

Mapping online political talks through
network analysis
A case study of the website of Italy's Five
Star Movement

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IPP2014: Crowdsourcing for Politics and Policy
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Framework

Hypothesis

Five Star MoVement: A brief history

Forum statistics

Network analysis

Debate analysis

Conclusion

WHAT is going on and WHO is talking

- ▶ *Everyday political talk*
 - ▶ Habermas (1962/1989 and 1981/1984)
 - ▶ Mansbridge (1999)
 - ▶ J. Kim and E. J. Kim (2008)

WHAT is going on and WHO is talking

- ▶ *Everyday political talk*
 - ▶ Habermas (1962/1989 and 1981/1984)
 - ▶ Mansbridge (1999)
 - ▶ J. Kim and E. J. Kim (2008)
- ▶ *Networked self*
 - ▶ Rainie and Wellman (2012)

Hypothesis

- ▶ H1: There is a correlation between public events and online participation;
- ▶ H2: Online political participation decreases gender imbalances;
- ▶ H3: Users engage in discussions on limited topics;
- ▶ H4: Online political participation fragments in conversations among like-minded;
- ▶ H5: Forum activity shows a property of preferential attachment with a 'the-rich-get-richer' effect.

Five Star Movement: A brief history

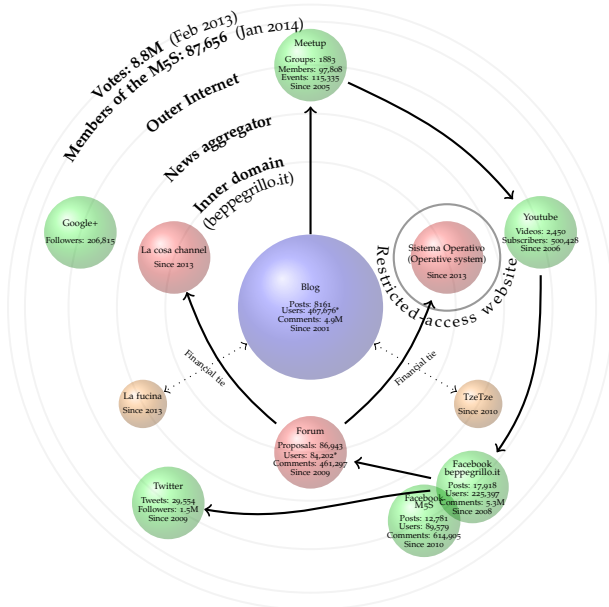
- ▶ January 2005: www.beppegrillo.it launched
- ▶ September 2007: First *Fuck Off Day* (Vaffanculo Day or V-Day)
- ▶ Mid-2009: Movement participation to first elections
- ▶ October 2009: Movement named 'Five Star Movement' (M5S)
- ▶ February 2013: M5S won 25.5 percent popular vote (1st party with 8,689,168 votes)

Five Star Movement: A brief history

Table: Provenance of the electorate of the M5S in 2013 Italian general election by party voted in 2008 (%) - (Source: Tronconi, 2013)

City	Far left	Idv	Pd	Udc	Pdl	Mpa	Lega	Far right	Did not vote	Others
Turin	6	20	37				2	10	25	
Milan	10	13	13	4			29	9	20	2
Bologna	5	12	48		4		8	12	10	1
Florence	5	2	58		5		2	5	22	1
Rome	7	9	11		26			10	35	2
Naples	8	9	44	3	26			2	7	1
Catania		6	18	11		34		2	27	2

An integrated media system



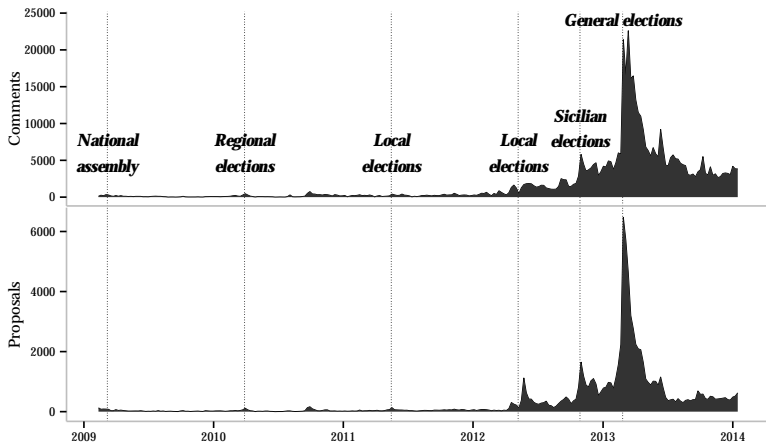
Forum statistics

Table: Users, proposals and comments published per week between 11 February 2009 and 31 January 2014

