

**Internet and Politics:  
Evidence from UK Local Elections and  
Local Government Policies**

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# Motivation

- The Internet has profoundly changed many markets:
  - Bookstores, Travel Agencies, Advertising Markets.
  - Media: Printed newspaper exits. US Newspaper staffs have been cut by a third between 2000 and 2010.
- Some changes have raised alarms, many related to politics:
  - Internet makes us “shallower:”  
*“When we’re constantly distracted and interrupted, as we tend to be online, our brains are unable to forge the strong and expansive neural connections that give depth and distinctiveness to our thinking.” Carr (2011).*
  - Internet increases ideological polarization:  
*“People restrict themselves to their own points of view.” Sunstein (2001, 2007).*
  - Internet decreases civic engagement: Putnam (2000).
  - Internet increases government corruption: Starr (2009).

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# This Paper: Questions and Setting

- EMPIRICAL QUESTIONS:
  - Does the Internet affect elections?
  - Does the Internet affect government policy?
  - Mechanism: Does the Internet affect news consumption?
- SETTING: UK Local Elections and Local Governments.
  - The effect of the Internet displacing traditional media should be larger for local elections, as many local newspapers disappeared;
  - Greater variation than national elections and policies;
  - Good data on internet penetration at a disaggregated level;
  - More direct channel between local voting and local policies.→ Ideal ground for testing.
- IDENTIFICATION:
  - IV based on lagged weather that (exogenously) shifts internet penetration, controlling for contemporaneous weather that may affect elections directly;
  - Falsifications based on pre-internet period;
  - Bounds based on OLS, as in Altonji, Elder and Taber, 2005, (Not shown today).

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# This Paper: Results

- Evidence that Internet affects Local Elections:
    - Decrease in Turnout:
      - One-percentage-point increase in penetration decreases turnout by 0.25 percentage points.
      - Larger Effects on Less Educated and Young Voters.
    - Increase in incumbents' vote share.
  - Suggestive Evidence that Internet affects Local Gov't Policies:
    - Decrease in Expenditures and in Taxes:
      - One-percentage-point increase in penetration decreases expenditures and taxes by 0.29 and 0.33 percent.
      - Larger Decrease in Expenditures that Target Low-Income Voters (Social Expenditures).
- Evidence on the Mechanism:
- Internet Decreases News Consumption, Increase in Leisure; Crowding out of Political Engagement:
    - Decrease in Newspapers' Circulation;
    - Aggregate Evidence from Other Media (TV and Radio);
    - Greater Effect among Less Educated and Young Individuals.

# Related Literature

- Media and Elections:

Strömberg (2004), Gentzkow (2006), Larcinese (2007), DellaVigna and Kaplan (2007), Ferraz and Finan (2008), Snyder and Strömberg (2010), Enikolopov, Petrova, and Zhuravskaya (2011), Gentzkow, Shapiro, and Sinkinson (2011), Drago, Nannicini, and Sobbrío (2015).

- Introduction of New Media:

- **Radio:** Strömberg (2004);

- **TV:** Gentzkow (2006), Campante and Hojman (2013);

- **Internet:** Falck, Gold, and Heblich (2014), Miner (2013), Campante, Durante, and Sobbrío (2013).

- Key differences: Better Data + Local Elections + Local-Government Policies + Different Identification.

- Media and Policies:

Besley and Burgess (2002), Strömberg (2004), Snyder and Strömberg (2010).

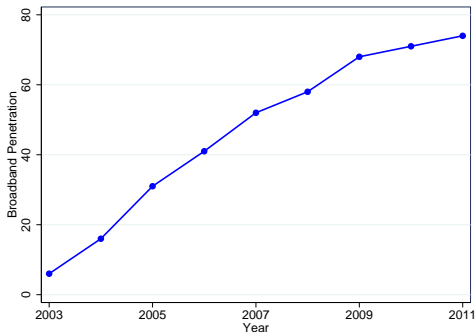
- Political Participation and Policies:

Lott and Kenny (1999), Strömberg (2004), Lizzeri and Persico (2010).

# Internet in the UK, 2001-2010 (1)

- Broadband Internet in the UK:

- Technology: 80 percent through telephone network (BT); 20 percent through cable (Virgin).
- BT Network has remained the same since 1930. 5,587 nodes called Local Exchanges (LEs).
- ADSL technology provides Internet through an upgrade at the LE level. Each house connects to one LE.
- De-regulation in the early 2000s, allowing firms to provide broadband internet services over BT's network.



