their platform which makes it useless for individuals to predict the post-electoral behaviour of parties from the pre-electoral platform. Accordingly, we assume that the individuals' decisions are based on the pre-electoral platform.

pay for information in order to arrive at their decisions in favour of a party (rationally uninformed voters). However, similar to URSPRUNG (1994: 261) we assume that the individual wants to make a qualified decision once he has arrived at the ballot box. Therefore, the individuals are supposed to use existing information channels which do not bear additional information costs such as TV or the daily newsletter. Credibility in our context is defined as a new interpretation of responsibility in the DOWNSIAN concept of reputation which declared a party responsible if its policies in one period are consistent with its actions in the preceding period (DOWNS 1957: 104-105). In correspondence, we declare a party credible if its current platform is consistent with its record. On the one hand, deviating from the record reduces a party's credibility which we interpret as costs of voting. The individual considers these costs the higher the bigger the sensibility of the individual is towards the issue. On the other hand, as a party moves towards the median voter position, its chances to win increase and thus reduces the individual's cost of voting or increases the benefits of voting respectively. We then assume that a potential voter casts his vote if his utility (party utility minus costs of voting) has a positive value. We now call him a voter of the party. Individuals are supposed to have the same intrinsic sensibility towards a policy issue but different sensibilities across issues. Sensibility is supposed to be high if a decision on an issue is heavily affecting basic needs such as security, individual freedom, food and energy supply etc. The sensibility-coefficient can be interpreted as a function of the external costs (BUCHANAN and TULLOCK 1962: 97-118) related to the decision making on an issue.

The parties have to take non-voters into account when choosing optimal policies. Hence, there is an indirect mechanism that prevents parties from leaving their traditional positions arbitrarily.

There are at least two good reasons for making non-voting a feature of electoral competition models. Firstly, non-voting is an existing phenomenon and secondly it provides an additional information source that is able to contribute to empirical evidence of party models.

2.1.2 The voters and mass media

We suggest a mutual relationship between mass media and potential voters (individuals). On the one hand mass media is able to influence the issue-specific perception of the individuals. They perceive only what media is reporting. On the other

hand, the individual is consumer of mass media and supposed to consume the medium that hits best the individual's information demand.

Without media reporting we assume that all individuals have the same intrinsic sensibility towards an issue. However, media blocks are able to report in a biased manner, e.g. by reporting less about the credibility loss of a favoured party and by reporting more about the other's than would correspond to the individuals intrinsic sensibility. We do not insinuate that media is lying about the distance of deviation but only vary the intensity of reporting.⁴ Accordingly, we assume the individuals to get desensitised towards the first party and over-sensitised towards the other, i.e. for an issue under consideration, the individuals have party-specific sensibility-coefficients due to media reporting.

The information requirement of the individuals, however, is supposed to be solely determined by their intrinsic sensibility. If we interpret the intrinsic sensibility as the individuals' demand for a certain frequency in reporting on an issue equal for each political party, biased reporting is not matching the demand and will be punished by the market. Nevertheless, by assuming that individuals perceive the average mass media market mix⁵ they get influenced by media in the intended way. In consequence, mass media is assumed to be actually able to create a party-specific sensibility by the price of losing market shares or decreasing sales. This effect is supposed to happen a period later. Accordingly, the influential power of mass media is not directly affected by biased reporting, i.e. it remains constant.

2.1.3 Mass media and the parties

We assume that mass media is not free of political interest. They are supposed to be traditionally dedicated to one or the other party. In contrast to persuasive campaigning of interest groups which usually are modelled as spending some budget on information distribution, lobbying etc. mass media is paying with market losses for biased information distribution. Although the economic interest (market shares) is strong in mass media's utility functions we assume that the election result of the fa-

⁴ This corresponds to comments by NANNSTAD and PALDAM (1991: 6) and TULLOCK (1967: 133) cited in URSPRUNG (1994).

⁵ URSPRUNG assumes that the voters check information on parties if they are 'correct'. Here we suggest that consuming the average media mix produces average (i.e. 'checked') information.

voured party is also part of it. Accordingly, mass media will try to report on political issues in a way that balances the influence on election results and the related economic losses due to the mismatch of the individuals' information demands.

It is further assumed that parties are able to communicate with their affiliated media blocks. They shall have some influence on the political bias of mass media. If communication is successful and deviating from the party record is strategically supported by a biased mass media campaign, then an election on an issue might be decided in favour of a party even if the situation at the beginning of the election campaign had not been that promising.

