Ethical voters and the demand for political news*

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Abstract

We present a model of the media market in which independent citizens’ demand for political news stems from the desire to learn which candidate is preferable in order to make an informed voting decision. Independents are assumed to derive utility from behaving ethically. Ethical behavior is defined as following a rule that maximizes an independent citizen’s utility if it is also followed by all other independents. The rule comprises not only a cutoff on the voting cost, as in the recent literature on ethical voting, but also a media outlet to consume. We investigate the implications of the presence of ethical citizens on the reporting strategies of media outlets, relating them to the media’s expertise, the polarization of society, and the number of competing outlets. Partisans prefer news that is slanted towards their own opinion. Independents prefer unbiased news because it gives them better information on their preferred candidate. Our analysis shows that competition in the market for news tends to increase media bias but also improves the electoral outcome, in the sense of making it more likely that the best candidate is elected. Even though increased competition may well lead to more partisan reporting, it increases the availability of a media outlet with an independent reporting strategy. Since what ultimately matters for the electoral outcome is the news the independents consume, competition in the market for political news has a beneficial effect on democratic elections.

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1 Introduction

A growing literature in political economy studies the impact of the media on political outcomes. Surprisingly, most of this literature assumes that voters demand political news because it affects some private actions (e.g., news about agricultural subsidies may affect farmers’ incentives to grow certain crops) and not for the purpose of voting.¹

A separate literature attempts to explain the so-called “paradox of not voting” (Palfrey and Rosenthal 1985): because in large elections individual voters have a low probability of being pivotal, turnout should be negligible as soon as there is a small cost of voting. The attempt to justify turnout through civic duty (Riker and Ordeshook 1968) is inconsistent with the empirical evidence in Blais (2000) and Levine and Palfrey (2007). Coate and Conlin (2004) and Feddersen and Sandroni (2006) propose a theory of ethical voting that overcomes this issue, following the group rule-utilitarian approach pioneered by Harsanyi (1980). In deciding whether to vote, an ethical voter follows a rule that, if followed by all members of her group, maximizes the welfare of the group as a whole.

We believe that the demand for the consumption of media is driven, at least partially, by voters’ decision to become informed about politics.² Therefore, the analysis of the media industry, as well as recommendations for policy and regulation, cannot disregard the process of political competition and how it affects the consumption of political information. The decision to become informed, however, is in many ways similar to the decision to vote: if a voter does not expect to be pivotal, why bother to learn about the best candidate to vote for? Furthermore, it is widely accepted that the media are often biased in favor of a particular ideology, party, or candidate.³ There is some evidence (see Gentzkow and Shapiro 2010) indicating that this bias is demand-driven, that is, it is the reader and not the owner or editor that causes media reporting of political news to be less than fully objective. All this suggests that there is a close interconnection between politics and the media.

In this paper, we combine both strands of the literature by applying the theory of ethical voting to the demand for political news. In a framework in which agents care about the electoral outcome and may consume political news so as to become informed, we relate the reporting strategies of media outlets to the media’s expertise and the polarization of society. We then examine how competition in the market for political news affects media bias and electoral outcomes. We show that, even though competition tends to increase supply and

²Indirect evidence for this claim comes from Oberholzer-Gee and Waldfogel (2009), who show that the availability of local political news in Spanish had a positive effect on turnout within the Hispanic community.
³Henceforth, by bias we refer to the political slant that an outlet may have. We disregard the bias in the accuracy of news as described in Ellman and Germano (2009), used by outlets to maximize advertising revenues.
consumption of biased news, it always improves the chances that the candidate preferred by
the majority of citizens wins the election.

We consider a model with two candidates and three types of voters: partisans of each
candidate, and independents. Prior to the election, the share of partisans of each candidate
and of independents is unknown. While partisan voters always prefer their own candidate,
the utility that the independents derive from a candidate winning the election depends on
the state of the world, which is favorable to either politician with equal probability. Besides
their political preference, voters differs in their cost of voting, which is drawn from a uniform
distribution.

We assume that there is a competitive market for soft news (i.e., news with entertainment
value, as opposed to hard political news), which determines the outside option for citizens
and therefore their opportunity cost of consuming political news. We focus on the market for
political news, considering different market structures, ranging from monopoly to triopoly.
All political media outlets obtain a (possibly empty) signal about the state of the world and
have to decide whether to publish the signal or not. A media outlet may decide to cater to
a group of partisans by only reporting news favorable to that group’s preferred candidate, or
to report accurately all realizations of the signal. Each media outlet credibly announces its
reporting strategy at the beginning of the game. Therefore, readers know each media outlet’s
slant (partisan or independent) before consuming news. Several studies in the social sciences,
documented in Mullainathan and Shleifer (2005), indicate that people prefer (and consider
more credible) news that is consistent with their beliefs. We assume therefore that partisan
voters prefer a media with a slant similar to theirs. As suggested in Groseclose and Milyo
(2005) we model media bias as the possibility for an informed media outlet to omit some of
the relevant information, but we exclude the possibility of fabricating news. Media outlets
are profit maximizers; advertising, their unique source of revenue, is an increasing function
of the size of their audience.

Voters are ethical: they obtain a payoff from behaving as they should, which means
following a rule understood by everyone in their group. We assume that partisans’ rule
specifies that they should always vote, so that partisans obtain a positive payoff from voting.
This simplifies the analysis by making the partisans’ behavior non-strategic. Independents
follow a rule that maximizes their utility if followed by all other independents. At the voting
stage, a rule consists of a cutoff value for the cost of voting that determines the share of
independents who are supposed to cast their ballot. At the news consumption stage, a rule
consists of a media outlet from which independents are supposed to consume the news.

Voters’ utility, net of the cost of voting, is separable in three components: the utility
from the political outcome, the utility from consuming news, and the utility from behaving
ethically, that is, the satisfaction they derive from following the ethical rule of the group they belong to. All citizens derive the same utility from consuming soft news. Independent voters derive no consumption utility from political news. The only reason for them to ever consume political news is to acquire information that may be useful at the voting stage. They demand political news if becoming informed benefits the group more than consuming soft news. By consuming political news, voters may discover the state of nature. Independents learn which candidate they should vote for and can increase the chances of their preferred candidate by participating in the election. Partisans obtain a positive consumption utility from news that confirms their beliefs (i.e., news showing that the state of the world is the one favorable to their preferred candidate), and a negative consumption utility from news that disconfirms their beliefs.

We show that partisans’ demand for political news depends on the political media’s expertise. Independents’ demand depends both on the media’s expertise and the expected proportion of independent citizens in the population. The proportion of independents influences the probability that their participation in the election will swing the voting in favor of their preferred candidate. We go on to derive the equilibrium reporting strategies for three different market structures: monopoly, duopoly, and triopoly. Our analysis centers around a comparison of the equilibria arising under the different market structures, which we use to draw conclusions on the effect of competition on media bias and electoral outcomes.

The remainder of the paper is organized as follows. Section 2 lays out the model. Section 3 derives the equilibrium in the market for political news. Section 4 compares the equilibria in terms of the extent of media bias and the right candidate’s chances of winning. Section 5 concludes.

2 Model

The state of the world is denoted $\omega$ and can be either $a$ or $b$. Each occurs with equal probability. There are two alternative candidates (or policies) $a$ and $b$. The population has unit mass and consists of three types of citizens $i \in \{a, b, \omega\}$: partisans of candidate $a$, partisans of candidate $b$, and independents. The proportion of each type of citizen in the population, denoted $\rho_i$, is unknown before the election; it is common knowledge that the triplet $(\rho_a, \rho_b, \rho_\omega)$ is drawn from a distribution $F$ over the simplex that is symmetric with respect to $\rho_a$ and $\rho_b$. The expected proportion of independents is $E(\rho_\omega) \equiv \alpha$ while the expected proportion of each type of partisans is $E(\rho_a) = E(\rho_b) = (1 - \alpha)/2$, where $\alpha \in (0,1)$. We will refer to $1 - \alpha$ as the degree of polarization of society. Each citizen has a cost of voting $c$ drawn independently from a uniform distribution on the support $[0, \bar{c}]$. The election
is decided by majority rule, and the winning candidate is denoted $\theta \in \{a, b\}$.

Media outlets maximize profits. There are $J$ outlets, of which $M$ operate in the market for hard news (i.e., political news) and $J - M$ in the market for soft news (i.e., news with entertainment value). We assume that $J$ is large relative to $M$, so that the market for soft news is competitive and does not allow media outlets to earn any rent. By contrast, the number of media outlets $M$ operating in the market for political news is small, perhaps because of some underlying scarcity, such as the number of qualified journalists or editors, or because of fixed costs or barriers to entry. Below, we will consider monopoly ($M = 1$), duopoly ($M = 2$), and triopoly ($M = 3$).