# Empirical Context: UK Local Authorities

- Local Authorities (LAs):
  - LAs (349 in England) councils make decisions on local services and local taxes (property tax).
  - Single-Tier versus Two-Tier LAs. Different functions and separate expenditures and taxation.
  - Local Services: education, transport, fire services, social services, public libraries, waste disposal, public housing, local planning and development applications, leisure and recreation facilities, waste collection, environmental health, and revenue collection.
  - Often services provided jointly with other LAs: Transportation.
  - Block grants from the central government are the most important source of funds for LAs' expenditures.
  - Council Tax accounts for approximately 25% of LAs' revenues.
- Election of Councils:
  - Council size: Average of 49 seats (standard deviation of 12).
  - Elections are conducted on a first-past-the-post basis (councilors).
  - Wards are the primary unit of the electoral system and, as of 2014, there are 7,707 of them in England.
  - Each ward returns between one and three councilors.

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# Data (1)

We combine four datasets for the period 2005-2009:

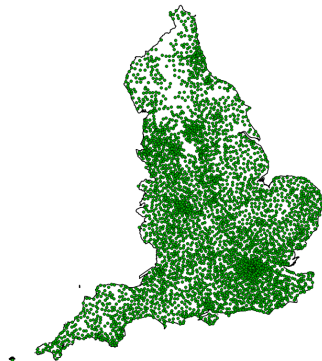
- 1. UK Local Election.** The Elections Centre at Plymouth University collects data on outcomes of all local council elections that took place in England: number of voters, number of votes (turnout), and parties' votes.
- 2. UK Local-Government Policies.** Expenditures and Taxes of 115 out of 124 single-tier Local Authorities (exclude those reorganized in 2008-2009).
  - Local-Government Expenditure: per-capita expenditures on Education, Social Services, Housing services, Waste Collection, Cultural and Planning, Environmental Services, and Central Services.
  - Taxes: Band D property value tax.

## Data (2)

### 3. Internet Penetration

Collected by Ofcom, the UK communication regulator:

- Quarterly information on the broadband market for each Local Exchange (LE), smallest local market;
- Number of ISPs, number of subscribers to each ISPs, the availability of cable technology, and the number of cable subscribers;
- Exact location of the LE and exact local catchment area (each postcode: average radius of less than 100 meters);
- LEs' catchment areas not used for other purposes.



## Data (3)

### 4. Demographics, Geography and Weather. Collected by ONS, Ordnance Survey, and Met Office.

- **Demographics:** Age, Education, Ethnic composition, Employment, etc., at the ward and LA level.
- **Geography:** Absolute and Relative Elevation (ruggedness).
- **Weather:** Monthly Rain.

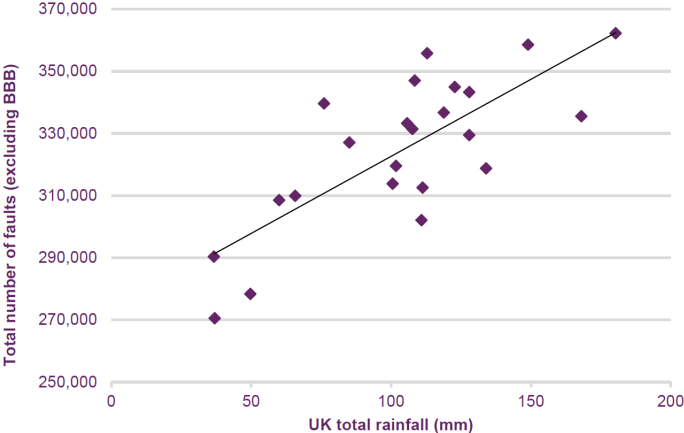
Ofcom: “[G]round water and soil saturation levels [...] have contributed to the rise in the volume of underground network faults encountered by Openreach in 2012.”

Openreach: “Openreach access network [...] is vulnerable to a wide range of weather variables (e.g., rainfall, high winds, lightning, etc.). The direct effect of weather damage may be the need to replace or repair assets, and this can be extensive and costly, but [the] generation of customer fault reports and failures of service to end-users is perhaps the most relevant issue.”

→ Supply-side Instruments that increase costs of providing reliable broadband.

