JOSEPH SCHUMPETER LECTURE
IDEOLOGY

Roland Bénabou
Princeton University

Abstract
I develop a model of ideologies as collectively sustained (yet individually rational) distortions in beliefs concerning the proper scope of governments versus markets. In processing and interpreting signals of the efficacy of public and market provision of education, health insurance, pensions, etc., individuals optimally trade off the value of remaining hopeful about their future prospects (or their children's) versus the costs of misinformed decisions. Because these future outcomes also depend on whether other citizens respond to unpleasant facts with realism or denial, endogenous social cognitions emerge. Thus, an equilibrium in which people acknowledge the limitations of interventionism coexists with one in which they remain obstinately blind to them, embracing a statist ideology and voting for an excessively large government. Conversely, an equilibrium associated with appropriate public responses to market failures coexists with one dominated by a laissez-faire ideology and blind faith in the invisible hand. With public-sector capital, this interplay of beliefs and institutions leads to history-dependent dynamics. The model also explains why societies find it desirable to set up constitutional protections for dissenting views, even when ex-post everyone would prefer to ignore unwelcome news. (JEL: H11, D72, D83, P16, Z1)

Social scientists have incorporated the costliness of information in their models, but have not come to grips with the subjective mental constructs by which individuals process information and arrive at conclusions that shape their choices. . . .

The subjective mental constructs of the participants will evolve an ideology that not only rationalizes the society's structure but accounts for its poor performance. As a result, the economy will evolve policies that reinforce the existing incentives and organizations.

—Douglass North (1990).
Institutions, Institutional Change and Economic Performance

1. Introduction

Coined on the eve of the 19th century by the Enlightenment philosopher and economist Destutt de Tracy, *ideologie* originally carried a hopeful connotation: It was to be a new "science of ideas" that would unify the social, political, and moral sciences, starting from a common foundation in psychology.[1] Over the next two hundred years, the word took on a variety of less positive meanings (starting with Marx and Engels's writings on the subject) and today it most often designates a system of beliefs that some group collectively upholds and maintains rigidly, even though it involves a substantial degree of reality denial or "false consciousness". It also implicitly conveys the notion of ideologies as competing and mutually incompatible worldviews.

In this paper I take ideology in both senses of the term: first, as an exercise in the study of ideas. I provide a model and describe recent work that answers the call for incorporating into political economy a more accurate representation of individuals' "subjective mental constructs"; second, I show how these interact across agents and with institutions to generate social cognitions that rest on distorted perceptions of reality, yet persist over time.

In doing so, I focus more concretely on one perennial ideological battleground: the relative merits of the market and the state. Figure 1 provides a good illustration of the range and clustering of these beliefs. Among Americans, for instance, about 71% express confidence in the free-market system and free enterprise—predictably above the survey's average of 65%, but below China's striking 74%. Among the French, only 36%, or *half as many*, agree—even lower than Russia's 43%, and considerably below neighboring Germany's 65%.

These are striking differences, and they have real meaning. In Figure 2, I plot the size of the government's "footprint" in the economy, measured by the share of taxes in GDP, against the extent of free-market beliefs in the country (from Figure 1). This reveals a negative and significant correlation, consistent with the view that popular beliefs shape policy, not just in democracies.[2] The question, however, is where these beliefs come from and how they can persistently diverge, especially in an age of widely available and cheap information. Another piece of the puzzle is that within any given country, the dominant beliefs are often

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1. Antoine Louis Claude, comte Destutt de Tracy (1754–1836), in his *Eléments d'Idéologie*, published between 1801 to 1815. De Tracy's own political views favored republicanism, liberalism, and free markets. He was an admirer of American democracy and, conversely, Thomas Jefferson was an admirer of his work, translating into English his *Treatise on Political Economy*.

2. Other measures, such as the restrictiveness of labor laws or overall regulation in the economy, lead to similar results, but are available for only a smaller sample of countries (10–12 OECD nations).
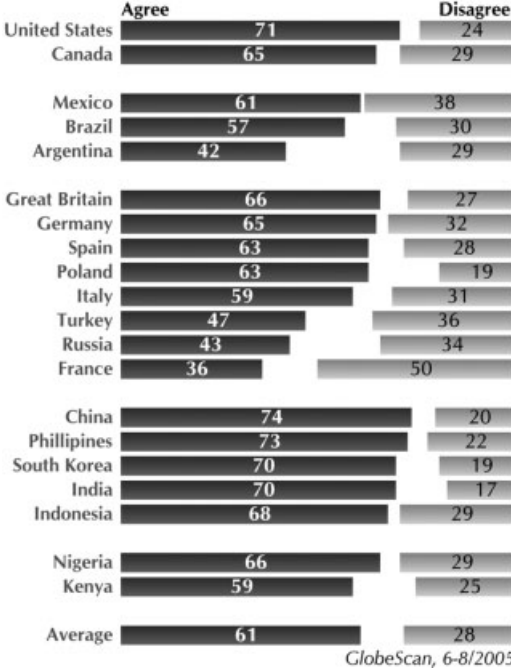
FIGURE 1. Responses to the statement, "The free enterprise system and free market economy is the best system on which to base the future of the world." Source: World Public Opinion Survey (2005).
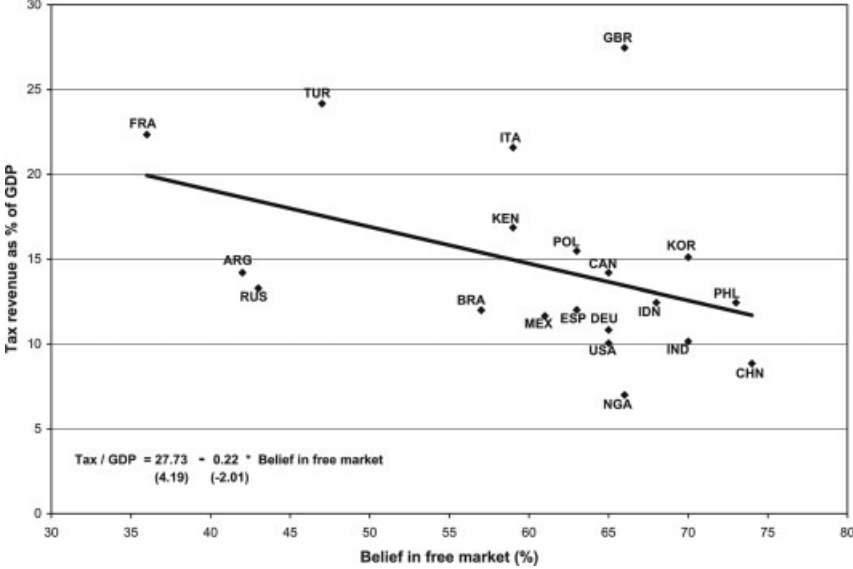

FIGURE 2. Free-market beliefs and the size of the state. Source: Author's calculations based on data from World Public Opinion (2005) and World Bank (2004).

demonstrably at odds with the facts.[3] Nonetheless they endure, and the power of collective reality-avoidance and adherence to comforting myths is often seen as a significant obstacle to necessary reforms.

To analyze these issues, I develop in this paper a simple model of ideology as *collectively sustained reality distortions* about the merits of state versus market. Agents vote over the extent to which a good with long-run payoffs such as education, health insurance, or pensions should be publicly provided or left to individual decisions. They also allocate their disposable income in ways that reflect their expectations of what the state or market will ultimately deliver. The relative efficacy of public and private provision is a priori uncertain. Agents observe a common signal about this variable (e.g., performance in the past or in other areas), which they can then process objectively or subjectively: paying attention to and acknowledging it, or on the contrary dismissing it, rationalizing it away and more generally minimizing their awareness of its content. In doing so, each agent optimally trades off the value of maintaining a reassuring, hopeful view of their future prospects or those of their children (anticipatory utility) versus the costs of delusion, in particular misallocating their own resources. The key point is that these "subjective mental constructs" are inevitably interdependent (as noted by North), even absent any built-in complementarities: The relative attractiveness of realism or denial depends on other agents' voting and private decisions, and therefore on the extent to which they themselves embrace reality or avert their eyes from it. "Social cognitions" thus endogenously emerge. I first show how a realistic equilibrium, in which people acknowledge the limitations and burdens of the welfare state, can coexist with one in which they remain blind to them, embracing a *statist ideology* and voting for a large but ineffective government. I then show how the presence of market failures can give rise to the converse scenario, in which a realistic equilibrium associated with appropriate public interventions coexists with one dominated by *laissez-faire ideology* and blind faith in unhindered markets. The role of history—inherited public-sector capital and prior beliefs—in determining which of these scenarios occurs is also investigated, with the interplay of beliefs and institutions generating path-dependent dynamics. Finally, the welfare analysis explains why societies will find it desirable to set up ex ante constitutional protections for the expression of dissenting views—guarantees of free speech, a free press, and so forth—even when ex post everyone (not just a majority) would want to ignore bad news or "kill" their messenger.

The model builds on and extends the motivated-beliefs and optimal-awareness (attention, memory) framework of Bénabou and Tirole (2002, 2004, 2006). It relates most closely to Bénabou (2007), in which I develop a general

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3.   See, for example, Kaiser Foundation et al. (1996a) and Caplan (2007) on the public's distorted views of competition, firms, and international trade; Kaiser Foundation et al. (1996b) on their distorted views of government; Gilens (1999), Kuklinski et al. (2000), and Alesina and Glaeser (2004) on misperceptions and stereotypes about welfare programs and the poor.

theory of "groupthink" as individually rational but collectively sustained episodes of wishful thinking in groups, organizations, and markets.