2.2 Individuals' choice

As described above the individual (I)⁶ first decides about which party position $p_i \in [0;1]$; $i = A, B$ potentially to vote and in a second step whether to vote. The first step is determined by the one-peaked party utility function given in (1) which is maximal when $p_i = I$.

$$(1) \quad u_I^p(p_i) = \frac{1}{1 + |p_i - I|}$$

Individuals with $u_I^p(p_A) > u_I^p(p_B)$ are potential voters of party A (V_A^p) and vice versa of party B (V_B^p), respectively. The indifferent individual is characterised by $u_I^p(p_A) = u_I^p(p_B)$. If the parties choose an identical position in the policy space we assume that the indifferent individual is the median voter, i.e. the individuals potentially vote according to their latent loyalty (s. above).

The costs of voting are assumed to be defined differently depending on the location of I as a potential voter of party A or party B ($I \in V_A^p, V_B^p$). Under the assumption $p_A < p_B$ we distinguish locations in between the party platforms and locations between a platform and the edge of the policy space (equation system 4). For the individuals at the edges of the policy space the position of their party is the more likely to win the further it is from the edge. The individuals in between the positions see

⁶ I denotes the individual as a person as well as his position on the policy spectrum ($I \in [0;1]$).

the likelihood of winning increase the closer to the indifferent voter the party position is located. For all individuals we assume that the costs of voting ($c(p_i, \sigma_i)$) increase by the square as a party deviates from its record (p_i^0) moving off the individuals position, i.e. it is easier to recognise large differences between p_i and p_i^0 than small ones.

$$(2a) \quad c(p_A, \sigma_A) = \frac{1}{1 + p_A - \text{sgn}(p_A - p_A^0) \cdot \sigma_A \cdot (p_A - p_A^0)^2} ; \quad \forall I \in V_A^P \wedge I \leq p_A$$

$$(2b) \quad c(p_A, \sigma_A) = \frac{1}{1 + \frac{1}{2} \cdot (p_B - p_A) - \text{sgn}(p_A^0 - p_A) \cdot \sigma_A \cdot (p_A - p_A^0)^2} ; \quad \forall I \in V_A^P \wedge I \geq p_A$$

$$(2c) \quad c(p_B, \sigma_B) = \frac{1}{1 + \frac{1}{2} \cdot (p_B - p_A) - \text{sgn}(p_B - p_B^0) \cdot \sigma_B \cdot (p_B - p_B^0)^2} ; \quad \forall I \in V_B^P \wedge I \leq p_A$$

$$(2d) \quad c(p_B, \sigma_B) = \frac{1}{1 + (1 - p_B) - \text{sgn}(p_B^0 - p_B) \cdot \sigma_B \cdot (p_B - p_B^0)^2} ; \quad \forall I \in V_B^P \wedge I \geq p_A$$

The coefficient σ_i is a non-negative party-specific measure for the sensibility of individuals towards the issue under consideration. Without media influence the coefficient is assumed to have the commonly known value σ_I for all individuals equally. This coefficient proportionally reflects the importance of a decision on a given issue to the individuals. Rational behaviour of the parties would imply that they deviate from their traditional position towards the median voter position (2a and d). If we assume that potential voters only cast their vote if they have a positive utility u_I of voting, the number of non-voters V_i^n of the rationally behaving party i is determined as follows:

$$(3) \quad \begin{aligned} V_i^n &\Rightarrow u_I(p_i, \sigma_i) = u_I^P(p_i) - c(p_i, \sigma_i) \leq 0 \\ &\Leftrightarrow V_A^n \stackrel{p_A \geq p_A^0}{=} \sigma_A \cdot (p_A - p_A^0)^2 ; \quad V_B^n \stackrel{p_B \leq p_B^0}{=} \sigma_B \cdot (p_B - p_B^0)^2 \end{aligned}$$

The expression $\sigma_i \cdot (p_i - p_i^0)^2$ will further be referred to as the weighted credibility loss of party i with the sensibility-coefficient σ_i being the weight for the credibility loss $(p_i - p_i^0)^2$.

We will now consider the impact of non-voting on the parties' policy choice.

2.3 Policy choice of the parties

Party A and B shall try to win the forthcoming elections, one being traditionally located on the left policy spectrum and the other on the right. The only goal of the parties is either maximising votes (first best) or winning the forthcoming election (second best). Their records $p_A^0 \in [0;0,5]$ on the left policy spectrum and $p_B^0 \in [0,5;1]$ on the right are assumed to be common knowledge. Deviating from these records lowers the utility of the parties by increasing the number of 'dissatisfied' potential voters who do not cast their votes.⁷ Individuals being part of the voter potential V_i^P of party i do not cast their votes (non-voters V_i^n of party i) if disappointment (costs) of policy deviation exceeds utility of voting. Accordingly, the number of votes V_i cast in favour of party i depends on the parties' voter potential, which we assume is determined by the position $p_i \in [0;1]$ chosen, and the number of non-voters within this potential being a function of the parties credibility.