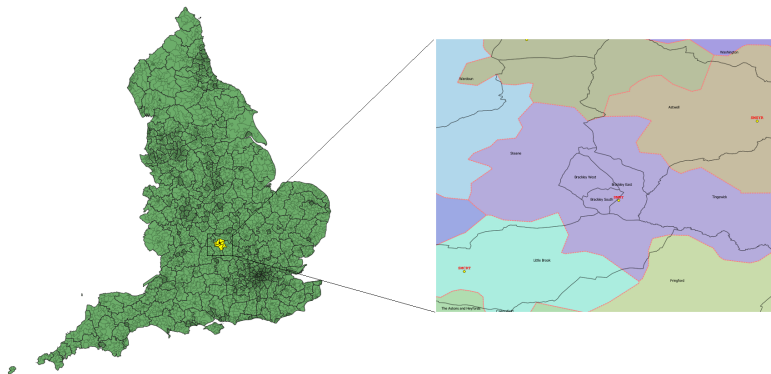
# Weather and Faults

Figure A31.16 Correlation between rainfall and fault report volumes<sup>1330</sup>



# Data Matching

- We restrict the analysis to England.
- We reconcile the different geographies (census, electoral, internet).
- Elections in May of year  $t$  matched to cumulative rain January-December of year  $t - 1$ .



# Data: Summary Statistics

PANEL A: WARDS (N=14149)	MEAN	STD. DEV.	MIN	MAX
TURNOUT (%)	42.69	13.02	9.59	83.25
INTERNET (%)	50.72	12.09	14.78	100
RAIN (MM/M <sup>2</sup> )	2.04	0.56	0.96	7.72
RAIN ELECTION DAY (MM/M <sup>2</sup> )	0.94	2.30	0.00	21.22
UNIVERSITY DEGREE (%)	39.22	11.55	13.30	90.40
HIGH SOCIO-ECONOMIC STATUS (%)	31.61	10.37	5.30	67.70
AVERAGE AGE (YEARS)	39.86	4.20	22.80	57.00
WHITE (%)	88.47	15.36	6.20	99.80
EMPLOYED (%)	62.63	7.34	6.60	83.20
URBAN (%)	81.48	38.59	0.00	100.00
LABOUR INCUMBENT	0.28	0.45	0.00	1.00
CONSERVATIVE INCUMBENT	0.40	0.49	0.00	1.00
$\Delta$ SHARE 1ST-2ND PARTY	22.24	17.00	0.01	100.00
MULTIPLE VACANCIES	0.29	0.45	0.00	1.00
PANEL B: LOCAL AUTHORITIES (N=570)				
PER CAPITA TOTAL EXP.	1219.47	200.40	851.37	2213.32
PER CAPITA EXP. ON EDUCATION	773.86	128.53	416.57	1394.95
PER CAPITA EXP. ON HOUSING AND SOC. SERV.	445.61	129.65	237.97	1306.15
PER CAPITA TAX REQUIREMENTS	349.05	58.27	147.07	568.59
INTERNET (%)	55.24	12.87	23.32	94.22
UNIVERSITY DEGREE (%)	40.11	9.73	25.80	75.60
WHITE (%)	79.96	17.08	29.00	98.60
EMPLOYED (%)	60.96	4.77	48.60	73.60
URBAN (%)	94.58	10.80	45.82	100.00
LABOUR MAJORITY	0.28	0.45	0.00	1.00
CONSERVATIVE MAJORITY	0.30	0.46	0.00	1.00

# Empirical Analysis: Elections

Basic framework is the following equation:

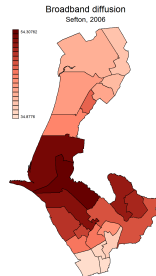
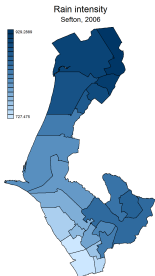
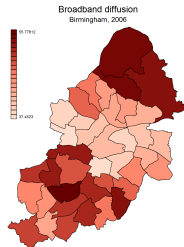
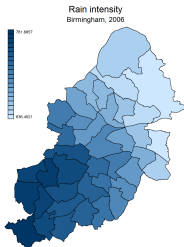
$$\text{LOG}(\text{TURNOUT}_{it}) = \beta \text{INTERNET}_{it} + \gamma X_{it} + \delta_I + \eta_t + \varepsilon_{it}$$

- $\text{INTERNET}_{it}$  is the share of houses with broadband in ward  $i$  year  $t$ ;
- $X_{it}$ : demographic characteristics; geographic characteristics; network characteristics (i.e., number of phone lines); election characteristics (i.e., number of candidates);
- $\delta_I$  Local Authority fixed effects; ward  $i$  belongs to LA  $I$ ;
- $\eta_t$  year fixed effects.