Media outlets operating in the market for soft news always report soft news, denoted $s$. Political media outlets receive a signal $\tilde{\omega}$ about the state of the world. The signal is the same for all $M$ outlets. With probability $q$, the signal is informative and equals the state of the world, $\tilde{\omega} = \omega$. With probability $1 - q$, there is no signal, $\tilde{\omega} = \emptyset$. We will refer to $q$ as the media’s expertise. Political media outlets can either report the true state of the world or report $\emptyset$; they cannot fabricate political news. Citizens are unable to observe whether a media outlet reports informative news before consuming it.\footnote{Reporting $\emptyset$ should not be interpreted as the newspaper or television newscast being empty. It should be interpreted as the news being uninformative about the state of the world. For example, the account of a parliamentary debate may not reveal any information that allows voters to update their beliefs about the state of the world.} Each citizen consumes at most one media outlet.\footnote{This can be justified by time constraints on the part of citizens, or, in the case of television news, by the fact that all channels broadcast their main newscast at the same time of the day.}

We assume that political media outlets never report soft news. There are two possible justifications for this. First, outlets may not want to jeopardize their reputation as being a reliable source of political news. Second, editors may not be able to perfectly distinguish between informative and non-informative news; they may thus be forced to publish whatever political news they receive so as to avoid missing a scoop. The news reported by media outlet $j$ is denoted $N_j \in \{a, b, \emptyset, s\}$.

The media’s only source of revenue is advertising. We assume that advertising revenue is proportional to an outlet’s audience. Therefore, each outlet tries to maximize its expected audience. Its exact audience is generally not known before citizens’ consumption decisions because the proportions of the different types of citizens are random variables. At the beginning of the game, each political outlet commits to a reporting strategy. Reporting can be independent, denoted $I$, in which case the outlet always reports the signal it receives. Alternatively, reporting can be partisan, denoted $A$ or $B$, in which case the outlet only reports the signal if it is favorable to its target group of partisans. Commitment to a reporting strategy is plausible since it can be achieved, e.g., by hiring an editor whose political views are publicly
Citizens derive utility from three sources: electoral outcomes, news consumption, and ethical behavior. The utility of a citizen of type $i$ consuming media outlet $j$ (gross of the cost of voting) is given by

$$u_{i,j} = u^P_i + u^N_{i,j} + u^V_i$$

where $u^P_i$, $u^N_{i,j}$, and $u^V_i$ differ depending on the type of citizen. For partisans ($i = a, b$),

$$u^P_i = \begin{cases} 
1 & \text{if } \theta = i \\
0 & \text{otherwise}, 
\end{cases}$$

$$u^N_{i,j} = \begin{cases} 
S & \text{if } N_j = s \\
H & \text{if } N_j = i \\
-h & \text{if } N_j = -i \\
0 & \text{if } N_j = \emptyset,
\end{cases}$$

and

$$u^V_i = \begin{cases} 
d_i & \text{if the citizen votes} \\
0 & \text{otherwise.}
\end{cases}$$

For independents ($i = \omega$),

$$u^P_\omega = \begin{cases} 
1 & \text{if } \theta = \omega \\
0 & \text{otherwise}, 
\end{cases}$$

$$u^N_{\omega,j} = \begin{cases} 
S & \text{if } N_j = s \\
0 & \text{otherwise},
\end{cases}$$

and

$$u^V_\omega = \begin{cases} 
d_\omega & \text{if the citizen behaves ethically} \\
0 & \text{otherwise.}
\end{cases}$$

We assume $H > h > 0$, $S > 0$, $d_a = d_b = d > 0$, and $d_\omega > \bar{c} + S$. Moreover, we impose the following assumption on the relative value of consuming hard and soft news.

**Assumption 1.** The utility from news consumption satisfies $\Delta H > 2S$, where $\Delta H \equiv H - h$.

Without this assumption, partisans never consume an independent media outlet for any value of $q$ (they always prefer soft news).

According to this utility specification, partisans obtain a payoff of 1 iff their preferred candidate is elected. Independents obtain a payoff of 1 iff the candidate corresponding to the state of the world is elected. Both also derive utility from the consumption of news. Soft news always procures them a payoff of $S$. Hard news only procures consumption utility to partisans: a payoff of $H$ in the case of favorable news (note that $H > S$ by Assumption 1), and a disutility of $h$ in the case of unfavorable news. Finally, both partisans and independents derive utility from ethical behavior. A partisan obtains a payoff of $d$ if he votes. Thus, in deciding whether to vote each partisan will compare his cost of voting $c$ to the civic-duty.
payoff \( d \). An independent obtains a payoff of \( d_\omega \) if he behaves according to the rule that, if followed by all other independents, maximizes his expected utility. A rule of ethical behavior comprises both a media outlet to consume and a threshold for the voting cost, \( c^* \), below which an independent is supposed to cast his ballot.

The existence of media outlets publishing soft news introduces an opportunity cost of consuming hard news for both partisans and independents. Partisans will compare their expected payoff from consuming political news with the certain payoff from soft news, \( S \). For independents, the only reason to consume political news in this model is to secure themselves the payoff \( d_\omega \) from behaving ethically. They will only forego the consumption of soft news if a) consuming hard news and participating in the election increases their collective payoff (making it ethical to behave in this way), and b) the payoff \( d_\omega \) is sufficiently large to compensate them for the cost of voting \( c \) and the foregone utility \( S \) from consumption of soft news.

The assumption that partisans and independents have different ideas about what constitutes ethical behavior simplifies the analysis considerably. In particular, it means that partisans behave non-strategically: they choose the same turnout regardless of the news that they consume (and thus, independent of how they expect independent citizens to behave). To decide whether to participate in the election, a partisan citizen compares his cost of voting \( c \) to the civic-duty payoff \( d \). He participates if and only if \( c \leq d \), so partisan turnout is \( d/c \) if \( d < \bar{c} \) and 1 otherwise.

Because partisan turnout is constant and does not depend on which media outlets citizens consume or what signals the media report, the probability that a given candidate wins the election can be expressed solely as a function of the independents’ turnout and the expected proportion of independents in the population. Because the distribution \( F \) is symmetric in \( \rho_a \) and \( \rho_b \), both candidates are equally likely to win if no independent citizen votes. Let the probability that a candidate wins the election when a fraction \( \phi \) of independents votes in her favor and their expected share of the population is \( \alpha \) be given by \( P(\phi, \alpha) \).

**Assumption 2.** The function \( P \) determining the probability that the candidate supported by the independents wins satisfies the following properties: \( P_\phi > 0 > P_{\phi\phi}, P_\alpha > 0, P(0, \alpha) = P(\phi, 0) = 1/2, \) and \( P_\phi(1, \alpha) < \bar{c}/3 \).

Subscripts denote partial derivatives. This assumption states that the probability \( P \) is increasing in both arguments, concave in \( \phi \), and equal to \( 1/2 \) if all independents abstain or if the expected proportion of independents is zero (which is equivalent to there being no independents in the population). The last part ensures an interior solution to the independents’ maximization problem.

The timing of the game is as follows. Nature draws the state of the world \( \omega \) and the
proportions of the different types of citizens, \( \rho_i, i = a, b, \omega \). Political media outlets announce their reporting strategy. They receive the signal \( \tilde{\omega} \). If the signal is nonempty, political outlets publish or suppress the signal depending on their reporting strategy. Citizens decide whether and from which of the \( J \) available outlets to consume news. Citizens then learn their cost of voting and decide whether and for which candidate to vote. The candidate receiving the majority of votes wins the election, and citizens’ payoffs from the electoral outcome are realized.

3 Equilibrium in the market for political news

We assume without loss of generality that if only one partisan outlet is available, it is \( A \), and that when choosing between two partisan outlets, independents choose \( A \). We solve the game backward starting from the voting stage.

3.1 The independents’ decision to vote

Each independent citizen understands what rule he should follow so as to obtain \( d_\omega \). At the voting stage, the rule consists in a cost threshold \( c^* \) below which the citizen is supposed to vote. The rule is chosen to maximize the probability that the independents’ preferred candidate wins, net of the expected cost of voting \( C \). The cost of voting being uniform over the support \([0, \bar{c}]\), choosing a threshold \( c^* \) means that a fraction \( \phi = c^*/\bar{c} \) of independents votes. Hence, choosing a threshold \( c^* \) is equivalent to choosing the fraction \( \phi \) directly. The maximization problem to determine the share of independents that casts the ballot is

\[
\max_{\phi} \Pr(\theta = \omega) - C, \tag{1}
\]

where

\[
C = \int_{0}^{\bar{c}\phi} c \, dc = \frac{\bar{c}^2}{2}\phi^2.
\]

The probability that the preferred candidate wins depends on the information held by the independents at the voting stage. Depending on the media outlet they consume, independents are more or less precisely informed about the state of the world. Figure 1 shows the information structure of the game and the news reported by a media outlet for each possible reporting strategy \((A, B, I, S)\) given the signal \( \tilde{\omega} \).

When the independents consume soft news, they remain uninformed about the state of the world and always abstain. When they consume a media outlet with an independent reporting strategy, there are two possible cases. If the news is non-informative \((N_I = \emptyset)\), the independents infer that there was no information \((\tilde{\omega} = \emptyset)\) and cannot update their beliefs. Because each candidate has probability 1/2 of being the right one, independents
cannot improve on the probability of the right candidate being elected by participating in the election; therefore they abstain. If the news is informative \(N_I = \omega\), independents know the state of the world. Thus, they know who their preferred candidate is and can improve her chances of winning by participating. The rule for turnout that maximizes each independent’s expected payoff solves

\[
\max_{\phi} P(\phi, \alpha) - \bar{c} \phi^2,
\]

leading to the first order condition

\[
P_{\phi}(\phi, \alpha) = \bar{c} \phi. \tag{2}
\]

Let \(\phi_{\omega}\) denote the solution to (2), which by Assumption 2 is necessary as well as sufficient.