Users	Proposals	Comments
84,203	86,943	461,297

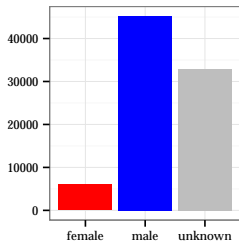
Forum statistics

Figure: Forum weekly activity [▶ Link](#)

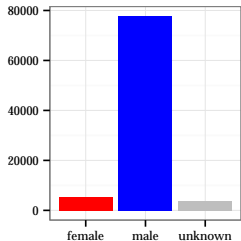


Forum statistics

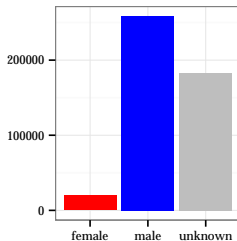
Figure: Gender distribution [▶ Link](#)



(a) Users ($N = 84,202$)



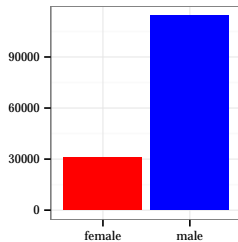
(b) Proposals ($N = 86,943$)



(c) Comments ($N = 461,297$)

Forum statistics

Figure: Elected local administrators in Italy ($N = 145,256$) (Source: Ministero Dell'Interno, 2013) [▶ Link](#)

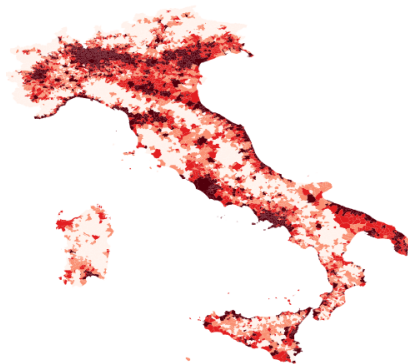


Forum statistics

Figure: User locations ($N = 364$)



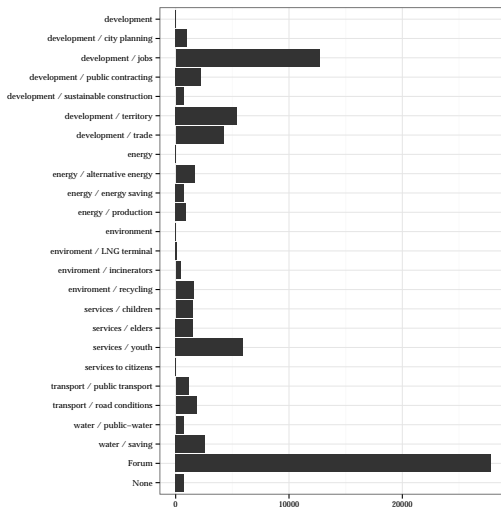
(a) M5S users



(b) Population density (Source: Istat, 2012)

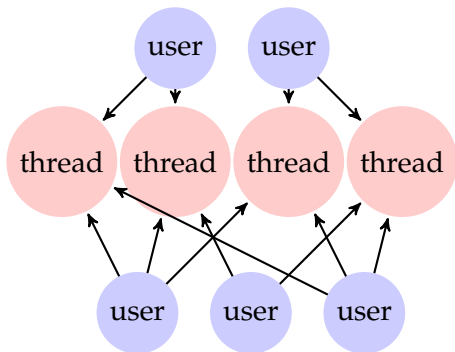
Forum statistics

Figure: Proposals by category [▶ Link](#)