## Identification (1)

- **OLS (with controls):** Likely upward biased. Demographics that increase turnout are positively correlated to Internet Penetration. Observables and Unobservables likely moving in similar direction.
  - Construct bounds based on Altonji, Elder and Taber (2005) and Oster (2013).
- **Exogenous Instruments:** Ofcom in technical reports emphasizes the role of **rainfall** and floods on costs and quality of service. We use rainfall in year  $t - 1$ 
  - RAIN<sup>2</sup> and the MAX RAIN (month);
  - We control for the rain on the day of the election and the month before election.
- **Falsification/Exclusion Restriction:** We use elections 1996-2000 to show that rain had no effect on turnout *before* internet diffusion.

# Identification (2)



# Results (1): Turnout

DEPENDENT VARIABLE:	YEARS 2006-2010			YEARS 1996-2000				
	OLS	IV 1ST	IV 2ND	OLS	OLS	OLS	IV 1ST	IV 2ND
	LOG(TURNOUT)	INTERNETLOG(TURNOUT)	LOG(TURNOUT)	LOG(TURNOUT)	LOG(TURNOUT)	LOG(TURNOUT)	INTERNET	LOG(TURNOUT)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INTERNET	-0.22*** ( 0.02)		-0.87*** ( 0.25)			0.02 ( 0.04)		-0.19 ( 0.48)
RAIN <sup>2</sup>		-8.59*** ( 1.23)		3.72 ( 3.71)	3.73 ( 3.71)		-7.00*** ( 1.38)	
MAX RAIN		-2.20*** ( 0.68)		-2.83 ( 2.51)	-2.83 ( 2.51)		0.34 ( 0.79)	
RAIN ELECTION DAY	1.98** ( 0.86)	1.04*** ( 0.29)	2.42** ( 0.96)	2.51** ( 1.16)	2.51** ( 1.16)	2.60** ( 1.13)	0.95*** ( 0.30)	2.69*** ( 0.94)
WORK AGE	-1.16*** ( 0.06)	0.33*** ( 0.02)	-0.93*** ( 0.12)	-0.78*** ( 0.09)	-0.78*** ( 0.09)	-0.79*** ( 0.09)	-0.01 ( 0.03)	-0.79*** ( 0.13)
HIGH SES	0.44*** ( 0.06)	0.15*** ( 0.02)	0.55*** ( 0.10)	0.04 ( 0.09)	0.04 ( 0.09)	0.03 ( 0.09)	0.28*** ( 0.03)	0.09 ( 0.18)
WHITE	-0.17*** ( 0.02)	0.00 ( 0.01)	-0.17*** ( 0.03)	-0.47*** ( 0.03)	-0.47*** ( 0.03)	-0.47*** ( 0.03)	0.03*** ( 0.01)	-0.46*** ( 0.05)
UNIVERSITY DEGREE	0.54*** ( 0.05)	0.04** ( 0.02)	0.56*** ( 0.07)	0.54*** ( 0.06)	0.54*** ( 0.06)	0.54*** ( 0.06)	0.05*** ( 0.02)	0.55*** ( 0.08)
EMPLOYED	-0.21*** ( 0.04)	0.07*** ( 0.01)	-0.18*** ( 0.06)	0.64*** ( 0.07)	0.64*** ( 0.07)	0.65*** ( 0.07)	0.04* ( 0.02)	0.65*** ( 0.09)
URBAN	-5.66*** ( 0.39)	1.65*** ( 0.15)	-4.62*** ( 0.62)	-11.74*** ( 0.66)	-11.73*** ( 0.66)	-11.75*** ( 0.66)	0.76*** ( 0.23)	-11.59*** ( 0.90)
POPULATION DENSITY	-0.95*** ( 0.21)	-0.01 ( 0.12)	-0.94*** ( 0.25)	-5.69 ( 9.24)	-6.36 ( 10.25)	-5.74 ( 9.26)	2.28** ( 0.98)	-5.96 ( 10.52)
NUMBER OF PARTIES	1.43*** ( 0.19)	-0.03 ( 0.07)	1.41*** ( 0.23)	-0.26 ( 0.30)	-0.26 ( 0.30)	-0.26 ( 0.30)	0.09 ( 0.08)	-0.24 ( 0.35)
YEAR FIXED EFFECTS	YES	YES	YES	YES	YES	YES	YES	YES
LA FIXED EFFECTS	YES	YES	YES	YES	YES	YES	YES	YES
LA FIXED EFFECTS × TIME	YES	YES	YES	YES	YES	YES	YES	YES
F-TEST		60.18					20.17	
R <sup>2</sup>	0.817	0.868	0.587	0.709	0.709	0.709	0.863	0.556
OBSERVATIONS	14149	14149	14149	12570	12570	12570	12570	12570

