# POLITICS 2.0: THE MULTIFACETED EFFECT OF BROADBAND INTERNET ON POLITICAL PARTICIPATION

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**Abstract**
We study the impact of the diffusion of high-speed Internet on different forms of political participation, using municipal data from Italy from 1996 to 2013. Our empirical strategy exploits the fact that the cost of providing ADSL-based broadband services in a given municipality depends on its relative position in the pre-existing voice telecommunications infrastructure. We first show that broadband Internet had a substantial negative effect on turnout in parliamentary elections up until 2008. It was, however, positively associated with other forms of political participation, both online and offline, such as the emergence of local online grassroots protest movements. The negative effect of the Internet on turnout in parliamentary elections essentially reversed after 2008, when local grassroots movements coalesced into the Five-Star Movement electoral list. Our findings support the view that: (i) the effect of the Internet varies across different forms of political participation; (ii) it changes over time, as new political actors emerge that are able to take advantage of the new technology to attract disenchanted or demobilized voters; and (iii) these new forms of mobilization eventually feed back into the mainstream electoral process, converting "exit" back into "voice." (JEL: D72, L82, L86)

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## 1. Introduction

The advent of the Internet has dramatically transformed the way individuals obtain, produce, and exchange information. Such a revolution, many believe, is likely to have a profound impact on various dimensions of social life, not least on politics.[1] Yet, empirical evidence on how the Internet may influence political participation remains relatively scant.

Debate on this issue has been strongly influenced by two alternative views. We emphasize that the Internet makes it easier for citizens to acquire political information from more numerous and diverse sources. To the extent that better-informed citizens tend to be more politically involved (Feddersen and Pesendorfer 1996, 1999; Lassen 2005), the Internet should therefore increase political participation (e.g., Kaye and Johnson 2002; Tolbert and McNeal 2003). The other view focuses, instead, on the fact that the Internet offers unprecedented entertainment opportunities, which may crowd out users' consumption of political content, ultimately turning them into less informed and participative citizens (e.g., Prior 2005).

These hypotheses are not new in the political economy literature on the impact of media technologies. In fact, they have previously been studied in relation to the diffusion of newspapers, radio, and television (Gentzkow 2006; Gentzkow, Shapiro, and Sinkinson 2011; Strömberg 2004). The empirical studies that have explored the impact of the Internet on political participation (Czernich 2012; Falck, Gold, and Heblich 2014; Jaber 2013; Larcinese and Miner 2012; Miner 2012) have largely used the same approach, focusing only on the short-run effect of the Internet on electoral turnout, and on the tension between the aforementioned "information" and "crowding out" channels.

The Internet is, however, fundamentally different from traditional media, in ways that ought to be especially important from a political economy perspective. First, Internet users do not only consume content but provide it as well; in this respect, the Internet offers citizens an unparalleled means of expressing their views, compared to TV or radio. In a similar vein, and again unlike traditional media, the Internet also offers users a remarkably effective way to interact and coordinate with other people.[2] Because of these features, the Internet has brought about new opportunities for political discussion and mobilization, made accessible to a wide range of political actors and with effects that will most likely take time to fully unfold. For all these reasons, understanding how the Internet may ultimately affect political outcomes requires a different, broader perspective.

1. See Larcinese and Miner (2012) for several interesting pieces of anecdotal evidence on views regarding the economic and political consequences of the Internet, and Hindman (2009) and Farrell (2012) for an overview of the debate among scholars and political activists.

2. As stated by Kevin Werbach, "The internet fundamentally lowers the barriers to organization [. . . ] Like-minded souls no longer need painstakingly to build an organizational structure; a mailing-list is often enough to band together online" (The Economist, Jan 5, 2013).

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This paper employs such a perspective to investigate the causal impact of the introduction of high-speed Internet on political participation in Italy, a country with solid democratic institutions but where traditional media are largely controlled by powerful political and private interests. In particular, our empirical analysis exploits differences in the timing of the introduction of broadband (asymmetric digital subscriber line (ADSL)) technology across Italian municipalities between 2005 and 2011 to examine the effect of the Internet on various forms of political participation (both offline and online), and how it evolved over a time period covering seventeen years and five electoral cycles.

To deal with endogeneity in access to broadband Internet, we exploit the fact that the diffusion of ADSL technology in a given municipality is affected by its relative position in the pre-existing voice telecommunications infrastructure. Specifically, because ADSL-based internet services could only be offered in municipalities connected to high-order telecommunication exchanges (Urban Group Stage, UGS) via optic fiber, we use the distance between a given municipality and the closest UGS—a good proxy for the investment required to connect the municipality—as a source of variation for the availability of high-speed internet. Because the pre-existing infrastructure was not randomly distributed, our identification strategy relies on interacting that distance with the time variation between the period before and after broadband became available, under the assumption that the correlation between distance and unobserved municipal characteristics did not change at that point in time, other than through the introduction of high-speed Internet.

Our findings point to a complex chain of effects in which the impact of broadband Internet availability changed over time, as new political actors emerged, in a "supply-side" response to "demand-side" changes in voter behavior. We first document that the diffusion of broadband Internet led, initially, to a significant decline in electoral turnout in national parliamentary elections between 1996–2001 (prebroadband) and 2006–2008 (postbroadband). This effect is sizeable—about 7 percentage points for going from no to full broadband access—and very robust to the use of different measures of broadband access and various specifications. Interestingly, however, we find that this initial negative effect of the Internet on turnout was largely reversed in the following elections, held in 2013.

To shed light on this nuanced pattern, we first document that the initial decline in turnout was especially detrimental to the electoral performance of "outsider" parties—namely, ideologically extreme forces outside of mainstream coalitions—whose supporters are generally well informed and politically active. We interpret this as consistent with the diffusion of the Internet having led to a particularly engaged but disenchanted segment of the electorate dropping out of the mainstream electoral process.

At the same time, we find that Internet diffusion fostered other forms of political participation. In particular, using a unique dataset on the geographic distribution of local grassroots protest groups organized through the online platform *Meetup.com*, we show that the diffusion of broadband Internet was associated with these groups forming earlier and growing faster. More interestingly, the strength of the online

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local groups soon translated into greater support for the Five-Star Movement (M5S), a largely web-based political movement that coalesced around those online groups and gradually evolved into a potent electoral force. Indeed, looking at local elections starting in 2008, we document that broadband Internet access was positively associated with the presence of the M5S on the ballots, and with electoral support for the M5S lists.

These results suggest that political entrepreneurs eventually seized the opportunity of using the Internet as a means of attracting a population of disenchanted (but engaged and "connected") individuals that the Internet itself had initially contributed to create, favoring their return to mainstream electoral politics. This tendency was confirmed by the results for the 2013 parliamentary elections, when the M5S first run at the national level, and which show a positive effect of broadband access on the electoral performance of the M5S and other new "web-friendly" parties.

In sum, our evidence underscores what we may call the "general-equilibrium" repercussions of change in media technology, exemplified by the onset of high-speed Internet. Such a shock entails a shift on the "demand side" of the political process, as voters react to the new medium. And yet, the latter is merely the first reaction in a more complex chain. Eventually, political entrepreneurs on the supply side take advantage of the opportunity presented by the initial demand-side movement—and by the possibilities and low barriers to entry that characterize the new medium itself—to enhance political mobilization in ways that eventually feed back into and alter the initial landscape. Quite simply, using the classic framework of "exit, voice, and loyalty" (Hirschman 1970), it seems that the new medium initially constituted an "exit" option from the mainstream political process but was eventually harnessed into a new "voice" mechanism within that process.

Within this framework, the transition from exit to voice is, in fact, quite natural once we consider that the effect of the mainstream political process on public-good provision ought to induce Hirschmanian "loyalty", as it is essentially impossible to completely exit its reach. In addition, although we might expect a similar pattern to hold with different instances of shifts in media technology, such a transition seems especially relevant in the case of the Internet, with its low barriers to entry into the production and diffusion of content.

Our paper relates to the vast literature on the role of mass media in democratic politics, and, specifically, to previous research on the impact of the introduction of new media technologies on electoral participation.[3] Although some of these studies have documented a positive effect of these episodes on voter turnout—namely for the cases of newspapers and radio (Gentzkow et al. 2011; Strömberg 2004)—others have stressed the possibility of a negative effect, possibly due to the new medium crowding-out traditional and potentially more informative media (see Gentzkow 2006 for the case of TV).

3. See Prat and Strömberg (2013) for an extensive literature review on the political economy of mass media.

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Our research also contributes to the incipient literature on the political economy of the Internet (Enikolopov, Petrova, and Sonin forthcoming; Gentzkow and Shapiro 2011) and, specifically, on its impact on electoral politics. This literature has found contrasting results with regard to voter turnout, ranging from positive (Jaber 2013; Miner 2012), to insignificant (Larcinese and Miner 2012), to negative (Falck et al. 2014).[4] In particular, the paper most closely related to ours is Falck et al. (2014), which investigates the effect of the introduction of high-speed internet on electoral participation in Germany.[5] Looking at Germany and exploiting cross-sectional variation and a geographical discontinuity in the technical availability of ADSL services, the authors find that Internet access was associated with a decline in turnout in nonlocal elections between 2004 and 2008, an effect they attribute to Internet users substituting online entertainment for the consumption of political information on traditional media.[6]

Our analysis improves upon the existing literature in several ways. First, our focus extends beyond electoral turnout to explore the effect of the Internet on alternative forms of political participation (both online and offline). Second, the longer time period covered by our data—four elections over 12 years—allows us to examine the impact of the Internet both in the short and in the longer run and to explore how the political supply side reacts to changes initially triggered by the new technology. Last but not least, the continuous and time-variant nature of our instrument strengthens our identification by allowing us to control not only for time-invariant municipal characteristics, but also for differential trends related to key demographics, and to estimate the effect on the entire sample, rather than relying on a restricted set of peculiar localities.

Although our findings confirm the initial negative effect of the Internet on turnout documented by Falck et al. (2014), we qualify this result as part of a larger and more complex picture in which, rather than fueling political apathy, the Internet actually encouraged alternative forms of political participation that, over time, would contribute to the transformation of Italy's political landscape and, ultimately, to the return of demobilized voters to mainstream electoral politics. This suggests that accounting for long-run dynamics and general equilibrium implications can considerably alter the interpretation of any short-run effect and, crucially, their policy implications.

The remainder of the paper is organized as follows. Section 2 introduces the conceptual framework that will guide the interpretation of our empirical findings.

4. These studies have also looked at other outcomes, such as the electoral performance of certain political forces (Larcinese and Miner 2012; Miner 2012) and campaign contributions (Jaber 2013; Larcinese and Miner 2012).

5. Prior to Falck et al. (2014), Czernich (2012) examined the same German context, finding, instead, a positive but statistically insignificant effect on turnout in federal elections.

6. This interpretation is based on the finding that Internet access is associated with a decline in TV consumption, although it is possible that online information replaced TV entertainment. Indeed, the authors find no evidence of a negative effect of Internet access on the consumption of newspapers, a medium that previous research has associated with political information and participation (Drago, Nannicini, and Sobbrio 2014; Gentzkow et al. 2011; Snyder and Strömberg 2010).

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Section 3 provides relevant background information on the diffusion of broadband in Italy and on the Italian institutional and political landscape over the period under examination. Section 4 describes the data and the empirical strategy. Section 5 presents the results on the impact of broadband Internet on turnout in parliamentary elections, whereas Section 6 discusses evidence on other forms of participation that can help elucidate the mechanism at work. Section 7 concludes by summarizing our interpretation of the main findings and discussing alternative mechanisms and external validity.

## 2. Conceptual Framework

The advent of the Internet can potentially influence political participation in several ways. By facilitating access to more and more diverse sources of political information, the Internet can foster political awareness and participation. More specifically, in addition to providing content, the Internet represents a powerful and easily accessible platform that individuals interested in politics can use to exchange ideas and coordinate their actions. At the same time, however, the vast entertainment opportunities offered by the Internet can crowd out the consumption of political information on traditional media, making people less interested and less active in politics.[7]

To shed light on how the interplay of these forces may determine the ultimate effect of the Internet on political participation, we employ the well-known "exit, voice, and loyalty" framework proposed by Hirschman (1970), which investigates how individuals react to discontent regarding an organization they are part of. In the particular context we analyze, the "organization of interest" is mainstream electoral politics—that is, the process through which policy makers are selected and monitored in a democracy. How the Internet will influence political participation will hence depend on how it affects citizens' strategic "exit" options—that is, abstaining from voting in elections—versus their "voice" options—that is, voting, or otherwise engaging with the electoral process.

As the above discussion suggests, the Internet opens both voice and exit opportunities. On the one hand, individuals that are unhappy with mainstream politics can use online platforms to voice their critical opinions and to articulate activities that can affect the electoral process. On the other hand, the Internet offers vast opportunities to drop out, either by tuning out of politics altogether, or by engaging in alternative political activities outside the electoral mainstream. Crucially, different strategies will appeal to different types of individuals, depending on their levels of intrinsic political engagement and their satisfaction with the mainstream political process. For individuals with a low level of political engagement—who use the Internet primarily

7. Although greatly expanded by the advent of social media, opportunities for online political participation have existed for quite some time, from commenting on political blogs to politically related emailing lists, etc.

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TABLE 1. Short-run effect of Internet on exit and voice.

| Voter types | High Engagement | Low engagement |
|---|---|---|
| High satisfaction | Voice | Exit (Entertainment) |
| Low satisfaction | Exit (Nonmainstream politics) | Exit (Entertainment) |

Notes: The table depicts the possible reaction to the introduction of the Internet by type of voters with regard to political engagement (high vs. low) and satisfaction with the political process (high vs. low).

for entertainment purposes—the new medium will arguably discourage all forms of political participation.[8] Among politically engaged individuals, instead, those that are satisfied with mainstream politics will be less likely to exit, whereas those that are critical may abstain from elections without, however, necessarily tuning out of politics altogether. These different possibilities are summarized in Table 1.

In the short-run, the Internet is likely to decrease electoral participation, as both dissatisfied and disengaged voters take advantage of the improved exit options offered by the new technology. Yet, the exit decisions of these two groups are driven by different motivations, pose different incentives to political actors, and are likely to have different consequences in the long run. Indeed, although politically disengaged individuals are likely to fall into political apathy, politically engaged individuals who have dropped out remain politically active and are open to returning to electoral participation, as long as someone caters to their preferences and addresses some of the sources of their discontent. The possibility of attracting this pool of individuals represents a pulling factor for political entrepreneurs to whom the Internet offers new avenues for engaging with these potential voters, who are both active and "connected". Furthermore, given the low barriers to entry imposed by the Internet, these opportunities are accessible even to actors with limited resources, facilitating the emergence of new political movements.