Related Literature

The perceived merits and flaws of markets and governments are among a number of societal beliefs about "how the world works" that are attracting increased attention from economists. Other important ones include those bearing on the role of effort versus luck in life outcomes,[4] the extent to which other people (or specific groups) can be trusted,[5] many aspects of culture, and of course religion.[6] These beliefs all share with those displayed in Figures 1 and 2 five key features, which I take as constitutive of ideologies (good or bad):

1. They vary widely across countries (even similarly developed ones) and are correlated with important political and economic outcomes.
2. At the individual level, they are strong predictors of voter preferences (toward redistribution, regulation, criminal justice, etc.) as well as important personal behaviors (savings, entrepreneurship, etc.).
3. There is a tendency for each society or group to think that its vision or "model" is the right one, not just for itself but for others as well.
4. Inevitably, because not everyone can be right, these beliefs are often clearly at odds with the relevant facts.[7]
5. Nonetheless they persist, displaying remarkable "immunity to evidence" and powerfully shaping the societies in which they take hold.

The idea that voters' attitudes often reflect distorted beliefs which they are affectively, culturally, or instrumentally attached to is common in political science and political psychology (e.g., Lane 1959; Lerner 1982; Hochschild 1981, 1996; Kuran 1995; Jost and Major 2001).

Bénabou and Tirole (2006) provide a first model of such phenomena for a broad class of beliefs relating to the *long-term rewards for personal effort*: "just-world" beliefs about self-reliance and economic mobility, perceptions of

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4.   See, for example, Piketty (1995), Bénabou and Ok (2001), Fong (2001), Alesina, Glaeser, and Sacerdote (2001), Alesina and La Ferrara (2005), Bénabou and Tirole (2006), and Di Tella, Galiani and Schargrodsky (2007).

5.   See, for example, Tirole (1996), Tabellini (2007, 2008), Putnam (2007), and Guiso, Sapienza, and Zingales (2007).

6.   On culture, see, for example Bisin and Verdier (2000, 2001), Tabellini (2005), Guiso et al. (2006) and Fernandez and Fogli (2006). On religion, see for example Barro and McCleary (2003), Noland (2003), Guiso et al. (2003), Scheve and Stasavage (2006), and Levy and Razin (2007).

7.   On the distorted nature of popular beliefs see the references in footnote 3; concerning their persistence, see Ferrie (2005) on misperceptions of American "exceptionalism" in social mobility, and Alesina and Fuchs-Schündeln's (2006) study of West versus former East Germany. Religions provide many other examples (for point [3] as well as point [5]), with creationism versus evolution and geology being the most obvious one.

the link between income and happiness, and religious doctrines offering differ-
ent "afterlife incentives" for thrift and industriousness. In that model, optimistic
beliefs about the fact that everyone will ultimately get their "just deserts" have
a functional value, helping individuals to motivate themselves or their children
towards effort, educational investment, and perseverance against adversity, and
away from the temptations of idleness, welfare dependency, and so on. This moti-
vation value, moreover, depends on the incentive properties of the institutions
which agents face: It is higher in a society that carries out little redistribution than
where marginal taxes are high and the safety net generous. Because the political
outcome itself depends on what people believe, there can be two stable outcomes.
A first "American" equilibrium is characterized by a dominance of just-world
beliefs (and resistance to contrary evidence), low redistribution, high effort, and
stigma attached to poverty. A second "European" equilibrium is characterized by
more "realistic pessimism" as the majority view, a more extensive welfare state,
more blaming of poverty on luck and circumstances, and lower effort.[8]

  In this paper I take up a different but equally important set of societal beliefs,
namely those concerning the relative virtues of markets and governments in deliv-
ering goods and services, particularly those that have society-wide benefits such as
education, health, or safety. I also emphasize the very different source of motivated
beliefs (hedonic anticipatory feelings instead of instrumental self-motivation) that
is relevant when uncertainty and the ideological debate bear on the value of public
goods and interventions in the market, rather than on how individuals come to be
rich or poor.

  This research thus brings together two literatures. The first, emanating from
the recent field of "economics and psychology," focuses on cognitive dissonance,
wishful thinking, and other forms of self-deception or belief distortion.[9] The sec-
ond, also fast-growing, stems from a wealth of recent survey data on variations
in beliefs and values across countries, regions, or social groups.[10] Beyond eco-
nomics, this work relates to the large literatures in social and political psychology
on motivated individual beliefs and on competing "worldviews" at the societal
level. It formalizes qualitative concepts such as "system justification" (Jost and
Major 2001), "social axioms" (Leung et al. 2002), or "cultural cognition" (Kahan
and Braman 2006).

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8. Alternative, "non-ideological" explanations are proposed by Piketty (1995), based on costly
learning and heterogeneous priors about the mobility process; and by Alesina and Angeletos (2005),
based on self-fulfilling, accurate beliefs about the extent to which individual incomes result from
productive investments.

9. On cognitive dissonance and belief distortion see, for example, Akerlof and Dickens (1982),
Schelling (1986), Kuran (1993), Carrillo and Mariotti (2000), Bénabou and Tirole (2002, 2004),
Battaglini, Bénabou and Tirole (2005), and Dessi (2005). On anticipatory utility, see for example
Loewenstein (1987), Caplin and Leahy (2001), Landier (2000), Caplin and Eliaz (2003), Brunner-
meier and Parker (2005), Köszegi (2006, 2007), Bernheim and Thomadsen (2005), and Bénabou
and Tirole (2007).

10. In addition to the references cited earlier see also Greif (2006), Cervellati et al. (2006), Corneo
and Jeanne (2007), and Saint-Paul (2007).

The motivated, evidence-averse nature of ideological beliefs makes them quite different from standard self-fulfilling expectations. In recent politico-economic models where different countries are identified with multiple rational-expectations equilibria,[11] voters' beliefs in each country correspond objectively to the statistical reality they observe. They would also never refuse information ex ante or process it in a biased way ex post, but treat good and bad news as equally valuable increments to their information set. For the same reason, ideological thought is quite different from the public misrepresentation of one's true beliefs due to a threat of repression or social sanctions (e.g., Kuran 1995); and very different as well from the off-equilibrium-path beliefs that sustain certain social outcomes in repeated-game models of culture (e.g., Greif 2006; Anderlini, Gerardi, and Lagunoff 2007). Ideology as motivated cognition also differs from a view based on outright indoctrination, but the two are highly complementary. First, whereas agents are modeled here as distorting their own processing of information, a near-identical model applies to parents who strategically shape the beliefs of their children.[12] Second, agents' endogenous "demand" for beliefs can also be read as a differential *receptivity* to propaganda supplied by competing political parties, interest groups and other political entrepreneurs.[13]

2. A Model of Ideology: The State or the Market

I now turn to the study of a particular set of "ideas," namely those concerning the proper scope of governments and markets.

Drawing on a large survey of American voters and economists (Kaiser Family Foundation et al. 1996a), Caplan (2007) presents extensive evidence of anti-market bias: distrust of the profit motive; unfairness of price allocations; perception of competition as a rigged, negative-sum game; desire to protect existing jobs against technological change and especially foreign competition, and so on. His explanation is that voters derive consumption value from beliefs, and since holding incorrect ones is of little personal consequence because each vote has a negligible chance of mattering, they freely indulge in a number of exogenous "feel-good" biases. The present analysis will share this emphasis on the consumption value of beliefs but also differ in several important ways.

First, why (or when) should anti-market beliefs and blind faith in public bureaucracies make voters "feel better" than anti-state beliefs and blind faith in the invisible hand? The international evidence shown in Figures 1 and 2 reveals

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11. See, for example, Bénabou (2000), Acemoglu and Robinson (2001), Alesina and Angeletos (2005).

12. See Bénabou and Tirole (2006) for such an equivalence in the context of anti- and pro-redistributive ideologies.

13. See, for example, Hochschild (1996), Gilens (1999), Alesina and Glaeser (2004), Glaeser (2005), and Saint-Paul (2007) for work emphasizing this "supply" side of politico-economic beliefs.

substantial variations in these beliefs across countries, which a theory of emotionally thinking voters should aim to address. Second, there are also common instances of anti-government, pro-market bias. For instance, in spite of massive, textbook-case market failures in the employer-based system of health insurance, a large share of American voters still perceives and fears as inefficient and bureaucratic "socialized medicine" the type of single-payer or centrally regulated system found in most other countries.[14]

To analyze these issues, one needs to explicitly model both the economic and the psychological costs and benefits of different worldviews, and in particular how they depend endogenously on the current or anticipated politico-economic environment.

2.1. Technology

A continuum of risk-neutral individuals, $i \in [0, 1]$, are endowed with 1 unit each of perfectly divisible labor. Labor can be transformed into a taxable market good at a rate of 1 for 1, or into home production or other non-taxable forms of output at a rate of 1 to $0 < 1 - \bar{\tau} < 1$. The highest feasible tax rate is thus $\bar{\tau}$, and the revenue from any rate $\tau \leq \bar{\tau}$ is equal to τ.

In period 1, agents use some of their disposable resources to accumulate human capital broadly defined (education, health), retirement assets, or some other good that might have external effects. Such investment can take place both privately and through government provision (e.g., public education or pension system), according to the technology:

$$h^i = \min\{\gamma e^i + \theta \tau, E\}, \tag{1}$$

in which $E < \gamma$ is some fixed maximal level.[15] The productivity of private expenditure is a known $\gamma > 1$, whereas that of public provision is uncertain (it could also be the reverse): $\theta = \theta_H$ in state H and $\theta = \theta_L$ in state L, with prior probabilities q and $1 - q$ respectively, and

$$0 \leq \theta_L < \gamma < \theta_H < E/\bar{\tau}. \tag{2}$$

The state could thus be less efficient than the market, or more. At the same time, government resources are limited, so some private investment is always needed ($\bar{\tau}\theta_H < E$). Note also that $\theta\tau$ is net of collection and administrative costs and

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14. See, for example, Krugman and Wells (2006) and references therein. Recall that the model developed herein can also be interpreted as explaining why agents are likely to be differentially receptive to arguments or propaganda from different sides of a contested issue.