## Magnitude of Effect on Turnout

- Within-LA standard deviation of RAIN is 0.33.
- One mm/m<sup>2</sup> of rain decreases internet penetration by 1.8 percentage points.
- Hence, the effect of a two-standard-deviations increase in RAIN is a 1.2-percentage-points decrease of INTERNET.
  - Narrow variation in internet penetration, much smaller than in overall sample.
- One-percentage-point increase in INTERNET (approx. what the within-LA variation in RAIN implies) decreased voter turnout by  $e^{-0.87} - 1 \approx -0.58$  percent.
- Average turnout is 43 percent.
- Hence, a one-percentage-point increase in INTERNET decreases TURNOUT by 0.25 percentage points.

# Results (2): Turnout, Education and Age

DEPENDENT VARIABLE: LOG(ELECTORAL TURNOUT)								
	(1)		(2)		(3)		(4)	
	IV 1ST	IV 2ND	IV 1ST	IV 2ND	IV 1ST	IV 2ND	IV 1ST	IV 2ND
INTERNET		-1.69*** (0.50)		-0.76*** (0.27)		-1.04* (0.57)		-0.73** (0.29)
RAIN <sup>2</sup>	-5.44*** (1.63)		-9.34*** (1.72)		-6.67*** (1.65)		-7.73*** (1.45)	
MAX RAIN	-0.07*** (0.02)		-0.10*** (0.04)		-0.06** (0.03)		-0.09*** (0.03)	
RAIN ELECTION DAY	1.19*** (0.36)	3.09** (1.38)	0.58 (0.41)	0.38 (1.09)	0.77** (0.35)	1.94 (1.34)	0.69* (0.37)	2.32** (1.01)
WORK AGE	0.22*** (0.02)	-0.49*** (0.15)	0.12*** (0.02)	-0.71*** (0.08)	-0.01 (0.02)	-0.85*** (0.09)	0.26*** (0.02)	-0.30*** (0.11)
HIGH SOCIO-ECONOMIC STATUS	0.35*** (0.04)	2.18*** (0.24)	0.06** (0.03)	1.48*** (0.09)	-0.02 (0.03)	1.20*** (0.12)	0.45*** (0.03)	1.29*** (0.18)
WHITE	-0.05*** (0.01)	-0.47*** (0.05)	-0.00 (0.01)	0.01 (0.03)	0.00 (0.00)	-0.31*** (0.03)	-0.05** (0.02)	0.04 (0.07)
UNIVERSITY DEGREE	-0.20*** (0.03)	-0.60*** (0.18)	0.16*** (0.02)	-0.25*** (0.08)	0.20*** (0.02)	0.13 (0.15)	-0.22*** (0.03)	0.03 (0.12)
MULTIPLE VACANCIES	-0.42*** (0.16)	-4.54*** (0.68)	0.30* (0.16)	-3.85*** (0.52)	-0.07 (0.19)	-2.27*** (0.77)	-0.09 (0.14)	-4.33*** (0.46)
LABOUR INCUMBENT	-0.01 (0.12)	-3.60*** (0.53)	-0.66*** (0.18)	-3.25*** (0.70)	-0.28** (0.11)	-3.53*** (0.54)	0.34** (0.16)	-4.56*** (0.62)
CONSERVATIVE INCUMBENT	-0.48*** (0.13)	-1.95*** (0.62)	-0.10 (0.12)	-2.89*** (0.40)	0.01 (0.13)	-0.76 (0.53)	-0.29** (0.12)	-2.48*** (0.41)
YEAR FIXED EFFECTS	YES	YES	YES	YES	YES	YES	YES	YES
DEMOGRAPHICS × TIME	YES	YES	YES	YES	YES	YES	YES	YES
LA FIXED EFFECTS	YES	YES	YES	YES	YES	YES	YES	YES
F-TEST		25.768		36.988		16.836		31.359
R <sup>2</sup>	0.851	0.758	0.887	0.761	0.886	0.752	0.854	0.759
OBSERVATIONS	8489	8489	8490	8490	8489	8489	8490	8490

