Identity, Beliefs and Political Conflict

Online Appendix

Giampaolo Bonomi

Nicola Gennaioli

Guido Tabellini

Contents

Appendix 1. Proofs

Proof of Proposition 1. Using (1), the distorted likelihood ratio between average group members is:

$$\frac{z^{\theta}\left(\tilde{\psi}\left|\overline{\psi}_G, G\right.\right)}{z^{\theta}\left(\tilde{\psi}\left|\overline{\psi}_{\overline{G}}, \overline{G}\right.\right)} = \frac{Z_G}{Z_{\overline{G}}} \frac{z\left(\tilde{\psi}\left|\overline{\psi}_G\right.\right)}{z\left(\tilde{\psi}\left|\overline{\psi}_{\overline{G}}\right.\right)} \left[\frac{z^{\theta}\left(\tilde{\psi}\left|\overline{\psi}_G, G\right.\right)}{z^{\theta}\left(\tilde{\psi}\left|\overline{\psi}_{\overline{G}}, \overline{G}\right.\right)}\right]^{2\chi}, \tag{26}$$

where Z_G and $Z_{\overline{G}}$ are positive normalization constants, and where the equation defines a fixed point condition $x = f(x)$. There is only one positive fixed point, which is stable provided $f(x)$ is concave. This is ensured by $2\chi < 1$, in which case, there also exist two constants Z_G and $Z_{\overline{G}}$ such that the belief distributions $z^{\theta}\left(\tilde{\psi}\left|\overline{\psi}_G, G\right.\right)$ and $z^{\theta}\left(\tilde{\psi}\left|\overline{\psi}_{\overline{G}}, \overline{G}\right.\right)$ integrate to one. Then, Equation (1) becomes:

$$z^{\theta}\left(\tilde{\psi}\left|\psi, G\right.\right) \propto z\left(\tilde{\psi}\left|\psi\right.\right) \left[\frac{z\left(\tilde{\psi}\left|\overline{\psi}_G\right.\right)}{z\left(\tilde{\psi}\left|\overline{\psi}_{\overline{G}}\right.\right)}\right]^{\frac{\chi}{1-2\chi}},$$

and an equivalent expression for $\overline{G}$, which is the BCGS (2016) equation with $\theta \equiv \frac{\chi}{1-2\chi}$. With Gaussian distributions this yields:

$$\psi_G^{\theta} \equiv \int \tilde{\psi} z^{\theta}\left(\tilde{\psi}\left|\psi, G\right.\right) d\tilde{\psi} = \psi + \theta\left(\overline{\psi}_G - \overline{\psi}_{\overline{G}}\right).$$

■

Proof of Corollaries 1 and 2. The disagreement among average group types is equal to:

$$\overline{\psi}_{SP}^{\theta} - \overline{\psi}_{SC}^{\theta} = \overline{\psi}_{SP} + \theta\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right) - \overline{\psi}_{SC} - \theta\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right) = \left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)(1 + 2\theta),$$

which proves Corollary 1. Denote by $\tilde{\psi}_G^{\theta}$ the random variable capturing distorted beliefs of the average member of G. Using Equation (1), the distorted perception of such average member satisfies:

$$z^{\theta}\left(\tilde{\psi}_{G}^{\theta}\right) \propto z^{\theta}\left(\tilde{\psi}\,|\overline{\psi}_{G}, G\right)\left[\frac{z^{\theta}\left(\tilde{\psi}\,|\overline{\psi}_{G}, G\right)}{z^{\theta}\left(\tilde{\psi}\,|\overline{\psi}_{\overline{G}}, \overline{G}\right)}\right]^{\chi},$$

so that, given again Gaussianity, the perceived position of the average member of G is equal to:

$$\widehat{\psi}_{SP}^{\theta} = \overline{\psi}_{SP}^{\theta} + \left(\frac{\theta}{1+2\theta}\right)\left(\overline{\psi}_{SP}^{\theta} - \overline{\psi}_{SC}^{\theta}\right),$$

where we exploited the definition $\chi \equiv \frac{\theta}{1+2\theta}$. This immediately implies that:

$$\widehat{\psi}_{SP}^{\theta} - \widehat{\psi}_{SC}^{\theta} = \left(\overline{\psi}_{SP}^{\theta} - \overline{\psi}_{SC}^{\theta}\right)\left(1 + \frac{2\theta}{1+2\theta}\right) = \left(\overline{\psi}_{SP}^{\theta} - \overline{\psi}_{SC}^{\theta}\right)\left(\frac{1+4\theta}{1+2\theta}\right).$$

■

Proof for the Conflict Function of Section III. Recall that:

$$W^{\varepsilon\psi}(\tau, q) = (1+\varepsilon)(1-\tau) - \frac{\varphi}{2}\tau^2 + (\nu + \beta\psi)\tau - \frac{\kappa}{2}(q-\psi)^2,$$

which can be written as:

$$W^{\varepsilon\psi}(\tau, q) \propto A_{\varepsilon\psi} - \left(\tau - \tau^{\varepsilon\psi}\right)^2 - \frac{\kappa}{\varphi}(q-\psi)^2,$$

where $\tau^{\varepsilon\psi}$ is the voter's bliss point and $A_{\varepsilon\psi}$ is a voter-dependent constant. This implies that:

$$W^{G}\left(\tau^{G}, q^{G}\right) - W^{G}\left(\tau^{\overline{G}}, q^{\overline{G}}\right) \propto \left(\tau^{\overline{G}} - \tau^{G}\right)^2 + \frac{\kappa}{\varphi}\left(\overline{\psi}_{\overline{G}} - \overline{\psi}_{G}\right)^2$$

Plugging in the expressions for the policy bliss points we get:

$$W^{G}\left(\tau^{G}, q^{G}\right) - W^{G}\left(\tau^{\overline{G}}, q^{\overline{G}}\right) \propto \frac{\beta^2}{\varphi^2}\left(\overline{\psi}_{\overline{G}} - \overline{\psi}_{G}\right)^2 - 2\frac{\beta}{\varphi^2}\left(\overline{\psi}_{G} - \overline{\psi}_{\overline{G}}\right)\left(\overline{\varepsilon}_{G} - \overline{\varepsilon}_{\overline{G}}\right) + \frac{\left(\overline{\varepsilon}_{G} - \overline{\varepsilon}_{\overline{G}}\right)^2}{\varphi^2} + \frac{\kappa}{\varphi}\left(\overline{\psi}_{\overline{G}} - \overline{\psi}_{G}\right)^2,$$

which, by collecting φ^2 in the denominator yields:

$$W^G\left(\tau^G, q^G\right) - W^G\left(\tau^{\overline{G}}, q^{\overline{G}}\right) \propto \left(\overline{\varepsilon}_G - \overline{\varepsilon}_{\overline{G}}\right)^2 + \left(\beta^2 + \kappa\varphi\right)\left(\overline{\psi}_{\overline{G}} - \overline{\psi}_G\right)^2 - 2\beta\left(\overline{\varepsilon}_G - \overline{\varepsilon}_{\overline{G}}\right)\left(\overline{\psi}_G - \overline{\psi}_{\overline{G}}\right),$$

which is our conflict function $C(G, \overline{G})$ in Equation (9) under the definition $\widehat{\kappa} \equiv \kappa\varphi$. ■

Proof of Proposition 2. All voters (ε, ψ) identify with their cultural group if and only if cultural conflict is larger than income conflict, $C\left(SP, SC\right) \geq C\left(U, L\right)$, which reads:

$$\begin{aligned}(\overline{\varepsilon}_{SP} - \overline{\varepsilon}_{SC})^2 + \left(\beta^2 + \widehat{\kappa}\right)(\overline{\psi}_{SP} - \overline{\psi}_{SC})^2 - 2\beta(\overline{\varepsilon}_{SP} - \overline{\varepsilon}_{SC})(\overline{\psi}_{SP} - \overline{\psi}_{SC}) \quad &\geq \\ (\overline{\varepsilon}_U - \overline{\varepsilon}_L)^2 + \left(\beta^2 + \widehat{\kappa}\right)(\overline{\psi}_U - \overline{\psi}_L)^2 - 2\beta(\overline{\varepsilon}_U - \overline{\varepsilon}_L)(\overline{\psi}_U - \overline{\psi}_L).&\end{aligned}$$

Exploiting correlations, the condition becomes:

$$(\overline{\psi}_{SP} - \overline{\psi}_{SC})^2\left(\rho^2 + \beta^2 + \widehat{\kappa} - 2\beta\rho\right) \geq (\overline{\varepsilon}_U - \overline{\varepsilon}_L)^2\left(1 + \beta^2\rho^2 + \widehat{\kappa}\rho^2 - 2\beta\rho\right),$$

which is equivalent to:

$$\widehat{\kappa}\left[\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}\right)^2 - \rho^2\right] \geq (1 - \beta\rho)^2 - (\beta - \rho)^2\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}\right)^2.$$

The left hand side is positive, for (A1) implies $\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}\right)^2 > \rho^2$. Thus, cultural identity prevails iff:

$$\widehat{\kappa} \geq \widehat{\alpha} \equiv \frac{(1 - \beta\rho)^2 - (\beta - \rho)^2\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}\right)^2}{\left[\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}\right)^2 - \rho^2\right]}. \tag{27}$$

If the numerator of $\widehat{\alpha}$ is negative, identity is always cultural. This occurs when:

$$\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}\right)^2 \geq \left(\frac{1 - \beta\rho}{\beta - \rho}\right)^2. \tag{28}$$

For $\beta < \rho$, inequality (28) is not met, for (A.1) implies $\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}\right)^2 < 1/\rho^2$. For $\beta > \rho$, (28) cannot also be met provided:

$$\beta \leq \beta^{**} \equiv \rho \frac{2}{1+\rho^2}.$$

Thus, for $\beta \leq \beta^{**}$, $\widehat{\alpha} > 0$. For $\beta > \beta^{**}$, $\widehat{\alpha}$ is negative when (28) is met. We return to this issue later.

Consider now property (ii). regardless of whether $\beta \leq \beta^{**}$ or $\beta > \beta^{**}$, inspection of $\widehat{\alpha}$ and of (28) immediately yields it. Consider property (iii). Note that after some algebra we can write:

$$\frac{\partial \widehat{\alpha}}{\partial \rho} \propto \left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^4 (\beta - \rho) - \left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 \beta \left(1 - \rho^2\right) + \rho \left(1 - \beta\rho\right).$$

By decomposing $\beta \left(1 - \rho^2\right)$ as $(\beta - \rho) + \rho (1 - \beta\rho)$, this can be factorized as:

$$\frac{\partial \widehat{\alpha}}{\partial \rho} \propto \left[\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 - 1 \right] \left[(\beta - \rho) \left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 - \rho (1 - \beta\rho) \right]. \tag{29}$$

Consider the conditions under which $\frac{\partial \widehat{\alpha}}{\partial \rho} < 0$. If $\beta < \rho$, the second term in square brackets is negative so $\frac{\partial \widehat{\alpha}}{\partial \rho} < 0$ if and only if $\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 > 1$. If $\beta > \rho$, the second term in square brackets is negative if and only if:

$$\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 \leq \vartheta \equiv \rho \left(\frac{1 - \beta\rho}{\beta - \rho} \right).$$

If $\beta < \beta^{**}$, $\vartheta > 1$. In this case, $\frac{\partial \widehat{\alpha}}{\partial \rho} < 0$ for $\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 \in (1, \vartheta]$. Note that if $\vartheta \geq 1/\rho^2$, then by assumption (A.1) $\frac{\partial \widehat{\alpha}}{\partial \rho} < 0$ for all admissible $\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 > 1$. The condition for $\vartheta \geq 1/\rho^2$ is:

$$\beta \leq \beta^{*} \equiv \rho \left(\frac{1 + \rho^2}{1 + \rho^4} \right) < \beta^{**}.$$

If $\beta > \beta^{**}$, $\vartheta < 1$. In this case, $\frac{\partial \widehat{\alpha}}{\partial \rho} < 0$ for $\left(\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L} \right)^2 \in (\vartheta, 1)$.

Assuming $\beta \leq \beta^{*}$ ensures properties (i) and (iii) of the proposition. ■

Proof of Proposition 3. Take the expression for ψ_G^{θ}. Given a Gaussian distribution $f\left(\tilde{\varepsilon} \,|\varepsilon\right)$

we can define, in line with (1), the distorted beliefs over income by a voter identified with G:

$$f^{\theta}\left(\tilde{\varepsilon}\,|\varepsilon, G\right) \propto f\left(\tilde{\varepsilon}\,|\varepsilon\right)\left[\frac{f^{\theta}\left(\tilde{\varepsilon}\,|\overline{\varepsilon}_G, G\right)}{f^{\theta}\left(\tilde{\varepsilon}\,|\overline{\varepsilon}_{\overline{G}}, \overline{G}\right)}\right]^{\chi},$$

which, repeating the logic of the fixed point, yields:

$$\varepsilon_G^{\theta} = \varepsilon + \theta\left(\overline{\varepsilon}_G - \overline{\varepsilon}_{\overline{G}}\right).$$

The policy demands of a voter (ε, ψ) identified with group G are then given by:

$$\begin{aligned}
\tau_G^{\varepsilon\psi} &= \frac{\nu + \beta\psi_G^{\theta} - \left(1 + \varepsilon_G^{\theta}\right)}{\varphi}, \\
q_G^{\varepsilon\psi} &= \psi_G^{\theta},
\end{aligned}$$

which, by replacing the expressions for beliefs, immediately yields the proposition. ■

Proof of Proposition 4. By inspection of (18)-(21). ■

Proof of Proposition 5. Denote by $\left(\tau_d^{\varepsilon\psi}, q_d^{\varepsilon\psi}\right)$ the policy demands of (ε, ψ) when she identifies along dimension $d = \tilde{\varepsilon}, \tilde{\psi}$. Neglecting constant terms, under class identity these demands are:

$$\tau_{\tilde{\varepsilon}}^{\varepsilon\psi} = \frac{\beta\psi - \varepsilon}{\varphi} - \theta\left(2I_U - 1\right)\frac{(1-\beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)}{\varphi}, \tag{30}$$

$$q_{\tilde{\varepsilon}}^{\varepsilon\psi} = \psi + \theta\left(2I_U - 1\right)\rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right), \tag{31}$$

where I_U is the indicator of U membership. Given that $var\left(I_U\right) = \pi_U\left(1-\pi_U\right)$, that $E\left(\varepsilon I_U\right) = \overline{\varepsilon}_U\pi_U$, and that $E\left(\psi I_U\right) = \rho\overline{\varepsilon}_U\pi_U$, and given that, due to $E(\varepsilon) = 0$, we have $\overline{\varepsilon}_U\pi_U =$

$(\overline{\varepsilon}_U - \overline{\varepsilon}_L)(1-\pi_U)\pi_U$, the variance covariance matrix is equal to:

$$\begin{aligned}
var\left(\tau_{\tilde{\varepsilon}}^{\varepsilon\psi}\right) &= var\left(\tau^{\varepsilon\psi}\right) + 4\theta(1+\theta)\frac{(1-\beta\rho)^2}{\varphi^2}(\overline{\varepsilon}_U - \overline{\varepsilon}_L)^2\pi_U(1-\pi_U),\\
var\left(q_{\tilde{\varepsilon}}^{\varepsilon\psi}\right) &= var\left(q^{\varepsilon\psi}\right) + 4\theta(1+\theta)\rho^2(\overline{\varepsilon}_U - \overline{\varepsilon}_L)^2\pi_U(1-\pi_U),\\
cov\left(\tau_{\tilde{\varepsilon}}^{\varepsilon\psi}, q_{\tilde{\varepsilon}}^{\varepsilon\psi}\right) &= cov\left(\tau^{\varepsilon\psi}, q^{\varepsilon\psi}\right) - 4\theta(1+\theta)\left(\frac{1-\beta\rho}{\varphi}\right)\rho(\overline{\varepsilon}_U - \overline{\varepsilon}_L)^2\pi_U(1-\pi_U).
\end{aligned}$$

where $\pi_U = \Pr(\varepsilon \in U)$.