$$V_i = V_i^P - V_i^n \Rightarrow$$

$$(4) \quad V_A = \frac{p_A + p_B}{2} - \sigma_A (p_A - p_A^0)^2$$

$$V_B = 1 - \frac{p_A + p_B}{2} - \sigma_B (p_B - p_B^0)^2$$

$$\text{s.t.} \quad p_A < p_B; \quad \sigma_i \geq 0; \quad p_A^0 \in [0;0,5]; \quad p_B^0 \in [0,5;1]$$

In the equations $0,5 \cdot (p_A + p_B)$ represents the position of the indifferent voter. Under the assumption $\hat{p}_A < 0,5 \wedge \hat{p}_B > 0,5$ both parties choose their optimal positions:

$$(5) \quad \frac{\partial V_i}{\partial p_i} = 0 \Rightarrow \hat{p}_A = p_A^0 + \frac{1}{4\sigma_A}; \quad \hat{p}_B = p_B^0 - \frac{1}{4\sigma_B} \quad \text{with} \quad \frac{\partial V_i^2}{\partial^2 p_i} \leq 0.$$

Accordingly, the location of the optimal position solely depends on a party's record and the individuals party-specific sensibility towards the issue (or bundle of issues).

The positions are the closer to each other the smaller the individuals' sensibility is, i.e. compromises are easier to find for issues that are less important for the individuals.

Proposition 1

- i □ *If the positions of the parties have the same distance to the median voter, the party with the lower weighted credibility loss wins the election.*
- ii □ *If the parties have the same weighted credibility loss, the position closer to the median voter wins the election.*

Proof. Be the position of the median voter $M = 0,5$. Under the assumption $M - p_A = p_B - M$ it follows according to (4): $V_A^p = V_B^p = 0,5$. According to (3) the number of non-voters equals the weighted credibility loss for each party. According to (4) we have: $V_A^p = V_B^p \wedge V_A^n > < V_B^n \Rightarrow V_A < > V_B$. If $p_A = p_B$ then the median voter is also the indifferent voter (see above). Then both parties have the same voter potential and the proof holds as well. From $M - p_A > < p_B - M \wedge M = 0,5$ it follows: $p_A + p_B < > 1$. If in addition we assume $\sigma_A \cdot (p_A - p_A^0)^2 = \sigma_B \cdot (p_B - p_B^0)^2$ Equation 4 yields $V_A < > V_B$. q.e.d.

Proposition 1 basically describes the same conditions for electoral victory as the probabilistic model in ENELOW and MUNGER (1993). We will now explore under which conditions the parties' optimal policy choices according to (5) are winning.

2.4 Equilibrium without mass media influence

Without mass media influence (independent reporting), all individuals have the same sensibility $\sigma_A = \sigma_B = \sigma_I$ to a given issue. Accordingly, the distance between the traditional position and the optimal position (Equation 5) is for both parties identical. For further analyses we will look at different sequences of policy choice. We distinguish between the situation where both parties choose their policies simultaneously

⁷ Accordingly, candidate motivation in the sense of WITTMANN 1983 and ALESINA 1988 does not play a role here.

in uncertainty about each others choice (uncertainty) and situations where one party chooses first and the position is common knowledge (A-moves-first, B-moves-first).

Proposition 2

- i □ *Under independent reporting and $\hat{p}_A < 0,5 \wedge \hat{p}_B > 0,5$, the unique political equilibrium is characterised by $p_A^* = \hat{p}_A$; $p_B^* = \hat{p}_B$, where party A (party B) wins if $p_A^0 + p_B^0 > (<) 1$.*
- ii □ *If in (i) $\hat{p}_A \geq 0,5 \vee \hat{p}_B \leq 0,5$, the median voter position $M = 0,5$ is either a winning position or a best response to the other parties policy choice.*