15. This specification is chosen for simplicity, as it allows for substitutability between public and private investment (making policy a choice between the two) while preserving the linearity of the model.

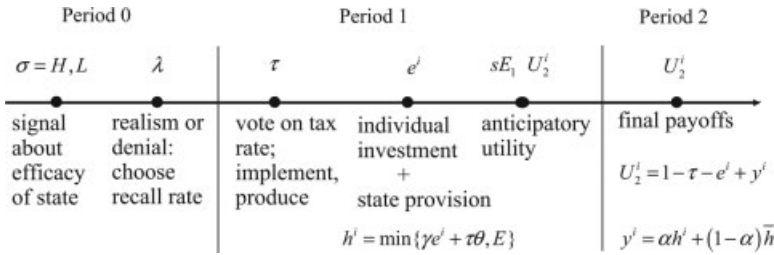| Period 0		Period 1			Period 2
$\sigma = H, L$	λ	τ	e^i	$sE_1 \ U_2^i$	U_2^i
signal about efficacy of state	realism or denial: choose recall rate	vote on tax rate; implement, produce	individual investment $+$ state provision $h^i = \min\{\gamma e^i + \tau\theta, E\}$	anticipatory utility	final payoffs $U_2^i = 1 - \tau - e^i + y^i$ $y^i = \alpha h^i + (1-\alpha)\bar{h}$

FIGURE 3. The state and the market: timeline.

could thus incorporate a deadweight loss, whether as a fixed proportion or as itself a source of uncertainty. In period 2, each agent, or his offspring, will have income (or some equivalent payoff)

$$y^i \equiv \alpha h^i + (1 - \alpha)\bar{h}, \tag{3}$$

where $\bar{h}$ is the population average and $1 - \alpha \geq 0$ represents the extent to which h^i is of a public-good nature, generating a spillover for the rest of society. The presence of such spillovers will strengthen the results, but is not essential. It is also important to note that there is no assumed complementarity between agents' choices.

2.2. Preferences and Decisions

During period 1, agents first vote on the tax rate τ, then make their individual investments, e^i (see Figure 3).[16] The remainder of their disposable income is saved until period 2, at which time it is consumed (or split between consumption and a bequest), resulting in final utility.[17]

$$U_2^i = 1 - \tau - e^i + y^i. \tag{4}$$

The only payoff received by an agent during period 1 stems from thoughts and feelings about his future prospects. Thus, from the time when τ and the e^i's are

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16. Because agents know τ when they choose effort, multiple equilibria due to standard "increasing fiscal returns" or "battle of the sexes" mechanisms between the private and public sectors are—intentionally—ruled out. The mechanism is also very different from that in Bénabou and Tirole (2006), as τ is here a lump-sum tax and thus has no incentive effect. The psychological motive underlying belief distortions also differs, as explained earlier.

17. The assumption that agents only want to consume in period 2 is inessential, as is the zero interest rate. It just simplifies the exposition by making standard, material consumption (derived from the resources $1 - \tau - e^i + y^i$) and "belief consumption" take place in separate periods, rather than having some of both occur in period 1. For the intergenerational interpretation, let a parent have utility $v(c, b, y) \equiv c^\beta (b + y)^{1-\beta}/\beta^\beta (1 - \beta)^{1-\beta}$ over old-age consumption c, her financial bequest to her child b, and the latter's effective human capital endowment y, given by equation (3). Given any initial inherited wealth b', parent i's lifetime budget constraint is $c^i + b^i + y^i = b' + 1 - \tau - e^i + y^i$. This is also her maximized date-2 utility v^i, which thus differs from U_2^i only by a constant.

chosen and until all uncertainty is resolved at $t = 2$, agent i experiences a flow of *anticipatory utility* $s E_1^i[U_2^i]$, where $s \geq 0$ parametrizes the importance of hope, anxiety, dread, and similar emotions. This parameter (which stands for "savoring") also typically increases with the length of period 1.[18] Anticipatory feelings could also occur prior to the determination of public and private investments; I leave this extension to the Appendix and will simply mention in the text the one place where it matters.

Given the tax rate, individual investment is chosen so as to maximize the discounted value of payoffs

$$U_1^i = s E_1^i[U_2^i] + \delta E_1^i[U_2^i], \tag{5}$$

which means maximizing $E_1^i[U_2^i]$. At $t = 1$, an agent with belief μ^i that the state is H thus solves

$$\max_e \left\{ 1 - \tau - e + \alpha[\mu^i \min\{\gamma e + \theta_H \tau, E\} + (1 - \mu^i) \min\{\gamma e + \theta_L \tau, E\}] \right\}. \tag{6}$$

Naturally, someone who is more optimistic about the public provision of education or retirement income (say) will rely less on the market. In particular, as long as

$$\alpha \gamma > 1 \geq (1 - q)\alpha \gamma, \tag{7}$$

an agent who has no credible information beyond his prior ($\mu^i = q$) will only invest $e^i = (E - \tau \theta_H)/\gamma$, whereas one who knows that the state is L ($\mu^i = 0$) will invest $e^i = (E - \tau \theta_L)/\gamma$.

An agent's beliefs at $t = 1$ depend on the news received at $t = 0$ and how he processed it—accepting reality or averting his eyes from it, as specified below. In doing so, he acts so as to maximize the discounted utility of all payoffs

$$U_0^i = -M + \delta E_0^i[s E_1^i[U_2^i]] + \delta^2 E_0^i[U_2^i], \tag{8}$$

where M represents the date-0 costs, if any, of his information-processing strategy and E_t^i reflects his beliefs at date $t = 0, 1$. Equation (8) embodies the key tradeoff between having accurate beliefs at $t = 1$, which leads to decisions that maximize $E_0^i[U_2^i]$, and having hopeful ones, which raises $E_1^i[U_2^i]$.

2.3. Information and Beliefs

To represent agents' optimal processing of information I use a variant of the recall or awareness "technology" from Bénabou and Tirole (2002, 2006). At

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18. See, for example, Caplin and Leahy (2001), Köszegi (2006, 2007), Brunnermeier and Parker (2005) or Bénabou and Tirole (2007). The linear specification, $s E_1^i[U_2^i]$, avoids exogenously building into the model either information aversion or information-loving.

$t = 0$, agents observe a common signal about the efficacy of state intervention: $\sigma = H, L$, with probabilities q and $1-q$, respectively.[19] This could be a measure of past performance, the policies and outcomes of other countries, an expert study, or media reports. Each agent then has some flexibility in how much attention to pay to this data, how to interpret it, whether to "keep it in mind" or "not think about it," and so forth. Formally, he has the following options:

(a) Accept the news realistically, thus truthfully encoding $\hat{\sigma}^i = \sigma$ into memory or awareness (his date-1 information set).
(b) Engage in denial or censoring, thus encoding $\hat{\sigma}^i = H$ instead of $\sigma = L$, or $\hat{\sigma}^i = H$ instead of $\sigma = L$. In addition to distorting later decisions, this may entail an immediate cost $m \geq 0$.
(c) Deal in partial truths, by using a mixed strategy. The relevant (stable) equilibria of the model, however, will turn out to be in pure strategies.

Instead of "tuning out" unwelcome news (denial), selective awareness can also take the form or investing more resources in retaining good ones (rehearsal, preserving evidence), when accurate information retention is naturally imperfect but can be raised at some cost (it is like setting $m < 0$ in the previous specification). Both mechanisms lead to broadly similar results, and can be combined: What matters is that there be a possibility (and a motive) for differential awareness of H and L, not how this is achieved. As mentioned earlier, ideological thought typically involves willful inattention, distorted interpretations and repression of inconvenient facts, ex post rationalizations, and so on. The model therefore emphasizes "optimal forgetting" or obfuscation rather than "optimal remembering."

Given equations (1) and (8), it is easy to see that it is only in state L that agents may want to censor their signal: Someone with anticipatory utility would not want to substitute bad news for good ones. I therefore focus here on cognitive decisions in state L, denoted simply

$$\lambda \equiv \Pr[\hat{\sigma} = L | \sigma = L]. \tag{9}$$

Later on I consider more general payoffs structures than equation (1), under which either state may (endogenously) be censored.

Although agents can process information selectively (or subjectively), their beliefs remain constrained by Bayesian rationality: At $t = 1$, agent i may no longer have direct access to the original signal, but if he (as others) has a systematic tendency toward selective attention or interpretation, he will take that into account,

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using Bayes's rule to form posteriors. Thus, when $\hat{\sigma}^i = L$ the agent knows that the state is L, but when $\hat{\sigma}^i = H$ his posterior belief is only

$$\Pr[\sigma = H \mid \hat{\sigma}^i = H, \lambda^i] = \frac{q}{q + (1-q)(1-\lambda^i)} \equiv r(\lambda^i), \qquad (10)$$

where λ^i is is his *equilibrium* rate of realism.[20] In particular, for an agent who systematically censors bad signals, being aware of only good signals is uninformative, $r(0) = q$.

2.4. Voting

To keep the model as transparent as possible, I abstract from heterogeneity in preferences or productivities. The unanimity of votes that will result is clearly unrealistic, but could be eliminated by introducing "partisan" agents with fixed preferences for either zero or maximal provision of government services.[21] Different social cognitions would then tip the majority rather than the whole electorate, but the basic message would remain unchanged (see Bénabou and Tirole 2006) for a similar effect in a redistributive-policy context). Finally, given the continuum of agents, there is no state of the world in which a single voter can be pivotal, hence no incentive for anyone to strategically alter his vote or his cognitive choices so as to upset the equilibrium. Agents are assumed to vote sincerely based on the information they have at the time ($t = 1$) and, when making their initial information-processing decisions ($t = 0$), to take the expected majority outcome as beyond their control.[22]

3. Statist Ideology

> The French Social Model is neither inefficient nor outdated. It has a great ambition which can be expressed simply: permanently to level up. We must keep it. In a way it's our national genius. It is a necessity.
> —French President Jacques Chirac, 14 July 2005

I now study the possibility of different societal beliefs, each associated to different public policies and private decisions. In doing so, I focus on symmetric pure-strategy equilibria: $\lambda^j \equiv 1$ (Realism) and $\lambda^j \equiv 0$ (Statist Ideology).