Neglecting constant terms, under cultural identity, the demands by (ε, ψ) are:

$$\tau_{\tilde{\psi}}^{\varepsilon\psi} = \frac{\beta\psi - \varepsilon}{\varphi} + \theta(2I_{SP}-1)\frac{(\beta-\rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)}{\varphi}, \tag{32}$$

$$q_{\tilde{\psi}}^{\varepsilon\psi} = \psi + \theta(2I_{SP}-1)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right), \tag{33}$$

Where I_{SP} is the indicator of social progressive membership. Given that $var(I_{SP}) = \pi_{SP}(1-\pi_{SP})$, that $E(\varepsilon I_{SP}) = \rho\overline{\psi}_{SP}\pi_{SP}$, and that $E(\psi I_{SP}) = \overline{\psi}_{SP}\pi_{SP}$, and given that, due to $E(\varepsilon) = 0$, we have that $\overline{\psi}_{SP}\pi_{SP} = \left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\pi_{SP}(1-\pi_{SP})$, the variance covariance matrix is:

$$\begin{aligned}
var\left(\tau_{\tilde{\psi}}^{\varepsilon\psi}\right) &= var\left(\tau^{\varepsilon\psi}\right) + 4\theta(1+\theta)\frac{(\beta-\rho)^2}{\varphi^2}\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)^2\pi_{SP}(1-\pi_{SP}),\\
var\left(q_{\tilde{\psi}}^{\varepsilon\psi}\right) &= var\left(q^{\varepsilon\psi}\right) + 4\theta(1+\theta)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)^2\pi_{SP}(1-\pi_{SP}),\\
cov\left(\tau_{\tilde{\psi}}^{\varepsilon\psi}, q_{\tilde{\psi}}^{\varepsilon\psi}\right) &= cov\left(\tau^{\varepsilon\psi}, q^{\varepsilon\psi}\right) + 4\theta(1+\theta)\frac{(\beta-\rho)}{\varphi}\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)^2\pi_{SP}(1-\pi_{SP}).
\end{aligned}$$

Suppose that identity switches from class to culture due to an increase in κ. Then, the variance of preferred taxes will decrease if an only if:

$$\begin{aligned}
var\left(\tau_{\tilde{\psi}}^{\varepsilon\psi}\right) &< var\left(\tau_{\tilde{\varepsilon}}^{\varepsilon\psi}\right) \Longleftrightarrow\\
(\beta-\rho)^2\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)^2\pi_{SP}(1-\pi_{SP}) &< (1-\beta\rho)^2(\overline{\varepsilon}_U - \overline{\varepsilon}_L)^2\pi_U(1-\pi_U),
\end{aligned}$$

which depends, among other things, on $\frac{\overline{\psi}_{SP} - \overline{\psi}_{SC}}{\overline{\varepsilon}_U - \overline{\varepsilon}_L}$ and on (π_U, π_{SP}). If $\widehat{\varepsilon} = \widehat{\psi}$, we have

$\frac{\overline{\psi}_{SP}-\overline{\psi}_{SC}}{\overline{\varepsilon}_U-\overline{\varepsilon}_L} = 1$ and $\pi_U = \pi_{SP}$. Given that $\beta < 1$, this implies $(\beta-\rho)^2 < (1-\beta\rho)^2$. So, disagreement over taxes falls when identity switches from class to culture.

The variance of bliss points over q increases provided:

$$\begin{aligned} var\left(q_{\tilde{\psi}}^{\varepsilon\psi}\right) &> var\left(q_{\tilde{\varepsilon}}^{\varepsilon\psi}\right) \Longleftrightarrow \\ \left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2 \pi_{SP}\left(1-\pi_{SP}\right) &> \rho^2\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2 \pi_U\left(1-\pi_U\right). \end{aligned}$$

Note that by A1 $\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2 > \left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2 \rho^2$, so this variance increases if groups are similar in size. In particular, it increases for $\widehat{\varepsilon}=\widehat{\psi}$. More generally, this variance increases if ρ is low enough.

Finally, consider the correlation between bliss points over τ and q. To begin, we prove that $\frac{cov\left(\tau_{\tilde{\psi}}^{\varepsilon\psi}, q_{\tilde{\psi}}^{\varepsilon\psi}\right)}{var\left(q_{\tilde{\psi}}^{\varepsilon\psi}\right)} > \frac{cov\left(\tau_{\tilde{\varepsilon}}^{\varepsilon\psi}, q_{\tilde{\varepsilon}}^{\varepsilon\psi}\right)}{var\left(q_{\tilde{\varepsilon}}^{\varepsilon\psi}\right)}$. This is equivalent to:

$$\begin{aligned} &\frac{cov\left(\tau^{\varepsilon\psi}, q^{\varepsilon\psi}\right)+4\theta(1+\theta)\frac{(\beta-\rho)}{\varphi}\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)}{var\left(q^{\varepsilon\psi}\right)+4\theta(1+\theta)\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)} > \\ &\frac{cov\left(\tau^{\varepsilon\psi}, q^{\varepsilon\psi}\right)-4\theta(1+\theta)\left(\frac{1-\beta\rho}{\varphi}\right)\rho\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right)}{var\left(q^{\varepsilon\psi}\right)+4\theta(1+\theta)\rho^2\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right)}. \end{aligned}$$

This is equivalent to:

$$\begin{aligned} & cov\left(\tau^{\varepsilon\psi}, q^{\varepsilon\psi}\right)\rho^2\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right)+var\left(q^{\varepsilon\psi}\right)\frac{(\beta-\rho)}{\varphi}\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right) \\ &\quad +4\theta(1+\theta)\frac{(\beta-\rho)}{\varphi}\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)\rho^2\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right) > \\ & cov\left(\tau^{\varepsilon\psi}, q^{\varepsilon\psi}\right)\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)-var\left(q^{\varepsilon\psi}\right)\left(\frac{1-\beta\rho}{\varphi}\right)\rho\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right) \\ &\quad -4\theta(1+\theta)\left(\frac{1-\beta\rho}{\varphi}\right)\rho\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right)\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right). \end{aligned}$$

This can be written as:

$$
\begin{aligned}
& var\left(q^{\varepsilon\psi}\right)\left[\frac{(\beta-\rho)}{\varphi}\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)+\left(\frac{1-\beta\rho}{\varphi}\right)\rho\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right)\right] \\
& \quad +4\theta\left(1+\theta\right)\left(\frac{1-\rho^2}{\varphi}\right)\rho\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right) \quad > \\
& \quad cov\left(\tau^{\varepsilon\psi},q^{\varepsilon\psi}\right)\left[\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)-\rho^2\left(\overline{\varepsilon}_U-\overline{\varepsilon}_L\right)^2\pi_U\left(1-\pi_U\right)\right].
\end{aligned}
$$

When the two groups have equal size, $\widehat{\varepsilon}=\widehat{\psi}$, the condition simplifies to:

$$
\beta var\left(q^{\varepsilon\psi}\right)+4\theta\left(1+\theta\right)\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)\rho>\varphi cov\left(\tau^{\varepsilon\psi},q^{\varepsilon\psi}\right),
$$

which, after noticing that $\varphi cov\left(\tau^{\varepsilon\psi},q^{\varepsilon\psi}\right)=\beta var\left(q^{\varepsilon\psi}\right)-\rho$, it is equivalent to:

$$
4\theta\left(1+\theta\right)\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right)^2\pi_{SP}\left(1-\pi_{SP}\right)\rho>-\rho,
$$

which is fulfilled. Note that when $\widehat{\varepsilon}=\widehat{\psi}$, it is also the case that the correlation between preferences over redistribution and cultural policy increases with cultural identity, because:

$$
\frac{cov\left(\tau,q\right)}{\sqrt{var\left(q\right)var\left(\tau\right)}}=\frac{cov\left(\tau,q\right)}{var\left(q\right)}\frac{\sqrt{var\left(q\right)}}{\sqrt{var\left(\tau\right)}},
$$

and we already established that under cultural identity $var\left(q\right)$ increases and $var\left(\tau\right)$ decreases.

■

Proof of Proposition 6. Denote by $\left(\tau_d^G,q_d^G\right)$ the distorted bliss points of the average member of G when she is identified along $d=\tilde{\varepsilon},\tilde{\psi}$. Then, Equations (4), (13) and (14) imply:

$$
\begin{aligned}
\tau_d^G &= \tau^G+\theta\left(\tau^G-\tau^{\overline{G}}\right), \\
q_d^G &= q^G+\theta\left(q^G-q^{\overline{G}}\right).
\end{aligned}
$$

These in turn imply that policy disagreement among groups with which individuals identify is equal to:

$$\begin{aligned}
\tau_d^G - \tau_d^{\overline{G}} &= \left(\tau^G - \tau^{\overline{G}}\right)(1+2\theta), \\
q_d^G - q_d^{\overline{G}} &= \left(q^G - q^{\overline{G}}\right)(1+2\theta).
\end{aligned}$$

Next consider conflict between groups with which voters are not identified. Under class identity, the bliss points of the average social progressive and social conservative are equal to:

$$\begin{aligned}
\tau_{\tilde{\varepsilon}}^{SP} &= \tau^{SP} - \theta\frac{(1-\beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)}{\varphi}\pi_{U|SP} + \theta\frac{(1-\beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)}{\varphi}\pi_{L|SP}, \\
q_{\tilde{\varepsilon}}^{SP} &= q^{SP} + \theta\rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)\pi_{U|SP} - \theta\rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)\pi_{L|SP}, \\
\tau_{\tilde{\varepsilon}}^{SC} &= \tau^{SC} - \theta\frac{(1-\beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)}{\varphi}\pi_{U|SC} + \theta\frac{(1-\beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)}{\varphi}\pi_{L|SC}, \\
q_{\tilde{\varepsilon}}^{SC} &= q^{SC} + \theta\rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)\pi_{U|SC} - \theta\rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)\pi_{L|SC},
\end{aligned}$$

where $\pi_{X|Y}$ is the share of members of Y that belong to X. So, disagreement among cultural groups under class identity is:

$$\begin{aligned}
\tau_{\tilde{\varepsilon}}^{SP} - \tau_{\tilde{\varepsilon}}^{SC} &= \left(\tau^{SP} - \tau^{SC}\right) - 2\theta\frac{(1-\beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)}{\varphi}\left(\pi_{U|SP} - \pi_{U|SC}\right) \\
q_{\tilde{\varepsilon}}^{SP} - q_{\tilde{\varepsilon}}^{SC} &= \left(q^{SP} - q^{SC}\right) + 2\theta\rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)\left(\pi_{U|SP} - \pi_{U|SC}\right).
\end{aligned}$$

Under cultural identity disagreement among cultural groups in both dimensions is $(1+2\theta)$ times the rational disagreement. Thus, a switch from class to culture increases their disagreement over q provided:

$$\begin{aligned}
q_{\tilde{\psi}}^{SP} - q_{\tilde{\psi}}^{SC} &> q_{\tilde{\varepsilon}}^{SP} - q_{\tilde{\varepsilon}}^{SC} \Leftrightarrow \\
\left(q^{SP} - q^{SC}\right) &\equiv \left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right) > \rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)\left(\pi_{U|SP} - \pi_{U|SC}\right),
\end{aligned}$$

which is true by (A.1). Consider now disagreement over τ between cultural groups:

$$\begin{aligned}
\tau^{SP}_{\tilde{\psi}} - \tau^{SC}_{\tilde{\psi}} &\gtreqless \tau^{SP}_{\tilde{\varepsilon}} - \tau^{SC}_{\tilde{\varepsilon}} \Leftrightarrow \\
\left(\tau^{SP} - \tau^{SC}\right) &\gtreqless -\frac{(1-\beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)}{\varphi}\left(\pi_{U|SP} - \pi_{U|SC}\right) \quad \Leftrightarrow \\
(\beta - \rho)(\bar{\psi}^{SP} - \bar{\psi}^{SC}) &\gtreqless -(1-\beta\rho)(\pi_{U|SP} - \pi_{U|SC})\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)
\end{aligned}$$

Hence, $\tau^{SP}_{\tilde{\psi}} - \tau^{SC}_{\tilde{\psi}} > \tau^{SP}_{\tilde{\varepsilon}} - \tau^{SC}_{\tilde{\varepsilon}}$ if $\beta > \rho$, since $\pi_{U|SP} \geq \pi_{U|SC}$ given that $\rho \geq 0$.

