Inequality and media capture

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Abstract

Popular support of redistributive policies depends on information they have about the tax system and efficiency of public projects. Mass media provides a convenient means for manipulating public opinion, even when voters understand that the media can be biased. I develop a theory of media capture in which the rich can influence information published in a media outlet at a cost. The model shows that higher inequality is associated with lower media freedom; this effect is stronger in democratic regimes. I find empirical support for the model in both panel data and cross-country analysis.
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1. Introduction

> "Democracy is, above all, the process of forming opinion"
> Hayek "Constitution of liberty" 1960

Popular support of a particular policy often depends on the information people have about this policy and the way it is presented. Mass media is the major source of this information for the general public. This paper links inequality and media objectivity by pointing out that, under imperfect information, it can be profitable for the rich to use the power of the media. Classical theoretical approaches, such as the Meltzer–Richard model and the Mirrlees concept of social insurance, imply a positive relationship between inequality and redistribution (Meltzer and Richard, 1981; Diamond and Mirrlees, 1978). Empirically, however, higher inequality is

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associated with a lower level of taxation and redistribution (Perotti, 1996; Alesina and Glaeser, 2004). This paper adds one more explanation of this phenomenon,[1] which emphasizes the influence of mass media on the beliefs and the preferences of ordinary people. Unequal societies may have a low level of redistribution because the median voter may misperceive her self-interest as a result of an information campaign by the rich.[2] Higher inequality in the economy implies more incentive for the rich to manipulate the preferences of voters and to use the power of the media to advocate a lower level of taxation. The influence of the rich on the media is one reason why income inequality leads to political inequality, and why policy outcomes are more responsive to the preferences of the rich than to those of the poor.[3]

In this paper, I develop a model of media capture in which the rich can spend money on influencing a media outlet. Forms of this influence include buying media firms, paying for political advertising, bribing etc. There are two groups of voters: those with high-income and those with low-income. There is public good production financed by a proportional income tax. The tax rate in the economy is determined by the median voter. The productivity of public good provision is ex-ante unknown, but the poor can get this information from the media outlet. As a result, the rich have the incentive to pay the media to affect voters' beliefs about this productivity and, consequently, their preferred levels of taxation. Voters are rational Bayesians and understand that the media can be captured, but they do not know it for sure. If the aggregate income in the economy is held constant, higher inequality implies larger gaps between the mean and the median income and between the preferred tax rates of the rich and the poor. An increase in inequality makes media capture more profitable for the rich, and the probability of media capture grows. In general, the main result of the model is that higher inequality in the economy increases the willingness of the rich to spend money on influencing the media.[4]

The logic of the model works better in democratic societies in which policy outcomes are responsive to the position of a median voter. In less democratic regimes, the rich can use other methods to achieve desired policy outcomes. It is only when politicians are accountable to voters that "educating the society" may be an efficient way to affect policy outcomes. The model assumes that a tax rate is not always determined by the median voter and shows that the effect of inequality on media capture is stronger in more democratic regimes. Empirically, I find that higher income inequality in a country is associated with a lower level of media freedom, and that this effect is stronger in democratic countries. The estimated coefficients remain significant after including country fixed effects and a number of controls.

The model in this paper is close to that of Besley and Prat (2006), who develop a theory of media capture, in which the media can report the news about the performance of incumbent

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[1] A number of explanations were offered recently to explain this puzzle, that stress the differences between high-inequality and low-inequality countries in cultural heritage (Alesina and Fuchs-Schündeln, 2006), in the perceptions of a social mobility (Piketty, 1995; Alesina and Glaeser, 2004), in the preferences for fairness (Alesina and Angeletos, 2005a, b; Benabou and Tirole, 2006), in the political power of the rich as a result of unequal campaign contributions (Campante, 2006), in the coercive power of the state (discussed in Boadway and Keen, 2000).

[2] Bartels (2005) finds that the public support for the estate tax repeal in the US can be explained by "unenlightened self-interest". He shows that most people with low and middle incomes have limited information about the tax, and that support for the tax repeal, which is not in their self-interest, is decreasing with the level of information which they have.

[3] Gilens, 2005 shows, using survey data, that the preferences of Americans with high-income have much greater influence on policy outcomes than Americans with low income; Bartels (2006) finds a similar effect for roll-call votes.

[4] A similar result holds if there is uncertainty about the value of deadweight losses from taxation rather than uncertainty in the productivity of public good provision.

politicians. My model is different from theirs in two respects. First, in my model the media affects the policy preferences of voters, and not their knowledge about misbehavior of politicians, and, second, as the rich influence the preferences of voters, the effect on policy outcomes may last longer than when media is captured by particular politicians in order to stay in power. In addition, my model generates testable predictions for the relationship between income inequality, media freedom, and public spending. Corneo (2006), using an approach similar to that of Grossman and Helpman (2001),[5] finds that there is a positive relationship between the ownership concentration for a media outlet and the probability of media capture. My model is different from his in that, first, it analyzes the effect of inequality in the economy rather than the ownership concentration in a particular media firm, and, as a result, the conflict of interests is between the rich and the poor in a society, and not between the general public and the owners of media product.[6] Second, the mechanism which generates the effect of inequality on media is different. In my model, higher inequality exacerbates the conflict of interests because of a larger gap between the mean and the median income, while in Corneo's model higher wealth concentration implies that the major owner controls a larger share of the media firm and internalizes a larger fraction of private benefits from a public bad project.

The structure of the rest of the paper is the following: Section 2 discusses the examples which illustrates the logic of the model, Section 3 contains a literature review, Section 4 presents the theoretical model, Section 5 describes empirical results, and Section 6 concludes.

2. Examples

In the model, the rich spend money to influence the media and, therefore, public opinion. Such spending may take the form of investing in media firms or paying for political advertising. The debate over the estate tax repeal in the US provides a nice example of these mechanisms at work.

Until 2001, the estate (inheritance) tax in the US, a highly progressive tax with a top marginal rate of 55%, was paid only by the richest 1–2% of Americans. In the 1990s wealthy American families started a campaign for abolishing this tax. According to the estimates of Citizens for Tax Justice, since 1998 18 ultra-rich families spent $490.3 million on various lobbying activities aimed to repeal the estate tax, most of which were spent on information campaigns in media rather than on direct campaign contributions.[7]

The groups participating in the information campaign explicitly state the importance of the media for their goal. They promote anti-tax ads, as it was done by www.deathtax.com.[8] Many of these newspapers also use their editorial page to reach out to the public. American Family

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[5] In Grossman and Helpman (2001), special interest groups can reveal part of their information about a particular policy in a cheap talk game in order to affect the policy preferences of a median voter.

[6] Empirical results of Gentzkow and Shapiro (2006b) suggest that at least in the US there is no significant conflict of interest between media owners and media consumers.

[7] Public Citizen (2006) includes the list of 18 wealthy families, their net worth and the amounts of money which they spent on the anti-estate tax campaign. These families together are expected to pay up to an aggregate of $71.6 billion in the estate tax, if it is not abolished. Campaign contributions of these 18 families added to approximately $27.7 million (as compared with total $490.3 million spending). (Data source: Center for Responsive Politics and Public Citizen's analysis of Section 527 data maintained by the Center of Public Integrity.)

[8] www.deathtax.com was founded by Frank A. Blechen, one of the most furious opponents of the estate tax. The net worth of his family is $650 million, and his heirs would have to pay approximately $253 million in estate taxes in post-2010 rates (if the repeal does not become permanent). "Death tax" is a name for the estate tax used by its opponents. Most surveys show that Americans are more likely to support abolishing the "death tax" than the "estate tax".

Business Institute (AFBI) placed TV and radio anti-tax ads in the states which representatives were expected to vote against the repeal.[9]

Media owners can often ensure the loyal behavior of their newspapers. For instance, Frank Blethen, the strong opponent of the estate tax, is the controlling owner of The Seattle Times. The newspaper consistently reflects the preferences of its owner in its articles and editorial pages.[10] In one of its editorials, it explicitly states that the elimination of the federal estate tax is "a cause for which The Seattle Times has campaigned many years", and that the opinion of a candidate with respect to the estate tax can be a basis for the newspaper's endorsements.[11] For most issues other than the estate tax, *The Seattle Times* is rather liberal. It gets almost the same conservativeness score as The New York Times, according to Mondo Times consumer rating (http://www.mondotimes.com), and is rather liberal according to the slant index calculated by Gentzkow and Shapiro (2006b).

Rich people also spend money extensively on ads against this "death tax". Robert Johnson of Black Entertainment Television[12] is a "staunch Democrat", and estate tax repeal was the only issue for which he supports Republicans.[13] During the estate tax debate, he paid for anti-estate tax ads in the Washington Post, USA Today, and other newspapers. These ads emphasized that the estate tax is especially harmful to minorities and African Americans in particular (yet in 2006 only 59 out of 38 million African Americans are expected to pay this tax).[14] When he was asked about the cost of this campaign, he said "Let's say $200,000".[15]

In 2001 the majority of Congress voted for the temporary estate tax repeal. Moreover, the majority of the population, according to polls, supported this act (40–70% by various polls).[16]

But if this tax was applicable only to the tiny richest fraction of the population, the question is how its repeal became so popular among ordinary Americans, whose preferences are typically determined by individual self-interest. Graetz and Shapiro (2005) call the public support for this act a "mystery about persuasion and politics". Bartels (2005) explains this pattern by common misperceptions. According to surveys, half of Americans believe that most families have to pay federal estate tax when someone dies. One third of respondents are sure that they are themselves subject to the estate tax.

This evidence about the estate tax in the US shows that the rich spend money on media in order to influence taxation preferences of ordinary people. Moreover, such efforts affect public opinion and actual policy outcomes, as it is predicted by the theoretical part of the paper.

Since the 1970s, inequality in the US has increased significantly. At the same time, the progressivity of the federal US tax system declined substantially during this period, as shown by Piketty (1995). The estate tax was repealed only in 2001. Graetz and Shapiro (2005) argue that it was not feasible in the 1970s, the 1980s or early 1990s. During this period of growing inequality, the amount of money spent on the campaign for tax cuts steadily increased, and the marginal tax rates declined. This illustrates the logic of the model: higher inequality is expected to increase the willingness to pay of the rich for influence via mass media.

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[9] "Death Tax Targeted For Extinction in American Family Business Institute Media Campaign" American Family Business Institute, April 13, 2006 http://www.nodeathtax.org/PRESSRELEASES/pr_0060413.htm.
[10] E.g. "Hope for death–tax repeal", July 11, 2000, or "Death Tax Squeezes smaller companies", May 17, 2005.
[11] "Mike McGavick for U.S. Senate", endorsement page, October 22, 2006.
[12] The estimated estate tax for his heirs is $273.4 million. Source: Public Citizen (2006).
[13] "Profile: Robert Johnson, founder of Black Entertainment Television", CNBC: Business Center, May 22, 2001.
[14] "Ultra-Rich Claim Estate Tax is 'Racist,' Only 59 Blacks Will Pay This Year", by Sam Davis, Think Progress, 2006. http://thinkprogress.org/2006/06/08/estate-tax-bob-johnson/.
[15] Graetz and Shapiro (2005), p.174.
[16] Graetz and Shapiro (2005), Bartels (2005), Hacker and Pierson (2005).

