The Impact of Foreign Media on Political Mobilization during the Arab Spring

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Abstract

We investigate how foreign media influenced political mobilization during the Arab Spring in the Middle East and North Africa (MENA) region. Focusing on two prominent transnational networks, Al Jazeera and Al Arabiya, we use Arab Barometer survey data to track political mobilization and media use indicators in Jordan, Lebanon, and the Palestinian Territories. To address potential endogeneity, we use the frequency of lightning strikes and submarine cable seaquake shocks as instrumental variables, which help isolate exogenous variation in access to foreign media. Our results show that access to foreign media has a positive and statistically significant effect on political mobilization. A one-standard-deviation increase corresponds to a rise in the likelihood of participating in protests of approximately 6.5 percentage points, a gain of approximately 39% at the sample mean. We argue that this effect is primarily driven by the informational dimension of foreign media, rather than its ideological content.

Keywords: Foreign Media, Al Jazeera, Al Arabiya, Arab World, Media, Political mobilization, Unrest, Arab Spring, Middle East and North Africa, Submarine Cables, Seaquake Incidences, Lightning Frequencies

JEL-Classification: D72, D83, D85, H56, 017, P26, Z13

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1 Introduction

The Arab world has long faced a lack of political transparency and accountability (Sakr, 2003; Kazemi and Norton, 2006; Makdisi, 2017). This environment eventually led to anti-government protests, uprisings, and rebellions in the early 2010s, collectively referred to as the "Arab Spring" (Anderson, 2011; Gelvin, 2012; Therme, 2012; Brownlee et al., 2015). The term "Arab Spring" describes a wave of anti-government demonstrations and armed confrontations that spread throughout the Arab world, beginning on 17 December 2010, when "a Tunisian vendor, Mohammed Bouazizi, set himself on fire to protest the arbitrary seizure of his vegetable stall by police for not having a permit" (History.Com, 2020).

Scholarly research has extensively examined the root causes of the Arab Spring (Campante and Chor, 2012, 2014; Chaney et al., 2012; Malik and Awadallah, 2013). Anecdotal evidence in the literature suggests that the expansion of foreign media, most notably Al Jazeera, was instrumental in fostering political mobilization during the Arab Spring (Manacorda and Tesei, 2020). In contrast, the limited resonance of comparable protests in March 2019 is often attributed to tighter media control (The Economist, 2019). Unlike in 2010–2011, outlets such as Al Jazeera exerted less influence in shaping a shared regional narrative, as autocratic regimes are believed to have drawn lessons from the Arab Spring and responded with increased repression of independent media. Despite these qualitative insights, the more quantitative impact of the media on political mobilization in the Middle East remains largely unexplored.

This paper addresses a gap in the literature by quantifying the influence of foreign media on the dynamics of Arab Spring protests within the Arab world. We focus on two major outlets, Al Jazeera and Al Arabiya, which we categorize as "foreign media" in contrast to channels controlled by local or national governments. Although these networks are backed by autocratic regimes in Qatar and Saudi Arabia, they paradoxically challenge the authority of other autocrats in the region. Using data from Arab Barometer surveys conducted before and after the Arab Spring, we analyze how access to foreign media influences participation in protests. Our study concentrates on the Middle East and North Africa (MENA) region, specifically examining Jordan, Lebanon, and the Palestinian Territories due to the availability of data. The findings indicate a clear positive relationship between the use of foreign media and active participation in protest activities.

To address potential concerns about endogeneity, we adopt an instrumental variable approach. We use two factors that influence access to wireless communication, both for television and the Internet: the frequency of lightning strikes and underwater seismic events, known as seaquakes, that affect submarine cables. Our results indicate that a one-standard-deviation increase in the share of users accessing foreign media leads to an estimated 6.5 percentage point increase in the likelihood of participating in protest activities. On average, this corresponds to a 39% increase in protest participation. A non-trivial challenge in our analysis is to disentangle the specific impact of foreign media networks from the broader influence of the Internet,

which is highly relevant in this context. However, we conduct an extensive set of robustness checks, most notably controlling for different forms of Internet usage, to ensure the stability of our results.

The contribution of the paper is two-fold. First, we expand the literature on the political economy of the media (DellaVigna and Kaplan, 2007; DellaVigna and La Ferrara, 2015; Enikolopov and Petrova, 2015; Durante et al., 2019). For example, DellaVigna and Kaplan (2007) examine the impact of Fox News on voting behavior in the United States and finds that exposure to the channel increases support for the Republican Party, suggesting both learning and persuasion effects. In our study, we shift the focus to the rise of foreign media in countries where the media landscape is dominated by state-controlled outlets (Enikolopov and Petrova, 2015).

Until now, most studies have concentrated on the effects of domestic TV channels on voting behavior in Russia (Enikolopov et al., 2011), Italy (Barone et al., 2011), and East Germany (Kern and Hainmueller, 2009). In addition to strategic use of the media during military operations in the Israeli-Palestinian conflict (Durante and Zhuravskaya, 2018), relatively little is known about the role of the media in the Middle East. A notable exception is Hatte et al. (2021), who show how user-generated Internet content shapes the coverage of the Israeli-Palestinian conflict on US television. This lack of evidence is surprising given the significant structural shifts in media exposure that have occurred in the region over recent decades (Fandy, 2000; Ghareeb, 2000; Khondker, 2011; Wiest and Eltantawy, 2015). In particular, the advent of foreign media, as demonstrated by the launch of Al Jazeera in Qatar in 1996 and Al Arabiya in Saudi Arabia in 2003, represents a significant development in the Arab world, contributing to the expansion of the space for freedom of expression (El-Nawawy and Iskandar, 2002, 2003; Zayani, 2005; Al-Saggaf, 2008; Sultan, 2013; Behravesh, 2014).

To our knowledge, we are the first to measure the impact of Al Jazeera and Al Arabiya in this context. Our study also investigates the different effects of these two networks on participation in protests. Although Al Jazeera was established earlier and remains the most widely used media outlet in the Arab world, we found no strong evidence that its influence differs significantly from that of Al Arabiya. Interestingly, despite their ideological differences, this distinction does not appear to lead to varying effects on mobilization. In fact, Al Arabiya seems to have a slightly stronger connection to protest participation.

Secondly, we make a distinct contribution to the literature on conflict and mass mobilization. Although research on the economics of conflict has focused primarily on factors such as economic shocks, ethnic diversity, and natural resources (Blattman and Miguel, 2010; Berman et al., 2017; Bertinelli et al., 2025), the role of the media has received relatively little attention. In addition to the influential study of Durante and Zhuravskaya (2018), notable exceptions include works by Yanagizawa-Drott (2014), Manacorda and Tesei (2020), and Armand et al. (2020). Yanagizawa-Drott (2014) examine the impact of radio broadcasts

on violence during the 1994 Rwandan genocide, while Armand et al. (2020) investigate how radio defection messages helped to reduce violence in Central Africa. Both studies explore how the media controlled by conflict actors influences the dynamics of violence. In contrast, Manacorda and Tesei (2020) contribute to a growing body of work that examines the role of social networks in protest movements (Enikolopov et al., 2020; Fergusson and Molina, 2020; Guriev et al., 2021; Zhuravskaya et al., 2020), demonstrating that the spread of mobile phones in Africa stimulated mobilization, particularly during periods of economic downturn.

The overlooked role of the media in the emergence of the Arab Spring is striking for two key reasons. First, there is considerable anecdotal evidence indicating that the media was essential in mobilizing citizens during the Arab Spring (Pew Research Center, 2012; Ghannouchi, Yusra, 2013). Second, research in various contexts highlights the increasing influence of new media networks within changing media landscapes (Putnam, 2000; Olken, 2009). Recent theoretical work supports this perspective, arguing that new media can facilitate collective action by disseminating relevant information or reducing coordination costs (Edmond, 2013; Little, 2016; Barbera and Jackson, 2017). In our research, we examine the influence of foreign media, especially focusing on the information channel. Media coverage that accurately represents the scale of participation in protests and highlights widespread perceptions of corruption and dissatisfaction tends to encourage people to engage in political activism. In such environments, the incentives to participate increase, while the perceived costs of participation decrease (Barbera and Jackson, 2017; Passarelli and Tabellini, 2017).[1]

The remainder of this paper is organized as follows. Section 2 provides the contextual background for our study. Section 3 outlines the research design, presents our empirical framework (Section 3.1) and describes the main datasets (Section 3.2). In Section 4, we present our key findings (Section 4.1) and discuss potential threats to validity (Section 4.2). Section 5 introduces additional results, and finally, Section 6 offers our concluding remarks.

2 The Emergence of Foreign Media in the Arab World

The information revolution in the Arab world began with the emergence of Arab newspapers and progressed with the introduction of satellite networks and Internet connectivity (Dunn, 2000). As highlighted by Arab Media Outlook (2012), satellite networks have become the dominant television platform in the region. Only a few markets, such as Bahrain, Kuwait, Lebanon, Qatar, and the United Arab Emirates, have relied on cable TV for a longer period of time. However, even in these countries, cable TV penetration has declined since the early 2010s. In Lebanon, for example, the television landscape is primarily polarized between two platforms:

[1] Research on the impact of social media on protests identifies two main channels: information and collective action (Enikolopov et al., 2020; Fergusson and Molina, 2020; Guriev et al., 2021; Manacorda and Tesei, 2020; Zhuravskaya et al., 2020). The information channel helps citizens assess government performance and is especially influential in contexts where the media are state-controlled. The collective action channel enables communication between individuals, reducing coordination costs and simplifying the organization of protests.

terrestrial analogue television, which is accessible to 14% of households, and free satellite television, available to 83% of households (GSMA, 2015). Similar trends are evident in the Palestinian territories and Jordan, underscoring the extensive influence of satellite television in the region.

The access to foreign media in the Arab world has expanded significantly, not only due to the rise of satellite television but also due to increased Internet access. Since the early 2000s, the deployment of submarine cables has increased globally and within the Arab region, driven by the growing demand for higher bandwidth to support emerging digital services. Egypt, strategically located at the crossroads of Europe, Asia, and Africa, has played a crucial role in this expansion. Most of the submarine cables connecting these three continents pass through Egypt through the Suez Canal, making it a vital hub for global connectivity. This development of infrastructure in Egypt has facilitated the broader deployment of submarine cables throughout the Arab world, improving connectivity throughout the region.

The influence of Al Jazeera is widely recognized by Arab regimes, which often accuse the network of contributing to political instability, although direct criticism of its patron state, Qatar, tends to be relatively restrained. The perceived role of Al Jazeera in the instigation of the Arab Spring has been especially controversial, with some claiming that the network provided the "gunpowder" that ignited widespread public anger and mobilized mass demonstrations calling for regime change (Sultan, 2013). These accusations have significant geopolitical implications; in particular, the demand to close Al Jazeera was one of the conditions behind the trade embargo imposed on Qatar by Egypt, Saudi Arabia, the UAE and Bahrain in June 2017 (Al-Malk et al., 2025). Governments such as Egypt and Jordan have contended that Al Jazeera's reporting "threatened the stability of their regimes and exposed them to criticism from their own people" (El-Nawawy and Iskandar, 2003). The editorial stance of the network has also caused friction in other regions; for example, Al Jazeera's Ramallah office was closed after airing a promotional trailer that presented an unflattering image of Chairman Yasser Arafat, before a documentary on the 1975–1990 Lebanese Civil War (El-Nawawy and Iskandar, 2002). Beyond addressing the lack of independent media, Al Jazeera fills a political vacuum in a region characterized by limited political pluralism and restricted public discourse. The network has emerged, especially outside of Qatar, as a de facto pan-Arab opposition outlet and a platform for dissent and political expression (Zayani, 2005).

In the wake of Al Jazeera's establishment, other regional media networks started to emerge within the Arab world. Notably, in response to Al Jazeera's critical coverage of the Saudi royal family during the 1990s, Al Arabiya was launched in 2003. Founded by members of the Saudi royal family, Al Arabiya is headquartered in Dubai and is often referred to as the "Saudi voice" of the Arab world (Behravesh, 2014). Broadcasting from Riyadh, Saudi Arabia, Al Arabiya operates as an international free-to-air news channel and is overseen by the Middle East Broadcasting Centre, part of a larger media conglomerate. It is widely recognized as a

representation of "Arab modernism" (Allied Media Corp., 2020). Al Arabiya, which is the second channel with the highest viewership after Al Jazeera, promotes its slogan "Know More" (Watkins, 2019). Similarly to Al Jazeera, Al Arabiya aims to provide Arab audiences with an impartial perspective, while "keeping with the greater political agenda pursued by the Saudi government in the external and domestic spheres" (Behravesh, 2014). Al Arabiya, similar to its counterpart Al Jazeera, has faced criticism from authorities in various Arab states. On 11 March 2010, Yemeni officials carried out raids on the offices of both networks, confiscating their broadcast equipment. Officials stated that these tools "should not serve to provoke trouble and amplify events in such a way as to harm public order" (Herd, 2011).