When the independents consume a media outlet with a partisan reporting strategy, say \(A\), there are again two cases, one of which is the same as before: if the news is informative, independents learn the state of the world and the rule that maximizes each independent’s utility is to choose a turnout of \(\phi_{\omega}\). If the news is non-informative, the situation is slightly different. Independents know that if \(N_A = \emptyset\), this can either be due to the signal being empty \(\tilde{\omega} = \emptyset\) or to the media outlet having suppressed news unfavorable to candidate \(a\).

Their posterior belief that the signal was \(\tilde{\omega} = b\) given that \(N_A = \emptyset\) is

\[
\hat{q} \equiv \Pr(\tilde{\omega} = b|N_A = \emptyset) = \frac{q/2}{q/2 + 1 - q} = \frac{q}{2 - q}.
\]

Because \(\hat{q}\) is strictly positive for any \(q > 0\), the independents can improve their payoff from the
electoral outcome by voting for candidate b whenever \( N_A = \emptyset \). The maximization problem determining the optimal turnout rule in that case is

\[
\max_\phi (1 - \hat{q}) \left[ \frac{1}{2} P(\phi, \alpha) + \frac{1}{2} (1 - P(\phi, \alpha)) \right] + \hat{q} P(\phi, \alpha) - \frac{\bar{c}}{2} \phi^2 = (1 - \hat{q}) \frac{1}{2} + \hat{q} P(\phi, \alpha) - \frac{\bar{c}}{2} \phi^2,
\]

leading to the first order condition

\[
\hat{q} P(\phi, \alpha) = \bar{c} \phi.
\]

Let \( \phi_\omega \) denote the solution to (3). It is clear from comparing (2) and (3) that \( \phi_\omega > \phi_\phi \).

Independents’ expected utility at the voting stage when consuming an independent outlet and following the rule for ethical behavior is

\[
V_I(q, \alpha) \equiv 1 - \frac{q}{2} + q \left[ P(\phi_\omega, \alpha) - \frac{\bar{c}}{2} \phi_\omega^2 \right].
\]

With probability \( 1 - q \), the signal is empty, independents abstain, and the right candidate wins with probability 1/2. With probability \( q \), the signal is nonempty. A fraction \( \phi_\omega \) of independents votes at expected cost \( \frac{\bar{c}}{2} \phi_\omega^2 \), and the right candidate wins with probability \( P(\phi_\omega, \alpha) \).

Independents’ expected utility when consuming a partisan outlet \( (A) \) is

\[
V_A(q, \alpha) \equiv \frac{q}{2} \left[ P(\phi_\omega, \alpha) - \frac{\bar{c}}{2} \phi_\omega^2 \right] + \left( 1 - \frac{q}{2} \right) \left[ (1 - \hat{q}) \frac{1}{2} + \hat{q} P(\phi_\phi, \alpha) - \frac{\bar{c}}{2} \phi_\phi^2 \right]
\]

\[
= \frac{q}{2} \left[ P(\phi_\omega, \alpha) - \frac{\bar{c}}{2} \phi_\omega^2 \right] + \left( 1 - q \right) \left[ \frac{1}{2} - \frac{\bar{c}}{2} \phi_\phi^2 \right] + \frac{q}{2} \left[ P(\phi_\phi, \alpha) - \frac{\bar{c}}{2} \phi_\phi^2 \right].
\]

With probability \( q/2 \), the signal is \( \tilde{\omega} = a \) and the media outlet publishes \( N_A = a \). A fraction \( \phi_\omega \) of independents votes for candidate \( a \) at cost \( \frac{\bar{c}}{2} \phi_\omega^2 \). Candidate \( a \), who is the right candidate, wins with probability \( P(\phi_\omega, \alpha) \). With probability \( 1 - q/2 \), the media outlet publishes \( N_A = \emptyset \). A fraction \( \phi_\phi \) of independents votes for candidate \( b \) at cost \( \frac{\bar{c}}{2} \phi_\phi^2 \). Conditional on \( N_A = \emptyset \), with probability \( \hat{q} \) the signal was \( \tilde{\omega} = b \). Candidate \( b \) is the right candidate and wins with probability \( P(\phi_\phi, \alpha) \). With probability \( 1 - \hat{q} \), the signal was empty, so that both candidates are equally likely to be right. Independents’ votes for candidate \( b \) do not have an effect on their expected payoff from the electoral outcome, which is 1/2.

The following lemma derives some properties of \( V_I \) and \( V_A \) that will be useful for the remainder of the analysis.

**Lemma 1.** Independents’ expected payoff at the voting stage satisfies the following properties:

(i) \( V_I(q, \alpha) \geq V_A(q, \alpha) \), with strict inequality for all \( (q, \alpha) \in (0, 1)^2 \).

\(^6\)We have \( \Pr(\omega = b|N_A = \emptyset) = \frac{1}{1 - q} > 1/2. \)
(ii) \( \partial V_I / \partial q \geq 0 \) and \( \partial V_A / \partial q \geq 0 \), with strict inequality for all \( \alpha \in (0, 1) \).

(iii) \( \partial V_I / \partial \alpha \geq 0 \) and \( \partial V_A / \partial \alpha \geq 0 \), with strict inequality for all \( q \in (0, 1] \).

**Proof.** Notice first that when \( \tilde{\omega} = b \), optimal turnout is \( \phi_\omega \), but independents consuming a partisan outlet choose a suboptimal turnout of \( \phi_\emptyset \). Comparing (3) and (2), we see that they differ only in the factor \( \hat{q} \leq 1 \) multiplying the LHS of (3); thus \( \phi_\emptyset \leq \phi_\omega \). It follows that

\[
P(\phi_\omega, \alpha) - \frac{\bar{c}}{2} \phi_\omega^2 \geq P(\phi_\emptyset, \alpha) - \frac{\bar{c}}{2} \phi_\emptyset^2.
\]

This implies that \( V_I \geq V_A \). As \( q \to 0 \), we have \( \phi_\emptyset \to 0 \), so

\[
\lim_{q \to 0} V_I(q, \alpha) = \lim_{q \to 0} V_A(q, \alpha) = 1/2.
\]

As \( q \to 1 \), we have \( \phi_\emptyset \to \phi_\omega \), so

\[
\lim_{q \to 1} V_I(q, \alpha) = \lim_{q \to 1} V_A(q, \alpha).
\]

As \( \alpha \to 0 \), we have \( \phi_\omega \to 0 \) and \( \phi_\emptyset \to 0 \), so

\[
\lim_{\alpha \to 0} V_I(q, \alpha) = \lim_{\alpha \to 0} V_A(q, \alpha) = 1/2.
\]

If \( \phi_\omega \) and \( \phi_\emptyset \) also tend to zero as \( \alpha \to 1 \), then we have the same in that case. This establishes (i).

Turning to (ii), we have

\[
\frac{\partial V_I}{\partial q} = -\frac{1}{2} + P(\phi_\omega, \alpha) - \frac{\bar{c}}{2} \phi_\omega^2 \geq 0
\]

because \( P(\phi_\omega, \alpha) - \frac{\bar{c}}{2} \phi_\omega^2 \) must be greater or equal \( 1/2 \) by the optimality of \( \phi_\omega \); the inequality is strict for any \( \phi_\omega > 0 \), i.e., as long as \( \alpha \in (0, 1) \). Applying the envelope theorem, we also have

\[
\frac{\partial V_A}{\partial q} = \frac{1}{2} \left[ P(\phi_\omega, \alpha) - \frac{\bar{c}}{2} \phi_\omega^2 - (1 - \hat{q}) \left( \frac{1}{2} - \frac{\bar{c}}{2} \phi_\emptyset^2 \right) - \hat{q} \left( P(\phi_\emptyset, \alpha) - \frac{\bar{c}}{2} \phi_\emptyset^2 \right) \right] - \left( 1 - q \right)^2 \left( \frac{2}{(1 - \hat{q})^2} P(\phi_\omega, \alpha) - \frac{1}{(2 - q)^2} \right) \geq 0,
\]

where the inequality follows from (4) and the fact that \( P(\phi, \alpha) \geq 1/2 \) by Assumption 2.

To establish iii, we can again apply the envelope theorem to find

\[
\frac{\partial V_I}{\partial \alpha} = q P_\alpha(\phi_\omega, \alpha) \geq 0
\]

\[
\frac{\partial V_A}{\partial \alpha} = \frac{q}{2} P_\alpha(\phi_\omega, \alpha) + \left( 1 - \frac{q}{2} \right) \hat{q} P_\alpha(\phi_\emptyset, \alpha) \geq 0,
\]

where the inequalities are due to Assumption 2.