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20. It is straightforward to allow for agent naiveté, parametrized for instance by a coefficient $\chi \leq 1$ multiplying $(1-q)(1-\lambda^i)$ in equation (10). This leaves all the positive results unchanged but can affect the welfare conclusions. See Bénabou and Tirole (2002, 2006) for such a treatment, as well as extensive discussions of the experimental and field evidence on motivated beliefs and selective recall.

21. For instance, some agents for whom $\theta^i \equiv 0$ in both states and $\alpha^i = 0$, and others for whom $\theta^i \equiv \theta_H$ in both states and $\alpha^i = 1$.

22. This simplifies the analysis and is realistic. At the same time, it is not essential to the results— what matters is that there be some aspect of the equilibrium environment that lies beyond their control (e.g., capital stocks inherited from past generations' political choices as in Section 5, or other agents' private behavior as in Bénabou [2007]).

3.1. Sustaining Realism

When $\lambda^j \equiv 1$, everyone acknowledges what public policy can or cannot deliver and responds appropriately, investing $e^j = (E - \tau\theta_L)/\gamma$ in state L and $e^j = (E - \tau\theta_H)/\gamma$ in state H, achieving $h^j = E$ in either case. A representative voter's date-1 expected utility from implementing a policy τ is thus $s + \delta$ times

$$1 - \tau - (E - \tau\theta_L)/\gamma + E \tag{11}$$

in the first case, and the same expression with θ_L replaced by θ_H in the second. Therefore, by equation (2), voters unanimously choose $\tau_L = 0$ in state L and the maximum feasible rate $\tau_H = \bar{\tau}$ in state H.

Because the policy outcome is different in each state, any agent who had censored at $t = 0$ the fact that $\sigma = L$ will be inescapably confronted again with that reality at $t = 1$, thus depriving him of the benefits of wishful thinking (and leaving his investment undistorted). Anticipating this, no one will invest in denial, which would only waste the cost m. Consequently, $\lambda = 1$ is always an equilibrium.

This result reflects a first general idea: Interacting with realists makes it more difficult to sustain delusions; conversely, the more others avoid the truth, the easier it is for one to avoid it—if so desired.[23] While this is straightforward, note how information aversion reverses a key property of standard models in which agents value accurate signals. In such models, their decisions are naturally substitutes: The more others invest in obtaining private signals, the more informative is the market price (or other aggregate variable), and thus the lower each individual's incentive to pay for information (Grossman and Stiglitz 1980). When people seek instead to avoid, dismiss, or distort unwelcome information, their actions are complements: The more others ignore or distort their signals, the more effectively each one can do so.

In the present context, this general mechanism has the stark implication that $\lambda = 1$ is sustainable as a social equilibrium for all values of s. This, however, is due to the assumption that when agents experience anticipatory feelings, they are no longer in doubt over which policy has prevailed—only over what its long-run effects will be. More generally, when anticipation also occurs prior to the determination of τ, with importance $s\phi$, $\lambda = 1$ is an equilibrium when[24]

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23. On a related point, Kuran (1993) contains an interesting (albeit informal) discussion of potential mechanisms by which ideas which are not explicitly expressed in society may eventually come to disappear from it.

24. For instance, anticipatory payoffs may be proportional to the duration of the relevant period of uncertainty: $s' = \phi s$ and $s'' = (1 - \phi)s$, where s is some baseline intensity and voting takes place at date $1 + \phi$. I focus the exposition on the case $\phi = 0$, so that $\hat{s} = +\infty$, and treat the more general case in the Appendix.

$$s \le \frac{m/\delta\phi}{(\theta_H/\gamma - 1)\bar{\tau}} \equiv \hat{s}. \tag{12}$$

The numerator reflects the absence of choice distortion (the only private cost of denial is m), and the denominator represents the financial savings that implementing an effective public policy permits in the good state.

3.2. Sustaining Ideology

When $\lambda^j \equiv 0$, agents avert their eyes from the limitations and burdens of the welfare state and "read" both signals as H, resulting in a constant posterior $r(0) = q$ on the state truly being H. From equation (7), they respond to τ by investing $e^i = (E - \tau\theta_H)/\gamma$, which is the optimal amount in state H but falls short by $\tau\Delta\theta/\gamma$ in state L. A representative voter at date 1 is one citizen *inter alia* with posterior belief q, so his expected utility from implementing a tax rate τ is now $s + \delta$ times

$$1 - \tau - (E - \tau\theta_H)/\gamma + qE + (1 - q)(E - \tau\Delta\theta). \tag{13}$$

The net marginal value of τ is positive, provided

$$\theta_H/\gamma > 1 + (1 - q)\Delta\theta, \tag{14}$$

and voters ignorant or in denial about the true state will then choose $\tau_H = \tau_L = \bar{\tau}$.

As the prevailing policy no longer reveals the state of the world, it is *feasible* for an agent to remain ignorant of a signal he initially censored. To determine whether it is *optimal* for him to remain blind to "government failures," consider his cognitive problem at $t = 0$, in state L.

If he retains the bad news, he will correctly invest $e^i = (E - \bar{\tau}\theta_L)/\gamma$ but have to live with the knowledge that the taxes levied are unproductive and that everyone else is underinvesting due to their excessive faith in the state, with adverse implications for his or his offspring's future prospects. His expected intertemporal utility will thus be (R stands for realism):

$$U^i_{0,R} \equiv \delta(s + \delta)[1 - \bar{\tau} - (E - \bar{\tau}\theta_L)/\gamma + \alpha E + (1 - \alpha)(E - \bar{\tau}\Delta\theta)]. \tag{15}$$

If the agent goes along with the prevailing ideology, he too will underinvest, but be able to maintain, in proportion to $r(\lambda^i)$, the comforting hope of a better future in which public expenditure will prove effective and there will be no shortfall of the public good. Hence (D stands for denial):

$$U^i_{0,D} = -m + \delta(s + \delta)[1 - \bar{\tau} - (E - \bar{\tau}\theta_H)/\gamma]$$
$$+ \delta s[r(\lambda^i)E + (1 - r(\lambda^i))(E - \bar{\tau}\Delta\theta)] + \delta^2[E - \bar{\tau}\Delta\theta]. \tag{16}$$
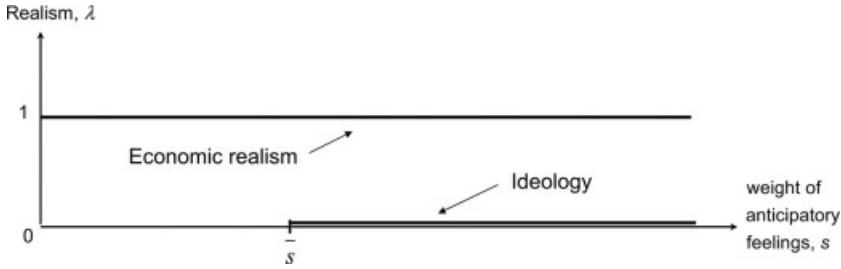
FIGURE 4. Societal beliefs on state versus market.

Agent i's ex post incentive to repress negative news, given that others are doing so ($\lambda^j = 0$) and that his own habitual (or conjectured) degree of truthfulness is λ^i, is thus

$$(U^i_{0,D} - U^i_{0,R})/\delta = -m/\delta - (s + \delta)(\alpha - 1/\gamma)\bar{\tau}\Delta\theta + sr(\lambda^i)\bar{\tau}\Delta\theta. \qquad (17)$$

The first two terms are the costs of denial—direct cost plus underinvestment. The last term is the gain in anticipatory utility: By maintaining hope that $\theta = \theta_H$, the agent avoids facing the fact that, due to others' ideological blindness, society is on the wrong track, wasting resources and ending up with a suboptimal level of (say) education or health $\bar{h}$.

  This reflects a second (and more novel) general insight, which in Bénabou (2007) I termed the *Mutually Assured Delusion* (MAD) principle: When others' denial of an unpleasant reality leads them to act in ways that further worsen an agent's prospects, this increases his own incentive to engage in wishful thinking, making cognitive strategies complements. Conversely, when others' ignorance of bad news is beneficial, that news becomes easier to face and cognitive strategies are substitutes. The political and economic interactions considered here clearly belong to the first case. Indeed, when an ideological electorate votes for the wrong policy, each citizen suffers an expected loss (fiscal channel).[25] Moreover, if people's distorted view of what the state or market will deliver leads them to underinvest in their children's education, undersave for their retirement, and so on, there will be further collective losses to bear (interactions channel). Hence, the following results, illustrated in Figure 4.

PROPOSITION 1.   (Statist ideology)

1. *Assume equations (2), (7), and (14). For*

$$s \geq \frac{m/\delta + \delta(\alpha - 1/\gamma)\bar{\tau}\Delta\theta}{(q - \alpha + 1/\gamma)\bar{\tau}\Delta\theta} \equiv \bar{s}, \qquad (18)$$

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25.   In a symmetric context. Looking at tax and spending policies with unequal incidence is a natural direction for further research.