The possibility of a reversal in the effect of the Internet is again related to another key aspect of the Hirschmanian framework, the concept of "loyalty", which refers to the difficulty of exiting an organization for an individual. In this context, because the mainstream political process shapes policy making and public good provision, it inevitably has an impact on all individuals, even those who have opted to exit. In other words, "full exit is impossible [and], in some sense, one remains (. . . ) a member of the organization in spite of formal exit" (Hirschman 1970, p.100). In this situation, loyalist behavior toward the organization is likely to emerge, particularly among more politically active individuals, who can use the new medium to devise new voice options and bring them back into the mainstream.

8. This hypothesis relates to previous work on the impact of the Internet on social capital and civic engagement which find evidence of a negative effect (Bauernschuster, Falck, and Woessmann 2014).

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## 3. Background

### *3.1. Broadband Internet in Italy*

Broadband Internet connection to residential customers in Italy has been traditionally provided through ADSL technology, whereas the use of alternative technologies, such as cable and satellite, has remained negligible (Between 2008; OECD 2001).[9] ADSL technology was introduced by the Italian telecommunications incumbent operator (Telecom Italia) in 1999. The broadband infrastructure developed rather slowly at first, but picked up pace in the following years. If by the end of 2000, only 117 out of 8,100 Italian municipalities had access to ADSL, by the end of 2005 ADSL was available in about half of all municipalities, accounting for approximately 86% of the population. Figure 1 summarizes the evolution of both the number of Italian municipalities with access to ADSL (panel A) and of the share of Italian households with an ADSL subscription (panel B) between 2000 and 2011, with election years marked by dashed vertical lines. Given that ADSL access and penetration were very low in 2001, we consider this as the last "prebroadband" election cycle.

ADSL technology typically relies on data transmission over traditional copper telephone wires. As a result, access to ADSL depends crucially on the user's position in the pre-existing voice telecommunications infrastructure. Two technical parameters are especially important in this regard. The first is the distance between the end user's premises and the closest telecommunication exchange (or "central office," henceforth CO), known as the "local loop." If this distance is above a certain threshold (between 4 and 5km), the ADSL connection cannot be implemented through copper wires, and optic fiber cables need to be deployed between the CO and the user's premises. This procedure involves significant costs because, unlike copper wires, optic fiber cables need to be laid underground. The second key parameter is the distance between the CO and the closest higher-order telecommunication exchange, or the UGS. Regardless of the length of the "local loop," for a given area to have ADSL, the respective CO must be connected to the closest UGS via optic fiber cables.[10]

In the context of Italy, the first parameter has not constituted a limiting factor for the development of the broadband infrastructure, as the "local loop" in the country's voice telecommunications network has traditionally been very short.[11] This has allowed telecom operators to provide ADSL services in most municipalities

9. Definitions of broadband Internet access vary widely (OECD 2001, p.6). The most common one, adopted by most telecommunications operators and by the OECD, refers to technologies that allow for a data download speed of at least 256 Kbps. Prior to the introduction of ADSL, Internet was available only via low-speed dial-up connection which, however, made it difficult for users to take proper advantage of web contents (as discussed in Falck, Gold, and Heblich 2012). Furthermore, the supply of content was also very limited prior to ADSL. For example, as shown in Drago et al. (2014), almost all online editions of Italian national and local newspapers were introduced after 2000.

10. See Online Appendix B for more technical details on the diffusion of ADSL in Italy.

11. Indeed, as depicted in Online Appendix Figure B.1, more than 95% of Italian users are located less than 4 km from the closest CO, and about 100% are less than 5 km away (OECD 2001).

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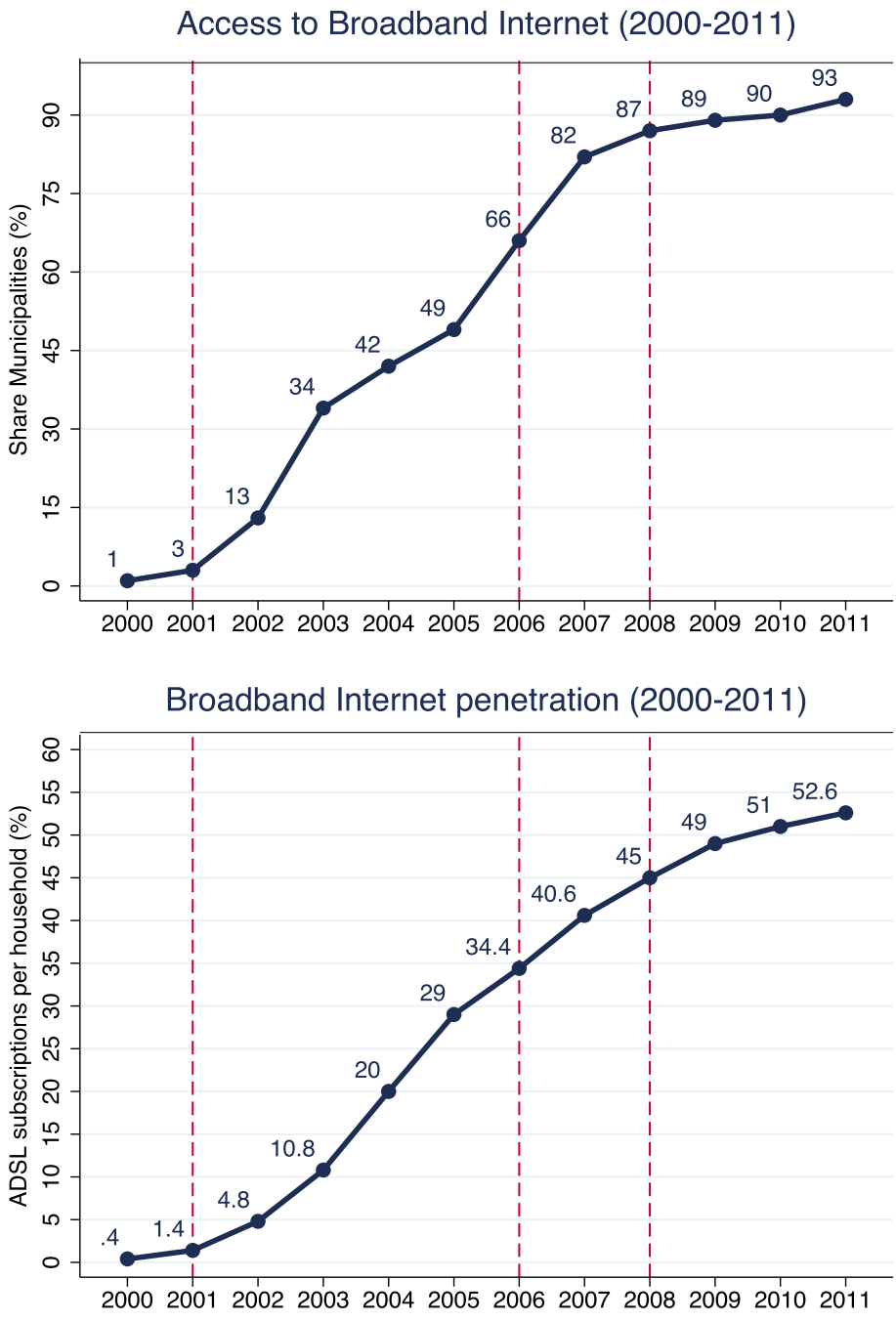


FIGURE 1. Evolution of broadband access and penetration in Italian municipalities. The figure reports the evolution of ADSL availability (top panel) and Internet penetration (share of households with an ADSL subscription, bottom panel), between 2000 and 2011; the dashed vertical lines indicate national elections years (2001, 2006, and 2008). Source: Between (2006, 2008) for ADSL access, and Between (2006, 2008) and AGCOM (2008-2012) for Internet penetration.

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through a system that only requires the deployment of optic fiber cables from UGSs to COs.[12,13] As a consequence, the distance between a municipality's COs and the closest UGS—which was irrelevant for voice communication purposes—became the main determinant of the investment needed to provide ADSL access to a municipality and, consequently, of the timing of ADSL adoption in that specific location (Ciapanna and Sabbatini 2008).

Of particular importance to this analysis is that because the 10,700 COs and the 628 UGSs were inherited from the pre-existing voice telecommunication system, their location was determined long before the advent of the Internet and was therefore not influenced by it (AGCOM, 2011; Impiglia et al. 2004). Hence, all else equal, the closer a municipality happened to be to a UGS when ADSL came into the picture, the more likely that that municipality would get ADSL access earlier on in the diffusion process.[14]

### *3.2. Political and Institutional Background (1996–2013)*

Italy is a parliamentary democracy characterized by a bicameral legislative system consisting of a lower and an upper house (Chamber of Deputies and Senate).[15] Our analysis focuses on five national elections over a 17-year period, held in 1996, 2001, 2006, 2008, and 2013. This period—referred to as Italy's Second Republic—followed the collapse in 1994 of Italy's post-World War II party system in the wake of an unprecedented series of corruption scandals known as *Tangentopoli* (Bribeville).[16]

During most of this period, right up to the 2013 elections, the Italian political landscape was largely dominated by two main coalitions, one from the center right and the other from the center left, which we will later describe in greater detail. The center-right coalition, led by Silvio Berlusconi, owner of Italy's largest private media conglomerate, typically included the heirs of the former fascist party, a northern

12. A graphical illustration of this system—known as "Fiber to the Exchange" (FTTE)'—is provided in Online Appendix Figure B.2.

13. For an insightful discussion of the diffusion of high-speed Internet technology in another European country, see Nardotto, Valletti, and Verboven (2015) on the UK broadband market.

14. Note that the cost of supplying ADSL to a municipality increases with distance to the closest UGS not only due to the cost of optic fiber cables and excavation *per se*. Telecommunication operators typically need the authorization of the municipalities where these cables have to be deployed (Ciapanna and Sabbatini 2008). Similarly, private landowners may, in principle, also delay the development of the broadband infrastructure when cable deployment involves their private property. As shown by Larcinese and Miner (2012) for the US, these dimensions are quite relevant in determining the bureaucratic costs that Internet Service Providers have to incur in order to provide broadband internet in a given geographical area. Hence, the farther away the closest UGS, the higher these bureaucratic costs are likely to be.

15. Although all Italians aged 18 years or over are entitled to vote for the Chamber, only those aged 25 years or older can vote for the Senate.

16. We choose to exclude the 1994 election, as the turmoil following the collapse of the First Republic makes it more challenging to draw the clear distinction between mainstream coalitions and outsiders crucial to our analysis. However, in the Online Appendix, we show that our key results are essentially unaffected if we also include 1994.

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separatist party (the Northern League) and, until 2006, part of the former Christian Democrats. The center-left coalition included part of the former communist party, left-leaning former Christian Democrats, and a few smaller parties. Both coalitions were made up of a big and relatively moderate party, which accounted for a very large share of the coalition's votes, accompanied by smaller and more ideologically extreme parties.

Despite the presence of these two coalitions, the Italian political system remained relatively fragmented, with more than 30 parties running in each election, and parties outside the mainstream coalitions attracting significant electoral support. This tendency became even more pronounced in 2013 with the considerable electoral performance of the M5S, led by blogger and former comedian Beppe Grillo.

In addition to national parliamentary elections, our analysis also examines all municipal elections held between 2001 and 2012. This is especially important for our analysis because the M5S became politically active at the local level a few years before entering the national stage.

*3.2.1. The Emergence and Rise of the M5S.* In the most recent parliamentary elections, held in February 2013, the M5S emerged as the most voted party, obtaining 25.5% of the votes. This represented the best electoral performance for a party running for the first time in a national election in postwar Italy. Popular perception is that the Internet was central to the emergence and political development of the M5S; this episode this provides a unique opportunity to understand the impact of the Internet on political participation, both online and offline. The M5S started in 2005 as a grassroots protest movement, and then consolidated into an organized political actor running for elections, first at the local level and finally at the national level.

The Internet and social media are at the heart of M5S organization and political activism, especially in the light of M5S activists' rejection of mainstream media, which they see as captured by powerful economic and political interests. A cornerstone of this organization is represented by the blog that Beppe Grillo, the Movement's charismatic leader, created in January of 2005, and from which most M5S political initiatives have traditionally originated. Another is the online platform, *Meetup.com*, which has been used by Grillo's supporters since 2005 to organize thematic groups and coordinate their activities at the local level.[17] The *Meetup.com* platform represented the springboard for the later emergence of a decentralized bottom-up political movement that ultimately made the leap to the national stage.

17. The *Meetup.com* platform was originally created in 2001 in the United States, to facilitate online networking among people sharing similar interests and enabling them to meet in person. Howard Dean is understood to be the first prominent politician to use the *Meetup.com* platform on a large scale to coordinate his supporters, during the 2004 Democratic party primaries. As pointed out by Hindman (2009): "New technology allowed Dean to create local, decentralized social networks from scratch." (Hindman 2009, p. 32). Interestingly, it seems that most of the Dean campaign volunteers recruited through the *Meetup.com* platform had not been involved in previous electoral campaigns Hindman (2009).

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In the first phase of the blog/*Meetup* experience between 2005 and 2007, the initiatives promoted by Grillo and his supporters were primarily aimed at voicing widespread popular discontent with the lack of transparency and accountability in the Italian political system. Their criticism was directed against corruption, the misuse of public funds by political parties, the inadequacy of the electoral system, and the absence of legislation imposing both term limits on elected officials and the ineligibility of previously convicted politicians.[18] Despite considerable popular response, these initiatives were largely ignored by mainstream politicians.

Grillo and his supporters then moved toward the creation of an active political movement so as to run in elections. This new phase began in 2008, when Grillo announced on his website that he would endorse local groups of citizens willing to run for office, particularly at the local level, as long as candidates subscribed to the movement's platform on a variety of issues (including free and universal broadband Internet access) and satisfied certain transparency requirements: no affiliation to any party, and no prior penal conviction. The endorsement would take the form of a "five-star seal" quality certification.[19]

The first Five-Star-certified lists ran in municipal elections in 2008, in a handful of municipalities, and in Sicily's regional elections that same year, both with rather modest outcomes. Since then, the M5S has taken part in an increasing number of municipal and regional elections with increasing success. It elected its first mayor in 2010, and became the most voted party in Sicily's 2012 regional elections, before running for national elections in 2013.

Throughout this trajectory, the use of web-based social media and of the original network of local *Meetup* groups has remained absolutely central to the evolution and growing electoral success of M5S. Indeed, the selection of M5S national candidates was carried out through online primary elections among M5S early activists. Furthermore, evidence on the presence of candidates of different parties on the web suggests that, despite the lack of financial resources on the same scale available to other parties, M5S candidates have been especially successful in communicating with potential voters through web-based platforms such as Youtube and social media such as Facebook, Twitter, Google+, and *Foursquare* (Mosca and Vaccari 2013).

18. For example, in November 2005, Grillo's blog launched a fund-raising campaign aimed at financing the publishing of a list of previously convicted Italian MPs on the *International Herald Tribune*, in the context of the so-called Clean Parliament Initiative. On September 8th 2007, a campaign was launched in several Italian cities to collect the signatures required to propose three popular initiative laws to Parliament. The proposed laws foresaw making convicted politicians ineligible, imposing of a two-term limit for both nationally and locally elected officials, and reforming the electoral system. Overall, more than 300,000 signatures were collected in one day.