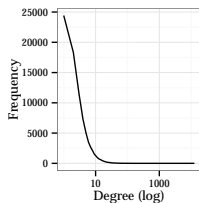
Network analysis

Figure: Bipartite directed network

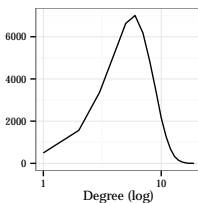


Network analysis

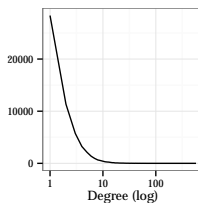
Figure: Indegree distribution



(a) Forum



(b) Random bipartite
Erdős-Rényi model

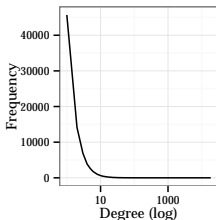


(c) Random
Barabási-Albert model

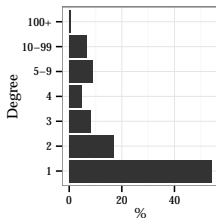
Mean	Median	Mode	Highest
6	3	1	12,606

Network analysis

Figure: Outdegree distribution



(a) Outdegree distribution



(b) Common outdegree

Mean	Median	Mode	Highest
7	1	1	18,519

Network analysis

Figure: Network components

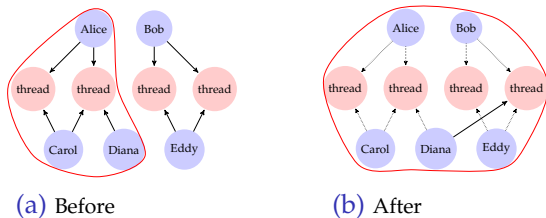
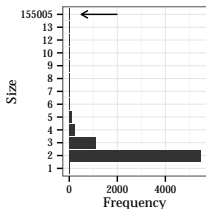
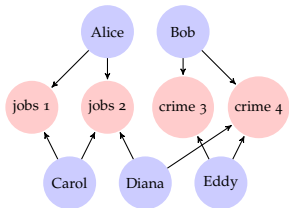


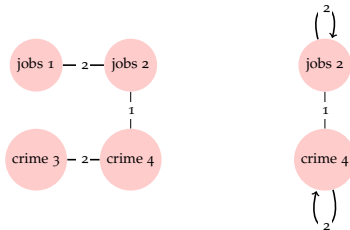
Figure: Distribution cluster size



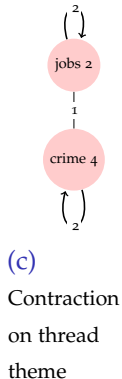
One-mode projection: threads by category



(a) Bipartite network



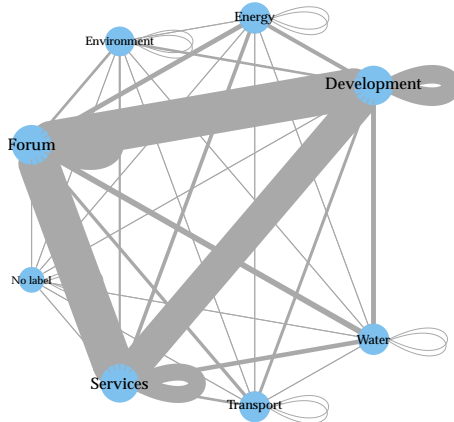
(b)
One-mode
projection



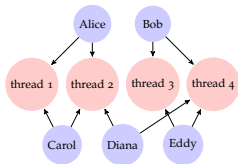
(c)
Contraction
on thread
theme

One-mode projection: threads by category

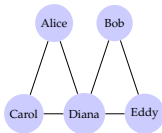
Figure: Relations between discussion themes [▶ Link](#)



