Inequality Aversion, Populism, and the Backlash Against Globalization

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and

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** University of Chicago, NBER, CEPR
We develop a model connecting two recent trends:

1. **Rise of populism** in the West
   - Anti-elitism
   - Anti-globalism (e.g., Brexit, Trump)

2. **Growing inequality** within countries
• We develop a model connecting two recent trends:

1. **Rise of populism** in the West
   - Anti-elitism
   - Anti-globalism (e.g., Brexit, Trump)

2. **Growing inequality** within countries

• **Backlash against globalization** emerges endogenously
  - Rational voters’ optimal response to rising inequality
  - Globalization carries the seeds of its own destruction
Global growth

\[ \downarrow \quad \text{(heterogeneous risk aversion)} \]

Inequality \[ \uparrow \]
Global growth

\[ \downarrow \quad (\text{heterogeneous risk aversion}) \]

Inequality \[ \uparrow \]

\[ \downarrow \quad (\text{inequality aversion}) \]

Backlash
Global growth
\[ \downarrow \quad \text{(heterogeneous risk aversion)} \]
Inequality $\uparrow$
\[ \downarrow \quad \text{(inequality aversion)} \]
Backlash

- Backlash = Elect a populist, \textit{Globalization} $\rightarrow$ \textit{Autarky}
  - Consumption $\downarrow$ but equality $\uparrow$
Global growth

\[ \downarrow \quad (\text{heterogeneous risk aversion}) \]

Inequality $\uparrow$

\[ \downarrow \quad (\text{inequality aversion}) \]

Backlash

- Backlash = Elect a populist, \textit{Globalization} $\rightarrow$ \textit{Autarky}
  - Consumption $\downarrow$ but equality $\uparrow$

- Heterogeneous risk aversion: Within countries $\Longrightarrow$ Inequality
  Across countries $\Longrightarrow$ Imbalances
Empirical Evidence

• Types of evidence
  – Across countries: Vote shares of populist parties + Surveys
  – Across individuals: Brexit + Trump voters
Empirical Evidence

• Types of evidence
  – Across countries: Vote shares of populist parties + Surveys
  – Across individuals: Brexit + Trump voters

• Evidence largely supports the model
  – **Countries**: More populist if they have
    * Higher inequality
    * Higher financial development
    * Lower current account balance
  – **Individuals**: More populist if they are
    * More risk-averse
    * More inequality-averse
Model

• Continuum of agents $i \in [0, 1]$ in countries $k \in \{US, RoW\}$
Model

- Continuum of agents $i \in [0, 1]$ in countries $k \in \{US, RoW\}$
- Preferences of agent $i \in \mathcal{I}^k$ at time $t \in [0, T]$:

$$U_i \left( C_{it}, V_t^k, t \right) = e^{-\phi t} \left( \frac{C_{it}^{1-\gamma_i}}{1-\gamma_i} - \eta_i V_t^k \right)$$

where

$$V_t^k = \text{Var} \left( \frac{C_{it}}{C_t^k} \mid i \in \mathcal{I}^k \right) = \text{Inequality} \text{ in country } k$$

$\gamma_i = \text{Risk aversion}$

$\eta_i = \text{Inequality aversion} \ (\approx \text{anti-elitism, “envy of the rich”})$
Heterogeneous Risk Aversion

• U.S. agents are less risk-averse than RoW agents
  - Interpretation: U.S. more financially developed than RoW
Heterogeneous Risk Aversion

- **U.S. agents are less risk-averse** than RoW agents
  - Interpretation: U.S. more financially developed than RoW

- Technical assumption:

\[
\lim_{x \to \infty} \frac{E^i[e^{x/\gamma_i} | i \in \mathcal{I}^{RoW}]}{E^i[e^{x/\gamma_j} | j \in \mathcal{I}^{US}]} = 0
\]

Examples:

1. \(\gamma_i < \gamma_j\) for all \(i \in \mathcal{I}^{US}, j \in \mathcal{I}^{RoW}\)

