

Taxes and Turnout

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INTRODUCTION

- Political competition w/ **endogenous policies** and **endogenous abstention**
 - two parties propose platform to max their probability of winning election
 - voters endogenously choose whom to support and whether to turn out
 - **trade-off**: widening base of supporters vs. raising their incentives to vote
 - **goal**: characterize best responses and equilibrium policies in this setting
- Application: **income tax schedule** policies: Mirrlees '71, Meltzer Richard '81
 - **stylized facts**: political preferences and turnout vary by income
 - \exists elaborate normative theory of redistributive taxation (Mirrlees), but no broadly accepted conceptual framework for **positive political econ analysis**

- **Endogenous policies:** probabilistic voting model of party competition
Coughlin Nitzan '81, Lindbeck Weibull '87
 - voters trade off utility from both platforms vs. idiosync. party preferences
 - literature: treats turnout as exogenous \rightsquigarrow paradox of voting
- **Endogenous abstention:** ethical voter model \rightsquigarrow civic duty to vote
Harsanyi '80, Feddersen Sandroni '06, Coate Conlin '04
 - “Kantian” agents: evaluate alternative rules by comparing outcomes if everyone who shares their preferences were to act according to same rule
 - vote if aggregate benefits of victory \geq voting costs for party's supporters
 - comp. stat. consistent w/ stylized facts: close race, polarized preferences
 - literature: exogenously given political alternatives in the election
- Our paper: both platform choices and turnout are equilibrium outcomes

MAIN RESULTS

- **Tractable model:** trade-off b/w maxing size of base vs. voter turnout
 - equiv: mobilizing own supporters vs. de-mobilizing opponent's supporters
- **Positive theory of redistributive taxation** \rightsquigarrow “ABC” formula: Diamond '98
 - derive political weights (rather than welfare weights) at each income
Saez Stantcheva '16
 - exogenous turnout: weights \propto fraction of **marginal (swing) voters**
 - endogenous turnout: fractions of own & rival **infra-mg (core) voters**
 - **key:** priority to rival core voters \uparrow in ex-ante **probability of winning**
- **Empirical case study:** *asymmetric demobilization* in Germany '09–17

Outline

- 1 Model of Political Competition
- 2 Characterization of Equilibrium
- 3 Application to Income Taxation
- 4 Case Study: Germany in the Era of Merkel

VOTING BEHAVIOR

- Competition between two political parties $j \in \{1, 2\}$
 - party j proposes policy $p^j \rightsquigarrow$ e.g., public good, tax schedule, etc
- Continuum of voters indexed by exogenous type (e.g., wage) $\omega \in \Omega$
 - $\varepsilon \in \mathbb{R}$: idiosyncratic preference for party 2 with distribution $B(\cdot \mid \omega)$
 - e.g., cultural values (gun control, abortion rights, gay marriage, etc.)
- Discrete choice: agent (ω, ε) supports party 1 iff $u(p^1, \omega) \geq u(p^2, \omega) + \varepsilon$
 - prob. that agent w/ wage ω supports party 1: $B(u(p^1, \omega) - u(p^2, \omega) \mid \omega)$

ETHICAL SUPPORTERS

- Mass of type- ω supporters of party j is split into two groups
 - fractions $\tilde{q}^j(\omega)$ of ethical supporters and $1 - \tilde{q}^j(\omega)$ of abstainers
 - random variables with mean $\bar{q}(\omega) \rightsquigarrow$ outcome of election is uncertain
- Ethical supporters choose the probability that they will turn out to vote
 - individual probability of voting $\sigma^j \rightsquigarrow$ per capita cost of voting = $\kappa \sigma^j$
 - in paper: more general model allows voting costs to be nonlinear in σ^j

- First key variable: base of party j = expected mass of ethical supporters
 - zero-sum game: bases of parties 1 and 2 add up to a constant

$$\Gamma^1(p^1, p^2) = \int_{\Omega} \bar{q}(\omega) B(u(p^1, \omega) - u(p^2, \omega) \mid \omega) \, dF(\omega)$$

