

The political economy of climate policy

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Introduction

“The United Nations’ Intergovernmental Panel on Climate Change is a political mechanism, not an unbiased scientific institution. Its unreliability is reflected in its intolerance toward scientists and others who dissent from its orthodoxy. We will evaluate its recommendations accordingly.”

Official platform of the US Republican Party, 2016

**Donald J. Trump** ✓

@realDonaldTrump

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The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive.

Retweets

105,452

Likes

67,751

11:15 am - 6 Nov 2012



12K



105K



68K

“Sahara has become a desert, it isn’t because of industry. You need to be as arrogant as men are to believe we changed the climate.”

Nicolas Sarkozy, during his (failed) presidential comeback, 2016

- ▶ Large scientific consensus about climate change, but widespread disagreement in public debates
- ▶ Some political parties seem to take active role in conveying their (non) belief in climate science
- ▶ More than political beliefs, political affiliation explains public opinion on climate change (Hornsey et al., 2016)

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“The largest demographic correlate of climate change belief is political affiliation. People who intend to vote for more liberal political parties are more likely to believe in climate change than those who align themselves with relatively conservative political parties. (...) The link between climate change beliefs and political ideology (...) is also significant, but less strong.”

This paper:

- ▶ **Research question:** understand the emergence of climate policy in a country where voters are à priori poorly informed about the issue of climate change

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- ▶ Two parties; hire experts and receive signal about true state of the world
- ▶ Then announce policy platforms and compete for office
- ▶ Voters may infer experts' signals that parties have received by observing policy platforms

Literature

- ▶ Heidhues and Lagerlöf (2003): two states, two signals, and binary policy space, only election motives. “Pandering Equilibrium”, parties recommend the most likely option regarding of the information they have
- ▶ Kartik, Squintani, Tinn (2015): continuum of states, signals, and continuous policy space, only election motives. “Anti-Pandering Equilibrium”, parties over-ract to their signals

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- ▶ See also, Loertscher (2015), Schultz (1996), Leslier and Van der Straeten (2004), Felgenhauer (2012), Shapiro (2016)

Model

- ▶ Two states of the world W : G ('good') and B ('bad')
- ▶ In bad state, approaching catastrophe, reduced by exerting effort $x \in [0, 1]$ at cost $\frac{x^2}{2}$

$$v(W, x) = \begin{cases} -\frac{x^2}{2} & \text{if } W = G \\ -\frac{x^2}{2} - (1 - x)D & \text{if } W = B \end{cases} \quad (1)$$

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- ▶ Two parties, $i \in \{1, 2\}$ with objective to maximize voters utility, plus an election motive $f_i > 0$, $i \in \{1, 2\}$

Information structure

- ▶ Parties receive independent private binary signals $s_i \in \{g, b\}$; with $s_i = g$ ($s_i = b$) indicating a higher probability that $W = G$ ($W=B$)
- ▶ Prior belief that $W = G$ is $1/2$
- ▶ Each party receives correct signal, conditional on true state, with probability $p \in (1/2, 1)$: $Pr[s_i = g | W = G] = p$
- ▶ After receiving signals, parties announce policy platforms $x_i \in [0, 1]$
- ▶ Election: winner implements announced platform

- ▶ Voters update their belief according to Bayes' rule after observing policy platforms
- ▶ $\hat{s}_i(x_i) \in \{g, b, n\}$: signal of party i as *inferred* by voters after observing x_i $\hat{s}_i(x_i) = n$: s_i cannot be inferred
- ▶ $\mu(\hat{s}_1(x_1), \hat{s}_2(x_2))$: voters' belief (probability) that $W = G$ after observing (x_1, x_2)

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- ▶ Conditional on their belief $\mu = \mu(x_1, x_2)$, voters' *most preferred policy* (in $\mathbb{X} = [0, 1]$) is:

$$\hat{x} = (1 - \mu)D.$$

- ▶ Voters prefer policy $x_1 < x_2$ if

$$u(\mu, x_1) > u(\mu, x_2) \Leftrightarrow |\hat{x} - x_1| < |x_2 - \hat{x}|$$

Social Optimum

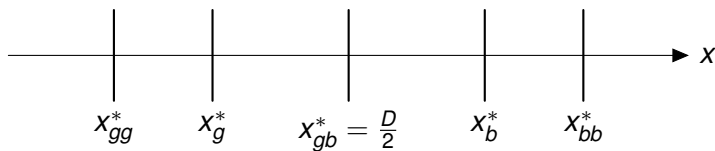


Figure: Social optimum, for $D = 1$, $p = .7$.