19. The M5S refuses to be placed within the traditional left-right dimension, claiming to be "beyond" such a framework. Indeed, some aspects of the M5S political platform (e.g., the emphasis on green energy or extended unemployment benefits) have clear roots in the tradition of leftist parties or the *green wave* started in western Europe in the 80s such as the German *Grünen* (Pedrazzani and Pinto 2013). At the same time, other parts of the M5S' program (e.g., opposition to Roma immigration, or skepticism towards European integration) are closer to the positions of right-wing parties.

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## 4. Data and Empirical Strategy

### *4.1. Data*

Electoral data at the municipal level for both local and parliamentary elections are available from the Italian Ministry of Interior. The Italian administrative system includes 8,100 municipalities with a median area of 22 km$^2$ and median population of 2,468 people; each municipality belongs to one of 110 provinces, and each province to one of 20 regions.[20] We focus on the balanced sample of 7,967 municipalities for which we have information for all of the parliamentary elections under consideration.[21] The data include information on eligible voters, turnout, and votes for individual parties and referendum questions. We focus, in particular, on the past five parliamentary elections, held respectively in 1996, 2001, 2006, 2008, and 2013, on municipal elections held between 2001 and 2012.

Data on the Beppe Grillo/M5S *Meetup* groups were gathered directly from the *Meetup.com* platform by applying a crawling procedure on the webpage of each group related to either Beppe Grillo or the M5S. For each group, we collected the following information: date of formation, geographic location, number of members, and the date at which each member joined the group. When multiple groups are present in a given municipality, we consider the date at which the oldest group was formed.

Data on access to ADSL Internet in Italian municipalities are available from the "*Osservatorio Banda Larga-Between*," a joint venture between the main Italian telecommunications operators, the Italian Ministry for Telecommunications, and other private and public stakeholders. The data include information on the percentage of households with access to ADSL-based services in each Italian municipality for each year between 2005 and 2011 on an asymmetric six-point scale corresponding to the following brackets: 0%, 1%–50%, 51%–75%, 76%–85%, 86%–95%, and above 95%.[22]

As an illustration, Figure 2 reports the distribution of access to broadband internet across Italian municipalities in 2005, the first year for which data are available, with ADSL availability increasing from dark (no access) to light (complete access).

No data are available for years prior to 2005; hence, for election year 2001 and before, we set the measure to zero as an approximation of the very low levels of broadband access at the time (see Figure 1). Also, given the absence of data on broadband access after 2011, we impute the 2011 data to election year 2013, a choice which naturally introduces some additional measurement error.

20. When looking at parliamentary elections, we exclude the region of Valle D'Aosta, because, starting with the 2001 elections, it adopted a different electoral system than the other regions. This means that our sample includes 109 provinces.

21. Results are essentially unaltered if we consider all municipalities available in any given year.

22. Figure B.5 in the Online Appendix reports the distribution of ADSL coverage by year with the percentage of households with ADSL access increasing from grey (limited access) to black (full access).

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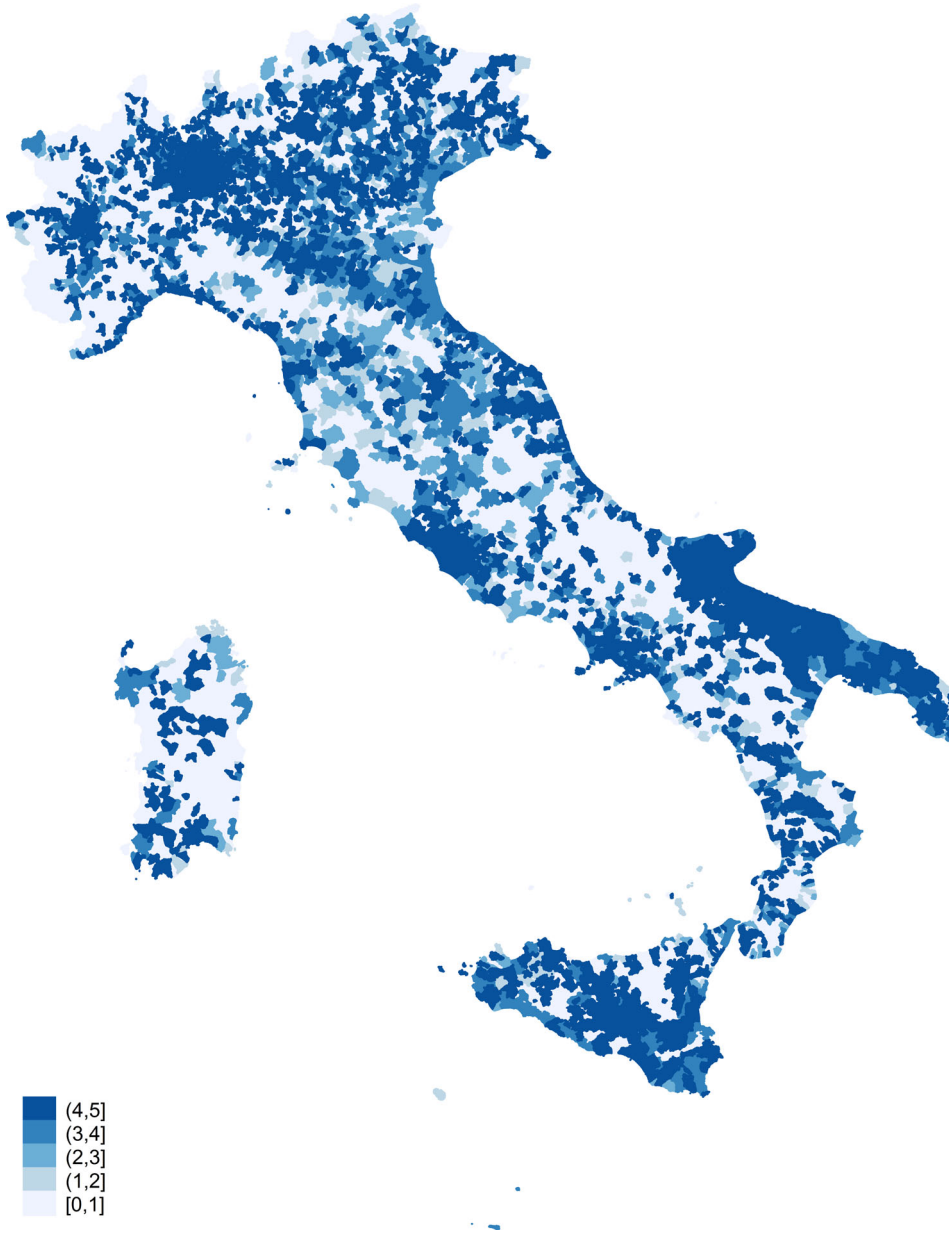


FIGURE 2. Geographical distribution of ADSL access in 2005. The figure illustrates the distribution of ADSL access across Italian municipalities at the end of 2005 on the six-point scale used in our data, with lighter colors indicating no or low access and darker colors indicating high or full access. Source: Between.

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We choose to use data on broadband access, rather than penetration, first and foremost because the latter is obviously the result of endogenous individual decisions. That said, and very much as expected, there is a clear positive correlation between broadband access and penetration at the regional level, the smallest level for which penetration data are available (see Figure B.6 in the Online Appendix).

We use the baseline six-point-scale variable as our main measure of broadband Internet access, which we label as "*Broadband Access*". However, we also experiment with alternative measures of ADSL access, both to check the robustness of our results and to better interpret them. First, we use "*Years Since Good Broadband*", defined as the number of years because at least 50% of households in a municipality have had ADSL access. The main advantage of this measure is that it allows for the possibility that the effect of the Internet accumulates over time. A disadvantage, however, is that we are forced to consider 2005 as the first year of good broadband access for all municipalities that were covered up to that point, because that is the first year for which data are available; this naturally adds considerable noise to this measure in the early years of our sample. In contrast, the error introduced by attributing 2011 broadband access data to the 2013 observations should be less important when we consider this alternative measure. Finally, we use two dummy variables: "*Full Access*", which takes value 1 if "*Broadband Access*" is equal to 5 (above 95% access), and "*Some Access*", which takes value 1 if "*Broadband Access*" is greater than 0. Using these measures can facilitate the interpretation, as they do not rely on the asymmetric scale, and can allow us to better understand what variation is driving our results.

Finally, information on additional sociodemographic controls, which we discuss below, is available from the Italian national statistical office (ISTAT).[23]

### *4.2. Empirical Specification and Identification Strategy*

Based on our discussion of the technical aspects of the diffusion of ADSL technology in Italy (Section 3.1), our identification strategy exploits differences across Italian municipalities in the distance between a municipality and the closest UGS, which, as explained above, represents a key determinant of the cost of supplying ADSL services in a municipality. In particular, we would expect the distance to the closest UGS to affect the pattern of ADSL roll-out, with municipalities located farther away from UGSs getting access to ADSL later on, ceteris paribus. This prediction is indeed corroborated by Figure 3, which depicts a clear negative relationship between distance to the closest UGS and access to broadband (as of 2006).

As mentioned above, the presence and the location of both COs and UGSs precede the development (and even the existence) of broadband in Italy. This of course does not mean that their spatial distribution is random and, in fact, the data reveal that UGSs are more likely to be located for instance, in provincial capitals and, more generally, in more densely populated and educated places. These are all characteristics that could

23. Descriptive statistics for all of our main variables can be found in Online Appendix Tables A.1–A.3.

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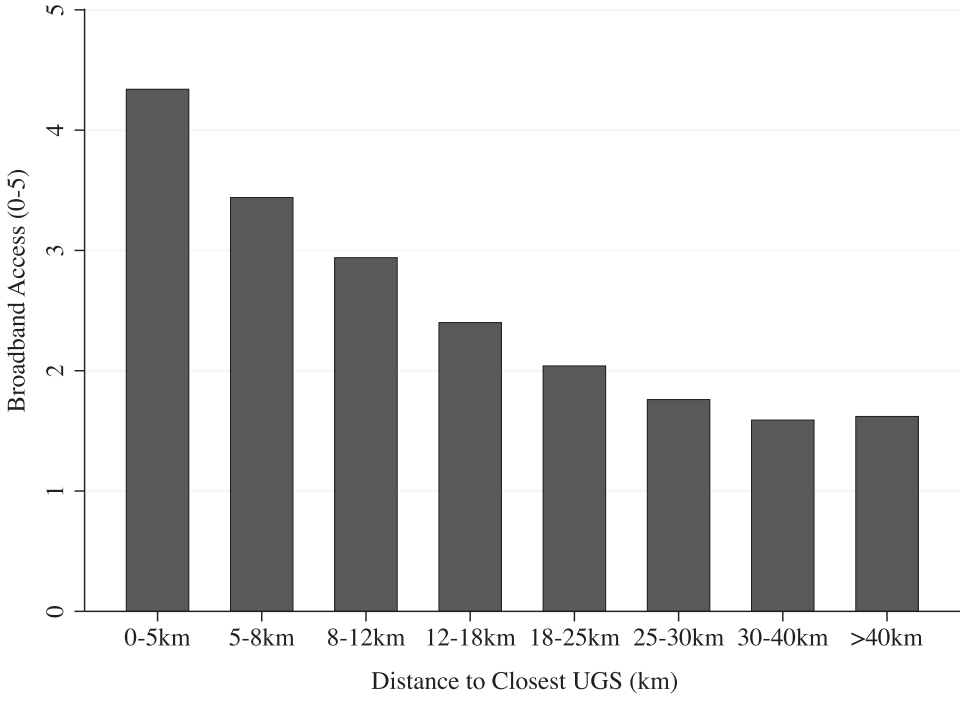


FIGURE 3. ADSL coverage (2006) by distance to closest UGS. The figure reports the average ADSL access score (from 0 to 5) in 2006 for municipalities located at various distances to the closest UGS (from 0–5 km to 40 km or more). Source: Between.

be expected to correlate with our outcomes of interest in ways that could confound causal interpretation. We can go some way in addressing these confounding factors by exploiting the panel structure of our data and including municipality fixed effects. This does not, however, control for those factors that change over time.

To address this issue, our key source of variation will come from the interaction between the distance to a municipality to the closest UGS and a dummy for the post-2001 period (i.e., after the introduction of broadband Internet). In essence, we implement a differences-in-differences approach, which allows us to use variation from a broad set of municipalities, thereby naturally enhancing the generalizability of our findings. Our underlying identification assumption is that, whatever correlation existed between the distance to the closest UGS and relevant municipality characteristics, this did not change at the time of introduction of ADSL technology. In other words, we are identifying the effect off the change in the impact of distance on the outcomes of interest, under the assumption that any change in that impact occurs solely through the introduction of the Internet.

This basic assumption justifies the following two-stage specification:

$$Y_{m,t} = \gamma Broadband_{m,t} + \beta X_{m,t} + \alpha_m + \tau_t + \varepsilon_{m,t} \quad (1)$$

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$$Broadband_{m,t} = \varphi Distance\ UGS_m \times Post-2001 + \sigma X_{m,t} + \zeta_m + \theta_t + \eta_{m,t}, \tag{2}$$

where subscripts $m$ and $t$ indicate, respectively, municipality and electoral year, $Y$ represents the outcome of interest (e.g., turnout), $\alpha$ and $\zeta$ are sets of municipality fixed effects, $\tau$ and $\theta$ are year fixed effects, and $X$ encompasses a set of control variables that we discuss below. *Broadband* stands for one of the measures of broadband access described above, whereas *Distance UGS* is the (time invariant) distance to a municipality's centroid to the closest UGS. We interact this variable with a dummy (*Post-2001*) that takes the value of 1 for electoral years after 2001. This implies that the shift introduced by the availability of ADSL technology stays constant after its introduction, which seems consistent with the data.[24]

Our basic identification assumption would be violated if there are subjacent trends in our outcomes of interest that happen to correlate with factors that are in turn correlated with *Distance UGS*. For instance, it could be the case that turnout evolved differentially in urban versus rural places around the time of the introduction of ADSL technology, for reasons unrelated to the Internet. To account for this possibility, we make the use of a number of economic and sociodemographic municipal characteristics available from the 2001 Census. Specifically, we include in $X$ the interaction of these characteristics with either a fourth-order polynomial in time, with the *Post-2001* dummy, or, finally, with election year fixed effects. This lets us control very flexibly for the possibility of differential time trends: The polynomial allows those trends to differ smoothly, the *Post-2001* dummy considers the possibility of a break right around the introduction of broadband, and the year fixed effects impose minimal structure. Hence, our identification strategy requires that there is no change in the correlation between distance to UGS and the outcomes of interest around the time of broadband introduction once we account for those demographic-related trends.[25]

The baseline group of controls includes population, age structure (measured by the share of the population aged 65 or more, and the share aged 20–34 years, i.e., old and young voters), unemployment rate, and urbanization (on a three-point scale based on the official ISTAT classification). In addition, in all regressions, we also control for yearly population, the only variable available at this frequency at the municipal level. As shown in Online Appendix Table A.4, these variables are highly correlated with the initial diffusion of the internet, as was to be expected.