3 Research Design

This section outlines our empirical framework and discusses how we address potential endogeneity concerns (Section 3.1). We then describe the data used in the analysis (Section 3.2).

3.1 Empirical Framework and Identification Strategy

We examine the influence of foreign media on political mobilization, focusing on whether individuals in regions with greater exposure prior to the Arab Spring to transnational news channels (Al Jazeera and Al Arabiya) were more likely to participate in protests after the Arab Spring began. Our analysis uses individual-level survey data from the Arab Barometer for Jordan, Lebanon and the Palestinian Territories, covering Wave 2 (2010–2011) and Wave 4 (2016). To ensure that media exposure precedes mobilization, we restrict the Wave 2 pre-treatment sample to interviews conducted before 17 December 2010, when *"Tunisian vendor Mohammed Bouazizi sets himself on fire to protest the arbitrary seizing of his vegetable stand by police over failure to obtain a permit"* (History.Com, 2020).[2]

Our baseline OLS model to assess the correlation between foreign media use and participation in protests is as follows.

$$P_{ijct} = Post_t + Region_j + \beta_1(ForeignMedia_{jc} * Post_t) + \beta_2 X_{ijct} + \beta_3 Q_{jct} + \epsilon_{ijct} \tag{1}$$

where P_{ijct} denotes self-reported participation in protests, marches, or sit-ins of respondent i in region j of country c during year t.[3] The key regressor, $ForeignMedia_{jc} \times Post_t$, interacts a post–Arab Spring indicator ($Post_t$) with the pre–Arab Spring share of respondents in a region naming Al Jazeera or Al Arabiya as their

[2]While this date marks the onset of the Tunisian uprising, many other MENA countries became involved only later in 2011, after the initial news coverage had spread. We document the evolution of protests in the three countries under study, which shows a pronounced surge in early 2011 (see Figure A1).

[3]Section 5 explores mechanisms and introduces additional outcomes related to political accountability and satisfaction.

most trusted political news source. We also estimate separate effects by channel and standardize all variables for comparability.

The individual controls vector X_{ijct} includes age and age squared, gender, education, marital status, religion, employment, public sector employment, and urban residency. Regional controls Q_{jct} include shares of users of the Internet and traditional media, as well as climatic variables (precipitation, temperature and extremes), which can affect both the likelihood of protest (Miguel et al., 2004; Hsiang et al., 2013; Mach et al., 2019) and satellite reception through "rain fade".[4] Media usage controls distinguish between the Internet and traditional media consumption (Yoon and Kim, 2001; La Ferle et al., 2000; Johnson and Kaye, 2004; Gaskins and Jerit, 2012; Dimmick et al., 2004) and account for general exposure to Internet, TV, and press not related to foreign media. $Post_t$ and $Region_j$ are fixed effects in time and regions. Finally, standard errors are clustered at the region-settlement level (Abadie et al., 2017, 2022), and sampling weights ensure national representativeness. The results of the OLS model are presented in Table 2 in Section 4, with further details on the control variables in the Appendix.

Addressing Endogeneity. The primary concern with Equation 1 is the omitted variable bias, which may persist despite the inclusion of a wide range of controls. Unobservable characteristics, such as an individual's propensity for "critical thinking", could simultaneously affect both foreign media consumption and participation in protests (Sunstein, 2017). Reverse causality is less likely since protest participation is measured at the individual level and foreign media exposure at the regional level, defined before the Arab Spring. Table 1 analyzes the determinants of foreign media use before the Arab Spring, relying exclusively on Wave II of the Arab Barometer. Being female or employed is negatively correlated, while being married or identifying as Muslim is positively correlated. Previous participation in protests shows a positive but insignificant association with the use of foreign media, consistent with the notion that politically engaged individuals can seek alternative sources of information.

[4]Rain fade occurs when atmospheric moisture attenuates satellite signals, particularly in the Ku band (10.7–12.75GHz) (Garrett, 2019; Tom, 2021).

Table 1: Determinants of Foreign Media Use, before the Arab Spring

	(1)	(2)
	Foreign Media	
Participation		
Participation in Protests		0.0268 (0.0361)
Demographics		
Gender: Female	-0.0156** (0.0070)	-0.0162** (0.0070)
Age	-0.0289 (0.0426)	-0.0168 (0.0427)
Age squared	-0.0043 (0.0401)	-0.0157 (0.0410)
Climate Controls		
Precipitation	-0.0785 (0.1666)	-0.0803 (0.1667)
Temperature	-0.4856 (0.4401)	-0.4962 (0.4414)
Extreme Precipitation	-0.0538 (0.1491)	-0.0417 (0.1477)
Education		
Primary	0.0114 (0.0197)	0.0116 (0.0193)
Secondary	0.0195 (0.0210)	0.0196 (0.0205)
Tertiary	0.0228 (0.0205)	0.0223 (0.0201)
Other Controls		
Religion: Muslim	0.0520** (0.0206)	0.0513** (0.0202)
Married	0.0201** (0.0095)	0.0178* (0.0092)
Employed	-0.0251** (0.0103)	-0.0265** (0.0102)
Urban Settlement	0.1207 (0.1013)	0.1240 (0.1006)
Observations	3,441	3,382
R-squared	0.765	0.767
Root MSE	0.417	0.416
Mean Y	0.186	0.186
Country FE	Y	Y

Notes: Robust standard errors clustered at the region-settlement level (47) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Nb. of countries: 3 (Jordan, Lebanon, and the Palestinian Territories). FE = Fixed Effects.

Instrumental Variable Strategy. To convincingly address unobserved confounding, we employ an instrumental variable strategy that takes advantage of exogenous variation in media access arising from natural disturbances. Since foreign media are accessed primarily through satellite television and the Internet, we rely on two types of natural shocks: (i) *seaquakes*, which can damage submarine fibre optic cables (Cariolle, 2019), and (ii) *lightening storms*, which disrupt ICT infrastructure and interfere with satellite and cable transmissions (Andersen et al., 2012; Alfano and Görlach, 2022; Manacorda and Tesei, 2020).

The first instrument is constructed by interacting the number of seaquakes occurring in 2010 within a buffer of 100 km from the submarine cable with the distance to the nearest cable landing station, multiplied by $Post_t$. The second is the average number of lightning strikes per region over the period 1995-2010, interacted with $Post_t$. The first stage of the Two-stage Least Squares (2SLS) equation is:

$$\begin{aligned} ForeignMedia_{jc} \times Post_t &= Post_t + Region_j + \gamma_1(Seaquakes_{jc} \times \log(dist_{jc}) \times Post_t) \\ &+ \gamma_2(Lightning_{jc} \times Post_t) + \gamma_3 X_{ijct} + \gamma_4 Q_{jct} + \mu_{jct} \end{aligned} \tag{2}$$

The covariates X_{ijct} and Q_{jct} and the fixed effects match those of Equation 1. Standard errors are clustered at the region–settlement level. Alternatively, we cluster at the regional level, which is the level of our treatment, with a Wild Bootstrap technique (Cameron and Miller, 2015) due to the limited number of regions (34). The results from our benchmark estimation appear in Table 3, with further details on instrument construction in the Appendix.

3.2 Data Description

Our empirical analysis complements individual-level data from the Arab Barometer with multiple external datasets to construct outcomes, treatments, instruments, and controls. Table A1 details each source, while Table A2 documents the coverage of the outcome and the treatment by country and wave. Only Jordan, Lebanon, and the Palestinian Territories in Waves 2 (2010–2011) and 4 (2016) offer complete and comparable coverage of media use and participation in protests, exogenous instruments, and geocoded controls, which motivates restricting the study sample to these three countries and two waves. The summary statistics are shown in Table A3. The pooled sample is slightly male-skewed; 69% are married, 84% identify as Muslim, 47% are employed (of whom 34% work in the public sector), and 71% reside in urban areas.

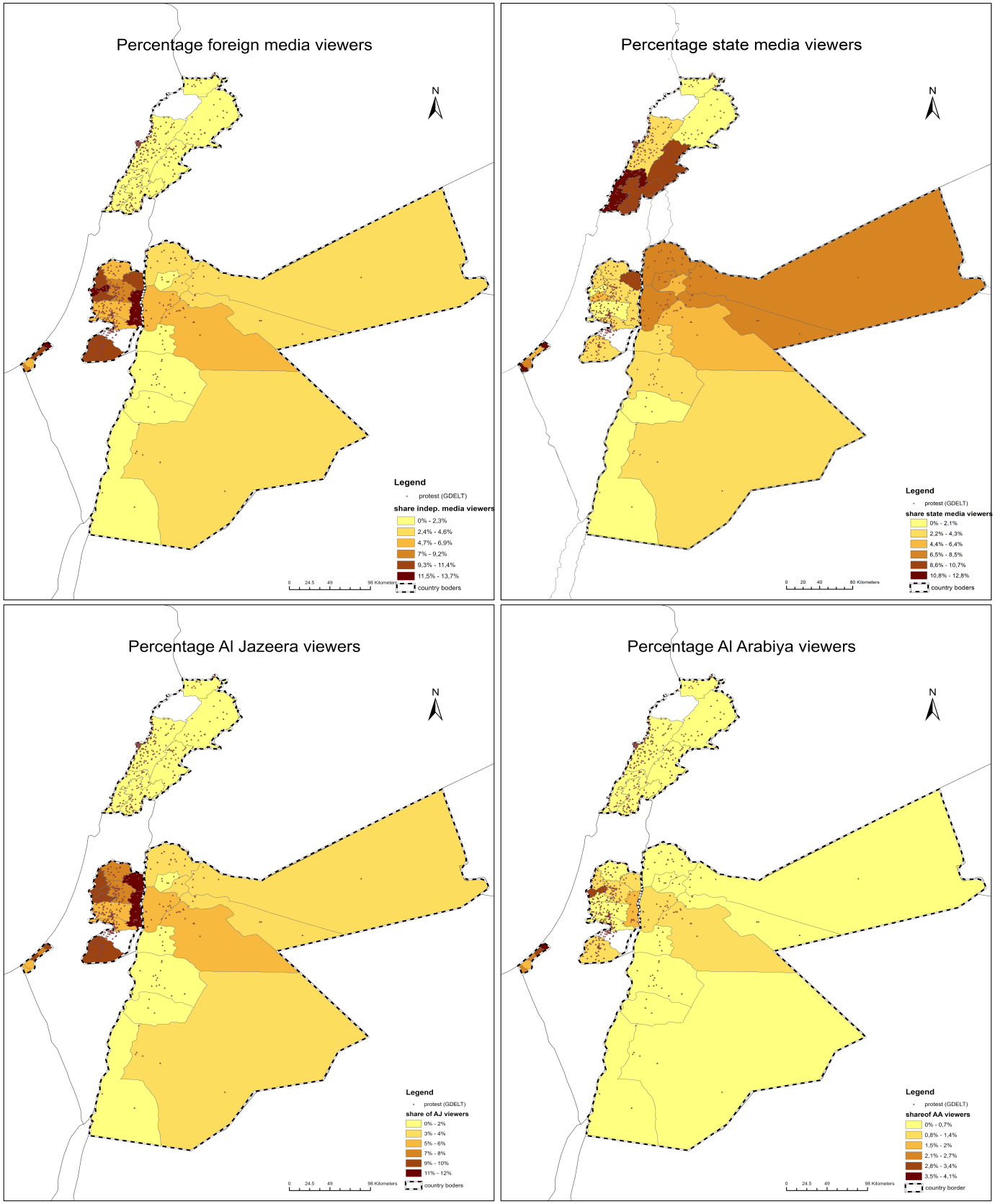
Media Exposure. Foreign media exposure is measured at the regional level using Arab Barometer Wave 2 data, collected prior to December 2010. Respondents were first asked to indicate their main source of political news (e.g. radio, television, Internet) and then to specify the outlet. We define a region's exposure to foreign media as the percentage of respondents who named Al Jazeera or Al Arabiya as their primary channels of

political information. Based on the initial question on political news sourcing, we also construct regional shares of traditional media users (television and press) and Internet users.[5] In addition, we construct a measure of exposure to state media, defined as outlets under both financial and editorial control of the national government.[6] Figure 1 illustrates the spatial variation in the viewership of foreign media, state media and protest participation in the three countries.

[5]The set of possible answers also included radio, word of mouth, or not seeking information, so the control shares do not sum up to one.

[6]See Webster, David and Institute for Contemporary Studies (1992) for details.