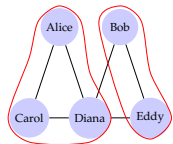
One-mode projection: users



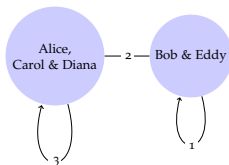
(a) Bipartite network



(b)
One-mode
projection



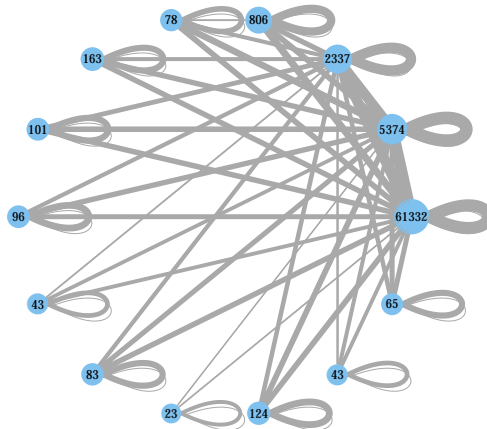
(c)
Community
detection



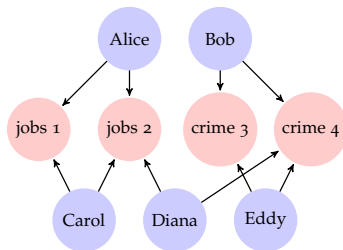
(d) Contraction on
communities

One-mode projection: users

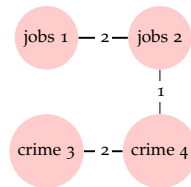
Figure: Relations between user communities



One-mode projection on threads



(a) Bipartite network



(b) One-mode projection

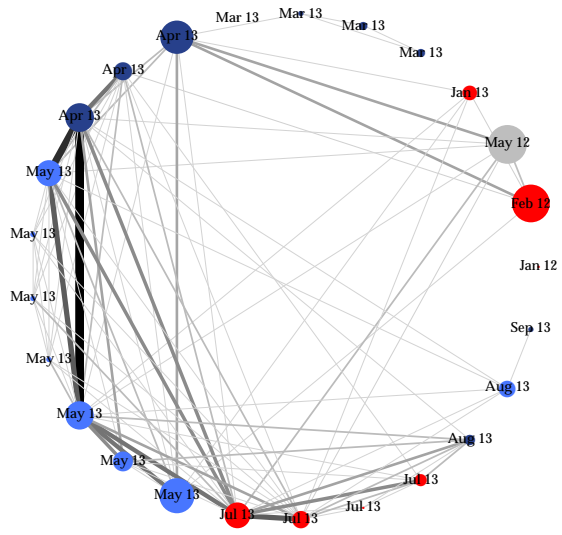
Gravity model

For each pair of discussion threads, given the *time* difference between the first two postings and the product of *size* of the two threads, how many users may be expected to take part in *both* discussions?

$$\text{Log}_e(\text{shared_users}) = \beta_0 + \beta_1 \times \text{mult_size} + \beta_2 \times \text{time_diff}$$

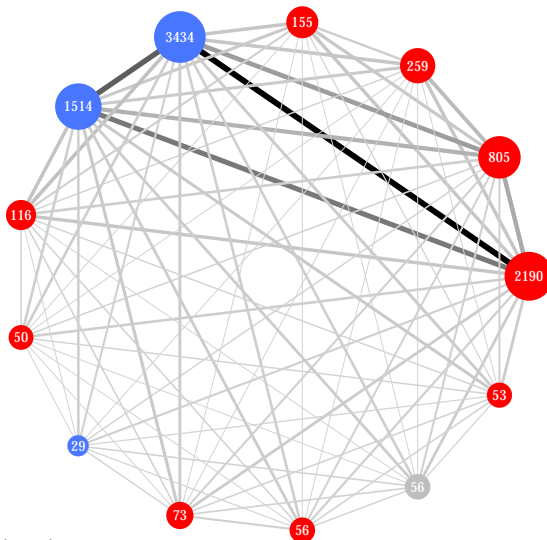
Immigration

Figure: Relations between discussion threads on immigration [▶ Link](#)








Coalition government

Figure: Relations between discussion threads on supporting a colation government [▶ Link](#)







Hypothesis	Supported by the data
H1: There is a correlation between public events and online participation	Yes
H2: Online political participation decreases gender imbalances	No
H3: Users engage in discussions on limited topics	No
H4: Online political participation fragments in conversations among like-minded	No
H5: Forum activity shows a property of preferential attachment with a 'the-rich-get-richer' effect	Yes