To further account for trends related to differences in human capital, urbanization, and economic conditions, we also consider a second set of controls that includes: the

24. We also experiment with letting that impact vary with time, by setting $T = 1$ for 2001, $T = 2$ for 2002, and successively and find consistent results. However, if we exclude the pre-2001 period and focus on the later years only, the interaction between distance and time loses its power as a predictor of broadband access. This indicates that the shift introduced by ADSL availability was indeed a one-off.

25. Jaber (2013) applies a related insight to the case of the United States. Specifically, he uses as an instrument for broadband availability the interaction between land elevation and a postbroadband dummy.

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share of the population with a high school or university diploma, the distance of the municipality to the closest provincial capital, the number of firms and the number of private sector workers per capita, as well as the change in both these variables between 1996 and 2001 (which capture net business failures, and changes in employment structure prior to the advent of the Internet). It is important to note that, by including both urbanization and distance to provincial capital, we are taking into account in multiple ways the possibility that small, isolated, rural towns, which are more likely to be far from a UGS, may have differential trends in our variables of interest, relative to larger urban centers.

Finally, we also include regional dummies interacted with the election-year dummies to account for any effect of unobservable regional factors that may vary over time.[26] This deals with pre-existing or underlying trends that could confound the causal interpretation of our estimated coefficients. In all regressions, we cluster standard errors at the province level to allow for the possibility of correlated shocks within each of the 109 provinces in our sample.

## 5. Broadband Access and Turnout in National Elections

Our central question is what is the effect of broadband Internet access on political participation? We start by looking at turnout in Italian legislative elections (focusing on the lower House), comparing the two prebroadband elections of 1996 and 2001 to the three postbroadband elections of 2006, 2008, and 2013. From an empirical perspective, looking at national elections has a major advantage in terms of data availability: For every election year, we have information for all of the roughly 8,000 municipalities. This greatly increases the effective sample size and allows us take full advantage of the contrast between the pre- and postbroadband eras, while also controlling for unobserved municipality characteristics. As emphasized in our conceptual discussion, the effect of the Internet on political engagement could potentially vary considerably over time; looking at multiple postbroadband elections allows us to better examine the evolution of such effect.

### *5.1. Preliminary Evidence*

We start by looking at the raw turnout data. Figure 4 summarizes the evolution of the difference in turnout between localities that would eventually be early adopters of broadband Internet and those that would lag behind in this respect. We can clearly see that, in the prebroadband years of 1996 and 2001, eventual early adopters display substantially higher turnout—consistent with the fact that these were, on average, more educated and densely populated localities. This difference remains essentially unchanged between the two elections. However, the picture changes substantially after

26. We obtain similar results using province dummies instead of region dummies.

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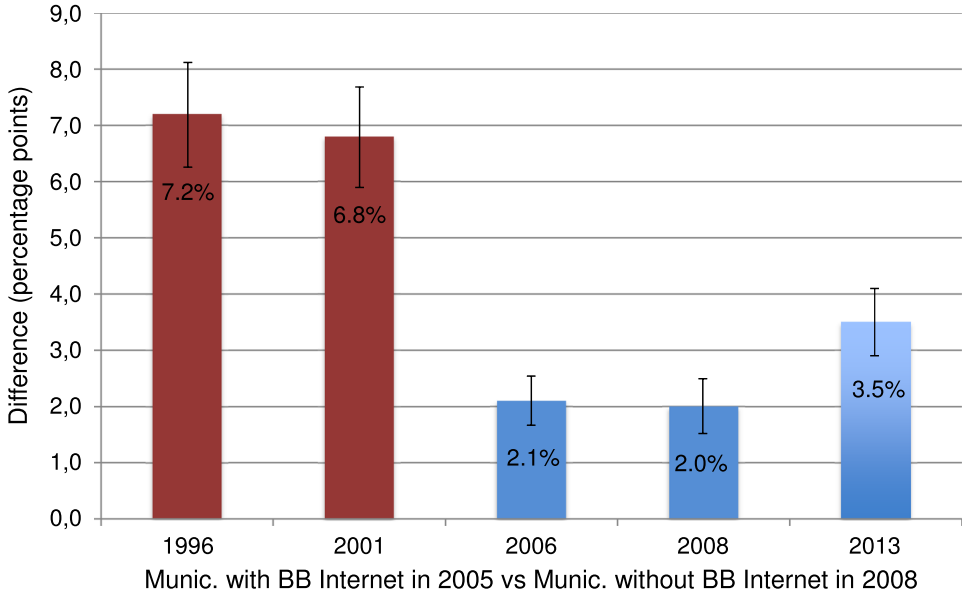


FIGURE 4. Difference in turnout between early- and late-Internet adopters. The figure reports the difference in average turnout in the national elections held in 1996, 2001 (before the diffusion of ADSL, in light grey) and in 2006, 2008, and 2013 (after, in dark grey) between municipalities that had access to ADSL in 2005 (the first year for which data are available) and municipalities that still did not have access to ADSL in 2008.

broadband is introduced: The gap in turnout drops considerably, consistent with a substantial *negative* initial effect of broadband access on turnout. This initial drop then seems to be partially reversed in 2013.

How does this pattern relate to our key source of variation? We split the sample of municipalities according to the distance to the closest UGS and compare the evolution of turnout over time across the different groups. Figure 5 compares groups of municipalities with below- and above-median distance to UGS—for shorthand, "treated" and "not treated", respectively—in the natural experiment of broadband access induced by the structure of the pre-existing telecommunications network.[27] The top panel indicates that the movements in turnout in each subgroup are dominated by the general fluctuations. However, there are important differences between the two groups, particularly with regard to the intensity of the increase in turnout after 2001. To see this more clearly, in the bottom panel, we average over pre- and postbroadband periods, so as to leave aside general fluctuations. In particular, although turnout stayed

27. The average shows the fluctuations in overall turnout over time with a spike in 2006 (a very close election) and a substantial decline from 2008 to 2013 (from over 0.8 to under 0.75). The median distance in the sample is about 12.5 km. The average "*Broadband Access*" scores of the two groups, as of 2006, were 3.4 and 2.1, respectively, whereas the share of unconnected municipalities was 21.2% and 46.3%, respectively. Even by 2008, one in five municipalities above the median were still not connected, compared to 7% for the "treatment" group.

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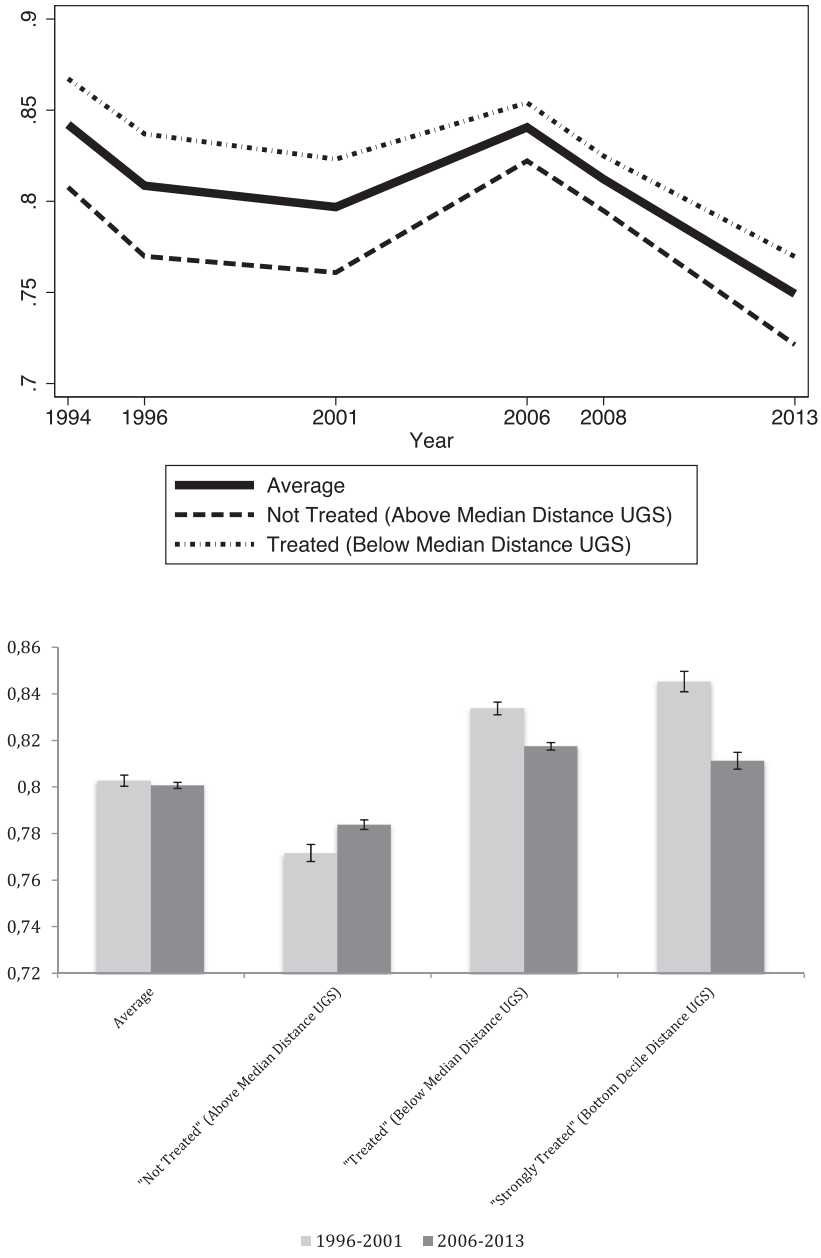


FIGURE 5. Turnout by distance to closest UGS. The top panel of the figure reports average turnout in national elections between 1996 and 2013 for all municipalities in the sample (solid line) and separately for municipalities with above- and below-median distance to the closest UGS (dashed lines). The bottom panel reports the average turnout in pre-Internet elections (1996 and 2001, in grey) and in post-Internet elections (2006 through 2013, in black) for all municipalities in the sample (on the left), and separately for municipalities with above- and below-median distance to the closest UGS (in the middle), and for municipalities in the bottom decile of the distribution of distance to the closest UGS (on the right).

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on average about the same between the two periods, the "not treated" group actually witnessed a modest increase. In contrast, the "treated" localities witnessed a decline, which was in fact considerably more pronounced for the subset of municipalities closest to a UGS ("strongly treated", bottom decile).[28]

Taken together, this preliminary evidence suggests a substantial negative effect of broadband access on turnout upon the introduction of the technology, perhaps followed by a partial reversal in later years. In what follows, we show that this conclusion very much survives further scrutiny of the data.

### *5.2. "Short-Run" Effects: 2006–2008*

We start by examining the more immediate impact of broadband introduction, by comparing the last two prebroadband elections, held in 1996 and 2001, and the first two postbroadband elections, held in 2006 and 2008.

To gain intuition, consider first a reduced-form regression of turnout on distance to the closest UGS, estimated separately for each election year. Figure 6 reports the coefficients obtained from estimating such a regression including the full set of controls described and both province and local labor market (SLL) fixed effects.[29] Importantly, although there seems to be a systematic residual relationship prior to the advent of broadband (more distant places display lower levels of turnout), there is no evidence of any trend. Moreover, consistent with the preliminary evidence above, distant localities become indistinguishable from closer ones upon the introduction of broadband.

The same pattern emerges from a simple differences-in-differences specification, still in the reduced-form context. We regress turnout on the interaction of the post-2001 dummy with a dummy for whether the municipality is in the "treated" group of below-median distance to the closest UGS.[30] The coefficient on the interaction term—plotted in the left column of Figure 7—is negative, which indicates a relative decrease in turnout in areas located closer to a UGS after broadband was introduced. A consistent pattern emerges in the remaining columns of Figure 7 where we plot the coefficient by quartile: The reduction in turnout is more pronounced the closer a municipality is to a UGS. In Online Appendix Figure A.2, we show that no such pattern emerges when we run a "placebo" specification with a dummy for post-1996, instead of post-2001: There is no break around a time when there was no broadband introduction.

In Table 2, we implement the two-stage specification in (1) and (2). Column (1) reports the basic OLS results controlling for population, unemployment, as well as region-year and municipality fixed effects. Not surprisingly, at this point, the coefficient on broadband access is negative and statistically significant: The advent of high-speed

28. The bottom decile is defined by municipalities less than 4.7 km from a UGS.

29. SLL are commuting areas designated by the Italian statistical office as groups of municipalities that are contiguous, and geographically and statistically comparable. The country is divided in 658 SLLs, with each SLL comprising, on average, just over ten municipalities.

30. The regression controls for smooth trends in the full set of demographics, as well as municipality and region-year fixed effects, as in column (4) in Table 2 below.

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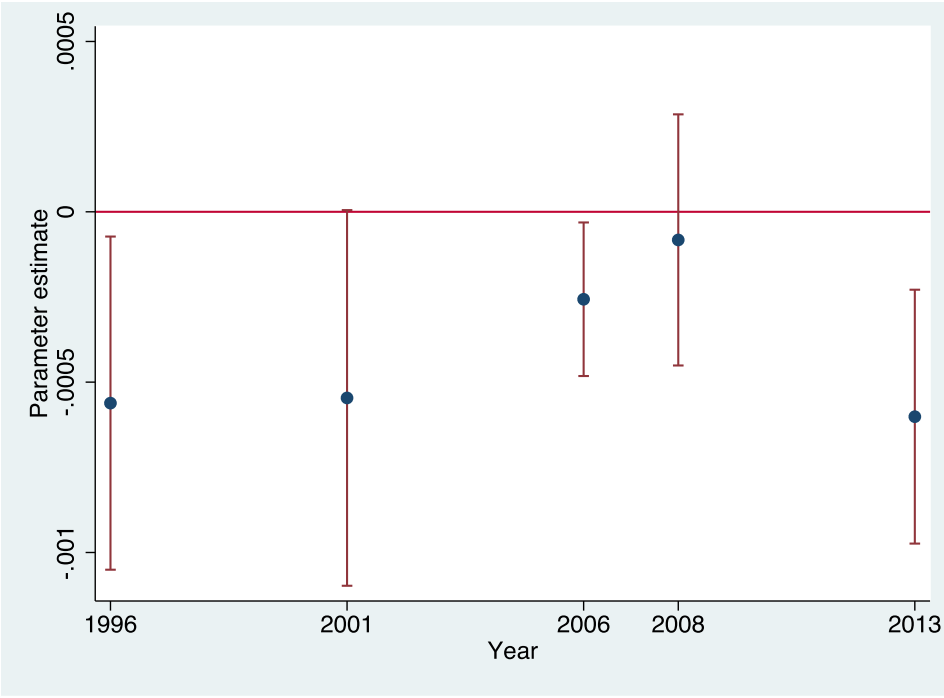


FIGURE 6. Coefficient from reduced-form regression: Turnout on distance to closest UGS (1996–2013). The figure reports the estimated coefficient, and respective confidence interval, from a regression of electoral turnout on distance to the closest UGS separately for each of the two prebroadband elections (1996 and 2001) and each of the three postbroadband elections (2006, 2008 and 2013). All regressions include province and local labor market fixed effects as well as the entire set of controls described in our empirical section.