Figure 1: Protests and Regional Use of Media Networks in Jordan, Lebanon, and the Palestinian Territories.



Source: Arab Barometer; GDELT for protest data.

Political Mobilization. Our primary outcome is self-reported participation in protests, marches, or sit-ins in the past three years, from Arab Barometer Waves 2 (2010-11) and 4 (2016). The sample covers approximately 7,000 people from Jordan, Lebanon, and the Palestinian Territories; approximately 16.5% of the respondents report participation in protests.[7] For additional validation, in Section 4.2, we use protest event data from the Global Database of Events, Language, and Tone (GDELT) (Leetaru and Schrodt, 2013), which classifies political events via the CAMEO framework.[8] We focus on protest-related events involving collective action described as forceful or destructive. The dataset provides high-frequency geolocated coverage; our sample includes about 120,000 records of protest events. Although media-rich areas can lead to duplication (Jenkins and Maher, 2016), GDELT offers fine spatial and temporal resolution absent in other datasets for our setting.

Secondary outcomes of the Arab Barometer are explored to capture broader political and institutional contexts, including democratic perceptions, views on corruption, political satisfaction, support for government, petition signing, and trust in civil society. Across Waves 2 and 4, only 18% consider most people trustworthy, 40% believe that citizens must support government decisions even when disagreeing, and 74% perceive widespread corruption.

Instrumental Variables: Submarine cables, Seaquakes, Lightning. To address endogeneity, we construct instruments for foreign media access from natural disruptions to Internet and satellite transmission.

Submarine cables. Data on global submarine fibre optic cables and landing stations from 1989–2018 were obtained from Telegeography (TeleGeography, 2025). The 2000s saw rapid expansion linking low- and middle-income countries to the high-speed Internet. Today, almost all countries, including those without water, are connected to at least one submarine cable. National backbones typically extend connectivity from the landing stations of submarine cables to telecom operators, but digitized backbone data is unavailable except for Jordan.

To measure regional access, we identify landing stations per coastal country (three for Lebanon, one for Jordan; the West Bank of the Palestinian Territories is landlocked, and Gaza lacks a station). Landing stations are often located in remote coastal areas due to cost, maintenance, security, and access to the backbone. We calculate the shortest distance from each station to the centroid of every GADM 1 region. For the Palestinian Territories, we use the distance from Israel's Tel Aviv station to the closest border point near Salfit, then from this point to the centroids of 17 GADM 2 regions[9]. Although this distance-based approach can introduce minor measurement errors (Cariolle, 2019) and endogeneity concerns, it serves primarily as

[7] Data availability by country and wave is detailed in Table A2.

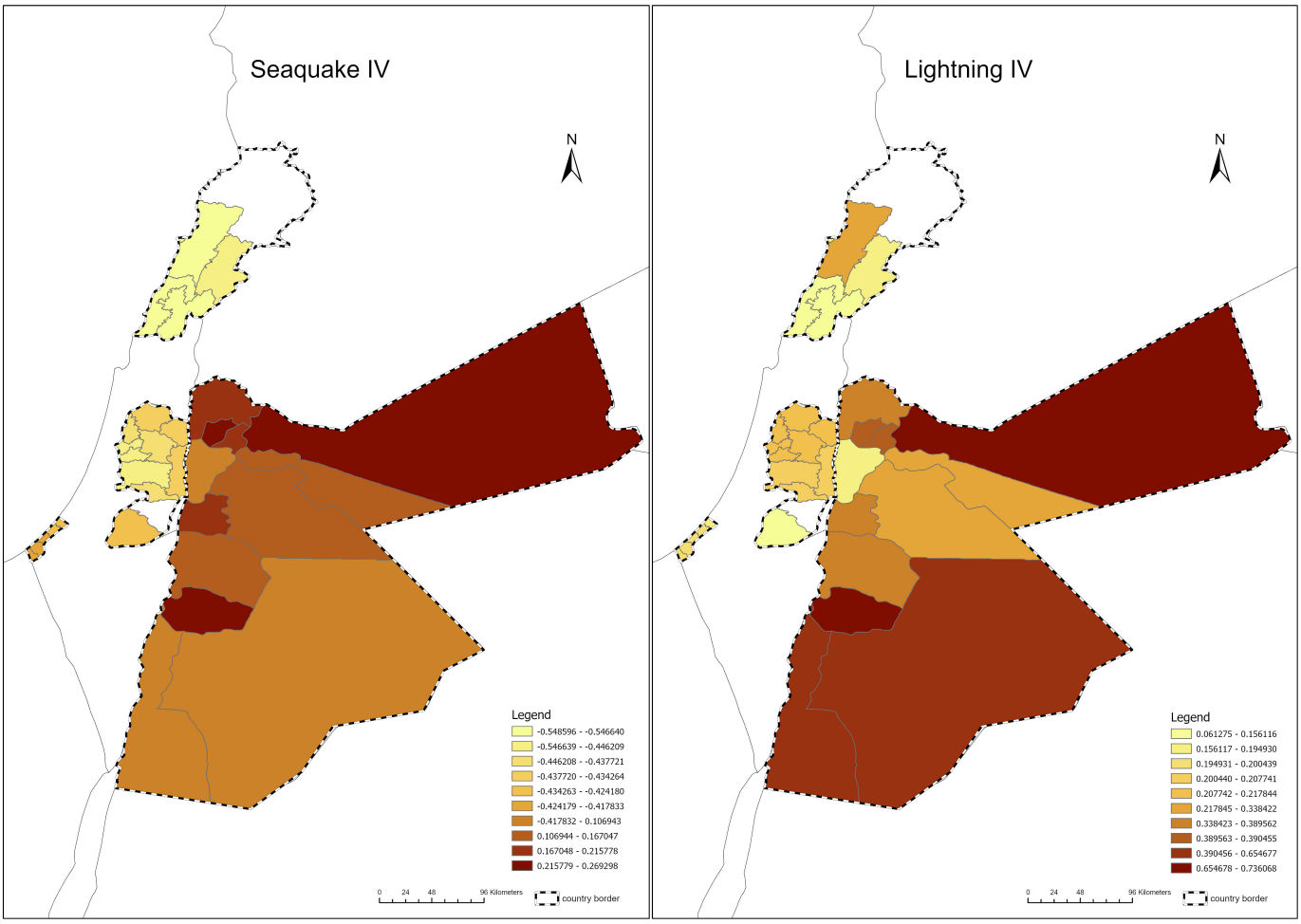
[8] The Cameo (Conflict and Mediation Event Observations) framework applies a three-level coding system to identify the type of event, its impact, and the actors involved

[9] Tel Aviv is chosen among Israel's three stations due to proximity; the Palestinian Territories relies on Israel for Internet traffic (World Bank, 2016).

a weight for our measure of Internet access, which focuses on potential disruptions due to natural hazards (seaquakes). As in theoretical road networks, the use of the shortest distances helps mitigate endogeneity in the actual national backbone (Faber, 2014; Redding and Turner, 2015; Banerjee et al., 2020).

Seaquakes. Submarine cables, often privately owned, can be laid based on political or commercial considerations potentially endogenous to our outcome, that is protest activity. To introduce plausibly exogenous shocks to the accessibility of the Internet, we follow Cariolle (2019) and use seaquake activity. Seismic events, especially seaquakes, are a major natural source of cable disruptions, along with human-related incidents such as trawling or anchoring. Although earthquakes can affect broader infrastructure and the outcome variable through multiple channels, seaquakes primarily influence it through submarine cables disruptions.[10] Seaquake data come from the USGS Earthquake Hazards Program, which provides epicentre coordinates, dates, rupture times, and magnitudes. The left panel of Figure 2 shows the variation in seaquake shocks that we use in the construction of our instrumental variables.

Figure 2: Incidence of Seaquakes and Lightning Strikes in Jordan, Lebanon, and the Palestinian Territories



Source: US Geological Survey (USGS) and Global Hydrology Resource Center.

[10]To avoid direct inland effects, Section 4.2 reruns the analysis excluding seaquakes within 100 km of the shore.

Lightning. Data from the Global Hydrology Resource Centre (OTD/LIS instruments) measure average lightning strikes (1995–2010), which can disrupt ICT infrastructure, particularly satellite TV. The spatial variation of this variable is shown on the right panel of Figure 2.

Regional Characteristics. We use several additional regional-level information. First, we used CEDA (Harris et al., 2020) data to calculate the cumulative average monthly rainfall and temperature averages over the 36 months preceding each survey (and divide by the area of the region), as well as binary indicators for extreme anomalies (deviation $>$ 1 standard deviation) (Sardeshmukh et al., 2011; Pérez-Morga et al., 2013). We also retrieve data on NOAA nighttime lights (NOAA, 2021), to compute the average annual stable light density (2000-2013) that approximates economic activity (Henderson et al., 2011, 2012). Furthermore, we used data on ruggedness (percentage of mountainous terrain per region) from UNEP-WCMC and regional coverage of 2G (high signal) and 3G (any signal) in 2010 from Collins Bartholomew (Collins Bartholomew, 2025).

4 Empirical analysis

This section presents our main findings. We begin with the benchmark results in Section 4.1, followed by the supplementary analyses in Section 4.2.

4.1 Main Results

Table 2 reports the results of the linear probability model estimated using OLS, as specified in Equation 1, which examines the relationship between the regional share of foreign media users and individual participation in protests. Each column corresponds to a different specification, varying in the set of control variables included. In all cases, we control for time and region fixed effects to account for common shocks and regional unobservable characteristics that are invariant over time. In Column (1), we include climatic controls, specifically precipitation density, extreme precipitation, temperature, and extreme temperature. Column (2) adds individual characteristics, such as gender, age, and squared age, educational attainment, religious affiliation, marital status, employment status, public sector employment, and urban residency. In Column (3), we additionally control for the regional share of Internet users, while Column (4) further includes the share of traditional media users (television and press). By incorporating these control variables, the analysis aims to isolate the relationship between the use of foreign media and participation in protests from the broader usage of the Internet and television.

Table 2 shows that the regional share of individuals using foreign media is positively and significantly associated with participation in protests. In addition, being male, highly educated, and employed are

positively and significantly correlated with protest activity. Both temperature and age exhibit non-linear relationships with protest participation.

Table 2: Foreign Media and Participation to Protest, OLS

	(1)	(2)	(3)	(4)
	Participation to Protests			
Foreign Media	0.0632***	0.0530***	0.0505**	0.0549***
	(0.0167)	(0.0179)	(0.0193)	(0.0187)
Precipitation	0.9203	0.9189	0.9443	0.8804
	(0.6162)	(0.6183)	(0.6149)	(0.6543)
Extreme Precipitation	0.0021	-0.0025	-0.0026	0.0009
	(0.0383)	(0.0383)	(0.0386)	(0.0408)
Temperature	0.1170**	0.1036*	0.1023**	0.1095**
	(0.0549)	(0.0522)	(0.0505)	(0.0493)
Extreme Temperature	0.0604	0.0559	0.0637	0.0386
	(0.0463)	(0.0474)	(0.0455)	(0.0579)
Gender: Female		-0.0308***	-0.0308***	-0.0308***
		(0.0077)	(0.0077)	(0.0077)
Age		0.0351	0.0349	0.0335
		(0.0233)	(0.0233)	(0.0241)
Age Squared		-0.0451**	-0.0449*	-0.0435*
		(0.0225)	(0.0226)	(0.0233)
Education: Primary		-0.0006	-0.0005	-0.0002
		(0.0095)	(0.0095)	(0.0094)
Education: Secondary		0.0016	0.0017	0.0019
		(0.0085)	(0.0084)	(0.0084)
Education: Tertiary		0.0185**	0.0185**	0.0183**
		(0.0079)	(0.0078)	(0.0078)
Religion: Muslim		0.0018	0.0018	0.0016
		(0.0103)	(0.0103)	(0.0103)
Marital Status: Married		-0.0015	-0.0015	-0.0014
		(0.0056)	(0.0056)	(0.0056)
Employment: Employed		0.0119*	0.0119*	0.0119*
		(0.0065)	(0.0065)	(0.0065)
Settlement: Urban		0.0026	0.0029	0.0010
		(0.0071)	(0.0072)	(0.0074)
Share of Regular Internet Users			0.0101	0.0222
			(0.0226)	(0.0301)
Share of Regular Trad.Media Users				-0.0487
				(0.0482)
Observations	7,247	6,969	6,969	6,969
R-squared	0.1217	0.1404	0.1405	0.1408
Root MSE	0.334	0.331	0.331	0.331
Mean Y	0.165	0.165	0.165	0.165
Region and Time FE	Y	Y	Y	Y

Notes: Estimated Equation: Equation1. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Share of Regular Trad. Media Users: combined shares of TV and press viewership. FE: Fixed Effects. Robust standard errors clustered at the region-settlement level (67) in parentheses. *** p<0.01, ** p<0.05, * p<0.1

As discussed in Section 3.1, the relationship between the use of foreign media and political mobilization is likely to be subject to omitted variable bias. An individual's capacity for critical thinking and openness to information beyond state-controlled sources, such as foreign media, may violate the conditional zero mean assumption required for causal inference. To address these endogeneity concerns, we adopt an instrumental variable strategy. Specifically, we predict the regional share of foreign media users using exogenous variation in media accessibility before the Arab Spring. This accessibility is mediated by the occurrence of seaquakes along submarine cable routes (in conjunction with the proximity to landing stations) and the frequency of lightning strikes. We report the results of the 2SLS model with standard errors clustered at the region-settlement level (67) in Table 3. In Table A4 of the Appendix, we estimate the same model clustering the standard error at the regional level, and applying Wild Bootstrapping.