\( \square \)
According to Lemma 1, $V_I$ is always greater than $V_A$, and both functions are increasing in both $q$ and $\alpha$. That is, the independents’ utility at the voting stage is greater when consuming an independent outlet than when consuming a partisan outlet. The intuition is that, when consuming partisan outlet $A$, independents sometimes vote for $b$ even though abstention would be optimal, and whenever voting for $b$ is indeed optimal, they do not choose a high enough turnout. As $q$ tends to 0 or 1, both partisan and independent outlets become equally (un-)informative, so the two functions converge. As $\alpha$ tends to 0, independents have no influence on the election, so again the two functions converge. As $\alpha$ tends to 1, $V_I$ and $V_A$ also converge if $\phi_\omega$ and $\phi_\emptyset$ tend to zero.

### 3.2 The demand for news

In deriving the demand for news, we assume that all citizens of the same type choose the same media outlet. If there are several media outlets with the same reporting strategy available, each of these outlets is equally likely to be chosen. The partisans’ demand for news is straightforward to derive. Since partisans behave non-strategically at the voting stage, they only consider the consumption utility of news. If available, they always prefer their own partisan outlet to an independent outlet, and an independent outlet to the opposing partisan outlet. Moreover, they always prefer soft news to the opposing partisan outlet. Whether partisans prefer soft news to political news depends on the media’s expertise, measured by $q$. If $q < 2S/H$, they prefer soft news even to their own partisan outlet. A low $q$ means that political news is so rarely informative that it yields lower expected utility than soft news. If $2S/H \leq q \leq 2S/\Delta H$, they prefer partisan news to soft news, and soft news to independent news. Intermediate values of $q$ mean that partisan news yields higher expected utility than soft news; independent news does not, however, which is due to the disutility from unfavorable political news that partisans are forced to endure if they consume independent news. Finally, if $q > 2S/\Delta H$, they prefer partisan news to independent news, and independent to soft news. A high $q$ means that even independent news yields sufficiently large expected utility to dominate soft news.

Unlike partisans, independents derive no consumption utility from political news. Their demand for news stems solely from the value of news for making an informed voting decision. The independents’ preferred candidate depends on the state of the world. To be informed about the state of the world, the independents need to acquire information, which can be done by consuming a media outlet diffusing political news.

To decide which media outlet to consume, each independent citizen again considers the rule that maximizes his utility if the same rule is followed by all other independents as well. Following this rule yields an independent citizen the payoff from ethical behavior, $d_\omega$ (if he
also follows the cutoff rule on \( c \) in deciding whether to vote; see the previous subsection). To find the optimal rule, one needs to compare the sum of the consumption utility and the utility from the electoral outcome. For soft news, consumption utility is \( S \) and political utility is \( \frac{1}{2} \). For political news, consumption utility is always zero. Political utility is \( V_I \) for an independent outlet and \( V_A \) for a partisan outlet. Figure 2 depicts the payoffs from consuming soft, independent, and partisan news for a given \( \alpha \) as a function of \( q \). The payoff from soft news is constant and equal to \( \frac{1}{2} + S \). Independent news yields a higher payoff than soft news if and only if \( V_I(q, \alpha) \geq \frac{1}{2} + S \iff q \geq \tilde{q} \). Similarly, partisan news yields a higher payoff than soft news if and only if \( V_A(q, \alpha) \geq \frac{1}{2} + S \iff q \geq \tilde{q} \). As \( \alpha \) increases, the \( V_I \) and \( V_A \) curves pivot upwards, so that \( q \) and \( \tilde{q} \) both shift to the left.

We can thus define two thresholds in the \((q, \alpha)\) space. These thresholds characterize the independents’ demand for news and are implicitly defined by

\[
V_I(q, \alpha) = \frac{1}{2} + S \tag{5}
\]

\[
V_A(q, \alpha) = \frac{1}{2} + S \tag{6}
\]

Let \( \alpha \) denote the value of \( \alpha \) solving (5) and \( \overline{\alpha} \) the value solving (6); clearly, both are functions of \( q \). In Figure 3, the blue curve represents \( \underline{\alpha} \) and the red curve \( \overline{\alpha} \). Let \( \hat{\alpha} \) be defined by \( V_I(1, \hat{\alpha}) = \frac{1}{2} + S \). For \( \alpha \leq \hat{\alpha} \), independents never demand political news, whatever the value of \( q \). Note that, by the implicit function theorem, \( \partial \hat{\alpha} / \partial S = 1/(\partial V_I(1, \alpha)/\partial \alpha) > 0 \), so \( \hat{\alpha} \) is increasing in \( S \).

Figure 3 summarizes the previous analysis by dividing the parameter space into different

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\(^7\) We focus on \( \alpha \) for expositional convenience. Note that Figure 2 depicts the values of \( q \) that solve (5) and (6); these are simply the inverse functions of \( \underline{\alpha} \) and \( \overline{\alpha} \).
regions. In what follows, we restrict attention to values of $q \geq 2S/H$. For smaller values of $q$, the independents are the only ones to ever demand political news. There is either no market for political news (if $\alpha < \underline{\alpha}$), or a market for independent news only, in which case all media outlets will choose independent reporting. The interesting part of the parameter space is given by the regions denoted 1-6 in the figure. In regions 1-3, partisans prefer their own partisan news to soft news, and soft news to independent news. In regions 4-6, partisans prefer independent news to soft news as well. In regions 3 and 6, independents never consume political news. In regions 2 and 5, they prefer independent news to soft news, and soft news to partisan news. Finally, in regions 1 and 4, independents prefer partisan news to soft news as well.

### 3.3 Market structure and reporting strategies

We assume that when there are multiple equilibria and these equilibria are payoff equivalent for media outlets, the equilibrium that is selected is the one that maximizes the citizens’ utility. For technical reasons, we make the following assumption:

**Assumption 3.** The consumption value of soft news, $S$, is sufficiently large to have $\hat{\alpha} > 3/11$.

This assumption guarantees the existence of an equilibrium for the entire parameter space. We now consider the equilibrium in reporting strategies for three market structures:
monopoly, duopoly, and triopoly.

**Monopoly**

When there is a single media outlet in the market for political news, there are no strategic considerations in choosing a reporting strategy. The monopolist’s reporting strategy is determined solely by the audience it is expected to generate. For each region of the parameter space, we have to consider two possible reporting strategies: \( T \) and \( A \). The following lemma describes the optimal reporting strategy as a function of \( q \) and \( \alpha \).

**Lemma 2 (Monopoly).** If there is a monopoly in the market for political news, it will do partisan reporting \((A)\) for \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in \left[0, \max\{1/3, \alpha\}\right] \cup [\overline{\alpha}, 1] \), and independent reporting \((I)\) otherwise.

**Proof.** See the Appendix.

According to Lemma 2, when there is a single media outlet in the market for political news, it will do partisan reporting in regions 1 and 3, as well as in region 2 if the expected proportion of independents is below \(1/3\), and independent reporting in regions 4-6, as well as in region 2 if the expected proportion of independents is above \(1/3\). The intuition for the threshold \(1/3\) is that when \( \alpha \geq 1/3 \), the independents are a larger group than either group of partisans, so getting the demand of independents is better than getting the demand of one of the partisan groups.

**Duopoly**

When there are two media outlets in the market for political news, their reporting strategies will also depend on strategic considerations: outlet 1’s reporting strategy must be a best response to outlet 2’s strategy, and vice versa. We have to consider all three possible reporting strategies, \( A, B, \) and \( I \). The following lemma describes the equilibrium in reporting strategies as a function of \( q \) and \( \alpha \). We adopt the convention that the first strategy corresponds to outlet 1 and the second to outlet 2; of course, symmetric constellations are also an equilibrium.

**Lemma 3 (Duopoly).** If there is a duopoly in the market for political news, the equilibrium reporting strategies will be as follows:

\((A, B)\) for \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in \left[0, \max\{1/3, \alpha\}\right] \cup [\overline{\alpha}, 1/2] \), as well as for \( q > 2S/\Delta H \) and \( \alpha < \alpha \);

\((A, I)\) for \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in \left[\max\{1/3, \alpha\}, \min\{1/2, \overline{\alpha}\}\right] \); and

\((I, I)\) otherwise.
Proof. See the Appendix.

There is a unique equilibrium for each possible combination of parameters, except for some events of measure zero. In regions 3 and 6, as well as in region 1 for $\alpha \leq 1/2$ and in region 2 for $\alpha \leq 1/3$, the equilibrium is $(A, B)$. In region 2 for $1/3 \leq \alpha \leq 1/2$, the equilibrium is $(A, I)$. In regions 4 and 5, as well as in regions 1 and 2 for $\alpha \geq 1/2$, the equilibrium is $(I, I)$.

**Triopoly**

Finally, we consider the case where there are three media outlets in the market for political news. The following lemma again describes the equilibrium in reporting strategies as a function of $q$ and $\alpha$. We adopt the convention that the first strategy corresponds to outlet 1, the second to outlet 2, and the third to outlet 3; of course, symmetric constellations are also an equilibrium.

**Lemma 4** (Triopoly). If there is a triopoly in the market for political news, the equilibrium reporting strategies will be as follows:

$(A, A, B)$ for $\alpha < \alpha$;

$(A, I, B)$ for $q \in [2S/H, 2S/\Delta H]$ and $\alpha \in [\alpha, 1/2]$ as well as for $q > 2S/\Delta H$ and $\alpha \in [\alpha, 1/3]$;

$(A, I, I)$ for $q \in [2S/H, 2S/\Delta H]$ and $\alpha \in [1/2, 3/5]$

$(I, I, I)$ otherwise.