# Results (3): Incumbents

DEPENDENT VARIABLE:	OLS	IV 2ND	OLS	IV 2ND	OLS	IV 2ND
	INCUMBENT VOTE SHARE (1)	VOTE SHARE (2)	RE-ELECTION (3)	(4)	$\Delta$ SHARE (5)	1ST-2ND PARTY (6)
INTERNET	0.10*** ( 0.02)	0.38* ( 0.23)	0.33*** ( 0.08)	0.24 ( 0.75)	0.05* ( 0.03)	0.60** ( 0.27)
RAIN ELECTION DAY	2.32*** ( 0.84)	2.14** ( 0.86)	-0.61 ( 2.71)	-0.55 ( 2.63)	2.89*** ( 1.01)	2.52** ( 1.04)
WORK AGE	0.14*** ( 0.05)	0.04 ( 0.10)	0.06 ( 0.17)	0.09 ( 0.32)	0.33*** ( 0.07)	0.14 ( 0.13)
HIGH SOCIO-ECONOMIC STATUS	0.22*** ( 0.06)	0.17** ( 0.08)	-0.04 ( 0.19)	-0.03 ( 0.25)	0.27*** ( 0.07)	0.17 ( 0.11)
WHITE	-0.05*** ( 0.01)	-0.05*** ( 0.02)	-0.08* ( 0.05)	-0.08 ( 0.06)	-0.02 ( 0.02)	-0.02 ( 0.02)
UNIVERSITY DEGREE	-0.20*** ( 0.04)	-0.20*** ( 0.05)	-0.02 ( 0.14)	-0.01 ( 0.17)	-0.30*** ( 0.05)	-0.31*** ( 0.07)
EMPLOYED	-0.16*** ( 0.04)	-0.17*** ( 0.05)	0.10 ( 0.12)	0.10 ( 0.15)	-0.23*** ( 0.05)	-0.26*** ( 0.06)
URBAN	-0.61 ( 0.40)	-1.06* ( 0.61)	1.10 ( 1.28)	1.24 ( 1.86)	-0.76 ( 0.52)	-1.62** ( 0.82)
POPULATION DENSITY	-0.22 ( 0.39)	-0.22 ( 0.35)	-3.47*** ( 0.87)	-3.47*** ( 0.81)	-1.21*** ( 0.42)	-1.21*** ( 0.36)
YEAR FIXED EFFECTS	YES	YES	YES	YES	YES	YES
LA FIXED EFFECTS	YES	YES	YES	YES	YES	YES
LA FIXED EFFECTS $\times$ TIME	YES	YES	YES	YES	YES	YES
F-TEST		59.34		59.34		60.18
R <sup>2</sup>	0.869	0.259	0.076	0.031	0.222	0.146
OBSERVATIONS	13997	13997	13997	13997	14149	14149

# Results (4): Parties

DEPENDENT VARIABLE: PARTY SHARE	OLS	IV 2ND	OLS	IV 2ND	OLS	IV 2ND	OLS	IV 2ND
	LABOUR		CONSERVATIVES		LIB DEMS		OTHERS	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INTERNET	-0.09*** ( 0.02)	0.20 ( 0.31)	0.00 ( 0.02)	-0.17 ( 0.17)	0.04* ( 0.03)	-0.14 ( 0.38)	-0.01 ( 0.04)	0.29 ( 0.30)
RAIN ELECTION DAY	1.46** ( 0.64)	1.28* ( 0.67)	-1.73** ( 0.72)	-1.62** ( 0.76)	0.03 ( 0.92)	0.36 ( 1.01)	-0.86 ( 0.94)	-1.24 ( 1.05)
WORK AGE	-0.10* ( 0.05)	-0.17** ( 0.08)	0.12** ( 0.05)	0.19** ( 0.09)	-0.09 ( 0.08)	-0.06 ( 0.11)	0.01 ( 0.06)	-0.08 ( 0.12)
HIGH SOCIO-ECONOMIC STATUS	-0.22*** ( 0.05)	-0.23*** ( 0.06)	0.19*** ( 0.06)	0.22*** ( 0.08)	-0.07 ( 0.05)	-0.05 ( 0.08)	-0.02 ( 0.06)	-0.04 ( 0.08)
WHITE	-0.22*** ( 0.01)	-0.22*** ( 0.02)	0.18*** ( 0.01)	0.18*** ( 0.01)	0.04 ( 0.03)	0.03 ( 0.03)	0.05*** ( 0.02)	0.05** ( 0.02)
UNIVERSITY DEGREE	-0.16*** ( 0.04)	-0.20*** ( 0.07)	0.04 ( 0.05)	0.04 ( 0.06)	0.24*** ( 0.04)	0.26*** ( 0.06)	0.02 ( 0.05)	-0.01 ( 0.06)
EMPLOYED	0.21*** ( 0.03)	0.18*** ( 0.06)	-0.13*** ( 0.04)	-0.12** ( 0.05)	0.03 ( 0.05)	0.05 ( 0.07)	0.02 ( 0.04)	0.00 ( 0.05)
URBAN	-1.92*** ( 0.58)	-2.24*** ( 0.62)	-1.09*** ( 0.36)	-0.79 ( 0.52)	1.56*** ( 0.51)	1.81** ( 0.73)	1.73*** ( 0.62)	1.18 ( 0.84)
POPULATION DENSITY	-0.16 ( 0.19)	-0.17 ( 0.21)	-0.09 ( 0.41)	-0.10 ( 0.40)	6.14** ( 3.08)	6.58** ( 3.24)	0.14 ( 2.57)	-0.81 ( 2.56)
NUMBER OF PARTIES	-12.34*** ( 1.02)	-12.30*** ( 1.10)	-5.88*** ( 0.88)	-5.94*** ( 0.99)	-12.30*** ( 2.48)	-11.18*** ( 2.42)	-17.71*** ( 2.75)	-18.02*** ( 2.66)
F-TEST		16.59		17.77		59.15		37.28
R <sup>2</sup>	0.723	0.570	0.580	0.482	0.748	0.620	0.588	0.422
OBSERVATIONS	11833	11833	11319	11319	13704	13704	9174	9174