Next, consider economic groups. Under class identity, the disagreement over tax rates and cultural policies between the average upper and lower class voters are $(1 + 2\theta)$ times their rational disagreement. Consider now disagreement under cultural identity. Bliss points are:

$$\begin{aligned}
\tau^U_{\tilde{\psi}} &= \tau^U + \theta\frac{(\beta-\rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)}{\varphi}\pi_{SP|U} - \theta\frac{(\beta-\rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)}{\varphi}\pi_{SC|U}, \\
q^U_{\tilde{\psi}} &= q^U + \theta\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\pi_{SP|U} - \theta\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\pi_{SC|U}, \\
\tau^L_{\tilde{\psi}} &= \tau^L + \theta\frac{(\beta-\rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)}{\varphi}\pi_{SP|L} - \theta\frac{(\beta-\rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)}{\varphi}\pi_{SC|L}, \\
q^L_{\tilde{\psi}} &= q^L + \theta\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\pi_{SP|L} - \theta\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\pi_{SC|L},
\end{aligned}$$

where $\pi_{X|Y}$ is the share of members of Y that belong to X. So, disagreement among economic classes under cultural identity is:

$$\begin{aligned}
\tau^L_{\tilde{\psi}} - \tau^U_{\tilde{\psi}} &= \left(\tau^L - \tau^U\right) - 2\theta\frac{(\beta-\rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)}{\varphi}\left(\pi_{SP|U} - \pi_{SP|L}\right) \\
q^L_{\tilde{\psi}} - q^U_{\tilde{\psi}} &= \left(q^L - q^U\right) - 2\theta\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\left(\pi_{SP|U} - \pi_{SP|L}\right).
\end{aligned}$$

As a result:

$$
\begin{aligned}
q^U_{\tilde{\psi}} - q^L_{\tilde{\psi}} &> q^U_{\tilde{\varepsilon}} - q^L_{\tilde{\varepsilon}} \Leftrightarrow \\
\left(q^U - q^L\right) &> \left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\left(\pi_{SP|U} - \pi_{SP|L}\right) \Leftrightarrow \\
\rho\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right) &> \left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\left(\pi_{SP|U} - \pi_{SP|L}\right),
\end{aligned}
$$

which is true if $\hat{\varepsilon} = \hat{\psi}$, since then $\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right) = \left(\pi_{SP|U} - \pi_{SP|L}\right)$ and $\rho > \left(\pi_{SP|U} - \pi_{SP|L}\right)$ given that (ε, ψ) is a standard bivariate normal (see Lemma 1 below). We also have:

$$
\begin{aligned}
\tau^L_{\tilde{\psi}} - \tau^U_{\tilde{\psi}} &< \tau^L_{\tilde{\varepsilon}} - \tau^U_{\tilde{\varepsilon}} \Leftrightarrow \\
-\frac{(\beta - \rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)}{\varphi}\left(\pi_{SP|U} - \pi_{SP|L}\right) &< \left(\tau^L - \tau^U\right),
\end{aligned}
$$

which is equivalent to

$$
-(\beta - \rho)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right)\left(\pi_{SP|U} - \pi_{SP|L}\right) < (1 - \beta\rho)\left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right),
$$

which is always true if $\widehat{\varepsilon} = \widehat{\psi}$ and hence $\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right) = \left(\overline{\varepsilon}_U - \overline{\varepsilon}_L\right)$. ■

Lemma 1. If $\hat{\varepsilon} = \hat{\psi} > 0$, then $\rho > \pi_{SP//U} - \pi_{SP//L}$

Proof. Let $a = \hat{\varepsilon} = \hat{\psi} > 0$. Recall that $\pi_{SP//U} = \Pr(\psi > a|\varepsilon > a)$, $\pi_{SP//L} = \Pr(\psi > a|\varepsilon \leq a)$, and that (ε, ψ) are normally distributed with mean 0, variance of 1 and correlation coefficient $\rho > 0$. Define

$$
g(\rho, a) := P(\psi > a|\varepsilon > a) - P(\psi > a|\epsilon < a) = \frac{P(\psi > a, \varepsilon > a)}{1 - \Phi(a)} - \frac{P(\psi > a, \varepsilon < a)}{\Phi(a)} \tag{34}
$$

Where $\Phi(a) := P(\psi < a)$. Now, we can write:

$$1 - \Phi(a) = P(\psi > a) = P(\psi > a, \varepsilon > a) + P(\psi > a, \varepsilon < a) \tag{35}$$

Then using (35) we can rewrite (34) as:

$$g(\rho, a) = \frac{P(\psi > a, \varepsilon > a)}{(1 - \Phi(a))\Phi(a)} - \frac{1 - \Phi(a)}{\Phi(a)} < \frac{P(\psi > a, \varepsilon > a)}{(1 - \Phi(a))\Phi(a)} \tag{36}$$

So, if we show that this last term is indeed smaller than ρ $\forall \rho \in (0, 1)$ then we are done. Clearly $g(0, a) = 0$ and $g(1, a) = 1$. Since at the extremes of the domain $\rho = g(\rho, a)$, we can show that (36) is smaller than ρ by showing that it is convex in ρ for $\rho \in (0, 1)$. Notice that only the numerator of (36) depends on ρ, hence we can compute:

$$\frac{\partial^2}{\partial \rho^2} \int_a^\infty \int_a^\infty \frac{1}{2\pi\sqrt{1 - \rho^2}} \exp\left(- \frac{x^2 + y^2 - 2\rho xy}{2(1 - \rho^2)} \right) dxdy \tag{37}$$

After computation we obtain:

$$\frac{e^{-\frac{a^2}{1+\rho}} (\rho - 1)^2 (\rho + 1)(a^2(1 - \rho) + \rho + \rho^2)}{2\pi(1 - \rho^2)^{\frac{7}{2}}} > 0 \tag{38}$$

with the inequality holding since $\rho < 1$.

We show hereafter the computation to get from (37) to (38):

$$
\begin{aligned}
& \frac{\partial^2}{\partial\rho^2}\int_a^\infty\int_a^\infty \frac{1}{2\pi\sqrt{1-\rho^2}}\exp\left(-\frac{x^2+y^2-2\rho xy}{2(1-\rho^2)}\right)dxdy \\
= & \int_a^\infty \frac{\partial}{\partial\rho}\int_a^\infty \frac{\partial}{\partial\rho}\frac{1}{2\pi\sqrt{1-\rho^2}}\exp\left(-\frac{x^2+y^2-2\rho xy}{2(1-\rho^2)}\right)dxdy \\
= & \int_a^\infty \frac{\partial}{\partial\rho}\int_a^\infty \left\{\frac{\rho\exp\left(-\frac{x^2+y^2-2\rho xy}{2(1-\rho^2)}\right)}{2\pi\left(1-\rho^2\right)^{3/2}}+\frac{\exp\left(-\frac{x^2+y^2-2\rho xy}{2(1-\rho^2)}\right)\left(\frac{xy}{1-\rho^2}-\frac{\rho\left(x^2+y^2-2\rho xy\right)}{\left(1-\rho^2\right)^2}\right)}{2\pi\sqrt{1-\rho^2}}\right\}dxdy \\
= & \int_a^\infty \frac{\partial}{\partial\rho}\int_a^\infty \exp\left(-\frac{x^2+y^2-2\rho xy}{2\left(1-\rho^2\right)}\right)\frac{-\rho^3+xy+\rho^2 xy-\rho(x^2+y^2-1)}{2\pi(1-\rho^2)^{\frac{5}{2}}}dxdy \\
= & \int_a^\infty \frac{\partial}{\partial\rho}\exp\left(-\frac{a^2+y^2-2\rho ay}{2\left(1-\rho^2\right)}\right)\frac{(-1+\rho^2)(a\rho-y)}{2\pi(1-\rho^2)^{\frac{5}{2}}}dy \\
= & \int_a^\infty -\exp\left(-\frac{a^2+y^2-2\rho ay}{2\left(1-\rho^2\right)}\right) \\
& \frac{-a^3\rho^2+a^2\rho(2+\rho^2)y-a(1+2\rho^2)(-1+\rho^2+y^2)+\rho y(-3+3\rho^2+y^2)}{2\pi(1-\rho^2)^{\frac{7}{2}}}dy \\
= & \frac{e^{-\frac{a^2}{1+\rho}}(\rho-1)^2(\rho+1)(a^2(1-\rho)+\rho+\rho^2)}{2\pi(1-\rho^2)^{\frac{7}{2}}}
\end{aligned}
$$

■

Appendix 2. Economic Foundations for ρ

Skill Biased Technical Change

We show that skilled biased technical change may increase the correlation between income and social progressiveness. Output is produced using the CES technology:

$$Y = \left[\gamma S^{\mu} + (1-\gamma) U^{\mu}\right]^{\frac{1}{\mu}}, \ \mu > 0, \ 0 \leq \gamma \leq 1$$

where μ captures the degree of substitution between skilled labor S and unskilled labor U. When $\gamma = 1/2$ the technology is skill neutral, when $\gamma > 1$ it is skill biased (when $\gamma < 1/2$ it is biased in favor of unskilled labor which, as we will see, has counterfactual implications).

Each voter is described by (s, u, ψ). s is the voter's expected endowment of skilled labor, u that of unskilled labor, which are normally distributed in the population around mean $(0, 0)$, variances $\sigma_s^2 = \sigma_u^2 = \sigma^2$, and covariance $\sigma_{su} = 0$. These assumptions on the variance covariance matrix are only made for simplicity and could be relaxed. ψ is normally distributed in the population with mean zero and $\sigma_{\psi}^2 = 1$. It also features covariances $\sigma_{s\psi} = \omega\sigma > 0$ and $\sigma_{u\psi} = 0$. Skilled labor is positively correlated with progressiveness, owing for instance to education. The average and hence aggregate endowment is $\overline{s} = \overline{u} = 1$.

Profit maximization at the aggregate endowment yields the skill premium:

$$\frac{\gamma}{1-\gamma}\left(\frac{\overline{s}}{\overline{u}}\right)^{\mu-1} = \frac{w_s}{w_u},$$

where w_s and w_u are the wages earned by one unit of skilled and unskilled labor, respectively. Given equal aggregate endowment, this yields:

$$\frac{\gamma}{1-\gamma} = \frac{w_s}{w_u}. \tag{39}$$

Output in the economy is equal to one, which is split between skilled and unskilled labor as follows:

$$w_s = \gamma, \;\; w_u = 1 - \gamma. \tag{40}$$

The worker's labor income is equal to:

$$\gamma s + (1 - \gamma)\, u,$$

which is normally distributed in the population with mean 1.

The variance of workers' income in society is equal to:

$$\sigma_\varepsilon^2 = \left[\gamma^2 + (1 - \gamma)^2\right] \sigma^2.$$

The covariance between income and social progressiveness is then equal to:

$$\sigma_{\varepsilon,\psi} = \gamma \omega \sigma. \tag{41}$$

Income and social progressiveness are positively correlated. Socially progressive voters have in fact a larger skill endowmnet, which translates into higher income, especially if the remuneration γ of skills is higher.

As the remuneration γ of skills increases, the correlation between income and social progressiveness increases because:

$$\frac{\partial}{\partial \gamma} \frac{\sigma_{\varepsilon,\psi}}{\sqrt{\sigma_\varepsilon^2}} = \frac{\omega \sigma^3 (1 - \gamma)}{\sigma_\varepsilon^3} > 0.$$

In the model of Section III, the variance of income and of social progressiveness are fixed at one. To apply Proposition 2 to this model, then, we need to consider an increase in skill bias γ that increases the correlation ρ while holding the variance of income constant. This experiment corresponds to a marginal increase in γ starting from a skill neutral technology $\gamma = 1/2$ (and assuming that σ^2 is such that $\sigma_\varepsilon^2 = 1$). In fact, $\partial \sigma_\varepsilon^2 / \partial \gamma = 2\,(2\gamma - 1)\,\sigma^2$, which is zero at $\gamma = 1/2$.

More generally, higher skill bias γ increases ρ as well as σ_ε^2. The latter effect, if strong, may favor class identity. Thus, skilled biased technical change favors cultural identity provided the new technology exerts a strong upward effect on correlation ρ and a weaker, albeit possibly positive, effect on income inequality σ_ε^2.

Globalization

We now show that openness to trade can also increase the correlation between income and social progressiveness if voters working in import competing sectors are more conservative. A voter's utility from private consumption is:

$$c_n + U\left(c_x\right) + U\left(c_m\right),$$

where c_n is consumption of a non-tradeable good, c_x is consumption of the exported good, c_m is consumption of the imported good, where $U\left(c\right) = ac - c^2/2$, where $a > 1$. All voters have an equal endowment of one unit of the non-tradeable good. Each voter is also endowed with x units of labor in the export sector and m units of labor in the import sector. Labor endowments vary across voters.

Specifically, x and m are normally distributed around $\overline{x} = \overline{m} = 1/2$ with equal variance σ^2 and covariance $\sigma_{xm} = 0$ (these assumptions on the variance covariance matrix are also made for simplicity only). Labor is transformed into goods one to one. Labor endowments are correlated with a voter's culture ψ. In particular, export sector labor is positively correlated with progressiveness, $cov\left(\psi, x\right) = \omega\sigma > 0$, while $cov\left(\psi, m\right) = 0$.

A voter is described by (x, m, ψ). The government levies distortionary taxes on labor income. Nothing substative changes if also the nontradeable good is taxed (we only need to adjust the level of the aggregate nontradeable and labor endowments). The public good is in terms of the nontradeable good.

In autarky, the prices of the tradeable goods in terms of the non-tradeable good are given by:

$$p_x = p_m = a - 1/2.$$

We assume for simplicity that the two goods have the same autarky price $p = 1$, i.e. $a = 3/2$. If the country opens up, the prices of tradeable goods change (we can think of "opening up" as the coordinated removal of non tariff barriers to imports by many countries). As in the case of skilled biased technical change, we consider price changes that leave total income constant: the price of the export goods increases by $dp_x > 0$, that of the import good decreases by the same amount, $dp_m = -dp_x$. This implies that the income of a generic voter is equal to:

$$x + m + dp_x (x - m),$$

where $dp_x = 0$ corresponds to autarky. Higher dp_x signifies more openness.

The variance of income in society is equal to:

$$\sigma_\varepsilon^2 = \left[(1 + dp_x)^2 + (1 - dp_x)^2\right] \sigma^2.$$

The covariance between income and social progressiveness is then equal to:

$$\sigma_{\varepsilon,\psi} = (1 + dp_x) \omega\sigma. \tag{42}$$

Income and social progressiveness are positively correlated, the more so the higher is openness dp_x. Socially progressive voters have in fact a larger export sector endowment, which translates into higher income, especially if the premium dp_x for the export good is higher.