Internet was associated with lower turnout. The estimated coefficient is, however, relatively small: Going from zero to full broadband access would correspond to a decline in turnout of about 2 p.p. (relative to an average turnout of 80% in 1996 and 2001).

We then instrument broadband access with the interaction between distance to the closest UGS and the post-2001 dummy. Again, we find a negative and statistically significant effect (column (2)). Quite strikingly, the effect is much larger than in the baseline OLS specification: Going from zero to full broadband coverage is now associated with a decrease in turnout of almost 13 p.p..[31] However, the estimated effect drops substantially, to 7 p.p., when we control for the smooth trends (column (3)); this

31. The downward bias of the OLS coefficient could have different sources. First, in line with the evidence shown in Figure 4, municipalities with higher/earlier broadband coverage tend to exhibit a higher degree of electoral participation overall, suggesting that coverage might be related to unobservable municipal characteristics associated with a higher propensity to turn out in elections. That said, controlling for observable characteristics reduces the absolute value of the OLS coefficient (available upon request). It could also be related to the coarseness of our measure of broadband access, especially at the bottom: for

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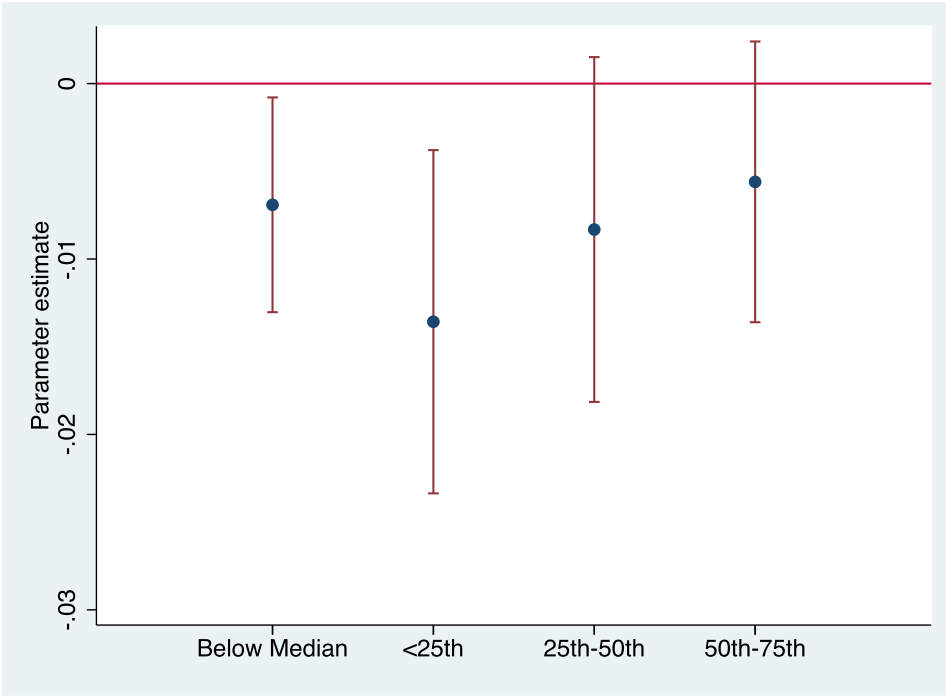


FIGURE 7. Coefficient from differences-in-differences regression: Turnout on post-2001×Distance to the closest UGS (1996–2008). The figure reports the estimated coefficient on the interaction between a post-2001 dummy and dummies for whether the municipality is in the labeled segment of the distribution of distance to the closest UGS, for the period 1996–2008. All regressions include municipality and region-year fixed effects, and control for population and interactions between a fourth-order polynomial in time and the full set of demographic controls described in our empirical section.

suggests that it is indeed important to control for differential trends in population, age structure, and urbanization.

Column (4) shows that the inclusion of the second set of demographic controls has absolutely no effect on the coefficient of interest. In addition, in columns (5) and (6), we show that the coefficient remains virtually unchanged—and if anything increases ever so slightly—when we consider the interactions of the two sets of demographics with election-year fixed effects, which control flexibly for the possibility of demographic trends, though precision is affected. In sum, these results document a substantial negative effect of broadband Internet on voter turnout in the immediate aftermath of its introduction.

In Table 3, we attempt to further address the possibility that we could be picking up some underlying trend in turnout that just happens to be correlated

instance, going from 1% to 49% access would be entirely missed by our measure, and yet have the strongest impact, if we assume diminishing returns to broadband access.

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TABLE 2. Broadband access and turnout in national elections: 'short-run" effects (1996–2008).

| Dep. variable: turnout | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | OLS | IV | IV | IV | IV | IV |
| Broadband Access | −0.004*** | −0.027*** | −0.014*** | −0.015** | −0.015* | −0.017 |
| | (0.001) | (0.004) | (0.005) | (0.006) | (0.009) | (0.012) |
| Demographics I × Time polynomial | | | Yes | Yes | | |
| Demographics II × Time polynomial | | | | Yes | | |
| Demographics I × Year FEs | | | | | Yes | Yes |
| Demographics II × Year FEs | | | | | | Yes |
| First-stage *F*-statistic | | 63.21 | 36.64 | 44.91 | 17.59 | 18.76 |
| Observations | 31,868 | 31,868 | 31,868 | 31,868 | 31,868 | 31,868 |
| Number of municipalities | 7,967 | 7,967 | 7,967 | 7,967 | 7,967 | 7,967 |

Notes: Sample includes election years 1996, 2001, 2006, and 2008. All regressions include municipality and region×year fixed effects and control for contemporaneous population. Instrumental variable: distance to closest UGS × post-2001 dummy. Demographics I (in baseline Census year 2001): population, % population aged 20–34 years, % population over 65 years, urbanization, unemployment rate; Demographics II (in baseline Census year 2001): % population with a high school or university diploma, firms per capita, change in firms per capita between 1996 and 2001, private sector workers per capita, change in private sector workers per capita between 1996 and 2001, distance of the municipality to the closest provincial capital. Time polynomial: fourth-order polynomial in time. Robust standard errors clustered by province reported in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

TABLE 3. Broadband access and turnout in national elections: prebroadband placebo.

| Dep. variable: turnout | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | OLS | IV | IV | IV |
| Broadband Access | 0.000 | 0.002 | 0.001 | 0.001 |
| | (0.001) | (0.002) | (0.007) | (0.009) |
| Demographics I × Time polynomial | | | Yes | Yes |
| Demographics II × Time polynomial | | | | Yes |
| Observations | 15,934 | 15,934 | 15,934 | 15,934 |
| Number of municipalities | 7,967 | 7,967 | 7,967 | 7,967 |

Notes: Sample includes election years 1996 and 2001. For 2001 we impute the average "Broadband access" between 2005 and 2011. All regressions include municipality and region×year fixed effects and control for contemporaneous population. Instrumental variable: distance to closest UGS × post-2001 dummy. Demographics I (in baseline Census year 2001): population, % population aged 20 to 34 years, % population over 65 years, urbanization, unemployment rate; Demographics II (in baseline Census year 2001): % population with a high school or university diploma, firms per capita, change in firms per capita between 1996 and 2001, private sector workers per capita, change in private sector workers per capita between 1996 and 2001, distance of the municipality to the closest provincial capital. Time polynomial: fourth-order polynomial in time. Robust standard errors clustered by province reported in parentheses.

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TABLE 4. Broadband access and turnout in national elections: "Short-run" effects – robustness.

| Dep. Variable: Turnout | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | IV | IV | IV | IV | IV | IV | IV |
| Broadband Access | −0.014** | −0.011* | | | | −0.039** | −0.001 |
| | (0.007) | (0.007) | | | | (0.016) | (0.010) |
| Years Since Good Broadband | | | −0.111** | | | | |
| | | | (0.057) | | | | |
| Full Access | | | | −0.076*** | | | |
| | | | | (0.027) | | | |
| Some Access | | | | | −0.072*** | | |
| | | | | | (0.026) | | |
| Nonurban only | X | | | | | | |
| No own UGS | | X | | | | | |
| Bottom quartile Over 65 | | | | | | X | |
| Top quartile Over 65 | | | | | | | X |
| First-Stage *F*-statistic | 29.01 | 26.29 | 5.79 | 40.28 | 32.38 | 3.88 | 19.17 |
| Observations | 28,268 | 30,584 | 31,868 | 31,868 | 31,868 | 7,968 | 7,964 |
| Number of municipalities | 7,067 | 7,646 | 7,967 | 7,967 | 7,967 | 1,992 | 1,991 |

Notes: Sample includes election years 1996, 2001, 2006, and 2008. All regressions include municipality and region×year fixed effects and control for contemporaneous population. Instrumental variable: distance to closest UGS × post-2001 dummy. Demographics (in baseline Census year 2001): population, % population aged 20 to 34, % population over 65, urbanization, unemployment rate. Time polynomial: fourth-order polynomial in time. Robust standard errors clustered by province reported in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

with the diffusion of broadband. Specifically, we run "placebo" IV specifications for the pre-ADSL election years of 1996 and 2001 only, assuming that the patterns of Internet access observed in 2006 were present in 2001. Reassuringly, we see no impact of this fictitious episode of the introduction of broadband Internet, a result that further supports the view that our findings are not driven by pre-existing trends.[32]

In Table 4, we further test the robustness of this finding. As our baseline specification, we use the one with the interaction between the first set of demographics and a fourth-order time polynomial (as in column (3) of Table 2), because the inclusion of additional controls does not affect the estimated coefficient. We first deal with the concern that the results could be driven by the contrast between large cities (more likely to be close to a UGS) and small isolated towns. Although we have controlled throughout for the possibility of different trends according to both the degree of urbanization and proximity to provincial capitals, we re-estimate our main specification limiting our sample respectively to nonurban municipalities, as designated by the ISTAT classification (column (1)), and to municipalities without their own UGS (column (2)). In both cases, the coefficient on broadband access remains virtually unchanged.

32. Note that, with two years only, the specifications with year fixed effects interactions, as in columns (5)–(6) of Table 2, are equivalent to those with polynomial interactions. We thus omit the corresponding specifications. Tables A.5–A.6 in the Online Appendix show that the results are largely the same if we include 1994 as an additional prebroadband election year in the analysis.

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To further explore the nature of the effect, we then consider different measures of broadband access. In column (3), we use "*Years Since Good Broadband*" and find a similarly negative effect. In this case, however, the first stage becomes considerably weaker, likely due to measurement error which, as discussed in Section 4.1, is particularly important for this measure in the early years of broadband diffusion. In columns (4) and (5), we then consider our two alternative dummy variables. Quite remarkably, the coefficients are almost exactly the same for both the "*Full Access*" and the "*Some Access*" dummies, and correspond quantitatively to essentially the same effect estimated for our baseline "*Broadband Access*" measure (i.e., around 7 p.p.). This result suggests that the relevant variation in our data is coming from the comparison between municipalities with no access (0) and those with full access (5), rather than from municipalities with partial access (i.e., between 1 and 4) which, in fact, only represent about 8% of our sample.

Finally, we also check the results against demographic patterns. For instance, it would be surprising, and concerning, if the effect of broadband were coming primarily from municipalities with large older populations, which would presumably be less exposed to the Internet. In columns (7) and (8), we show that the effect is indeed significantly larger for municipalities with fewer elderly people (i.e., in the bottom quartile of the distribution of the share of over-65-year-olds), whereas there is no effect for municipalities with a larger older population (i.e., in the top quartile).

All in all, our estimates point very consistently to an immediate negative effect of the diffusion of broadband on turnout, of the order of about 7 p.p. To get a better sense of what this magnitude implies, following DellaVigna and Kaplan (2007) and DellaVigna and Gentzkow (2010), we compute the corresponding "persuasion rate". The persuasion rate is defined as the share of individuals who changed their behavior due to the treatment, out of those who could have changed it to begin with. In our case, because the change in behavior is from voting to not voting, the set of potentially affected individuals includes those who turned out in 2001, corresponding to 79.8% of the total population. Considering that, in 2008, 45% of the Italian population reported having broadband internet (ISTAT), out of the 93% of the population living in connected municipalities, and assuming that voters and nonvoters are equally likely to have broadband, we calculate that out of 100 Italians approximately 39 (100*0.798*0.45/0.93) could potentially be affected by the broadband "treatment". It follows that going from zero to full access would imply a persuasion rate of approximately 18 (100*5*0.014/0.39). In other words, 18% of the "treated" individuals were actually persuaded to abstain. This is very much within the range of the persuasion rates (between 4 and 20) reported by DellaVigna and Gentzkow (2010) in their survey of studies on the effect of media on voting behavior.

### *5.3. "Long Run" Effects: 2013*

We now turn to the effects of broadband access as seen from the vantage point of the 2013 elections. To do so, we compare the 2013 elections with the prebroadband period (1996 and 2001), leaving aside the elections of 2006 and 2008.

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TABLE 5. Broadband and turnout in national elections: 'long-run" effects (2013).

| Dep. variable: turnout | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | IV | IV | IV | IV | IV | IV |
| Broadband Access | 0.015 | 0.018 | | | | |
| | (0.016) | (0.017) | | | | |
| Years Since Good Broadband | | | 0.008 | 0.010 | | |
| | | | (0.009) | (0.009) | | |
| Full Access | | | | | 0.062 | |
| | | | | | (0.067) | |
| Some Access | | | | | | 0.084 |
| | | | | | | (0.094) |
| Nonurban only | | X | | X | | |
| First-stage *F*-statistic | 52.10 | 13.63 | 24.28 | 15.38 | 52.76 | 46.45 |
| Observations | 23,901 | 21,201 | 23,901 | 21,201 | 23,901 | 23,901 |
| Number of municipalities | 7,967 | 7,067 | 7,967 | 7,067 | 7,967 | 7,967 |

Notes: Sample includes election years 1996, 2001, and 2013. All regressions include municipality and region×year fixed effects and control for contemporaneous population. Instrumental variable: distance to closest UGS × post-2001 dummy. Demographics (in baseline Census year 2001): population, % population aged 20 to 34 year, % population over 65 year, urbanization, unemployment rate. Time polynomial: fourth-order polynomial in time. Robust standard errors clustered by province reported in parentheses.