## Participation and Policies

Several papers show that voters' information and political participation affects government policies:

- Snyder and Strömberg (2010) show that government expenditures are higher in U.S. districts in which congressmen receive greater press coverage.
- Lott and Kenny (1999) examine the growth of U.S. government spending as a result of giving women the right to vote;
- Lizzeri and Persico (2004) show that the extension of voting franchise was associated with increase in expenditure in local public goods in England.

→ What happens to Local Government spending and taxes?

# Empirical Analysis: Policies

- Basic framework is the following equation:

$$Y_{It} = \beta \text{INTERNET}_{It} + \gamma X_{It} + \delta_I + \eta_t + \varepsilon_{It},$$

- $\text{INTERNET}_{It}$  is the share of houses with broadband in LA  $I$  at year  $t$ ;
  - $X_{It}$  is a vector of control variables;
  - $\delta_I$  Local Authority fixed effects;  $\eta_t$  year fixed effects;
  - $Y_{It}$  is either (log of) per capita aggregate expenditures or per capita tax requirements.
- Aggregation to LAs implies additional challenges:
    - Fewer observations: from 14,141 ward-year observations to 570 LA-year observations;
    - It smooths out some of the cross-sectional variations.
  - Instruments can be challenged: exclusion restriction less valid.
- Only suggestive evidence.

## Results (5): Expenditures and Taxes

DEPENDENT VARIABLES:	LOG(EXPENDITURES)		LOG(TAXES)	
	(1)	(2)	(3)	(4)
	HOUS.&SOC. SERV. EDUC.			
INTERNET	-0.28** (0.12)	-0.30** (0.14)	-0.24 (0.15)	-0.32*** (0.12)
CONSERVATIVE MAJORITY	0.01 (0.01)	-0.00 (0.01)	0.01 (0.01)	0.01 (0.01)
LABOUR MAJORITY	0.00 (0.01)	-0.00 (0.02)	0.00 (0.01)	0.01 (0.01)
ELECTION YEAR	0.00 (0.00)	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.00)
YEAR FIXED EFFECTS	YES	YES	YES	YES
LA FIXED EFFECT	YES	YES	YES	YES
R <sup>2</sup>	0.404	0.121	0.421	0.266
OBSERVATIONS	565	565	565	565

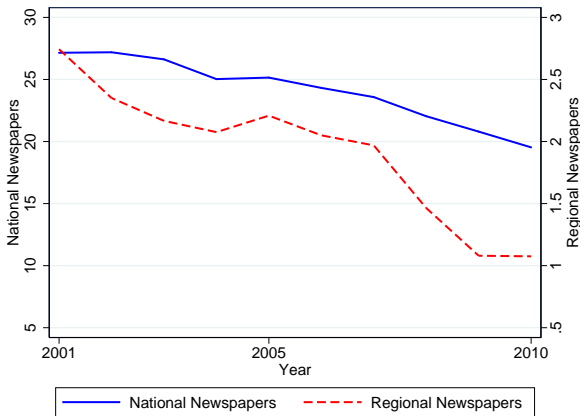
- Consistent with IV estimates.
- Consistent with bounds based on Altonji, Elder and Taber (2005) and on Oster (2013).