   *both realism ($\lambda = 1$) and collective denial ($\lambda = 0$) are equilibrium social
   cognitions. In the latter, agents believe in and vote for a large government, in
   spite of good evidence that it is inefficient.*[26]
2. *The more important the spillovers from a good, and the worse the efficiency of
   the state in providing it, the more likely is statist ideology: $\bar{s}$ falls with $1 - \alpha$
   and (for $m > 0$) increases with θ_L.*

   Observers of continental Europe frequently note and puzzle at the persistent
power of collective reality-avoidance and adherence to comforting myths in pre-
venting necessary reforms of welfare states and statist economies.[27] Proposition
1 sheds light on this phenomenon and on the conditions that make it more likely.
The first one, unsurprisingly, is a more favorable prior (a higher q), perhaps inher-
ited from a previous period of war reconstruction during which extensive state
intervention was indeed effective, even indispensable. Second, the more impor-
tant is the public-good nature of the activity under consideration (e.g., education
versus pensions), the easier it is to sustain collective illusions concerning it. At
the same time, the public-finance link alone can suffice to give rise to ideological
thinking: The proposition holds for $\alpha = 1$.
   The third result is somewhat striking: the worse the failings of a statist
system, the greater is the likelihood that agents will fall prey to ideological
blindness—for which they pay personal costs, including suboptimal investments
in human or retirement capital.[28] Although this stark form of the result is some-
what specification-dependent, it points to a more general message: A worsening
of state performance need not speed up reform, but can instead trigger ideological
"defenses" that will block or delay it further, until reality finally hits in a way that
can no longer be ignored or rationalized away.

3.3. Social Welfare

This leads naturally to the question of whether social cognitions bearing on gov-
ernments and markets are ultimately useful or harmful to society. To answer

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26.   When agents derive anticipatory utility both prior to and after the setting of τ, with importance
$s' = \phi s$ and $s'' = (1 - \phi)s$ as in footnote 24, equation (18) is unchanged but equation (12) is now
required for the $\lambda = 1$ equilibrium to exist. For $\bar{s} < \hat{s}$, these two conditions define an interval for s
leading to multiplicity.

27.   See, for example on the case of France, Krugman (1997), Landier and Thesmar (2007), De
Menil (2007), and Saint-Paul (2007). The latter two authors also point to France's extreme position
in the World Public Opinion Survey (2005) reported in Figure 1.

28.   By contrast, a downward shift in the entire probability distribution of what public intervention
is capable of achieving relative to the market, even in the best state (an increase in γ, which lowers
$\theta - \gamma$ uniformly across states) reduces the scope for statist ideology. Note also that if the pure cost
of information censoring m increases in proportion to the "size" of the news $\Delta\theta$, a change in θ_L or
θ_H leaves the equilibrium set unchanged.

it, I compare social welfare under realism and denial—whether achieved as equilibria, or through some collective commitment mechanism (as considered later on).

Consider first state $\sigma = L$, which occurs with probability $1 - q$. When agents are realists (setting $\lambda^j = 1$ in equation [15]), equilibrium welfare is $U^*_{L,R} = \delta(s+\delta)[1 - E/\gamma + E]$. When they are deniers (setting $\lambda^j = 0$ in equation [16]), it is

$$U^*_{L,D} = -m + \delta(s+\delta)[1 - E/\gamma + E + \bar{\tau}(\theta_H/\gamma - 1) - \bar{\tau}\Delta\theta] + \delta sq\bar{\tau}\Delta\theta, \quad (19)$$

where the last term reflect the value of maintaining hope in the efficacy of the state.

PROPOSITION 2.

1. *Following bad news (state L), there is a threshold $s^* \gtrless \bar{s}$ such that realism leads to higher welfare than statist ideology if and only if $s < s^*$. When $s^* > \bar{s}$ either equilibrium can lead to higher ex post welfare, depending on s.*
2. *When $s < \bar{s}$, where statist ideology exists it dominates realism, and for $s \in (s^*, \bar{s})$ agents would be better off in state L if everyone could commit to ignoring bad news.*

Consider now welfare in state H, which occurs with probability q. Given equation (14), in both equilibria the tax rate is $\bar{\tau}$ and agents invest $e^j = (E - \bar{\tau}\theta_H)/\gamma$. When $\lambda = 0$, however, they cannot be sure of whether the state is truly H, or it was really L and they censored the bad news, in which case everyone will underinvest. Due to this "rational doubt," welfare in state H is now lower in an ideological society:[29]

$$U^*_{H,R} = \delta(s + \delta)[1 - E/\gamma + E + \bar{\tau}(\theta_H/\gamma - 1)], \quad (20)$$

$$U^*_{H,D} = U^*_{H,R} - m - s(1 - q)\bar{\tau}\Delta\theta. \quad (21)$$

Averaging over the two states, finally, the gain from raising expectations in state L and the loss from lowering them in state H (last terms in equations (19) and (21), respectively) just cancel, reflecting Bayes's rule. The net welfare impact of denial is thus an unambiguous loss

$$U^*_{0,D} - U^*_{0,R} = -(1 - q)[m + \delta(s + \delta)\bar{\tau}(\Delta\theta(1 - 1/\gamma) + 1 - \theta_L/\gamma)] \quad (22)$$

incurred in state L.

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29. This "shadow of doubt" cost over the good state by the censoring of the bad state could also distort some decisions in state H, although in this instance it does not. Conversely, departing from Bayesian updating, for instance by introducing a "naivete" coefficient $\chi \leq 1$ multiplying $1 - \lambda$ in equation (10), would attenuate the losses in state H and thus allow ex ante gains. See Bénabou and Tirole (2002) for examples of both effects.

PROPOSITION 3.

1. *Following good news (state H), welfare is always higher, the more realistic agents are when faced with bad news (state L).*
2. *Ideology always lowers ex ante welfare.*

Thus, even when ideological thought generates social welfare gains in state L, those are always dominated by the losses it induces in state H. This normative result has important positive implications for how societies deal with "unwelcome news" and those bearing them.

3.4. Ideology, Dissent, and Freedom of Speech

Suppose now that, in state L, an individual or group with a lower s or a different payoff structure attempts to bring (back) to everyone's attention evidence of the public sector's low efficiency. If this occurs after policy has already been set and agents have made their private investments, all it does is reduce everyone's' utility in equation (5), so they will refuse to pay attention or may even try to silence the dissenter (pay a new cost to eliminate the signal). Anticipating that others will behave in this way, in turn, allows everyone to more confidently engage in ideological denial. More strikingly, even bad news that comes in time to correct course can be unwelcome: When $s > s^*$, the citizens would rather keep their pleasant illusions and "stay the course" than admit to a bleak future. Bringing back evidence about the state really being L (and society's opportunity set thus disappointingly limited) will again make everyone worse off, leading to a universal unwillingness to listen and rejection of dissenters. And yet, ideological cognition *always* remains socially harmful ex ante. This tension provides a new rationale for why societies find it desirable to set up commitment mechanisms such as constitutional rights to free speech, independence of the press, and so forth. If effective, these will ensure that bad news will most likely "resurface" ex post in a way that is hard to ignore, thus lowering the ex ante return (or raising the cost) of investing in denial.

4. Laissez-Faire Ideology

> Capitalism is based on self-interest and self-esteem; it holds integrity and trustworthiness as cardinal virtues and makes them pay off in the marketplace, thus demanding that men survive by means of virtues, not of vices. It is this superlatively moral system that the welfare statists propose to improve upon by means of preventative law, snooping bureaucrats, and the chronic goad of fear.
>
> —Alan Greenspan (1963)

The model so far helps explain the puzzle of countries that persist in an overoptimistic view of the effectiveness of the state—or of their own national brand of government intervention—relative to the market. The MAD principle cuts both ways, however, and can also take the form of anti-government ideology and blindness to market failures.[30] The example of health insurance in the United States was mentioned earlier, but other widespread anti-interventionist beliefs are also at odds with the facts. One is the public's vast overestimation of the "excessive" shares of public spending going to domestic welfare, the fraction of people on welfare, and the level of welfare benefits, or the even larger perceptual biases found concerning foreign aid.[31] Another example concerns estate taxation, which many middle- and working-class voters implausibly perceive as likely to affect them or their children, and consequently oppose.[32]

To demonstrate the workings of laissez-faire ideology, I simply extend equation (1) to[33]

$$h^i = \min\{\gamma e^i + \theta(\tau - \kappa), E\} \tag{23}$$

and distinguish two cases:

(a) When $\kappa < \bar{\tau}$, state H remains (conditionally on $\tau = \bar{\tau}$) a more favorable state than state L. One can then show that the results of the case $\kappa = 0$ carry through: For s large enough, a statist-ideology equilibrium coexists with the realistic one.[34]

(b) Assume instead that $\kappa > \bar{\tau}$. One can then think of state H as a "market failure" state in which there is a need for government intervention but, even when carried out to its fullest, it will not suffice to restore the first best. The MAD intuition can then be simply expressed as follows: Whereas agents

30. It is interesting in that respect (and in light of the latest crisis in financial markets) to relate this section's opening quotation to a later one: "An infectious greed seemed to grip much of our business community.…" The trouble, unfortunately, is that the shock of what has happened will keep malfeasance down for a while. But *human nature being what it is—and memories fade*—it will be back. And it is important that at that time appropriate legislation be in place to inhibit activities that we would perceive to be inappropriate" (Greenspan 2002a, 2002b; emphasis added).

31. Thus, in Kuklinski et al. (2000), survey respondents' average estimate of welfare's share in the federal budget was around 9%, versus 1% in reality. All six measures of bias in factual beliefs about welfare were highly correlated across individuals, and powerful predictors of respondents' attitudes towards the desirability of welfare cuts. On opposition to welfare, see also Gilens (1999) and Alesina and Glaeser (2004). On mistrust of government, see Kaiser Foundation et al. (1996b), and on foreign aid see that same source as well as the discussions and references in Caplan (2007).

32. See, for example, Bartels (2005), who analyzes data from the 2002 National Election Survey. For instance, 49% of respondents believed that "most families have to pay" the tax, and among the 57% in favor of its repeal, 69% cited as a reason the fact that "it might affect YOU someday."

33. I focus here, as in the core part of Proposition 1, on the benchmark case in which agents already know the policy when they experience anticipatory feelings—for example, the vote on τ occurs at the start of period 1 ($\phi = 0$).

34. It is also the unique ideological equilibrium if either $\kappa < 0$ (which is allowed in equation (23), as long as $\theta_H(\bar{\tau} - \kappa)$ remains less than E), or if q is large enough that the conditions of Proposition 4 are not satisfied. See Lemma 1 in the Appendix.