The results are shown in Table 5. In column (1), we estimate our preferred specification, with the interaction between demographics and the time polynomial. The coefficient of interest is now statistically insignificant and, although the absolute value is in line with what we found in Table 2, the sign of the coefficient is now *positive*. Hence, we find no evidence of a negative effect such as that documented for the immediate aftermath of broadband introduction. In line with the preliminary evidence presented above, this result confirms that the immediate impact of broadband on turnout had largely been reversed by 2013.[33]

The remainder of Table 5 further reinforces this message. First, we deal with the concern that, by 2013, the places still left without broadband access might be quite unusual (in fact, the first-stage *F*-statistic is considerably smaller than in the previous tables, indicating that distance to the closest UGS is less predictive of differences in broadband access by 2013.) In this respect, it is reassuring that, when estimating the effect only on the sample of nonurban municipalities (column (2)), the results are very similar. Similarly, the picture does not change in columns (3) and (4) when we use "*Years Since Good Broadband*" as a measure of broadband access, a variable for which there is still much variation even as of 2013. It is also worth noting that the measurement error for this variable seems less problematic in 2013,

33. In principle, a possible concern for our identification strategy as we reach 2013 may be posed by the presence of mobile broadband in areas where ADSL was not available. However, as explained in detail in Online Appendix B, the characteristics of the mobile broadband infrastructure, its coverage, and the use of mobile broadband in Italy, all point to the conclusion that this does not pose an issue for our analysis.

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TABLE 6. Broadband and turnout in national lower house elections: full sample (1996–2013).

| Dep. variable: turnout | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | OLS | IV | IV | IV | IV | IV |
| Broadband Access | −0.004*** | −0.026*** | −0.022*** | −0.024*** | −0.007 | −0.010 |
| | (0.001) | (0.004) | (0.004) | (0.004) | (0.010) | (0.014) |
| Demographics I × Time polynomial | | | Yes | Yes | Yes | |
| Demographics II × Time polynomial | | | | Yes | | |
| Demographics I × Year FEs | | | | | Yes | Yes |
| Demographics II × Year FEs | | | | | | Yes |
| First-stage *F*-statistic | | 59.86 | 54.81 | 63.12 | 17.87 | 19.41 |
| Observations | 39,835 | 39,835 | 39,835 | 39,835 | 39,835 | 39,835 |
| Number of municipalities | 7,967 | 7,967 | 7,967 | 7,967 | 7,967 | 7,967 |

Notes: Sample includes election years 1996, 2001, 2006, 2008, and 2013. All regressions include municipality and region×year fixed effects and control for contemporaneous population. Instrumental variable: distance to closest UGS × post-2001 dummy. Demographics I (in baseline Census year 2001): population, % population aged 20 to 34 years, % population over 65 years, urbanization, unemployment rate; Demographics II (in baseline Census year 2001): % population with a high school or university diploma, firms per capita, change in firms per capita between 1996 and 2001, private sector workers per capita, change in private sector workers per capita between 1996 and 2001, distance of the municipality to the closest provincial capital. Time polynomial: fourth-order polynomial in time. Robust standard errors clustered by province reported in parentheses. $^{***}p < 0.01$.

as illustrated by the fact that the first stage *F*-statistic is considerably larger than in Table 2. Finally, the results remain unchanged in columns (5) and (6) when using the dummies for "*Full Access*" and "*Some Access"* as alternative measures of Internet coverage.

In sum, our results show quite clearly that the effect of the Internet varied considerably over time. Although in the first years of Internet diffusion, broadband had a substantial negative effect on turnout in national elections, this tendency was at least partly reversed in later years. This pattern raises our confidence in the identification strategy. Indeed, any story that would ascribe the documented effect to unrelated spurious trends would also need to explain this sharp reversal, which does not seem obvious.

### *5.4. Full Sample*

For the sake of completeness, we also present the results of our estimation for the full sample of elections, that is, from 1996 to 2013 (Table 6). The pattern that emerges in columns (1) and (2) is quite similar to that found in Table 2, with a negative,

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statistically significant coefficient that is considerably larger for the IV specification (columns (1) and (2)). This similarity is not surprising, because most of the variation in the full sample comes from the initial years of the sample. The results do not change much in columns (3) and (4) when we include interactions between demographic characteristics and a fourth-order time polynomial to account for smooth unobservable trends.

Things look quite different, however, when we allow for the possibility of sharper trends by interacting the demographics with year fixed effects (columns (5)–(6)). In this case, the estimated effect of broadband on turnout is much smaller in magnitude, estimated around 3 p.p. for going from no coverage to full coverage, with the first stage also suffering considerably. It thus seems that the reversal pattern uncovered in the previous analysis is being picked up as sharp trends in the data, thus confounding our empirical strategy. By looking at these results, we might have concluded that the evidence of any effect of broadband on electoral turnout is weak when, in fact, much was occurring in the meantime.

## 6. Broadband Access and Political Participation: Elucidating the Mechanism

We have thus established that the impact of broadband Internet on political participation in Italian elections varied substantially over time. We now turn to the task of trying to elucidate the driving forces behind this nuanced pattern.

### *6.1. Winners and Losers*

In line with our conceptual discussion, we now ask what kinds of voters were more likely to drop out as a result of the introduction of broadband Internet. This should help elucidate the incentives faced by both established political forces and potential newcomers.

One approach is to look at which parties and coalitions were most affected by the drop in turnout in early postbroadband national elections. In fact, to the extent that supporters of different political forces differ with respect to their level of political engagement and political information, documenting a differential impact of the Internet on voters of different parties could be instructive.[34]

In Table 7, we distinguish between the mainstream center-right and center-left coalitions, and the "outsiders", that is, those political forces that come into elections

34. In addition, these patterns are interesting in and of themselves in that an across-the-board drop in turnout could have very different political implications from a scenario in which various parties or coalitions are affected differently. This can also speak to the question of whether or not the Internet has operated as a polarizing force, a topic of much debate with relatively conflicting evidence (Gentzkow and Shapiro 2011; Hindman 2009; Sunstein 2009).

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TABLE 7. Broadband and coalition performance: 2001 and 2008 (IV results).

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent variable: | Center right | Center left | Outsiders |
| Vote share | 0.010 | 0.012* | −0.022* |
| | (0.011) | (0.007) | (0.012) |
| (Mean vote share 2001) | 0.524 | 0.323 | 0.153 |
| Votes per eligible voters | −0.006 | 0.001 | −0.019** |
| | (0.011) | (0.006) | (0.010) |
| (Mean votes per eligible voter 2001) | 0.380 | 0.234 | 0.109 |
| Observations | 15,272 | 15,272 | 15,272 |
| Number of municipalities | 7,636 | 7,636 | 7,636 |

Notes: Sample includes election years 2001 and 2008. Reported coefficients are for broadband access. We exclude the Trentino Alto Adige (Südtirol) region, due to the difficulty of classifying SVP, the dominant regional autonomist party. All regressions include municipality and region×year fixed effects, and control for contemporaneous population and the following demographic controls (in baseline Census year 2001) interacted with a fourth-order polynomial in time: population, % population aged 20–34 years, % population over 65 years, urbanization, unemployment rate. Instrumental variable: distance to closest UGS × post-2001 dummy. Robust standard errors clustered by province reported in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$.

with very little chance of affecting the political balance.[35] We then compare the results obtained by these three groups of parties in the elections of 2001 and 2008.[36]

The first panel shows the coefficients on "*Broadband Access*" (with the full IV specification), using as dependent variable the vote shares of each of the three groups. The results suggest that the mainstream center-left coalition gained modestly at the expense of the outsider parties. However, this initial conclusion is very much qualified by the results in the second panel where, instead of using as dependent variable the vote share relative to the total number of votes cast, we use the share relative to the total number of eligible voters (which is very stable over time); this allows us to control for the negative impact on turnout documented above. This second set of results suggest that what looked like a gain for the center-left coalition was not, in fact, coming from an

35. Online Appendix Table A.9 reports the breakdown of the results for each of the main parties in the two mainstream coalitions, and for each of the main groups of outsider parties. For the definitions of coalitions, see Online Appendix Table A.10. The Italian political system has a large number of parties, with new ones forming and old ones merging and dissolving quite frequently. By the same token, the main coalitions are led by the same forces over the period under consideration, but their membership varies drastically across election cycles. For each election, we take the main center-right and center-left coalitions, and define all parties that do not belong to either as outsiders, with the exceptions of the M5S and the Monti coalition in 2013. Online Appendix Table A.11 describes how the different party labels in Table A.9 map onto different parties in different elections, due to mergers. Note also that we exclude the region of Trentino Alto Adage (Südtirol) from the analysis because of the presence of a regional autonomist party (SVP) that is hard to classify as "outsider," because it is the main party within the region, but does not align clearly with either the national center-left or center-right coalition. The results are robust to including the SVP based on its occasional national alliances.

36. We choose these years because in the 1996 election the coalitions were very different, and in 2006 different electoral rules greatly increased the incentive of smaller parties to join the main coalitions; as a result, the definitions of mainstream coalitions are very different in these elections.

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increase in electoral consensus but rather from a stable electoral consensus accounting for a larger share of a smaller pool of total votes. In terms of change in actual electoral performance, the most distinctive impact of the introduction of broadband is certainly the negative impact on votes for outsider parties.[37]

The fact that those who drop out are disproportionately the supporters of outsider parties—which include those at the more extreme ends of the ideological spectrum (e.g., unreformed Communists)—suggests that the drop in turnout is due to more subtle reasons than a simple reduction in the consumption of political information. To further explore this aspect, we use data from the Italian National Election Study (ITANES), a series of electoral surveys conducted on a representative sample of the Italian population in coincidence with national parliamentary elections. We focus on the 2001 wave, which interviewed 3,209 individuals and included various questions on self-reported voting choice, political participation, and media consumption. Based on this information, we construct measures of "*Interest in Politics*", "*Political Activism*", and "*Political Information*", and look at differences along these dimensions between voters of different parties and coalitions.

Figure 8 presents the results, comparing averages for voters who reported having voted for either of the mainstream coalitions or for an outsider party (variables are standardized so that magnitudes correspond to standard deviations of each of the variables). The comparison suggests that voters of outsider parties are among the most interested in and informed about politics and are certainly the most politically active.[38] This evidence seems hard to reconcile with the view that the effect of broadband Internet operates through demobilization induced by reduced information, because these voters are unlikely to be those disproportionately switching to online entertainment. All in all, this suggests that the depressing effect of broadband Internet on turnout in national elections was driven by the disengagement of individuals who were already disappointed with mainstream politics. If that is the case, the initial impact of broadband constituted an opportunity for political entrepreneurs to target this disenchanted audience.

This interpretation is further reinforced by the results on the electoral performance of different parties and coalitions in 2013, reported in Table 8, estimated using votes per eligible voters as dependent variable.[39] In columns (2) and (3), we see that traditional mainstream coalitions did not gain from the reversal in the initial drop in turnout. Instead, increased turnout benefited new political forces, especially the M5S (column (3)). The strong positive effect of longer exposure to broadband on support for M5S,

37. This effect was particularly pronounced for the extreme left, as shown in Online Appendix Table A.9.

38. The party breakdown (available upon request) shows that the unreformed Communists, who represent the bulk of outsider voters in 2001, score particularly high in all three dimensions.

39. Note that we attribute zeroes to the parties or movements that were not on the ballot in 2001, such as the M5S. This means that the identification in those cases is less clean, because it is essentially coming from cross-sectional variation.

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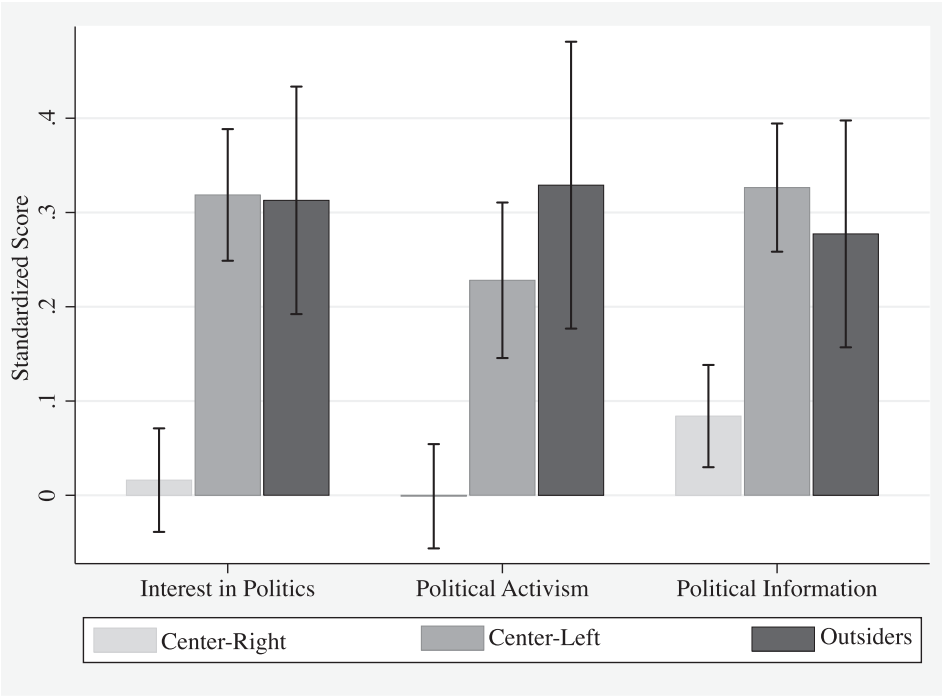


FIGURE 8. Interest in politics, political activism, and political information by voting choice (2001). The figure reports the average standardized score and 95% confidence intervals for the variables "Interest in Politics", "Political Activism" and "Political Information" separately for voters of the two mainstream coalitions (center right and center left), and of outsider parties. The variables are based on responses to questions included in the 2001 wave of the Italian National Election Study. The variable "Interest in Politics" is based on responses to the question "Generally speaking, are you very interested, fairly interested, a little interested or not at all interested in politics?", on a scale comprised between 0 (Not at all) and 4 (Very much). The variable "Political Activism" is based on responses to the following set of questions, by computing the first principal component: "I shall now read a list of things people sometimes do to participate in political life. Please, tell me whether you happened to make any of these things in the last 4–5 years (Yes or No): (1) Signing for law proposals or referenda; (2) signing in favor of a candidate's or a list's presence in the ballot; (3) sending letters or complains to public authority; (4) writing a letter to a newspaper; (5) participating in a political debate; (6) participating in a demonstration; (7) donating money to a candidate, a party or a party's paper; (8) spending time or work for a party; (9) attempting to persuade somebody (including family members) to vote for a party or a candidate". Finally, the variable "Political Information" is based on responses to the following set of questions, again by computing the first principal component: "Now, I shall read a list of things people did during the last election campaign. For each of them, please tell me if you happened to do it or not. And if you did it, did you do it with interest or without it? (1) Listening radio programs about the elections; (2) watching television programs about the elections; (3) reading articles in newspapers or magazines on the elections; (4) participating in public speeches and meetings about the elections; (5) reading Internet websites about the elections; (6) looking at posters about the elections; (7) watching TV parties' advertisements; (8) reading fliers or propaganda letters found in my mailbox".