As openness dp_x increases, the correlation between income and social progressiveness increases because:

$$\frac{\partial}{\partial dp_x} \frac{\sigma_{\varepsilon,\psi}}{\sqrt{\sigma_\varepsilon^2}} = \frac{2\omega\sigma^3}{\sigma_\varepsilon^3} (1 - dp_x),$$

which is positive (if $dp_x > 1$ the price of the import good would be negative).

Once again, to stay within the model fo Section III, consider an increase in dp_x that increases the correlation ρ while holding the variance of income constant. This experiment corresponds to a marginal increase in dp_x starting from autarky $dp_x = 0$ (and assuming that σ^2 is such that $\sigma_\varepsilon^2 = 1$). In fact, $\partial\sigma_\varepsilon^2/\partial dp_x = 2dp_x\sigma^2$, which is zero at $dp_x = 0$.

Thus, openness to trade can cause a switch to cultural identity. Note that this property is not generic to all trade shock. It is only true if openness to trade hurts conservative voters while it benefits progressive voters. Furthermore, even if the trade shock increases ρ, for a large price change dp_x it will also increase σ_ε^2. The latter effect, if strong, may favor class identity. In general, trade shocks that hurt conservative voters favor cultural identity provided they exert a strong upward effect on correlation ρ and a weaker, albeit possibly positive, effect on inequality σ_ε^2.

Appendix 3. Multidimensional Identity

A voter is captured by (ψ, ε) as before. The voter can identify with her income group $I = U, L$, or her cultural group $C = SP, SC$, but we now also allow her to identify with her income *and* cultural group (I, C). We call this latter case "joint identity." Each group G is summarized by its income-culture type $(\overline{\varepsilon}_G, \overline{\psi}_G)$. Under joint identity, the type of $G = (I, C)$ is $(\overline{\varepsilon}_I, \overline{\psi}_C)$, where $\overline{\varepsilon}_I$ is the average income of class I and $\overline{\psi}_C$ is the average culture of C. Note that this assumption implies that the narrow group, say (U, SP), is summarized by an individual with income $\overline{\varepsilon}_U$ and culture $\overline{\psi}_{SP}$. These two prototypical levels of income and culture do not in general correspond to the average income and the average culture of the group (U, SP).

Ingroup vs. Outgroup Types

In Section III voters are more likely to identify with $G = I, C$ the larger the income and cultural differences between it and the outgroup $\overline{G}$. This is also true with respect to joint identity $G = (I, C)$. Before studying identification, we characterize ingroup-outgroup differences under joint identity. As we will see, relative to the broader groups $G = I, C$, joint identity reduces ingroup-outgroup differences in income, culture, or both. This renders joint identity $G = (I, C)$ less appealing relative to identity with broader groups.

Denote by $\left(\overline{\varepsilon}_{\overline{(I,C)}}, \overline{\psi}_{\overline{(I,C)}}\right)$ the outgroup of $G = (I, C)$. This is the average income and cultural type of the other three quadrants, formally:

$$\overline{\varepsilon}_{\overline{(I,C)}} \equiv \frac{\sum_{(I',C')\neq(I,C)} \pi_{I',C'} \cdot \overline{\varepsilon}_{I'}}{\sum_{(I',C')\neq(I,C)} \pi_{I',C'}} = \frac{\pi_{I,\overline{C}}\overline{\varepsilon}_I + \pi_{\overline{I}}\overline{\varepsilon}_{\overline{I}}}{1 - \pi_{I,C}}, \tag{43}$$

$$\overline{\psi}_{\overline{(I,C)}} \equiv \frac{\sum_{(I',C')\neq(I,C)} \pi_{I',C'} \cdot \overline{\psi}_{C'}}{\sum_{(I',C')\neq(I,C)} \pi_{I',C'}} = \frac{\pi_{\overline{I},C}\overline{\psi}_C + \pi_{\overline{C}}\overline{\psi}_{\overline{C}}}{1 - \pi_{I,C}}. \tag{44}$$

Outgroup income in (43) averages the income of the outgroup class $\overline{\varepsilon}_{\overline{I}}$ and the income $\overline{\varepsilon}_I$

of the ingroup class. The latter owes to the share $\pi_{I,\overline{C}}$ of voters who are culturally different but economically similar to (I, C). Similarly, outgroup culture in (44) averages the values $\overline{\psi}_{\overline{C}}$ of the cultural outgroup with those of the cultural ingroup $\overline{\psi}_C$. The latter owes to the share $\pi_{\overline{I},C}$ of voters who are culturally similar but economically different from (I, C).

Using Equations (43) and (44), the income and cultural differences between ingroup (I, C) and outgroup, $\overline{(I, C)}$, are equal to:

$$\overline{\varepsilon}_{(I,C)} - \overline{\varepsilon}_{\overline{(I,C)}} = \frac{\pi_{\overline{I}}}{1 - \pi_{I,C}} \left(\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}\right), \tag{45}$$

$$\overline{\psi}_{(I,C)} - \overline{\psi}_{\overline{(I,C)}} = \frac{\pi_{\overline{C}}}{1 - \pi_{I,C}} (\overline{\psi}_C - \overline{\psi}_{\overline{C}}). \tag{46}$$

Income and cultural differences with outgroups load onto class inequality $(\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}})$ and cultural inequality $(\overline{\psi}_C - \overline{\psi}_{\overline{C}})$, respectively. Under broader identities, $G = I, C$, these differences load on the dimension of identification (income for $G = I$ and culture for $G = C$) according to the correlation coefficient ρ. Under joint identity, conflict depends on purer income and cultural differences in society.

Crucially, income and cultural differences with the outgroup are muted. Under joint identity income differences are smaller than under class identity, $\left|\overline{\varepsilon}_{(I,C)} - \overline{\varepsilon}_{\overline{(I,C)}}\right| < |\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}|$, and cultural differences are smaller than under cultural identity $\left|\overline{\psi}_{(I,C)} - \overline{\psi}_{\overline{(I,C)}}\right| < \left|\overline{\psi}_C - \overline{\psi}_{\overline{C}}\right|$. This occurs because under joint identity some outgroups are similar to ingroups (captured by $\pi_{\overline{I}} / (1 - \pi_{I,C}) < 1$ and $\pi_{\overline{C}} / (1 - \pi_{I,C}) < 1$).

How does joint identity (I, C) fare in terms of ingroup-outgroup cultural differences compared to class identity $G = I$? And how does it fare in terms of income differences compared to cultural identity $G = C$? The answer depends on whether the voter belongs to a quadrant (I, C) that exhibits positive correlation between income and culture $(\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}) \left(\overline{\psi}_C - \overline{\psi}_{\overline{C}}\right) > 0$ – i.e. when the voter is conservative-lower class (L, SC) or progressive-upper class (U, SP) – or to a quadrant that exhibits negative correlation $(\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}) \left(\overline{\psi}_C - \overline{\psi}_{\overline{C}}\right) < 0$, i.e. when the voter is progressive-lower class (L, SP) or conservative-upper class (U, SC).

LEMMA 2. There are two cases:

(i) If $(\varepsilon - \overline{\varepsilon}_I)\left(\psi - \overline{\psi}_C\right) > 0$, the following occurs. The cultural difference between ingroup $G = (C, I)$ and its outgroup has the same sign as $\left(\overline{\psi}_I - \overline{\psi}_{\overline{I}}\right)$, and it is larger in magnitude than the latter if and only if $\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| < \frac{1}{\rho}\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}$. The income difference between ingroup $G = (C, I)$ and its outgroup has the same sign as $(\overline{\varepsilon}_C - \overline{\varepsilon}_{\overline{C}})$, and it is larger in magnitude than the latter if and only if $\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| > \rho\frac{1-\pi_{I,C}}{\pi_{\overline{I}}}$.

(ii) If $(\varepsilon - \overline{\varepsilon}_I)\left(\psi - \overline{\psi}_C\right) < 0$, the following occurs. The cultural difference between ingroup $G = (C, I)$ and its outgroup has the opposite sign of $\left(\overline{\psi}_I - \overline{\psi}_{\overline{I}}\right)$. The income difference between ingroup $G = (C, I)$ and its outgroup has the opposite sign of $(\overline{\varepsilon}_C - \overline{\varepsilon}_{\overline{C}})$.

Simply put: in the positive correlation quadrants, which are the most relevant ones given the positive correlation between ε and ψ, joint identity preserves the direction of ingroup vs. outgroup differences relative to broader income and cultural groups. In the negative correlation quadrants, the effect of joint identity is more drastic: it changes the direction of ingroup vs outgroup conflict along one dimension. With respect to class identity, joint identity reverses cultural conflict with the outgroup. With respect to cultural identity, it reverses income conflict with the outgroup. The benefit of joint identity is that it better captures the distinctive cultural and income traits of each quadrant. As we will see, this implies that joint identity is favored in the negative correlation quadrants (L, SP) and (U, SC).

In sum, joint identity dilutes ingroup vs. outgroup conflict along the "primary" dimension along which the broader group is defined. In addition, joint identity better captures conflict along the "secondary" dimension in the negative correlation quadrants. These aspects turn critical for characterizing the identity regime and beliefs.

Identity Choice

A voter chooses the group $G = I, C, (I, C)$ maximizing group contrast:

$$C\left(G, \overline{G}\right) \simeq (\overline{\varepsilon}_G - \overline{\varepsilon}_{\overline{G}})^2 + \left(\beta^2 + \widehat{\kappa}\right)(\overline{\psi}_G - \overline{\psi}_{\overline{G}})^2 - 2\beta(\overline{\varepsilon}_G - \overline{\varepsilon}_{\overline{G}})(\overline{\psi}_G - \overline{\psi}_{\overline{G}}), \tag{47}$$

where $\left(\overline{\varepsilon}_{\overline{G}}, \overline{\psi}_{\overline{G}}\right)$ is the outgroup type. By inserting in Equation (47) the ingroup vs outgroup differences under different identities, we derive the following result.

Proposition 7. Suppose that the correlation between income and culture is sufficiently low, $\rho \leq \rho^*$, and that $\left(\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right) < 2\frac{\pi_{SC}}{\pi_L}$. Then:

(i) All voters in the positive correlation quadrants (L, SC) and (U, SP) never choose joint identity. They identify with their class when $\widehat{\kappa} < \widehat{\alpha}$ and with their culture otherwise.

(ii) All voters in the negative correlation quadrants (L, SP) and (U, SC) choose cultural identity when $\widehat{\kappa} \geq \widehat{\widehat{\alpha}}$, but some of them may choose class or joint identity if $\widehat{\kappa} < \widehat{\widehat{\alpha}}$, where $\widehat{\widehat{\alpha}} \geq 0$.

When the correlation ρ between income and culture is sufficiently low and when income conflict is sufficiently low relative to cultural conflict, $\left(\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right)$ is low enough, the possibility of joint identity does not affect the main patterns of identification. First people in the positive correlation quadrants (L, SC) and (U, SP) identify with their class or their cultural group, as if joint identity was not available ($\widehat{\alpha}$ is the same threshold of Section III).[1] Second, voters in the negative correlation quadrants (L, SP) and (U, SC) choose cultural identity provided the importance of cultural policy $\widehat{\kappa}$ is high enough. Below threshold $\widehat{\widehat{\alpha}}$, these voters may

[1]When correlation ρ is low, voters in the positive quadrants align according to the most salient issue of the moment, maximizing contrast there. If correlation ρ becomes high but not perfect, joint identity may become fitting because the dampening factors $\frac{\pi_{\overline{I}}}{1-\pi_{I,C}}$ and $\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}$ get closer and closer to one. However note that, as ρ gets higher and higher, all identities become similar to each other.

choose joint identity, or they may choose class identity for very low $\widehat{\kappa}$ and joint identity for intermediate $\widehat{\kappa}$. In general though, and consistent with our main model, higher $\widehat{\kappa}$ reduces the prevalence of class identity and increases the prevalence of cultural identity.[2]

Intuitively, voters in the negative correlation quadrants are most attracted by joint identity. A progressive lower class voter dislikes class identity due to its conservative trait, and dislikes cultural identity due to its upper class trait. She may thus identify with the narrower progressive-lower class group. The same principle holds for a conservative-upper class voter.

Identity Switches, Changes in Beliefs and in Policy Demands

Consider the effect of higher salience of cultural policy $\widehat{\kappa}$. Higher $\widehat{\kappa}$ causes voters in the positive correlation quadrants (L, SC) and (U, SP) to switch from class to cultural identity when $\widehat{\kappa}$ crosses $\widehat{\alpha}$. Thus, the beliefs and preferences of these voters mimic those in our main model.

Consider voters in the negative correlation quadrants (L, SP) and (U, SC). As $\widehat{\kappa}$ becomes large, these voters switch to cultural identity, from either joint or class identity. If the switch is from class to culture, the results are the same as in Section III. If they switch joint to cultural identity, the results are described below.

Proposition 8. Consider voters in quadrants (L, SP) and (U, SC). Under joint identity, their beliefs about income and culture are equal to:

$$\begin{aligned}
\varepsilon^{\theta}_{L,SP} &= \varepsilon + \theta\left(\frac{\pi_U}{1-\pi_{L,SP}}\right)(\overline{\varepsilon}_L - \overline{\varepsilon}_U) \quad \psi^{\theta}_{L,SP} = \psi + \theta\left(\frac{\pi_{SC}}{1-\pi_{L,SP}}\right)\left(\overline{\psi}_{SP} - \overline{\psi}_{SC}\right), \\
\varepsilon^{\theta}_{U,SC} &= \varepsilon + \theta\left(\frac{\pi_L}{1-\pi_{U,SC}}\right)(\overline{\varepsilon}_U - \overline{\varepsilon}_L) \quad \psi^{\theta}_{U,SC} = \psi + \theta\left(\frac{\pi_{SP}}{1-\pi_{U,SC}}\right)\left(\overline{\psi}_{SC} - \overline{\psi}_{SP}\right).
\end{aligned}$$

If $\widehat{\kappa}$ increases enough that the identity of these voters switches to culture, their beliefs

[2]In the current model class identity may never be chosen, even if $\widehat{\kappa} = 0$, because cultural disagreement is more important than income disagreement: it affects preferences over both redistributive and cultural policy.

change to:

$$\begin{aligned}
\varepsilon_{L,SP}^{\theta} &\rightarrow \varepsilon_{SP}^{\theta}=\varepsilon+\theta\rho\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right) \quad \psi_{L,SP}^{\theta}\rightarrow\psi_{SP}^{\theta}=\psi+\theta\left(\overline{\psi}_{SP}-\overline{\psi}_{SC}\right), \\
\varepsilon_{U,SC}^{\theta} &\rightarrow \varepsilon_{SC}^{\theta}=\varepsilon+\theta\rho\left(\overline{\psi}_{SC}-\overline{\psi}_{SP}\right) \quad \psi_{U,SC}^{\theta}\rightarrow\psi_{SC}^{\theta}=\psi+\theta\left(\overline{\psi}_{SC}-\overline{\psi}_{SP}\right).
\end{aligned}$$

Provided ρ is low enough, income conflict among these voters dampens, formally $\varepsilon_{SC}^{\theta} < \varepsilon_{U,SC}^{\theta}$ and $\varepsilon_{SP}^{\theta} > \varepsilon_{L,SP}^{\theta}$, while cultural conflict accentuates, formally $\psi_{SC}^{\theta} < \psi_{U,SC}^{\theta}$ and $\psi_{SP}^{\theta} > \psi_{L,SP}^{\theta}$.