Proof of part (i). Given $p_A < p_B$, (5) says that \hat{p}_A, \hat{p}_B maximise the votes for each party. These optima are the unique solution if we can show (here: for party A) that they are still optimal under $p_A = p_B$ and $p_A > p_B$. With $\hat{p}_B > 0,5$ we are able to find $p'_A < \hat{p}_B$ with $V_A^p(p'_A, \hat{p}_B) > 0,5 = V_A^p(p_A = \hat{p}_B)$. From $p'_A - p_A^0 < \hat{p}_B - p_A^0$, follows according to (4) $V_A(p'_A, \hat{p}_B) > V_A(p_A = \hat{p}_B)$. With (5) $p'_A < \hat{p}_B$ is optimal, if $p'_A = p_A^0 + 1/4\sigma_I = \hat{p}_A$. If $p''_A > \hat{p}_B$, party A is the right wing party, i.e. votes are calculated like V_B in (4). With $\hat{p}_B > 0,5$, $V_A^p(p''_A, \hat{p}_B) = 1 - 0,5 \cdot (p''_A + \hat{p}_B) < 0,5 < V_A^p(p'_A, \hat{p}_B)$ results. As $p''_A - p_A^0 > p'_A - p_A^0$, we have $V_A(p''_A, \hat{p}_B) < V_A(p'_A, \hat{p}_B) \leq V_A(\hat{p}_A, \hat{p}_B)$. Hence, \hat{p}_A is the best response to \hat{p}_B . Since we have a symmetric problem the opposite holds as well. This equilibrium is unique for $p_A < p_B$, since the optimal positions do not depend on each other. Solutions with $p_A = p_B$ can only be a best response if the parties have not an incentive to move to $\hat{p}_A < \hat{p}_B$. For party B this would be the case if $p_A = p_B > \hat{p}_B$ or $p_A > p_B > \hat{p}_B$. In both cases, party A would be better off choosing \hat{p}_A (see above). The same is true vice versa. Accordingly, $p_A^* = \hat{p}_A$; $p_B^* = \hat{p}_B$ is a unique equilibrium. Substituting (5) in (4) yields $V_A(\hat{p}_A, \hat{p}_B) = 0,5 \cdot (p_A^0 + p_B^0) - 1/16\sigma_I$ and $V_B(\hat{p}_A, \hat{p}_B) = 1 - 0,5 \cdot (p_A^0 + p_B^0) - 1/16\sigma_I$. From $p_A^0 + p_B^0 > (<) 1$ directly follows $V_A(\hat{p}_A, \hat{p}_B) > (<) V_B(\hat{p}_A, \hat{p}_B)$. q.e.d.

Proof of part (ii). For the proof of part (ii) we distinguish between three cases describing all possible situations if $\hat{p}_B \leq 0,5$: $\hat{p}_B < 0,5 \wedge \hat{p}_B \geq \hat{p}_A$ (case 1), $\hat{p}_B < 0,5 \wedge \hat{p}_B \leq \hat{p}_A < 0,5$ (case 2), $\hat{p}_B < 0,5 \wedge 0,5 \geq \hat{p}_A$ (case 3). In case 1, party A might improve its situation by choosing $p_A = \hat{p}_B$ or $p_A = \hat{p}_B^+$, where the latter is the optimal position for party A changing from a left wing party position to a right wing party position which in the optimum is marginally larger than \hat{p}_B . The condition for party A to select $p_A = \hat{p}_B^+$ is:

$$(6) \quad 1 - 0,5 \cdot (p_B + p_B^+) - \sigma_I \cdot (p_B^+ - p_A^0)^2 \geq 0,5 \cdot (\hat{p}_A + p_B) - \sigma_I \cdot (\hat{p}_A - p_A^0)^2$$

If we set the difference between p_B and p_B^+ to zero and use optimal party position according to (5) we find the following condition under which party A selects p_B^+ :

$$(7) \quad p_{B,2}^* = p_A^0 - \frac{3 \pm \sqrt{8 + 16\sigma_I - 32\sigma_I p_A^0}}{4\sigma_I},$$

where only the larger solution is of interest here. Now we will analyse if party A has an incentive to select p_B^+ if $p_B = 0,5$, i.e.:

$$(8) \quad 0,5 = p_A^0 - \frac{3 - \sqrt{8 + 16\sigma_I - 32\sigma_I p_A^0}}{4\sigma_I} \Rightarrow p_A^0 = 0,5 - \frac{1}{4\sigma_I} \Rightarrow \hat{p}_A = 0,5$$

However, $\hat{p}_A = 0,5$ is a contradiction to the definition of case 1. If party A chooses $p_A = p_B$ we find the same result. Hence, party A is better off remaining at \hat{p}_A , if party B chooses $p_B = 0,5$. In that case $V_B^p > V_A^p$ and $V_B^n < V_A^n$. Thus, $p_B = 0,5$ wins. The proof holds as well in case 2. In case 3, $M = 0,5$ is a Nash-equilibrium for both parties. Each party, leaving the position would loose potential voters with a marginal rate of 0,5. Since both parties have not yet reached the optimal position according to (5), the marginal reduction in non-voters is smaller than 0,5. Thus, there is no incentive to leave this position given the other party has chosen $M = 0,5$, i.e. it is a best response to the other party's strategy. Since we are looking at symmetrical problems, the proof holds as well for $\hat{p}_A \geq 0,5$. q.e.d

The rational choice according to (7) is the risk avers⁸ second best choice for party B under the information modes uncertainty and B-moves-first. If party A could be forced to move first (A-moves-first) it would choose \hat{p}_A . In this case party B could choose the first best solution \hat{p}_B which would be more efficient for party B. Accordingly, party B has an incentive in case 1 to hold its party conference where the platform is fixed as close to the elections as possible. In case 2 it would be fatal for party B to choose is optimal policy according to (5). The voter potential would be heavily reduced due to changing from a right wing party to a left wing party. As first mover, party B would select its position according to (7). As first mover and under the assumption of risk avers parties, party A would choose \hat{p}_A . In that case party B, now as the second mover, could choose \hat{p}_A^+ as optimal policy with a better election result as in the first-mover situation. The policy choices of risk avers parties under different sequence-modes are given in Table 1.

