Els Opuscles del CREI

num. 44

December 2017

Mass media and its influence on behaviour

Ruben Enikolopov
Maria Petrova

CREi

Centre de Recerca
en Economia Internacional

The Centre de Recerca en Economia Internacional (CREI) is a research centre sponsored by the Universitat Pompeu Fabra (UPF) and the Generalitat de Catalunya. It is located at the campus of the UPF in Barcelona.

CREI's objective is to promote research in international economics and macroeconomics subject to the highest standards of academic scholarship.

Els *Opuscles del CREI* are the instruments for the diffusion of CREI's research beyond the academic world. Each *Opuscle*, aimed at a general public, gathers together conclusions and observations of specialized papers published, or about to be published, in professional journals. The opinions stated in *Els Opuscles del CREI* are the sole responsibility of the authors.

Pdf version of this *opuscle* and all the others *Opuscles del CREI* can be downloaded at: www.crei.cat/opuscles.

Published by: CREI
Universitat Pompeu Fabra
Ramon Trias Fargas, 25-27 - 08005 Barcelona
Tel. 93 542 13 88

Design: Fons Gràfic
ISSN: 2604-2266

Mass media and its influence on behaviour

Ruben Enikolopov and Maria Petrova

Mass media is the important source of information at the macro level in most of the countries. Information provided by mass media can affect a variety of outcomes ranging from results of the voting, to public policies, to ethnic violence, to teenage pregnancies. This opuscle reviews recent literature in economics that studies how mass media affects the behaviour of people. It first discusses recent theoretical models that can help to understand both incentives of media outlets and, correspondingly, people's responses. It then provides an overview of the empirical evidence that documents the effects of mass media on a variety of political and social outcomes.

1. Introduction

Mass media is a major source of information for the majority of population in most countries. It can shape public opinion and ensure popular support of particular politicians and policies. As a result, often politicians and other interested parties have incentives to influence the media to make sure it is friendly enough, whenever they have opportunity to do so. The main goal of this paper is to overview evidence on the effect of mass media on people's behaviour, primarily, in the political domain. However, since the influence of mass me-

dia provides incentives for politicians and other agents to influence media coverage, we will also discuss evidence of media capture and the impact of captured media.

This *Opuscle* reviews the recent economic literature on the effects of mass media. We start with briefly describing theoretical framework for analysing the effect of mass media. We then discuss the challenges of estimating media effects, and review papers that quantify media impact in various circumstances. Finally, we'll talk about the evidence for media capture and the limits of media captures.

2. Theoretical framework

There are two main theoretical explanations for why media can influence people's behaviour. First of all, it can change their beliefs by providing relevant information. Second, it can have a direct effect on behaviour, independently of people's information, through persuasion (see DellaVigna and Gentzkow 2010).

The effect of mass media through the provision of information can be explained by most standard models of rational Bayesian updating, such as informative (Stigler 1961) and signalling (Nelson 1970) models of advertising, cheap talk models (Crawford and Sobel 1982) and persuasion games (Milgrom and Roberts 1986). In most of these models it is assumed that the information that is provided is correct, and that if there is any bias in media reports, it will not have any effect on the behaviour of people, since it will be fully discounted in the process of rational Bayesian updating. However, in some models media bias can influence people's behaviour even if media consumers are rational (Kamenica and Gentzkow, 2011). Such effects take place if media omits some relevant facts or provides deliberately incomplete information. In these instances even fully rational Bayesian media consumers that are aware that the media is biased cannot fully undo the bias without getting access to more complete information from alternative sources. Therefore, biased media can have an effect on people's behaviour even in the situations when the audience knows about a potential bias in media reports (see Strömberg 2016, Prat 2016, and Gentzkow, Shapiro, and Stone 2016 for more detailed surveys of the theoretical literature on biased media).

The ability of media to influence behaviour by providing information and changing beliefs is more apparent in behavioural models that assume specific deviations from fully rational Bayesian updating that comes in the form of categorical thinking (Mullainathan, Schwarzstein, and Shleifer 2008), limited memory (Mullainathan 2002), or double-counting of repeated information (DeMarzo, Vayanos, and Zwiebel, 2003). In all of these models, mass media can have an important effect on behaviour even if it provides distorted and biased information, especially if people neglect the incentives of the sender of the information (Eyster and Rabin 2009). Overall, the literature suggests that it is very hard to "fool" fully rational Bayesian consumers of media, but it is much easier to do if the consumers are not fully rational.

Models in which media can change behaviour without affecting beliefs assume that information directly affects utility that people derive from certain actions (Stigler and Becker 1977, Becker and Murphy 1993). This type of theory includes the models of persuasive advertising (Bagwell 2007) and psychological models in which non-informative "peripheral" factors may play a central role (see for example, Petty and Cacioppo 1996).

There are several predictions of belief-based and persuasion-based models that in principle allow for distinguishing them empirically (DellaVigna and Gentzkow 2010). The two main specific predictions of the belief-based models is that; i) the effect of media will be stronger when receivers are less certain about the truth; and ii) the effect of media depends on its credibility. The two main predictions of the preference-based models are that: i) the content of media reports may affect behaviour even when it conveys no information; and ii) potential audience may take costly steps to avoid exposing themselves to persuasion by mass media. As we will see in the following section, there is clear evidence that supports predictions of the belief-based models (e.g. Enikolopov, Petrova, and Zhuravskaya 2011, Chiang and Knight 2011), but there are also studies that provide support for the preference-based models, especially in the context of advertising (e.g. Bertrand et al 2010).

3. Methodology

The first systematic studies of media persuasion date back to the 1940s. They were inspired by the seemingly effective mass persuasion campaigns organized by Joseph Goebbels in Nazi Germany in the 1930s. Perhaps surprisingly, these early studies, which were based on U.S. data, did not find any important media effects (Lazarsfeld, Berelson, and Gaudet 1944, Berelson, Lazarsfeld, and McPhee 1944). Concluding that media has only a minimal effect on people's behaviour, they found that media strengthens people's predispositions, so that people become more confident in the views they already hold. However, these studies faced a fundamental empirical challenge of endogeneity of media exposure. The choice of newspapers that people read, of radio stations that they listen to, or of TV channels that they view reflects people's preexisting beliefs and attitudes. Thus, if we look at two newspapers with a particular political stance and compare the behaviour of their readers, we do not know if the behaviour is different because reading the newspaper made people behave differently or because their preexisting political attitudes made them choose a particular newspaper and, at the same time, influenced their behaviour. Since the earlier studies have done little to address this issue, it remains unclear if the correlations that they uncover indeed reflect causation.

In contrast, more recent empirical studies of media effects are based on the idea of finding some source of exogenous variation in media exposure, or media content, to ensure that self-selection in media consumption or supply-side factors are not biasing the results. In other words, modern researchers use different, sometimes complicated empirical strategies to identify the causal impact of media exposure. Three empirical techniques, most widely used by researchers, are field experiments, difference-in-differences method, and instrumental variables approach.

3.1 Field experiments

The most reliable method of identifying causal effects in scientific research, which is often considered as the "gold standard" in empirical analysis, is conducting a field experiment. In the context of media studies, field experiments imply randomizing access to certain media outlet or specific piece of media content (e.g. particular radio or TV program).

For example, to study the effect of newspapers on political behaviour, Gerber, Karlan, and Bergan (2009) offered a 10-week-long subscription, free of charge, to either the *Washington Post* or the *Washington Times* to randomly selected residents

of the Washington, D.C., area. Comparing the voting outcomes for citizens that received free subscription to one of these newspapers with a control group (the group that has not received a free subscription to either of the newspaper) allows identifying causal effect of a particular newspaper on voting outcomes.

In another field experiment, Green and Vasudevan (2016) estimated the effect of a large-scale radio campaign in India aimed at persuading voters not to support politicians who were known to be engaged in vote buying. In the experiment, 60 different radio stations were randomly divided into two groups of equal size and in one of the groups radio stations were paid to broadcast a series of 60-second ads (each repeated 48 times over the course of several days). The ads contained a dramatized vignette that involved a conversation between two voters, one of which received a gift from a politician in exchange for his vote, and another one arguing that this was a corrupt practice and that the first voter should not support the politician. By comparing voting outcomes in areas in which citizens could listen to radio stations that were randomly assigned to transmitting these ads with areas in which citizens could listen to radio stations that were randomly assigned not to transmitting these ads, it was possible to identify causal effect of this anti vote-buying campaign.

Although field experimentation is the most reliable method for the study of media persuasion, it is rarely used in practice. First, implementation difficulties preclude researchers from randomizing media exposure. Second, it is not ethical to conduct field experiments to study media persuasion in real-world circumstances if there is a risk that media might provoke dangerous behaviour (e.g. ethnic violence). In these circumstances, researchers are forced to use various quasi-experimental variation or natural experiments to study the effect of media on the behaviour of interest.

3.2 The differences-in-differences approach

Another method to estimate the persuasive effects of media is to use so-called "difference–in-differences" (DID) approach. As in the experimental design described above, people exposed to mass media are considered to belong to the "treatment" group, while people not exposed to mass media belong to the "control" group. In contrast to experiments, however, individuals exposed to mass media may have some demographic or political characteristics, which are systematically different from those unexposed to mass media. If we observe the outcomes of interest for the treatment group before it was exposed to mass media, one can still estimate the causal impact of mass media by comparing how the difference between treatment or control groups changes after the treatment group got exposed to mass media. This comparison provides a reliable estimate of the causal effect of mass media under the "parallel trends" assumption, i.e. under the assumption that the distribution of subjects in treatment or control groups is such that the *difference* in people's behaviour of interest between the two groups in the absence of media exposure would have remained the same.