The model also predicts that the rich have less incentive to influence taxation preferences of the general public in less democratic regimes, as in such regimes they can rely on other channels of influence. This statement can be illustrated by the repeal of the inheritance tax in Russia. Russian inheritance tax was permanently abolished in 2005 after President Vladimir Putin proposed this act in his Annual Address to the Federal Assembly. Even before the final voting for this act, most articles in the press discussed the repeal as an already accomplished task which "Putin gave to the government".[17] There was no discussion of the consequences of this repeal in the national newspapers except those that quoted in the President's Address.[18]

3. Literature

Media capture is one possible form of institutional subversion used by the rich to grasp benefits in the struggle for resources in an economy. This paper is thus related to broader literature on the subversion of democracy, which started with Stigler (1971) and Peltzman (1976). In a democracy, the rich can disproportionately affect politics in a variety of ways: through lobbying and campaign contributions (Baron, 1994; Grossman and Helpman, 2001), subversion of the judiciary system (Glaeser et al., 2003; Sonin, 2003), threats (Dal Bo and Di Tella, 2003), and corruption (You and Khagram, 2005). A detailed account of how the media was used to undermine democratic accountability in Peru is presented in Mcmillan and Zoido (2004).

My approach is based on the assumption that people's support of a certain redistributive policy depends on the nature and availability of information about the costs of taxation and the efficiency of public projects. People are likely to be unaware of the relative efficiency and exact costs of different public projects (Coate and Morris, 1995; Alesina et al., 2000). Bartels (2005) shows the impact of political information on people's preferences for redistribution: more informed respondents were less likely to support tax cuts for the rich. Baron and McCaffery (2006) argue that the perception of a tax system depends on the "way it is framed, or presented." Alesina and Glaeser (2004) emphasize the effect of indoctrination in shaping voters' preferences for redistribution. As they put it, "indoctrination appears to trump reality in forming beliefs about social mobility", which, in turn, affects the preferences for taxation and redistribution.

A lack of accurate information by voters is an especially important issue in democracies where all citizens make voting decisions which affect their future well-being.[19] The majority of the population receives most of its information about costs of taxation and public projects from mass media. This is the type of information that can hardly be obtained by other means, such as direct experience (some researchers, though, focus on the effect of individual learning, e.g. learning from "dynastic" experience, analyzed in Piketty, 1995). Gilens (1999) shows that, most Americans support an increase in spending on most social programs (such as Medicare, Medicaid, income tax credits etc.), but at the same time they strongly dislike the idea of spending more on "welfare" programs. He argues that this is the case because of the negative images surrounding welfare and its recipients created by mass media.

Mass media also serves as a natural constraint on the behavior of elected politicians which helps representative democracy to work. As Hamilton (2004) put it, "if too many voters lack information

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[17] "Polnoe bezvozmezdie", Vremya novostei, May 12, 2005.

[18] Content analysis of articles in more than 100 Russian national and local newspapers, 2005 (source: ISI Emerging Markets media archive www.securities.com) revealed only three articles discussing possible benefits and drawbacks of the tax; two of them were interviews.

[19] Voters' ignorance (and consequent uninformed voting choices) is a growing concern in contemporary public policy debates (Hamilton, 2004, Patterson, 2002).

on too many topics... politicians can enjoy too much freedom to pursue policies which their constituents would reject if they were actual decision makers." Gentzkow et al. (2004) show that at the end of the XIXth century, after most newspapers in the US had become independent from political parties, there was a significant increase in the informativeness of the press. Media content may also be affected by the patterns of media ownership. As demonstrated in Djankov et al. (2003), countries with a higher share of state-owned media have less media freedom.

The influence of mass media also depends on its coverage and the availability of alternative sources of information. Media coverage can affect policy outcomes. Stromberg (2001, 2004) provides empirical evidence that in the U.S. in the 1930s radio diffusion in a county was positively correlated with the level of public expenditures in the region. Besley and Burgess (2002) found that in India the newspaper circulation in the state is an important factor which influences government's responsiveness to the food shortages and the damages from floods. Reinikka and Svensson (2005) show that in Uganda the amount of public spending on education was higher in those schools for which their funding arrangements were covered by local newspapers.

4. Theory

The theoretical model is a modified Meltzer–Richard model, in which the utility of a voter depends on her post-tax income and the amount of public goods. There is uncertainty over the costs of public projects and a possible mechanism for information revelation: a media outlet. The actors in the model are rich and poor voters, and a media outlet.

Voters observe the report in the media, update their prior about the costs of public projects, and vote for a tax rate. If there is a positive probability that the median voter is ex-ante uninformed (and has to rely on the media outlet as the only source of information), then the rich have the incentive to offer money to the media outlet, even when voters are rational Bayesians. In the model below, I explore under which circumstances media capture becomes profitable for the rich.

4.1. Setup

There is a continuum of individual voters in the economy (the size of the population is normalized to 1). The fraction $\alpha < \frac{1}{2}$ of the population has high pre-tax income, W_H, and the other fraction, of the size $1 - \alpha$, receives low-income, $W_L < W_H$. The utility function of an individual is $U = W(1 - t) + \sqrt{G}$, where G is the amount of public good, and t is the tax rate. Agents maximize their expected utility under imperfect information. The aggregate income in the economy is

$$Y = \alpha W_H + (1 - \alpha)W_L. \tag{1}$$

The production function of the public good is linear, $G(x) = bx$, where b is an initially unknown parameter, and x is a monetary input. There are two states of the world; in one of them $b = b_L$, and in the other $b = b_H$, where $b_L < b_H$. The ex-ante probability of the state of the world $b = b_L$ equals γ. The tax rate is determined by the median voter.[20] All tax revenues are spent on the public good provision, so that $G = btY$.

The state of the world (b) is observed by those with high-income, but not by those with low-income. There is one media outlet, e.g. the newspaper, in the economy,[21] which also perfectly observes the state of the world and reports the news about it. This report can be either truthful or

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[20] This can be modeled by either direct democracy or representative democracy with two-party Downsian competition.
[21] The extension of the model with N media outlets is analyzed in the working paper version of the model.

false.[22] A falsification is costly for the newspaper, either because of the direct costs, or the fear of losing its reputation and the audience in the long run (Gentzkow and Shapiro, 2006a), or simply because of the disutility of lying for journalists and the editor-in-chief. These costs are equal to $C+\varepsilon$, where ε is a random variable with a commonly known uniform distribution $F(\cdot)$ with the support $\left[-\frac{1}{2\phi},\frac{1}{2\phi}\right]$. The rich can offer a bribe to the newspaper.[23] I assume that the members of the high-income group divide expenditures on this bribe equally. The newspaper can either accept or reject the bribe. Its payoff is $B-C-\varepsilon$ if it accepts the bribe, and 0 otherwise. There is also an alternative source of information which cannot be bribed (e.g. the Internet), but only a fraction δ of low-income voters have access to this alternative source.

The voters are rational Bayesians in the sense that they can correctly predict the probability of media capture and update their priors about the state of the world based on this information. Also I make two important assumptions about low-income voters.

1. There is uncertainty in the distribution of voters who actually participate in elections, which arises because of either a stochastic voter turnout or uncertainty in the preferences of voters (see Roemer, 1998). In particular, I assume that the probability that a median voter is informed grows as the fraction of the informed population increases. Technically, the probability that the median voter has access to the alternative source of information is a monotonically increasing function $q(\delta)$ (here δ is the fraction of the population with access to this alternative source). In addition, the fraction of low-income voters is large enough to ensure that the median voter always has low-income.
2. The ideal tax rate of the poor in the state of the world b_L is higher than the ideal tax rate of the rich in the state of the world b_H. Formally, this implies that[24]

$$\frac{b_L}{b_H} > \frac{W_L^2}{W_H^2}. \tag{2}$$

4.2. Timing

The timing of events is as follows.

1. Nature determines the state of the world $b \in \{b_L, b_H\}$ and newspaper's costs of falsification $C+\varepsilon$.
2. High-income voters observe the state of the world b and the costs of falsification. Then they decide whether to offer a bribe to the newspaper. The alternative source of information reports the true value of b.
3. The newspaper accepts or rejects the bribe and reports news $s \in \{s_H, s_L\}$ about b. (Here s_i denotes the report "$b=b_i$").

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[22] Alternatively, we can assume that the newspaper does not report news about $b=b_L$ ("normal times"), but normally reports news about $b=b_H$ (in a way similar to Mullainathan and Shleifer, 2005). It can choose not to report the news in the latter case.
[23] As mentioned before, bribing is just one of the methods which the rich might use to influence the media. Modeling this influence as bribing is chosen for the simplicity of the model and in line with the approach of Besley and Prat (in press). Other methods of influence include investing in media firms, spending money on political advertising, paid publications, etc.
[24] The ideal tax rate of the poor in $b=b_L$ is $\frac{b_L Y}{4W_L^2}$, and the ideal tax rate of the rich in $b=b_H$ is $\frac{b_H Y}{4W_H^2}$. The former is higher than the latter if $\frac{b_L}{W_L^2} > \frac{b_H}{W_H^2}$ or if $\frac{b_L}{b_H} > \frac{W_L^2}{W_H^2}$. This assumption is always fulfilled if the society is not too egalitarian or if the volatility of productivity shocks is not too high. Otherwise, if the rich manage to convince a certain fraction of the poor that the state of the world is b_L, there may be a good chance that a median voter is from the high-income group. I do not consider this case in the paper.

4. Low-income voters update their priors using information from the newspaper and knowing the probability of media capture. In addition, fraction δ of low-income voters receive information about b from the Internet. The median voter determines the tax rate in the economy. All agents receive their payoffs.

4.3. Analysis

The game described above can be solved by backward induction. At stage 4, unless a voter does have access to the alternative source of information, her posterior depends on the information written in the newspaper. Low-income voters observe report s in the newspaper and then choose their preferred tax rate $t_L^*(s)$. They know that the rich have no incentive to bribe the media if the state of the world is b_L. If $s=s_H$, low-income voters solve the following problem max $W_H(1-t) + \sqrt{b_H tY}$ (if the report is s_H, they know for sure that the true state of the world is $b=b_H$). The preferred tax rate of the poor if they observe $s=s_H$ is, therefore,

$$t_L^*(s_H) = \frac{b_H Y}{4W_L^2}. \tag{3}$$

If the report in the media is $s=s_L$, there is a probability that the media is captured by the rich. Let's denote p the probability that the media is captured conditional on the report $s=s_L$.[25] If a voter observes $s=s_L$, this implies that either, with the probability p, the media is captured and $b=b_H$, or, with the probability $1-p$, $b=b_L$ is the true state of the world. The preferred tax rate of the poor is determined from the maximization of expected utility $\max_t (1-p)U(W_L, t, b_L) + pU(W_L, t, b_L)$. Here $U(W_L, t, b_L)$ is the utility of a person with the income W_L, if the tax is t and the state of the world is $b=b_L$. The problem of a low-income voter who reads the newspaper can, therefore, be rewritten as

$$\max_t (1-p)\left[W_L(1-t) + \sqrt{b_L tY}\right] + p\left[W_L(1+t) + \sqrt{b_H tY}\right]. \tag{4}$$

The first order condition for this problem is

$$-(1-p)W_L + \frac{1-p}{2}\sqrt{\frac{b_L Y}{t}} - pW_L + \frac{p}{2}\sqrt{\frac{b_H Y}{t}} = 0. \tag{5}$$

The solution of the last equation is

$$t_L^*(s_L) = \frac{Y}{4W_L^2}\left[(1-p)\sqrt{b_L} + p\sqrt{b_H}\right]^2. \tag{6}$$

Note that $t_L^*(s_L)$ is a function of p (to be determined later).