"could live with" and realistically accept such a *second-best* situation, an uncorrected market failure (*third-best*) is much harder to face, resulting in a greater incentive to maintain faith in the invisible hand (*first-best*). Thus, alongside with the realistic equilibrium in which citizens have recourse to government intervention when necessary, there exists for s high enough an ideological one in which they systematically censor the signal $\sigma = H$ and vote against public provision.

The parallelism between the two cases can be seen by recasting the second one in terms of the effectiveness of market provision relative to the government alternative: $\tilde{\theta}_{\tilde{H}} \equiv -\theta_L$ in state $\tilde{H} \equiv L$ and $\tilde{\theta}_{\tilde{L}} \equiv -\theta_H$ in state $\tilde{L} \equiv H$, with respective probabilities $\tilde{q} \equiv 1 - q$ and $1 - \tilde{q}$ and voters choosing the degree of laissez-faire in policy, $\tilde{\tau} \equiv \kappa - \tau \in [\kappa - \bar{\tau}, \kappa]$. Apart from these substitutions, the only condition that differs is the one ensuring that agents acting on their priors now choose $\tau = 0$, which corresponds to the maximal value of $\tilde{\tau}$. As shown in the Appendix, equation (14) is replaced by

$$\theta_L/\gamma < 1 - q\Delta\theta. \tag{24}$$

PROPOSITION 4. (Laissez-faire ideology)   *Assume equation (24) and let $1 - q$ and κ, respectively, replace q and $\bar{\tau}$ in each of the conditions stated for Proposition 1.*

1. *For*

$$s \geq \frac{m/\delta + \delta(\alpha - 1/\gamma)\kappa\Delta\theta}{(1 - q - \alpha + 1/\gamma)\kappa\Delta\theta} \equiv \bar{s}, \tag{25}$$

   both realism ($\lambda = 1$) and collective denial of market failures ($\lambda = 0$) are equilibrium social cognitions. In the latter, agents distrust and vote against government provision in spite of good evidence that it is necessary and effective.
2. *The more important the spillovers from a good, and the worse the market failure, the more likely is laissez-faire ideology: $\bar{s}$ is decreasing in $1 - \alpha$ and (for $m > 0$) decreasing in θ_H.*

The welfare analysis is the same as with statist ideology, and so are its implications concerning the necessity of constitutional (ex ante) protections for dissenting speech.

5. The Role of History and Public Capital

Multiple equilibria are most interestingly thought of as the steady states of a cumulative dynamic process, with initial conditions and historical accidents determining which one the economy converges to.

The relevant state variable here is public-sector capital: physical infrastructure, institutions, civil-service human capital, and so on. The larger the stock inherited from previous generations, the greater is citizens' incentive to believe that this is a productive asset that will deliver valuable benefits. If such is the prevailing ideology, in turn, voters will opt for high taxes and continued investment in public capital, much of which will remain for the next generation. Conversely, where there is little preexisting public capital, so that a meaningful stock would have to be built up at considerable tax expense, cognitive incentives go in the direction of thinking that it is not really needed. Hence voters will not support public investment and a small public sector will persist.

The following dynamic extension of the model formalizes this idea. The timeline in Figure 3 now represents the life-cycle of a representative generation, with no altruism links between successive ones. Public services flow from a stock of public capital K_t,

$$h_t^i = \min\left\{\gamma e_t^i + \theta(K_t - \kappa), E\right\}, \qquad (26)$$

which accumulates across generations according to

$$K_t = (1 - d)K_{t-1} + \tau_t. \qquad (27)$$

Thus, τ_t is the tax-financed investment in generation t and $d < 1$ is the depreciation rate (previously equal to 1). Everything else in the model is unchanged; is in particular, each generation receives a signal $\sigma \in \{H, L\}$ about the productivity θ of public capital. The latter is, for simplicity, independent and identically distributed (i.i.d.) across periods.[35] Note that equation (26) is the same as (23), but with a state-dependent $\kappa_t \equiv \kappa - (1 - d)K_{t-1}$. Therefore, the model leads to the following results.

First, starting from any K_0 there exists a realistic equilibrium in which public investment occurs only in state H and capital evolves according to the difference equation (27), where τ_t is i.i.d., equal to $\bar{\tau}$ with probability q and to 0 with probability $1 - q$. The average (stochastic steady-state) capital stock is $K_R^* \equiv q\bar{\tau}/d$.

Second, if preceding generations invested enough that $(1 - d)K_{t-1} > \kappa - \bar{\tau}$, then generation t faces the same problem as analyzed in Section 3: Because $\kappa_t < 0$, H is both the state in which θ is high and a "better" state to be in than L. Thus, if s is high enough, it is an equilibrium for agents to ignore any negative signal about public-sector efficiency and invest the maximum $\tau_t = \bar{\tau}$ in both states.

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[35]   It could also be persistent, for example, constant, as long as each generation is either: (i) unable to observe, or observes only with sufficient noise, the output and consumption outcomes of previous generations (their previous policy choice, on the other hand, contain no information along a denial equilibrium); or (ii) able to treat such observations as any other initial signal about the state that can be denied, forgotten, rationalized away, and so forth.

Conversely, if previous generations did not invest, or invested little enough that $(1 - d)K_{t-1} < \kappa - \bar{\tau}$, generation t faces the same problem as analyzed in Section 4: $\kappa_t > \bar{\tau}$, so even when using policy to maximal effect, H is now a worse state to be in than L. Thus, if s is high enough, it is an equilibrium for agents to ignore any positive signal about public-sector efficiency (or negative signal about market efficiency) and invest nothing in both states, $\tau_t = 0$.

Putting the last two cases together, let

$$\left(\frac{d}{1-d}\right)\kappa < \bar{\tau} < \kappa \tag{28}$$

and denote

$$K^*_{LF} \equiv 0 < \underline{K} \equiv \frac{\kappa - \bar{\tau}}{1 - d} < \bar{K} \equiv \frac{\kappa}{1 - d} < K^*_{ST} \equiv \frac{\bar{\tau}}{d}. \tag{29}$$

PROPOSITION 5.   *Let inequality (28) hold and let q satisfy the conditions listed in both Propositions 1 and 4. For s above some finite threshold, the following hold.*

1. *For $K_0 > \bar{K}$, there is a unique ideological equilibrium, which is statist: Agents in each generation censor L signals and invest $\bar{\tau}$ in public capital. The capital stock K_t converges monotonically to the steady-state $K^*_{ST} = \bar{\tau}/d$.*
2. *For $K_0 < \underline{K}$, there is a unique ideological equilibrium, which is laissez-faire: Agents in each generation censor H signals and invest nothing in public capital. The capital stock K_t converges monotonically to the steady-state $K^*_{LF} = 0$.*
3. *For $K_0 \in [\underline{K}, \bar{K}]$, there is a multiplicity of ideological equilibrium paths.*

Both ideology and policy thus exhibit history dependence, mediated by the stock of public-sector assets. When it is high enough or low enough there is a unique "adapted" ideology that can take hold and become self-sustaining. For intermediate values, which ideology emerges as dominant is indeterminate and depends (as usual) on how agents' expectations are coordinated.

6. Conclusion

While I have focused here on ideologies concerning the state versus the market, the model illustrates three more general points that are applicable to most collective beliefs such as those concerning trust in others, poverty and redistribution, culture, identity, and religion. First, individuals' cognitive approaches to information, and thus their resulting perceptions of reality, are highly interdependent. In particular, subjective beliefs both shape social institutions and optimally adapt to them. Second, this leads to the development of history-dependent and

mutually incompatible visions of how the world works, some of them embody-ing evidence-resistant delusions that severely impede necessary reforms. Third, whereas concepts such as wishful thinking, collective denial, or ideology used to lie outside the realm of economics, today we increasingly have the tools to model and analyze them rigorously. In particular, an explicitly information-based approach can capture the key phenomenon of "not wanting to know" that is cen-tral to most ideologies. It also leads, as we saw, to interesting results concerning the desirability of constitutional, ex ante protections for free speech, even though ex post society will often unanimously prefer to ignore or silence the bearers of bad news.

While De Tracy's vision of a unified "science of ideas" is still some years away, the recent *rapprochements* between political science, economics, and psy-chology are moving us closer. In particular, a rich and exciting research agenda lies ahead in the bringing together of political economy with social and political psychology.

Appendix

Proof of Proposition 1. I first treat the benchmark case discussed in the text and the proposition, in which agents experience anticipatory feelings only after τ is chosen. Because the ex post incentive for denial, given by equation (17), is increasing in $r(\lambda^i)$, there is a unique (Bayesian perfect) equilibrium of agent i's intrapersonal game of information transmission between $t = 0$ and $t = 1$. This unique "best response" to $\lambda^{-i} = 0$ involves denial with probability 1 if and only if equation (17) is positive for $r^i = r(0) = q$, which corresponds to s satisfying equation (18); note that equation (7) implies $q > \alpha - 1/\gamma$. For s above this threshold (and in that case only), $\lambda = 0$ is a social equilibrium. Together with the results in the text on the existence of the $\lambda = 1$ equilibrium, this establishes the proposition.

I now extend the results to the more general case with anticipatory feelings both before and after voting. Period 1 is now divided into two subperiods, of durations ϕ and $1 - \phi$, respectively. At $t = 1 + \phi$, agents first vote on a tax rate τ, then choose their levels of private investment. As before: (i) the remaining disposable income is consumed only in period 2; (ii) during the remainder of period 1, agents experience anticipatory utility, parametrized by s'', over their period-2 prospects. Thus, at $t = 1 + \phi$, the intertemporal welfare which they seek to maximize is

$$U^i_{1+\phi} = (s'' + \delta) E^i_{1+\phi} [1 - \tau - e + y^i_2], \qquad (A.1)$$

leading—in each state—to the very same decisions over e^i and τ as before (case $\phi = 0$), under the same parameter assumptions and with s simply replaced by s''.