A widely known application of the "difference-in-differences" approach to the study of mass media is the study of DellaVigna and Kaplan (2007), who estimated the impact of Fox News on voters' behaviour in 2000 elections in the United States. A central empirical challenge in the paper was that pre-existing preferences for Republican party could drive both the demand for Fox News and voting for Republicans, making it difficult to understand whether exposure to Fox News truly shifted political behaviour or whether it simply reflected preexisting political views. To solve this

problem, the authors showed that the initial roll-out of Fox News was primarily determined by the constraints of local cable companies in each particular place and was not associated with the pre-existing trends in political preferences. This allowed the authors to estimate the effect of Fox News by comparing the *differences* in the votes for Republicans between places that received Fox News in 2000 and those that did not receive it, between 1996 (when Fox News did not yet exist) and 2000.

3.3 Instrumental variables approach

The instrumental variable (IV) approach is designed to solve the endogeneity problem, i.e. a situation in which people in treatment and control groups are systematically different, and, therefore, one cannot meaningfully compare them. The main idea behind this method is to find one or more factors, which influence media exposure, but do not directly affect the behaviour of interest through any other channel. If such factors can be identified, it is possible to estimate the causal impact of media exposure on the behaviour of interest by exploiting the part of the variation in media exposure that is driven by this factor. An example of a study that uses this approach is Strömberg (2004b). It examined the effect of radio on federal redistributive spending in the United States in the 1930's through a New Deal relief program. The hypothesis was that federal spending was higher when more voters listened to radio and, as a consequence, were better informed about the fact that the federal program was available. The problem in identifying this effect was that demand-side factors (such as general interest in politics) could explain both why some counties received more funds and why people in these same counties were more likely to listen to radio. To deal with this problem, the author used the fact that radio signal quality, together with radio ownership, depended on the geographic determinants of radio propagation, such as the proportion of woodland and ground conductivity. The idea was that these geographic factors were unlikely to influence relief spending directly, and, therefore, they could be used as "instrumental variables" to establish causal relationship of radio on federal spending.

A related method is based on estimating the signal strength of radio or television waves using models of electromagnetic propagation such as the Irregular Terrain Model (ITM). To the best of our knowledge, the paper by Olken (2009) was the first to employ ITM for the analysis of media effects in his paper that studied the effect of television and radio on social capital in Indonesia. The approach was based on a simple idea. Consider two villages: for one of them, a hill stands on the line of sight between a radio transmitter and the village that blocks radio waves and makes radio reception problematic; for the other one, there is free space with no obstacles between the transmitter and the village, so that the transmission is not worsened by topography. These villages could be similar in any other respect, except signal availability. Therefore, the existence of the hill between a transmitter and a receiver introduces a quasi-random variation in the availability of media. This approach works particularly well in countries or regions with rugged terrain, but is also suitable for more flat terrain, in which case the variation comes primarily from the curvature of the Earth. When feasible, this is a powerful method for identifying causal effects. Using this method Olken (2009) found that the availability of TV and radio indeed led to less participation in social life and lower self-reported trust, but it does not have an effect on corruption or other measures of the local quality of governance. There is a growing number of other papers using this method, including Enikolopov, Petrova, and Zhuravskaya (2011), DellaVigna et al. (2014), Yanagizawa-Drott (2014), Adena et al. (2015), Bursztyn and Cantoni (2016), Durante et al. (2016).

3.4 Identifying effects of specific media content

The methods described about allow the researchers to estimate the effects of specific types of media or specific media outlets, but not the effects of specific content within media outlets. An alternative approach to study media effects uses the fact that all media outlets have to respect the constraints of limited space and time, and thus they are forced to choose which content is deemed newsworthy. Whether a particular piece of news is reported or not, and whether it is given a lot of coverage, should depend, partly, on the presence of other newsworthy material. For example, Eisensee and Strömberg (2007) studied whether media coverage of non-U.S. natural disasters increases the probability that the U.S. government provides disaster relief funds. For an empirical researcher, a problem is that some disasters are more likely to attract disaster relief funds for reasons that are not related to the media coverage, depending, for example, on the severity of a disaster or the needs of the potential recipients. All these factors could at the same time affect whether the event is deemed newsworthy. To deal with this problem, Eisensee and Strömberg (2007) exploited the timing of natural disasters, or, more specifically, whether or not these disasters occurred during some other newsworthy events (e.g., the Olympic Games), in which case, news about a disaster are crowded out and receive less attention. Under the plausible assumption that the timing and the severity of natural disasters are not related to scheduled major sports events, news coverage, driven by these events, is as good as randomly assigned. Using this empirical method, the authors then showed that indeed when there is less media coverage of natural disasters, due to Olympic Games or other unrelated events, there is substantially less humanitarian aid allocated by the United States in relief funds.

A similar approach is used in Durante and Zhuravskaya (2016), who analysed strategic timing of certain events, rather than the effect of media content. They provided evidence that Israeli attacks in the Israel-Palestinian conflict, which are associated with the risk of civilian casualties, are strategically timed to reduce their potential coverage in the U.S. media. In particular, they are more likely to occur a day before some predictable major newsworthy events, which are distracting attention of the viewers in the United States. Their results imply that international media attention can partly explain the dynamics of a major long-term military conflict.

4. Evidence on media influence

In this section we provide a review of empirical evidence that demonstrates important effects of mass media on political and policy outcomes (subsection 4.1), violence and nationalism in conflict environments (subsection 4.2), such social outcomes as education and fertility (subsection 4.3), financial markets (subsection 4.4), as well as the growing evidence on the effects of social media (subsection 4.5).

4.1 Influence of media on political and policy outcomes

McMillan and Zoido (2004) provide the first detailed forensic evidence of the role of media in politics. Their paper, in particular, studies Peru during the times of Fujimori, when Vladimir Montesinos, the chief of secret police, paid bribes and kept the records of these bribes paid to different actors, such as politicians, judges, and the heads of media outlets. The paper demonstrates that the directors of TV channels were paid much larger bribes, as compared with judges or politi-

cians. Overall, Montesinos paid 100 times more in bribes to media outlets than to all politicians and judges together. In exchange, the directors of TV channels allowed Montesinos to view daily news programs before airing them to the audience and to select information about political candidates to be broadcasted, after his written approval. Therefore, in Peru mass media seemed to be the most expensive threat to a corrupt political system, worth regular payments of extensive bribes. This proved to be the right assessment of the power of mass media, since eventually it helped to bring an end to Fujimori's regime. One of the videos that showed Montesinos giving a bribe to a congressmen was leaked, and one small cable TV channel, whose director refused to take bribes, started to show this video around the clock instead of its regular programming. To promote dissemination, people put large TV sets in the streets to show the channel to those who did not have subscription to the cable channel. Even bribed channels soon also started to broadcast the video, as otherwise they risked losing their audience. As a result, the number of people opposing the regime increased quickly, and eventually Fujimori was forced to resign and flee the country. This example provides a vivid illustration of the importance of mass media in determining political outcomes.

There is a substantial body of empirical evidence that shows that mass media has an important causal impact on political and policy outcomes. For example, the paper by Strömberg (2004b), mentioned above, showed that the availability of radio in the United States in the 1930's increased the turnout in gubernatorial elections and had a positive effect on public spending, with one percent increase in radio penetration in a county leading to 0.61 percent higher federal spending per capita in a county.

Snyder and Strömberg (2010) provided additional evidence on the influence of media coverage on political accountability. Their study first made the observation that geographical political markets (electoral districts) and media markets of the newspapers sometimes coincide, but sometimes their overlap is imperfect. Specifically, one can measure the overlap – or congruence – between media markets and U.S. congressional districts. The higher is the congruence, the higher is the share of the newspapers' audience that is interested in a particular congressman. As a result, the local press covers "its" U.S. House representatives more in some districts, as compared with the others, for reasons not related to other determinants of information, people's political attitudes, or people's political behaviour. Using the method of computing congruence between political and media markets for identification, Snyder and Strömberg (2010) find that low degree of congruence (i.e., a low overlap between media and political markets) leads to lower levels of political knowledge and lower turnout in congressional elections. This, in turn, has an adverse effect on political accountability, so that the politicians representing communities with low congruence work less for their constituencies, which results in lower federal spending per capita.

DellaVigna and Kaplan (2007) demonstrated that a politically biased TV channel, such as Fox News, increases the number of votes received by the candidates supported by this channel in the elections. In particular, it showed that Fox News increased the vote share for George W. Bush by 0.5 percentage points. Although the magnitude of the effect appears small, the 2000 Presidential elections in the United States were so close that according to the authors' estimates, Fox News could have changed the outcome of the elections.

The results of the field experiment in Gerber, Karlan, and Bergan (2009) provide evidence that politically biased newspapers can also affect electoral outcomes. They showed that residents of Washington D.C. who received a free subscription to the *Washington Post*, which is known for its liberal bias, were eight percent more likely to vote for a Democratic candidate in an upcoming gubernatorial election. Similarly, Chiang and Night (2011) show that explicit endorsements of candidates by newspapers have an effect on voting outcomes, although the effect is stronger if the endorsement is "surprising" (e.g. if a democratically-leaning newspaper endorses a republican candidate).