A switch from joint to cultural identity triggers the same change in beliefs as a switch from class to cultural identity in our main model. Provided ρ is low enough, as the progressive-lower class voters abandon their narrow group and become culturally identified, their income extremism weakens and their cultural progressiveness magnifies. Likewise, as the conservative-upper class voters leave their narrow group and identify with their culture, they become less polarized on income and more polarized on their conservatism. In terms of policy preferences, polarization in the demand for redistribution may go up or down, while polarization over cultural policy goes up. Views on cultural policy and redistribution become more correlated, because culture is a more important determinant of both views.

We cannot fully characterize the identity regime of voters in the negative correlation quadrants, so we cannot rule out the possibility that, as the salience of cultural policy $\widehat{\kappa}$ increases from low to intermediate, their identity switches from class to joint. Even in this case, however, there is a monotonic shift towards lower income conflict and stronger cultural conflict.

To see this, consider the (L, SP) voters first. As their identity switches from class to joint, their beliefs about income switch from the lower class prospect ε_{L}^{θ} to the less pessimistic joint prospect $\varepsilon_{L,SP}^{\theta}$. Along cultural values, the same voters switch from the mildly socially conservative stance of the lower class ψ_{L}^{θ} (which is especially mild if ρ is small), to the strongly socially progressive stance $\psi_{L,SP}^{\theta}$. Thus, their cultural preferences become more extreme and more correlated with preferences over taxes.

Consider next the voters in (U, SC). As they switch from income to joint identity, they abandon the upper class income prospect ε_U^θ and embrace the less optimistic prospect of their narrower group $\varepsilon_{U,SC}^\theta$. They also switch from the mild progressiveness of the upper class ψ_U^θ (which is especially mild if ρ is small), to a strongly conservative stance $\psi_{L,SC}^\theta$. Also these voters, then, become economically less extreme, culturally more extreme, and more correlated in their economic and cultural preferences.[3]

The bottom line is simple: both types of voters behave similarly as if they were switching from economic to cultural identity: their income polarization drops, their cultural extremism increases. Joint identity can thus be viewed as an intermediate stage between income and cultural identity. Voters choose it when neither of the two dimensions is salient enough, but it preserves a monotonic progression from income to cultural conflict as the salience of cultural policy $\widehat{\kappa}$ increases.

Proof of Proposition 7. The contrast under income, cultural, and joint identification is respectively equal to: ■

$$C\left(I, \overline{I}\right) = (\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}})^2 \left[(1-\beta\rho)^2 + \widehat{\kappa}\rho^2\right], \tag{48}$$

$$C\left(C, \overline{C}\right) = (\overline{\psi}_C - \overline{\psi}_{\overline{C}})^2 \left[(\beta-\rho)^2 + \widehat{\kappa}\right], \tag{49}$$

$$C\left[(I,C), \overline{(I,C)}\right] = \tag{50}$$

$$= (\overline{\psi}_C - \overline{\psi}_{\overline{C}})^2 \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[\left(\beta - (2I_{>0}-1)\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right)^2 + \widehat{\kappa}\right] \tag{51}$$

where $I_{>0}$ is a dummy variable equal to 1 if the voter belongs to a group (I, C) featuring positive correlation between attributes, $(\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}})(\overline{\psi}_C - \overline{\psi}_{\overline{C}}) > 0$, and equal to zero in the negative correlation case.

[3] It is immediate to see that this argument is also valid for voters located in the positive correlation quadrants when ρ is high enough that even these voters may choose joint identity when $\widehat{\kappa}$ is intermediate. Overall, then, even if joint identity is allowed for, an increases in $\widehat{\kappa}$ exerts very similar effects to those in our main model.

By using (48) and (50), one finds that the voter at (I, C) prefers class identity to joint identity iff:

$$\widehat{\kappa} \leq \alpha_*(I,C) \equiv \frac{\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 (1-\beta\rho)^2 - \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[\beta - (2I_{>0}-1)\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right]^2}{\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2}, \tag{52}$$

where we assume that $\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2 > 0$ for all (I, C). This latter condition is satisfied provided ρ is low enough. Indeed, $\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2$ is equal to zero when $\rho = 0$ and increases in ρ until $\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 > 0$. The term $\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2$ starts positive, it then increases in ρ for $I_{>0} = 1$ and decreases in ρ for $I_{>0} = 0$. At $\rho = 1$ we have $\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 < 1$. Thus, for $\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \geq 1$ (which we have assumed in Propositions 4, 5 and 6), there is threshold $\rho_1 > 0$ such that, for $\rho \leq \rho_1$, we have $\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2 > 0$.

By using (49) and (50), one finds that the voter at (I, C) prefers cultural to joint identity iff:

$$\widehat{\kappa} \geq \alpha^*(I,C) \equiv \frac{\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[\beta - (2I_{>0}-1)\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right]^2 - (\beta-\rho)^2}{1 - \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2}. \tag{53}$$

On the basis of our prior analysis, and in particular owing to Proposition 2, it is evident that for $\widehat{\kappa} > \max[\widehat{\alpha}, \alpha^*(I,C)]$ all voters belonging to (I, C) identify culturally. By the same token, for $\widehat{\kappa} \leq \min[\widehat{\alpha}, \alpha_*(I,C)]$, all voters belonging to (I, C) identify with their class. In these cases, voters in (I, C) behave identically to the voters in our baseline model.

Consider now the two separate leading cases. First, the case in which (I, C) features positive correlation, $(\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}})(\overline{\psi}_C - \overline{\psi}_{\overline{C}}) > 0$, namely $I_{>0} = 1$. In this case, one can rule out joint identity by imposing:

$$\begin{aligned}
\alpha^*(I,C) &< \alpha_*(I,C) \\
\frac{\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[\beta - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right]^2 - (\beta-\rho)^2}{1 - \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2} &< \frac{\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 (1-\beta\rho)^2 - \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[\beta - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right]^2}{\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2},
\end{aligned}$$

which is equivalent to:

$$\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[\beta - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right]^2 \left[1 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2\right] <$$
$$(1-\beta\rho)^2 \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \left[1 - \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2\right] + (\beta-\rho)^2 \left[\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2\right].$$

A sufficient condition for the above inequality is that:

$$\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[\beta - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right]^2 \left[1 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2\right] < (1-\beta\rho)^2 \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \left[1 - \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2\right],$$

which can in turn be written as:

$$\left(\frac{\beta - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}}{1-\beta\rho}\right)^2 \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[1 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \rho^2\right] < \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|^2 \left[1 - \left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2\right].$$

The first term in round brackets on the left hand side increases in β provided $\rho \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}} \leq 1$. We assume for now that this is the case. This implies that if the inequality hods at $\beta = 1$, it also holds at any $\beta < 1$. As a result, given $\left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \geq 1$, a sufficient condition is in turn:

$$\left(\frac{\pi_{\overline{C}}}{1-\pi_{I,C}}\right)^2 \left[1 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right]^2 < (1-\rho)^2,$$

which leads to the even more stringent condition:

$$\left(1 - \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right)^2 < (1-\rho)^2,$$

which is equivalent to:

$$\rho < \left|\frac{\overline{\varepsilon}_I - \overline{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right| \left(\frac{\pi_{\overline{I}}}{\pi_{\overline{C}}}\right) < 2-\rho.$$

Under the maintained assumption $\pi_L \geq \pi_{SC}$ and hence $\left(\frac{\bar{\varepsilon}_U - \bar{\varepsilon}_L}{\overline{\psi}_{SP} - \overline{\psi}_{SC}}\right) \geq 1$, considering quadrants (U, SP) and (L, SC) this condition becomes:

$$\rho < \rho_2 \equiv \min\left[\left|\frac{\bar{\varepsilon}_I - \bar{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|\left(\frac{\pi_U}{\pi_{SP}}\right), 2 - \left|\frac{\bar{\varepsilon}_I - \bar{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|\left(\frac{\pi_L}{\pi_{SC}}\right)\right],$$

which can be fulfilled provided the necessary condition $2 > \left|\frac{\bar{\varepsilon}_I - \bar{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|\left(\frac{\pi_L}{\pi_{SC}}\right)$ is satisfied, which we assume to be the case. We also have the previous condition $1 \leq \rho\left|\frac{\bar{\varepsilon}_I - \bar{\varepsilon}_{\overline{I}}}{\overline{\psi}_C - \overline{\psi}_{\overline{C}}}\right|\left(\frac{\pi_L}{\pi_{SC}}\right)$ ensuring sufficiency for evaluating the inequality at $\beta = 1$. This condition boils down to $\rho \leq \rho_3$, where ρ_3 is a suitable threshold. This implies that, provided $\rho < \rho^* \equiv \min(\rho_1, \rho_2, \rho_3)$, voters in the quadrants (U, SP) and (L, SC) never choose joint identity and hence behave exactly as in the main model.

Consider now the case in which (I, C) features negative correlation, $(\bar{\varepsilon}_I - \bar{\varepsilon}_{\overline{I}})(\overline{\psi}_C - \overline{\psi}_{\overline{C}}) < 0$, namely $I_{>0} = 0$. By inspecting Equation (50) and by comparing it with (48) and (49) one can see that it is not possible to rule out joint identity. In particular, even if $\rho < \rho^*$, it is possible that for sufficiently low levels of $\widehat{\kappa}$ joint identity prevails over class identity for voters in this quadrant. It is in particular not possible to find conditions that ensure that $\alpha^*(I, C) < \alpha_*(I, C)$ is positive for all $\rho < \rho^*$. Thus, there exist parameter constellations in which, provided $\widehat{\kappa}$ is low enough, joint identity prevails. Of course, as $\widehat{\kappa}$ becomes large enough that $\widehat{\kappa} > \widehat{\widehat{\alpha}} \equiv \max[\alpha^*(U, SC), \alpha^*(L, SP)]$, cultural identity prevails in all these quadrants.

Appendix 4. Empirical Analysis

Trends in Political Conflict: PEW and ANES

The data used to create Figure II are publicly available on the *Pew Research Center* website. Specifically, we use data from the following surveys: *June 2018 Political Survey*, *January 2017 Political Survey*, *December 2015 Political Survey*, *December 2014 Political Survey*, *March 2012 Political Survey*, *December 2011 Political Survey*, *February 2010 Political Survey*, *February 2009 Political and Economic Survey*, *January 2008 Political Survey*, *September 2007 Political Survey*, *January 2006 News Interest Index*, *January 2005 News Interest Index*, *July 2004 Foreign Policy and Party Images*, *April 2003 Iraq Poll*, *February 2001 News Interest Index.* All such surveys are conducted on nationally representative samples of US adults aged 18 or more, with size ranging from 1303 individuals in 2010 to 2009 individuals in 2004. Survey weights are used to enhance representativeness at national level.

For the analysis of the most important problem we rely on the following question: "What do you think is the most important problem facing the country today? [Record up to three responses, in order of mention]." The question is open-ended, but in the public release of the datasets answers have been classified in roughly 55 macro categories, with only minor changes in classification over time. We further aggregate the categories "Abortion" and "Rights of Women Under Attack/Rolling Back" in the macro category "Abortion and Women Rights." To create the trends, we consider for each of the selected issues the share of respondents including such issue among their first three mentions.

All other figures use data from the *American National Election Studies* (ANES), and in particular of the surveys carried out in 1996, 1998, 2000, 2004, 2008, 2012 and 2016. We use the version of the variables available in the cumulative dataset of December 2018, and complement such information with data from the yearly releases when required. Following standard practice of dynamic analyses on ANES, we restrict the analysis to the Face-to-Face sample. Results are robust if we add the WEB sample, available for years 2012 and 2016.

Given that the target population of the analysis consists of all adult individuals living in the US, in computing moments (means, variances, correlations) and running regressions we use individual survey weights, which ensure that the sample is representative of the US adult population, at national level. Individual survey weights are rescaled so that each wave/year has a cumulative weight of one. Yearly sample sizes range from roughly 1200 individuals in 2004 to about 2300 individuals in 2008. Below we describe the questions and variables used in the analysis.

To measure policy opinions we rely on the following questions:

Redistr. Spending "Some people think the government should provide fewer services, even in areas such as health and education, in order to reduce spending. Other people feel that it is important for the government to provide many more services even if it means an increase in spending. Where would you place yourself on this scale?" Answers are given on a seven-point scale, and recoded so that the variable is increasing in respondents' desired size of government.

Redistr. Assist "Some people feel that the government in Washington should see to it that every person has a job and a good standard of living. Others think the government should just let each person get ahead on their own. Where would you place yourself on this scale?" Answers are given on a seven-point scale, and recoded so that the variable is increasing in respondents' desired government assistance.

Immigration "Do you think the number of immigrants from foreign countries who are permitted to come to the United States to live should be [1. increased a lot; 2. increased a little; 3 left the same as it is now; 4 decreased a little; 5. decreased a lot]?" Answers are in a scale from 1 to 5, following the order in which they appear in the question. We reverse the scale so that higher values correspond to more liberal views.

Race Relations Index constructed from the following two questions (Group Thermometer): "Still using the thermometer, how would you rate the following group: Blacks." "Still using the thermometer, how would you rate the following group: Whites." Answers are collected on a 0-100 scale, and answers higher than 97 are coded as 97 by the ANES staff. 0 represents the "coldest" (most averse) feelings, while 100 is "warmest" feelings. Our index of race relations is simply the difference between the rating given to black people and the one given to white people.