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- Second key variable: measure of **what supporters of party j have at stake**
 - aggregate welfare gain of ethical supporters of party j resulting from victory by party j rather than by party $-j$

$$W^1(p^1, p^2) = \int_{\Omega} \bar{q}(\omega) \left[\int_{\mathbb{R}} \max \{ u(p^1, \omega) - [u(p^2, \omega) + \varepsilon] ; 0 \} \, dB(\varepsilon \mid \omega) \right] \, dF(\omega)$$

ENDOGENOUS TURNOUT

- Ethical supporters of each party j choose probability of voting $\sigma^j(p^1, p^2)$
 - goal: maximize expected welfare of party j supporters net of voting costs
- Calculus of voting: choose $\sigma^j \in [0, 1]$ to maximize

$$\pi^j(p^1, p^2, \sigma^1, \sigma^2) \times W^j(p^1, p^2) - \kappa \sigma^j \times \Gamma^j(p^1, p^2)$$

- probability that party j wins \times net utility gain for party j supporters
 - minus aggregate expected voting costs of party j ethical supporters
-
- Eqm turnout given (p^1, p^2) : pair of mutually best responses $(\sigma^{1*}, \sigma^{2*})$

ENDOGENOUS POLICIES

- Parties seek to maximize their probability of winning the election
 - given policy p^{-j} proposed by party $-j$, the best response of party j is:

$$p^{j*} = \arg \max \pi^j(p^1, p^2, \sigma^{1*}(p^1, p^2), \sigma^{2*}(p^1, p^2))$$

- Subgame perfect equilibrium: parties choose policies taking into account
 - ... that alternative choices affect equilibrium of the participation subgame
- Existence of pure strategy eqm \rightsquigarrow strategic interdependence of policies
 - direct proof / sufficient conditions later when we specify the policy space
 - more generally, we are interested in best response to fixed opponent policy

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- Lemma 1: Equilibrium **relative turnout** σ_1^*/σ_2^* given policies p^1, p^2 is:

$$\frac{\sigma^{1*}(p^1, p^2)}{\sigma^{2*}(p^1, p^2)} = \frac{W^1(p^1, p^2) / \Gamma^1(p^1, p^2)}{W^2(p^1, p^2) / \Gamma^2(p^1, p^2)}$$

- ratio of net welfare gains per capita W^j/Γ^j from a victory by party j

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- Assumption A1: \exists random variables $\eta^1, \eta^2 \geq 0$ with mean 1 s.t.:

$$\tilde{q}^j(\omega) = \eta^j \cdot \bar{q}(\omega), \text{ for all } \omega \in \Omega$$

- shock to participation of party j -supporters across the income distribution
- e.g., characteristic of candidate j : likeability, effort to reach supporters

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- ratio of net welfare gains per capita W^j/Γ^j from a victory by party j
- Lemma 2: Suppose A1 holds. Objective of party 1 given policy p^2 is:

$$p^{1*} = \arg \max \frac{\Gamma^1(p^1, p^2)}{\Gamma^2(p^1, p^2)} \times \frac{\sigma^{1*}(p^1, p^2)}{\sigma^{2*}(p^1, p^2)}$$

- tradeoff between maximizing base vs. turnout advantage [**saddle point**]

EQUILIBRIUM CHARACTERIZATION

- **Proposition 1**: Suppose A1 holds. Objective of party 1 (resp., 2) is:
 - *with exogenous turnout*: maximize (resp., minimize) $\Gamma^1(p^1, p^2)$
 - *with endogenous turnout*: maximize (resp., minimize) $\frac{W^1(p^1, p^2)}{W^2(p^1, p^2)}$
 - intuition: base \uparrow implies voting cost \uparrow and turnout \downarrow one-for-one
- Party 1's tradeoff: mobilizing own supporters vs demobilizing opposition
 - encourage own supporters to turn out by \uparrow what they have at stake, W^1 : policy p^1 makes own supporters as well off as possible compared to p^2
 - discourage opponents from voting by \downarrow what they have at stake, W^2 : policy p^1 should not hurt party 2's supporters too much compared to p^2