There is also mounting evidence from non-US countries about the importance of media for political outcomes. For instance, Ferraz and Finan (2011) provided evidence that voters in Brazil are less likely to vote for the candidates who were exposed to be more corrupt than average. However, this effect is observed only in places with a local radio station that disseminated information about corruption of the incumbent mayor. Similar evidence for Mexico is provided in Larreguy et al (2014).

Finally, the results of the field experiment described in Green and Vasudevan (2016) indicated that an anti-vote-buying campaign was successful and led to more than four percentage points reduction in the vote share of the parties, accused in vote buying practices.

All the evidence on media effects presented so far comes from countries with free and independent media. But can an independent media outlet change people's behaviour if most media outlets in a country are controlled by the government? Theoretically, media effects could be even stronger in this case, as compared with the case of a fully competitive, non-captured media market (e.g. Besley and Prat 2006). Enikolopov et al. (2011) addressed this question by studying the impact of an independent Russian TV channel on voting in the Russian Parliamentary elections of 1999. In particular, the authors used the fact that there was only one independent TV channel (NTV) at that time, whereas all the remaining channels were state-controlled. The state-controlled channels supported the pro-governmental party *Unity*, the party that helped Vladimir Putin to come to power, whereas NTV provided a more even coverage of the main parties. Importantly, NTV was available for approximately two thirds of Russian population, while 99 percent of the population had access to the state-controlled TV channels. Exploiting the fact that access to NTV depended primarily on exogenous geographic factors, the authors found that NTV increased the combined vote share of the opposition parties by 6.3 percentage points, while decreasing the vote share of *Unity* by 8.9 percentage points. In a similar vein, Barone et al. (2016) showed that introduction of digital TV in Italy decreased the audience of the channels controlled by Berlusconi and led to a reduction in public support of parties associated with Berlusconi by 5.5–7.5 percentage points, with the effect being stronger in municipalities with older and less educated voters. These results together imply that media effects in Russia and Italy are stronger than the ones found in the United States (see DellaVigna and Gentzkow, 2010 for a detailed overview), consistent with the idea that media effects are, on average, stronger in captured environments.

Even in environments in which media is fully controlled by the government, people can still be influenced by foreign media. For instance, Hainmueller and Kern (2009) study the influence of cross-border exposure of people in Eastern Germany to the television from Western Germany. They show that Western TV had an adverse effect

and Eastern Germans that exposed to it were more likely to be supportive of the communist ideas and less likely to apply for asylum in the West. At the same time, Garcia-Arenas (2015) shows that the exposure to *Radio Liberty* decreased the number of votes received by the communists in the first Russian democratic elections in 1991. Taken together, these results demonstrate that independent media have especially important effects in the environment in which most other media outlets are controlled by the state.

4.2 Influence of media in conflict environments

Examples described above cover non-conflict environments, mostly in reasonably democratic countries where the stakes of changing individual behaviour are relatively small. Much less is known about the role of mass media in promoting intrastate and interstate violence, and how political elites may exploit persuasion methods to achieve political goals through violent means.

One of the first papers on this topic is Yanagizawa-Drott (2014), which studied the effect of propaganda during the 1994 Rwandan genocide. In particular, the author investigated the effect of government-backed radio station Radio Télévision Libre des Mille Collines (RTLM) that led propaganda efforts to spread hate against the Tutsi minority population, encouraging the Hutu majority population to kill Tutsi minority. Listening to the station could have affected violence via two broad mechanisms, direct and indirect persuasion. First, *direct persuasion* means that some marginal listeners could have been convinced that participation in attacks on Tutsi was preferable to non-participation. This mechanism is plausible given that the broadcasts contained not only strong anti-Tutsi rhetoric that may have increased hatred, but also information about relevant tradeoffs: they made it clear that the government would not punish participation in the killing of Tutsi citizens, but instead encouraged such a behaviour. Second, a direct persuasion effect could coexist or be reinforced with *indirect persuasion* through social interactions. A key element of radio broadcasts is that they are public, so that everybody who listens knows that all the other listeners receive the same messages. Thus, radio broadcasts can work as a coordination device.

Using the ITM model approach, described above, Yanagizawa-Drott (2014) showed that RTLM's hate messages indeed increased participation in the violence perpetrated by both local militia and ordinary citizens. The magnitude of the effect was quite large, and the estimates suggest that approximately 10 percent of participation in the genocide could be attributed to RTLM broadcasts. The results also provided evidence of spillover effects: radio reception in any given village not only increased militia violence in that village, but in nearby villages as well. Moreover, the magnitudes of the effects suggested that spillovers had a greater aggregate effect on militia violence, as compared with the direct effects of radio signal reception. This latter result indicates that one channel by which mass media can amplify mass violence is through coordination and social contagion. Thus, both direct and indirect persuasion seemed to have mattered.

Adena *et al.* (2015) studied the effect of radio in another historically important context, that of Germany in the 1930's. Combining panel ITM-based data on radio signal availability with the data on changes in radio content of radio broadcasts they documented several findings. First, they showed that radio did not affect voting outcomes before 1929, when the content of the radio was apolitical, but reduced voting for NSDAP and Hitler in 1930 -1932, when the content of the radio was

biased against the Nazis. Second, after Hitler was appointed the Chancellor, exposure to radio had a positive effect on different indicators of Nazi support, such as voting for Nazis in the last competitive elections of March 1933 and joining the Nazi party. Third, in the late 1930s radio increased anti-Jewish acts and denunciations of Jews to authorities by ordinary citizens. However, the paper also documented an important heterogeneity in these results, as the effect of radio crucially depended upon people's *predispositions* to Nazi messages. Specifically, the effect of the radio was stronger in places in which people were historically predisposed toward Nazi messages (as measured by historical anti-Semitism since the fourteenth century, votes for nationalistic parties in 1924, or by historical land inequality). At the same time, propaganda backfired in places with negative predispositions toward Nazi messages and led to *less* anti-Jewish violence. This finding is consistent with the findings in Yanagizawa-Drott (2014) that the effects of hate radio were significantly weaker in areas with higher primary education levels and literacy rates, indicating that investments in education may mitigate people's susceptibility to inflammatory propaganda in times of conflict.

Mass media can have an effect not only during the conflict, but also in a post-conflict environment. For example, DellaVigna, et al. (2014) studied the impact of foreign radio on postwar nationalism and reconciliation in the context of former Yugoslavia. In particular, they study the effect of Serbian public radio in 2000s, which still carried nationalistic, anti-Croatian content, on the behaviour of radio listeners in Croatia. They established several facts: first, according to survey data, many ethnic Croats listened to Serbian radio despite it being hostile to them; second, in places where Serbian radio was available in the 2000s, people were more likely to vote for extreme nationalist parties and more likely to draw nationalistic graffiti; and, third, Croatian subjects in a field-based laboratory experiment exhibited more anti-Serbian sentiment after listening to just 10 minutes of Serbian radio. The laboratory experiment in particular sheds light on the mechanism, as even neutral (not nationalistic) Serbian radio still had a positive and significant effect on anti-Serbian attitudes.

Overall, the results in this subsection indicate that at least in some circumstances media can have a significant impact on fuelling major outcomes such as violence and nationalism and prevent post-conflict reconciliation.

4.3 Influence of media on education and social outcomes

In the previous sections, we focused mainly on the effects of mass media on political outcomes. However, the effects of media exposure are not limited to political domain and can be manifested in a variety of other areas ranging from education to fertility decisions.

Some recent papers look at the effect of media exposure on education. Theoretically, the effect of TV on education is ambiguous. On the one hand, as long as TV programs contain useful information that is presented in a rich language, watching such programs can improve knowledge and increase language proficiency. On the other hand, watching TV can crowd out more useful activities such as reading, studying, social interactions etc., and, thus, have a negative effect on individuals' development, especially for young children. Thus, whether the effect of TV on educations is positive or negative is ultimately an empirical question. Gentzkow and Shapiro (2008b) used the difference-in-differences approach, described above, to estimate the effect of TV exposure in early childhood on educational outcomes of young adults. In particular, they exploited the fact that television

licenses in the Unites States in the 1940s and early 1950s were given out in waves, so that some areas were getting access to national TV much earlier than others for seemingly random reasons. Using data for over 300,000 American school students in grades 6, 9, and 12, collected in 1965, the authors estimated how the length of exposure to TV during early childhood affected student's performance in standardized tests in math and English. The results in the paper indicated that, contrary to popular beliefs, exposure to TV did not have any negative effect on educational outcomes. Moreover, it had some positive effects as it led to improvements in test scores in English for minorities and immigrants.

Kearney and Levine (2015a) provided another piece of evidence on the potential positive effects of television on education outcomes. They used idiosyncratic variation in the availability of the TV stations that broadcasted children's educational program, *Sesame Street*, to estimate the effect of exposure to this program, which aimed specifically at improving first-grade readiness of the children. The results in the paper indicated that outcomes of the children, who lived in areas with better access to Sesame Street, were indeed better during their school years, especially for boys, Blacks, and those living in disadvantaged neighbourhoods. However, there was almost no detectable effect of the program on longer-term outcomes, such as college attendance, employment, and wages. Importantly, the papers that find positive effect of television on education examined the effect of national and public television. The results in Gentzkow and Shapiro (2008b) and Kearney and Levine (2015a) related to the effect of national and public television respectively. The effect of commercial entertainment television seems to be quite different. In particular, there are papers that show that the exposure to commercial TV in Italy and Norway had a lasting negative effect on children's cognitive abilities (Durante et al 2016, Hernæs et al 2016).