If a voter has access to the alternative source of information then her posterior about b coincides with the value reported by the alternative source (which cannot be bribed, and,

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[25] If we denote the probability that media is captured in the state of the world $b=b_H$ as p_1, then $P = \frac{p_1(1-\gamma)}{p_1(1-\gamma)+\gamma}$, here p_1 $(1-\gamma)$ is the ex-ante probability of media capture, and $1-\gamma$ is the probability of the state of the world $b=b_H$.

consequently, has no incentive to lie). The preferred tax rate of this person is $\frac{b_i Y}{4W_L^2}$ which corresponds to the observed state of the world $b=b_i$, $i \in \{L, H\}$.

The election outcome in the last stage of the game is the following. If the media outlet reports $s=s_H$, the chosen tax rate, according to (3), is given by $t_L^*(s_H) = \frac{b_H Y}{4W_L^2}$ (this is the same preferred tax for both the voters with access to the alternative source of information and the voters without such access). Recall that the median voter has the access to the alternative source of information with probability q. As a result, if the media reports $s=s_L$ then the chosen tax rate is $t_L^*(s_H)$, given by (3), with probability q and $t_L^*(s_L)$, determined by (6), with probability $1-q$.

At stage 3, the newspaper decides whether to accept the bribe and make the false report, or reject the bribe and report the truth. It observes the bribe (if it is offered) and agrees to manipulate information if and only if $B \geq C+\varepsilon$, where B is the size of the bribe. If the bribe is not offered or the offer is rejected, then the newspaper reports the true state of the world.

Now consider stage 2, the most important part of the story. The rich have the incentive to manipulate the news only if $b=b_H$. In this state of the world they can either offer a bribe $B \geq C+\varepsilon$ and receive the full support of the newspaper, or not offer this bribe and let the newspaper report the true state of the world. The expected utilities of the rich from these strategies are:

$$(1-q)U(W_H, t_L^*(s_L), b_H) + qU(W_H, t_L^*(s_H), b_H) - \frac{B}{\alpha} \tag{7}$$

and

$$U(W_H, t_L^*(s_H), b_H) \tag{8}$$

respectively. Therefore, it is profitable for high-income voters to offer the bribe if and only if

$$(1-q)[U(W_H, t_L^*(s_L), b_H) - U(W_H, t_L^*(s_H), b_H)] - \frac{B}{\alpha} > 0 \tag{9}$$

or, equivalently, if the bribe is sufficient to persuade the media to misreport, and is not larger than the following threshold:

$$B \backslash \bar{B} = \alpha(1-q)\left[W_H(1 - t_L^*(s_L)) + \sqrt{t_L^*(s_L)b_H Y} - W_H(1 - t_L^*(s_H)) - \sqrt{t_L^*(s_H)b_H Y} \right]. \tag{10}$$

Denote $X(p) = [(1-p)\sqrt{b_L} + p\sqrt{b_H}]^2$. Then the maximum possible bribe which can be offered in the equilibrium is

$$\bar{B} = \alpha(1-q)\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p)[\sqrt{b_H} - \sqrt{b_L}]}{2W_L} \right]. \tag{11}$$

It is profitable for the rich to offer a bribe if and only if $C+\varepsilon \leq \bar{B}$. If $C+\varepsilon \leq \bar{B}$ then in the equilibrium the rich pay exactly $C+\varepsilon$, which is the lowest amount sufficient to persuade the media to misreport. The probability of this event (if the state of the world is b_H) $\mathbf{P}(\varepsilon < \bar{B} - C) = F(\bar{B} - C) = \frac{1}{2} + \phi(\bar{B} - C)$. The anticipated probability of media capture should

coincide with the actual probability of media capture, i.e. $\frac{1}{2} + \phi(\bar{B} - C)$ equals $\frac{p\gamma}{(1-p)(1-\gamma)}$.[26] Therefore, p is determined as a solution of the following equation

$$\frac{p\gamma}{(1-p)(1-\gamma)} = \phi\left(\alpha(1-q)\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p)\left[\sqrt{b_H} - \sqrt{b_L}\right]}{2W_L}\right] - C\right) + \frac{1}{2}. \quad (12)$$

This equation determines the equilibrium probability of media capture p as a function of other parameters of the model. It takes into account that low-income voters know this probability, update their priors about b based on p, and vote accordingly. This equation has only one solution such that $p \in [0, 1)$, as in this range of p the right-hand side of (12) is decreasing (see the Proof of proposition 1), and left-hand side of (12) is increasing.

4.4. Comparative statics

The next step is to see what happens to p, the equilibrium probability of media capture, determined by (12), if the parameters of the model change. The next proposition establishes the link between inequality and media capture, which is the main theoretical result in the paper:

Proposition 1. *If the inequality $\frac{W_H}{W_L}$ increases, and the aggregate income Y remains constant, then the probability of media capture p increases.*

Proof. In Appendix. □

The intuition behind this result is straightforward: higher inequality makes media capture more attractive for the rich, even taking into account that the voters are sophisticated and partially discount information from the newspaper. Consequently, the maximum bribe, which the rich are ready to pay to the media for misreporting, increases. As a result, the media is captured more often, and the probability of media capture increases.

The next proposition links the probability of media capture p and the availability of the alternative source of information δ.

Proposition 2. *If the alternative source of information becomes more accessible, i.e. the fraction δ of people who enjoyed access to it grows, then the probability of media capture decreases.*

Proof. In Appendix. □

This proposition shows that when the alternative source of information, such as the Internet, becomes more accessible, the rich have less incentive to control the media, as such control becomes less useful. In the limit, when all people have access to both the newspaper and the Internet, the rich never capture the newspaper, because it's no longer profitable for them: nobody would believe the biased newspaper.

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[26] Probability $\mathbf{P}(\varepsilon < \bar{B} - C)$ should be equal to the probability that the media is captured if $b = b_H$, i.e. to p_1, using the notation of Footnote 25. But, by the formula in this footnote, p_1 is equal to $\frac{p\gamma}{(1-p)(1-\gamma)}$, which is an increasing function of p if $p \in [0, 1)$.

The next proposition formally shows what happens with the equilibrium tax rate and, as a result, the amount of public goods produced when the media is captured.

Proposition 3. *The expected tax rate t and the amount of public goods G in the state of the world b_H is lower if the media is captured (or the probability of media capture p>0), as compared with the case in which media cannot be captured.*

Proof. In Appendix. □

This proposition links the probability of media capture and policy outcomes. It shows that in the state of the world $b=b_H$ the expected tax rate and, correspondingly, the level of public good provision are higher if the media cannot be captured.

4.5. Effect of democratic institutions

The model so far is based on the assumption that a policy outcome in the economy is determined by the median voter. But even in mature democracies this is not always true; if we consider developing democracies or authoritarian regimes, an exact correspondence between the chosen policy and the position of the median voter seems unrealistic. In this section, I analyze an extension of the model in which this assumption is relaxed.

The model is modified in the following way: let's assume that the policy outcome is determined by the median voter only with a probability $\lambda \leq 1$, and in all other cases the policy is determined by the rich (i.e. there is some probability that the state is captured by the rich, but this strategy of "direct capture" succeeds only with the probability $1 - \lambda$). The parameter λ reflects an important feature of a political regime: the responsiveness of the policy outcome to the position of a median voter.

In this case, the tax rate in the economy in the state of the world is b_H is $t_L^*(s_L)$ with the probability $\lambda(1-q)$, $t_L^*(s_H)$ with the probability λq and $t_H^* = \frac{b_H Y}{4W_H^2}$ with the probability $1-\lambda$. Here t_H^* describes the ideal tax rate of the rich (it is not conditional on s as the rich have full information about b). After the same calculations as above, we can find that the maximum bribe which the rich are ready to pay is $\bar{B}_\lambda = \alpha\lambda(1 - q)\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p)[\sqrt{b_H} - \sqrt{b_L}]}{2W_L}\right]$, and, therefore, Eq. (12) can be rewritten as

$$\frac{p\gamma}{(1-p)(1-\gamma)} = \varphi\left(\alpha\lambda(1 - q)\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1 - p)[\sqrt{b_H} - \sqrt{b_L}]}{2W_L}\right] - C\right) + \frac{1}{2}. \quad (13)$$

This equation implicitly determines the equilibrium level of p. The comparative statics with respect to inequality $\frac{W_H}{W_L}$ and accessibility of the alternative source of information δ can be summarized in the following propositions:

Proposition 4. *For a given λ if the inequality $\frac{W_H}{W_L}$ increases, and the average income Y remains constant, then the equilibrium probability of media capture increases. The described effect $\frac{\partial p}{\partial\left(\frac{w_H}{w_L}\right)}|Y = const$ becomes weaker as λ decreases (i.e. $\frac{\partial^2 p}{\partial\left(\frac{w_H}{w_L}\right)\partial\lambda}|Y=const>0$).*

Proof. In Appendix. □

Proposition 5. *For a given λ if the alternative source of information becomes more accessible, or the fraction of people δ who enjoyed access to it increases, then the probability of media capture declines. The magnitude of this effect decreases as λ decreases, i.e.* $\frac{\partial^2 p}{\partial\delta\partial\lambda}$ <0.

Proof. In Appendix. □

Intuition behind these propositions is the following. If λ is higher, it increases incentives for the rich to capture the media, so that the maximum amount of money $\overline{B}_\lambda$ which the rich are ready to pay to the media is larger. As a result, both of the described effects, that of inequality on media capture, and that of availability of alternative source of information on media capture, become stronger.

5. Empirics

5.1. Testable predictions

In the empirical section, I use the indices of media freedom developed by Freedom House and Reporters without Borders to proxy for the main dependent variable in my analysis, which is the probability of media capture p. Unfortunately, these measures do not perfectly correspond to the theoretical concept of the media capture by the rich; however, there are reasons to think that these indices are correlated with the extent of media capture. These measures are based on expert estimates for various parameters related to news production. They are focused on the freedom of expression for journalists from the influence by the state, as well as from the influence by private actors and interest groups.

The index of Freedom House includes estimates of such aspects as editorial independence for both state-owned and private owned media or the extent of pressure which journalists feel from "the government or a particular partisan interest". In addition, this index incorporates the structure and the transparency of ownership for private media, which is directly related to the theoretical concept of media capture. Besley and Prat (2006) show that there is a significant negative correlation between this index and the concentration of newspaper ownership. In addition, they show that the correlation between the index and the foreign ownership (which presumably restricts the influence of the rich in a particular country) is positive.