Bibliography I

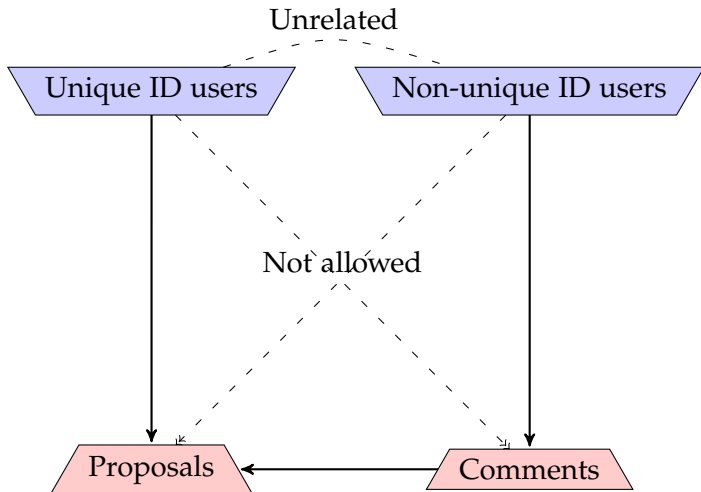
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-  Habermas, J. (1989). *The structural transformation of the public sphere: An inquiry into a category of bourgeois society.* (T. Burger & F. Lawrence, Trans.). Cambridge, MA: MIT Press. (Original work published 1962)
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-  Forum: Movimento 5 Stelle. (2013, August). Retrieved August 29, 2013, from <http://www.beppegrillo.it/listeciviche/forum/2013/08/proposta-di-legge-o-studio-commissione-parlamentare-per-introduzione-incentivi-per-utilizzo-batterie.html>
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-  Tronconi, F. (2013). Da dove arrivano i voti del Movimento 5 Stelle? *il Mulino*, (2), 356–363.

Forum architecture

Figure: Forum user structure.



Forum user interface

Figure: Forum's homepage ('Forum: Movimento 5 Stelle', 2009)



Forum
LISTE CIVICHE
per un Nuovo Rinascimento

Login | Non sei registrato? [Registrali](#)



Home | Forum | **Crea la tua lista** | Certifica la tua lista | Iscriviti | Contattaci

Sei in: [Liste_civiche](#) - Forum

Forum Home

Proponi le tue idee: diventeranno parte del programma delle liste civiche

+ [Scrivi una proposta](#)
Questa settimana | **Questo mese** | [In assoluto](#)

PROPOSTE PIÙ VOTATE

il nostro candidato sindaco - Cologno Monzese

di [Roberto Turriali](#) il 27 Apr. 2009 alle 10:10 AM ★ 3 Voti

L'amma ragnone e produttiva del nostro nord con quella sociabile e profondamente umana del nostro sud, hanno trovato in Cologno il luogo ideale di incontro e, con gli anni, di perfetta integrazione. Rocco Pandiccia è il rappresentante esemplare di questo...

[Invia un commento](#)

Obbligare "i centri commerciali" istallazione pannelli solar.

di [rebert bona](#) il 23 Apr. 2009 alle 5:22 PM ★ 2 Voti

I centri commerciali mattina pomeriggio e sera hanno illuminazione interna access ed i condizionatori a manetta, se fuori è inverno dentro il centro commerciale è estate e se fuori è estate dentro il centro commerciale è inverno. E giusto essendo...

4 commenti
ULTIMO COMMENTO
[Leggi il commento](#)

AIUTI AI POVERI

di [stefania martali](#) il 24 Apr. 2009 alle 11:05 AM ★ 2 Voti

Creare accoglienza per gli indigenti, non voglio i mendicanti per strada perchè non voglio più persone che non sappiano dove andare la notte, che siano costrette a girare tutto il giorno per la città senza meta e senza un alloggio....

2 commenti
ULTIMO COMMENTO
[Leggi il commento](#)

Categorie

<p>Acqua</p> <ul style="list-style-type: none"> • Acqua pubblica (37) • Risparmio (30) <p>Energie</p> <ul style="list-style-type: none"> • Energie alternative (68) • Produzione (29) • Risparmio energetico (28) <p>Sviluppo</p> <ul style="list-style-type: none"> • Appalti pubblici (44) • Commercio (46) • Edilizia sostenibile (22) • Lavoro (83) • Territorio (78) • Urbanistica (38) 	<p>Ambiente</p> <ul style="list-style-type: none"> • Inceneritori (21) • Raccolta differenziata (54) • Riassessorati (6) <p>Servizi ai cittadini</p> <ul style="list-style-type: none"> • Connettività (82) • Per gli anziani (21) • Per i bambini (40) • Per i giovani (49) <p>Trasporti</p> <ul style="list-style-type: none"> • Mezzi pubblici (54) • Viabilità (45)
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Le Liste Civiche a Cinque Stelle