Television can also affect family outcomes, such as fertility and family planning by exposing the viewers to particular role models their entertainment content. For example, La Ferrara et al. (2012) estimated the effect of soap operas on fertility rates in Brazil. The reason why the soap operas could have had such an effect is that the main female characters in these series are usually women with no children or just one child, which was very different from the number of children per woman in traditional families. The paper exploits detailed data on the expansion of the media giant Rede Globo, which was the main provider of soap operas, to estimate the effect of soap operas on fertility using the difference-in-differences approach. The results indicate that watching Globo indeed led to significant decrease in fertility, especially among the women of lower socio-economic status. The magnitude of the effect suggests that the expansion of Globo can account for about seven percent of the reduction in the probability of giving birth in the decade of 1980–1991. Using a similar approach, Chong and La Ferrara (2009) show that expansion of Globo not only decreased fertility, but also increased the divorce rate.

Effects of television on family outcomes are not limited to developing countries. In a recent study, Kearney and Levine (2015b) examined the effect of a popular MTV show *16 and Pregnant* on teenage pregnancies in the United States. This show, about the life of teenagers during pregnancy and early days of motherhood, essentially demonstrated how difficult this life is, which can encourage the viewers to avoid such situations. The paper exploits an instrumental variable approach, which uses popularity of MTV shows before the introduction of *16 and Pregnant* as a source of exogenous variation in the viewership of the show.

The results indicated that the show increased information seeking on birth control and abortion in the Internet and, eventually, led to a significant decrease in in teen births, which could explain up to a third of all the decline in in teen births in the US at that time.

Overall, there is a significant body of evidence that mass media can affect a variety of important social outcomes that are not limited to education and family outcomes, but also include migration (Farre and Fasani 2013), consumption (Bursztyn and Cantoni 2016), beliefs in the drivers of success (Hennighausen 2015) or violence (Dahl and DellaVigna, 2009, Card and Dahl 2011). See DellaVigna and La Ferrara (2016) for a more detailed overview of this literature.

4.4 Influence of media on financial markets

There is a growing body of evidence that mass media plays an important role in financial markets (see Tetlock 2015 for a survey). Media reports on specific companies were shown cause a significant increases in trading activity of individual investors. Engelberg and Parsons (2011) compared the trading behaviour of investors exposed to different local media coverage of the same information event – firm earnings announcements. It showed that daily trading activity of individual investors increases by 48 percent if a local newspaper covered an earnings announcement of a specific firm. Peress (2014) exploited newspaper strikes as a source of exogenous variation in media coverage. The study showed that the strikes reduce daily trading volume by 14 percent and return volatility by 9 percent. It also showed that this effect is stronger for small stocks, which have high individual ownership.

A number of studies demonstrated that the tone of media coverage had an effect on market outcomes. The study by Tetlock (2007) was one of the first to apply automated content analysis to the text of news articles about the stock market. It demonstrated that the fraction of negative words in financial columns in the *Wall Street Journal* were associated with lower same-day stock returns and predict lower returns the following day. Within a week of a publication with highly negative tone, stock prices completely recovered to their initial level on the day of the column, which was consistent with the interpretation that negative tone of the articles represented pessimistic sentiment, which temporarily influenced stock prices. Garcia (2013) uses a similar methodology to study the effect of publications in the *New York Times* in the period 1905–2005 and shows that media sentiment is especially important during the recession.

Tetlock, Saar-Tsechansky, and Macscassy (2008) analysed the tone of firm-specific newspaper stories, rather than financial columns related to market as a whole. They showed that the number of negative words in the articles predict negative information about firm earnings even if one takes into account traditional measures of firm performance. They found that stock market prices immediately incorporated over 80 percent of the information from negative words, although there was also a significant delayed reaction. This evidence suggests media articles provide information on the aspects of firms' fundamentals that are hard to quantify and are only slowly absorbed by the market due to investors' inattention.

Fang and Peress (2009) demonstrated that investor awareness of particular stocks increases valuation of these firms. They used firm-specific media coverage in four major national newspapers as a proxy for investor attention and showed that stocks without media coverage in the prior month earned three percent higher annualized returns than stocks with above-average media coverage.

The effect was much stronger for stocks with low market capitalizations, low analyst coverage, high individual investor ownership, and high idiosyncratic volatility.

There is also evidence that media plays an important monitoring role that affects corporate governance. For example, Dyck, Volchkova, and Zingales (2008) showed that corporate governance violations by Russian firms from 1999 to 2002 were more likely to be reversed, if they received attention from international newspapers such as the *Wall Street Journal* or *Financial Times*.

4.5 Influence of social media

Social media plays an increasingly important role as a source of information. In the end of 2016 62 percent of adult U.S. population indicated that they get news on social media. One of the key distinguishing features of social media is that it allows for large number of users to converse directly without intermediaries at a very low cost. New evidence demonstrates that this feature can have important consequences for political behaviour, as it increases the role of social influence and makes it easier for the users of social media to coordinate and overcome collective action problem.

Enikolopov, Makarin, and Petrova (2016) provided evidence that social media penetration has a causal effect on participation in political protests. In particular, the paper showed that penetration of VK, the dominant Russian online social network, affected protest activity during a wave of political protests in Russia in 2011. To take into account endogenous nature of social media penetration the paper used the IV approach, which relies on the fact that people who were directly or indirectly acquainted with the founder of the social network, were more likely to join it. In particular, the paper used information on the city of origin of the students who studied together with the founder of VK, controlling for the city of origin of the students who studied at the same university several years earlier or later, as a source of exogenous variation in network penetration. The intuition behind this identification strategy was that students who studied together with the founder of VK were more likely to be the first adopters of the network, which made their relatives and friends in their hometowns also more likely to join the network. Their results indicated that a 10 percent increase in VK penetration increased the probability of a protest by 4.6 percent, and the number of protesters by 19 percent. At the same time, VK penetration increased pro-governmental support, with no evidence of increased polarization, which suggested that social media has affected protest activity by reducing the costs of coordination, rather than by spreading information critical of the government.

In a different setting, a large-scale field experiment, conducted by Facebook during the 2010 U.S. Congressional Election, showed that an online get-out-the-vote message had an effect on the real world voting behaviour, (Bond et al. 2012). In particular, more than 61 million users of Facebook users were randomly allocated to one of the three groups. The first treatment group, which consisted of about 0.6 million users, was shown an "informational message" on the top of their News Feed that encouraged the user to vote, provided a link to find local polling places, showed a clickable button reading 'I Voted', and showed a counter indicating how many other Facebook users had previously reported voting using this button. The second treatment group, which consisted of more than 60 million users, in addition to the same informational messages, was shown a "social message," which consisted of six small randomly selected 'profile pictures' of the user's Facebook friends who had already clicked the 'I Voted' button. Finally, the control group, which

also consisted of about 0.6 million users, did not receive any message at the top of their News Feed. Around 6 million of users in the experiment were matched to publicly available voter registration records, which made it possible to study the effect of messages on actual voting behaviour.

The results demonstrated that getting the "informational message" made people more likely to click on the "I voted" button, but had no effect on their actual voting. The "social message", however, not only increased the number of users who clicked 'I Voted' button, but increased the number of people who actually voted by 0.39 percent. This social influence effect was limited to "close friends" who interact frequently on Facebook and, thus, were more likely to have stronger real-world relationships. The magnitude of the results indicated that the message directly made 60,000 additional people to vote in 2010. Importantly, by comparing the voting behaviour of the friends of those who received the message and the friends of those who did not, the study found that the message indirectly influenced an additional 280,000 people to vote. These results were confirmed by a replication study that conducted a similar experiment during the 2012 presidential elections and showed that the results not only hold, but also are very similar in magnitude (Jones et al 2017). Overall, these results demonstrated that online social networks can affect offline behaviour through social influence mechanisms and that the indirect effects of messages in social media could be several times stronger than the direct effects.

There is also evidence that social media affects not only political, but economic and financial outcomes. For instance, Enikolopov, Petrova, and Sonin (forthcoming) have shown that publications in a Russian blog about corruption in state control companies not only had a significant effect on stock market performance of these companies,

but also, in longer run, were associated with improvements in corporate accountability. Chen, De, Hu, and Wang (2013) found that the content of the crowdsourcing platform *Seeking Alpha* predicts future returns of the companies discussed in this forum.

Taking into account increasing importance of social media as a source of information, we expect to see more papers on the effects of social media in the coming years.

5. Media capture

The fact that media has such an important influence on political and social outcomes provides strong incentives for the interested parties to try to exploit the power of media to achieve their own private goals. A situation in which the editorial policy of a media outlet is influenced by the interests of some group (e.g. politicians, advertisers, special interest groups), which results in reporting of deliberately biased information, is called media capture. In this subsection, we summarize empirical evidence of media capture, discuss the relationship between media and political outcomes in captured environments, and talk about the limits of media capture.

5.1 Capture by politicians

When mass media is free from external influence, it plays an important role in promoting government accountability, as it monitors public officials and can uncover and publish the stories about the government misbehaviour.[1] Incumbent politicians or governments can control media outlets through various channels, e.g. direct ownership, media regulation, provision of subsidies or other form financial resources. Whether mass me-

dia can improve government accountability even if the government is able to control it is an open question. Theoretically, competition between outlets can force even captured media to reveal some information, although not to the same extent as independent sources (Besley and Prat 2006, Gentzkow and Shapiro 2008a, Gehlbach and Sonin 2014), though conditions for the beneficial impact of competition are not straightforward (Gentzkow and Kamenica 2017).