Panel A of Table 3 reports the OLS estimates presented earlier, which are included here for comparison. Panel B displays the second-stage results of the 2SLS analysis, while Panel C presents the corresponding first-stage estimates. In Panels A–C, all columns include time and region fixed effects, while progressively adding covariates to align with those reported in Table 2. Column (4) presents the results of our benchmark specification, which controls for the full set of individual and regional characteristics, including the regional shares of Internet and traditional media users. As emphasized above, a key element of our empirical strategy is to account for alternative sources of variation in media consumption, particularly Internet usage and exposure to non-foreign television channels. A one-standard deviation increase in the share of foreign media users is associated with an increase of approximately 6.5 percentage points in the likelihood of participating in protests. Given the mean participation rate in the protest of 0.16, this corresponds to an increase of around 39%. The first stage coefficients are negative and significant along all the specifications, as the instrumental variables are supposed to disrupt access to foreign media. The coefficients with alternative clustering in Table A4 are overall similar the ones of our main specification.

Despite the likely strength of our instrumental variables, whose Kleibergen-Paap rk Wald F statistics always exceed the rule of thumb of 10 (Angrist and Pischke, 2009), there are potential identification threats to the 2SLS model to take into account. We analyze them in the following Section of the paper.

Table 3: Main Analysis: Foreign Media and Participation in Protests, 2SLS

	(1)	(2)	(3)	(4)
	Participation in Protests			
Panel A:	**Ordinary Least Squares (OLS)**			
Foreign Media	0.0632***	0.0530***	0.0505**	0.0549***
	(0.0167)	(0.0179)	(0.0193)	(0.0187)
R-squared	0.1217	0.1404	0.1405	0.1408
Panel B:	**Second-Stage: Two-Stage Least Squares (2SLS)**			
Foreign Media	0.0868***	0.0685**	0.0698**	0.0648**
	(0.0243)	(0.0270)	(0.0275)	(0.0260)
Observations	7,247	6,969	6,969	6,969
R-squared	0.0090	0.0265	0.0236	0.0242
Kleibergen-Paap rk Wald F	50.84	50.32	41.23	86.71
Root MSE	0.333	0.330	0.330	0.330
Hansen J p-value	0.176	0.194	0.197	0.318
Mean Y	0.165	0.165	0.165	0.165
Panel C:	**First-Stage: Predicted Foreign Media**			
Incidence of Seaquakes	-1.6375***	-1.5725***	-1.5635***	-2.0099***
	(0.1905)	(0.1894)	(0.1806)	(0.1695)
Lightning Frequency Strikes	-2.5627***	-2.5622***	-2.1935***	-1.0945***
	(0.4261)	(0.4114)	(0.5606)	(0.3925)
R-squared	0.9383	0.9392	0.9446	0.9693
Climate Controls	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y
Share of Regular Internet Users	N	N	Y	Y
Share of Regular Trad. Media Users	N	N	N	Y

Notes: Estimated Equation in Panel A: Equation (1). Estimated Equation in Panel B: Equation (2) using as IV the incidence of seaquakes times the distance from the region's centroid to the cable landing station and the frequency of lightning strikes (as in Panel C). Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Columns (3) and (4) include as controls the shares of Internet and traditional (TV and press) users. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

4.2 Identification threats

In this section, we assess threats to the validity of our identification and describe how we address them. We focus on two assumptions: (i) the exclusion restriction required by the instrumental-variables (IV) design and (ii) the parallel-trends condition underlying the two-way fixed-effects (TWFE) specification. In our setting, these assumptions are closely related—the credibility of the IV design reinforces the plausibility of parallel trends—see Jaeger et al. (2020).

Exclusion restriction. Our IV strategy relies on the assumption that the instruments affect protest participation exclusively through their impact on access to foreign media. The baseline specification includes time and region fixed effects to absorb common economic and political shocks as well as time-invariant regional characteristics. We further control for climate variables, individual covariates, and regional shares of Internet and traditional media use. Nonetheless, these adjustments may not fully rule out alternative channels. The main concern is a potential violation of the exclusion restriction if the instruments influence protest participation through general Internet access rather than solely through foreign media exposure. Prior research shows that seaquakes and lightning strikes directly disrupt Internet connectivity (Cariolle, 2019; Hatte et al., 2021; Alfano and Görlach, 2022; Manacorda and Tesei, 2020; Guriev et al., 2021), while the regional share of regular Internet users—introduced in the baseline specification—is, at best, a proxy for overall Internet consumption and likely endogenous. In our setting, disentangling the effects of general Internet use from those of foreign media is inherently challenging, but we implement a series of robustness checks designed to mitigate these concerns. The second-stage coefficients from the additional analysis are reported in Table 4; the detailed table for each robustness check appears in the Appendix. For ease of comparison, Row A of Table 4 reproduces the benchmark specification.

First, following Manacorda and Tesei (2020), we replace the 2010 regional share of Internet users from the Arab barometer with more reliable pre-determined measures of mobile network availability. We compile cell-level 2G/3G coverage for 2010 in all regions of the three countries (high/variable/no signal), aggregate to the regional level, and construct two dummies: (i) a 2G indicator equal to one if high coverage predominates in the region, and (ii) a 3G indicator equal to one if any 3G signal is present. We interact each dummy with the *Post* indicator and include these interactions in place of the "Share of Regular Internet Users" variable used in the baseline. The aim of these controls is to absorb changes in protest participation that operate through general mobile Internet access rather than foreign media exposure. We also control for the share of respondents who declare to regularly use social media for political news in Wave II of the Arab barometer.[11] Relative to the benchmark, adding social media control and then the *Post* × 2G and 3G terms leaves the

[11] In the three countries of analysis, social media use was extremally low prior to the Arab Spring (Figure A2, Wave II of the Arab Barometer).

foreign media effect robust (Table A5); the *Post* × 2G coefficient—consistent with broader 2G availability in 2010—shows the expected positive and statistically significant association with the propensity to protest. The results are summarized in Row B of Table 4.

Controlling for 2G and 3G availability is an important robustness check for our empirical strategy, but it may still fail to capture the wide range of Internet uses (and intensities) likely correlated with foreign media consumption. To further disentangle the effect of our treatment variable from general Internet use, we restrict the analysis to regions without 3G coverage in 2010 (slightly more than half of the sample), while still controlling for 2G trends. Although the reduced sample size limits statistical power, this exercise provides suggestive evidence on whether regions lacking fast Internet connections exhibited protest participation trajectories similar to those observed in the full sample. As Row C of Table 4 and Table A6 show, the estimated coefficients are of comparable magnitude and follow the same pattern as in the baseline results. [12]

Second, we take care of potential bias coming from the "distance component" of the seaquakes -based instrument. Given that landing stations of submarine cables are often located in sparsely populated coastal areas (Subsection 3.1), the distance from the centroid of a region to the nearest landing station can correlate with the underlying economic or demographic factors and therefore be endogenous. To make sure that our instrument induce as-if random variation in foreign media viewership across regions, conditional on region-fixed effects and covariates, we add the centroid-to-landing-station distance and its interaction with *Post* to the main specification. As an alternative control for proximity to economic hubs, we also compute the distance from each region centroid to the nearest large city and include this measure as a control, interacted with *Post*. The 2SLS estimates are essentially unchanged (Table A7). We summarize this robustness check in Row D of Table 4.

In addition, we augment the specification presented in Table A5 with the interaction of the log of the distance to the nearest landing station and *Post*. This absorbs residual spatial trends in connectivity that could co-move with instrument strength. The foreign media coefficient and relevance of the first stage remain qualitatively unchanged (Table A8). We summarize this robustness check in Row E of Table 4.

Third, to eliminate non-random exposure embedded in the distance component of our seaquake-based instrument, we implement a placebo test inspired by the recent econometric advances in Borusyak and Hull (2023). The *re-centering* procedure that they propose is shown to be preferable to simply controlling for the endogenous component of the variable (the distance, in our case), given the potential multidimensional nature of the omitted variable bias stemming from non-random exposure. We construct an "expected instrument" by averaging the yearly seaquake incidence at the landing-station level over the period 1989–2009 and we interact it with the 2010 centroid-to-landing-station distance. We then define the *re-centered instrument*

[12] We cannot replicate the exercise for 2G, since all regions had at least some signal—albeit with varying intensity. However, only seven regions fall into the category of unstable coverage.

as the 2010 seaquake×distance minus this expected value, interacted with *Post*. We re-estimate the 2SLS model using this re-centered instrument in place of the baseline specification and find that the estimates remain unchanged (Table A9). This robustness check is summarized in Row F of Table 4.[13]

Fourth, although the incidence of seaquakes is plausibly random, events close to shore could directly influence the dynamics of the protest (via physical damage or casualties) or be correlated with earthquakes propensity. To address this, we re-estimate Equation 2 after excluding all seaquakes within 100 km of the coastline, thus isolating shocks to submarine cables from potential onshore-destruction channels. The resulting 2SLS estimates are qualitatively unchanged relative to the benchmark (Table A10). We summarize this robustness check in Row G of Table 4.

Fifth, to address residual omitted-variable concerns for both instruments rising from other unobserved socio-economic or geographical characteristics at the regional level, we allow for differential post-2010 trends correlated with proximity to cable landings and infrastructure intensity. Starting from Column (4) of Table 3, we add (i) an urban-specific time trend, (ii) the interaction of the pre-Arab Spring log(nightlight density) with *Post* to capture the baseline economic dynamism, and (iii) the interaction of terrain ruggedness with *Post* (following Armand et al. (2020)). The resulting estimates, reported in Table A11 and summarized in Row H of Table 4—leave the foreign-media coefficient stable in magnitude and significance, indicating that our results are not driven by differences between economically dynamic vs. less dynamic regions (Hjort and Poulsen, 2019), rugged vs. less rugged areas or urban vs. rural locations.[14] Finally, we test for correlations between the time-invariant components of the instruments—namely, seaquake intensity, the distance between regional centroids and cable landing stations, and the number of lightning strikes—and protest participation in 2010 (Table A13). Reassuringly, none of these variables correlates significantly with the outcome, indicating that no unobservable regional characteristic moves along the variables forming our IVs and drives protest participation.

We now turn to threats specific to our second instrument—the regional frequency of lightning strikes—beyond the concern, already commented, that lightning has been shown to affect access to mobile Internet through 2G/3G networks ((Manacorda and Tesei, 2020; Hatte et al., 2021)). Lightning could affect protest participation directly, through higher physical/logistical costs and, more indirectly, via persistent infrastructure underinvestment and weaker connectivity in thunderstorm-prone regions. We mitigate concerns about the direct effect by including a rich set of weather and extreme weather controls. To address the cumulative impact of lightning, we collect additional data that allow us to add a new control: the cumulative regional average of lightning strikes over 2000–2005, interacted with *Post*[15]. This additional control absorbs regional

[13]Note that this re-centering procedure is not applicable to the lightning-based IV, which varies at the regional level and has no separate exposure share.

[14]This concern may be reframed in terms of a violation of the parallel trend assumption.

[15]The data on the cumulative average of lightning strikes for 2000-2005 come from the OTD/LIS missions by the Global

differences in thunderstorm propensity that may proxy for long-term infrastructure or connectivity gaps. The foreign media coefficient and the first stage strength are essentially unchanged (Table A12). The summary entry appears in Row I of Table 4.

In the same spirit, we use the new set of data on lightning strikes to estimate a just-identified placebo first-stage equation and we compare the results with those from a just-identified specification employing the actual instrumental variable. If the placebo first-stage was significant, it would suggest a long-term infrastructure-driven channel linking lightning strikes with media access. As shown in Panel A of Table A14, the placebo instrument using the regional lightning averages from 2000–2005 interacted with *Post* does not predict foreign media consumption in 2010, in contrast to our baseline IV in Panel B.[16]

Hydrology and Climate Change Center (GHCC), of the Marshall Space Flight Center Earth Science Office, which is part of NASA, with flashes expressed per km^2 per day.