Proof. See the Appendix.

Just like in the duopoly case, there is a unique equilibrium for each possible combination of parameters, except for some events of measure zero. In regions 3 and 6, the equilibrium is $(A, A, B)$; all media outlets are partisan and none are independent. In regions 1 and 2 for $\alpha \leq 1/2$ and in regions 4 and 5 for $\alpha \leq 1/3$, the equilibrium is $(A, I, B)$; all types of citizens obtain their preferred news. In regions 1 and 2 for $1/2 \alpha \leq 3/5$, the equilibrium is $(A, I, I)$; only one group of partisans obtains their preferred news. In regions 1 and 2 for $\alpha \geq 3/2$ and in regions 4 and 5 for $\alpha \geq 1/3$, the equilibrium is $(I, I, I)$; all media outlets are independent and none are partisan.

**Some comparative statics**

What is the effect of an increase in the media’s expertise $q$ and the polarization of society $\alpha$, on supply and consumption of news, holding everything else constant, including the market
structure? The following proposition reports some comparative statics results for each of the three market structures we have considered. As previously, we focus on \( q \geq 2S/H \).

**Proposition 1** (Impact of expertise and polarization). For any given market structure, a sufficiently large increase in \( q \) always leads to an increase in the supply of independent news and in a reduction of the consumption of partisan news. Under triopoly, an increase in \( \alpha \) always leads to an increase in the number of independent outlets. Under monopoly and duopoly, the number of independent outlets increases with \( \alpha \) only for \( q \) sufficiently large; otherwise the effect is ambiguous.

*Proof.* See the Appendix.

Note that locally (for small increases in \( q \)) it is nevertheless possible to observe (under monopoly and duopoly) an increase in media bias, with an increase in the provision of partisan news, consumed both by partisans and independents.

4 The effect of competition on media bias and electoral outcomes

We are interested in the effect of an exogenous increase in the number of media outlets, which we will sometimes refer to as an increase in competition, on the equilibrium in the market for political news. As we go from monopoly to duopoly and from duopoly to triopoly, how does this affect the supply and consumption of biased news? How does it affect the probability that the right candidate is elected? We address these questions in the following two propositions.

**Proposition 2** (Media bias). An exogenous increase in the number of media outlets leads to more biased reporting and more consumption of biased news in almost all regions of the parameter space. The only exception is when \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in [\max\{1/2, \pi\}, 1] \), where media bias decreases when moving from monopoly to duopoly (or monopoly to triopoly).

*Proof.* The proposition can be split into the following statements:

(i) for \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in [\max\{1/2, \pi\}, 1] \), media bias decreases when moving from monopoly to duopoly or from monopoly to triopoly.

(ii) otherwise media bias increases.

*Element (i).* If we move from monopoly to duopoly, the market equilibrium passes from \((A)\) to \((I, I)\). If we move from monopoly to triopoly, we pass from \((A)\) to either \((A, I, I)\) or \((I, I, I)\). Therefore, in all cases the consumption of partisan outlets weakly decreases.
Figure 4: Comparing equilibria across market structures for $2S/H \leq q \leq 2S/\Delta H$

Figure 5: Comparing equilibria across market structures for $q > 2S/\Delta H$
Element (ii). For \( q \in [2S/H, 2S/\Delta H] \), and excluding the case already analyzed, we observe no changes in the provision of partisan news when increasing competition on the market, with two notable exceptions: when passing from monopoly to duopoly, with \( \alpha < \max\{1/3, \alpha\} \), in which case we pass from \((A)\) to \((A,B)\); and for any change in \( M \), when we are in the segment 2 (figure no numbered) with \( \alpha \in [1/3, 3/5] \). For the case of monopoly we have \((I)\), for duopoly \((A,I)\), and for triopoly either \((A,I,B)\) or \((A,I,I)\). In all cases, an increase in \( M \) always implies (weakly) an increase in the supply and consumption of partisan news.

For \( q > 2S/\Delta H \), under monopoly we only have an independent outlet, which is replaced, under duopoly, by a combination \((A,B)\) for \( \alpha < \alpha \). Moving from duopoly to triopoly, the only relevant change occurs for \( \alpha \in [\alpha, 1/3] \), for which we pass from \((I,I)\) to \((A,I,B)\). In both cases, we observe an increase in the variety of partisan outlets available, implying an increase in the consumption of partisan news.

**Proposition 3** (Electoral outcome). An exogenous increase in the number of media outlets weakly improves the probability that the right candidate is elected.

**Proof.** The probability of the right candidate to be elected is directly related to the information set of the independent voters at the moment of the election. The chances of the right candidate to win the elections are maximized when the independents are consuming independent news. They achieve their minimum when independents consume soft news. Finally, they are at an intermediate level when they consume a partisan outlet. We can therefore disregard the areas 3 and 6 in the figure, for which independents never consume hard news, and therefore there is no difference when passing from a market structure to another.

Concerning region 2, for \( \alpha < 1/3 \), the independents consume soft news under monopoly and duopoly, while they have access to an independent outlet in the case of triopoly. In the remaining part of region 2, they always consume an independent outlet. Therefore, there is no change from monopoly to duopoly, but the chances of the right candidate to win the elections increase when we move to a triopoly.

In region 1, under monopoly the independents consume soft news. Under duopoly they consume soft news for \( \alpha < 1/2 \), and independent news otherwise. Therefore, the chances of the right candidate to win under duopoly are weakly larger than under monopoly. When passing from duopoly to triopoly, there is no change for \( \alpha > 1/2 \), in which case there is always an independent outlet available, but we observe a change from \((A,B)\) to \((A,I,B)\) for \( \alpha < 1/2 \), thus again the chances of the right candidate to win are weakly increasing.

In regions 4 and 5, there is always at least an independent outlet available. Therefore, a change in the degree of competition does not affect the chances of the right candidate to be selected.
Propositions 2 and 3 are illustrated in Figures 4 and 5, which compare the equilibrium reporting strategies under different market structures for the case $2S/H \leq q \leq 2S/\Delta H$ and $q > 2S/\Delta H$, respectively. According to Proposition 2, media bias, measured both by the supply and the consumption of biased (i.e., partisan) news, tends to increase with competition. Except for one particular case (namely, region 1 and $\alpha \geq 1/2$ as we move from monopoly to duopoly or monopoly to triopoly), the number of partisan outlets and the proportion of the population consuming partisan news become larger as the number of media outlets increases. For example, in region 2 for $\alpha \geq 1/3$, a monopolist produces independent news, but under duopoly and triopoly, in addition to an independent outlet there is also at least one partisan outlet active in the market; partisans switch from consuming soft news to consuming partisan news as their preferred partisan outlet becomes available.

According to Proposition 3, the increase in media bias does not have an adverse effect on elections, however. On the contrary, competition always leads to weakly better electoral outcomes. Moving from monopoly to duopoly and from duopoly to triopoly increases the probability that the candidate corresponding to the state of the world, and thus preferred by the majority of citizens, is elected. The intuition for this result is the following. What matters for the electoral outcome is the news consumed by independents. Even though competition increases the supply and consumption of biased news, it also increases the availability of independent news. Because independents prefer unbiased news, this means they consume independent news more often when the number of media outlets is higher. It follows that independents have better information about who the better candidate is, enabling them to make better decisions at the ballot box. Competition in the market for political news tends to improve the selection of politicians.

5 Conclusion

We have presented a model of the market for political news in which independent citizens’ demand for news stems from the desire to learn which candidate is preferable in order to make an informed voting decision. Independents are assumed to derive utility from behaving ethically. Ethical behavior is defined as following a rule that maximizes a citizen’s utility if it is also followed by all other independent citizens. The rule comprises not only a cutoff on the voting cost, as in the recent literature on ethical voting, but also a media outlet to consume. We have investigated the implications of the presence of ethical citizens on the reporting strategies of media outlets, relating them to the media’s expertise and the polarization of society. We have shown that competition in the market for news tends to increase media bias but also improves the electoral outcome, in the sense of increasing the probability that
the better candidate is elected. Even though increased competition may well lead to more partisan reporting, it also unambiguously increases the availability of a media outlet with an independent reporting strategy. Since what ultimately matters for the electoral outcome is the news the independents consume, competition in the market for political news has a beneficial effect on democratic elections.
Appendix: Proofs of Lemmata 2-4 and Proposition 1

Lemma 2 (Monopoly). If there is a monopoly in the market for political news, it will do partisan reporting (A) for \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in [0, \max\{1/3, \alpha\}] \cup [\bar{\alpha}, 1] \), and independent reporting (I) otherwise.

Proof. In region 1, if the monopolist chooses I, it will be consumed by independents only. If it chooses A, it will be consumed by both independents and partisans of a. Thus, A is optimal. In region 2, I generates demand from independents, whose expected proportion is \( \alpha \), while A generates demand from partisans of a, whose expected proportion is \( (1 - \alpha)/2 \). Thus, the monopolist chooses I if \( \alpha \geq (1 - \alpha)/2 \Leftrightarrow \alpha \geq 1/3 \), and A otherwise. In region 3, there is no demand for I while A will be demanded by partisans of a. Thus, A is optimal. In regions 4 and 5, I will generate demand from all types of citizens, while A will generate demand from independents and partisans of a (region 4) or partisans of a only (region 5). Thus, the monopolist chooses I. In region 6, I will be demanded by both types of partisans, while A will only be demanded by partisans of a. Thus, I is optimal.