Documenting the effect of media capture is not simple. To show that media bias occurs as a result of media capture, it is necessary to show that the bias is a *consequence* of media capture, and does not merely reflect the fact the politicians simply choose to subsidize media outlets, which provide media coverage that is more aligned with politicians' interests for reasons unrelated to media capture. Another empirical issue is that media bias comes in many different forms. Usually, media bias is understood as the situation when media content is favourable to sponsoring groups, so that the way certain topics are covered is distorted. However, media outlets may also be involved in selective coverage and try to influence their audience through agenda setting, priming, or filtering.

Newspapers in the United States in the second half of the 19th century and the beginning of 20th century provide a nice example for those studying media capture, since at that time the newspapers explicitly reported affiliations with specific political parties. The New York Times, for example, was founded as a Republican newspaper, i.e. newspaper officially affiliated with the Republican Party. Gentzkow et al. (2015) have provided systematic study of the influence of the politicians in power on the affiliation of American newspapers between 1869 and 1928. They found that there is no evidence that incumbent governments influenced the newspapers. In particular, they found no significant impact of the party in power on political affiliation of the newspapers, their circulation, or their content. However, an important exception is the newspapers in the South during and after the Reconstruction after the Civil War. For this period, the authors found that the party in power had a strong effect on the partisan affiliation of newspapers and their circulation. More specifically, if the party in charge of the state government was Democratic after being Republican, it was associated with an increase in the share of circulation of Democratic daily newspapers by approximately 10 percentage points. These results imply that in a democratic setting media outlets are not typically controlled by the governments, probably because of the strong market forces, but media capture can still be present when the media market is particularly weak and/or political incentives are strong enough.

The direct provision of monetary subsidies from government, for example through government-sponsored advertising, is one of the methods used by the governments to control media and to make sure that media coverage is favorable. For instance, Di Tella and Franceschelli (2012) investigated how often stories about corruption are mentioned in the newspapers that receive financial support from the government in the form of government advertising. To do that, the authors analysed the content of the front pages and the types of advertising that appeared in the newspapers for the four main newspapers . They showed that newspapers in Argentina during 1998-2007 that relied on government advertising were less likely to report about government corruption. The magnitude of the effect implies that one standard deviation increase in government advertising leading to a decrease in coverage of corruption scandals equal to 23 percent of a front page per month. Szeidl and Szucs (2017) provide evidence that under right-wing—but not left-wing—govern-

ments in Hungary, state-owned firms heavily tilted advertising to connected newspapers. In return, connected media provided less coverage of corruption scandals. Overall, these results imply that the newspapers in special relationships with the government in power are less likely to cover corruption scandals.

Media regulation is yet another method employed by the governments to control mass media and affect media coverage. For instance, Stanig (2015) found that defamation laws are strong determinants of media coverage of corruption stories in Mexico in 2000s. In particular, he shows that local newspapers devoted less space to corruption coverage in Mexico in 2001 in those states in which defamation laws were stricter. This finding is consistent with the idea that state regulation of media markets, and defamation laws in particular, could be one of the ways to control mass media. Starr (2004) provided a historical overview of media regulation, media development, and media capture in different countries, and reaches similar conclusions. In sum, in various countries and during different time periods we can see the same pattern: in places with stricter media regulation incumbent politicians are less likely to receive critical coverage by mass media.

Media outlets not only cover news, but also give opportunity to different politicians to speak directly to the public, which provides another way to introduce distortion in media coverage. If the government controls the media, some politicians might have abundant access to media broadcast time, while some others rarely have any opportunity to appear in the media. For example, Enikolopov et al. (2011) provided evidence on the frequency of appearances of different politicians in Russia in 1999 on different national TV channels. They find that the state-controlled channels were indeed giving more time to pro-government politicians. In a similar vein, Durante and Knight (2012) show that in Italy politicians from the Berlusconi party were more likely to appear on public TV when Berlusconi was a Prime Minister. Relatedly, Adena et al. (2015) demonstrate that the politicians from the Nazi party had almost zero access to radio before 1933, but were given disproportionately large access to radio in February 1933, after Hitler was appointed the Chancellor of the Weimar Republic. In summary, there is plentiful evidence from a variety of contexts that captured media indeed provide disproportionate access to some politicians, but not to others.

Finally, mass media can be affected by government even in the countries with high levels of media freedom via differential access to certain types of information (Gentzkow and Shapiro 2008a). For example, Qian and Yanagizawa-Drott (2015) have found that foreign policy interests of U.S. government affected human rights reporting in U.S. newspapers. To identify the effect, they used random assignment of non-permanent members of the Security Council of the United Nations. They showed that the coverage of human rights violations in the countries that were not U.S. allies was higher when those countries were the members of the UN Security Council. At the same time, for the countries that were strong allies of the United States, such coverage decreased during the years of their membership in the UN Security Council.

In the recent years, with the technological progress and the proliferation of new information technologies, media capture also takes new distinct forms. If the government cannot perfectly control all information available in the public sphere, e.g. in blogs and online news aggregators, it can use a different censorship strategy and engage in selective deletion of information. A case in point is China, where ex-post deletion of particular types of online content has become widespread.

King et al. (2013, 2014) examined what types of online content is more likely to get censored in modern China. They showed that Chinese censors were deleting primarily appeals for any types of collective action, even if the latter was related to pro-government coordination. At the same time, they did not find evidence of censoring of blog posts that contained critique of the Communist Party and of the incumbent regime. In addition to censoring unwanted content, government can distort the content of social media by fabricating posts through paid bloggers. The results in King et al. (2017) indicate that Chinese government is engaged in a massive operation to alter the content of social media and its strategy is not to go after the critics of the regime, but to avoid discussing controversial issues and to distract the public and change the subject.

5.2. Capture by other interest groups

Governments and incumbent politicians are not the only players interested in influencing mass media. Various other interest groups, including media owners, journalists, advertisers, and private companies, might also have incentives to distort media coverage. Reuter and Zitzewitz (2006) showed that the financial recommendations of financial magazines and newspapers about investment in mutual funds in the U.S. were correlated with the amount of advertising money these magazines and newspapers get. One exception is *Wall Street Journal* for which the bias was found to be statistically indistinguishable from zero. Similarly, Gambaro and Puglisi (2015) showed that in Italy newspapers cover advertisers more favourably using a thorough data analysis that takes into account time-invariant unobservable characteristics of both newspapers and advertisers. There is also evidence that media could be biased in favour of other special interest groups, such as environmental groups (Shapiro 2016) or landless peasants (Allston et al. 2010).

Overall, there is empirical evidence that the phenomenon of media capture is not limited to the capture by governments. Nevertheless, government control of media received more attention of researchers for two reasons: first, governments have better means to control media and, second, the implications of such a control for the social welfare are much larger. Whether different types of media capture interact with each other in a meaningful way is an open question and we expect to see more papers about this topic in the future.

5.3 Determinants of media capture

Whether media is captured or not depends on both supply-side factors, i.e. the incentives of politicians or other special interest to influence the media, and demand-side factor, i.e. the incentives of the profit-maximizing media outlets to change their coverage to tailor to the preferences of the audience. Low political competition and direct state ownership of the media are often associated with the government control of media (see, for example, Djankov et al., 2003), but that they are not the only important factors. Equally important is the ability of media outlets to raise some independent revenues. For instance, Gentzkow et al. (2006) analysed key trends in the newspaper market in the United States in the end of 19th and the beginning of 20th century and provided a theoretical model that predicts media to be more independent from external influence if marginal advertising revenue is higher or the marginal cost of production is lower. Petrova (2011) empirically tested this claim and investigated whether the growth of private advertising indeed helped newspapers to become independent in the 19th century U.S. In particular, the paper found that in places with higher advertising revenues, the newspapers were more likely to enter the market with "independent", non-partisan affiliation and were more likely to switch

their political affiliation from partisan (Republican or Democratic) to independent. This effect was also holding when the author used the instrumental variables approach, focused on the changes in advertising revenues driven by the restrictions on outdoor advertising and handbill distribution. Overall, the results in the paper were consistent with the hypothesis that the growth of advertising was an important factor driving the development of independent press in the 19th century U.S.

Media capture also depends on the incentives of the government and other special interests. Egorov et al. (2009), for example, found that higher oil rents are associated with less media freedom, and this effect is especially strong in nondemocratic countries. They argue that higher media freedom is associated with better quality of bureaucracy through increased monitoring of their actions and it is the main reason why free media could be tolerated in dictatorships. Higher rents from oil and other natural resources diminish incentives of the governments to have high-quality bureaucracy and, as a result, these governments care less about monitoring the bureaucracy and can afford to control the media. Consistent with this explanation, Qin et al. (2016) have shown that in China the topics that are discussed in the newspapers depend on how strong is the control of the newspapers by the Communist party. In particular, they have shown that the most tightly controlled media outlets are the newspapers most likely to write about low-level political corruption, whereas newspapers that depend more on commercial revenues are less likely to report about low-level corruption and, relatedly, are more likely to produce entertaining content, such as sports or celebrity stories. VonDoepp and Young (2013) showed that media freedom is affected by regime stability, because governments that face threats to staying in power have stronger incentives to control the media. Finally, Petrova (2008) found that higher income inequality leads to lower media freedom. The paper argues that this happens because in more unequal countries rich elites have stronger incentives to manipulate public opinion in order to reduce the levels of taxation and redistribution.