Abortion "There has been some discussion about abortion during recent years. Which one of the opinions on this page best agrees with your view? You can just tell me the number of the opinion you choose. [1. By law, abortion should never be permitted; 2. The law should permit abortion only in case of rape, incest, or when the woman's life is in danger; 3. The law should permit abortion for reasons other than rape, incest, or danger to the woman's life, but only after the need for the abortion has been clearly established; 4. By law, a woman should always be able to obtain an abortion as a matter of personal choice]."

Using the questions described above, we construct the following indexes, based on the polychoric correlation matrix computed pooling the seven waves together.

Redistribution First polychoric principal component extracted from "Redistr. Spending" and "Redistr. Assist." It correlates positively with both measures.

Culture First polychoric principal component extracted from "Immigration", "Race Relations" and "Abortion." It correlates positively with all three measures.

Each of the two principal components described above is then regressed on individual party affiliation and wave fixed effects using the following regression, estimated with OLS,

$$y_i = \alpha + \alpha_t + \sum_{g \in \{D,R\}} \gamma_{gt} party_g + \epsilon_i$$

where y_i is the attitude/preference of individual i, α_t are wave fixed effects, $party_g$ are group dummy variables for people identifying as Democrats or Republicans (the omitted category being political independents); the coefficients of these group dummies, γ_{gt}, are wave-specific. We use standardized residuals from these regressions as our final measures of individual policy opinions/preferences in all the analyses carried out on ANES data, except for figures A.1, A.2, A.5, A.6 and panels (b) and (c) of Figure A.7. In Figure A.1, we use the variables "Redistribution" and "Culture" without residualizing; in Figure A.2, the sample is restricted to people who identify as Independents, and therefore we do not residualize. In Figure A.5 and in panel (b) of Figure A.7 we do not condition on party affiliation, but only on wave fixed effects. The latter are used to highlight the trends in contrast between different groups in each year. Similarly, in Fugure A.6 and in panel (c) of Figure A.7, when focusing on political independents, we use residuals after conditioning on wave fixed effects only. Prior to plotting the trends of figures I, IV, A.1, A.2, A.5, A.6 and Figure A.7, "Redistribution" and "Culture" (or the corresponding residuals) are standardized to have zero mean and unit variance on the pooled sample (1996–2016).

Note that in Figure A.3 and and Figure A.4, we look at yearly differences in average thermometers between social groups, the residualization of thermometer variables on wave fixed effects is redundant. See the definition of "Affective Cultural Polarizarion" and "Affective Class Polarization" (below) for a description of the construction of figures III, A.3 and A.4.

The other variables used in the analysis are the following:

Class "There's been some talk these days about different social classes. Most people say they belong either to the middle class or the working class. Do you ever think of yourself as belonging in one of these classes?" Depending on the answer, the following follow-up questions are asked: (i) "Well, if you had to make a choice, would you call yourself middle class or working class?"; (ii) "Well, if you had to make a choice, would you call yourself middle class or working class?"; (iii) "Would you say that you are about average middle/working class or that you are in the upper part of the middle/working class?" We aggregate answers "Lower Class (Volunteered)", "Average Working", "Working" and "Upper Working" in the macro category "Lower/Working Class"; answers "Lower Middle" and "Average Middle" in the macro category "Middle Class"; and "Upper Middle" and "Upper (Volunteered)" in "Upper Middle/Upper Class." The question is not asked in 1996 and 1998.

Religiosity "Do you consider Religion to be an important part of your life?" Answers are binary, and we code "Yes" as 1, "No" as 0. We classify idividuals as "Religious" if "Religiosity" is equal to 1 and as "Secular" if "Religiosity" is equal to 0.

Party "Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?." A small share of respondents answers "None/No preference." we code Independents and these respondents in the same category.

Income Self-reported family income in the year before the survey. The variable contained in the ANES cumulative file classifies observations in 5 quantile groups: 1. 0 to 16 percentile; 2. 17 to 33 percentile; 3. 34 to 67 percentile; 4. 68 to 95 percentile; 5. 96 to 100 percentile.

Education Highest degree obtained, in 7 categories: 1. 8 grades or less ("grade school"); 2. 9–12 grades ("high school"), no diploma/equivalency; 3. 12 grades, diploma or equivalency; 4. 12 grades, diploma or equivalency plus non-academic training; 5. Some college, no degree; junior/community college level degree; 6. BA level degrees; 7. Advanced degrees incl. LLB.

Affective Class Polarization To construct the indexes of class polarization used in Figure III, we rely on the following two questions: "Still using the thermometer, how would you rate the following group: Big Businesses."; "Still using the thermometer, how would you rate the following group: Labor Unions." For both variabes, answers are collected on a 0-100 scale, and answers higher than 97 are coded by the ANES staff as 97. 0 represents the "coldest" (most averse) feelings, while 100 is "warmest" feelings. Using the same specification presented above, we regress the two measures on the interaction between party affiliation and wave dummy variables, and compute the corresponding residuals. Residuals are standardized to have zero mean and unit variance on the pooled sample. For each of the two residualized measures and each year, we construct the indexes of "Affective Class Polarizarion" by taking the difference in average feelings between "Upper Middle/Upper Class" and "Lower/Working Class" . In Figure A.3, we replicate the analysis without residualizing feelings. In Figure A.4, the sample is restricted to people who identify as political independents, and therefore we do not residualize. In both cases, the thermometer variables are still standardized to have 0 mean and unit variance on the pooled sample.

Affective Cultural Polarization To construct the indexes of cultural polarization used in Figure III, we rely on the following two questions: "Still using the thermometer, how would you rate the following group: Christian Fundamentalist."; "Still using the thermometer, how would you rate the following group: Catholics." The question is not asked in 1996, 1998 and 2016. For both variabes, answers are collected on a 0-100 scale, and answers higher than 97 are coded by the ANES staff as 97. 0 represents the "coldest" (most averse) feelings, while 100 is "warmest" feelings. Using the same specification presented above, we regress the two measures on the interaction between party affiliation and wave dummy variables, and compute the corresponding residuals. Residuals are then standardized to have zero mean and unit variance on the pooled sample. For each of the two residualized measures and each year, we construct the indexes of "Affective Cultural Polarizarion" by taking the difference in average feelings between respondents classified as "Religious" and "Secular." In Figure A.3, we replicate the analysis without residualizing feelings. In Figure A.4, the sample is restricted to people who identify as political independents, and therefore we do not residualize. In both cases, the thermometer variables are still standardized to have 0 mean and unit variance on the pooled sample.

Traditionalism First polychoric principal component of four questions asking if respondents agree strongly, agree somewhat, neither agree nor disagree, disagree somewhat or disagree strongly with each the following statements: (i) "The newer lifestyles are contributing to the breakdown of our society"; (ii) "The world is always changing and we should adjust our view of moral behavior to those changes"; (iii) "This country would have many fewer problems if there were more emphasis on traditional family ties"; (iv) "We should be more tolerant of people who choose to live according to their own moral standards, even if they are very different from our own." Anwers are given on a 5-point scale, ranging from "Agree strongly" to "Disagree strongly." The principal component is based on polychoric correlations, on the sample obtained by pooling all waves together. The first principal component correlates positively with (ii) and (iv) and negatively with (i) and (iii).

Conservative/Progressive In each year, respondents are classified as "Conservative" if they score (strictly) above the median of the distribution of Traditionalism in that year; respondents are classified as "Progressive" if they score (weakly) below the median of Traditionalism in that year.

Cluster Analysis

Figure A.8 is constructed as follows: (i) We estimate the residuals of Culture and Redistribution on party, alone and interacted with wave fixed effects, and standardize them on the full pooled sample, as described earlier in this section (the resulting residuals are the same ones used in Figure I and Figure IV). (ii) We then cluster individuals based on the two residualized variables, using the K-means algorithm with K = 2. We initialize the algorithm setting as initial centroids the group means obtained with Ward's clustering on the same residuals (cutting the dendrogram at two clusters). The clustering exercise is performed on 2000–2008 and 2012–2016 separately. (iii) For each of the two periods, we plot respondents in the two-dimensional space identified by the residuals, with two different colors to highlight cluster membership. We use blue markers for the cluster which is on average more in favor of redistribution, red markers for the one more averse to redistribution. Dashed lines indicate cluster means.

The initialization method chosen has two main advantages. First, it removes the randomness associated with K-means clustering, since the solution does not depend on random starting points. Second, it has been found to improve K-means solutions, especially in the presence of certain types of noise (Milligan 1980).[4] Nonetheless, our clustering solutions prove stable when random starting points are used in place of Ward's centroids. We ran 1000 repetitions of the K-means analysis illustrated above, each time using random starting points. We found that on average less than 3% of the observations switched clusters with respect to the partition obtained with Ward's starting points (both in 2000–2008 and 2012–2016). Moreover, in roughly 50% of the iterations, the partition was exactly the same as the one obtained using

[4]Milligan, Glenn W., "An Examination of the Effect of Six Types of Error Perturbation on Fifteen Clustering Algorithms," *Psychometrica*, 45 (1980), 325-342.

Ward's starting points, with no observation reclassified (again, this holds for both 2000–2008 and 2012–2016).

In Table A.1 the following additional ANES questions are used to describe the two clusters:

Trade "Some people have suggested placing new limits on foreign imports in order to protect American jobs. Others say that such limits would raise consumer prices and hurt American exports. Do you favor or oppose placing new limits on imports, or haven't you thought much about this? [1. Favor; 3. Haven't though much about this; 5. Oppose]"

Trust in Government Index contained in the ANES cumulative file. It is constructed aggregating the following five variables: "Trust the Federal Government To Do What is Right", "Federal Government Run by Few Interests or for the Benefit of All", "How Much Does the Federal Government Waste Tax Money", and "How Many Government Officials Are Crooked." The final index ranges between 0 and 100.

For each policy variable (Redistribution, Immigration, Race Relations, Abortion, and Trade) and for Trust in Government, Table A.1 reports cluster means of the residuals of these variable after conditioning on party affiliation, alone and interacted with wave fixed effects. Prior to computing the means, residuals are standardized to have zero mean and unit standard deviation on the full sample period (1996-2016).

In Table A.2 the dependent variable is a dummy variable equal to 1 (0) if the individual is classified in the blue (red) cluster. Estimation is by probit, with robust standard errors, and is carried out on 2000–2008 and 2012–2016 separately. The associated latent variable is modeled as follows,

$$Blue_i^* = \alpha + \alpha_t + \beta_1 Class_i + \beta_2 Religiosity_i + \epsilon_i,$$

where α and α_t are the constant and year fixed effects, $Class_i$ is respondent i's social class (as defined previously in this Appendix) and $Religiosity_i$ is a dummy equal to 1(0) if the respondent is religious (secular).

TABLE A.1
Cluster Description

	2000–2008 Blue (Light)	2000–2008 Red (Dark)	2012–2016 Blue (Light)	2012–2016 Red (Dark)
Redistribution	0.77	-0.74	0.51	-0.57
Immigration	0.19	-0.04	0.45	-0.39
Race Relations	0.22	-0.19	0.47	-0.47
Abortion	0.17	-0.08	0.30	-0.20
Trade	-0.04	0.03	0.12	-0.16
Trust in Gvt	0.03	0.01	0.14	-0.21
Independent	40.2	40.4	40.2	39.9
Democrat	31.0	31.7	31.9	33.2
Republican	28.8	27.9	28.0	26.9
Population share	47.8	52.2	51.4	48.6

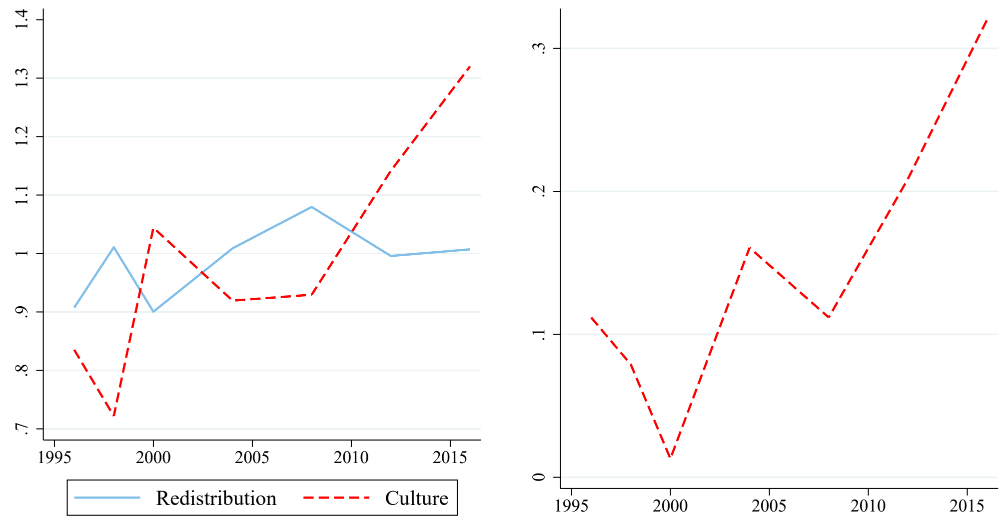
Notes. Immigration, Race Relations, Redistribution, Abortion, Trade and Trust in Government are cluster means of the residuals obtained after conditioning on wave fixed effects, alone and interacted with respondents' party identity. Residuals are standardized to have zero mean and unit variance across all waves (see Appendix 4 for more detail). For these six measures, higher values represent more liberal and trustful attitudes. Parties are the share of cluster members identified with each political group. Population share is the share of sample respondents classified in each cluster. Estimates weighted with survey weights. Source: ANES

TABLE A.2

Cluster Membership and Core Demographics

	Blue (Light) Cluster	
	2000-2008	2012-2016
Class	-0.159***	0.0789
	(0.0447)	(0.0513)
Religiosity	-0.0490	-0.266***
	(0.0737)	(0.0824)
Observations	2,126	1,966

Notes. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is a dummy equal to 1 (0) if the respondent is classified in the blue (red) cluster. All specifications include wave fixed effects. Estimation by probit. Robust standard errors in parentheses. Estimates weighted with survey weights. Source: ANES.