During the first part of period 1, however, prior to the setting of τ (which may reveal the state) and the e^j's , agents now experience a flow payoff $s'E_1^i[1 - \tau - e + y_2^i]$. Finally, intertemporal preferences at $t = 0$ are again the expected present value of all future payoffs, which now takes the form

$$U_0^i = -m(1 - \lambda) + \delta E_0^i[s'E_1^i[1 - \tau - e + y_2^i] + s''E_{1+\phi}^i[1 - \tau - e + y_2^i]]$$
$$+ \delta^2 E_0^i[1 - \tau - e + y_2^i] \tag{A.2}$$

(reducing to the basic model when $s' = 0$).

In an *ideological equilibrium*, $(\lambda^j \equiv 0)$, the tax rate must be the same in both states and thus can reveal no information (nor does any other aggregate variable). Thus $E_{1+\phi}^i[\cdot] = E_1^i[\cdot]$ and U_0^i is the same as before, except that s is now replaced by $s' + s'' \equiv s$. Consequently, this equilibrium exists under the same conditions as stated in the text of Proposition 1.

In a *realism equilibrium* $(\lambda^j \equiv 1)$, voters are informed and choose $\tau = \bar{\tau}$ in state H and $\tau = 0$ in state L (recall from what precedes that equilibrium tax rates and effort levels are unchanged by the presence of a prior subperiod of savoring, because the latter is "sunk" by the time decisions are made). Therefore, looking forward, an agent learning that $\sigma = L$ at $t = 0$ knows that no matter whether he censors the signal or not, he will be fully informed by $t = 1 + \phi$. His expected intertemporal utility from realism given $\sigma = L$ is thus

$$U_{0,R}^i = \delta(s' + s'' + \delta)[1 - E/\gamma + E]. \tag{A.3}$$

Under denial, it differs only by the fact that, between $t = 1$ and $t = 1 + \phi$ the agent will expect (with probability $r(\lambda^i)$) the state $\theta = \theta_H$, with associated policy $\tau = \bar{\tau}$, and he will consequently invest only $(E - \bar{\tau}\theta_H)/\gamma$ instead of E. Thus:

$$U_{0,D}^i - U_{0,R}^i = -m + \delta s'r(\lambda^i)(\theta_H/\gamma - 1)\bar{\tau}. \tag{A.4}$$

Since the ex post incentive for denial is increasing in λ^i, there is again a unique equilibrium for agent i. It involves realism, and is thus consistent with $\lambda = 1$ being a social equilibrium, if and only if $U_{0,D}^i - U_{0,R}^i \leq 0$ for $\lambda^i = 1$, which translates into equation (12). Finally, for $s' = \phi s$ and $s'' = (1 - \phi)s$, the two conditions for multiplicity become

$$\left(\frac{1}{1-\phi}\right)\left(\frac{m/\delta + \delta(\alpha - 1/\gamma)\bar{\tau}\Delta\theta}{(q - \alpha + 1/\gamma)\Delta\theta}\right) \leq s \leq \left(\frac{1}{\phi}\right)\left(\frac{m/\delta}{(\theta_H/\gamma - 1)\bar{\tau}}\right), \tag{A.5}$$

defining a nonempty interval for s provided $\phi/(1 - \phi)$ is below some simple threshold. □

Proof of Proposition 2. From equation (19), we can compute

$$\left(U_{0,D}^i - U_{0,R}^*\right)/\delta = -m/\delta + (s+\delta)(\theta_H/\gamma - 1)\bar{\tau} - [s(1-q)+\delta]\bar{\tau}\Delta\theta. \quad \text{(A.6)}$$

This expression is increasing in s because $\theta_H/\gamma - 1 > (1-q)\Delta\theta$ by equation (14). It is positive if

$$s > \frac{m/\delta + \delta[\Delta\theta - (\theta_H/\gamma - 1)]\bar{\tau}}{[\theta_H/\gamma - 1 - (1-q)\Delta\theta]\bar{\tau}} \equiv s^*. \quad \text{(A.7)}$$

To show that s^* can be above or below $\bar{s}$, I focus on the case where $m = 0$. From equations (18) and (A.7), $\bar{s} < s^*$ then takes the form

$$\frac{\alpha - 1/\gamma}{q - \alpha + 1/\gamma} < \frac{\Delta\theta - (\theta_H/\gamma - 1)}{\theta_H/\gamma - 1 - (1-q)\Delta\theta} \iff \frac{q}{\alpha - 1/\gamma} > \frac{q\Delta\theta}{\Delta\theta - (\theta_H/\gamma - 1)},$$

or $\Delta\theta(1 - \alpha + 1/\gamma) > \theta_H/\gamma - 1$. So, given equation (14), $\bar{s} < s^*$ if

$$1 + (1-q)\Delta\theta < \theta_H/\gamma < 1 + (1 - \alpha + 1/\gamma)\Delta\theta. \quad \text{(A.8)}$$

In this case, the denial equilibrium leads to lower (interim) welfare in state L than the realism equilibrium for $s \in (\bar{s}, s^*)$, and to higher welfare for $s > s^*$. The opposite results apply when $\theta_H/\gamma > 1 + (1 - \alpha + 1/\gamma)\Delta\theta$. □

The following lemma extends Proposition 1 to the more general technology given by equation (23), and it will also be used in proving Proposition 4.

LEMMA 1.   For all κ with $0 \leqslant \kappa < \bar{\tau}$, Proposition 1 applies unchanged, with $\bar{\tau}$ simply replaced by $\bar{\tau} - \kappa$ in equations (2) and (18). Furthermore, if $\kappa \leq 0$ the statist equilibrium in which agents censor L signals and $\tau = \bar{\tau}$ is the only (pure-strategy) ideological one. In particular, there can be no equilibrium in which they censor H signals.

Proof. The proof proceeds in two steps, focusing respectively on statist equilibria, in which state L is miscoded or misremembered as H (these will be abbreviated as $L \to H$ equilibria) and on laissez-faire equilibria, in which state H is miscoded or misremembered as L (these will be abbreviated as $H \to L$ equilibria).[36]

Step 1. Existence of $L \to H$ equilibrium.
   (a) Consider first such an equilibrium in which $\tau - \kappa > 0$. The arguments used in the text to establish equation (13) apply unchanged with $\tau - \kappa$ substituted

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36.   It is easy to show (as in Bénabou [2007]) that for all $m > 0$ there can be no equilibrium in which both states are miscoded (even with mixed strategies). With $m = 0$ there could be such "babbling" equilibria but they are of no interest and can be eliminated as such, or by assuming an arbitrarily small positive lower bound for m.

for τ. Condition (14) then implies that τ must equal $\bar{\tau}$, and the rest of the proof of Proposition 1 applies unchanged with $\bar{\tau} - \kappa$ substituted for $\bar{\tau}$, as long $\theta_H(\bar{\tau} - \kappa) < E$, which amounts to the same substitution in condition (2).

(b) Consider an $L \to H$ equilibrium in which $\tau - \kappa \leq 0$. Since $\mu^i = q$ in such an equilibrium, an agent's investment problem is now

$$\max_e \{1 - \tau - e + \alpha[q \min\{\gamma e + \theta_H(\tau - \kappa), E\} + (1 - q) \min\{\gamma e + \theta_L(\tau - \kappa), E\}]\}. \tag{A.9}$$

Given that $\alpha\gamma > 1$, the solution is

$$\gamma e^i = \begin{cases} E + \theta_H(\kappa - \tau) & \text{if } q\alpha\gamma \geq 1, \\ E + \theta_L(\kappa - \tau) & \text{if } q\alpha\gamma < 1. \end{cases} \tag{A.10}$$

In the first case, the voter's problem is again defined by equation (13) and, given equation (14), it leads to $\tau = \bar{\tau} > \kappa$, a contradiction. In the second case, the voter's problem becomes

$$\max_\tau \{1 - \tau - (E + \theta_L(\kappa - \tau))/\gamma + E - q\Delta\theta(\kappa - \tau)\}. \tag{A.11}$$

If $\theta_L/\gamma > 1 - q\Delta\theta$ then the derivative in τ is positive, leading again to a contradiction. If $\theta_L/\gamma < 1 - q\Delta\theta$ (this is condition (24) in the text; I abstract from the measure-zero case where there is equality) then $\tau = 0$ is chosen. Moving back to $t = 0$, consider now the agent's cognitive problem (or incentive constraint) in state L, knowing that the equilibrium tax rate will be $\tau = 0$:

$$U^i_{0,R}/\delta = (s + \delta)([1 - (E + \theta_L\kappa)/\gamma + E], \tag{A.12}$$

$$U^i_{0,D}/\delta = -m/\delta + \delta[1 - (E + \theta_L\kappa)/\gamma + E]$$
$$+ s[1 - (E + \theta_L\kappa)/\gamma + E - q\kappa\Delta\theta]$$
$$= U_{0,R}/\delta - m/\delta - sq\kappa\Delta\theta. \tag{A.13}$$

For $\kappa < 0$ this could be an equilibrium, but for $\kappa \geq 0$ it cannot, so the only $L \to H$ equilibrium in this case has $\tau = \bar{\tau}$.

Step 2. Ruling out $H \to L$ equilibria.