Theoretical models suggest that media competition can serve as another force limiting the effect of propaganda (see, for example, Besley and Prat 2006 or Gentzkow and Shapiro 2008a). For instance, even though newspapers affiliated with political parties had biased content in the 19th century U.S., their entries and exits did not have a sizable impact on electoral choices, although they did affect political participation (Gentzkow et al. 2011). In a closely related work, Fonseca-Galvis et al. (2016) have studied the effect of media competition on media capture in the United States during the same time period. The authors show that newspapers were, not surprisingly, more likely to cover political scandals involving politicians from parties they were not affiliated with and less likely to cover political scandals involving politicians from "their" party. However, these effects were substantially lower in places with strong media competition. More specifically, if a co-partisan newspaper was the only newspaper in the local market during the scandal, it devoted significantly less space, if any, to this scandal. In contrast, in media markets, in which there were competing newspapers affiliated with other parties, even co-partisan newspapers ended up having at least some coverage of political scandals. In summary, both Gentzkow et al. (2011) and Fonseca-Galvis et al. (2016) imply that newspaper competition is indeed an important force that protects against media capture.

5.4 Limits of the effect of captured media

The fact that media capture happens indicates that at least politicians believe that media consumers could be influenced by propaganda. If the consumers are fully rational, however, that should limit the propaganda effectiveness, since the audience should realize that captured media are biased in a particular direction and, correspondingly, discount information coming from the captured media outlets, limiting the effect of propaganda to special cases of information omission that cannot be fully undone (Kamenica and Gentzkow 2011). In practice, nevertheless, such full discounting is unlikely to take place. For instance, according to worldwide surveys, people in the countries with state control of the media often have quite high levels of trust in media. According to the data from Global Trust Barometer, for example, the country with the highest level of trust in media is China, while U.S. and U.K. are both in the bottom third of the rating.[2] The results discussed above provide evidence that propaganda does have an influence on the behaviour of people (e.g. Yanagizawa-Drott, 2014 Adena et al 2015). However, a natural question is whether there are any limitations to the efficiency of propaganda and in which situations the effect of captured media is stronger. In this subsection we review some empirical evidence on the limits of media capture.

In theory, if media consumers know that the media can be captured, they should discount information coming from the biased media sources. Bai et al. (2014) conducted a lab experiment and tested this premise directly by studying how people update their prior beliefs about air pollution in China after they receive information from either government-controlled or relatively independent media. The authors found that people discounted repeated information coming from government-controlled media, though they did not discount repeated information, and, at the same time, the subjects had troubles interpreting conflicting information coming from pro-government and independent sources. These results are consistent with the findings of Chiang and Knight (2011) that endorsements in the newspapers in the United States had smaller influence on the behaviour of voters, if the newspaper is known to be biased in favour of the candidate it endorses.

Another mechanism that can limit the use of propaganda is so-called "backfiring" of propaganda. In particular, if the message in the captured media is too different from the prior beliefs of the audience, the propaganda can backfire and have an effect, which is the opposite of the intended. For example, Adena et al. (2015) found that the effect of Nazi radio broadcasts on people's anti-Semitic behaviour in Germany crucially depended on people's predispositions. On average, exposure to Nazi radio increased denunciation of Jews and led to more expressions of anti-Semitic violence. However, in places in which the population was historically tolerant to Jews or in places with low historical land inequality, exposure to Nazi radio actually had an opposite, negative effect on denunciation of Jews and anti-Semitic violence. These results are consistent with the idea that the effect of propaganda is the strongest when it is consistent with the preexisting beliefs of the audience, but can backfire if it runs in conflict with people's predispositions.

In addition to filtering out the bias in the captured media, the audience could also react by switching from captured media outlets to independent news sources. In particular, Durante and Knight (2012) find that viewers of the public channels in Italy in 1990s-2000s responded to the changes in the content of their favourite TV channels by switching to alternatives. More specifically, when Berlusconi came to power, news content on

public TV channels shifted to the right. After that, some right-wing viewers started watching public television, while the left-wing viewers, in contrast, switched from more centrist public channels to the left-leaning public channel. In the end, left-leaning viewers started to trust public television less, while right-leaning viewers reported higher trust in public TV. In a similar vein, Knight and Tribin (2016) have shown that viewers in Venezuela were turning off TV or switching to cable channels, when *cadenas* – unexpected Chavez speech that all non-cable channels had to show – were broadcasted.

Overall, the results reviewed in this section imply that media consumers respond to media bias and propaganda both by switching to other sources of information and by discounting information from a biased source, which, therefore, at least partially offsets the impact of media capture.

6. Conclusions

This *Opuscle* provides an overview of recent empirical literature on the role of mass media in influencing political, social, and financial outcomes. Empirical evidence indicates that mass media has a very important effect on a variety of outcomes, including political outcomes, such as electoral support of particular parties and participation in political protests, social outcomes, such as education outcomes and fertility decisions, and financial outcomes, such as stock returns and corporate governance performance.

The power of mass media provides strong incentives for the special interest groups to try to exploit this influence. There is plenty of evidence documenting media capture not only by governments and politicians, but by private special interests, such as advertisers. Media capture, however, is limited both by the market forces that provide incentives for the media to report truthful information and by the reaction of the audience, who are likely to discount information from biased sources and to switching to alternative sources of information.

There are several directions for future research that we envision. First, precise mechanisms for persuasion are far from being clear, and studying heterogeneity of the effects is very important for our understanding of media effects. New more detailed "big" data is now becoming available, thus allowing researchers to do what the previous literature could not achieve. Second, we still know little about the impact of new technologies, such as Internet and social media, on the behaviour of people and of media outlets. Finally, the role of media in autocracies besides propaganda is not fully clear and requires farther investigation.

Notes

(1) For an interested reader, Strömberg (2016) overviews this literature in more detail.

(2) http://www.edelman.com/post/freedom-of-the-press-and-trust-in-media/

References:

Acemoglu, D., T. Hassan, and A. Tahoun (2016), "The power of the street: Evidence from Egypt's Arab Spring", Working paper.

Adena, M., R. Enikolopov, M. Petrova, V. Santarosa and E. Zhuravskaya (2015), "Radio and the rise of Nazis in prewar Germany", *Quarterly Journal of Economics*, 130(4), 1885-1939.

Alston, L. J., Gary D. Libecap and B. Mueller (2010), "Interest groups, information manipulation in the media, and public policy: The case of the landless peasants movement in Brazil", NBER Working paper 15865.

Bagwell, K. (2007), "The economic analysis of advertising". A M. Armstrong and R. Porter (Eds.), *Handbook of Industrial Organization*, Vol. 3, Elsevier, 1701-1844.

Bai, J., M. Golosov, N. Qian and Y. Kai (2014), "Understanding the influence of government controlled media: Evidence from air pollution in China", Working paper.

Baron, D. (2006), "Persistent media bias", *Journal of Public Economics*, 90 (1-2), 1-36.

Barone, G., F. d'Acunto and G. Narciso (2015), "Telecracy: Testing for channels of persuasion", *American Economic Journal: Economic Policy*, 7(2), 30-60.

Berelson, B., P. F. Lazarsfeld and W. N. McPhee (1954), *Voting: A Study of Opinion Formation in a Presidential Campaign*. Chicago, IL: The University of Chicago Press.

Bernhardt, D., S. Krasa, and M. Polborn. (2008), "Political polarization and the electoral effects of media bias", *Journal of Public Economics*, 92 (5-6), 1092-1104.

Bertrand, M., D. Karlan, S. Mullainathan, E. Shafir and J. Zinman (2010), "What's advertising content worth? Evidence from a consumer credit marketing field experiment", *The Quarterly Journal of Economics*, 125(1), 263-306.

Besley, T. and R. Burgess (2002), "The political economy of government responsiveness: Theory and evidence from India", *Quarterly Journal of Economics*, 117 (4), 1415-52.

Besley, T. and A. Prat (2006), "Handcuffs for the grabbing hand: Media capture and government accountability", *American Economic Review*, 96(3), 720-36.

Bond, R. M., C. J. Fariss, J. J. Jones, A. D. Kramer, C. Marlow, J. E. Settle and J. H. Fowler (2012), "A 61-million-person experiment in social influence and political mobilization", *Nature*, 489, 295-298.

Bursztyn, L. and D. Cantoni (2016), "A tear in the iron curtain: The impact of western television on consumption behaviour", *Review of Economics and Statistics*, 98(1), 25-41.

Card, D. and G. B. Dahl (2011), "Family violence and football: The effect of unexpected emotional cues on violent behaviour", *Quarterly Journal of Economics*, 126, 1-41.

Chong, A. and E. La Ferrara (2009), "Television and divorce: Evidence from Brazilian novelas", *Journal of the European Economic Association: Papers & Proceedings*, 7(2-3), 458-468.

Chiang, C-F. and B. Knight (2011), "Media bias and influence: Evidence from newspaper endorsements", *Review of Economic Studies*, 78(3), 795-820.

Crawford V. and J. Sobel (1982), "Strategic information transmission", *Econometrica*, 50(6), 1431-51.

Dahl, G. and S. DellaVigna (2009), "Does movie violence increase violent crime?", *Quarterly Journal of Economics*, 124(2), 677-734.