- Adria Ro
- Ancona
- Bergamo
- Biella
- Bologna
- Bomporto
- Brindisi
- Campi
- Cattolica
- Cavriago
- Casena
- Cologno Monzese
- Fano
- Ferrara
- Firenze
- Folonica
- Frosinone
- Genova
- Guastalla
- Modena
- Montebelluna Veneto
- Montemurlo
- Novara
- Padova
- Paese
- Palazzolo sull'Oglio
- Parma

PROPOSTE RECENTI

L'urbanistica a Modena

postato da [Sandra Poppi](#) il 28/04/2009 ★

0 Voti

AGENZIA PER LA SICUREZZA

postato da [Francesco Mennoli](#) il 28/04/2009 ★

0 Voti

COMMENTI

<p style="text-align: center;">0</p> <p style="text-align: center;">Commenta</p>	<p style="text-align: center;">0</p> <p style="text-align: center;">Commenta</p>
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Forum user interface

Figure: The page of a Forum's proposal ('Forum: Movimento 5 Stelle', 2013)

The screenshot shows the forum page for 'Energie alternative' on the Movimento 5 Stelle website. The page features a navigation bar at the top with links like 'Home', 'Forum', and 'Liste a 5 Stelle'. A search bar and a 'Forum Privato' button are also present. The main content area displays a proposal by NICOLA MOTTA, dated 01/08/2013, with 9 votes and 9 comments. The proposal text discusses incentives for domestic photovoltaic systems and the use of batteries. To the right, there are sections for 'Categorie' (Acqua, Ambiente, Energia, Sviluppo, Servizi ai cittadini, Trasporti) and 'Le Liste Civiche a Cinque Stelle' (listing various municipalities). A 'feedback' button is visible on the left side of the page.

Home Forum Liste a 5 Stelle Eventi a 5 Stelle Programma Non-Statuto Crea la tua lista Contattaci Login Iscriviti al Movimento 5 Stelle

Movimento 5 Stelle BETA Non riceve alcun finanziamento pubblico

Cerca nel sito Forum Privato

Energie alternative

Proponi le tue idee: diventeranno parte del programma delle Liste civiche [Scrivi una proposta](#)

PROPOSTA DI LEGGE O STUDIO COMMISSIONE PARLAMENTARE PER INTRODUZIONE INCENTIVI PER UTILIZZO BATTERIE DA IMPIANTO FOTOVOLTAICO

postata da **NICOLA MOTTA** il 01/08/2013 [9](#) [★](#) 9 Voti (Registrati e clicca per votare)

[Like](#) [3](#)

PER CHI POSSIEDE UN IMPIANTO FOTOVOLTAICO DOMESTICO E' DOBBLIO INDIRIZZARE L'ENERGIA PRODOTTA E NON CONSUMATA ALLA RETE (ENEL). FINO A FOCO FA V EBRANO INCENTIVI PER L'ENERGIA PRODOTTA GARANTITI DALLO STATO PER 20 ANNI. OGGI INVECE SI PUO' USURPIRE DI DETRAZIONI PERIODICHE IN DICHIARAZIONI DI REDDITI IN PERCENTUALE DEL COSTO SOSTENUTO PER L'IMPIANTO. OGGI CI SONO IN COMMERCIO ANCHE BATTERIE DA VARI KILOWATT CHE COLLEGATE ALL'IMPIANTO FOTOVOLTAICO POSSO CONSERVARE L'ENERGIA PRODOTTA DALL'IMPIANTO E NON UTILIZZATA AL MOMENTO CONSENTENDO COSI UN DISTACCO COMPLETO DALLA RETE ENEL. IN SOSTANZA IL PRINCIPIO E' LO STESSO... L'ENEL OGGI FUNGE DA GRANDE BATTERIA CHE RICEVE CORRENTE NON INCENTIVATA E LA RESTITUISCE VENDENDOLA IN BOLLETTA SOTTO LA VOCE SERVIZI DI VENDITA (ENERGIA CONSUMATA) PERO' AGGIUNGE INGIUSTAMENTE UNA QUOTA PARI QUASI AL 100% DELLA PRECEDENTE SOTTO LA VOCE SERVIZI DI RETE (UTILIZZO DELLA RETE ENEL) UNA BOLLETTA COL CONSUMO DI 30 EURO DI CORRENTE ARRIVA CON L'APPLICAZIONE DEI COSTI DI RETE DI INA ECC A QUASI 100 EURO. IN GERMANIA SONO MOLTO PIU' AVANTI IN QUANTO LA CORRENTE PRODOTTA E CONSERVATA NELLE BATTERIE COLLEGATE ALL'IMPIANTO E RESTITUITA ALLA RETE DOMESTICA IN BASE AL BISOGNO E' INCENTIVATA DALLO STATO. SI RAAGGIUNGONO COSI 2 IMPORTANTI RISULTATI, SIA IL DISTACCO DALLA RETE NAZIONALE E A I RELATIVI COSTI DI RETE, SIA LA PRODUZIONE INCENTIVATA DI ENERGIA ALTERNATIVA. CHIEDIAMO ALLA COMMISSIONE ENERGIA DEI 5 STELLE DI APPROFONDIRE TALE DISCUSSIONE IN TERMINI TECNICI E PROPORRE INCENTIVI NAZIONALI PER L'UTILIZZO DELLE BATTERIE