Table 1: Policy choice without media influence under different information modes

Information Modus	uncertainty	A-moves-first	B-moves-first
$\hat{p}_B < 0,5 \wedge \hat{p}_B \geq \hat{p}_A$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_B$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_B$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_A^{++}$
$\hat{p}_B < 0,5 \wedge \hat{p}_B \leq \hat{p}_A < 0,5$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_A^{++}$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_A^+$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_A^{++}$
$\hat{p}_B < 0,5 \wedge 0,5 \geq \hat{p}_A$	$p_A^* = 0,5; p_B^* = 0,5$	$p_A^* = 0,5; p_B^* = 0,5$	$p_A^* = 0,5; p_B^* = 0,5$
$\hat{p}_A > 0,5 \wedge \hat{p}_A \leq \hat{p}_B$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_B$	$p_A^* = \hat{p}_B^{--}; p_B^* = \hat{p}_B$	$p_A^* = \hat{p}_A; p_B^* = \hat{p}_B$
$\hat{p}_A > 0,5 \wedge 0,5 < \hat{p}_B \leq \hat{p}_A$	$p_A^* = \hat{p}_B^{--}; p_B^* = \hat{p}_B$	$p_A^* = \hat{p}_B^{--}; p_B^* = \hat{p}_B$	$p_A^* = \hat{p}_B^-; p_B^* = \hat{p}_B$

$$\hat{p}_A^{++} = p_A^0 - \frac{3 - \sqrt{8 + 16\sigma_I - 32\sigma_I p_A^0}}{4\sigma_I}$$

$$\hat{p}_B^{--} = p_B^0 + \frac{3 - \sqrt{8 + 16\sigma_I - 32\sigma_I p_A^0}}{4\sigma_I}$$

$$\hat{p}_A^+ = \hat{p}_A + \varepsilon$$

$$\hat{p}_B^- = \hat{p}_B - \varepsilon^9$$

⁸ That means they prefer the second best winning position even if a position existed that might result in more votes, however, by the risk of being pushed to the unfavourable part of the spectrum and losing the election.

⁹ ε symbolises a infinitesimal small distance.

Proposition 2 and the results given in Table 1 lead to the following interpretations:

- In the model suggested here, a party is in a favourable pre-electoral position if its traditional policy is closer to the median voter than that of its opponent.
- If only one party is able to leave its traditional position to its optimal policy beyond the median voter position the other party can improve its (losing) election result by holding its party conference after the favoured party (second mover advantage).
- If both parties are able to choose an optimal policy beyond the median voter position, they both select the median voter position as best strategies.

Under independent reporting the winner of an election is basically determined by his record. In the following section we assume that mass media is able to alter the individuals' sensibility by reporting in a biased manner.

3 The Influence of Mass Media

In this study we assume that mass media can either report independently or in a biased manner. Initially, media landscape is assumed to be equally divided between devotion to either party A (mass media block A) or party B (mass media block B). The control variable of mass media is the sensibility-coefficient introduced above. In an ideal world where voters would be able to get any required information they would like the intensity of reporting correspond with their sensibility σ_I towards a given issue. In real world, however, voters basically receive information via mass media. Hence, we assume that a bias in reporting is able to increase or decrease voters sensibility towards an issue in a party-specific manner. E.g. if party A deviated as far from its traditional position as party B ($|p_A - p_A^0| = |p_B - p_B^0|$) and mass media reported on party B's deviation more intensively than on party A's, we would assume the number of non-voters of party B being bigger than that of party A ($V_B^n > V_A^n$). In that case mass media had managed to alter the intrinsic sensibility σ_I into the party-specific perceived sensibility σ_A and σ_B with $\sigma_A < \sigma_B$.