DellaVigna, S., R. Enikolopov, V. Mironova, M. Petrova and E. Zhuravskaya (2014), "Cross-border effects of foreign media: Serbian radio and nationalism in Croatia", *American Economic Journal: Applied Economics*, 6(3), 103-132.

DellaVigna, S. and M. Gentzkow (2010), "Persuasion: Empirical evidence", *Annual Review of Economics*, 2(1), 643-669.

DellaVigna, S. and E. Kaplan (2007), "The Fox news effect: Media bias and voting", *Quarterly Journal of Economics*, 122(3), 807-860.

DellaVigna, S. and E. La Ferrara (2016), "Economic and social impact of mass media". A S. Anderson, J. Strömberg i D.Waldfogel (Eds.), *Handbook of Media Economics*, Vol. 2, Elsevier, 723-768.

DeMarzo P., D. Vayanos and J. Zweibel (2003), "Persuasion bias, social influence, and uni-dimensional opinions", *Quarterly Journal of Economics*, 118, 909-68.

Di Tella, R. and I. Franceschelli (2011), "Government advertising and media coverage of corruption scandals", *American Economic Journal: Applied Economics*, 3(4), 119-51.

Djankov, S., C. McLiesh, T. Nenova and A. Shleifer (2003), "Who owns the media?", *Journal of Law and Economics*, 46(2), 341-82.

Durante, R. and B. Knight (2012), "Partisan control, media bias, and viewer responses: Evidence from Berlusconi's Italy", *Journal of the European Economic Association*, 10(3), 451-481.

Durante, R., P. Pinotti and A. Tesei (2016), "The political legacy of entertainement TV", Working paper.

Durante, R. and E. Zhuravskaya (2016), "Attack when the world is not watching: U.S. media and the Israeli-Palestinian conflict", *Journal of Political Economy*, forthcoming.

Dyck, A., N. Volchkova and L. Zingales (2008), "The corporate governance role of the media: Evidence from Russia", *The Journal of Finance*, 63(3), 1093-1135.

Egorov, G., S. Guriev and K. Sonin (2009), "Why resource-poor dictators allow freer media: A theory and evidence from panel data", *American Political Science Review*, 103(4), 645-668.

Eisensee, T. and D. Strömberg (2007), "News droughts, news floods, and U.S. disaster relief", *Quarterly Journal of Economics*, 122(2), 693-728.

Ellman, M. and F. Germano (2009), "What do the papers sell?", *Economic Journal*, 119, 668-704.

Engelberg, J. E. and C. A. Parsons (2011), "The causal impact of media in financial markets", *The Journal of Finance*, 66(1), 67-97.

Enikolopov, R., M. Petrova and E. Zhuravskaya (2011), "Media and political persuasion: Evidence from Russia", *American Economic Review*, 111(7), 3253-3285.

Enikolopov, R., A. Makarin and M. Petrova (2016), "Social media and protest participation: Evidence from Russia", Working paper.

Enikolopov, R., M. Petrova and K. Sonin (2016), "Social media and corruption", *American Economic Journal: Applied Economics*, de propera publicació.

Eyster, E. and M. Rabin (2010), "Naïve herding in rich-information settings", *American Economic Journal: Microeconomics*, 2(4), 221-243.

Fang, L. and J. Peress (2009), "Media coverage and the cross-section of stock returns", *The Journal of Finance*, 64(5), 2023-2052.

Farré, L. and F. Fasani (2013), "Media exposure and internal migration - evidence from Indonesia", *Journal of Development Economics*, 102, 48-61.

Fonseca-Galvis, Á., J. M. Snyder Jr. and B. K. Song (2016), "Newspaper market structure and behaviour: Partisan coverage of political scandals in the U.S. from 1870 to 1910", *Journal of Politics*, 78(2), 368-381.

Gambaro, M. and R. Puglisi (2015), "What do ads buy? Daily coverage of listed companies on the Italian press", *European Journal of Political Economy*, 39, 41-57.

Garcia, D. (2013), "Sentiment during recessions", *The Journal of Finance*, 68(3), 1267-1300.

García-Arenas, J. (2015), "The impact of free media on regime change: Evidence from Russia", Working paper.

Gehlbach, S. and K. Sonin (2014), "Government control of the media", *Journal of Public Economics*, 118, 163-171.

Gentzkow, M., E. Glaeser and C. Goldin (2006), "The rise of the Fourth Estate: How newspapers became informative and why it mattered". In E. Glaeser and C. Goldin (Eds.). *Corruption and Reform: Lessons from America's Economic History*. Chicago: NBER/University of Chicago Press.

Gentzkow, M. and E. Kamenica (2017), "Competition in persuasion", *Review of Economic Studies*, 84(1), 300-322.

Gentzkow, M., N. Petek, J. M. Shapiro and M. Sinkinson (2015), "Do newspapers serve the state? Incumbent party influence on the US press, 1869-1928", *Journal of European Economic Association*, 13(1), 29-61.

Gentzkow, M. and J. M. Shapiro (2006), "Media bias and reputation", *Journal of Political Economy*, 114 (2), 280-316.

Gentzkow, M. and J. M. Shapiro (2008a), "Competition and truth in the market for news", *Journal of Economic Perspectives*, 22(2), 133-154.

Gentzkow, M. and J. M. Shapiro (2008b), "Preschool television viewing and adolescent test scores historical evidence from the coleman study", *Quarterly Journal of Economics*, 123(1), 279-323.

Gentzkow, M., J. M. Shapiro and M. Sinkinson (2011), "The effect of newspaper entry and exit on electoral politics", *American Economic Review*, 101(7), 2980-3018.

Gentzkow, M., J. M. Shaprio and D. Stone (2016), "Media bias in the marketplace: Theory". In S. Anderson, J. Strömberg and D. Waldfogel (Eds.), *Handbook of Media Economics*, vol. 2, chapter 14, Elsevier, 623-645.

Gerber, A. S., D. Karlan and D. Bergan (2009), "Does the media matter? A field experiment measuring the effect of newspapers on voting behaviour and political opinions", *American Economic Journal: Applied Economics*, 1(2), 35-52.

Green, D. and V. Vasudevan (2016), "Diminishing the effectiveness of vote buying: Experimental evidence from a persuasive radio campaign in India", Working paper.

Hainmueller, J. and H. L. Kern (2009), "Opium for the masses: How foreign media can stabilize authoritarian regimes", *Political Analysis*, 17, 377-99.

Hennighausen, T. (2015), "Exposure to television and individual beliefs: Evidence from a natural experiment", *Journal of Comparative Economics*, 43(4), 956-980.

Hernæs, Ø., S. Markussen and K. Roed (2016), "Television, cognitive ability, and high school completion", Working paper.

Jones, J. J., R. M. Bond, E. Bakshy, D. Eckles and J. H. Fowler (2017), "Social influence and political mobilization: Further evidence from a randomized experiment in the 2012 US presidential election", *PloS one*, 12(4), e0173851.

Kamenica, E. and M. Gentzkow (2011), "Bayesian persuasion", *American Economic Review*, 101, 2590-2615.

Kearney, M. S. and P. B. Levine (2015a), "Early childhood education by MOOC: Lessons from Sesame Street", Working paper.

Kearney, M. S. and P. B. Levine (2015b), "Media Influences on social outcomes: The impact of MTV's 16 and Pregnant on teen childbearing", *American Economic Review*, 105(12), 3597-3632.

King, G., J. Pan and M. E. Roberts (2013), "How censorship in China allows government criticism but silences collective expression", *American Political Science Review*, 107(2), 326-343.

King, G., J. Pan and M. E. Roberts (2014) "Reverse-engineering censorship in China: Randomized experimentation and participant observation", *Science*, 345(6199), 1-10.

King, G., J. Pan and M. E. Roberts (2017), "How the Chinese government fabricates social media posts for strategic distraction, not engaged argument", *American Political Science Review*, 111(3), 484-501.

Knight, B. and A. Tribin (2015), "The limits of propaganda: Evidence from Chavez's Venezuela", NBER Working Paper 22055.

La Ferrara, E., A. Chong, and S. Duryea (2012), "Soap operas and fertility: Evidence from Brazil", *American Economic Journal: Applied Economics*, 4(4), 1-31.

Lazarsfeld, P. F., B. Berelson and H. Gaudet (1944), *The People's Choice: How the Voter Makes Up His Mind in a Presidential Campaign*, New York: Columbia University Press.

Larreguy, H. A., J. Marshall and J. M. Snyder Jr. (2014), "Revealing malfeasance: How local media facilitates electoral sanctioning of mayors in Mexico", Working paper.

McMillan, J. and Pablo Zoido (2004), "How to subvert democracy: Montesinos in Peru", *Journal of Economic Perspectives*, 18(4), 69-92.

Milgrom P. and J. Roberts (1986), "Relying on the information of interested parties", *RAND Journal of Economics*, 17(1), 18-32.

Mullainathan S. (2002), "A memory-based model of bounded rationality", *Quarterly Journal of Economics*, 117(3), 735-74.

Mullainathan S., J. Schwartzstein and A. Shleifer (2008), "Coarse thinking and persuasion", *Quarterly Journal of Economics*, 123(2), 577-619.

Mullainathan, S. and A. Shleifer (2005), "The market for news", *American Economic Review*, 95(4), 1031-1053.

Nelson P. (1970), "Information and consumer behaviour", *Journal of Political Economy*, 78, 311-29.