An index developed by Reporters without Borders takes into account not only the abuses of press freedom by the state, but also the pressure by interest groups or organizations which "can pose a real threat to press freedom". As the rich are often organized into interest groups (it can be any kind of a special interest group fighting for tax cuts), this index also, at least partly, reflects the media capture by the rich. A more detailed description of these indices is given below in the next subsection.

According to the theoretical model, there is a relationship between media capture and income inequality, holding the aggregate income constant. The previous discussion shows that the indices of media freedom can be used to proxy for media capture. Therefore, a testable prediction is the following:

Hypothesis 1. Controlling for GDP per capita, inequality has a negative effect on media freedom; the magnitude of this effect is greater in countries with stronger democratic institutions.

The second hypothesis comes from Proposition 5 of the theoretical section. Here, again, I assume that the media freedom indices are used to proxy for the media capture by the rich.

Hypothesis 2. Accessibility of an alternative source of information has a positive effect on media freedom; the magnitude of this effect is greater in countries with stronger democratic institutions.

The last hypothesis comes from Proposition 3, which states that there should be more public goods when media is not captured. This implies that greater media freedom is associated with higher level of public spending, controlling for strength of democratic institutions.

Hypothesis 3. Level of public spending is higher in the countries with greater media freedom.

5.2. Data

For the empirical investigation, I use the data on media freedom, inequality, political institutions, media accessibility, and control variables for up to 102 countries for the years 1994–2003.[27] More technical information on the sample and the variables is presented in Appendix.

As a proxy for media freedom I mainly use Freedom House media freedom index (available for 1994–2004 for 194 countries). This index is based on the expert estimates made by various respondents around the world. Technically, it is a sum of three components, which assess the legal environment for the media, the political environment (including editorial independence of both state-owned and privately owned media, official censorship and self-censorship, the ability of foreign and local reporters to cover the news freely and without harassment), and the economic environment (including the structure of media ownership and the subsidies from the state or other actors).[28] This index ranges from 0 (complete media freedom) to 100 (absolute absence of freedom). In the further analysis I use a transformed index (new index = 100 − original index), so that the higher values of this index correspond to greater media freedom.

Data on inequality come from the World Income Inequality Database composed by the WIDER Institute of the United Nations University. Since the presented data on pre-tax gini coefficients are typically available from the different sources for different countries, I choose the most reliable sources widely used in academic research, such as Transmonee for Eastern Europe and the former USSR, and Deininger and Squire for Latin America. I strictly use exactly one source for each country to make at least intertemporal comparison reasonable. As a result, there is a panel with 323 data points available for 102 countries with a mean of 3.1 observations per country and a median of 2 observations per country.

As a measure of the strength of democratic institutions (λ in the model) I use the "democracy" variable from the Polity IV dataset, which reflects the "general openness of political institutions." It ranges from 0 to 10, 10 corresponding to the strongest democratic institutions. The index is constructed from the expert estimates of different characteristics of the political system such as

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[27] Most variables are available for a larger set of countries, but since I focus mainly on the effect of inequality, I include only those countries that have at least one reliable observation for inequality (marked as having "high quality" in the WIDER database) during the considered period of time.

[28] The economic factors in Freedom House index include the structure of ownership (which seems to be directly related to the extent of media capture by the rich), but do not include measures of income or inequality in a country. In particular, an economic part of the index consists of "the structure of media ownership; transparency and concentration of ownership; the costs of establishing media as well as of production and distribution; the selective withholding of advertising or subsidies by the state or other actors; the impact of corruption and bribery on content; and the extent to which the economic situation in a country impacts the development of the media". Source: Freedom House, 2006.
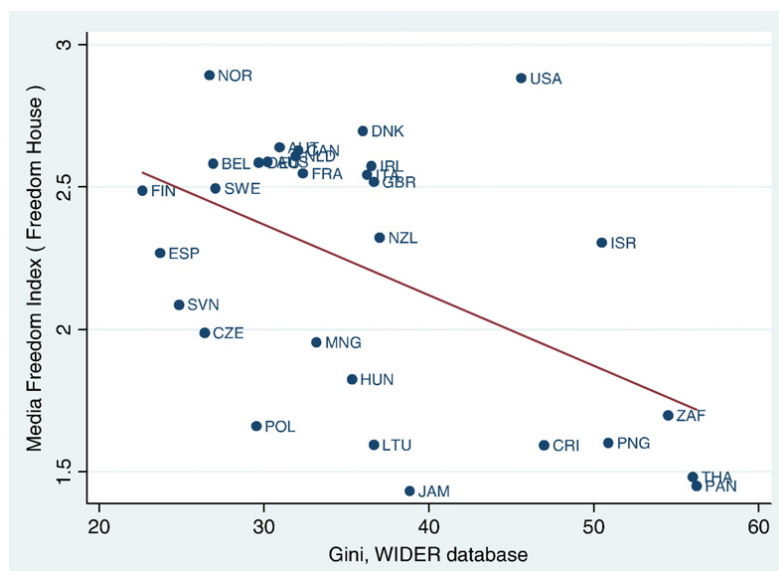
Fig. 1. Inequality and media freedom (Freedom House) for democratic for countries (democracy score ≥ 9); controlling for GDP per capita.

openness and competitiveness of executive recruitment, regulation of executive recruitment, executive constraints, and so on.[29]

As an alternative measure of media freedom I use a media freedom index (later RSF index) developed by "Reporters without Borders", an international journalist organization, and available for 2002–2004. This index is compiled on the basis of a worldwide survey carried out by journalist organizations. It measures media freedom violations affecting news media (censorship, confiscation of issues, searches and harassment) and journalists (such as murders, imprisonment, physical attacks and threats). It takes into account not only the pressure on media freedom by the state, but also the pressure by various interest groups. The scale ranges from 0 to 100, with 0 corresponding to full media freedom. Again, to make figures and coefficients more intuitive, I use a transformed index in the form new index = 100 − original index, so that 100 corresponds to full media freedom.

As a measure of the availability of alternative sources of information (δ in the model), I use the number of Internet users per capita (from WDI) and the Digital Access Index (DAI), devised by the International Communication Union, which measures access to information and communication technologies.

In addition, I use several variables to test Proposition 4 of the model, which states that the level of public good provision is higher if the media is not captured. I use the levels of public spending on health and education (the fraction of GDP) as measures of the level of public good provision (G in the model).

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[29] Note that this measure does not directly incorporate media freedom, which allows its usage as a control variable in the regression models with media freedom as a dependent variable.
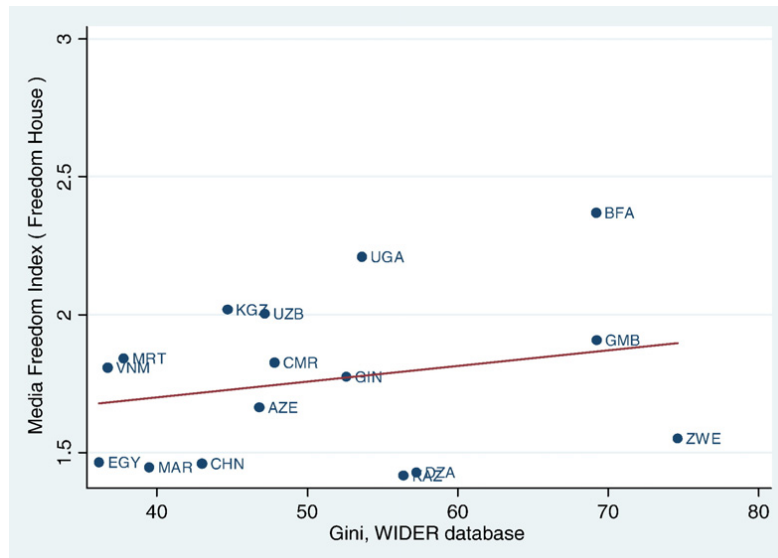
Fig. 2. Inequality and media freedom (Freedom House) for autocracies (democracy score ≤ 1); controlling for GDP per capita.

5.3. Analysis

First, I present the bivariate plots that show relationships between the variables of interest. Since the hypotheses above predict different relationships between variables of interests in democratic
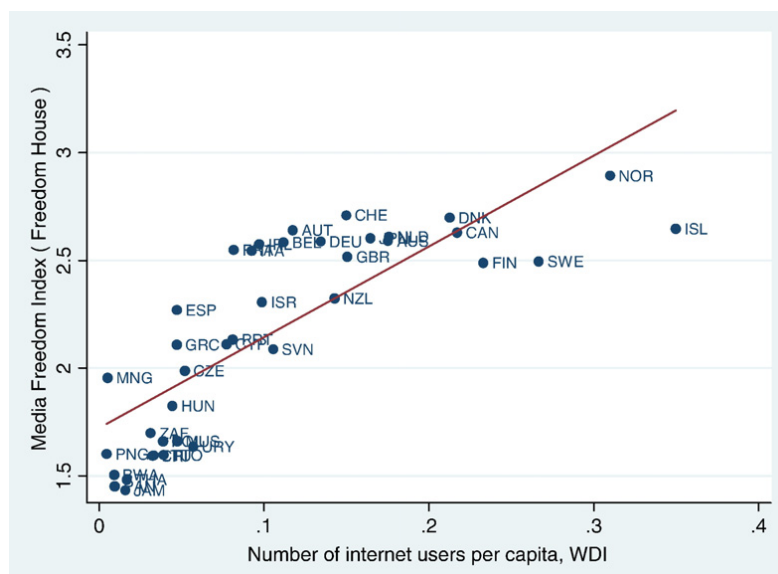

Fig. 3. Accessibility of alternative source of information (number of Internet users) and Media Freedom (Freedom House) for democracies (democracy score ≥ 9); controlling for GDP per capita.
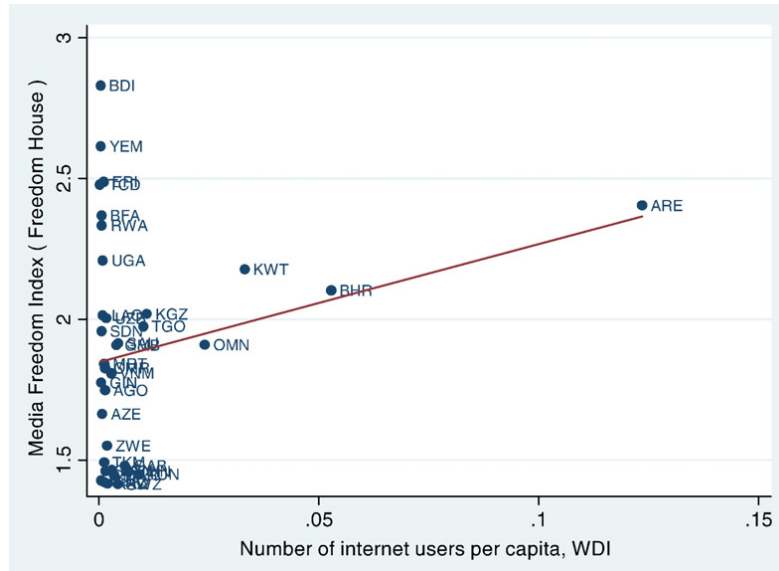
Fig. 4. Accessibility of alternative source of information (number of Internet users) and media freedom (Freedom House) for autocracies (democracy score ≤1); controlling for GDP per capita.

and authoritarian regimes, it is important first to look at bivariate plots separately for different kinds of regimes. To construct Figs. 1–8 I use 10-year averages of the variables for years 1994–2003. Plots for democracies are made for the countries with average democracy scores 9 or higher; plots for autocracies are made for the countries with democracy scores 1 or lower.