2. U.S. risk tolerance \(\frac{1}{\gamma_i} \sim U[a, b]\), RoW’s \(\frac{1}{\gamma_j} \sim U[a, c]\), with \(b > c\)

3. Truncated normals for \(\frac{1}{\gamma_i}\) in both countries, same truncation points, same dispersion, higher mean in the U.S.
Global output: $D_t = D_t^{US} + D_t^{RoW}$. Its log, $\delta_t \equiv \log(D_t)$, follows

$$d\delta_t = \mu_\delta \, dt + \sigma_\delta \, dZ_t$$

where $\mu_\delta > 0 \Rightarrow$ output trends upward
- Global output: $D_t = D_t^{US} + D_t^{RoW}$. Its log, $\delta_t \equiv \log(D_t)$, follows

$$d\delta_t = \mu_\delta \, dt + \sigma_\delta \, dZ_t$$

where $\mu_\delta > 0 \Rightarrow$ output trends upward

- For simplicity, also assume (relaxed later):

$$\frac{D_t^{US}}{D_t} = \text{U.S. population share}$$

- Agents trade stocks, bonds
Two possible regimes:

1. **Globalization**: Cross-border trading allowed
   Global risk sharing

2. **Autarky**: Cross-border trading not allowed
   Local risk sharing
Two possible regimes:

1. **Globalization**: Cross-border trading allowed
   - Global risk sharing

2. **Autarky**: Cross-border trading not allowed
   - Local risk sharing

Both countries hold **elections** at known time $\tau \in [0, T]$:

1. **Mainstream** candidate: Keep globalization
2. **Populist** candidate: Move to autarky
   - Elections decided by the median voter
• Two possible regimes:
  1. **Globalization**: Cross-border trading allowed
     Global risk sharing
  2. **Autarky**: Cross-border trading not allowed
     Local risk sharing

• Both countries hold **elections** at known time $\tau \in [0, T]$
  1. **Mainstream** candidate: Keep globalization
  2. **Populist** candidate: Move to autarky
     – Elections decided by the median voter

• Default not allowed (no expropriation of wealth)
  – Can’t move to autarky if other country suffers consumption loss
Markets dynamically complete $\implies$ Agent $i$ in country $k$ solves

$$\max_{\{C_{it}\}} \mathbb{E}_0 \left[ \int_0^T U_i \left( C_{it}, V^k_t, t \right) dt \right] \quad \text{s.t.} \quad \mathbb{E}_0 \left[ \int_0^T \pi^k_t C_{it} dt \right] = w_i$$

where $\pi^k_t = \text{state price density}$, $w_i = \text{initial endowment}$
Optimal Consumption

- Markets dynamically complete $\implies$ Agent $i$ in country $k$ solves

$$\max_{\{C_{it}\}} \mathbb{E}_0 \left[ \int_0^T U_i (C_{it}, V_{kt}, t) \, dt \right] \quad \text{s.t.} \quad \mathbb{E}_0 \left[ \int_0^T \pi^k_t C_{it} \, dt \right] = w_i$$

where $\pi^k_t = \text{state price density}$, $w_i = \text{initial endowment}$

- Optimal consumption:

$$C_{it} = e^{\psi_i} + \frac{g^k_t - y}{\gamma_i}$$

where $\xi_i \equiv e^{y-\gamma_i \psi_i} = \text{Lagrange multiplier}$, $g^k_t \equiv -\phi t - \log \left( \pi^k_t \right)$
Equilibrium under Globalization

- Integrated markets $\implies \pi_t^{US} = \pi_t^{RoW} = \pi_t$
Equilibrium under Globalization

• Integrated markets \( \implies \pi_t^{US} = \pi_t^{RoW} = \pi_t \)

• Market clearing: \( D_t = \int_{i \in I} C_{it} \, di \implies \text{Equilibrium } \pi_t = \pi(\delta_t) \)
Equilibrium under Globalization