Olken, B. (2009), "Do television and radio destroy social capital? Evidence from Indonesian villages", *American Economic Journal: Applied Economics*, 1(4), 1-33.

Peress, J. (2014), "The media and the diffusion of information in financial markets: Evidence from newspaper strikes", *The Journal of Finance*, 69(5), 2007-2043.

Petrova, M. (2008), "Inequality and media capture", *Journal of Public Economics*, 92(1-2), 183-212.

Petrova, M. (2011), "Newspapers and parties: How advertising revenues created an independent press", *American Political Science Review*, 105(4), 790-808.

Petrova, M. (2012), "Mass media and special interest groups", *Journal of Economic Behavior and Organization*, 84, 17-38.

Petty R. and J. T. Cacioppo (1996), *Attitudes and Persuasion: Classic and Contemporary Approaches*. Westview Press.

Prat, A. (2016), "Media capture and media power". In S. P. Anderson, D. Strömberg and J. Waldfogel (Eds.), *Handbook of Media Economics*, vol. I, Elsevier, 669-686.

Prat, A. and D. Stromberg (2013), "The political economy of mass media." In D. Acemoglu, M. Arellano and E. Dekel (Eds.), *Advances in Economics and Econometric: Tenth World Congress. Applied Economics*, vol. 2, Cambridge University Press, 135-187.

Reuter, J., E. Zitzewitz, (2006), "Do ads influence editors? Advertising and bias in the financial media", *Quarterly Journal of Economics*, 121 (1), 197-227.

Qian, N. and D. Yanagizawa-Drott (2016), "Government distortion in independently owned media: Evidence from U.S. cold war news coverage of human rights", *Journal of European Economic Association*, forthcoming.

Qin, B., Y. Wu and D. Strömberg (2016), "Determinants of media capture in China," Working paper.

Shapiro, J. M. (2016), "Special interests and the media: Theory and an application to climate change", *Journal of Public Economics*, 144, 91-108.

Snyder J. and D. Strömberg (2010), "Press coverage and political accountability" *Journal of Political Economy*, 118(2), 355-408.

Stanig, P. (2015), "Regulation of speech and media coverage of corruption: An empirical analysis of the Mexican press", *American Political Science Review*, 59(1), 175-193.

Starr, P. (2004), *The Creation of the Media: Political Origins of Modern Communications*. New York: Basic Books.

Stigler, G. and Becker G. (1977), "De gustibus non est disputandum", *American Economic Review*, 67, 76-90.

Strömberg, D. (2004), "Mass media competition, political competition, and public policy", *Review of Economic Studies*, 71(1), 265-84.

Strömberg, D. (2004b), "Radio's impact on public spending", *Quarterly Journal of Economics* 119(1), 189-221.

Strömberg, D. (2016), "Media coverage and political accountability: Theory and evidence". In S. Anderson, D Strömberg and J. Waldfogel, (Eds.), *Handbook of Media Economics*, vol. I, chapter 13, Elsevier, 595-622.

Tetlock, P. C. (2007), "Giving content to investor sentiment: The role of media in the stock market", *The Journal of Finance*, 62(3), 1139-1168.

Tetlock, P. C. (2016), "The role of media in finance". In S. Anderson, D. Strömberg and J. Waldfogel, (Eds.), *Handbook of Media Economics*, vol. I, chapter 18, Elsevier, 701-721.

Tetlock, P. C., M. Saar Tsechansky and S. Macskassy (2008), "More than words: Quantifying language to measure firms' fundamentals", *The Journal of Finance*, 63(3), 1437-1467.

VonDoepp, P. and D. J. Young (2013), "Assaults on the Fourth Estate: Explaining media harassment in Africa", *The Journal of Politics*, 75(1), 36-51.

Yanagizawa-Drott, D. (2014), "Propaganda and conflict: Theory and evidence from the Rwandan genocide", *Quarterly Journal of Economics*, 129(4), 1947-1994.

Opuscles already published

1. **Reconsidering Spanish unemployment**
   Ramon Marimon (June 97)
2. **Reducing unemployment. At any cost?**
   Fabrizio Zilibotti (December 97)
3. **Capital and labor taxes, macroeconomic activity, and redistribution**
   Albert Marcet (November 98)
4. **The lender of last resort in today's financial environment**
   Xavier Freixas (November 99)
5. **Why does the public sector grow? The role of economic development, trade and democracy**
   Carles Boix (November 99)
6. **Gerontocracy and social security**
   Xavier Sala-i-Martin (July 2000)
7. **The political viability of labour market reform**
   Gilles Saint-Paul (December 2000)
8. **Are EU policies fostering growth and reducing regional inequalities?**
   Fabio Canova (May 2001)
9. **Agglomeration effects in Europe and the USA**
   Antonio Ciccone (September 2001)
10. **Economic polarization in the Mediterranean basin**
    Joan Esteban (May 2002)
11. **How do households invest their wealth?**
    Miquel Faig (October 2002)
12. **Macroeconomic and distributional effects of social security**
    Luisa Fuster (April 2003)
13. **Educating intuition: A challenge for the 21st century**
    Robin M. Hogarth (September 2003)
14. **Capital controls in post-war Europe**
    Hans-Joachim Voth (April 2004)
15. **Taxation of financial intermediaries**
    Ramon Caminal (September 2004)
16. **Ready to take risks? Experimental evidence on risk aversion and attraction**
    Antoni Bosch-Domènech / Joaquim Silvestre i Benach (November 2005)
17. **Social networks and labour market outcomes**
    Antoni Calvó-Armengol (January 2006)
18. **The effects of employment protection in Europe and the USA**
    Adriana D. Kugler (February 2007)

19. **Urban sprawl: Causes and consequences**
Diego Puga (January 2008)

20. **Western European long term growth, 1830-2000: Facts and issues**
Albert Carreras and Xavier Tafunell (June 2008)

21. **Overcoming coordination failure in firms and organizations: Experimental evidence**
Jordi Brandts (March 2009)

22. **The misallocation of talent**
José V. Rodríguez Mora (May 2009)

23. **Complementarities in innovation strategy and the link to science**
Bruno Cassiman (September 2009)

24. **Simple mechanisms to resolve conflicting interests and to share the gains**
David Pérez-Castrillo (November 2009)

25. **Transfer of university innovations**
Inés Macho-Stadler (January 2010)

26. **Firing costs, dismissal conflicts and labour market outcomes**
Maia Güell (June 2010)

27. **Inequality and tax progressivity**
Juan Carlos Conesa (October 2010)

28. **Happiness economics**
Ada Ferrer-i-Carbonell (May 2011)

29. **School choice in Spain: Theory and evidence**
Caterina Calsamiglia (September 2011)

30. **Corporate social responsibility and social welfare. How to promote socially responsible business strategies**
Juan-José Ganuza (March 2012)

31. **The effectiveness of foreign aid: From the macroeconomic perspective to the experimental evaluation**
José G. Montalvo / Marta Reynal-Querol (June2012)

32. **Fiscal policy in the European Monetary Union**
Evi Pappa (September 2012)

33. **How important are capital markets Imperfections in determining firm decisions and aggregate fluctuations?**
Andrea Caggese (November 2012)

34. **Globalization, technology and inequality**
Gino Gancia (April 2013)

35. **Credit cycles and systemic risk**
José-Luis Peydró (December 2013)

36. **The labour market impact of immigration**
Albrecht Glitz (June 2014)

37. **Density forecasts in economics and policymaking**
Barbara Rossi (September 2014)

38. **Local labor markets**
Jan Eeckhout (December 2014)

39. **Globalization and aggregate fluctuations: The role of international trade and large firms**
Julian di Giovanni (February 2015)

40. **The social effects of divorce laws**
Libertad González (June 2015)

41. **Why do people buy private health insurance in the presence of a public option?**
Pau Olivella (July 2016)

42. **Health interventions in low income countries: A (not so) low hanging fruit?**
Alessandro Tarozzi (October 2016)

43. **Media failures and media markets**
Fabrizio Germano (January 2017)

44. **Mass Media and Its Influence on Behaviour**
Ruben Enikolopov and Maria Petrova (December 2017)

Ruben Enikolopov

Ruben Enikolopov is ICREA Research Professor at Universitat Pompeu Fabra and Associate Professor of economics at the New Economic School, Moscow. His research interests include political economy, economics of mass media, and development economics. He has published in the leading academic journals such as *American Economic Review, Quarterly Journal of Economics, Review of Economic Studies, Proceedings of National Academy of Science, American Political Science Review, American Economic Journal: Applied Economics, Journal of Public Economics*.

Maria Petrova

Maria Petrova is ICREA Research Professor at Universitat Pompeu Fabra and a Researcher at the Barcelona Institute for Political Economy and Governance. Her research interests include political economy and economics of mass media. She is a Co-Editor at the Journal of Public Economics and a member of the Editorial Board at the *Review of Economic Studies*. She has published in leading academic journals such as *American Economic Review, Quarterly Journal of Economics, Proceedings of National Academy of Science, American Political Science Review, American Economic Journal: Applied Economics, Journal of Public Economics*.

CREi
Centre de Recerca
en Economia Internacional

Academic Unit of the Barcelona GSE Graduate School of Economics

Ramon Trias Fargas, 25-27 - 08005 Barcelona
Tel: 93 542 13 88 - Fax: 93 542 28 26
E-mail: crei@crei.cat
http://www.crei.cat

upf. Universitat Pompeu Fabra Barcelona

Generalitat de Catalunya