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TABLE 8. Broadband and coalition performance in national elections: 2001 and 2013 (IV results).

| Votes per eligible voter | (1) M5S | (2) Center right | (3) Center left | (4) Outsiders | (5) Fare | (6) Monti |
|---|---|---|---|---|---|---|
| Years Since Good Broadband | 0.027*** | −0.010 | −0.001 | −0.010** | 0.002*** | 0.004 |
| | (0.009) | (0.007) | (0.004) | (0.005) | (0.001) | (0.003) |
| Mean (2013) | 0.173 | 0.231 | 0.197 | 0.033 | 0.007 | 0.058 |
| Observations | 15,272 | 15,272 | 15,272 | 15,272 | 15,272 | 15,272 |
| Municipalities | 7,636 | 7,636 | 7,636 | 7,636 | 7,636 | 7,636 |

Notes: Sample includes election years 2001 and 2013. All regressions include municipality and region×year fixed effects, control for contemporaneous population and the following demographic controls (in baseline Census year 2001) interacted with a fourth-order polynomial in time: population, % population aged 20 to 34 years, % population over 65 years, urbanization, unemployment rate. Instrumental variable: distance to closest UGS × post-2001 dummy. Robust standard errors clustered by province reported in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$.

in particular, is consistent with the fact that Grillo's movement relied crucially on the Internet for its organization and, later, for its campaign efforts.

We also find direct suggestive evidence that disenchantment with mainstream politics underpinned the rise of the M5S. Figure 9 plots M5S performance in the 2013 national election against the difference in average turnout between 2006–2008 and 1996–2001, at the municipality level. The negative relationship that emerges indicates that municipalities where the M5S performed best were disproportionately likely to have seen turnout drop following the introduction of broadband Internet. For instance, in the top 1% or 10% of localities by M5S performance, just over 75% witnessed a decline in turnout from 1996–2001 to 2006–2008. In contrast, that share is about 53% in the bottom half of the distribution.

Interestingly, the remainder of Table 8 shows that the M5S was not the only party to benefit from the Internet's mobilization potential. Another new "web-friendly" political movement, "*Fare per Fermare il Declino*" ("Act to Stop the Decline"; *Fare* for shorthand), was also able to leverage the effect of the Internet, though to a much more limited extent than the M5S (column (4)).[40] This further supports the view that the supply side of the political system did react to the initial shock represented by the diffusion of high-speed Internet and the subsequent emergence of a pool of "connected" but disenchanted individuals.

In sum, the evidence presented suggests quite clearly that the initial negative effect of broadband Internet on political participation in national elections was driven by individuals who were relatively engaged and informed about politics to begin with, but disenchanted with mainstream political offerings. By the same token, its reversal

40. This movement was cofounded by a group of US-based academic economists. Similarly to the M5S, it also exploited a blog as its springboard (namely, *noisefromamerika.org*, founded in 2006). However, the party suffered a political scandal regarding the qualifications of its political leader just before the elections, naturally detracting from its performance. Its average share of votes was a mere 0.7%, though it did receive a significant share (up to 29%) in a few localities.

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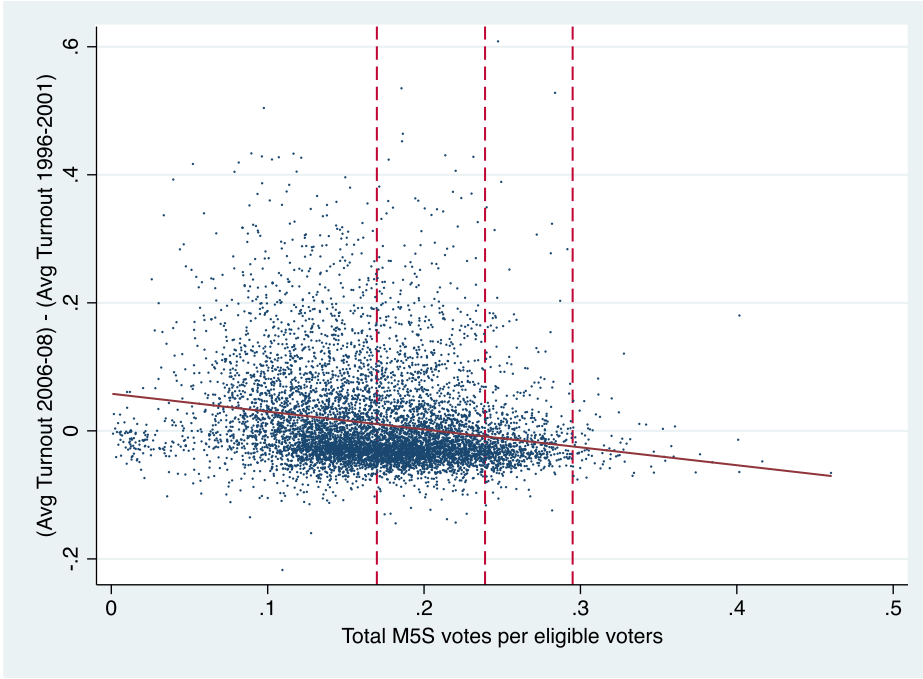


FIGURE 9. M5S performance in 2013 and change in turnout between prebroadband (1996–2001) and postbroadband elections. The figure plots M5S votes as a share of total eligible voters against the difference in average turnout in 2006–2008 (postbroadband) and 1996–2001 (prebroadband). Each dot represents one municipality. The solid line represents the fitted values (slope: −0.279, *p*-value: 0.000). The dashed vertical lines mark the 50th (0.1698), 90th (0.2390), and 99th (0.295) percentiles in the distribution of M5S votes as a share of eligible voters.

benefited new political forces which presumably emerged in response to the incentives posed by that initial effect.

### *6.2. Other Forms of Participation: Online Platforms and the Rise of the M5S*

We now turn to the question of what happened between the initial negative impact of broadband on turnout and its reversal. Specifically, can we find evidence that those who presumably dropped out of the mainstream political process remained politically active in other ways? Can we establish a link between these other forms of political activism and the eventual reversal in electoral turnout? To address these questions, we look at other forms of political engagement that were also happening in the intervening years, both online and offline, beyond mainstream national elections. Fortunately, the Italian political system, and its evolution in recent years, offers a number of windows through which to examine these different patterns.

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*6.2.1. Online Activity and the M5S.* We start by looking at the effects of broadband access on a notable measure of online political activity: the evolution of the local grassroots protest groups inspired by Beppe Grillo on the online media platform *Meetup.com*. As discussed in Section 3.2.1, these groups constituted an important springboard in the expansion of the M5S, and in the eventual creation of M5S-affiliated electoral lists at the local level. It is not unreasonable to expect that the presence of these online protest groups would be enhanced by the diffusion of broadband Internet—although we may also wonder whether the disengagement opportunities offered by the Internet, in the form of entertainment and different kinds of information, could negate that impulse.

To test for this, we construct a novel and comprehensive dataset with information on the formation and membership of all local *Meetup.com* groups associated with the Beppe Grillo-led protest movement, which would eventually coalesce into the M5S. Specifically, for each municipality, we know whether, by 2012, one such group existed and, if so, the date at which it was originally created. Unfortunately, this means that we cannot use the time variation induced by the pre- vs. post-2001 breakdown. We thus focus on variation across municipalities—hence excluding the municipality fixed effects and instrumenting $Broadband_{m,t}$ using $Distance\ UGS_m$. As a result, the identification here is not as clean as when we can actually use the time variation within municipalities. To improve upon this, we include both province and SLL fixed effects—hence identifying the effect from comparing municipalities within a very small area—and control for the full set of municipal sociodemographic and economic characteristics specified in Section 4.2. Our identification assumption would now have to be more stringent than before, requiring that the distribution of UGS within provinces and SLLs to be as good as random, once we control for these characteristics. In light of this, we will refrain from pushing any causal interpretation of our estimated coefficients.

In addition, as explained in Section 4.1, we also have information on the date at which each member joined each *Meetup* group. Hence, we can exploit these data to construct the number of members of all *Meetup.com* groups between 2005 and 2011 across the entire sample of Italian municipalities (we normalize membership in each municipality by 1,000 inhabitants).[41] In this case, there is time variation, and we can set the number at zero for the prebroadband period of 2001. Still, the relevant variation again comes from the postbroadband period only, and caution is still needed in interpreting the results. Table 9 reports the results, using IV specifications. The first column uses as dependent variable the time since the creation of the first local group, as of 2012, to examine whether broadband access is associated with earlier

41. We should stress that it is possible for an individual to be a member of multiple local groups, including in localities other than the one where she lives. To the extent that there exists an effect of broadband access on the existence of local groups, this possibility of multiple membership would magnify the difference between localities with extensive and limited access. We would argue that this magnified effect corresponds to the true impact of broadband access. In any event, the data on the date of formation of the groups should not be affected by multiple membership.

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TABLE 9. Broadband and creation of Beppe Grillo/M5S *Meetup.com* groups (IV results).

| Dependent Variable: | (1) Log days since creation | (2) Members per 1,000 |
|---|---|---|
| Broadband Access | 1.148*** | 0.100** |
| | (0.376) | (0.043) |
| Years | 2012 | 2001, 2005–2011 |
| Demographics | Yes | |
| Province and SLL FEs | Yes | |
| Demographics × Time polynomial | | Yes |
| Municipality and region-year FEs | | Yes |
| First-stage *F*-statistic | 8.58 | 3.858 |
| Observations | 7,950 | 63,736 |
| Number of municipalities | | 7,967 |

Notes: Log days since creation: Log (1 + days since creation of first group). Members per 1,000: Number of affiliates per 1,000 inhabitants. All regressions control for contemporaneous population. Instrumental variable: distance to closest UGS (column (1)), distance to closest UGS × post-2001 dummy (column (2)). Demographic controls (in baseline Census year 2001): population, % population aged 20 to 34 years, % population over 65 years, urbanization, unemployment rate. Time polynomial: fourth-order polynomial in time. Robust standard errors clustered by province reported in parentheses. AR weak-instrument robust *p*-values. $^{**}p < 0.05$, $^{***}p < 0.01$.

group formation. The results confirm that in municipalities that had earlier access to broadband internet, groups indeed tended to form earlier. In column (2), we then look at the panel variation in membership. We see that these groups also tended to have more members in places where broadband arrived earlier. On average, there are 0.039 *Meetup* members per 1000 inhabitants in a municipality in a given year, whereas the standard deviation is 0.63, and with a maximum number of 69. Hence, overall, the magnitude of the effect found in column (2) of Table 9 suggests that moving from zero to full broadband coverage in a municipality is associated with an increase in the number of M5S *Meetup* members of about 0.8 standard deviation of membership (or alternatively, 0.5 standard deviation of the increase in membership over the period).

Although this pattern is not exactly surprising, it is also not as obvious as might appear. Indeed, there is not necessarily a relationship between broadband access and an increase in online participation *in political activities*. In other words, that broadband access leads individuals to participate in this specific type of online activity is a hypothesis, rather than a fact, which our results support.

Most importantly, in light of the connection between these online groups and the creation and expansion of the M5S movement, the results in Table 9 immediately beg the question of whether the diffusion of broadband access impacted the performance of that movement, once it started taking part in the electoral process. This would provide direct evidence that the kind of political entrepreneurship exemplified by the M5S indeed eventually developed into the ability to translate these new mobilization tools into electoral participation and concrete results.

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TABLE 10. Broadband, turnout, and M5S results in municipal elections.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable | M5S on ballot | M5S on ballot | M5S votes per eligible voters | M5S votes per eligible voters |
| Broadband Access | 0.091*** | | 0.002*** | |
| | (0.023) | | (0.001) | |
| Years Since Good Broadband | | 0.156*** | | 0.005*** |
| | | (0.036) | | (0.001) |
| Observations | 7,192 | 8,188 | 7,192 | 8,188 |

Notes: Sample includes municipal elections held between 2008 and 2011 (columns (1) and (3)) and between 2008 and 2012 (columns (2) and (4)), IV Regressions. All regressions include year, province, and SLL fixed effects and control for contemporaneous population. Instrumental variable: distance to closest UGS. Demographic controls (in baseline Census year 2001): population, % population aged 20 to 34 years, % population over 65 years, urbanization, unemployment rate. Robust standard errors clustered by province reported in parentheses. $^{***}p < 0.01$.

For that we look at data on local elections. Municipal elections in Italy typically take place every five years, in staggered fashion such that every year has some elections taking place. We consider elections between 2008 and 2012.

Table 10 displays the results. In column (1), we see that municipalities with better access to broadband were more likely to have the M5S on the ballot, consistent with the idea that the creation of local *Meetup.com* groups translated into an M5S electoral presence at the local level. Note that, as we focus on more recent years, the fact that our ADSL coverage data only goes up until 2011 leads us to drop much useful information from 2012. We consequently also show a specification with "*Years Since Good Broadband*" as our key independent variable, which allows us to include the 2012 elections (column (2)).[42] Finally, in columns (3) and (4), we estimate the same two specifications using as dependent variable the share of votes obtained by M5S candidates (as a share of eligible voters). Consistent with the previous findings, these results confirm that, in places with stronger and earlier broadband diffusion, M5S candidates' electoral performance was significantly better.[43]

The evidence presented suggest that the emergence of new political forces—likely in tandem with the evolution of the Internet itself, with the rise of social media and user-generated content—may have substantially changed the effect of broadband access on political engagement. Still, the empirical variation that underlies these results is unavoidably narrow, coming from a small and select group of places—the number

42. The number of municipalities with M5S presence was 17 (2008), 51 (2009), 11 (2010), 78 (2011), and 103 (2012); the number of elections was 610, 4,284, 1,072, 1,338, and 1,006, respectively. The measure of years of good broadband coverage includes some inevitable additional measurement error for 2012.

43. As for the impact of broadband on turnout in municipal elections, we find no robust result. Note that here we have variation coming from a small number of municipalities, because most localities did not have more than one election in the years of our sample (2001 and 2005–2011). This means that our coefficient is rather imprecisely estimated, and the first-stage relationship is much weaker than was the case in Table 2.

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of municipalities with the M5S on the ballot is rather small, and these municipalities tend to be relatively large in terms of population, and again we cannot control for unobservable characteristics at the municipal level.

## 7. Discussion

### *7.1. Interpreting the Italian Evidence*

The main takeaway from our results is that the impact of broadband Internet was rather nuanced. In particular, it varied across different forms of political participation and, quite crucially, over time, consistent with the demand and supply sides of politics reacting endogenously to the increasing challenges and opportunities posed by the diffusion of the new medium.