- Integrated markets $\implies \pi^U S = \pi^{RoW} = \pi$

- Market clearing: $D_t = \int_{i \in I} C_{it} di \implies$ Equilibrium $\pi_t = \pi(\delta_t)$

- Consumption share of agent $i \in I^k$: $\frac{C_{it}}{C^k_t} \uparrow \text{ in } \delta_t \text{ iff } \gamma_i < \gamma^k(\delta_t)$
  $\implies$ Low-$\gamma_i$ agents grow disproportionately rich
Equilibrium under Globalization

- Integrated markets \( \implies \pi_t^{US} = \pi_t^{RoW} = \pi_t \)

- Market clearing: \( D_t = \int_{i \in I} C_{it} \, di \implies \) Equilibrium \( \pi_t = \pi(\delta_t) \)

- Consumption share of agent \( i \in I^k: \frac{C_{it}}{C_t} \uparrow \text{ in } \delta_t \iff \gamma_i < \overline{\gamma}^k(\delta_t) \)

\( \implies \text{Low-}\gamma_i \text{ agents grow disproportionately rich} \)

- \( \delta_t \uparrow \implies \overline{\gamma}^k(\delta_t) \downarrow \implies \text{Increasingly lonely at the top} \)

\( \implies \text{Benefits of growth accrue increasingly to "elites"} \)
• Analytical solution for inequality $V^k[\delta_t]$

• **Proposition.** For $\delta_t$ large, $V^k[\delta_t]$ increases as $\delta_t$ increases. Also, $V^k[\delta_t] \to \infty$ as $\delta_t \to \infty$. 
Inequality

• Analytical solution for inequality $V^k[\delta_t]$

• **Proposition.** For $\delta_t$ large, $V^k[\delta_t]$ increases as $\delta_t$ increases.
  Also, $V^k[\delta_t] \to \infty$ as $\delta_t \to \infty$.

• **Corollary.** For $\delta_t$ large, Skewness $\left( \frac{C_{it}}{C_r^k} \mid i \in I^k \right) \uparrow$ as $\delta_t \uparrow$.
  Also, Skewness $\to \infty$ as $\delta_t \to \infty$.

$\Longrightarrow$ Inequality grows with output, driven by elites’ consumption
Panel A. Inequality in US

Panel B. Inequality in RoW

Panel C. Skewness in US

Panel D. Skewness in RoW
• **Proposition.** For $\delta_t$ large, U.S. runs a current account deficit, RoW runs a surplus.

\[
\int_{i \in I^{US}} C_{it} \, di > D^{US}_t, \quad \int_{i \in I^{RoW}} C_{it} \, di < D^{RoW}_t
\]
• Segmented markets $\implies \pi_t^{US} \neq \pi_t^{RoW}$

• Market clearing: $D_t^k = \int_{i \in I^k} C_{it} \, di$, for $k \in \{US, RoW\}$
  $\implies$ Equilibrium $\pi^k(\delta_t)$
• Segmented markets \( \implies \pi_t^{US} \neq \pi_t^{RoW} \)

• Market clearing: \( D^k_t = \int_{i \in I^k} C_{it} \, di \), for \( k \in \{US, RoW\} \)
  \( \implies \) Equilibrium \( \pi^k(\delta_t) \)

• Proposition. U.S. inequality is lower under autarky than under globalization. The opposite is true for RoW:

\[
V_t^{US} \left[ \pi^{US} (\delta_t) \right] < V_t^{US} \left[ \pi (\delta_t) \right] \\
V_t^{RoW} \left[ \pi^{RoW} (\delta_t) \right] > V_t^{RoW} \left[ \pi (\delta_t) \right]
\]
Elections

- At time $\tau$, agents in country $k$ vote, comparing expected utilities

$$\mathbb{E}_\tau \left[ \int_\tau^T e^{-\phi(s-\tau)} \left( \frac{C_{is}^{1-\gamma_i}}{1 - \gamma_i} - \eta^i V_s^k \right) d\tau \right]$$

under the two candidates (mainstream, populist)
• At time $\tau$, agents in country $k$ vote, comparing expected utilities

$$\mathbb{E}_\tau \left[ \int_\tau^T e^{-\phi(s-\tau)} \left( \frac{C_{is}^{1-\gamma_i}}{1-\gamma_i} - \eta^i V^k_s \right) \, ds \right]$$

under the two candidates (mainstream, populist)