Further we assume biased reporting to be restricted through mass media market. If potential voters as consumers of mass media do not get the information (reporting

intensity) that they require ($\sigma_A, \sigma_B \neq \sigma_I$), we assume them to lose interest in that medium, i.e. the demand for the medium is reduced. We assume that this market effect occurs after the election, i.e. the influential power (market share) of a medium is not affected immediately when the reporting bias happens.¹⁰ Accordingly, we propose the following utility functions for the mass media blocks a and b (MBA and MBB):

$$(9) \quad \begin{aligned} u_{MBA} &= \alpha \cdot (\sigma_B - \sigma_A) - (1 - \alpha) \cdot \left(\frac{(\sigma_{MBA}^A - \sigma_I)^2}{2} - \frac{(\sigma_{MBA}^B - \sigma_I)^2}{2} \right); \quad \alpha \in [0;1] \\ u_{MBB} &= \beta \cdot (\sigma_A - \sigma_B) - (1 - \beta) \cdot \left(\frac{(\sigma_{MBB}^A - \sigma_I)^2}{2} - \frac{(\sigma_{MBB}^B - \sigma_I)^2}{2} \right); \quad \beta \in [0;1] \end{aligned}$$

In (9) α and β are measures for the political bias of the media blocks and σ_{MBi}^j is the reporting bias of media block i towards party j. The first term represents the utility stemming from the party result. The second term represents the economically driven utility loss. We assume that the mass media market is punishing with more power than the political market is able to reward. Therefore, the second part of (9) reduces media utility by the square of reporting bias. In the independent case, only the second part of the utility function would be optimised. The maximum value is zero in the case of $\sigma_{MBi}^j = \sigma_I$, i.e. in the optimum the independent media block is reporting what is required by the consumer.

3.1 Optimal reporting

Assuming equal weight¹¹ of MBA and MBB in the media market, the sensibility towards party A and party B is determined according to Equation 10.

$$(10) \quad \sigma_A = \frac{\sigma_{MBA}^A + \sigma_{MBB}^A}{2}; \quad \sigma_B = \frac{\sigma_{MBA}^B + \sigma_{MBB}^B}{2}$$

¹⁰ Repeating the game has to take care of effects on market shares.

¹¹ That means that the losses in market share do not have an effect on the market shares in this period. However, the utility functions of mass media already anticipate effects on their sales.

Substituting (10) into (9) and differentiating to MBI's control variables yields:

$$(11) \quad \begin{aligned} \frac{\partial u_{MBA}}{\partial \sigma_{MBA}^A} = 0 &\Rightarrow \hat{\sigma}_{MBA}^A = \sigma_I - \frac{\alpha}{2(1-\alpha)}; & \frac{\partial u_{MBA}}{\partial \sigma_{MBA}^B} = 0 &\Rightarrow \hat{\sigma}_{MBA}^B = \sigma_I + \frac{\alpha}{2(1-\alpha)} \\ \frac{\partial u_{MBA}}{\partial \sigma_{MBA}^A} = 0 &\Rightarrow \hat{\sigma}_{MBA}^A = \sigma_I + \frac{\beta}{2(1-\beta)}; & \frac{\partial u_{MBA}}{\partial \sigma_{MBA}^B} = 0 &\Rightarrow \hat{\sigma}_{MBA}^B = \sigma_I - \frac{\beta}{2(1-\beta)} \end{aligned}$$

Since sensibility has a non-negative value, $\hat{\sigma}_{MBA}^A$ and $\hat{\sigma}_{MBA}^B$ are supposed to have no further effect on the related party result if $\alpha, \beta > 2\sigma_I / (2\sigma_I + 1)$. We will further assume the media blocks to respect these restrictions.¹²

3.2 Equilibrium in media reporting

We distinguish between two information levels concerning the relationship between parties and mass media. In the first case parties make their policy choice regardless of what media is reporting about it (IL1). In the second case we assume that parties are able to correctly anticipate media influence (IL2). The "media game" is characterised by two strategies for each media block: reporting independently or reporting with optimal bias.

Proposition 3

In the media game described above we find the Nash-equilibrium (NE) conditions:

□ i □ *NE in independent media reporting only occurs if $\alpha = \beta = 0$ (NE^I).*

□ ii □ *NE in favour of party A exists, if $\beta < \frac{2\alpha}{1+\alpha}$ (case a) and*

NE in favour of party B exists, if $\alpha < \frac{\beta}{1+\beta}$ (case b)

¹² That means the result of the affiliated party can not be further improved but the result of the opposing party could still be lowered. However, we assume media not to be that unfair.

□ iii □ The NE of (ii) is unique, if in case a $\beta < \frac{\alpha}{2-\alpha}$ (NE^A) and in case b

$$\alpha < \frac{\beta}{2-\beta}$$

(NE^B).

The proof of (i) and (ii) follows straight forward from solving the 2x2-game matrix describing the media game above (Table 2).

Part (iii),(a) follows from the logical conditions Part (ii),(a) AND NOT Part (ii),(b).

Part (iii),(b) follows from the logical condition Part(ii),(b) AND NOT Part (ii),(a).