Categorie

Acqua	Ambiente
<ul style="list-style-type: none"> Acqua pubblica (875) Risparmio (2715) 	<ul style="list-style-type: none"> Incentivatori (471) Raccolta differenziata (1852) Rigassificatori (118)
Energia	Servizi ai cittadini
<ul style="list-style-type: none"> Energie alternative (1904) Produzione (1005) Risparmio energetico (942) 	<ul style="list-style-type: none"> Connettività (12218) Per gli anziani (1754) Per i bambini (1812) Per i giovani (7039)
Sviluppo	Trasporti
<ul style="list-style-type: none"> Appalti pubblici (2832) Commercio (5326) Economia sostenibile (837) Lavoro (16164) Territorio (8383) Urbanistica (1175) 	<ul style="list-style-type: none"> Mezzi pubblici (1365) Viabilità (2346)

Le Liste Civiche a Cinque Stelle

- Abano Terme
- Acule
- Acuma
- Acì Sant'Antonio
- Acquaviva delle Fonti
- Acqui Terme
- Adria
- Affari Costituzionali ed Interno
- Affari sociali e Sanità
- Afragola
- Agroscultura
- Arosio
- Alba Adriatica
- Albano Laziale
- Alghero
- Alessandria
- Alezio

Commenta

9 commenti [★](#) 2

[Lascia un messaggio...](#)

francesco.bailo@sydney.edu.au

Mini- - Commenti - Il mio Discussione Condividi

Data collection

- ▶ Google Custom Search Engine
- ▶ Disqus API
- ▶ Data retrieval

Data cleansing

Table: Forum raw data gathered until 19 February 2014 and published between 11 February 2009 and 31 January 2014

Proposals	Comments	Unique users	Non-unique users
108,269	510,909	30,921	121,603

Table: Suspect spam

Spam users	Spam comments
6618	41,353

Data integration

Figure: User unification

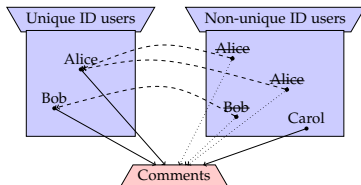


Figure: User unification

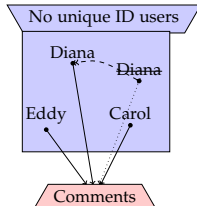


Table: Regression summary

	Dependent variable:	
	e_weight	
	Naive SE (1)	Robust SE (2)
mult_size	0.000003*** (0.00000005) t = 70.960000 p = 0.000000	0.000003*** (0.000001) t = 5.862000 p = 0.000000
time_diff	-0.000000*** (0.000000) t = -13.590000 p = 0.000000	-0.000000*** (0.000000) t = -56.880000 p = 0.000000
Constant	0.073010*** (0.001196) t = 61.040000 p = 0.000000	0.073010*** (0.000382) t = 191.300000 p = 0.000000
Observations	980,929	980,929
Log Likelihood	-1,028,512.000000	-1,028,512.000000
Akaike Inf. Crit.	2,057,030.000000	2,057,030.000000
Residual Deviance (df = 980926)	57,501.000000	57,501.000000
Null Deviance (df = 980928)	59,396.000000	59,396.000000

Note:

*p<0.1; **p<0.05; ***p<0.01