Fig. 5. Media freedom (Freedom House) and public spending on education for democracies (democracy score ≥9); controlling for GDP per capita.

Fig. 6. Media freedom (Freedom House) and public spending on education for autocracies (democracy score ≤ 1); controlling for GDP per capita.

Hypothesis 1 implies a negative relationship between inequality and media freedom for democratic countries (with a high responsiveness of the policy outcome to the position of a median voter) and weaker relationship for autocracies. Bivariate relationship between the media freedom index and gini index is shown on Figs. 1 and 2 (controlling for GDP per capita). In

Fig. 7. Media freedom (Freedom House) and public spending on health for democratic countries (democracy score ≥ 9); controlling for GDP per capita. Sources: Freedom House, WDI World Bank, democracy score from Polity IV dataset, 1994-2003.
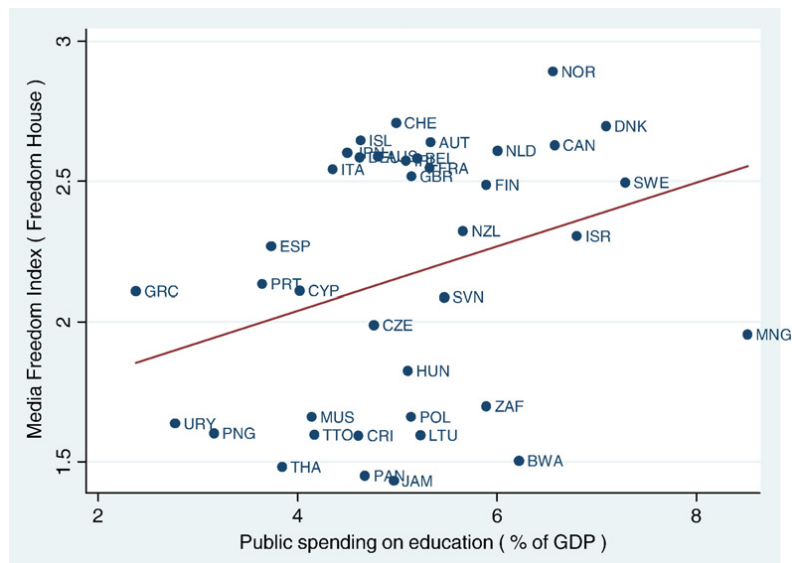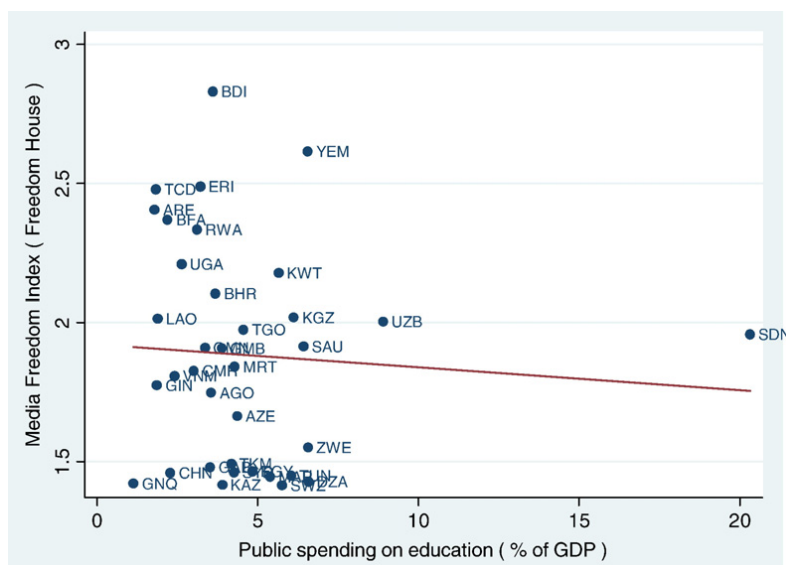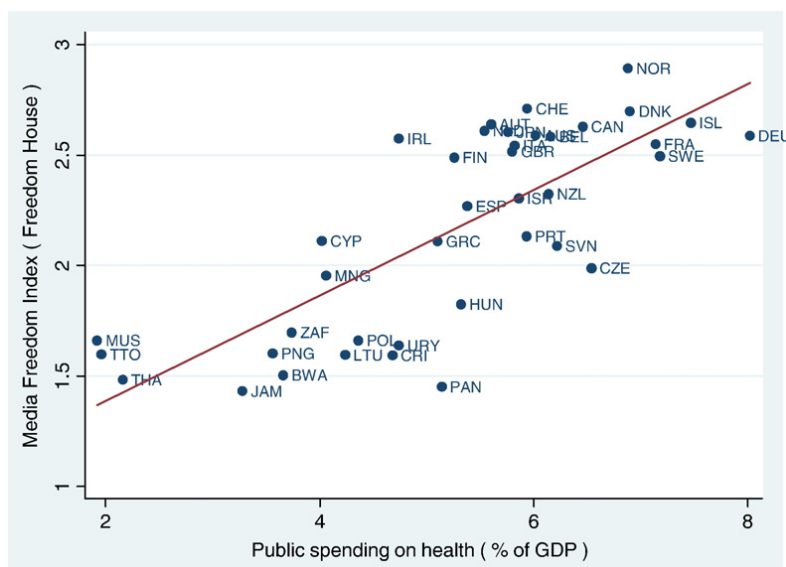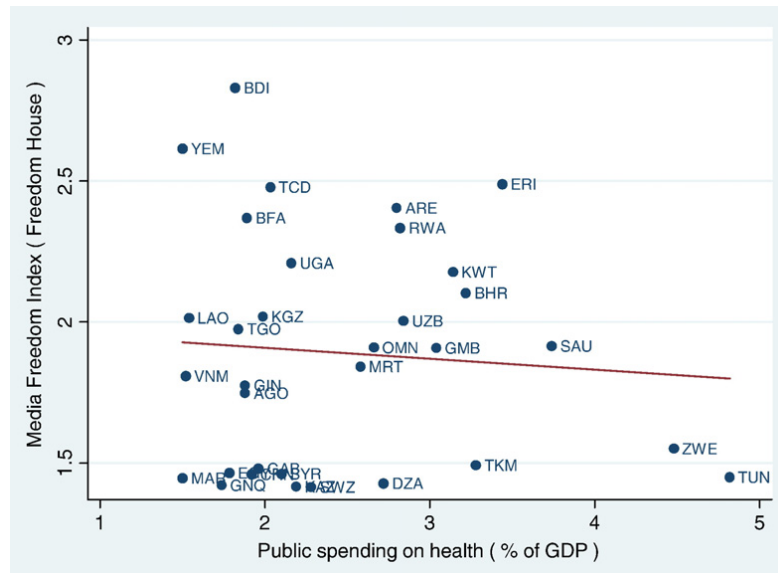
Fig. 8. Media freedom (Freedom House) and public spending on health autocracies (democracy score ≤ 1); controlling for GDP per capita.

democracies (Fig. 1), media freedom is a negative function of the level of democracy (*p*-value of *t*-statistics is 0.05), while corresponding relationship in autocracies (Fig. 2) is slightly positive but not significant (*p*-value is 0.11).[30] Figures for RSF index as dependent variable (not reported here) look similar.

Hypothesis 2 implies that the relationship between the number of Internet users and media freedom is positive, and it is stronger for democratic countries. Figs. 3 and 4 illustrate this relationship for democracies and autocracies. There is a clear positive relationship in democracies (Fig. 3, *p*-value is 0.0004). The relationship between the number of Internet users and media freedom in autocracies (shown on Fig. 4) is positive and insignificant (*p*-value is 0.77).

The relationships between media freedom and public spending (spending on health and education) as a fraction of GDP are shown on Figs. 5–8. The relationship is positive for democracies (*p*-values are 0.14 for education and 0.07 for health) and negative and insignificant for autocracies (*p*-values are 0.17 for education and 0.97 for health).

5.4. Regressions results

This section contains the results of the regression analysis conducted to test the hypotheses described above. These hypotheses predict a differential impact of independent variables in

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[30] There are 55 countries in the sample which are neither democracies nor autocracies according to used classification (i.e. have democracy score between 1 and 9). The relationship between gini and media freedom index in these countries is negative and non-significant (*p*-value of *t*-statistics is 0.154 if democracy variable is included as a control).

Table 1
Inequality and median freedom, panel

	Media freedom index (Freedom House)			
Gini * democracy	−0.089 [3.76]***	−0.061 [2.41]**	−0.076 [1.65]*	−0.079 [1.70]*
Gini	0.212 [1.25]	0.128 [0.66]	0.186 [0.52]	0.222 [0.62]
Democracy	7.474 [7.16]***	6.076 [5.41]***	5.413 [2.81]***	5.607 [2.90]***
Log (GDP per capita)		4.324 [2.45]**	2.324 [0.38]	5.462 [0.78]
Population (in millions)		−0.016 [2.04]**	0.06 [0.41]	0.06[0.41]
Post-communist country		−8.635 [2.43]**		
Literacy		−0.052 [0.55]	−0.39 [0.67]	−0.168 [0.27]
Internet users per capita		11.122 [1.25]	7.015 [0.89]	11.189 [1.24]
Year (time trend)				−0.29 [0.94]
Random effects	Yes	Yes	No	No
Fixed effects	No	Year	Country	Country
Observations	304	253	253	253
Countries	99	84	84	84
R-squared, overall	0.68	0.76	0.15	0.15

Absolute value of z statistics (t statistics for fixed effect specifications) in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

democracies and autocracies. In most panel regressions specified below I present a random effects model with year fixed effects, and a country fixed effects model. In cross-section regressions an additional dependent variable is the media freedom index of "Reporters without Borders".