A Nash-equilibrium for both media blocks reporting in a biased manner would follow from $\alpha = \beta = 1$. However, these values of α and β were excluded above.

Table 2: The game matrix of the mass media game

	MBA = independent ($\alpha = 0$)	MBA = biased ($0 < \alpha \leq \frac{2\sigma_I}{2\sigma_I + 1}$)
MBB = independent ($\beta = 0$)	$u_{MBA} = 0$ $u_{MBB} = 0$	$u_{MBA} = \frac{\alpha^2}{4 \cdot (1 - \alpha)}$ $u_{MBB} = 0$
MBB = biased ($0 < \beta \leq \frac{2\sigma_I}{2\sigma_I + 1}$)	$u_{MBA} = 0$ $u_{MBB} = \frac{\beta^2}{4 \cdot (1 - \beta)}$	$u_{MBA} = \frac{\alpha^2}{4 \cdot (1 - \alpha)} - \frac{\alpha \cdot \beta}{2 \cdot (1 - \beta)}$ $u_{MBB} = \frac{\beta^2}{4 \cdot (1 - \beta)} - \frac{\alpha \cdot \beta}{2 \cdot (1 - \alpha)}$

3.3 Impacts on policy choice

If we consider the Nash-equilibria in reporting we find the following distribution of perceived voter sensibilities according to the three unique cases of Proposition 3:

$$(12a) \quad \sigma_A = \sigma_B = \sigma_I \text{ (NE}^1\text{)}$$

$$(12b) \quad \sigma_A = \sigma_I - \frac{\alpha}{4(1-\alpha)} \geq \frac{1}{2}\sigma_I; \quad \sigma_B = \sigma_I + \frac{\alpha}{4(1-\alpha)} \leq \frac{3}{2}\sigma_I \quad (\text{NE}^A)$$

$$(12c) \quad \sigma_A = \sigma_I + \frac{\beta}{4(1-\beta)} \leq \frac{3}{2}\sigma_I; \quad \sigma_B = \sigma_I - \frac{\beta}{4(1-\beta)} \geq \frac{1}{2}\sigma_I \quad (\text{NE}^B)$$

(12a) describes exactly the situation of Chapter 2. (12b and c) give room for further interpretations depending on the information level between parties and media blocks. The boundaries follow from the comment to (11).

1□ Under IL1 media blocks try to mobilise the non-voters of their favoured party and demoralise the voters of the other party by reporting in a biased manner under given voter potential.

2□ Under IL2 it is possible for a party to enlarge its voter potential towards its "non-traditional" policy area by anticipating a favourable media reporting bias.

In general, we expect the second possibility to be more efficient than the first, due to the existence of a larger information quantity.

4 Making winners out of losers

Since we want to give an answer to the question if and under which conditions mass media is able to have decisive influence on electoral outcome, we will now analyse under which conditions a potential loser of an election can be made a winner.

4.1 No anticipation of media reporting in policy choice

Under IL1 we assume that the parties act as described in Chapter 2. In respect to policy choice we do not get any new aspects due to media influence. However, we are able to introduce new restrictions to mass media bias if we assume that media blocks act in an opportunistic way. That means reporting in a biased manner is only worthwhile when the favoured party is able to win the forthcoming election or when the danger of losing an election exists. We now try to find combinations of traditional positions which do not give any incentive for biased reporting.

Proposition 4

Under IL1 opportunistic media blocks have an incentive to report in a biased manner only if:

$$(13) \quad 1 - \frac{1}{16\sigma_I} \leq p_A^0 + p_B^0 \leq 1 + \frac{1}{16\sigma_I}.$$

Combinations smaller (bigger) than the given interval do not leave a chance for party A (B) to win.

Proof. Under IL1 the parties choose $\hat{p}_A(\sigma_I) = p_A^0 + 1/4\sigma_I$; $\hat{p}_B(\sigma_I) = p_B^0 - 1/4\sigma_I$. The most favourable situation for party A now would be NE^A. In this situation party A would win if the following condition is satisfied:

$$(14) \quad \frac{p_A^0 + p_B^0}{2} - \frac{\sigma_I - \alpha/4 \cdot (1 - \alpha)}{16 \cdot \sigma_I^2} \geq 1 - \frac{p_A^0 + p_B^0}{2} - \frac{\sigma_I + \alpha/4 \cdot (1 - \alpha)}{16 \cdot \sigma_I^2}$$

The left part of (13) follows straightforward from using the boundaries $\sigma_A \geq \sigma_I/2$ and $\sigma_B \leq 3\sigma_I/2$ given in (12b). The right part follows from the analogous procedure for party B under NE^B. q.e.d.