[16]The estimates concerning the first-stage, as well as with the findings of Table A13 are not summarized in Table 4.

Table 4: Summary Table: Exclusion Restriction

	(1)	
	Foreign Media	
A. Benchmark results (N=6,969)[a]	0.0648**	(0.0260)
Exclusion Restriction.		
B. Redefining Internet usage: Social Media (N=6,969)[b]	0.0619**	(0.0250)
Social Media + 2G (N=6,911)[b]	0.0718***	(0.0245)
Social Media + 3G (N=6,911)[b]	0.0766***	(0.0263)
C. Excluding regions with 3G coverage: Social Media + 2G trend (N=4,087)[c]	0.0453**	(0.0183)
D. Controlling for trends in distances: Log(Distance)*Post (N=6,969)[d]	0.0660**	(0.0333)
Distance to Large City*Post (N=6,500)[d]	0.0572**	(0.0234)
E. Controlling for: Social Media + Log(Distance)*Post (N=6,969)[e]	0.0607*	(0.0325)
Social Media + 2G trend + Log(Distance)*Post (N=6,911)[e]	0.0580*	(0.0329)
Social Media + 3G trend + Log(Distance)*Post (N=6,911)[e]	0.0750*	(0.0342)
F. Re-centering seaquake IV (N=6,969)[f]	0.0631**	(0.0245)
G. Excluding seaquakes within 100km (N=6,969)[g]	0.0678**	(0.0282)
H. Controlling for trends in regional characteristics: Urban trends (N=6,969)[h]	0.0582**	(0.0232)
Urban + Ruggedness trends (N=6,969)[h]	0.0581**	(0.0234)
Urban + Ruggedness + Nightlights trends (N=6,969)[h]	0.0480*	(0.0285)
I. Controlling for Lightning Strikes in 2000–2005 (N=6,500)[i]	0.0541**	(0.0273)

Notes: Estimated equation: Equation (2) by 2SLS with alternative specifications. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Robust standard errors clustered at the region-settlement level (65) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects. See: [a] Column (4) in Table 3; [b] Columns (2-4) in Table A5; [c] in Table A6; [d] in Table A7; [e] in Table A8; [f] in Table A9; [g] in Table A10; [h] in Table A11 and [i] in Table A12.

Assumption of Parallel Trends. Our DiD interpretation is based on two identification conditions (Roth et al., 2022): (i) no pre–Arab Spring ("anticipatory") effects of foreign media access and (ii) parallel protest trajectories, absent the Arab Spring, across regions with high vs. low foreign media exposure. The first assumption is relaxed by the way we cope with the endogenous adoption of Al Jazeera and Al Arabiya. At the same time, the earlier discussion on the exclusion restriction already addresses many of the key threats that could undermine the validity of this assumption. As shown in Table A11, regions exposed to high versus low disruption episodes do not exhibit differential trends in socioeconomic or geographic characteristics that might influence the outcome variable. In other words, so long as no other relevant

factors vary systematically across regions exposed to different intensities of seaquakes and lightning shocks, the parallel trends assumption remains plausible. To probe common trends more directly, we turn to GDELT, which provides a longer protest series, and estimate reduced-form event studies using monthly protest counts over 37 months around 17 December 2010, regressing protests on leads/lags of each IV separately, with region controls (Internet share, traditional-media share, log nightlights) and fixed effects. Figure A3 shows no pre-trends for either instrument; post 2010 coefficients are negative as expected, with significant lags primarily for the lightning-based IV. Power is limited in the post period because some controls change mainly at the time of treatment rather than monthly, but the figures are similar with or without these controls.[17]

Placebo Tests and Heterogeneity Analysis. We probe mechanisms with two complementary exercises. First, as a placebo, we replace the foreign media viewership with the state-owned media viewership in the protest equation (Table A15). Because our instruments are tailored to foreign media access, not state media, the first stage for this placebo is weak and the results should not be interpreted causally; nevertheless, the estimates show a clear negative association between state media consumption and protest participation, consistent with a demobilizing role of state outlets. Second, we examine heterogeneity by employment sector (Table A16). Splitting the sample, or equivalently interacting foreign media exposure with a public sector indicator, reveals negligible effects for public employees but a significant, positive effect for workers outside the public sector, in line with higher career risk and monitoring in government jobs dampening mobilization incentives.

External Validity. Our conclusions are necessarily tied to the settings we study and, in agreement with IV logic, identify a local average treatment effect (LATE). Three features mitigate concerns that estimates are too local. First, the inclusion of rich covariates strengthens the plausibility of conditional independence and the exclusion restrictions (Angrist and Pischke, 2009). Second, the OLS and 2SLS coefficients are similar in magnitude and remain stable as controls are added, suggesting the effect is not confined to a narrow subgroup. Third, two distinct instruments deliver consistent estimates; with multiple instruments, 2SLS recovers a weighted average across different complier groups, reducing worries that results hinge on a single margin of compliance.

A related external validity concern is measurement: Participation in the protests is self-reported and can vary with perceived risk or social desirability. Exposure to foreign media could increase the willingness to disclose participation after treatment, mechanically lowering pretreatment reports among more exposed individuals, and attenuating estimated effects. To address this, we complement the survey-based analysis

[17] See Borusyak et al. (2023); Jaeger et al. (2020) for caution about including controls that change during treatment; our figures are robust in excluding them.

with an event study (Figure A3) using GDELT protest data (reported in the media rather than self-reported). The alignment of results across sources supports the view that our findings are not driven by reporting behaviour alone.

5 Channels

The existing literature has highlighted the critical role of the Internet and social networks in facilitating political mobilization (Enikolopov et al., 2020; Jha and Kodila-Tedika, 2020; Campante et al., 2022). These technologies have often been understood as effective coordination devices for collective action (Barbera and Jackson, 2017; Manacorda and Tesei, 2020). In our case, however, we show that even when controlling for Internet access through various channels, foreign media, whether accessed via television or the Internet, have exerted a significant influence on protest activity during the Arab Spring. This effect is difficult to attribute solely to the coordination mechanisms. Where domestic media are state-dominated, foreign media are likely to promote political mobilization by informing citizens and promoting accountability mechanisms. We also consider alternative channels, including the ideological orientation of foreign media outlets and other forms of civic and political engagement.

Ideology versus Political Accountability. Unlike recent contributions to the literature that examine the ideological content of media (Gentzkow and Shapiro, 2010; Djourelova, 2023), our data do not allow for an analysis of the specific content disseminated by foreign media. However, we provide suggestive evidence that the presence of foreign media has mainly contributed to political accountability rather than ideological persuasion. In Table 5, we explore the potentially distinct roles played by Al Jazeera and Al Arabiya in shaping the participation to protests. These two networks, widely recognized as the most trafficked Arab news platforms[18], have been the subject of extensive comparative analysis, particularly in terms of their coverage of conflict, terrorism, and socio-economic crises in the region (Zeng and Tahat, 2012; Fahmy and Emad, 2011; Kharbach, 2020). Both outlets are backed by influential and rival regional powers: Qatar and Saudi Arabia, respectively. However, as shown in Table 5, our results do not reveal statistically significant differences in their respective impacts on protest behavior, although the estimated effect associated with Al Arabiya viewers appears somewhat larger in magnitude than that of Al Jazeera.

[18] Al Jazeera and Al Arabiya are the top two most-visited news websites in the Arab world (Arab Media Outlook, 2012).

Table 5: Al Jazeera vs. Al Arabiya and Participation in Protests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Participation in Protests							
Panel A:	**Ordinary Least Squares (OLS)**							
Al Jazeera vs. Al Arabiya	0.0547***	0.0426**	0.0402**	0.0440**	0.0653***	0.0590***	0.0741***	0.0785***
	(0.0178)	(0.0188)	(0.0191)	(0.0186)	(0.0103)	(0.0111)	(0.0176)	(0.0167)
R-squared	0.1206	0.1395	0.1398	0.1400	0.1240	0.1426	0.1431	0.1436
Panel A:	**Second-Stage: Two-Stage Least Squares (2SLS)**							
Al Jazeera vs. Al Arabiya	0.0913***	0.0717**	0.0708**	0.0665**	0.0974***	0.0786***	0.0922***	0.0801***
	(0.0270)	(0.0293)	(0.0296)	(0.0281)	(0.0261)	(0.0296)	(0.0287)	(0.0261)
Observations	7,247	6,969	6,969	6,969	7,247	6,969	6,969	6,969
R-squared	0.0072	0.0222	0.0253	0.0230	0.0107	0.0258	0.0295	0.0274
Kleibergen-Paap rk Wald F	50.87	49.16	40.63	82.93	17.22	16.81	13.20	21.26
Root MSE	0.334	0.330	0.330	0.330	0.333	0.329	0.329	0.329
Hansen J p-value	0.188	0.210	0.183	0.285	0.141	0.139	0.306	0.543
Climate Controls	Y	Y	Y	Y	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Share of Regular Internet Users	N	N	Y	Y	N	N	Y	Y
Share of Regular Trad. Media Users	N	N	N	Y	N	N	N	Y

Notes: Estimated Equation: Equation (1) using OLS in Panel A. Estimated Equation: Equation 2 in Panel B and Panel C using as IV the incidence of seaquakes times the distance from the centroid of the region to the cable landing station and the frequency of lightning strikes. Column (1) to (4): viewership shares of Al Jazeera. Column (5) to (8): viewership shares of Al Arabiya (%). Individual Controls: age, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

In contrast, our findings support the notion that foreign media can influence viewers' political preferences through persuasive mechanisms, as theorized by DellaVigna and Gentzkow (2009). We explore this channel employing responses on political alignment as a proxy for persuasion. The results are reported in Column (5) of Table 6, which indicates a significant negative effect of exposure to foreign media on political alignment. Furthermore, Column (4) of Table 6 reveals widespread dissatisfaction with the current political situation, while Column (3) shows a positive and statistically significant impact on perceptions of corruption. By contrast, we do not find any discernible effect on perceived levels of democracy or trust in civil society, as shown in Columns (2) and (7), respectively.

Other Forms of Engagement. Another potential channel involves the displacement of alternative forms of civic engagement, including non-violent activities. To explore this mechanism, we examine responses related to petition signing. As shown in Column (6) of Table 6, exposure to foreign media does not appear to have had a discernible effect on this form of participation during the Arab Spring.

Table 6: Foreign Media and Political Actions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Protest	Democracy	Corruption	Gvt. Satisfaction	Political Alignment	Petitions	Trust
Panel A:	**Ordinary Least Squares (OLS)**						
Foreign Media	0.0549***	-0.0292	0.0346	-0.0178	-0.1107***	0.0024	-0.0009
	(0.0187)	(0.0274)	(0.0223)	(0.0197)	(0.0356)	(0.0173)	(0.0170)
R-squared	0.1408	0.1640	0.1468	0.1593	0.1463	0.0982	0.0359
Panel B:	**Second-Stage: Two-Stage Least Squares (2SLS)**						
Foreign Media	0.0648**	-0.0279	0.0484*	-0.0459*	-0.1141**	-0.0011	0.0117
	(0.0261)	(0.0375)	(0.0287)	(0.0272)	(0.0478)	(0.0178)	(0.0193)
Observations	6,969	6,830	6,004	7,030	6,860	6,968	6,960
R-squared	0.0242	0.0232	0.0110	0.0190	0.0320	0.0346	0.0051
Kleibergen-Paap rk Wald F	86.71	85.83	80.50	85.81	84.80	86.57	85.57
Root MSE	0.330	0.444	0.406	0.430	0.457	0.339	0.380
Hansen J p-value	0.318	0.392	0.0646	0.284	0.936	0.132	0.540
Climate Controls	Y	Y	Y	Y	Y	Y	Y
Individual Controls	Y	Y	Y	Y	Y	Y	Y
Region and Time FE	Y	Y	Y	Y	Y	Y	Y
Share of Regular Internet users	Y	Y	Y	Y	Y	Y	Y
Share of Regular Trad. Media users	Y	Y	Y	Y	Y	Y	Y

Notes: Estimated Equation: Equation 1 in Panel A. Estimated Equation: Equation 2 in Panel B using as IV the incidence of the seaquake times the distance of the region centroid to the cable landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

6 Conclusion

This paper investigates the impact of foreign media on the participation of individuals in protests within the Arab world. Before the late 1990s, the media landscape in the region was largely characterized by state control, leaving limited space for dissenting voices or alternative narratives that challenged incumbent governments. The emergence of Al Jazeera in Qatar as the leading foreign media outlet in the region, followed by the establishment of Al Arabiya in Saudi Arabia, significantly reshaped the flow of information. These platforms provided a space for citizens to voice their discontent with government actions and policies, forming a critical backdrop to our analysis.