• **Proposition.** For any U.S. agent $i$ with $\eta_i > 0$, there exists $\bar{\delta}_i$ such that for any $\delta_\tau > \bar{\delta}_i$, the agent votes populist.
Elections

- At time $\tau$, agents in country $k$ vote, comparing expected utilities
  \[
  E_\tau \left[ \int_\tau^T e^{-\phi(s-\tau)} \left( \frac{C_{is}^{1-\gamma_i}}{1-\gamma_i} - \eta_i V_s^k \right) ds \right]
  \]
  under the two candidates (mainstream, populist)

- **Proposition.** For any U.S. agent $i$ with $\eta_i > 0$, there exists $\delta^i$ such that for any $\delta_\tau > \delta^i$, the agent votes populist.

- **Intuition:** Consumption-equality tradeoff
  - Move to autarky $\implies C_{it} \downarrow$ but also $V_t^{US} \downarrow$
• At time $\tau$, agents in country $k$ vote, comparing expected utilities

$$E_{\tau} \left[ \int_{\tau}^{T} e^{-\phi(s-\tau)} \left( \frac{C_{1s}^{1-\gamma_i}}{1 - \gamma_i} - \eta^i V_s^k \right) ds \right]$$

under the two candidates (mainstream, populist)

• **Proposition.** For any U.S. agent $i$ with $\eta_i > 0$, there exists $\delta^i$ such that for any $\delta_{\tau} > \delta^i$, the agent votes populist.

• **Intuition:** Consumption-equality tradeoff
  
  – Move to autarky $\implies C_{it} \downarrow$ but also $V_t^{US} \downarrow$
  
  – $\delta_t \uparrow \implies$ Marginal utility of $C_{it} \downarrow \implies$ Equality dominates
    
    * Equality is a *luxury good*
• **Proposition.** There exists $\bar{\delta}$ such that for any $\delta_T > \bar{\delta}$, the populist wins the U.S. election.

The Populist Vote Share
Can Redistribution Save Globalization?

• Social planner would preserve globalization
  – But market equilibrium ≠ social planner solution (externality)
Can Redistribution Save Globalization?

• Social planner would preserve globalization
  – But market equilibrium ≠ social planner solution (externality)

• **Proposition.** Any redistributive policy \( \{T_{i,t}(\delta_t)\} \) s.t. \( \int T_i \, di = 0 \) is equivalent to a redistribution of initial endowments \( w_i \)
  – With complete markets, redistributive policies are “traded away”

• Agent \( i \)'s budget constraint under redistribution:

\[
E_0 \left[ \int_0^T \pi_t^k C_{it} \, dt \right] = w_i + E_0 \left[ \int_0^T \pi_t^k T_{it} \, dt \right]
\]

To implement redistributive policy \( \{T_{i,t}(\delta_t)\} \), augment agent \( i \)'s initial endowment by \( \tilde{w}_i = E_0 \left[ \int_0^T \pi_t^k T_{it} \, dt \right] \). Note: \( \int \tilde{w}_i \, di = 0 \).
Can Redistribution Save Globalization?

• For tractability, we consider initial endowments of the form

\[ w_i = e^{\psi_i} E_0 \left[ \int_0^T e^{-\phi t + \left( g_t^k - y \right)/\gamma_i - g_t^k} dt \right] \]

• Increase \( y \iff \) Redistribute \( w_i \) from low-\( \gamma_i \) to high-\( \gamma_i \) agents
  – From those who benefit from globalization to those who lose

![Graph showing the correlation between risk aversion and initial wealth](image-url)
Can Redistribution Save Globalization?

- **Corollary.** For any redistributive policy $y$ there exists $\bar{\delta}$ such that for any $\delta_\tau > \bar{\delta}$, the populist wins the U.S. election.