According to the proposition, a loser situation in traditional positions (s. Proposition 2(i)) can be turned into an electoral victory by mass media. However, the power of media shrinks with increasing intrinsic voter sensibility. On the other hand, very low voter sensibility ($\sigma_I \leq 1/16$) gives media the power to turn every combination of traditional positions into an electoral success.

4.2 Parties anticipate media behaviour correctly

If we use the boundaries given in (12b and c) and assume that parties are able to anticipate the related Nash-equilibrium situations we can formulate a condition for media bias similar to Proposition 4.

Proposition 5

Under IL2 opportunistic media blocks have an incentive to report in a biased manner only if:

$$(15) \quad 1 - \frac{1}{4\sigma_I} \leq p_A^0 + p_B^0 \leq 1 + \frac{1}{4\sigma_I}.$$

Proof. If the parties correctly anticipate NE^A , they optimally choose:

$$(16) \quad \hat{p}_A(NE^A) = p_A^0 + \frac{1}{4 \cdot (\sigma_I - \alpha/4 \cdot (1 - \alpha))}; \quad \hat{p}_B(NE^A) = p_B^0 - \frac{1}{4 \cdot (\sigma_I + \alpha/4 \cdot (1 - \alpha))}.$$

Substituting (16) into (4) and formulating the condition $V_A(\hat{p}_A(NE^A)) \geq V_B(\hat{p}_B(NE^A))$ analogously to (14); with the boundaries of (12b) we obtain the left part of (15). The right part follows from the analogous solution for party B, NE^B and using the boundaries in (12c). q.e.d.

The difference in the intervals of Proposition 4 and 5 can be interpreted as efficiency gains or as the speculative gains for the parties due to successful communication with mass media. However, there is a risk which occurs if a party speculates on a favourable Nash-equilibrium (NE^A or NE^B) and the affiliated media block is not able to increase its political bias as required according to Proposition 3 or the party speculated wrong on the bias respectively. In that case, the broadening of the voter potential by deviating more from the traditional position is overcompensated by the number of non-voters who do not consider the party credible anymore.¹³

4.3 Stackelberg strategies

The propositions above indicate that a party i whose traditional position is relatively far from the median voter position is still able to win an election if mass media reports in NE^i and party i anticipates the situation. Therefore, it is necessary that the political bias of the affiliated media block MB_i exceeds a certain level while the bias of the competing media block (MB_j) has to stay below a certain level. This is possible if party i and its affiliated media block convince their opponents that mass media market barriers would not hinder them to achieve NE^i before policy choices are made (Stackelberg-leader). A winning strategy of party i could look like this:

¹³ Note that Proposition 5 only considers the case that the parties correctly anticipate the media equilibrium. If one party speculated wrong, the winning chances of the other would be improved and the interval in the proposition would be even larger.

- Party i has to commit itself to a platform beyond the " σ^1 -optimum" in order to signalise MB_i that it really wants to win the election and it is worthwhile mobilising the political forces of MB_i .
- The opposing party (j) has to be convinced that party i will have extreme difficulties to win the election in order to keep political bias of MB_j low.

The opponents of party i could try to ensure a victory with the following strategy:

- The opposing media block MB_j launches some politically biased reports before party i holds its party conference to signalise a strong political bias which makes NE^i seem unrealistic.

No matter which of the strategies sketched above is considered, the precondition for its success is a positive relationship between a party and the related media block. For Bill Clinton, Tony Blair and Gerhard Schröder this obviously has been the case which gives some empirical evidence to the model suggested in this study.

5 Discussion and Conclusion

The model proposed in this study indicates that it is possible for mass media to decide upon the winner of elections. The preconditions for winning out of an unfavourable starting position are:

- 1 □ The starting position based on the parties traditional positions has to be located within a certain interval of the political spectrum which leaves a possibility for mass media to turn that situation into a victory. We found that in a two party model this is not the case for extreme positions or issues with high sensibilities to the individuals. Hence, an extreme political position is not able to win against a moderate position even if half of mass media is almost totally neglecting its economic grounds in favour of extreme political propaganda.¹⁴
- 2 □ A favourable Nash-equilibrium in mass media reporting has to exist, i.e. the party with the worse starting position has to convince its affiliated mass media repre-

¹⁴ Extreme political positions might become relevant if substantial amounts of money are spent on non-market driven and non-excludable persuasion channels (e.g. advertisement pillars).

sentatives to report in a more politically biased manner than the competitors on the mass media market even on the risk of losing market shares.

3□ The media block affiliated with the favourite of the election can not be convinced to increase its political bias to a level sufficient to prevent an unfavourable equilibrium in reporting against the favoured party.

Even if some of these conclusions sound like being empirically rational it is important for future work to obtain empirical values for the sensibility-coefficient and to test the model on the basis of existing political decision making processes.

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