With the onset of the Arab Spring in late 2010, individual grievances erupted publicly in multiple Arab countries. Although a substantial body of research has examined the structural and sociopolitical drivers behind these uprisings, the role of media, particularly foreign media, has received comparatively limited empirical attention. The existing literature has often referred to the influence of Al Jazeera and Al Arabiya in anecdotal terms, without systematically quantifying their impact on political mobilization.

This study addresses this gap by providing a quantitative assessment of the influence of Al Jazeera and Al Arabiya on the participation of protests during the Arab Spring. Drawing on data from Arab Barometer surveys, we construct a measure of foreign media use at the regional level. We then examine how exposure to these networks correlates with the propensity of individuals to participate in protests. A key empirical challenge is the potential endogeneity of foreign media engagement, which may be driven by unobservable factors such as an individual's level of "critical thinking."

To address this concern, we implement an instrumental variable approach, using access to satellite television and Internet infrastructure as channels through which individuals receive foreign media. To isolate exogenous variation in access, we exploit natural shocks, specifically lightning strikes (which alter satellite transmission) and seaquakes (which disrupt submarine cables). These shocks allow us to instrument for the regional share of foreign media users in an overidentified Two-Stage Least Squares model.

Our findings indicate a positive and statistically significant relationship between foreign media usage and protest participation. The results suggest that foreign media played an important role in political mobilization, enhancing citizen access to information, increasing government accountability, and ultimately challenging authoritarian rule. In contrast, we find no significant effect of state media, nor of foreign media usage among public sector employees, on protest participation.

A central limitation of this study concerns data availability, which constrains our ability to distinguish between the effects of general Internet use—including social media—and those of foreign media consumption. The Arab Barometer surveys do not provide consistent measures of individual media usage across all waves and countries, which complicates efforts to analyze temporal patterns or to draw generalizable conclusions

for the region as a whole. Future research would benefit from drawing on alternative data sources with wider temporal and geographic coverage, both to assess the external validity of these findings and to advance our understanding of how media shape political behaviour in the Arab world.

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Additional Information, Tables, and Figures for:

The Impact of Foreign Media on Political Mobilization during the Arab Spring

November 4, 2025

Abstract

This document contains an appendix with supplemental material.

Tables and Figures

A Tables

Table A1: Overview of Data Sources and Coverage

Data	**Source**	**Coverage (Time / Space)**	**Description**
Foreign Media, State Media, Internet, TV and press viewership	Arab Barometer (Arab Barometer, 2020)	Waves 2 (2010 – 2011); Jordan, Lebanon, and the Palestinian Territories	Individual survey on media use, political attitudes, protest participation, and socio-demographics; nationally representative (weights).
Arab Barometer (Arab Barometer, 2020)	Waves 2 (2010 – 2011) & 4 (2016); Jordan, Lebanon and the Palestinian Territories	Individual survey on media use, political attitudes, protest participation, and socio-demographics; nationally representative (weights).	Participation in protest, political alignment and accountability, Perceived Democracy and Corruption, Satisfaction
Protest Events	GDELT Database (Leetaru and Schrodt, 2013)	2000−2016; georeferenced to subnational regions	Daily geolocated protest-related events (CAMEO), incl. actors, event type, and location.
Submarine cable landing stations	Telegeography (TeleGeography, 2025)	Jordan, Lebanon landings; distances for the Palestinian territories	GIS data on global submarine cables/landings; distance from region centroids to nearest landing used for instrument.
Seaquake Events	US Geological Survey (USGS)	2010; within 100km of cables	Seismic events as exogenous shocks to submarine cables; USGS provides epicentre, date/time, magnitude; follows Cariolle (2019).
Lightning Strikes	Global Hydrology Resource Centre (OTD/LIS)	1995 – 2010; regional aggregation	LEO sensors (OTD/LIS), ∼10 km resolution; per-pass obs ∼3 min (OTD) / 1.5 min (LIS). Flash counts adjusted for detection efficiency; intensity = flashes / observation time (strikes/km^2/yr).
Nighttime Lights	NOAA (DMSP-OLS) (NOAA, 2021)	2000 – 2013 ; regional aggregation	Stable lights, yearly cloud-free composites (30 arc-sec). In 12/14 years, two satellites averaged; log intensity 1.36 – 4.14. Proxy for economic activity.
Climate Data (Precipitation / Temperature)	CEDA (UK) (Harris et al., 2020)	2000–2013; monthly, aggregated to regions	CRU monthly grids (0.5) for 1901 – 2019 via CEDA; we use 2000–2013. Provides long-run means/anomalies; controls for weather (incl. rain fade).
2G / 3G Mobile Coverage	Collins Bartholomew (Collins Bartholomew, 2025)	2010 snapshot; 1 km raster	Mobile network availability; cell-level signal (1 km) aggregated to regions; binary indicators for 2G coverage and any 3G.
Ruggedness	UNEP-WCMC (Harris et al., 2021)	Static; regional aggregation	Share of mountainous land by UNEP-WCMC mountain classes from USGS DEM (1996); classes combine elevation, slope, and local elevation range (six categories).

Table A2: Summary Table of Data Availability on Media Networks and Political Mobilization from the Arab Barometer

Data	**The Arab Barometer**[I]			**Comments**
Period	Wave 2[II] 2010-2011	Wave 3 2012-2014	Wave 4 2016-2017	
Algeria	15 Apr-11 May 2011	13 Mar-6 Apr 2013	3 May-16 May 2016	Data on media network available in Wave 2 after 17 December 2010. Data on political mobilization available in waves 2-4.
Egypt	16 Jun-30 Jun 2011	31 Mar-7 Apr 2013	15 Apr-23 Apr 2016	Data on media network available in Wave 2 after 17 December 2010. Data on protests and petitions available in waves 3-4. Data on political alignment and institutional trust available in waves 2-4.
Iraq	20 Feb-12 Mar 2011	6 Jun-29 Jun 2013	–	Data on media network available in Wave 2 after 17 December 2010. Data on political mobilization available in waves 2-3.
Jordan	10 Dec-16 Dec 2010	27 Dec 2012-6 Jan 2013	9 Mar-16 Mar 2016	Data on media network available in Wave 2 before 17 December 2010. Data on political mobilization available in waves 2-4.
Lebanon[III]	24 Nov-6 Dec 2010 9 Apr-24 Apr 2011	3 Jul-26 Jul 2013	20 Jul-16 Aug 2016	Data on media network available in Wave 2 before 17 December 2010. Data on political mobilization available in waves 2-4.
Saudi Arabiya[IV]	5 Jan-6 Feb 2011 26 Mar to 9 Apr 2011	–	–	Data on media network available in Wave 2 after 17 December 2010. Data on political mobilization only available in Wave 2.
The Palestinian Territories	2 Dec-5 Dec 2010	20 Dec-29 Dec 2012	18 Feb-27 Feb 2016	Data on media network available in Wave 2 before 17 December 2010. Data on political mobilization available in waves 2-4.
Sudan[V]	12 Dec-30 Dec 2010 24 Mar-23 Apr 2011	29 Apr-29 May 2013 Round 5 (2012-2013)	– –	Data on media network available in Wave 2 around 17 December 2010. Data on political mobilization available in waves 2-3.
Tunisia	30 Sep-11 Oct 2011	3 Feb-25 Feb 2013	13 Feb-3 Mar 2016	Data on media network available in Wave 2 after 17 December 2010. Data on protests and petitions available in waves 3-4. Data on political alignment and institutional trust available in waves 2-4.
Yemen	5 Jan-6 Feb 2011 26 Mar-9 Apr 2011	2 Nov-4 Dec 2013	–	Data on media network available in Wave 2 after 17 December 2010. Data on political mobilization available in waves 2-3.

I Wave 1 of the Arab Barometer is excluded because there is no data on survey respondents' region.

II Only countries with data on survey respondents' most reliable media network are reported. This information is available in Wave 2 of the Arab Barometer.

III Data from supplementary interviews in 2011 (wave 2) excluded as after 17 December 2010.

IV Saudi Arabiya is excluded from the study as no data is available after wave 2 of the Arab Barometer.

V Sudan is included as a robustness check as data on respondents' most reliable media network is available slightly before and slightly after 17 December 2010. Data from supplementary interviews in 2011 (wave 2) is excluded as it was obtained after 17 December 2010. Data on Political mobilization was completed with data from round 5 of the Afrobarometer, which corresponds to 2012-2013. Data from rounds 6 and 7 of the Afro Barometer only give a sub-set of the initial regions and, therefore, are not used.

Table A3: Descriptive Statistics

	(1)	(2)
	Mean	**SD**
Individual Characteristics		
Age	39	14
Education: Primary	0.3371	0.4727
Education: Secondary	0.3220	0.4673
Education: Tertiary	0.2998	0.4582
Employed	0.4732	0.4993
Employed in Public Sector	0.3396	0.4737
Married	0.6925	0.4615
Muslim	0.8424	0.3643
Christian	0.1576	0.3643
Urban Residence	0.7100	0.4538
Political Mobilization		
Participation in Protests	0.1650	0.3712
General Trust	0.1819	0.3858
Political Alignment	0.4017	0.4903
Signing Petitions	0.1614	0.3679
Perceived Democracy	0.5926	0.4914
Satisfaction with Government	0.3090	0.4621
Perceived Corruption	0.7457	0.4355
Media Networks		
Al Jazeera	0.0378	0.0313
Al Arabiya	0.0068	0.0088
Foreign Media	0.0446	0.0382
State Media	0.0595	0.0281
Foreign TV	0.0372	0.0325
Foreign Internet	0.0108	0.0114
Regular TV viewers	0.1437	0.0488
Regular Internet users	0.1245	0.0475
Social Media Users	0.0001	0.0002
Climatic Shocks & Regional Characteristics		
Lightning Frequency Strikes	33319.1029	35168.0456
Lightning Density	9.9302	1.9666
Temperature	2.8179	0.2307
Precipitation	5.6827	1.8775
Extreme Temperature	0.4853	0.4998
Extreme Precipitation	0.3818	0.4859
Seaquakes (100 km buffer)	76.8133	67.9095
Ruggedness	0.4558	0.3591
Nightlights (log)	3.1578	0.6098
2G coverage	0.6717	0.4696
3G Coverage	0.4086	0.4916

Table A4: Clustering at the Treatment Level.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Panel A:	**Ordinary Least Squares (OLS)**			
Foreign Media	0.0630***	0.0530**	0.0505**	0.0549**
	(0.0184)	(0.0204)	(0.0210)	(0.0203)
R-squared	0.1242	0.1404	0.1405	0.1408
Panel B:	**Second-Stage: Two-Stage Least Squares (2SLS)**			
Foreign Media	0.1014***	0.0685**	0.0698**	0.0648**
	(0.0294)	(0.0302)	(0.0307)	(0.0276)
Observations	7,405	6,969	6,969	6,969
R-squared	0.0075	0.0265	0.0236	0.0242
Kleibergen-Paap rk Wald F	24.81	27.98	23.84	51.93
Root MSE	0.338	0.330	0.330	0.330
Hansen J p-value	0.198	0.274	0.274	0.404
Mean Y	0.170	0.165	0.165	0.165
Panel C:	**Second-Stage: Two-Stage Least Squares (2SLS) with Wild Bootstrapping**			
Foreign Media	0.101***	0.069*	0.070*	0.065*
Bootstrap p-value	0.000	0.032	0.043	0.048
95% CI	[.03537, .1722]	[.005569, .1362]	[.001401, .1385]	[.0004415, .1291]
Climate Controls	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y
Share of Regular Internet Users	N	N	Y	Y
Share of Regular Trad. Media Users	N	N	N	Y

Notes: Estimated Equation: Equation (1) using OLS in Panel A. Estimated Equation: Equation (2) in Panel B and using as IV the seaquake incidence times the distance of the region's centroid to the cable landing station and the frequency of lightning strikes with bootstrap wild cluster confidence intervals in Panel C. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the regional level (34) are in parentheses in Panel A and B, while Panel C reports the p-value and 95% Confident Interval of the Wild Bootstrapping. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

Table A5: Redefining Internet Usage.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Panel A:	**Second-Stage: Two-Stage Least Squares (2SLS)**			
Foreign Media	0.0648**	0.0619**	0.0718***	0.0766***
	(0.0260)	(0.0250)	(0.0245)	(0.0263)
Shares of Trad. Media Users	-0.0532	-0.0379	-0.0232	-0.0227
	(0.0447)	(0.0477)	(0.0319)	(0.0393)
Shares of Regular Internet Users	0.0207	0.0139		
	(0.0305)	(0.0304)		
Shares of Social Media Users		-0.7039	-0.3160	-0.6395
		(0.5177)	(0.5976)	(0.5529)
Trend in 2G			0.2323**	
			(0.1127)	
Trend in 3G				0.0005
				(0.0364)
Observations	6,969	6,969	6,911	6,911
R-squared	0.0242	0.0248	0.0258	0.0247
Kleibergen-Paap rk Wald F	86.71	92.41	90.68	86.69
Root MSE	0.330	0.329	0.330	0.331
Hansen J p-value	0.318	0.404	0.767	0.837
Mean Y	0.165	0.165	0.166	0.166
Panel B:	**First-Stage: Predicted Foreign Media**			
Incidence Seaquakes	-2.0099***	-1.9823***	-1.6476***	-1.6615***
	(0.1695)	(0.1588)	(0.1574)	(0.1519)
Lightning Frequency Strikes	-1.0945***	-1.1970***	-3.1826***	-2.9046***
	(0.3925)	(0.3826)	(0.7146)	(0.6391)
R-squared	0.9693	0.9708	0.9470	0.9475
Climate Controls	Y	Y	Y	Y
Individual Controls	Y	Y	Y	Y
Region and Time FE	Y	Y	Y	Y

Notes: Estimated Equation in Panel A and in Panel B: Equation (2) using as IV the incidence of the seaquake times the distance of the region's centroid to the cable landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[b] Results for Foreign Media in Columns (2), (3), and (4) presented in Row B of Table 4.