Table 2
Inequality and media freedom, cross-country

	Media freedom index (Freedom House)				Media freedom index (Reporters without Borders)			
Gini * democracy	−0.093 [3.45]***	−0.086 [3.06]***	−0.069 [2.59]**	−0.081 [3.12]***	−0.085 [2.25]**	−0.079 [2.19]**	−0.068 [1.67]*	−0.078 [2.04]**
Gini	0.41 [1.92]*	0.288 [1.36]	0.263 [1.3]	0.327 [1.6]	0.451 [1.66]*	0.374 [1.47]	0.388 [1.45]	0.369 [1.36]
Democracy	9.0 [7.75]***	8.131 [6.46]***	7.597 [6.36]***	8.014 [6.95]***	7.815 [4.61]***	7.448 [4.28]***	7.091 [3.70]***	7.474 [4.11]***
Log (GDP per capita)		1.684 [1.27]	0.944 [0.47]	−2.376 [0.68]		−0.45 [0.24]	−0.565 [0.2]	2.057 [0.36]
Population (in millions)		−0.015 [4.24]***	−0.013 [3.16]***	−0.015 [3.70]***		−0.039 [4.25]***	−0.037 [3.91]***	−0.039 [4.07]***
Post-communist country		−7.39 [3.49]***	−5.93 [2.12]**	−7.374 [2.91]***		2.03 [0.57]	3.895 [0.76]	2.482 [0.52]
Literacy			−0.082 [1.07]	−0.14 [1.52]			−0.078 [0.72]	−0.059 [0.45]
Internet users per capita			40.08 [1.85]*				27.549 [0.64]	
Digital Access Index				31.996 [1.59]				−10.667 [0.3]
Observations	100	98	93	91	96	95	90	89
R-squared	0.78	0.81	0.83	0.82	0.52	0.60	0.60	0.60

Robust t statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3
Availability of alternative sources of information and media freedom, panel

	Media Freedom (Freedom House)			
Internet users per capita * democracy	3.164 (2.95)**	4.835 [3.59]***	3.813 [2.95]***	3.801 [2.93]***
Internet users per capita	−22.926 (2.28)*	−37.209 [2.80]***	−33.064 [2.67]***	−30.888 [2.43]**
Democracy	2.406 (15.99)**	1.994 [12.71]***	1.094 [6.42]***	1.11 [6.47]***
Log (GDP per capita)		4.864 [4.44]***	0.207 [0.10]	0.836 [0.40]
Population (in millions)		−0.011 [1.59]	0.109 [2.94]***	0.118 [3.12]***
Post-communist country		−7.861 [2.60]***		
Literacy		0.133 [2.24]**	−0.173 [1.64]	−0.114 [0.74]
Random effects	Yes	Yes	No	No
Fixed effects	No	Year	Country	Country, Year
Observations	1021	939	939	939
Countries	152	137	137	137
R-squared	0.72	0.67	0.07	0.08

Absolute value of z statistics (t statistics for fixed effect specifications) in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

To analyze the relationship between inequality and media freedom in countries with different institutional environment, I estimate the following model:

$$\text{media freedom}_{it} = \sigma_0 + \sigma_1 \cdot \text{democracy}_{it} + \sigma_2 \cdot \text{gini}_{it} + \sigma_3 \cdot \text{democracy}_{it} * \text{gini}_{it} \\ + \sigma_5 \cdot \text{control}_{it} + e_{it}.$$

By Hypothesis 1, the sign of the coefficient for the interaction term is expected to be negative and significant. The direct coefficient for gini is expected to be insignificant. Regressions for panel data models and corresponding cross-section models are presented in Tables 1 and 2. First hypothesis predicts that there is a negative effect of inequality on media freedom, and this effect is stronger in democracies. Results in Tables 1 and 2 provide strong support for this hypothesis,

Table 4
Accessibility of alternative sources of information and media freedom, cross-country

	Media freedom index (Freedom House)		Media freedom index (Reporters without Borders)	
Internet users per capita * democracy	13.928 [3.14]***		17.8 [3.58]***	
Internet users per capita	−65.79 [1.43]		−116.227 [2.31]**	
DAI * democracy		6.732 [3.69]***		8.359 [3.56]***
DAI (Digital Access Index)		−0.553 [0.03]		−50.63 [1.49]
Democracy	4.211 [9.73]***	1.849 [2.14]**	3.674 [5.30]***	0.755 [0.60]
Log (GDP per capita)	1.837 [0.93]	−3.772 [1.11]	0.512 [0.21]	−0.078 [0.02]
Post-communist country	−3.684 [1.18]	−4.843 [1.91]*	6.035 [1.14]	5.155 [1.06]
Population (in millions)	−0.012 [4.02]***	−0.01 [3.22]***	−0.037 [6.36]***	−0.032 [5.40]***
Gini	−0.06 [0.44]	−0.018 [0.15]	0.079 [0.40]	0.061 [0.35]
Literacy	−0.111 [1.31]	−0.139 [1.48]	−0.104 [0.70]	−0.046 [0.27]
Observations	93	91	90	89
R-squared	0.82	0.84	0.60	0.63

Robust t statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5
Inequality and media freedom in democracies (average democracy score >=9)

	Media freedom index (Freedom House)		
Gini	−0.245 [2.03]*	−0.367 [2.47]**	−0.348 [1.88]*
Log (GDP per capita)	5.02 [3.15]***	3.896 [1.80]*	2.267 [0.90]
Population (in millions)		−0.097 [2.07]**	−0.099 [1.98]*
Post-communist country		−5.579 [1.58]	−6.52 [1.88]*
Literacy		−0.285 [1.24]	−0.352 [1.28]
Internet users per capita		21.348 [2.03]*	
Digital Access Index			20.954 [1.12]
Observations	31	30	29
R-squared	0.46	0.69	0.63

Robust *t* statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

since the coefficients for the cross-term are significantly negative in all specifications. The effect of inequality in autocracies, given by the coefficient for gini variable, is insignificant. The effect of being in a post-communist country is significantly negative which suggests that the communist heritage can still have an influence on people's preferences for redistribution (in line with findings of Alesina and Fuchs-Schündeln, 2006).

Regressions for the effect of the accessibility of the alternative source of information (the number of Internet users or, sometimes, Digital Access Index) are shown in Tables 3 and 4. For most regressions the following specification is estimated:

$$\text{media freedom}_{it} = \sigma_0 + \sigma_1 \cdot \text{democracy}_{it} + \sigma_2 \cdot \text{av\_alt\_source}_{it} + \sigma_3 \cdot \text{democracy}_{it} * \text{av\_alt\_source}_{it} + \sigma_5 \cdot \text{control}_{it} + e_{it}.$$

Hypothesis 2 predicts that the effect of availability of Internet on media freedom is positive, and it is larger in democracies. According to this hypothesis, the coefficient σ_3 is expected to be positive and significant. The results from Table 3 show that it is the case even if country and year fixed effects are included simultaneously. The regression results for cross-country regressions, presented in Table 4, are similar.[31]

To deal with the concern that all the results are driven by the possible endogeneity between democracy and media freedom, I also run cross-country regressions separately for democracies and autocracies (Tables 5 and 6). These regressions do not include democracy as independent variable. The regression results are similar to that observed in Tables 1 and 2: inequality has a negative effect on media freedom in democracies and has no significant effect in autocracies.

To test Hypothesis 3, which predicts positive relationship between the extent of media freedom and the level of public spending, I run regressions with the public spending on health and education as dependent variables (Table 7). Coefficients for media freedom are positive and

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[31] I do not test Hypotheses 1 and 2 simultaneously for a couple of reasons. First, theoretical propositions (comparative statics) are derived under "other things being equal" assumption, which implies that interaction terms should not be included simultaneously. Also, there arises a problem of multicollinearity. If both interaction terms are included simultaneously, the interaction between gini and democracy remains significant at 5% level (at 10% level for the fixed effect specification).

Table 6
Inequality and media freedom in autocracies (average democracy score <=1)

	Media freedom index (Freedom (House)		
Gini	0.311 [1.69]	0.185 [0.83]	0.227 [1.07]
Log (GDP per capita)	−13.16 [2.03]*	−14.193 [1.65]	−19.545 [1.54]
Population (in millions)		−0.008 [0.49]	−0.007 [1.19]
Post-communist country		−8.153 [0.73]	−9.089 [0.75]
Literacy		−0.135 [0.90]	−0.188 [1.10]
Internet users per capita		821.969 [0.22]	
Digital Access Index			36.874 [0.66]
Observations	16	14	14
R-squared	0.37	0.58	0.6

Robust *t* statistics in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

significant in most specifications, controlling for GDP per capita and level of democracy. These results provide empirical support for Hypothesis 3.

In sum, the empirical section of the paper contains the results which support the predictions of the model. I find that inequality has negative effect on media freedom, and this effect is stronger in democracies. I show that the number of Internet users per capita is positively associated with media freedom, and this relationship is stronger in autocracies. In addition, I find that the level of

Table 7
Public spending on education and health, and media freedom

	Public spending on education (% of GDP)			Public spending on health (% of GDP)		
Media freedom index	0.021	0.022	0.04	0.031	0.029	0.013
(Freedom House)	[2.17]**	[2.18]**	[2.75]***	[3.01]***	[2.65] ***	[1.27]
Log (GDP per capita)	0.351	0.361	−0.435	0.657	0.624	−1.84
	[1.55]	[1.57]	[0.53]	[3.53]***	[3.13]***	[3.16]***
Democracy	0.207	0.229	−0.969	0.222	0.79	−0.26
	[1.04]	[1.14]	[2.76]***	[1.08]	[1.28]	[0.96]
Population (in millions)	−0.001	−0.001	−0.002	−0.002	−0.002	
	[1.05]	[0.96]	[0.03]	[1.98]**	[1.86]*	
Gini	0.013	0.016	−0.182	0.029	0.034	−0.02
	[0.44]	[0.54]	[3.35]***	[0.98]	[1.12]	[0.50]
Gini*democracy	−0.005	−0.006	0.025	−0.004	−0.005	0.004
	[1.26]	[1.38]	[3.12]***	[1.07]	[1.28]	[0.80
ELF	−0.144	−0.3		−0.312	−0.383	
	[0.19]	[0.40]		[0.56]	[0.65]	
Post-communist country	−0.153	−0.26		0.703	0.664	
	[0.21]	[0.36]		[1.31]	[1.15]	
Random effects	Yes	Yes	No	Yes	Yes	No
Fixed effects	No	Year	Country	No	Year	Country
Observations	127	127	189	98	98	161
Countries	58	58	79	48	48	68
R-squared, overall	0.41	0.41	0.04	0.68	0.68	0.21

Absolute value of *z* statistics (*t* statistics for fixed effect specifications) in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

public spending as percentage of GDP is higher in those countries in which media freedom is higher.

6. Conclusion

As the mass media is the important source of information about public policy for common people, it becomes an attractive tool that can be used by the rich to influence public opinion. If aggregate income stays constant, the greater inequality in the economy implies lower income of the median voter, which leads to a higher popular demand for redistribution. This, in turn, increases incentives for those with high-income to affect the preferences for taxation and public good provision of those with low-income. In this paper, I develop a model of media capture in which the rich can influence the news published in a media outlet. I show that higher income inequality is associated with lower media freedom, but higher accessibility of an alternative source of information leads to greater media freedom. According to the model, the magnitude of these effects depends positively on the strength of democratic institutions in a country. Results of the empirical analysis support these theoretical predictions. I show that higher income inequality in the country is associated with a lower level of media freedom, and this effect is stronger in democratic countries.

Overall, the results suggest that the media plays an important role in shaping people's preferences and policy outcomes, and its influence on these preferences is more important in countries with strong democratic traditions than in autocracies (where the elite has no incentive to affect policy preferences of the median voter). The Internet also has a stronger positive effect on media freedom in democracies than in autocracies. Also I find that the extent of media freedom has a positive effect on the level of public spending on health and education.

This paper, along with many others, focuses on the supply side of media misreporting, and explains media bias by conscious manipulation by media owners or editors. Other papers which follow the same approach explain media bias by the capture by government or incumbent politicians (Besley and Prat, 2006; Puglisi, 2004a), interest groups (Herman and Chomsky, 1988; Grossman and Helpman, 2001), or the political preferences of journalists (Baron, 2006; Puglisi, 2004b) and the whole set of actors involved in the news production (Bovitz et al., 2002). Papers which focus on the demand side of media bias include Mullainathan and Shleifer, 2005; Gentzkow and Shapiro, 2006a; Dyck et al., 2005.