Parties' optimization behavior

- ▶ Party i chooses x_i to maximize its expected utility, given its signal s_i and strategy of the other party: $x_{-i}(s_{-i})$
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Refinement:

- ▶ Let $S_1^*(x'_1)$ be the signal realizations of party 1 after which a deviation to out-of-equilibrium platform x'_1 is profitable for *some* beliefs of voters $\hat{s}_1(x'_1) \in \{g, b, n\}$
- ▶ Definition: A PBE has “plausible beliefs” if for all out-of-equilibrium actions x'_1 , it holds that:
 - ▶ if $S_1^*(x'_1) = \{g\}$ then $\hat{s}_1(x'_1) = g$,
 - ▶ if $S_1^*(x'_1) = \{b\}$ then $\hat{s}_1(x'_1) = b$,
 - ▶ if $S_1^*(x'_1) \in \{\{g, b\}, \emptyset\}$ then $\hat{s}_1(x'_1) = n$.

Results

- ▶ Distinguish between symmetric and asymmetric outcomes
- ▶ “Symmetric truthful revealing equilibria”: two choices, x_g and x_b , such that $x_i(g) = x_g$ and $x_i(b) = x_b$ for both parties
- ▶ Asymmetric outcomes: four different policies can be implemented (instead of just two) – potentially welfare superior

Symmetric outcomes

Proposition

There exists a unique symmetric truthful revealing equilibrium with plausible beliefs, if f_i is in an intermediate range $\forall i \in \{1, 2\}$. In this equilibrium, parties adopt the anti-pandering 'strategies' x_{gg}^ and x_{bb}^**

Symmetric outcomes

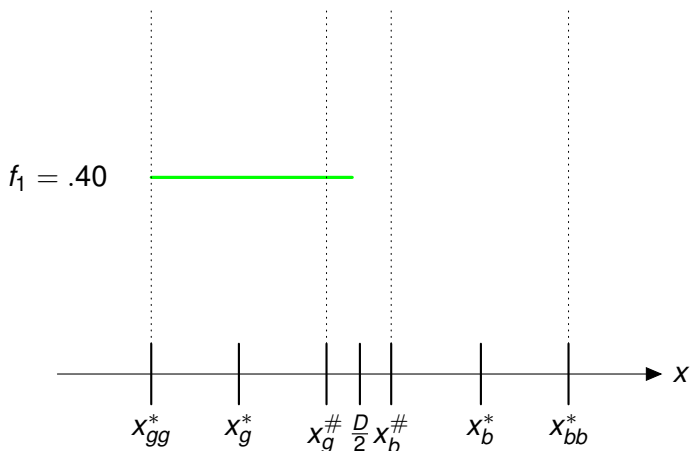


Figure: Profitable deviations from the equilibrium strategies $\{x_{gg}^*, x_{bb}^*\}$ for *some* beliefs; thick green line: after observing $s_1 = g$; thin red line: $s_1 = b$, for $D = 1$, $p = .7$

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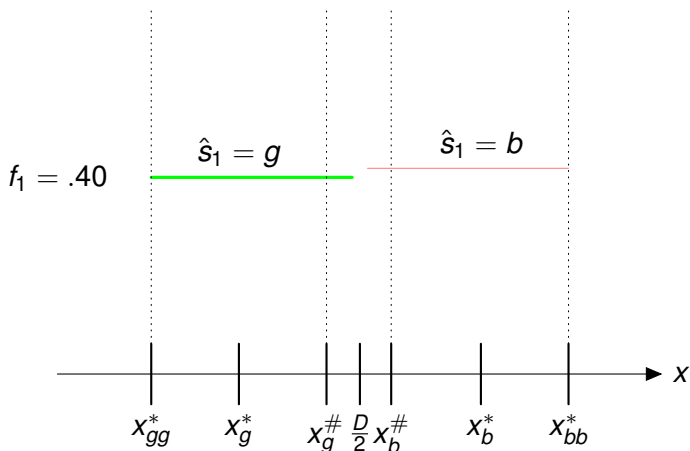


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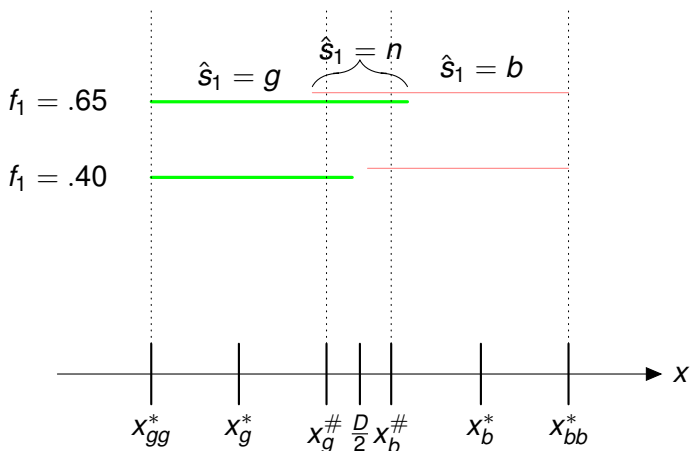