Lemma 3 (Duopoly). If there is a duopoly in the market for political news, the equilibrium reporting strategies will be as follows:

\( (A,B) \) for \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in [0, \max\{1/3, \alpha\}] \cup [\bar{\alpha}, 1/2] \), as well as for \( q > 2S/\Delta H \) and \( \alpha < \bar{\alpha} \);

\( (A,I) \) for \( q \in [2S/H, 2S/\Delta H] \) and \( \alpha \in [\max\{1/3, \alpha\}, \min\{1/2, \bar{\alpha}\}] \); and

\( (I,I) \) otherwise.

Proof. There are four equilibrium candidates to consider: \( (A,A) \), \( (A,B) \), \( (A,I) \), and \( (I,I) \). Candidate \( (A,A) \) can be ruled out immediately for the entire parameter space because either firm can increase its expected payoff by deviating to B, thus having the same chance of getting independents while no longer having to share partisans with the other outlet. In region 3, the only possible equilibrium is \( (A,B) \), as there is no demand for political news from independents and partisans will not consume an independent outlet. In region 6, there is also no demand from independents, but partisans are willing to consume independent outlets. Candidates \( (A,B) \), \( (A,I) \), and \( (I,I) \) are all equilibria, but they are payoff equivalent for media outlets, and citizens’ preferred equilibrium is \( (A,B) \). According to our selection criterion, the equilibrium is thus \( (A,B) \). We now derive the equilibria for region 1, 2, 4, and 5 in turn.

Region 1. Consider first candidate \( (A,B) \). Partisans of a consume outlet 1 and partisans of b consume outlet 2. Independents consume each outlet with probability 1/2. This yields
equilibrium payoffs $(1/2, 1/2)$. Neither outlet can gain from deviating to the opposing partisan reporting strategy. For either outlet, deviating to $I$ yields $\alpha$; thus neither outlet can gain if $\alpha \leq 1/2$. Next consider candidate $(A, I)$. Partisans of $a$ consume outlet 1 and independents consume outlet 2; partisans of $b$ consume soft news. Equilibrium payoffs are $((1-\alpha)/2, \alpha)$.

Note first that for outlet 2, deviating to $B$ always dominates deviating to $A$. By deviating to $B$, outlet 2 secures the demand of partisans of $b$ and, with probability 1/2, the demand of independents, yielding a payoff of 1/2. Outlet 2 cannot gain from deviating to $B$ if $\alpha \geq 1/2$. Outlet 1 can secure the demand of independents with probability 1/2 by deviating to $I$; this is unprofitable if $\alpha/2 \leq (1-\alpha)/2 \Leftrightarrow \alpha \leq 1/2$. Thus, one of the two outlets can always gain by deviating, and this equilibrium candidate can be eliminated. Finally, consider candidate $(I, I)$. Independents consume each outlet with probability 1/2; partisans consume soft news. Equilibrium payoffs are $(\alpha/2, \alpha/2)$. By deviating to partisan reporting, either outlet can secure the demand of one group of partisans; this is unprofitable if $\alpha/2 \geq (1-\alpha)/2 \Leftrightarrow \alpha \geq 1/2$.

We conclude that the equilibrium is $(A, B)$ for $\alpha \leq 1/2$ and $(I, I)$ for $\alpha \geq 1/2$.

**Region 2.** Consider first candidate $(A, B)$. Partisans of $a$ consume outlet 1 and partisans of $b$ consume outlet 2. Independents consume soft news. This yields equilibrium payoffs $((1-\alpha)/2, (1-\alpha)/2)$. Neither outlet can gain from deviating to the opposing partisan reporting strategy. For either outlet, deviating to $I$ yields $\alpha$; thus neither outlet can gain if $\alpha \leq (1-\alpha)/2 \Leftrightarrow \alpha \leq 1/3$. Next consider candidate $(A, I)$. Partisans of $a$ consume outlet 1 and independents consume outlet 2; partisans of $b$ consume soft news. Equilibrium payoffs are $((1-\alpha)/2, \alpha)$. Note first that for outlet 2, deviating to $B$ always dominates deviating to $A$. By deviating to $B$, outlet 2 secures the demand of partisans of $b$, yielding a payoff of $(1-\alpha)/2$. Outlet 2 cannot gain from deviating to $B$ if $\alpha \geq (1-\alpha)/2 \Leftrightarrow \alpha \geq 1/3$. Outlet 1 can secure the demand of independents with probability 1/2 by deviating to $I$; this is unprofitable if $\alpha/2 \leq (1-\alpha)/2 \Leftrightarrow \alpha \leq 1/2$. Finally, consider candidate $(I, I)$. Independents consume each outlet with probability 1/2; partisans consume soft news. Equilibrium payoffs are $(\alpha/2, \alpha/2)$. By deviating to partisan reporting, either outlet can secure the demand of one group of partisans; this is unprofitable if $\alpha/2 \geq (1-\alpha)/2 \Leftrightarrow \alpha \geq 1/2$. We conclude that the equilibrium is $(A, B)$ for $\alpha \leq 1/3$, $A, I$ for $1/3 \leq \alpha \leq 1/2$, and $(I, I)$ for $\alpha \geq 1/2$.

**Region 4.** Consider first candidate $(A, B)$. Partisans of $a$ consume outlet 1 and partisans of $b$ consume outlet 2. Independents consume each outlet with probability 1/2. This yields equilibrium payoffs $(1/2, 1/2)$. Neither outlet can gain from deviating to the opposing partisan reporting strategy. For either outlet, deviating to $I$ yields $\alpha + (1-\alpha)/2 > 1/2$; thus an outlet always gains from deviating, and this candidate is eliminated. Next consider candidate $(A, I)$. Partisans of $a$ consume outlet 1; independents and partisans of $b$ consume outlet 2. Equilibrium payoffs are $((1-\alpha)/2, \alpha + (1-\alpha)/2)$. Outlet 1 can keep half the partisans and on
top of that it can secure the demand of independents with probability 1/2 by deviating to I. This is always profitable, so this candidate is eliminated as well. Finally, consider candidate (I, I). Independents and partisans consume each outlet with probability 1/2. Equilibrium payoffs are (1/2, 1/2). By deviating to partisan reporting, either outlet can secure the demand of one group of partisans but loses the demand of independents; this can never be profitable because 1/2 > (1 − α)/2. We conclude that the equilibrium is (I, I).

Region 5. The analysis for region 4 implies that I, I is also an equilibrium in region 5, where deviations to partisan reporting are even less attractive because independents do not consume partisan news, while at the same time deviations to independent reporting are at least as attractive as in region 5.

Lemma 4 (Triopoly). If there is a triopoly in the market for political news, the equilibrium reporting strategies will be as follows:

(A, A, B) for α < α;

(A, I, B) for q ∈ [2S/H, 2S/ΔH] and α ∈ [α, 1/2] as well as for q > 2S/ΔH and α ∈ [α, 1/3];

(A, I, I) for q ∈ [2S/H, 2S/ΔH] and α ∈ [1/2, 3/5]

(I, I, I) otherwise.