  $\implies$ For any given $y$, when $\tau$ is large enough, the populist wins
• **Corollary.** For any redistributive policy $y$ there exists $\delta$ such that for any $\delta_\tau > \delta$, the populist wins the U.S. election.

\[ \implies \text{For any given } y, \text{ when } \tau \text{ is large enough, the populist wins} \]

![Graph showing the output threshold $\delta$ for populist victory against redistribution coefficient $y$.]
Evidence: Which Countries Are Populist?

• **Predictions:** Populism is stronger in countries with
  
  – Higher inequality
  
  – Lower current account balance
  
  – Higher financial development
Evidence: Which Countries Are Populist?

- **Predictions:** Populism is stronger in countries with
  - Higher inequality
  - Lower current account balance
  - Higher financial development

- Examine a recent cross-section of rich countries

- Measure populism in four ways
  - **Vote share of populist parties** in recent elections
    - Data from ParlGov and 2014 Chapel Hill Survey of Experts
  - **Survey**-based support for protectionism; 2013 ISSP data
Vote Share of Nationalist Parties

Panel A. Inequality: Gini Coefficient

Panel B. Inequality: Top 10% Share

Panel C. Current Account Balance

Panel D. Financial Development
Vote Share of Anti-Immigrant Parties

Panel A. Inequality: Gini Coefficient

Panel B. Inequality: Top 10% Share

Panel C. Current Account Balance

Panel D. Financial Development
Vote Share of Anti-Elite Parties

Panel A. Inequality: Gini Coefficient

Panel B. Inequality: Top 10% Share

Panel C. Current Account Balance

Panel D. Financial Development
Support for Protectionism

Panel A. Inequality: Gini Coefficient

Panel B. Inequality: Top 10% Share

Panel C. Current Account Balance

Panel D. Financial Development
Who Are the Populist Voters?

**Proposition.** Agents with higher $\gamma_i$ and $\eta_i$ tend to vote populist.
The Role of Wealth

- Richer agents have lower MU(C)... but they are also less risk-averse
  \[ \Rightarrow \text{Choose higher risk exposure} \Rightarrow \text{Lose more from autarky} \]
Evidence: Who Are the Populist Voters?

- Use survey data on Brexit and Trump voters
  - **Brexit:** 2014-2018 British Election Study, panel data
  - **Trump:** 2016 Cooperative Congressional Election Survey

- Empirical proxies:
  - **Risk aversion**
    * Brexit: *Income*, *Education*, *WillingnessToTakeRisk*
    * Trump: *Income*, *Education*
  - **Inequality aversion**
    * Trump: *Income*, *Religious*, *Republican*
## Determinants of the Support for Brexit

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**Observations**: 31095, 40783, 40890, 25328

**$R^2$**: 0.02, 0.09, 0.002, 0.11
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Determinants of the Support for Trump

Panel A. Controlling for Republican Dummy

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## Determinants of the Support for Trump

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• State price density: \( \frac{d\pi_t}{\pi_t} = -r(\delta_t)\,dt - \sigma_\pi(\delta_t)\,dZ_t \)

• Proposition. \( \sigma_{\pi}^{US} < \sigma_{\pi} < \sigma_{\pi}^{RoW} \)

• Proposition. For \( t < \tau \), \( \delta_t \uparrow \implies \frac{P_t^{US}}{P^{US}_t + P^{RoW}_t} \uparrow \)

• Proposition. For \( t < \tau \) and \( t' > \tau \), \( \delta_t \uparrow \implies r_t^{US}(t') \downarrow \)
Panel A. Market Price of Risk

- Globalization
- US under Autarky
- RoW under Autarky

Panel B. Global Market Share of US Stocks

Panel C. Bond Yields

- US
- RoW
Global Share of U.S. Stock Market

- Trump Enters Presidential Race (June 16, 2015)
- Trump Becomes GOP Nominee (July 19, 2016)
- US Presidential Election (November 8, 2016)
Extensions $\implies$ Same Conclusions