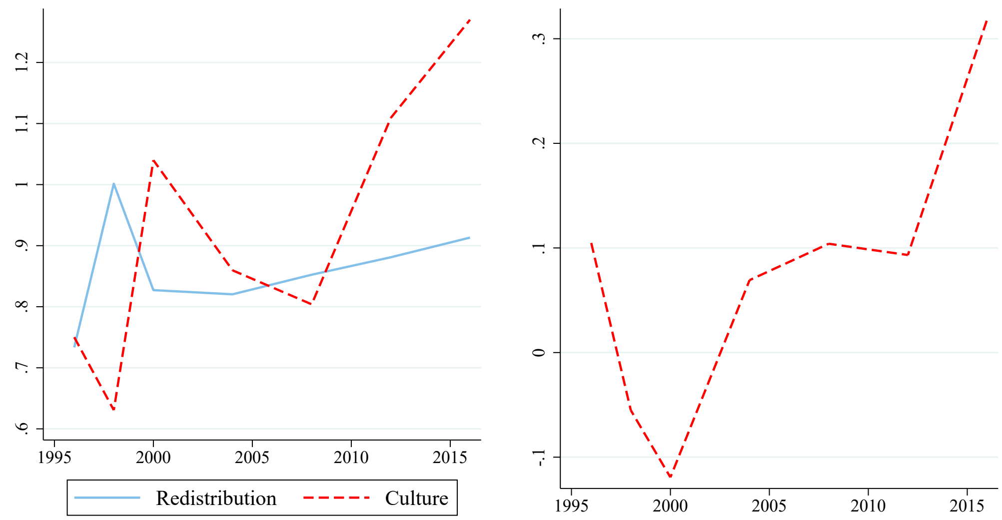


(a) Variance

(b) Correlation Coefficient

FIGURE A.1
Population Moments (Raw Variables)

Notes. Panel (a) reports the variances of Redistribution and Culture. Panel (b) reports the Pearson correlation coefficient for these two measures. Redistribution is the first polychoric principal component of the following questions: (i) "Some people think the government should provide fewer services, even in areas such as health and education, in order to reduce spending. Other people feel that it is important for the government to provide many more services even if it means an increase in spending. Where would you place yourself on this scale?"; (ii) "Some people feel that the government in Washington should see to it that every person has a job and a good standard of living. Others think the government should just let each person get ahead on their own. Where would you place yourself on this scale?" Answers to these two questions are given on a 7-point scale. Culture is the first polychoric principal component of desired immigration levels, attitudes towards race relations and abortion policy. Below we report the corresponding questions. Immigration levels: "Do you think the number of immigrants from foreign countries who are permitted to come to the United States to live should be [1. increased a lot; 2. increased a little; 3. left the same as it is now; 4. decreased a little; 5. decreased a lot]?" Attitudes towards race are the difference between respondents' feelings towards black and white people. Feelings toward black (white) people: "How would you rate the following group: Blacks (Whites)", on a 0-100 scale, from coldest to warmest feelings. Abortion policy: "There has been some discussion about abortion during recent years. Which one of the opinions on this page best agrees with your view? [1. By law, abortion should never be permitted; 2. The law should permit abortion only in case of rape, incest, or when the woman's life is in danger; 3. The law should permit abortion for reasons other than rape, incest, or danger to the woman's life, but only after the need for the abortion has been clearly established; 4. By law, a woman should always be able to obtain an abortion as a matter of personal choice]." Both principal components (Redistribution and Culture) are computed on the pooled sample from 1996 to 2016, and based on polychoric correlations. Higher values correspond to more liberal views. Before computing the moments in Figure A.1, Redistribution and Culture are standardized to have zero mean and unit variance across all waves. Estimates weighted with survey weights. Source: ANES.

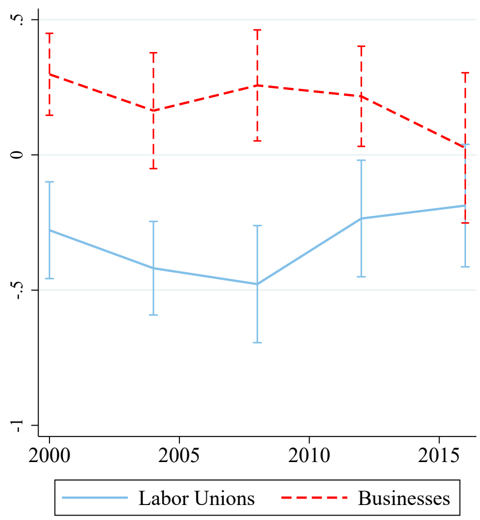


(a) Variance

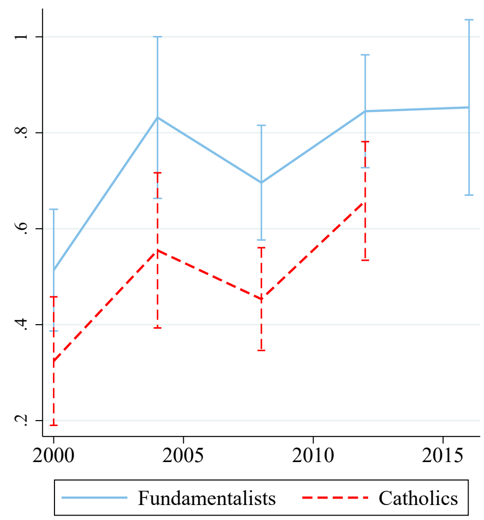
(b) Correlation Coefficient

Figure A.2
Population Moments (Independents)

Notes. Panel (a) reports the variances of Redistribution and Culture. Panel (b) reports the Pearson correlation coefficient for these two measures. Redistribution is the first polychoric principal component of the following questions: (i) "Some people think the government should provide fewer services, even in areas such as health and education, in order to reduce spending. Other people feel that it is important for the government to provide many more services even if it means an increase in spending. Where would you place yourself on this scale?"; (ii) "Some people feel that the government in Washington should see to it that every person has a job and a good standard of living. Others think the government should just let each person get ahead on their own. Where would you place yourself on this scale?" Answers to these two questions are given on a 7-point scale. Culture is the first polychoric principal component of desired immigration levels, attitudes towards race relations and abortion policy. Below we report the corresponding questions. Immigration levels: "Do you think the number of immigrants from foreign countries who are permitted to come to the United States to live should be [1. increased a lot; 2. increased a little; 3. left the same as it is now; 4. decreased a little; 5. decreased a lot]?" Attitudes towards race are the difference between respondents' feelings towards black and white people. Feelings toward black (white) people: "How would you rate the following group: Blacks (Whites)", on a 0-100 scale, from coldest to warmest feelings. Abortion policy: "There has been some discussion about abortion during recent years. Which one of the opinions on this page best agrees with your view? [1. By law, abortion should never be permitted; 2. The law should permit abortion only in case of rape, incest, or when the woman's life is in danger; 3. The law should permit abortion for reasons other than rape, incest, or danger to the woman's life, but only after the need for the abortion has been clearly established; 4. By law, a woman should always be able to obtain an abortion as a matter of personal choice]." Both principal components (Redistribution and Culture) are computed on the pooled sample from 1996 to 2016, and based on polychoric correlations. Higher values correspond to more liberal views. Before computing the moments in Figure A.2, Redistribution and Culture are standardized to have zero mean and unit variance across all waves. The sample is restricted to political independents. Estimates weighted with survey weights. Source: ANES.



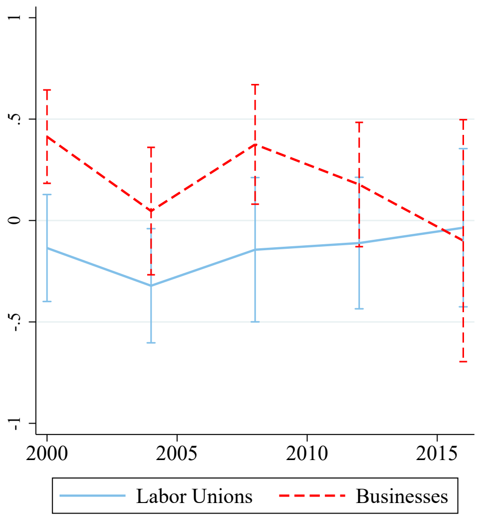
(a) Differences by Class



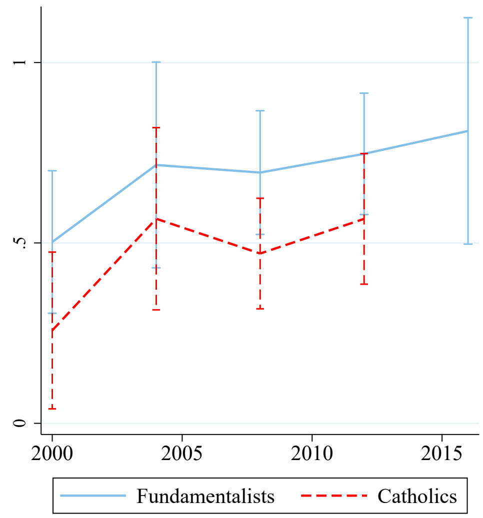
(b) Differences by Religiosity

FIGURE A.3
Social Groups and Feeling Thermometer (Raw Variables)

Notes. Panel (a) plots the differences in the mean feelings of the upper-middle/upper class vs lower/working class towards labor unions (solid line) and big businesses (dashed line), with 95% confidence intervals. Panel (b) plots the differences in the mean feelings of religious vs secular individuals towards Christian fundamentalists (solid line) and Catholics (dashed line), with 95% confidence intervals. Feelings towards each of the four groups are measured with questions of this kind: "How would you rate the following group: group X." Answers are on a 0-100 scale, from colder to warmer feelings. Before constructing Figure III, answers to the feeling thermometer questions are standardized to have zero mean and unit variance across all waves. Class is a self-reported variable with the following categories: Lower, Average Working, Working, Upper Working, Average Middle, Middle, Upper Middle, and Upper. Lower/working class (L/W Class) is obtained aggregating Lower, Average Working, Working and Upper Working (roughly 50% of the pooled sample); upper-middle/upper class (U-M/U class) is obtained aggregating Upper Middle and Upper (roughly 15% of the pooled sample). Religiosity is measured by the question "Do you consider Religion to be an important part of your life? [Yes; No]." Respondents answering "Yes" ("No") are classified as Religious (Secular). Estimates weighted with survey weights. Source: ANES.



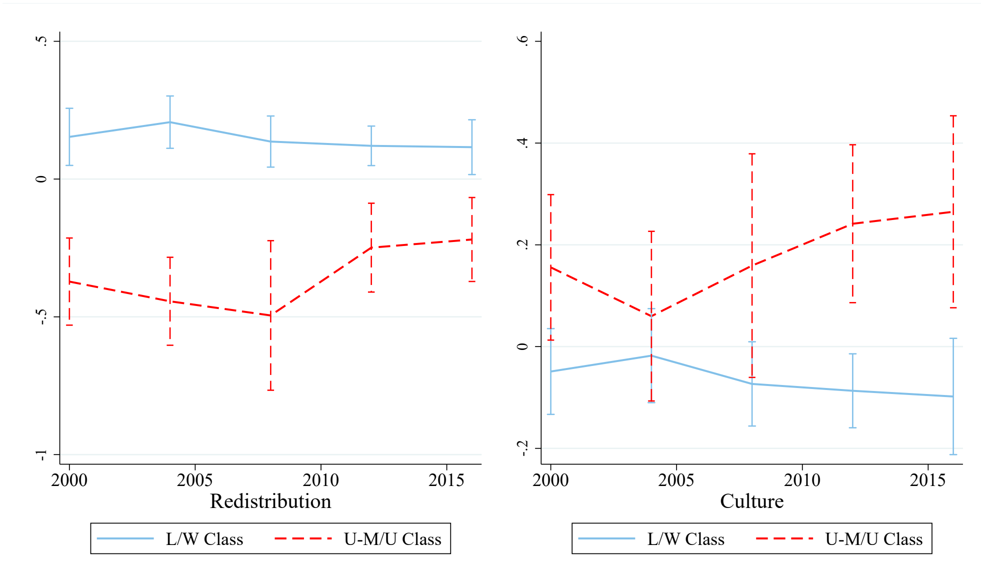
(a) Differences by Class



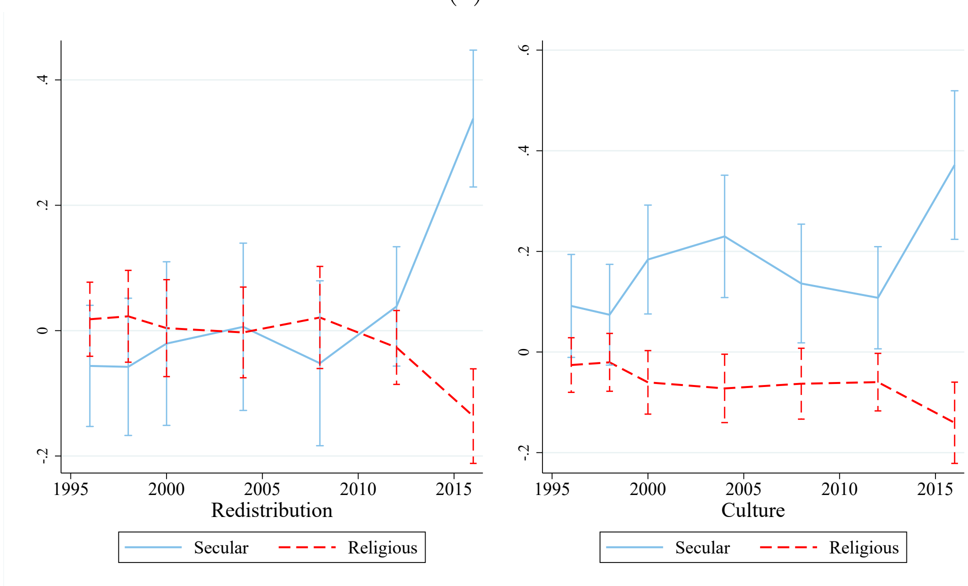
(b) Differences by Religiosity

FIGURE A.4
Social Groups and Feeling Thermometer (Independents)

Notes. Panel (a) plots the differences in the mean feelings of the upper-middle/upper class vs lower/working class towards labor unions (solid line) and big businesses (dashed line), with 95% confidence intervals. Panel (b) plots the differences in the mean feelings of religious vs secular individuals towards Christian fundamentalists (solid line) and Catholics (dashed line), with 95% confidence intervals. Feelings towards each of the four groups are measured with questions of this kind: "How would you rate the following group: group X." Answers are on a 0-100 scale, from colder to warmer feelings. Before constructing Figure III, answers to the feeling thermometer questions are standardized to have zero mean and unit variance across all waves. Class is a self-reported variable with the following categories: Lower, Average Working, Working, Upper Working, Average Middle, Middle, Upper Middle, and Upper. Lower/working class (L/W Class) is obtained aggregating Lower, Average Working, Working and Upper Working (roughly 50% of the pooled sample); upper-middle/upper class (U-M/U class) is obtained aggregating Upper Middle and Upper (roughly 15% of the pooled sample). Religiosity is measured by the question "Do you consider Religion to be an important part of your life? [Yes; No]." Respondents answering "Yes" ("No") are classified as Religious (Secular). The sample is restricted to political independents. Estimates weighted with survey weights. Source: ANES.