Proof. There are six equilibrium candidates to consider: (A, A, A), (A, A, I), (A, A, B), (A, I, B), (A, I, I), and (I, I, I). Candidate (A, A, A) can be ruled out immediately for the entire parameter space because any outlet can increase its expected payoff by deviating to B, thus having the same chance of getting independents while no longer having to share partisans with the other outlets; a similar argument applies to candidate (A, A, I). In regions 3 and 6, the only possible equilibrium is (A, A, B). There is no demand for political news from independents in either region. In region 3, partisans will not consume independent outlets. In region 6, although partisans are willing to consume independent outlets if their own partisan outlet is not available, (A, I, B) is not an equilibrium because outlet 2 does not get any demand and could ensure itself a 50% chance of getting the demand of one group of partisans by deviating to either A or B; (A, I, I) is not an equilibrium because outlets 2 and 3 can improve on their equilibrium payoff of (1 − α)/4 by deviating to B, yielding (1 − α)/2; and (I, I, I) is not an equilibrium because the outlets’ equilibrium payoff (1 − α)/3 is lower than the payoff of deviating to partisan reporting, given by (1 − α)/2. Conversely, there is no incentive to deviate from (A, A, B) for any of the three outlets: outlets 1 and 2 cannot increase their payoff by deviating to B, and outlet 3 loses by deviating to A. We now derive the equilibria for regions 1, 2, 4, and 5 in turn.
Region 1. Consider first candidate \((\mathcal{A}, \mathcal{A}, \mathcal{B})\). Partisans of \(a\) consume either outlet 1 or 2, each with probability 1/2, and partisans of \(b\) consume outlet 3. Independents consume each outlet with probability 1/3. This yields equilibrium payoffs \(((1 - \alpha)/4 + \alpha/3, (1 - \alpha)/4 + \alpha/3, (1 - \alpha)/2 + \alpha/3)\). No outlet can gain from deviating to the opposing partisan reporting strategy. For any outlet, deviating to \(\mathcal{I}\) yields \(\alpha\); this is most attractive for outlets 1 and 2. Neither of them can gain if \(\alpha \leq (1 - \alpha)/4 + \alpha/3 \Leftrightarrow \alpha \leq 3/11\). But since under Assumption 3, \(\hat{\alpha} > 3/11\), this is impossible, so \((\mathcal{A}, \mathcal{A}, \mathcal{B})\) can be eliminated. Now consider candidate \((\mathcal{A}, \mathcal{I}, \mathcal{B})\). Partisans of \(a\) consume outlet 1, partisans of \(b\) consume outlet 3, and independents consume outlet 2. Equilibrium payoffs are \(((1 - \alpha)/2, \alpha, (1 - \alpha)/2)\). Outlet 1 (outlet 3) cannot gain from deviating to \(\mathcal{B}\) (\(\mathcal{A}\)). Outlets 1 and 3 can secure the demand of independents with probability 1/2 by deviating to \(\mathcal{I}\); this is unprofitable if \(\alpha/2 \leq (1 - \alpha)/2 \Leftrightarrow \alpha \leq 1/2\). Outlet 2 cannot gain from deviating to partisan reporting, in which case it would get half of one partisan group and one third of independents in expectation, if \(\alpha \geq (1 - \alpha)/4 + \alpha/3 \Leftrightarrow \alpha \geq 3/11\), which is always satisfied under Assumption 3. Next consider candidate \((\mathcal{A}, \mathcal{I}, \mathcal{I})\). Partisans of \(a\) consume outlet 1 and independents consume outlets 2 and 3 each with probability 1/2; partisans of \(b\) consume soft news. The equilibrium payoffs are \(((1 - \alpha)/2, \alpha/2, \alpha/2)\). Outlet 1 cannot gain from deviating to \(\mathcal{B}\). Outlet 1 cannot gain from deviating to \(\mathcal{I}\), giving it a third of the demand of independents in expectation, if \((1 - \alpha)/2 \geq \alpha/3 \Leftrightarrow \alpha \leq 3/5\). Outlets 2 and 3 cannot gain from deviating to \(\mathcal{B}\), giving them the demand of partisans of \(b\), if \(\alpha/2 \geq (1 - \alpha)/2 \Leftrightarrow \alpha \geq 1/2\) (implying that they cannot gain from deviating to \(\mathcal{A}\) either). Finally, consider candidate \((\mathcal{I}, \mathcal{I}, \mathcal{I})\). Independents consume each outlet with probability 1/3; partisans consume soft news. Equilibrium payoffs are \((\alpha/3, \alpha/3, \alpha/3)\). By deviating to partisan reporting, any outlet can secure the demand of one group of partisans; this is unprofitable if \(\alpha/3 \geq (1 - \alpha)/2 \Leftrightarrow \alpha \geq 3/5\). We conclude that the equilibrium is \((\mathcal{A}, \mathcal{I}, \mathcal{B})\) for \(\alpha \leq 1/2\), \((\mathcal{A}, \mathcal{I}, \mathcal{I})\) for \(1/2 \leq \alpha \leq 3/5\), and \((\mathcal{I}, \mathcal{I}, \mathcal{I})\) for \(\alpha \geq 3/5\).

Region 2. Consider first candidate \((\mathcal{A}, \mathcal{A}, \mathcal{B})\). Partisans of \(a\) consume either outlet 1 or 2 and partisans of \(b\) consume outlet 3. Independents consume soft news. This yields equilibrium payoffs \(((1 - \alpha)/4, (1 - \alpha)/4, (1 - \alpha)/2)\). No outlet can gain from deviating to the opposing partisan reporting strategy. For any outlet, deviating to \(\mathcal{I}\) gives it the demand of independents; thus neither outlet can gain if \(\alpha \leq (1 - \alpha)/4 \Leftrightarrow \alpha \leq 1/5\). Since \(1/5 < 3/11\), this cannot happen under Assumption 3. Now consider candidate \((\mathcal{A}, \mathcal{I}, \mathcal{B})\). Partisans of \(a\) consume outlet 1, partisans of \(b\) consume outlet 3, and independents consume outlet 2. Equilibrium payoffs are \(((1 - \alpha)/2, \alpha, (1 - \alpha)/2)\). Outlets 1 and 3 cannot gain from deviating to the opposing partisan reporting strategy. By deviating to \(\mathcal{I}\), outlets 1 and 3 can secure half of the demand of independents in expectation; this is unprofitable if \(\alpha/2 \leq (1 - \alpha)/2 \Leftrightarrow \alpha \leq 1/2\). Outlet 2 cannot gain from deviating to partisan reporting,
giving it half the demand of one partisan group, if \( \alpha \geq (1-\alpha)/4 \Leftrightarrow \alpha \geq 1/5 \). This is always true under Assumption 3. Next consider candidate \((A, I, I)\). Partisans of \( a \) consume outlet 1 and independents consume outlets 2 and 3 each with probability 1/2; partisans of \( b \) consume soft news. Equilibrium payoffs are \(((1-\alpha)/2, \alpha/2, \alpha/2)\). Outlet 1 cannot gain by deviating to \( B \). Outlet 1 cannot gain from deviating to \( I \), giving it a third of independents in expectation, if \( \alpha/3 \leq (1-\alpha)/2 \Leftrightarrow \alpha \leq 3/5 \). Outlets 2 and 3 cannot gain from deviating to \( B \), which secures the demand of partisans of \( b \), if \( \alpha/2 \geq (1-\alpha)/2 \Leftrightarrow \alpha \geq 1/2 \) (implying that they cannot gain from deviating to \( A \) either). Finally, consider candidate \((I, I, I)\). Independents consume each outlet with probability 1/3; partisans consume soft news. Equilibrium payoffs are \((\alpha/3, \alpha/3, \alpha/3)\). By deviating to partisan reporting, any outlet can secure the demand of one group of partisans; this is unprofitable if \( \alpha/3 \geq (1-\alpha)/2 \Leftrightarrow \alpha \geq 3/5 \). We conclude that the equilibrium is \((A, I, B)\) for \( \alpha \leq 1/2 \), \((A, I, I)\) for \( 1/2 \leq \alpha \leq 3/5 \), and \((I, I, I)\) for \( \alpha \geq 3/5 \).

**Region 4.** Consider first candidate \((A, A, B)\). Partisans of \( a \) consume outlets 1 and 2 each with probability 1/2 and partisans of \( b \) consume outlet 3. Independents consume each outlet with probability 1/3. This yields equilibrium payoffs \(((1-\alpha)/4 + \alpha/3, (1-\alpha)/4 + \alpha/3, (1-\alpha)/2 + \alpha/3)\). No outlet can gain from deviating to the opposing partisan reporting strategy. For any outlet, deviating to \( I \) secures the demand of independents; this deviation is unprofitable for outlets 1 and 2 (and a fortiori for outlet 3) if \( \alpha \leq (1-\alpha)/4 + \alpha/3 \Leftrightarrow \alpha \leq 3/11 \). This is impossible under Assumption 3, so this candidate is eliminated. Now consider candidate \((A, I, B)\). Partisans of \( a \) consume outlet 1, partisans of \( b \) consume outlet 3, and independents consume outlet 2. Equilibrium payoffs are \(((1-\alpha)/2, \alpha, (1-\alpha)/2)\). Outlet 1 (outlet 3) cannot gain from deviating to \( B (A) \). By deviating to \( I \), outlets 1 and 3 can secure the demand of independents with probability 1/2 while keeping the demand of their group of partisans with probability 1/2; this is unprofitable if \( \alpha/2 + (1-\alpha)/4 \leq (1-\alpha)/2 \Leftrightarrow \alpha \leq 1/3 \). Outlet 2 cannot gain from deviating to partisan reporting, in which case it would get half of one partisan group and one third of independents in expectation, if \( \alpha \geq (1-\alpha)/4 + \alpha/3 \Leftrightarrow \alpha \geq 3/11 \), which is always satisfied under Assumption 3. Next consider candidate \((A, I, I)\). Partisans of \( a \) consume outlet 1; independents and partisans of \( b \) consume outlets 2 and 3 each with probability 1/2. The equilibrium payoffs are \(((1-\alpha)/2, \alpha/2 + (1-\alpha)/4, \alpha/2 + (1-\alpha)/4)\). Outlet 1 cannot gain from deviating to \( B \). Outlet 1 cannot gain from deviating to \( I \), giving it a third of the demand of all citizens in expectation, if \( (1-\alpha)/2 \geq 1/3 \Leftrightarrow \alpha \leq 1/3 \). Outlets 2 and 3 cannot gain from deviating to \( B \), giving them the demand of partisans of \( b \), if \( \alpha/2 + (1-\alpha)/4 \geq (1-\alpha)/2 \Leftrightarrow \alpha \geq 1/3 \) (implying that they cannot gain from deviating to \( A \) either). Thus, at least one of the outlets can always gain by deviating, and this equilibrium candidate can be eliminated. Finally, consider candidate \((I, I, I)\). All citizens consume each
outlet with probability 1/3. Equilibrium payoffs are (1/3, 1/3, 1/3). By deviating to partisan reporting, any outlet can secure the demand of one group of partisans; this is unprofitable if 1/3 ≥ (1 − α)/2 ⇔ α ≥ 1/3. We conclude that the equilibrium is (\(A, I, B\)) for α ≤ 1/3 and (\(I, I, I\)) for α ≥ 1/3.