Table A6: Excluding Regions with 3G Coverage.

	(1)	(2)	(3)
	Participation in Protests		
Foreign Media	0.0689**	0.0480**	0.0453**
	(0.0269)	(0.0199)	(0.0183)
Shares of Regular Trad. Media Users	-0.0982**	-0.0546	-0.0318
	(0.0398)	(0.0334)	(0.0341)
Shares of Regular Internet Users	0.0585***	0.0412**	
	(0.0211)	(0.0191)	
Shares of Social Media Users in wave 2		-1.0594***	-1.0991***
		(0.2968)	(0.2874)
Trends in 2G			0.3894***
			(0.0947)
Observations	4,087	4,087	4,087
R-squared	0.0138	0.0149	0.0153
Kleibergen-Paap rk Wald F	82.14	291.8	400.1
Root MSE	0.312	0.312	0.312
Hansen J p-value	0.394	0.0742	0.156
Mean Y	0.125	0.125	0.125
Climate Controls	Y	Y	Y
Individual Controls	Y	Y	Y
Region and Time FE	Y	Y	Y

Notes: Estimated equation follows Equation (2) using as IV the seaquake incidence times the distance of the region's centroid to the cable's landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature.Robust standard errors clustered at the region-settlement level (31) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[c] Results for Foreign Media in Column (4) presented in Row C of Table 4.

Table A7: Controlling for Trends in Distances.

	(1)	(2)	(3)
	Participation in Protests		
Foreign Media	0.0644***	0.0660**	0.0572**
	(0.0232)	(0.0333)	(0.0234)
Shares of Regular Internet Users	0.0206	0.0205	0.0126
	(0.0305)	(0.0307)	(0.0292)
Shares of Regular Trad. Media Users	-0.0527	-0.0552	-0.0369
	(0.0439)	(0.0503)	(0.0409)
Log(Distance)*Post		0.0023	
		(0.0333)	
Distance to Large City*Post			-0.0199
			(0.0123)
Observations	6,969	6,969	6,500
R-squared	0.0242	0.0242	0.0273
Kleibergen-Paap rk Wald F	85.81	52.72	95.53
Root MSE	0.330	0.330	0.326
Hansen J p-value	0.325	0.324	0.0624
Climate Controls	Y	Y	Y
Individual Controls	Y	Y	Y
Region and Time FE	Y	Y	Y

Notes: Estimated Equation: Equation (2) using as IV the seaquake incidence times the distance of the region's centroid to the cable's landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (65) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[d] Results for Foreign Media in Columns (2) and (3) presented in Row D of Table 4.

Table A8: Redefining Internet Usage and controlling for Log of Distance.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Foreign Media	0.0660**	0.0607*	0.0580*	0.0750**
	(0.0333)	(0.0325)	(0.0329)	(0.0342)
Shares of Regular Internet Users	0.0205	0.0138		
	(0.0307)	(0.0305)		
Shares of Trad.Media Users	-0.0552	-0.0362	-0.0029	-0.0223
	(0.0503)	(0.0554)	(0.0441)	(0.0533)
Shares of Social Media Users in wave 2		-0.7069	-0.3369	-0.6395
		(0.5364)	(0.5855)	(0.5591)
Log(Distance)*Post	0.0023	-0.0008	-0.0132	0.0017
	(0.0333)	(0.0330)	(0.0325)	(0.0339)
Trends in 2G			0.2556*	
			(0.1308)	
Trends in 3G				-0.0004
				(0.0376)
Observations	6,969	6,969	6,911	6,911
R-squared	0.0271	0.0277	0.0262	0.0247
Kleibergen-Paap rk Wald F	52.72	54.23	53.55	48.89
Root MSE	0.330	0.329	0.330	0.331
Hansen J p-value	0.317	0.411	0.769	0.841
Mean Y	0.165	0.165	0.166	0.166
Climate Controls	Y	Y	Y	Y
Individual Controls	Y	Y	Y	Y
Region and Time FE	Y	Y	Y	Y

Notes: Estimated equation follows Equation (2) using as IV the seaquake incidence times the distance of the region's centroid to the cable's landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature.Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[e] Results for Foreign Media in Columns (2), (3), and (4) presented in Row E of Table 4.

Table A9: Re-centering the IV.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Panel A:	**Second-Stage: Two-Stage Least Squares (2SLS)**			
Foreign Media	0.0856***	0.0669***	0.0679**	0.0631**
	(0.0234)	(0.0258)	(0.0264)	(0.0245)
Shares of Regular Internet Users			0.0052	0.0210
			(0.0215)	(0.0302)
Shares of Regular Trad. Media Users				-0.0524
				(0.0454)
Observations	7,247	6,969	6,969	6,969
R-squared	0.0091	0.0266	0.0237	0.0242
Kleibergen-Paap rk Wald F	42.41	41.87	33.57	68.83
Root MSE	0.333	0.330	0.330	0.330
Hansen J p-value	0.181	0.204	0.207	0.328
Mean Y	0.165	0.165	0.165	0.165
Panel B:	**First-Stage: Predicted Foreign Media**			
Re-centered IV - Incidence Seaquakes	-2.0170***	-1.9150***	-1.8924***	-2.4229***
	(0.2616)	(0.2593)	(0.2566)	(0.2723)
Lightning Frequency Strikes	-2.8139***	-2.8055***	-2.4531***	-1.4693***
	(0.5569)	(0.5247)	(0.6376)	(0.5042)
R-squared	0.9348	0.9364	0.9410	0.9642
Climate Controls	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y

Notes: 2SLS estimates in Panel A and in Panel B. Estimated Equation: Equation (2) using as IV the "recentered" value of the incidence of seaquakes in 2010 times the distance of the region's centroid to the cable landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[f] Results for Foreign Media in Column (4) presented in Row F of Table 4.

Table A10: Excluding Seaquakes within 100km from the Coast.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Foreign Media	0.0896***	0.0718**	0.0731**	0.0678**
	(0.0257)	(0.0286)	(0.0294)	(0.0282)
Share of Regular Internet Users			0.0038	0.0202
			(0.0224)	(0.0307)
Share of Regular Trad. Media Users				-0.0546
				(0.0442)
Observations	7,247	6,969	6,969	6,969
R-squared	0.0089	0.0264	0.0235	0.0241
Kleibergen-Paap rk Wald F	62.75	61.23	42.38	81.16
Root MSE	0.334	0.330	0.330	0.330
Hansen J p-value	0.170	0.181	0.186	0.305
Climate Controls	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y

Notes: Estimated Equation: Equation (2) using as IV the seaquake incidence without events within 100 km from the coast times the distance of the region's centroid to the cable's landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[g] Results for Foreign Media in Column (4) presented in Row G of Table 4.

Table A11: Controlling for Trends in Regional Characteristics.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Foreign Media	0.0644***	0.0582**	0.0581**	0.0480*
	(0.0232)	(0.0232)	(0.0234)	(0.0285)
Shares of Regular Internet Users	0.0206	-0.0193	-0.0151	-0.0195
	(0.0305)	(0.0439)	(0.0417)	(0.0411)
Shares of Regular Trad. Media Users	-0.0527	0.0379	0.0423	0.0531
	(0.0439)	(0.0768)	(0.0787)	(0.0760)
Trend in Urban Share		-0.0002*	-0.0002*	-0.0002*
		(0.0001)	(0.0001)	(0.0001)
Trend in Ruggedness			0.0098	0.0044
			(0.0201)	(0.0235)
Trend in Log of Nightlights				0.0327
				(0.0537)
Observations	6,969	6,969	6,969	6,969
R-squared	0.0242	0.0255	0.0256	0.0259
Kleibergen-Paap rk Wald F	85.81	107	114.5	62.55
Root MSE	0.330	0.329	0.329	0.329
Hansen J p-value	0.325	0.681	0.458	0.192
Climate Controls	Y	Y	Y	Y
Individual Controls	Y	Y	Y	Y
Region and Time FE	Y	Y	Y	Y

Notes: Estimated Equation: Equation (2) using as IV the seaquake incidence times the distance of the region's centroid to the cable's landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[h] Results for Foreign Media in Columns (2), (3), and (4) presented in Row H of Table 4.

Table A12: Controlling for Lightning Strikes (Cumulative over 5 years, 2000-2005).

	(1)	(2)	(3)	(4)
	Participation in Protests			
Panel A:	**Second-Stage: Two-Stage Least Squares (2SLS)**			
Foreign Media	0.0753***	0.0543*	0.0560*	0.0541**
	(0.0255)	(0.0280)	(0.0286)	(0.0273)
Lightning Strikes	0.0315***	0.0323***	0.0319***	0.0314***
	(0.0065)	(0.0071)	(0.0070)	(0.0071)
Share of Regular Internet Users			0.0034	0.0146
			(0.0213)	(0.0290)
Share of Trad. Media Users				-0.0383
				(0.0434)
Observations	6,769	6,500	6,500	6,500
R-squared	0.0113	0.0310	0.0285	0.0288
Kleibergen-Paap rk Wald F	55.56	54.23	41.09	79.42
Root MSE	0.330	0.325	0.325	0.325
Hansen J p-value	0.166	0.196	0.180	0.241
Mean Y	0.165	0.165	0.165	0.165
Panel B:	**First-Stage: Predicted Foreign Media**			
Incidence Seaquakes	-1.6320***	-1.5775***	-1.5919***	-2.0463***
	(0.2029)	(0.2055)	(0.1927)	(0.1804)
Lightning Frequency Strikes	-2.3429***	-2.3659***	-1.9498***	-0.8195**
	(0.3857)	(0.3877)	(0.5550)	(0.3836)
R-squared	0.9393	0.9398	0.9451	0.9707
Climate Controls	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y

Notes: Estimated Equation: Equation 2, Second Stage in Panel A estimates, First Stage in Panel B. Instrumental variables: seaquake incidence times the distance of the region's centroid to the cable landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual controls include age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate controls include extreme precipitation and temperature. Robust standard errors clustered at the region-settlement level are in parentheses (65). *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

[h] Results for Foreign Media in Column (4) presented in Row I of Table 4.

Table A13: Correlation between the Time-Invariant Instrumental variables and Participation to Protest before the Arab Spring.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Lightning Frequency Strikes	-0.0257			
	(0.0395)			
Log of Distance		0.0001		
		(0.0003)		
Seaquakes* Log of Distance			-0.0003	
			(0.0002)	
Observations	3,520	3,520	3,520	
R-squared	0.0556	0.0552	0.0574	
Climate Controls	Y	Y	Y	
Country FE	Y	Y	Y	

Notes: Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (47) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

Table A14: First-Stage Estimates Using Lightning Strikes (Cumulative over 5 years, 2000-2005) and Lightning Frequency Strikes (Cumulative over 15 years, 1995-2010) .