We have documented that, initially, the introduction of broadband Internet across Italian municipalities was associated with a decline in political participation in the form of electoral turnout in national parliamentary elections. Our conceptual framework suggests, however, that this should best be interpreted as merely the immediate, partial-equilibrium effect of the change in media technology. Indeed, the initial drop in electoral participation was counteracted by rather distinct effects on other forms of political engagement, both online and offline. In particular, we provide evidence that early access to the Internet facilitated the emergence and expansion of local grassroots online protest groups. This pattern suggests that, although the Internet may have operated in the short run as a "demobilizing" force with regard to participation in mainstream elections, the same was not necessarily the case for political engagement more broadly.[44]

What is more, our findings document how these new forms of mobilization seem to have eventually fed back into the mainstream electoral process. This is exemplified most clearly by the emergence of the M5S, which, to a large extent, grew out of local online groups and, in due course, turned into a potent electoral force. Our results show that, once the M5S started competing in elections, it was able to leverage the expansion of broadband access into better outcomes—as was also the case, to a lesser extent, with other web-friendly newcomers. Their success strongly suggests that the initial demobilization, coupled with the possibilities offered by the new media platform, presented an opportunity that new, Internet-savvy political entrepreneurs were able to seize to enhance mobilization. Once this supply-side reaction had taken place, the initial negative effect on parliamentary election turnout was largely reversed.

44. Table A.12 in the Online Appendix shows survey evidence (from the 2013 Italian National Election Survey) that individuals who spend more time on the Internet are also more politically involved online. For example, the frequency of Facebook use is positively correlated with sharing online political content, engaging in online discussions related to politics or elections, and attending political events following an online invitation. This is unsurprising, as online participation necessarily requires an online presence, but underscores the point that individuals are indeed engaging in online political activities.

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This pattern is very much consistent with the exit, voice, loyalty framework discussed in Section 2. This is first underscored by the fact that it was outsider parties, whose supporters we would have deemed more likely to exit, that essentially lost voters in the immediate aftermath of the introduction of broadband. In addition, the M5S, and to a lesser extent other similar forces, encapsulate the Internet's potential to transition from exit device to a novel source of voice within mainstream politics. These were movements that initially emerged outside and in explicit repudiation of mainstream politics, but that eventually gravitated toward taking part in it, constituting, in this sense, another mechanism for what Hirschman called the "influence and power that come from having nowhere to go" (1970, p.73). In other words, disenchanted voters opting for exit from mainstream politics eventually became the driving force of a political movement that ended up punishing the very political forces that had disaffected them, through the movement's strong impact on mainstream politics.

In fact, survey evidence clearly shows that the M5S fished into a pool of demobilized voters. More specifically, people who did not vote in the 2008 national elections are largely overrepresented among M5S voters compared to other parties: One out of seven people who voted for the M5S in 2012 local elections reported having abstained in the 2008 parliamentary elections, compared to an overall figure of only one out of 15 (Pedrazzani and Pinto 2013).

### *7.2. Alternative Mechanisms*

There could also be alternative interpretations for these demand-side movements, beyond the role of disenchantment. The initial drop in turnout, for instance, is consistent with the existing literature on the effects of new media technologies, which has underlined how they may sometimes have negative effects on political participation. The usual explanation is related to the potential crowding-out of the consumption of existing media sources that place greater weight on relevant political information. The pool of demobilized voters surely included many purely apathetic citizens, likely to tune out political information when given the chance.

There is strong evidence, however, that the initial demobilization was indeed associated with disenchantment rather than pure apathy. First, we have documented that the drop in turnout was mostly linked to supporters of outsider parties, and unreformed Communists in particular, who tend to report relatively high levels of interest in politics and news consumption. Second, a pure apathy story would not lead us to expect other forms of participation to be enhanced by the Internet, as found in the data.

Additional evidence in this regard comes from looking at the sociodemographic characteristics of M5S voters. They typically have a medium-to-high level of educational attainment and are generally well-informed about politics (Pedrazzani and Pinto 2013). Rather unsurprisingly, M5S voters were also heavy Internet users: 80% of M5S voters access the Internet and 42% use it as their main source of news (compared with a population average of 61% and 26%, respectively). They are also more likely to express political opinions on websites or social media and to visit party

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or candidate websites (Mosca and Vaccari 2013). In sum, these are to a large extent "people who have resources to be active and the willingness to do it but that find high barriers to entry into the traditional channels of political participation" (Passarelli, Tronconi, and Tuorto 2013, p.130); people whose electoral abstention seems to be driven by protest rather than apathy (Tuorto 2006).

This antiestablishment profile is also apparent from direct survey evidence, showing that M5S voters are more prone to believing that voting is useless, and that political parties are not necessary in a democracy. It is further underscored by evidence that those places with the strongest M5S performance were also those most likely to have witnessed substantial drops in turnout in the immediate aftermath of broadband introduction.

At the same time, the coordinating role of the Internet might also have been complemented by an informational role, thus amplifying its effects. For example, Bailard (2012) shows that, in a weakly institutionalized environment, the Internet may also foster disenchantment, by increasing citizens' level of information about an electoral system perceived as disreputable. By the same token, Chong et al. (2015) point out that an exogenous increase in the level of information about incumbent politicians' misbehavior may translate into lower levels of electoral participation. Hence, in a political system widely perceived as dysfunctional, such as that of Italy in the 2000s, the Internet may have also boosted the short run *exit* (and then its long run conversion into *voice*) via an information channel.

### *7.3. External Validity*

A final question is whether we should expect the pattern we have detected in the case of Italy to be repeated in other contexts. There is good reason to think this could be the case.

Our conceptual framework suggests that the observed reversal should be expected once two main "ingredients" combine. First, the presence of a strong contingent of citizens who are dissatisfied with mainstream political forces, but not disengaged from politics in general. This phenomenon seems rather widespread, judging by recent trends observed in other countries. In particular, over recent decades voter turnout has decreased in many advanced democracies (Franklin 2004)—a process that, many have argued, has been accompanied by an increase in the extent of public dissatisfaction with the performance and institutions of representative democracy (Dalton 2004; Pharr, Putnam, and Dalton 2000). The second ingredient is the fact that the Internet is a mobilization and coordination platform with relatively low barriers to entry, which is obviously not specific to the Italian case either. Although the first ingredient implies that there will be an incentive for political entrepreneurs to jump into the electoral arena, the second one ensures that they will have an effective tool for doing so.

Although more evidence is certainly needed, there are examples from other countries that seem prima facie compatible with this logic. For example, in the United States, Howard Dean, Barack Obama, and the Tea Party all represented underdogs who both attracted different pools of voters who were disenchanted with mainstream

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politics, and used Internet as a coordination device to mobilize these voters.[45] Similar examples from other countries may include the so-called pirate parties (Scandinavia, Germany), Yesh Atid (Israel), Alexei Navalny (Russia), Rede Sustentabilidade (Brazil), and the Aam Aadmi Party (India), with different degrees of success in influencing mainstream elections.

These examples also make clear that the aforementioned ingredients are likely to interact with institutional characteristics, such that specific patterns will differ depending on context. For instance, in a two-party system like the United States, with very high barriers for third-party candidates, the role of the Internet in helping newcomer political entrepreneurs seems to have taken place within mainstream parties (via primary elections). This is rather different from what happened in Italy, with its relatively open proportional-representation system. As another example, we might consider a relatively authoritarian regime in which one party exerts overwhelming influence over pre-existing media, and where the Internet might represent the only news source available for alternative points of view (see Miner 2012, for the case of Malaysia and Enikolopov, Makarin, and Petrova 2016 for the case of Russia).

Last but not least, broadband speed may also be a source of heterogeneity across countries. For example, speed might be particularly important for data-demanding activities such as online entertainment (e.g., online games, movie streaming, etc.). Hence, it might be the case that the Internet leads to more political disengagement in countries/places with very high broadband speed.[46] The role of such institutional and technological features on the specific timing and shape of the effect of the Internet on political participation represents an exciting avenue for future research.

## References

AGCOM (2008–2012). "Annual Reports."

Bailard, Catie Snow (2012). "A Field Experiment on the Internet's Effect in an African Election: Savvier Citizens, Disaffected Voters, or Both?" *Journal of Communication*, 62, 330–344.

Bauernschuster, Stefan, Oliver Falck, and Ludger Woessmann (2014). "Surfing Alone? The Internet and Social Capital: Evidence from an Unforeseeable Technological Mistake." *Journal of Public Economics*, 117, 73–89.

Between, Osservatorio Banda Larga (2006). "Il Punto sulla Banda Larga in Italia", Report.

Between, Osservatorio Banda Larga (2008). "Analisi sulle Determinanti del Processo di Sviluppo della Banda Larga. Rapporto Finale", Report.

Chong, Alberto, Anna De la O, Dean Karlan, and Leonard Wantchekon (2015). "Does Corruption Information Inspire the Fight or Quash the Hope? A Field Experiment in Mexico on Voter Turnout, Choice and Party Identification" *Journal of Politics*, 77, 55–71.

45. For some evidence in the case of the United States, see Larcinese and Miner (2012) and Jaber (2013).

46. Notice that, though Italy does not have very high broadband Internet speed, its average and median advertised download speeds for fixed broadband in 2014 are comparable to those in Germany or the United Kingdom (OECD 2015)

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Ciapanna, Emanuela and Daniele Sabbatini (2008). "La Banda Larga in Italia." *Questioni di Economia e Finanza (Occasional Papers)*, Banco d'Italia. (https://www.bancaditalia.it/pubblicazioni/qef/2008-0034/QEF_34.pdf). (34).

Czernich, Nina (2012). "Broadband Internet and Political Participation: Evidence for Germany." *Kyklos*, 65, 31–52.

Dalton, R. J. (2004). *Democratic Challenges, Democratic Choices: The Erosion of Political Support in Advanced Industrial Democracies*. Comparative Politics, Oxford University Press, UK.

DellaVigna, Stefano and Matthew Gentzkow (2010). "Persuasion: Empirical Evidence." *Annual Review of Economics*, 2, 643–669.

DellaVigna, Stefano and Ethan Kaplan (2007). "The Fox News Effect: Media Bias and Voting." *The Quarterly Journal of Economics*, 122, 1187–1234.

Drago, Francesco, Tommaso Nannicini, and Francesco Sobbrio (2014). "Meet the Press: How Voters and Politicians Respond to Newspaper Entry and Exit." *American Economic Journal: Applied Economics*, 3, 159–188.

Enikolopov, Ruben, Alexey Makarin, and Maria Petrova (2016). "Social Media and Protest Participation: Evidence from Russia." CEPR Discussion Paper #11254.

Enikolopov, Ruben, Maria Petrova, and Konstantin Sonin (forthcoming). "Social Media and Corruption." *American Economic Journal: Applied Economics*.

Falck, Oliver, Robert Gold, and Stephan Heblich (2012). "E-Lections: Voting Behavior and the Internet." IZA Discussion Paper.

Falck, Oliver, Robert Gold, and Stephan Heblich (2014). "E-Lections: Voting Behavior and the Internet." *American Economic Review*, 7, 2238–2265.

Farrell, Henry (2012). "The Consequences of the Internet for Politics." *Annual Review of Political Science*, 15, 35–52.

Feddersen, Timothy J. and Wolfgang Pesendorfer (1996). "The Swing Voter's Curse." *The American Economic Review*, 86(3), 408–424.

Feddersen, Timothy J. and Wolfgang Pesendorfer (1999). "Abstention in Elections with Asymmetric Information and Diverse Preferences." *American Political Science Review*, 93, 381–398.

Franklin, Mark N. (2004). *Voter Turnout and the Dynamics of Electoral Competition in Established Democracies Since 1945*. Cambridge University Press.

Gentzkow, Matthew (2006). "Television and Voter Turnout." *Quarterly Journal of Economics*, 121, 931–972.

Gentzkow, Matthew and Jesse M. Shapiro (2011). "Ideological Segregation Online and Offline." *Quarterly Journal of Economics*, 126, 1799–1839.

Gentzkow, Matthew, Jesse M. Shapiro, and Michael Sinkinson (2011). "The Effect of Newspaper Entry and Exit on Electoral Politics." *American Economic Review*, 101, 2980–3018.

Hindman, Matthew (2009). *The Myth of Digital Democracy*. Princeton University Press.

Hirschman, Albert O. (1970). *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*, vol. 25. Harvard University Press, Cambridge, MA.

Jaber, Ahmed (2013). "Individual Campaign Contributions and Voter Turnout: The Role of Broadband Network Availability." Working Paper, Cornell University.

Kaye, Barbara K. and Thomas J. Johnson (2002). "Online and in the Know: Uses and Gratifications of the Web for Political Information." *Journal of Broadcasting and Electronic Media*, 46, 54–71.

Larcinese, Valentino and Luke Miner (2012). "The Political Impact of the Internet on US Presidential Elections." Working Paper, LSE and New Economic School.

Lassen, David Dreyer (2005). "The Effect of Information on Voter Turnout: Evidence from a Natural Experiment." *American Journal of Political Science*, 49, 103–118.

Miner, Luke (2012). "The Unintended Consequences of Internet Diffusion: Evidence from Malaysia." Working Paper, New Economic School.

Mosca, Lorenzo and Christian Vaccari (2013). "Il Movimento e la rete." In *Il Partito di Grillo*, edited by P. Corbetta and E. Gualmini. Il Mulino.

Nardotto, Mattia, Tommaso Valletti, and Frank Verboven (2015). "Unbundling the incumbent: Evidence from UK broadband." *Journal of the European Economic Association*, 13, 330–362.

Downloaded from https://academic.oup.com/jeea/article/16/4/1094/4731803 by guest on 10 August 2021

OECD (2001). "The Development of Broadband Access in OECD Countries."
OECD (2015). *OECD Digital Economy Outlook 2015*. OECD Publishing.
Passarelli, Gianluca, Filippo Tronconi, and Dario Tuorto (2013). "Dentro il Movimento: Organizzazione, Attivisti e Programmi." In *Il Partito di Grillo*, edited by P. Corbetta and E. Gualmini. Il Mulino.
Pedrazzani, Andrea and Luca Pinto (2013). "Gli elettori del Movimento 5 stelle." In *Il Partito di Grillo*, edited by P. Corbetta and E. Gualmini. Il Mulino.
Pharr, Susan J., Robert D Putnam, and Russell J. Dalton (2000). "A Quarter-Century of Declining Confidence." *Journal of democracy*, 11, 5–25.
Prat, Andrea and David Strömberg (2013). "The Political Economy of Mass Media." In: *Advances in Economics and Econometrics: Theory and Applications, Tenth World Congress*.
Prior, Markus (2005). "News v. Entertainment: How Increasing Media Choice Widens Gaps in Political Knowledge and Turnout." *American Journal of Political Science*, 49, 594–609.
Snyder, James and David Strömberg (2010). "Press Coverage and Political Accountability." *Journal of Political Economy*, 118, 355–408.
Strömberg, David (2004). "Radio's Impact on Public Spending." *The Quarterly Journal of Economics*, 119, 189–221.
Sunstein, Cass R. (2009). *Republic.com 2.0*. Princeton University Press.
Tolbert, Caroline J. and Ramona S. McNeal (2003). "Unraveling the Effects of the Internet on Political Participation?" *Political Research Quarterly*, 56, 175–185.
Tuorto, Dario (2006). *Apatia o Protesta?: L'Astensionismo Elettorale in Italia*. Il Mulino.

## Supplementary Data

Supplementary data are available at *JEEA* online.

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