Region 5. Consider first candidate (\(A, A, B\)). Partisans of \(a\) consume outlets 1 and 2 each with probability 1/2 and partisans of \(b\) consume outlet 3. Independents consume soft news. This yields equilibrium payoffs ((1 − α)/4, (1 − α)/4, (1 − α)/2). No outlet can gain from deviating to the opposing partisan reporting strategy. For any outlet, deviating to \(I\) secures the demand of independents; this deviation is unprofitable for outlets 1 and 2 (and a fortiori for outlet 3) if α ≤ (1 − α)/4 ⇔ α ≤ 1/5. This is impossible under Assumption 3, so this candidate is eliminated. Now consider candidate (\(A, I, B\)). Partisans of \(a\) consume outlet 1, partisans of \(b\) consume outlet 3, and independents consume outlet 2. Equilibrium payoffs are ((1 − α)/2, α, (1 − α)/2). Outlet 1 (outlet 3) cannot gain from deviating to \(B\) (\(A\)). By deviating to \(I\), outlets 1 and 3 can secure the demand of independents with probability 1/2 while keeping the demand of their group of partisans with probability 1/2; this is unprofitable if α/2 + (1 − α)/4 ≤ (1 − α)/2 ⇔ α ≤ 1/3. Outlet 2 cannot gain from deviating to partisan reporting, in which case it would get half of one partisan group in expectation but lose the independents, if α ≥ (1 − α)/4 ⇔ α ≥ 1/5, which is always satisfied under Assumption 3. Next consider candidate (\(A, I, I\)). Partisans of \(a\) consume outlet 1; independents and partisans of \(b\) consume outlets 2 and 3 each with probability 1/2. The equilibrium payoffs are (((1 − α)/2, α/2 + (1 − α)/4, α/2 + (1 − α)/4). Outlet 1 cannot gain from deviating to \(B\). Outlet 1 cannot gain from deviating to \(I\), giving it a third of the demand of all citizens in expectation, if (1 − α)/2 ≥ 1/3 ⇔ α ≤ 1/3. Outlets 2 and 3 cannot gain from deviating to \(B\), giving them the demand of partisans of \(b\), if α/2 + (1 − α)/4 ≥ (1 − α)/2 ⇔ α ≥ 1/3 (implying that they cannot gain from deviating to \(A\) either). Thus, at least one of the outlets can always gain by deviating, and this equilibrium candidate can be eliminated. Finally, consider candidate (\(I, I, I\)). All citizens consume each outlet with probability 1/3. Equilibrium payoffs are (1/3, 1/3, 1/3). By deviating to partisan reporting, any outlet can secure the demand of one group of partisans; this is unprofitable if 1/3 ≥ (1 − α)/2 ⇔ α ≥ 1/3. We conclude that the equilibrium is (\(A, I, B\)) for α ≤ 1/3 and (\(I, I, I\)) for α ≥ 1/3.

Proposition 1 (Impact of expertise and polarization). For any given market structure, a sufficiently large increase in \(q\) always leads to an increase in the supply of independent news and in a reduction of the consumption of partisan news. Under triopoly, an increase in \(\alpha\) always leads to an increase in the number of independent outlets. Under monopoly and duopoly, the number of independent outlets increases with \(\alpha\) only for \(q\) sufficiently large;
otherwise the effect is ambiguous.

Proof. The proposition regroups the following statements, which can be treated separately:

(i) For \( M = 1 \), a sufficiently large increase in \( q \) implies an increase in the supply of independent news and a decrease in the consumption of partisan news.

(ii) For \( M = 2 \), a sufficiently large increase in \( q \) implies an increase in the supply of independent news and a decrease in the consumption of partisan news.

(iii) For \( M = 3 \), a sufficiently large increase in \( q \) implies an increase in the supply of independent news and a decrease in the consumption of partisan news.

(iv) For \( M = 1 \), an increase in \( \alpha \) leads to an increase in the number of independent outlets if \( q \) is sufficiently large, the effect is ambiguous otherwise.

(v) For \( M = 2 \), an increase in \( \alpha \) leads to an increase in the number of independent outlets if \( q \) is sufficiently large, the effect is ambiguous otherwise.

(vi) For \( M = 3 \), an increase in \( \alpha \) leads to an increase in the number of independent outlets.

Element (i). Under monopoly, the outlet’s optimal strategy for \( q \in [2S/H, 2S/\Delta H] \) is either \( A \) or \( I \), while for \( q \geq 2S/\Delta H \) it is \( I \). This implies that the supply of independent news is necessarily weakly increasing for any change in \( q \) implying moving from \( q \in [2S/H, 2S/\Delta H] \) to \( q \geq 2S/\Delta H \). The consumption of partisan news is weakly decreasing: a partisan outlet is consumed for some values of \( \alpha \) and \( q < 2S/\Delta H \), while for \( q \geq 2S/\Delta H \) there is no provision of partisan news.

For changes within the interval \( q \in [2S/H, 2S/\Delta H] \), some changes in the supply of news may occur when crossing the \( \alpha \) or the \( \bar{\alpha} \) line. In the first case, the change in \( q \) is effective for \( \alpha > 1/3 \), passing from \( A \) to \( I \). This implies replacing the consumption of an independent outlet for a partisan one. The opposite is true for changes implying the crossing of the line \( \bar{\alpha} \), in which case we observe that locally the consumption of partisan news increases.

Element (ii). Under duopoly, for any \( \alpha < \alpha(q = 2S/\Delta H) \) or \( \alpha \geq 1/2 \), a change in \( q \) is ineffective.

For \( \alpha \in [\alpha(q = 2S/\Delta H), 1/2] \), when the change implies passing from \( q \in [2S/H, 2S/\Delta H] \) to \( q \geq 2S/\Delta H \) we observe a change from either \((A, B)\) or \((A, I)\) to \((I, I)\), therefore the supply and the consumption of independent news weakly increase, while the one of partisan news passes from strictly positive to 0.

Concerning local changes within \( q \in [2S/H, 2S/\Delta H] \), crossing the \( \alpha \) line implies i) no changes for \( \alpha < 1/3 \) or otherwise ii) replacing a partisan outlet with an independent one,
therefore increasing the consumption of independent news and reducing the one of partisan news. Instead, a small change in \( q \) inducing a crossing of the \( \bar{\alpha} \) line implies an opposite change (replacing the independent outlet with a partisan one). Therefore, locally, there may be a reduction in the consumption and supply of independent news.

**Element (iii).** It is easy to see that an increase in \( q \) for \( M = 3 \) is always either ineffective or inducing an increase in both the supply and consumption of independent news, and a (weak) decrease in the consumption of partisan news. In particular, for \( \alpha > 3/5 \), changes in \( q \) are ineffective, while for \( \alpha \in [1/2, 3/5] \) we move from \((A, I, I)\) to \((I, I, I)\), therefore the consumption of independent news remains constant and the one of partisan news weakly decreases.

For values of \( \alpha \) below \( 1/2 \), an increase in \( q \) (if it induces a change in the equilibrium) it will imply moving either from equilibrium \((A, A, B)\) to \((A, I, B)\), thus increasing the consumption of independent news, with no effect on the consumption of partisan news, or from \((A, I, B)\) to \((I, I, I)\), therefore implying an increase in the consumption of independent news and a reduction in the supply and consumption of partisan news.

**Element (iv).** For the case of monopoly, a change in \( \alpha \) is ineffective for \( q > 2S/\Delta H \). For \( q < 2S/\Delta H \), instead, it implies moving from \((A)\) to \((I)\) for \( \alpha \) < \( \bar{\alpha} \), and from \((I)\) to \((A)\) when crossing the line \( \alpha = \bar{\alpha} \).

**Element (v).** For the case of monopoly, a change in \( \alpha \) \( q > 2S/\Delta H \) implies moving from equilibrium \((A, B)\) to \((A, I)\), thus increasing the number of independent outlets and its consumption. For \( q < 2S/\Delta H \), the number of independent outlets may decrease if the increase in \( \alpha \) implies crossing the \( \bar{\alpha} \) line, with \( \alpha \in [1/3, 1/2] \). In all the remaining cases, an increase in \( \alpha \) implies moving from \((A, B)\) to \((A, I)\) or from \((A, I)\) to \((I, I)\), therefore we observe that both supply and consumption of \( I \) are weakly increasing, and supply and consumption of partisan outlets is weakly decreasing.

**Element (vi).** Depending on the value of \( q \), an increase in \( \alpha \) implies a) passing from \((A, A, B)\) to \((A, I, B)\) to \((A, I, I)\), to \((I, I, I)\), or b) passing from \((A, A, B)\) to \((A, I, B)\) to \((I, I, I)\). Therefore, we observe that both supply and consumption of \( I \) are weakly increasing, and supply and consumption of partisan outlets is weakly decreasing.
References