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A				**Panel B**			
	Foreign Media							
Lightening Strikes	0.1717	0.1372	0.1207	0.1301				
	(0.1309)	(0.1135)	(0.0957)	(0.0954)				
Shares of Regular Internet Users			0.2555**	0.1061			0.2407*	0.1489
			(0.1274)	(0.1430)			(0.1315)	(0.1436)
Shares of TV and Press Users				0.5329**				0.3703
				(0.2099)				(0.2230)
Lightning Frequency Strikes					-1.7214***	-1.9110***	-1.5243**	-1.1220*
					(0.6025)	(0.5501)	(0.5842)	(0.6548)
Observations	6,769	6,500	6,500	6,500	7,247	6,969	6,969	6,969
R-squared	0.8684	0.8815	0.8886	0.8949	0.8672	0.8838	0.8898	0.8927
Climate Controls	Y	Y	Y	Y	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Estimated Equation: Equation 2, First Stage. Panel A: using as IV the average frequency of lightning strikes in 2000-2005 times *Post*. Panel B: using as IV the frequency of lightning strikes 1995-2010 times *Post*. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (65 in panel A and 67 in panel B) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

Table A15: State Media and Participation in Protests, Placebo test.

	(1)	(2)	(3)	(4)
	Participation in Protests			
Panel A:	**Ordinary Least Squares (OLS)**			
State Media	-0.0623*	-0.0543	-0.0717*	-0.0734*
	(0.0329)	(0.0342)	(0.0361)	(0.0393)
R-squared	0.1206	0.1399	0.1411	0.1411
Panel B:	**Second-Stage: Two-Stage Least Squares (2SLS)**			
State Media	-0.2798***	-0.2515**	-0.2423**	-0.2685**
	(0.1070)	(0.1267)	(0.1020)	(0.1358)
Observations	7,247	6,969	6,969	6,969
R-squared	-0.0206	0.0003	0.0094	0.0062
Kleibergen-Paap rk Wald F	3.826	2.556	2.929	1.374
Root MSE	0.338	0.334	0.332	0.333
Panel C:	**First-Stage: Two-Stage Least Squares (2SLS)**			
Incidence Seaquakes	0.5493***	0.4809**	0.4934**	0.3415
	(0.2063)	(0.2226)	(0.2041)	(0.2783)
Lightning Frequency Strikes	-0.1259	-0.1449	0.3672	0.7412
	(0.9080)	(0.9078)	(0.7627)	(0.7308)
R-squared	0.8999	0.9012	0.9136	0.9171
Climate Controls	Y	Y	Y	Y
Individual Controls	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y
Share of Regular Internet Users	N	N	Y	Y
Share of Regular Trad. Media Users	N	N	N	Y

Notes: Estimated Equation: Equation 1 in Panel A and Equation 2 in Panel B and Panel C, using as IV the incidence of seaquakes times the distance from the centroid of the region to the cable landing station and the frequency of lightning strikes. State Media: share of State media viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment, and urbanity. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level (67) are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

Table A16: Foreign Media among Workers in Public vs. Non-Public Sectors and Participation in Protests.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Public Workers				**Non-Public Workers**			
	Participation in Protests							
Panel A:	**Ordinary Least Squares (OLS)**							
Foreign Media	0.0571	0.0635*	0.0477	0.0627	0.0628***	0.0541***	0.0544***	0.0581***
	(0.0345)	(0.0378)	(0.0413)	(0.0437)	(0.0172)	(0.0181)	(0.0192)	(0.0189)
R-squared	0.3008	0.3047	0.3057	0.3071	0.1072	0.1235	0.1235	0.1238
Panel B:	**Second-Stage: Two-Stage Least Squares (2SLS)**							
Foreign Media	0.0875*	0.0967*	0.0918	0.0895	0.0876***	0.0739**	0.0755***	0.0681***
	(0.0507)	(0.0575)	(0.0672)	(0.0594)	(0.0260)	(0.0290)	(0.0286)	(0.0262)
Observations	730	708	708	708	6,517	6,266	6,266	6,266
R-squared	0.0064	0.0129	0.0137	0.0167	0.0100	0.0209	0.0247	0.0215
Kleibergen-Paap rk Wald F	53.94	53.83	26.90	68.39	49.05	48.12	41.92	86.55
Root MSE	0.340	0.340	0.340	0.339	0.329	0.326	0.326	0.326
Hansen J p-value	0.0965	0.0983	0.0784	0.0915	0.357	0.407	0.440	0.687
Panel C:	**First-Stage: Predicted Foreign Media**							
Incidence Seaquakes	-1.8486***	-1.7335***	-1.6472***	-2.1013***	-1.6087***	-1.5502***	-1.5510***	-2.0001***
	(0.2187)	(0.2130)	(0.2313)	(0.1877)	(0.1887)	(0.1884)	(0.1761)	(0.1689)
Lightning Frequency Strikes	-2.1880***	-2.2829***	-1.8429***	-0.8586**	-2.6661***	-2.6535***	-2.2842***	-1.1531***
	(0.3871)	(0.3804)	(0.5748)	(0.3601)	(0.4480)	(0.4321)	(0.5914)	(0.4313)
R-squared	0.9409	0.9429	0.9465	0.9715	0.9393	0.9402	0.9462	0.9697
Individual Controls	N	Y	Y	Y	N	Y	Y	Y
Region and Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Share of Regular Internet Users	N	N	Y	Y	N	N	Y	Y
Share of Regular Trad. Media Users	N	N	N	Y	N	N	N	Y

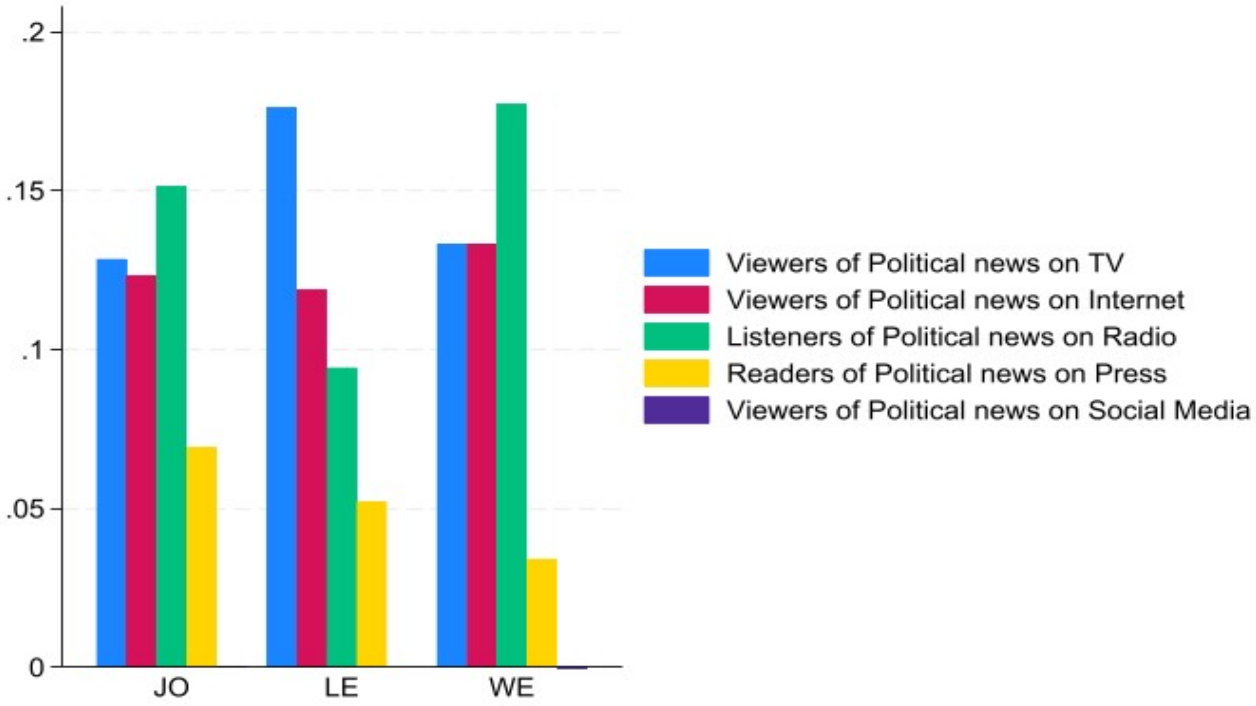
Notes: Estimated Equation: Equation (1) using OLS in Panel A. Estimated Equation: Equation 2 in Panel B and Panel C using as IV the incidence of seaquakes times the distance from the centroid of the region to the cable landing station and the frequency of lightning strikes. Foreign Media: Combined shares of Al Jazeera and Al Arabiya viewership (%). Individual Controls: age, age squared, gender, education, religion, marital status, employment. Climate Controls: (extreme) precipitation and temperature. Robust standard errors clustered at the region-settlement level are in parentheses. *** denotes statistical significance at the 1 % level ($p < 0.01$), ** at the 5 % level ($p < 0.05$), and * at the 10 % level ($p < 0.10$), all for two-sided hypothesis tests. FE: fixed effects.

B Figures

Figure A1: Protests in the Arab World before and during the Arab Spring.

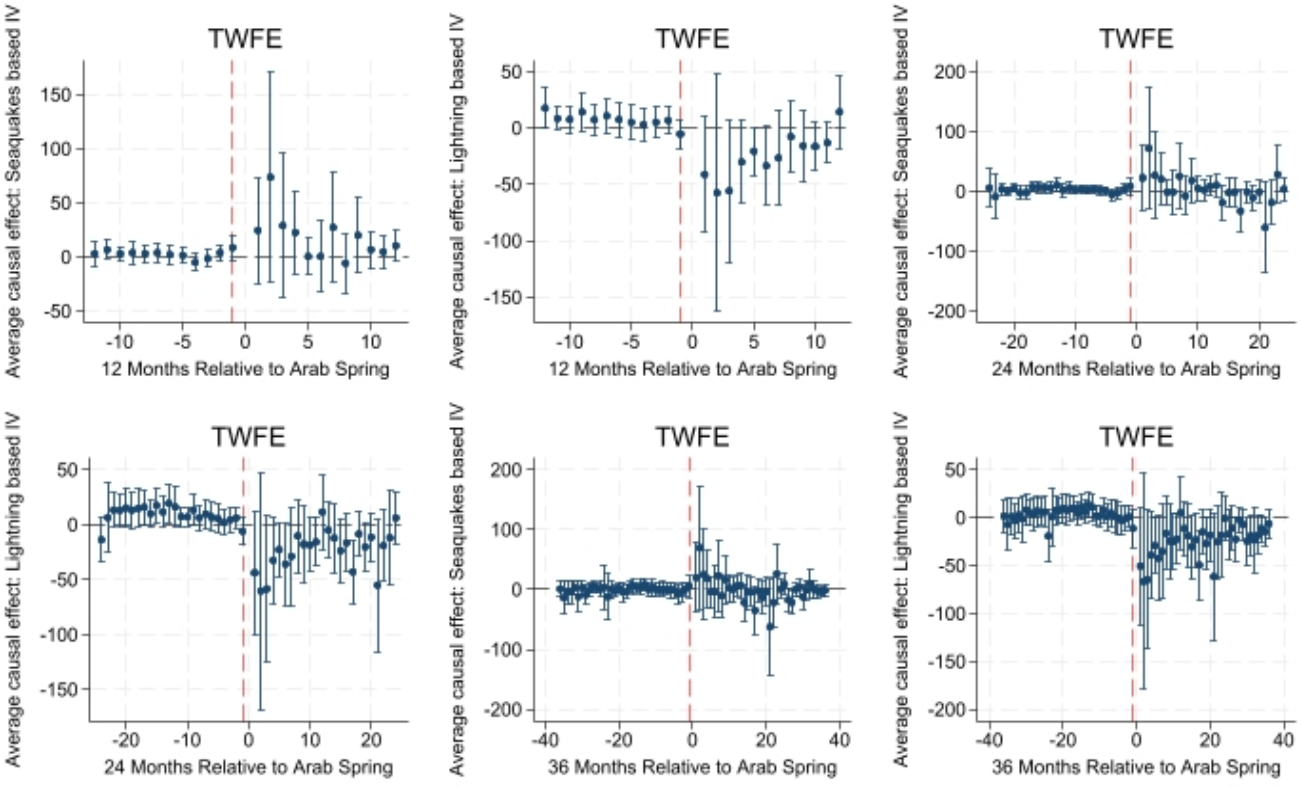
Source: Global Database of Events, Language and Tone. The graph represents number of daily reported protests events since January 1, 2010 until the end of the Arab Spring at the end of 2012 in Jordan, Lebanon and the Palestinian Territories.

Figure A2: Viewership for political news, Arab Barometer II.



Source: Arab Barometer Wave II. The bars represent the share of respondents consuming political news for each source.

Figure A3: Event Study.



Source: The figures implement an event study in reduced form. We regress separately the GDELT monthly protests on our instrumental variables, using 12, 24, 36 lags, and leads.