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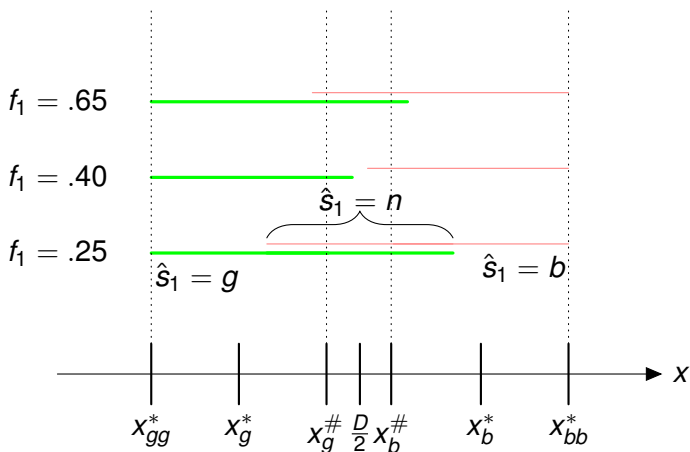


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Asymmetric outcomes

Proposition

There exists an asymmetric truthful revealing equilibrium with plausible beliefs where party 1 plays the strategy $x_1(g) = x_{gg}^$ and $x_1(b) = x_{bb}^*$, while party 2 plays $x_2(g) = D/2 - \alpha$ and $x_2(b) = D/2 + \alpha$, if f_2 is not too large*

- ▶ If f_2 sufficiently small then $\alpha = \epsilon$ (infinitesimally small)
- ▶ For intermediate values of f_2 , α strictly positive

Asymmetric outcomes

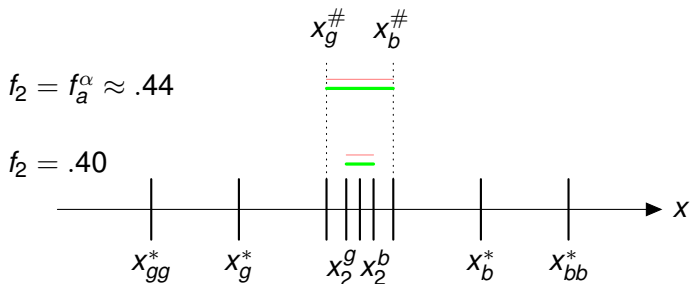


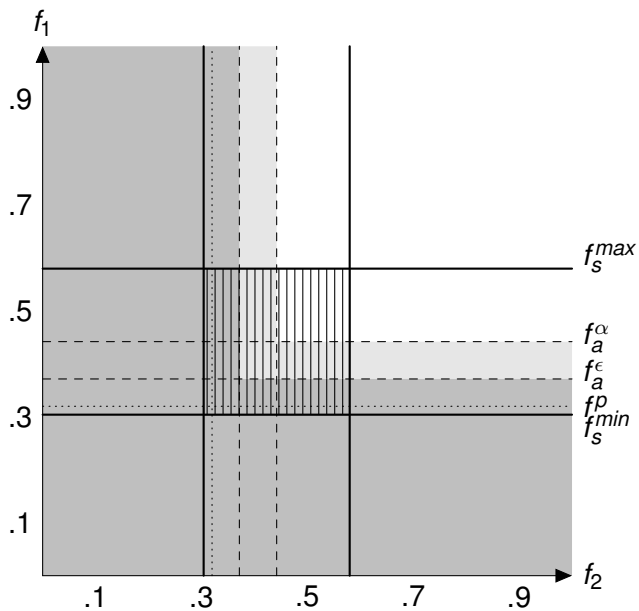
Figure: Profitable deviations from the asymmetric equilibrium strategies for the moderate party 2 for *some* beliefs; thick green line: after observing $s_1 = g$; thin red line: $s_1 = b$, for $D = 1$, $p = .7$, with $x_2^g = D/2 - \alpha$ and $x_2^b = D/2 + \alpha$.

Non informative equilibrium

Proposition

There exists a symmetric pandering equilibrium with plausible beliefs where both parties play the strategy $x = D/2$ regardless of the signal they receive if for both parties office motivation is sufficiently high

- ▶ Intuition: if both parties have strong office motivation, voters cannot infer anything from a deviation
- ▶ Hence, they prefer the neutral (“pandering”) policy $D/2$



Conclusion

- ▶ Electoral competition as a driver of public disagreement about climate change
- ▶ It can be enough to have one policy motivated party for an “almost efficient” policy
- ▶ The policy motivated party is “moderate”, while the office motivated party offers extreme platforms

Conclusion

- ▶ Electoral competition as a driver of public disagreement about climate change
- ▶ It can be enough to have one policy motivated party for an “almost efficient” policy
- ▶ The policy motivated party is “moderate”, while the office motivated party offers extreme platforms
- ▶ Our results are driven by the binary nature of the question (IPCC as a “natural monopoly”) while policy space is continuous
- ▶ Our equilibria survive different refinements, the parameter space for which they exist may however change