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POLICY DOMAIN

- Policy domain: tax schedules $T : \mathbb{R}_+ \rightarrow \mathbb{R}$ satisfying budget balance
 - utility under tax policy T^j is $u(T^j, \omega) \equiv U(y^j(\omega) - T^j(y^j(\omega)), \frac{y^j(\omega)}{\omega})$
 - where income $y^j(\omega)$ endogenous to the tax schedule T^j (standard FOC)
 - for simplicity: no income effects (GHH), constant labor supply elasticity e
- Lemma 3: Existence, uniqueness and symmetry of SP equilibrium
 - case 1: affine tax schedules = cst tax rates $\tau \in \mathbb{R}$ w/ lump-sum rebate
 - case 2: non-linear tax schedules \rightsquigarrow infinite-dimensional policy space
 - case 1: direct proof; case 2: sufficient conditions on primitives

SOCIAL WELFARE MAXIMIZING POLICY

- Benevolent planner w/ Pareto weights $\gamma(\omega)$ (e.g., constant: utilitarian)

$$\max_T \int_{\Omega} \gamma(\omega) u(T, \omega) dF(\omega) \quad \text{s.t.} \quad \int_{\Omega} T(y(\omega)) dF(\omega) \geq 0$$

- Lemma 4: optimal taxes \rightsquigarrow mg. social welfare weights $\gamma(\omega) u'_c(\omega)$
- heuristically: $\frac{\partial SW}{\partial c(\omega)} = \uparrow$ in SW from marginal \uparrow in consumption of type ω

$$\frac{T^{*'}(y(\omega))}{1 - T^{*'}(y(\omega))} = \left(1 + \frac{1}{e}\right) \frac{1 - F(\omega)}{\omega f(\omega)} \left(1 - \mathbb{E} \left[\frac{\gamma(\omega) u'_c(\omega)}{\text{MVPF}} \mid x \geq \omega \right] \right)$$

- Tax schedule arising in sym. eqm of political competition game
- result: SPE = same formula for some objective $\int \zeta(\omega) u(T, \omega) dF$

EQUILIBRIUM POLITICAL WEIGHTS

- Proposition 2.a: [exogenous turnout] party 1 maximizes $\Gamma^1(T^1, T^2)$

$$\zeta(\omega) = \bar{q}(\omega) b(0 | \omega)$$

- key: benefits targeted at marginal (swing) voters

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- Proposition 2.b: [endogenous turnout] party 1 maximizes $\frac{W^1(T^1, T^2)}{W^2(T^1, T^2)}$

$$\zeta(\omega) = \bar{q}(\omega) [B(0 | \omega) + \psi_*^1 (1 - B(0 | \omega))]$$

- key: benefits targeted at own or rival inframarginal (core) voters
- key: $\psi_*^1 \equiv \frac{W^1}{W^2}$ (closed-form) increasing in party 1's probability of winning

INTERPRETATION

- $W^1(T^1, T^*)$ objective: maximize what party 1's supporters have at stake
 - $B(0 \mid \omega) = \frac{\partial W^1}{\partial c^1(\omega)} = \text{increase in supporters' stake by } \uparrow \text{ consumption of } \omega$

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- $W^2(T^1, T^*)$ objective: minimize what party 2's supporters have at stake
 - $1 - B(0 \mid \omega) = \frac{\partial W^2}{\partial c^1(\omega)} = \text{decrease in rivals' stake by } \uparrow \text{ consumption of } \omega$

INTERPRETATION

- $W^1(T^1, T^*)$ objective: maximize what party 1's supporters have at stake
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 - $1 - B(0 \mid \omega) = \frac{\partial W^2}{\partial c^1(\omega)} = \text{decrease in rivals' stake by } \uparrow \text{ consumption of } \omega$
- $\frac{W^1(T^1, T^*)}{W^2(T^1, T^*)}$ objective: mobilization vs. demobilization trade-off
 - weights $\frac{\partial W^1}{\partial c^1(\omega)} - \frac{W^1}{W^2} \frac{\partial W^2}{\partial c^1(\omega)}$, with $\frac{W^1}{W^2} \equiv \psi_*^1$ increasing in prob. of winning