# Magnitudes of Effects on Expenditures and Taxes

- A one-percentage-point increase in INTERNET decreases Expenditures by 0.28 percent.
- Per capita Total Expenditures are approximately £1,200.
- A decrease of £3.4, which is approx 1.7 percent of one standard deviation of per capita Expenditures in our sample.
- A one-percentage-point increase in INTERNET decreases Taxes by 0.32 percent.
- Per capita Tax Requirements are approximately £350.
- A decrease of £1.1, which is approx 2 percent of one standard deviation of per capita Tax Requirements in our sample.

# Mechanism: Less (Local) News, More Leisure

- **Newspapers:** Few National and many Local Newspapers.
  - Dramatic Decline in Circulation.



# Mechanism: Less (Local) News, More Leisure

- **Newspapers:** Decline in Circulation as the Internet Diffuses in the Area

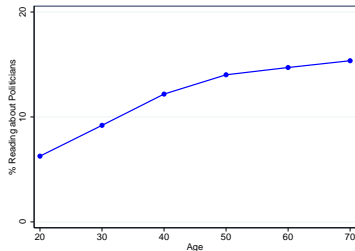
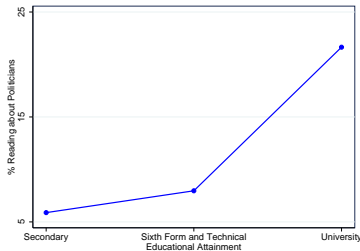
DEPENDENT VARIABLE: $\Delta \text{LOG}(\text{CIRC})$	ALL NEWSPAPERS		ALL NEWSPAPERS		WEEKLY NEWSPAPERS		DAILY NEWSPAPERS		ENGLAND NEWSPAPERS	
	OLS	IV 1ST	IV 2ND	IV 1ST	IV 2ND	IV 1ST	IV2ND	IV 1ST	IV2ND	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
INTERNET	-0.03 (0.12)		-2.35*** (0.53)		-2.48*** (0.55)		-1.70 (1.21)		-2.37*** (0.56)	
RAIN <sup>2</sup>		1.45 (1.74)		1.51 (1.77)		0.69 (2.22)		2.12 (1.79)		
MAX RAIN		-3.31*** (1.02)		-3.56*** (1.04)		-1.57 (1.15)		-3.77*** (1.09)		
TIME	0.01 (0.01)	0.08*** (0.00)	0.18*** (0.04)	0.08*** (0.00)	0.20*** (0.04)	0.07*** (0.00)	0.12 (0.08)	0.08*** (0.00)	0.19*** (0.04)	
TIME <sup>2</sup>	-0.00*** (0.00)	-0.00*** (0.00)	-0.01*** (0.00)	-0.00*** (0.00)	-0.01*** (0.00)	-0.00*** (0.00)	-0.01* (0.00)	-0.00*** (0.00)	-0.01*** (0.00)	
NEWSPAPER DUMMY	YES	YES	YES	YES	YES	YES	YES	YES	YES	
F-TEST		7.200		7.824		1.659		6.444		
R <sup>2</sup>	0.172	0.989	0.042	0.989	0.048	0.983	0.165	0.987	0.031	
OBSERVATIONS	10604	10604	10604	8878	8878	1726	1726	8902	8902	

## Other Media in the UK, 2001-2010 (2)

- **TV:** 5-national public-service channels plus several subscription-based channels
  - No role for Local stations.
  - Aggregate TV consumption and advertising is stable 2001-2010, but started to decline since 2010.
  - Decline in viewership of News; Increase in Sports, Reality TV and TV shows.
- **Radio:** few national stations and many local commercial stations
  - Main supplier of news is BBC radio national/local, experienced a decline of 10.8% of listeners between 2007-10 mainly due to young listeners.
  - Commercial radio revenue per listener decreased by almost 20%.

# Internet Use

- How do people use the internet? Oxford Internet Survey:
  - Communicate: 93%.
  - Download video, music, play games: 50-60%.
  - Access news: 28%.
  - Look for info about an MP, local councilor or politician: 11%.
- News/Leisure usage varies dramatically according to education, socio-economic status, and age:



# Conclusions

- Internet crowds out political engagement:
  - Turnout decreases.
- (Suggestive evidence) Policies seem to respond to change in electorate:
  - Lower expenditures and taxes.
- Heterogeneous Effects:
  - Less-educated use the internet mainly for entertainment, become less politically involved, vote less. Similar patterns for young.
  - Suggestive evidence of less-favorable policies for less-educated/low-income individuals.
- Results raise a few observations:
  - Potentially, unintended consequences of closing the “Digital Divide:” Increasing the “Political Divide” between groups.
  - Large decrease in turnout of local election: recent devolution of powers towards Local Governments raises question of accountability.