The model in the paper can be extended in several possible ways. First, there can be uncertainty in deadweight losses from taxation unknown to the majority of population, in addition to the uncertainty about efficiency of public good provision. Also, the model can be extended for the case of several media outlets with partly overlapping audiences which can have different quality and reputation costs. Then, not all the rich can be organized as a group attempting to influence the media; some of them might stand aside. Finally, in this paper there are no governments or politicians with their own interests, but the model can be also extended in this direction.

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Appendix A

Proof of proposition 1. Denote right-hand side of (12) as $Z(p)$. First, let's show that $\frac{\partial Z}{\partial p} = F'(\cdot)\frac{\partial \bar{B}}{\partial p} < 0$. Here $F'(\cdot) = \phi > 0$, and $\frac{\partial \bar{B}}{\partial p} < 0$, because it is equal to $\alpha(1-q)\left[-\frac{W_H Y X'(p)}{4W_L^2} + \frac{Y\sqrt{b_L}[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}\right]$, which can be rewritten as $\alpha(1-q)\left[\frac{Y\sqrt{b_L}[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}\left(-\frac{W_H}{W_L}+1\right) - \frac{W_H Y p}{2W_L^2}[\sqrt{b_H}-\sqrt{b_L}]^2\right] < 0$. Now consider a mean-preserving spread of income distribution if p is fixed. In order to calculate how it affects Z, let's calculate derivative $\frac{\partial \bar{B}}{\partial\left(\frac{w_H}{w_L}\right)}$. Note that derivative $\frac{\partial\left(\frac{1}{w_L}\right)}{\partial\left(\frac{w_H}{w_L}\right)}$ is equal to $\frac{\alpha}{Y}$, by (1). Then $\frac{\partial \bar{B}}{\partial\left(\frac{w_H}{w_L}\right)} = \alpha(1-q)\left[\frac{Y(b_H-X(p))}{4W_L}+\frac{W_H\alpha(b_H-X(p))}{4W_L}+\frac{\alpha\sqrt{b_H}(1-p)[\sqrt{b_L}-\sqrt{b_L}]}{2}\right]$. By assumption (2) $\frac{W_H}{W_L} > \sqrt{\frac{b_H}{b_L}}$. Then $\frac{\partial \bar{B}}{\partial\left(\frac{w_H}{w_L}\right)} > \alpha(1-q)\left[\frac{Y(b_H-X(p))}{4W_L}+\sqrt{\frac{b_H}{b_L}}\frac{\alpha(b_H-X(p))}{4}+\frac{\alpha\sqrt{b_H}(1-p)[\sqrt{b_L}-\sqrt{b_H}]}{2}\right]$. The expression $\sqrt{\frac{b_H}{b_L}}\frac{\alpha(b_H-X(p))}{4}+\frac{\alpha\sqrt{b_H}-(1-p)[\sqrt{b_L}-\sqrt{b_H}]}{2}$ can be rewritten as $\sqrt{\frac{b_H}{b_L}}\frac{\alpha(b_H-[(1-p)\sqrt{b_L}+p\sqrt{b_H}]^2)}{4}+\frac{\alpha\sqrt{b_H}(1-p)[\sqrt{b_L}-\sqrt{b_H}]}{2} = \sqrt{\frac{b_H}{b_L}}\cdot\frac{\alpha}{4}\left(b_H-(1-p)^2 b_L - 2p(1-p)\sqrt{b_H b_L}-p^2 b_H + 2(1-p)[b_L-\sqrt{b_H b_L}]\right) = \sqrt{\frac{b_H}{b_L}}\cdot\frac{\alpha}{4}\left((1-p)^2 b_H+(1-p^2)b_L - 2(1-p^2)\sqrt{b_H b_L}\right) = \sqrt{\frac{b_H}{b_L}}\cdot\frac{\alpha}{4}(1-p^2)\left(b_H-\sqrt{b_L}\right)^2 \geq 0$.

As a result, these calculations show that $\frac{\partial \bar{B}}{\partial\left(\frac{w_H}{w_L}\right)} > 0$, and the entire expression for $\bar{B}$, and thus for Z, increases. Since Z is a decreasing function of p and the left-hand side of (12) is an increasing function of p, then Z as a function of p shifts upward as a result of an increase in $\frac{W_H}{W_L}$. Then equilibrium probability of media capture p increases. $\square$

Proof of proposition 2. By assumption 1, the probability that the median voter has access to the alternative source of information, q, is a strictly increasing function of δ. As a result, to prove the statement of the proposition it is sufficient to show that equilibrium p is an increasing function of q. The derivative of Z, which is a right-hand side of (12), with respect to q is $-\alpha F'(\cdot)\left[\frac{W_H Y(b_H-X(p))}{4W_L^2}+\frac{Y\sqrt{b_L}(1-p)[\sqrt{b_L}-\sqrt{b_H}]}{2W_L}\right] < 0$. Therefore, Z is a decreasing function of q. As $Z(p)$ is a decreasing function of p and the left-hand side of (12) is an increasing function of p, then $Z(p)$ shifts downward when q increases. As a result, equilibrium p is an increasing function of q. $\square$

Proof of proposition 3. If the media is captured with probability $p > 0$ then the expected tax rate in the state of the world $b = b_H$ is given by $q t_L^*(s_H)+(1-q)t_L^*(s_L)$. If the media is not captured ($p = 0$) then the expected tax rate in this state of the world is $t_L^*(s_H)$. Note that $t_L^*(s_L) = \frac{Y}{4W_L^2}[(1-p)\sqrt{b_L}+p\sqrt{b_H}]^2 < \frac{Yb_H}{4W_L^2} = t_L^*(s_H)$, which implies that the expected tax rate is higher if media is not captured. The level of public good provision is correspondingly higher if the media is not captured. $\square$

Proof of proposition 4. Denote right-hand side of (13) as $Z_\lambda(p)$. The first part of the proposition can be shown by the same logic as the Proof of proposition 1. The only difference is that function $Z_\lambda(p)$ is instead of $Z(p)$. Denote $A(p) = Z_\lambda(p) - \frac{p\gamma}{(1-p)(1-\gamma)}$. Equation $A\left(p, \frac{W_H}{W_L}\right) = 0$ determines the implicit function $p\left(\frac{W_H}{W_L}\right) \cdot \frac{\partial A}{\partial p} < 0$ if $p \in [0, 1)$ as in this range of p it holds that $F'(\cdot)\frac{\partial \overline{B}}{\partial p} < 0$ and $\frac{\gamma}{(1-p)^2(1-\gamma)} > 0$. Also, $\frac{\partial A}{\partial \left(\frac{W_H}{W_L}\right)} = \phi \times \alpha\lambda(1-q)\left[\frac{Y(b_H - X(p))}{4W_L} + \frac{W_H\alpha(b_H - X(p))}{4W_L} + \frac{\alpha\sqrt{b_H}(1-p)[\sqrt{b_L} - \sqrt{b_H}]}{2}\right]$, and this derivative is higher than 0 under assumption 2 (see the Proof of proposition 1). The first derivative of $p\left(\frac{W_H}{W_L}\right)$ with respect to $\frac{W_H}{W_L}$ is

$$
\frac{\partial p}{\partial \left(\frac{W_H}{W_L}\right)} = \frac{\frac{\partial A}{\partial \left(\frac{W_H}{W_L}\right)}}{\frac{\partial A}{\partial p}}
$$

$$
= -\frac{\phi\alpha\lambda(1-q)\left[\frac{Y(b_H - X(p))}{4W_L} + \frac{W_H\alpha(b_H - X(p))}{4W_L} + \frac{\alpha\sqrt{b_H}(1-p)[\sqrt{b_L} - \sqrt{b_H}]}{2}\right]}{\phi\alpha\lambda(1-q)\left[\frac{Y\sqrt{b_L}[\sqrt{b_H} - \sqrt{b_L}]}{2W_L}\left(-\frac{W_H}{W_L} + 1\right) - \frac{W_H Y_p}{2W_L^2}[\sqrt{b_H} - \sqrt{b_L}]^2\right] - \frac{\gamma}{(1-\gamma)(1-p)^2}}.
$$

$$(14)$$

The sign of derivative $\frac{\partial p}{\partial \left(\frac{W_H}{W_L}\right)}$ is positive, since nominator $\frac{\partial A}{\partial \left(\frac{W_H}{W_L}\right)} > 0$ and the whole expression in the denominator is negative. This proves the first part of Proposition 4.

Let's denote the right-hand side of (14) as G_1. Then the second mixed derivative of p with respect to λ and $\frac{W_H}{W_L}$ can be found as $\frac{\partial^2 p}{\partial \left(\frac{W_H}{W_L}\right)\partial \lambda} = \frac{\partial G_1}{\partial \lambda} + \frac{\partial G_1}{\partial p}\frac{\partial p}{\partial \lambda}$. Denote $G_{1n} = \phi\alpha\lambda(1-q)\left[\frac{Y(b_H - X(p))}{4W_L} + \frac{W_H\alpha(b_H - X(p))}{4W_L} + \frac{\alpha\sqrt{b_H}(1-p)[\sqrt{b_L} - \sqrt{b_H}]}{2}\right]$ and $G_{1d} = \phi\alpha(1-q)\left[\frac{Y\sqrt{b_L}[\sqrt{b_H} - \sqrt{b_L}]}{2W_L}\left(-\frac{W_H}{W_L} + 1\right) - \frac{W_H Y_p}{2W_L^2}[\sqrt{b_H} - \sqrt{b_L}]^2\right]$. Then $\frac{\partial G_1}{\partial \lambda} = -\frac{G_{1n}(\lambda G_{1d} - 1) - G_{1d}\lambda G_{1n}}{\left[\lambda G_{1d} - \frac{\gamma}{(1-\gamma)(1-p)^2}\right]^2} = \frac{G_{1n}}{\left[\lambda G_{1d} - \frac{\gamma}{(1-\gamma)(1-p)^2}\right]^2}$. The term $\frac{\partial G_1}{\partial p}$ can be rewritten as $-((\varphi\alpha\lambda(1-q)$

$[((-(Y + W_H\alpha)X'(p))/(4W_L)) - ((\alpha\sqrt{(b_H)}[\sqrt{(b_L)} - \sqrt{(b_H)}])/2)] [\lambda G_{1d} - (\gamma/((1-\gamma)(1-p)^2))] +$

$((W_H Y)/(2W_L^2))[\sqrt{(b_H)}/ - \sqrt{(b_L)}]^2\lambda G_{1n})/([\lambda G_{1d} - (\gamma/((1-\gamma)(1-p)^2))]^2))$. The term $\frac{\partial p}{\partial \lambda}$ can be found by implicit function theorem as $-\dfrac{\phi\alpha(1-q)\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p)[\sqrt{b_H} - \sqrt{b_L}]}{2W_L}\right]}{\left[\lambda G_{1d} - \frac{\gamma}{(1-\gamma)(1-p)^2}\right]}$.