(a) Class

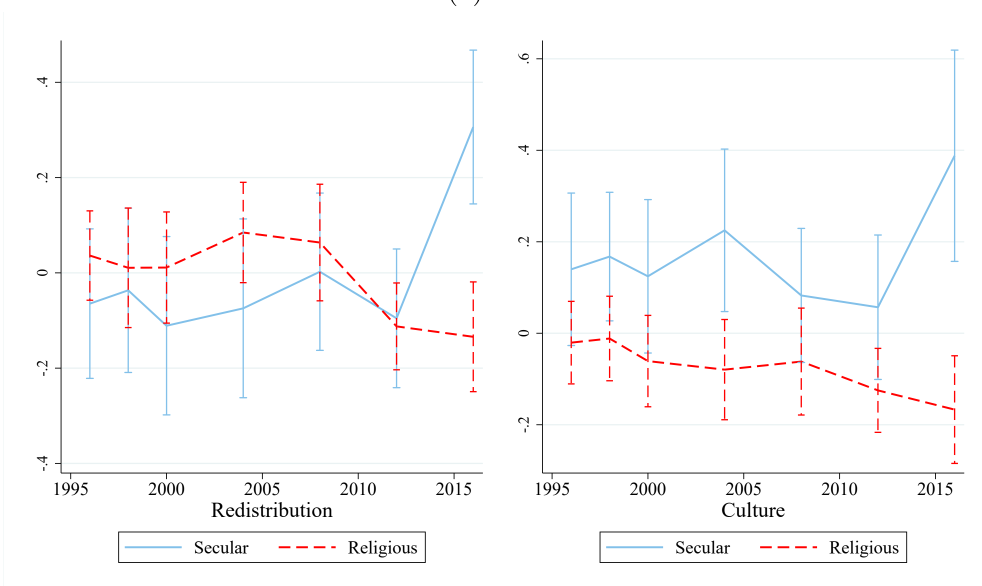


(b) Religiosity

FIGURE A.5
Trends in Group Conflict (Raw Variables)

Notes. Panel (a) reports trends in the means of Redistribution and Culture for the lower/working class (solid line) and the upper-middle/upper class (dashed line), with 95% confidence intervals. Panel (b) reports trends in the means of Redistribution and Culture for secular (solid line) and religious individuals (dashed line), with 95% confidence intervals. Redistribution is the first polychoric principal component of two questions on government spending and government's role in seeing to citizens' jobs and living standards; Culture is the first polychoric principal component of desired immigration levels, attitudes towards race and abortion policy (see the note of Figure I for the specific questions). For Redistribution and Culture, higher values correspond to more liberal views. The two variables are residualized on wave fixed effects and standardized to have zero mean and unit variance across all waves. Class and religiosity are self-reported (see the note of Figure III). Estimates weighted with survey weights. Source: ANES.

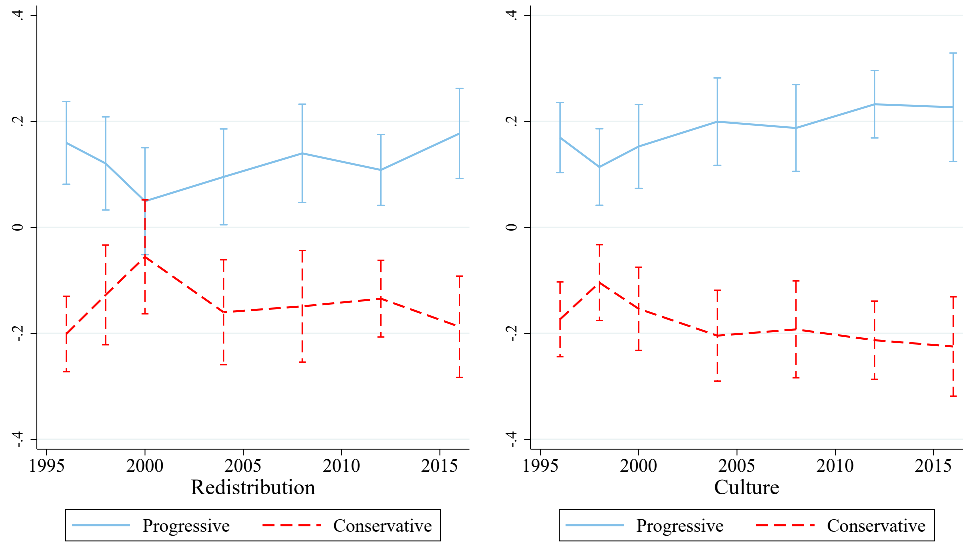
(a) Class



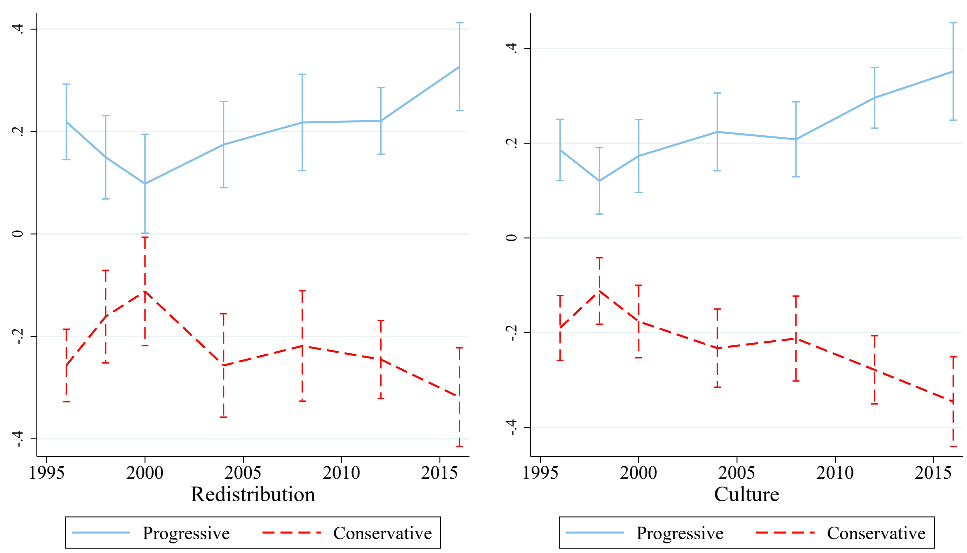
(b) Religiosity

Figure A.6
Trends in Group Conflict (Independents)

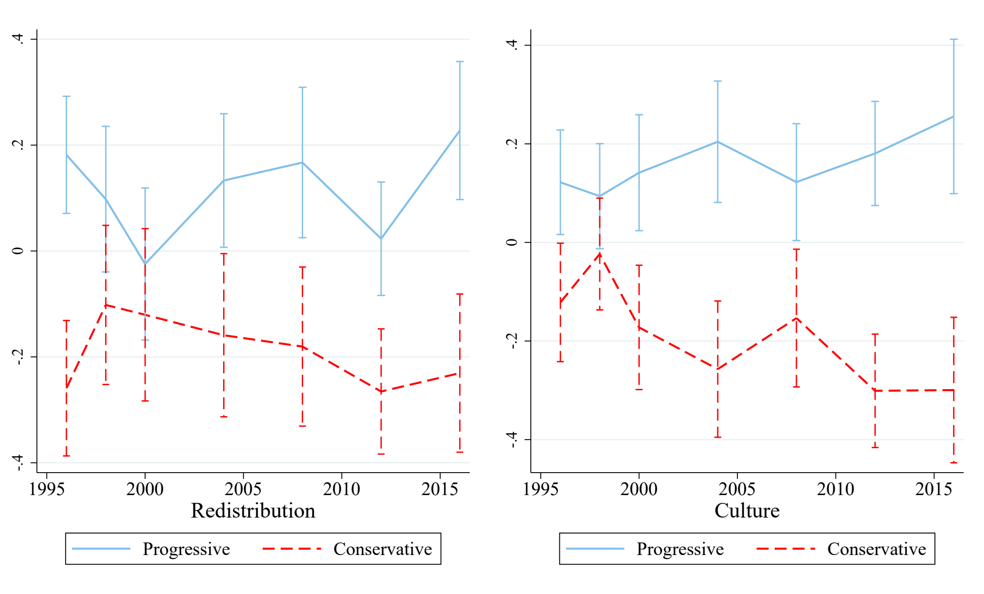
Notes. Panel (a) reports trends in the means of Redistribution and Culture for the lower/working class (solid line) and the upper-middle/upper class (dashed line), with 95% confidence intervals. Panel (b) reports trends in the means of Redistribution and Culture for secular (solid line) and religious individuals (dashed line), with 95% confidence intervals. Redistribution is the first polychoric principal component of two questions on government spending and government's role in seeing to citizens' jobs and living standards; Culture is the first polychoric principal component of desired immigration levels, attitudes towards race and abortion policy (see the note of Figure I for the specific questions). For Redistribution and Culture, higher values correspond to more liberal views. The two variables are residualized on wave fixed effects and standardized to have zero mean and unit variance across all waves. Class and religiosity are self-reported (see the note of Figure III). The sample is restricted to political independents. Estimates weighted with survey weights. Source: ANES.



(a) Residualized



(b) Raw Variables



(c) Independents

FIGURE A.7
Trends in Group Conflict (Traditionalism)

Notes. Panels (a), (b), and (c) report trends in mean Redistribution and mean Culture for progressive and conservative respondents separately (solid and dashed lines, respectively). Redistribution is the first polychoric principal component of two questions on government spending and government's role in seeing to citizens' jobs and living standards; Culture is the first polychoric principal component of desired immigration levels, attitudes towards race and abortion policy. For these two measures, higher values correspond to more liberal attitudes. In panel (a) Redistribution and Culture are residualized on party, alone and interacted with wave fixed effects. In panel (b) and (c) Redistribution and Culture are residualized on wave fixed effects. In panel (c) the sample is restricted to political independents. All residuals are standardized to have zero mean and unit variance across all waves. Traditionalism is the first polychoric principal component of questions on the value and importance of traditional values, with higher values corresponding to more traditional views (the specific questions are reported in Appendix 4). For each year, we classify as Conservative (Progressive) those scoring above (below) the median of Traditionalism in that year. Estimates weighted with survey weights. Source: ANES.

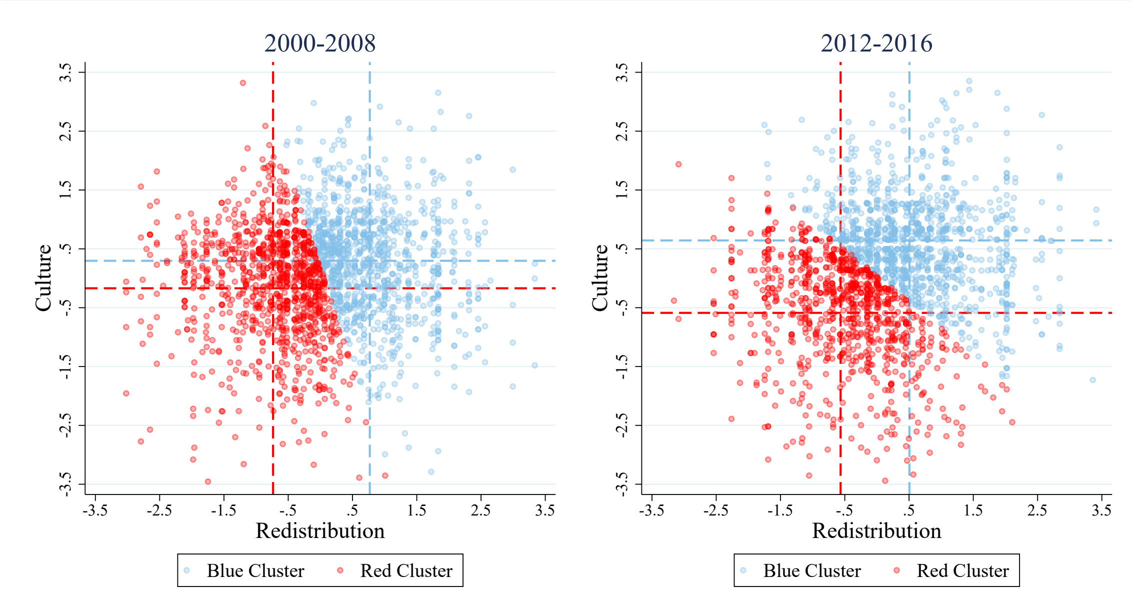


Figure A.8
Changing Dimension of Political Conflict: Cluster Analysis

Notes. The vertical axes measure attitudes on cultural policy issues (higher values correspond to more open attitudes), the horizontal axes attitudes on redistribution (higher values correspond to more desired redistribution), for samples representative of the US adult population in 2000–2008 and 2012–2016. These measures were constructed by first extracting the first polychoric principal component from two sets of questions, one set for each of these two dimensions of political conflict, and then estimating the residuals after conditioning on wave fixed effects, alone and interacted with respondents' party identity. Each marker corresponds to an individual. The colors indicate how respondents were split between two clusters, individuated applying K-means method on the above-mentioned residuals, for the two periods separately. As initial guess for the group means we use centers obtained applying Ward's method on the same data. Dashed lines represent group means. The principal component on cultural issues (Culture) is extracted from questions on desired immigration levels, abortion policy and attitudes towards race. The principal component on preferences for redistribution (Redistribution) is extracted from a question on desired government spending and a question on government's role in seeing to citizens' jobs and living standards (see the note to Figure I for the specific questions). Appendix 4 provides more information on the clustering method and how the variables were treated before the analysis. Source: ANES