- Time-varying U.S. output share $F_t$
  - Populist elected if $\delta_\tau > \bar{\delta}(F_\tau)$, where $\bar{\delta}'(F_\tau) > 0$
  - U.S. output share $\downarrow \implies$ Populism $\uparrow$

- Time-varying population shares
  - Immigration from RoW to U.S. $\implies$ Populism $\uparrow$

- Higher costs of autarky
  - Lower output growth, $\mu_\delta$
  - Higher output volatility, $\sigma_\delta$
Conclusions

• We connect the rise of populism to growing inequality

• Backlash against globalization arises endogenously in our model
  – Rational voters’ optimal response to rising inequality. Inevitable

• Key modeling ingredients:
  – Inequality aversion
  – Heterogeneous risk aversion (within & across countries)
  – Risk sharing (global vs. local)

• Evidence across countries and voters largely supports the model
  – Countries are more populist if they have more inequality, more financial development, and current account deficits
  – Voters are more populist if more risk- and inequality-averse
## Parameter Choices

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Distribution of Initial Endowments

- Budget constraint:

\[ w_i = e^{-\frac{\log(\xi_i)}{\gamma_i}} E_0 \left[ \int_0^T e^{-\phi t + \left(\frac{1}{\gamma_i} - 1\right) g_i^k} dt \right] \]

- For tractability, we define

\[ \log(\xi_i) = y + \log(\tilde{\xi}_i) \]

\[ \psi_i = -\frac{1}{\gamma_i} \log(\tilde{\xi}_i) \]

- Distribution of \( \psi_i \) (assumed indep. of \( \gamma_i \)) \( \implies \) Randomness in \( w_i \)

- Vary \( y \) \( \implies \) Redistribution across \( \gamma_i \)
Properties of Equilibrium SDF

- Under **globalization**, market clearing: \( D_t = \int_{i \in \mathcal{I}} C_{it} \, di \)
- Substitute optimal \( C_{it} \), use law of large numbers, obtain
  \[
  \delta_t = \log \left( E^i \left[ e^{(g_t - y_i)/\gamma_i} \mid i \in \mathcal{I} \right] \right) - \log \left( E^i \left[ e^{-y_i/\gamma_i} \mid i \in \mathcal{I} \right] \right)
  \]
- Solve for equilibrium \( g_t = g(\delta_t) \). Properties:
  1. \( g'(\delta_t) = 1/E_w^i \left[ \frac{1}{\gamma_i} \mid i \in \mathcal{I} \right] > 0 \), where \( E_w^i[.] \) weights by \( C_{it}/\bar{C}_t \)
  2. \( g''(\delta_t) < 0 \implies \) Global risk aversion ↓ when \( \delta_t \uparrow \)
  3. \( g(\delta_t) \to \infty \) as \( \delta_t \to \infty \)

- Under **autarky**, \( D^k_t = \int_{i \in \mathcal{I}_k} C_{it} \, di \implies \) Equilibrium \( g^k(\delta_t) \)
- Find that for \( \delta_t \) large: \( g^{US}(\delta_t) < g(\delta_t) < g^{RoW}(\delta_t) \)
**International Borrowing**

- **Corollary.** U.S. agents are net borrowers, RoW net lenders
- **Corollary.** For \( \delta_t \) large, U.S. wealth > U.S. stock market cap
  RoW wealth < RoW stock market cap
• State price density: $\pi_t = e^{-\phi t - g(\delta_t)}$

• Dynamics:

$$\frac{d\pi_t}{\pi_t} = -r(\delta_t) \, dt - \sigma_{\pi}(\delta_t) \, dZ_t$$

$$r(\delta_t) = \phi + g'(\delta_t) \, \mu_\delta - \frac{1}{2} \left( g'(\delta_t)^2 - g''(\delta_t) \right) \sigma_\delta^2$$

$$\sigma_{\pi}(\delta_t) = g'(\delta_t) \, \sigma_\delta$$