As $G_{1n} > (\varphi\alpha\lambda(1-q)[((-(Y + W_H\alpha)X'(p))/(4W_L)) - ((\alpha\sqrt{(b_H)}[\sqrt{(b_L)} - \sqrt{(b_H)}/2)] [\lambda G_{1d} - (\gamma/$

$((1-\gamma)(1-p)^2))] + ((W_H Y)/(2W_L^2))[\sqrt{(b_H)} - \sqrt{(b_L)}]^2\lambda G_{1n}) \times \varphi\alpha\lambda(1-q)[((W_H Y(b_H - X(p)))/$

$(4W_L^2)) - ((Y\sqrt{(b_H)}(1-p)[\sqrt{(b_H)} - \sqrt{(b_L)}])/(2W_L))]$, then as a result, $\frac{\partial G_1}{\partial \lambda} + \frac{\partial G_1}{\partial p}\frac{\partial p}{\partial \lambda} < 0$. $\square$

Proof of proposition 5. The first part of this proposition can be shown using the same logic as in the proof of Proposition 2. As before, we have $A(p) = Z_\lambda(p) - \frac{p\gamma}{(1-p)(1-\gamma)}$. Equation

$A(p, q)=0$ determines the implicit function p (q). Formally, $\frac{\partial A}{\partial q} = -\phi\alpha\lambda\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p)[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}\right]<0$. The first derivative $\frac{\partial p}{\partial q}$

$$\frac{\partial p}{\partial q} = -\frac{\frac{\partial A}{\partial q}}{\frac{\partial A}{\partial p}}$$

$$= \frac{-\phi\alpha\lambda\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p)[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}\right]}{\phi\alpha\lambda(1-q)\left[\frac{Y\sqrt{b_L}[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}\left(-\frac{W_H}{W_L}+1\right) - \frac{W_H Y_p}{2W_L^2}[\sqrt{b_H}-\sqrt{b_L}]^2\right] - \frac{\gamma}{(1-\gamma)(1-p)^2}}. \quad (15)$$

The sign of derivative $\frac{\partial p}{\partial q}$ is negative, since the nominator $\frac{\partial A}{\partial q}>0$, and the whole expression in the denominator is negative. This proves the first part of the Proposition 5.

Let's denote the right-hand side of (14) as H_1 Then the second mixed derivative of p with respect to λ and q can be found as $\frac{\partial^2 p}{\partial q \partial \lambda} = \frac{\partial H_1}{\partial} + \frac{\partial H_1}{\partial p}\frac{\partial p}{\partial \lambda}$. By the proof of the previous proposition,

$$\frac{\partial H_1}{\partial \lambda} = \frac{-\phi\alpha\lambda\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p)[\sqrt{b_h}-\sqrt{b_L}]}{2W_L}\right]}{\left[\phi\alpha\lambda(1-p)\left[\frac{Y\sqrt{b_L}[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}\left(-\frac{W_H}{W_L}+1\right) - \frac{W_H Yp}{2W_L^2}[\sqrt{b_H}-\sqrt{b_L}]^2\right] - \frac{\gamma}{(1-\gamma)(1-p)}\right]^2}<0.$$ Then,

$$\frac{\partial p}{\partial \lambda} = -\frac{\phi\alpha\lambda(1-q)\left[\frac{W_H Y(b_H - X(p))}{4W_L^2} - \frac{Y\sqrt{b_H}(1-p[\sqrt{b_H}-\sqrt{b_L}])}{2W_L}\right]}{\left[\lambda G_{1d} - \frac{\gamma}{(1-\gamma)(1-p)^2}\right]}>0 \text{ (see notation of the Proof of}$$

proposition 4), as denominator is less than 0 as we previously find. Finally, $\frac{\partial H_1}{\partial p} =$

$$\frac{-\phi\alpha\lambda\left[\frac{-W_H YX'(p)}{4W_L^2} + \frac{Y\sqrt{b_H}[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}\right]\left[\lambda G_{1d} - \frac{\gamma}{(1-\gamma)(1-p)^2}\right] + \frac{W_H Y}{2W_L^2}[\sqrt{b_H}-\sqrt{b_L}]^2\lambda H_{1n}}{\left[\lambda G_{1d} - \frac{\gamma}{(1-\gamma)(1-p)^2}\right]^2} \text{ where } H_{1n} \text{ is}$$

the nominator of (16). The last expression is less than 0, as $\lambda G_{1d} - \frac{\gamma}{(1-\gamma)(1-p)^2}<0$ and $\frac{-W_H YX'(p)}{4W_L^2} + \frac{Y\sqrt{b_H}[\sqrt{b_H}-\sqrt{b_L}]}{2W_L}<0$ (see the Proof of proposition 1). Therefore, $\frac{\partial H_1}{\partial \lambda} + \frac{\partial H_1}{\partial p}\frac{\partial p}{\partial \lambda}<0$. $\square$

Appendix B

Table A1
Countries included in the sample

Albania	Ecuador	Lesotho	Russia
Algeria	Egypt	Lithuania	Senegal
Armenia	El Salvador	Luxembourg	Singapore
Australia	Estonia	Macedonia	Slovakia
Austria	Ethiopia	Madagascar	Slovenia
Azerbaijan	Finland	Malaysia	South Africa
Bangladesh	France	Mali	Spain
Belarus	Gambia	Mauritania	Sri Lanka
Belgium	Georgia	Mexico	Sweden
Bolivia	Germany	Moldova	Tajikistan
Brazil	Ghana	Mongolia	Tanzania
Bulgaria	Guatemala	Morocco	Thailand
Burkina Faso	Guinea	Nepal	Turkey
Cambodia	Honduras	Netherlands	Uganda
Cameron	Hungary	New Zealand	Ukraine

Table A1 (*continued*)

Canada	India	Niger	United Kingdom
Chile	Indonesia	Nigeria	United States
China	Ireland	Norway	Uzbekistan
Colombia	Israel	Pakistan	Venezuela
Costa Rica	Italy	Panama	Vietnam
Cote d'Ivoire	Jamaica	Papua New Guinea	Yugoslavia
Croatia	Jordan	Paraguay	Zambia
Czech Republic	Kazakhstan	Peru	Zimbabwe
Denmark	Kenya	Philippines	
Djibouti	Kyrgyzstan	Poland	
Dominican Republic	Latvia	Romania	

Table A2
Descriptive statistics

Variable	Observations, cross-country	Observations, panel	Mean	Standard deviation	Minimum	Maximum
Media freedom index (Freedom House)	184	1787	53.74	24.50	1.40	93.4
Media freedom index (Reporters without Borders)	159		70.99	24.96	−7.5	99.5
Gini	102	320	42.68	11.16	22.63	74.61
Democracy	158	1534	5.12	3.84	0	10
Log (GDP per capita)	162	1453	8.32	1.12	6.15	10.63
Post-communist country dummy	227		0.12	0.33	0	1
Literacy	167	1734	76.85	23.45	6.7	99.73
Number of Internet users	218	1782	58.33	85.63	0.02	467.73
DAI index	123		0.42	0.22	0.04	0.85
Population	184	7729	23.88	94.75	0.02	1280.4
Public Spending on Education	177	2688	4.37	2.44	0.12	41.78
Public Spending on Health	183	915	3.39	1.78	0.2	8.5
Ethno-linguistic fractionalization	128	5639	0.42	0.29	0.004	0.93

Table A3
Correlations between variables of interests

	MF (FH)	MF (RSF)	Gini	dem	lgdp	com	lit	inetus	dai	pop	hsp	esp
Media freedom (Freedom House)	1											
Med. freedom (RSF index)	0.78	1										
Gini	−0.39	−0.29	1									
Democracy (dem)	0.88	0.72	−0.34	1								
Log (GDP per capita) (lgdp)	0.62	0.40	−0.43	0.56	1							
Post-communist	−0.07	0.08	−0.26	0.03	0.001	1						
Literacy (lit)	0.49	0.27	−0.32	0.53	0.72	0.33	1					
Internet users (inetus)	0.55	0.42	−0.48	0.50	0.71	−0.08	0.46	1				
DAI index	0.68	0.46	−0.52	0.66	0.96	0.11	0.80	0.79	1			

Table A3 (continued)

	MF (FH)	MF (RSF)	Gini	dem	lgdp	com	lit	inetus	dai	pop	hsp	esp
Population (pop)	−0.10	−0.21	−0.04	−0.02	−0.04	−0.05	−0.03	−0.06	−0.02	1		
Health spending (hsp)	0.62	0.44	−0.44	0.57	0.71	0.13	0.59	0.61	0.7529	−0.15	1	
Education spending (esp)	0.16	0.10	−0.25	0.05	0.20	0.12	0.27	0.21	0.4005	−0.13	0.34	1
ELF	−0.28	−0.16	0.25	−0.32	−0.51	−0.17	−0.42	−0.34	−0.5233	0.02	−0.44	−0.09

Table A4
Description of the variables

Variable	Description
Media freedom index (Freedom House)	This index consists of components typically associated with media freedom: legal environment for the media, political pressures that influence reporting, and economic factors that affect access to information. It is based on various sources including correspondents overseas, traveling staff, international visitors, the findings of human rights and press freedom organizations, specialists in geographic and geopolitical areas, the reports of governments and multilateral bodies, domestic and international news media. It ranges from 0 (complete media freedom) to 100 (absolute absence of freedom); to make the results more tractable, we use an inverted index (new index = 100 − original index). Source: Freedom House 2004, www.freedomhouse.org.
Media freedom index (Reporters without Borders)	This index is compiled on the basis of worldwide survey carried out by journalist organizations. Respondents of the survey are various correspondents around the world, partner organizations for freedom of expression, as well as journalists, researchers, jurists and human rights activists. It ranges from 0 to 100, 0 being best (i.e. complete freedom); again, to make the pictures and coefficient more intuitive, we use an inverted index in the form new index = 100 − original index. Source: Reporters without Borders 2004, www.rsf.org.
Gini index	This is a numerical measure of income inequality that reflects the conventional geometric depiction known as the Lorenz Curve. Source: WIDER World Income inequality Database, http://www.wider.unu.edu/.
Democracy	Index of democracy. Varies from 0 to 10 with 10 corresponding to the strongest democratic institutions. Source: Polity IV dataset.
GDP per capita, PPP	GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in 1995 international dollars. Source: WDI World Bank.
Literacy	Percentage of adults (over the age of 15) who can read and write short simple statements in their everyday life. Source: Databanks International http://www.databanks.sitehosting.ne.
Population	Population, in millions. Source: WDI World Bank.
Internet users	Number of internet users per 1000 people. Source: WDI World Bank
Digital Access Index (DAI)	DAI index measures access to information and communication technologies (ICT). The DAI combines eight variables, covering five areas, to provide an overall country score. The areas are availability of infrastructure, affordability of access, educational level, quality of ICT services, and Internet usage. Source: International Communication Union, http://www.itu.int/ITU-D/ict/dai/.
Education expenditures	Public Spending on Education as % of GDP, Source: WDI World Bank
Health expenditures	Public Spending on Health as % of GDP, Source: WDI World Bank
ELF	Index of ethno-linguistic fractionalization, Source: Ethnicity, Insurgency and Civil War Project, Stanford University, http://www.stanford.edu/group/ethnic/publicdata/publicdata.html.

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