TESTABLE IMPLICATIONS AND DISCUSSION

- Example: left-leaning front-runner proposes moderate top tax rates
 - front-runner puts relatively high weight on minimizing opponent's stakes
 - runner-up puts relatively high weight on maximizing its supporters' stakes
 - eqm is symmetric: both parties put high weight on the same objective
- Policies driven by fractions of swing or core voters: large empirical lit.
 - **evidence**: toward whom are campaign promises targeted? unresolved.
 - **swing voters**: Dahlberg Johansson '02, Stokes '05, **core voters**: Levitt Snyder '95, Calvo Murillo '04, **opponent's core voters**: Erikson Romero '90, Adams Merrill '03
 - our analysis: ex-ante winning odds determine which group is favored

- Our paper proposes a **positive theory of taxation**: Meltzer Richard '81
 - Mirrlees '71 is normative \rightsquigarrow there are many “reasonable” SW functions
 - identify SWF empirically by inverting ABC formula: Lockwood Weinzierl '16
- Question: how does society come to agree on a given SWF?
 - Arrow '50: impossible to aggregate indiv. tax policy preferences into SWF
 - Samuelson '67: reinterpret any process that selects a tax schedule as if it was the choice of an agent with preferences over the set of Pareto-optima
 - GMSWW: taxes also driven by non-welfarist judgments: Saez Stantcheva '16
- Our analysis: microfoundation of GMSWW from political econ. forces
 - **political failures**: weights $\zeta(\omega)$ may be non-monotonic with income

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- '05 election: Merkel (CDU, right) ran on fiscally conservative platform
 - nearly lost despite initially favorable odds [consistent with our model]
- '09, '13, '17 elections: “asymmetric demobilization” strategy \rightsquigarrow avoid conflict or adopt rival's platform to lower turnout of its potential voters
 - e.g., 06/13: minimum wage, rent control, financial transactions tax, etc.
 - Joffe (FT, 08/13): *“Ms Merkel's plan is to lull the other side; don't rile them and win by keeping them at home. How did she do it after the near-disaster of 2005? By shifting to the left. An apostle of free markets and low taxes ten years ago, Merkel simply outflanked the left on the left... She is the best Social Democrat the SPD could have asked for.”*
- Systematic quantitative analyses of party positions: Volkens et al. '18
 - text analysis of party manifestos: “Welfare State”, “Left-Right” indices
 - divergence between '02 and '05, then shift to the left and parallel trends
 - for both indices, CDU in 2017 was more left-leaning than CDU in 2005

MODEL SPECIFICATION

- Interpret Merkel's strategy through the lens of our model
 - affine tax policy τ^j : size of the welfare state or left-right index
 - party 1 is SPD (supported by $\varepsilon < 0$: "liberal values"), party 2 is CDU
 - CDU over-represented among high incomes: $\bar{q}(\omega) B(\Delta u \mid \omega) \downarrow$ in ω
- Status quo policy τ^2 ahead of '09 election: CDU "too far to the right"
 - '05: raising τ^2 could have raised CDU's probability of winning
 - yet: ex-ante probability of winning $1 - \bar{\pi}^1(\tau^1, \tau^2) > 1/2$ in all elections
 - lead in the polls $> 10\%$, odds of "Merkel Chancellor" on Betfair $> 90\%$

THEORETICAL COMPARATIVE STATICS AND ELECTION OUTCOMES

- Corollary 1: Deviation by party 2 toward the left ($\tau^2 \uparrow$) implies:
 - party 2's expected vote share increases, overall turnout decreases
 - demobilization is asymmetric: relative turnout ratio σ^{1*}/σ^{2*} decreases
- Empirically: election outcomes consistent with theoretical comp. stat.
 - same lead in the polls as in '09 but margin of victory \uparrow from 1 to 10pp
 - total turnout \downarrow by 7pp to 71% in '09 (all time low), slight \uparrow in '13, '17
 - 52% (resp., 62%) of the potential SPD (resp., CDU) voters turned out

CONCLUSION

- Equilibrium policies in a model of political competition
 - model both endogenous platform choices and endogenous turnout
 - trade-off between mobilizing supporters vs demobilizing the opposition
- Determinants of tax policies: positive theory, generalized MSWW
 - fraction of swing / supporting core / rival core voters at each income level
 - weight on competing objectives: ex-ante probability of winning election
- Comparative statics: illustration through a case study in Germany