(a) Consider first such an equilibrium in which $\tau - \kappa < 0$. Posteriors are again equal to q in both states so, as in part (b) of Step 1, if $q\alpha\gamma \geq 1$ then $\gamma e^i = E - \theta_H(\tau - \kappa)$ and the same derivation of the the equilibrium tax rate leads again to $\tau = \bar{\tau}$, a contradiction. If, on the contrary, $q\alpha\gamma < 1$, then as before we also need $\theta_L/\gamma < 1 - q\Delta\theta$ to have voters choose $\tau = 0$ rather than $\tau = \bar{\tau}$. Under these conditions, the agent's cognitive problem at $t = 0$ is now, in the

relevant state H,

$$U_{0,R}^i/\delta = (s + \delta)[1 - (E + \theta_H\kappa)/\gamma + E - (1 - \alpha)\kappa\Delta\theta], \tag{A.14}$$

$$U_{0,D}^i/\delta = -m/\delta + \delta[1 - (E + \theta_L\kappa)/\gamma + E - \kappa\Delta\theta] \tag{A.15}$$

$$+ s[1 - (E + \theta_L\kappa)/\gamma + (1 - q)E + q(E - \kappa\Delta\theta)]$$

$$= -m/\delta + (s + \delta)[1 - (E + \theta_L\kappa)/\gamma + E - \kappa\Delta\theta] + (1 - q)s\kappa\Delta\theta.$$

Finally,

$$\left(U_{0,D}^i - U_{0,R}^i\right)/\delta = -m/\delta + (1 - q)s\kappa\Delta\theta - (s + \delta)(\alpha - 1/\gamma)\kappa\Delta\theta,$$

Therefore, if $\kappa \leq 0$ there is no $H \to L$ equilibrium. For further use, note that for $\kappa > 0$ there is one if

$$s \geq \frac{m/\delta + \delta(\alpha - 1/\gamma)\kappa\Delta\theta}{(1 - q - \alpha + 1/\gamma)\kappa\Delta\theta}, \tag{A.16}$$

which corresponds to equation (25).

(b) Consider now an $H \to L$ equilibrium in which $\tau - \kappa > 0$. Recall that under equations (7) and (14) and posterior belief q, this leads to $\gamma e^i = E + \theta_H(\kappa - \tau)$ and $\tau = \bar{\tau}$. The agent's cognitive problem at $t = 0$ in state H is now

$$U_{0,R}^i/\delta = (s + \delta)[1 - \bar{\tau} - (E + \theta_H(\bar{\tau} - \kappa))/\gamma + E], \tag{A.17}$$

$$U_{0,D}^i/\delta = -m/\delta + \delta[1 - \bar{\tau} - (E + \theta_H(\bar{\tau} - \kappa)/\gamma + E] \tag{A.18}$$

$$+ s[1 - \bar{\tau} - (E + \theta_H(\bar{\tau} - \kappa))/\gamma + E - (1 - q)(\bar{\tau} - \kappa)\Delta\theta)]$$

$$= -m/\delta + (s + \delta)[1 - \bar{\tau} - (E + \theta_H(\bar{\tau} - \kappa))/\gamma + E] - sq(\bar{\tau} - \kappa)\Delta\theta,$$

so that

$$\left(U_{0,D}^i - U_{0,R}^i\right)/\delta = -m/\delta - sq(\bar{\tau} - \kappa)\Delta\theta < 0. \tag{A.19}$$

Thus, there cannot be an $H \to L$ equilibrium with $\tau - \kappa > 0$ and a fortiori with $\kappa \leq 0$.   ☐

Proof of Proposition 4. I will in fact show a stronger result, which corresponds to the "mirror image" of Lemma 1.

LEMMA 2.   Proposition 4 holds for all k such that $0 < \kappa \lessgtr \bar{\tau}$. Furthermore, if $\kappa \geq \bar{\tau}$ the laissez faire equilibrium in which agents censor H signals and $\tau = 0$ is the only (pure-strategy) ideological one. In particular, there can be no equilibrium in which they censor L signals.

Proof. With the notation defined in the text, equation (23) becomes

$$h^i = \min\{\gamma e^i + \tilde{\theta}\bar{\tau}, E\} \tag{A.20}$$

and the investment choice of an agent with posterior belief $\tilde{\mu}^i \equiv 1 - \mu^i$ on the state being $\tilde{H}$ and faced with policy $\tilde{\tau}$ can be written as

$$\max_e \left\{1 + \tilde{\tau} - \kappa - e + \alpha[\tilde{\mu}_i \min\{\gamma e + \tilde{\theta}_{\tilde{H}}\tilde{\tau}, E\} + (1 - \tilde{\mu}^i)\min\{\gamma e + \tilde{\theta}_{\tilde{L}}\tilde{\tau}, E\}]\right\},$$
(A.21)

which is identical to equation (6) except for the tildes and the change of $-\tau$ into $\tilde{\tau} - \kappa$ in the first term. The proof that an equilibrium with $\lambda = 1$ always exists, with $\tilde{\tau}$ taking its maximal value κ in state $\tilde{H}$ and its minimum value $\kappa - \bar{\tau}$ in state $\tilde{L}$, is then identical to the earlier one. The proof concerning ideological equilibria again proceeds in two steps.

Step 1. Existence of an $H \to L$ (i.e., $\tilde{L} \to \tilde{H}$) equilibrium.
   a) Consider first such an equilibrium in which $\kappa - \tau > 0$. The relevant analogue of equation (7) is

$$\alpha\gamma > 1 \geq (1 - \tilde{q})\alpha\gamma = q\alpha\gamma.$$
(A.22)

These conditions, together with the fact that $\tilde{\theta}_{\tilde{L}}\tilde{\tau} = -\theta_H(\kappa - \tau) < -\theta_L(\kappa - \tau) \equiv \tilde{\theta}_{\tilde{H}}\tilde{\tau}$, imply that when agents know the state is $\tilde{L}$ ($\tilde{\mu}^i = 0$) they invest $(E - \tilde{\tau}\tilde{\theta}_{\tilde{L}})/\gamma = E/\gamma + (\kappa - \tau)\theta_H/\gamma$, but under ignorance ($\tilde{\mu}^i = \tilde{q}$), they invest only $(E - \tilde{\tau}\tilde{\theta}_{\tilde{H}})/\gamma = E/\gamma + (\kappa - \tau)\theta_L/\gamma$.

   In an ideological equilibrium ($\lambda = 0$) both states are coded as $\tilde{H}$, resulting in a posterior $\tilde{q}$ on the state being truly $\tilde{H}$. Agents then always invest $(E - \tilde{\tau}\tilde{\theta}_{\tilde{H}})/\gamma$, which is the optimal amount (conditional on $\tilde{\tau}$) in state $\tilde{H}$, but will fall short by $\tilde{\tau}\Delta\theta/\gamma$ in state $\tilde{L}$. A representative voter's date-1 expected utility from implementing a policy $\tilde{\tau}$ is then $s + \delta$ times

$$1 + \tilde{\tau} - \kappa - (E - \tilde{\tau}\tilde{\theta}_{\tilde{H}})/\gamma + \tilde{q}E + (1 - \tilde{q})(E - \tilde{\tau}\Delta\theta),$$
(A.23)

which is identical to equation (11) except for the tildes and the change of $-\tau$ into $\tilde{\tau} - \kappa$ in the first expression. He will thus choose the maximum value, $\tilde{\tau}_{\tilde{H}} = \tilde{\tau}_{\tilde{L}} = \kappa$, provided

$$\tilde{\theta}_{\tilde{H}}/\gamma > -1 + (1 - \tilde{q})\Delta\theta,$$
(A.24)

or, equivalently, $\theta_L/\gamma < 1 - q\Delta\theta$, which is the relevant analogue to equation (14), and corresponds to equation (24).

   Consider now agent i's decision problem at $t = 0$, in state $\tilde{L}$. If he remains aware of the news, he will invest $e^i = (E - \kappa\tilde{\theta}_{\tilde{L}})/\gamma = E/\gamma + \kappa\theta_H/\gamma$ but know that everyone else is investing only $e^j = (E - \kappa\tilde{\theta}_{\tilde{H}})/\gamma = E/\gamma + \kappa\theta_L/\gamma$. His expected intertemporal utility will then be

$$U_{0,R}^i = \delta(s + \delta)[1 - \kappa - (E - \kappa\tilde{\theta}_{\tilde{L}})/\gamma + \alpha E + (1 - \alpha)(E - \kappa\Delta\theta)] + \delta(s + \delta)\kappa.$$

If, on the other hand, he goes along with society's denial, he will also underinvest, but will savor the thought of a more pleasant future in which government intervention is not really needed:

$$U_{0,D}^i = -m + \delta[1 - \kappa - (E - \kappa\tilde{\theta}_{\tilde{H}})/\gamma] + \delta(s + \delta)\kappa$$
$$+ \delta s[\tilde{q}E + (1 - \tilde{q})(E - \kappa\Delta\theta)] + \delta^2[E - \kappa\Delta\theta]. \qquad \text{(A.25)}$$

Thus $U_{0,R}^i$ and $U_{0,D}^i$ have the same expressions as before, except for the tildes and the fact that $\bar{\tau}$ (the maximal value of τ) is replaced by κ (the maximal value of $\tilde{\tau}$); hence the existence results.

(b) Ruling out $H \to L$ (i.e., $\tilde{L} \to \tilde{H}$) equilibria with $\kappa - \tau \leq 0$. The reasoning parallels that in Step 1(b) of Lemma 1, with the same transformed variables as earlier. It is omitted here to minimize repetition.

Step 2. Ruling out $L \to H$ (i.e., $\tilde{H} \to \tilde{L}$) equilibria. The reasoning parallels that in Step 2 of Lemma 1. It is again not explicited here to avoid repetition.   □

Proof of Proposition 5. For q in the the intermediate range where it satisfies the conditions of both Propositions 1 and 4, the results follow from the fact, noted in the text, that each generation faces a problem identical to the static one with $\kappa_t \equiv \kappa - (1 - d)K_{t-1}$.

Thus, for $K_{t-1} < \bar{K}$, that is, $(1 - d)K_{t-1} < \kappa - \bar{\tau}$, we have $\kappa_t > \bar{\tau}$, so by Lemma 2 a unique ideological equilibrium exists (for s above a large enough but fixed threshold) and it is laissez-faire, with $\tau_t = 0$. As a result, $K_t = (1 - d)K_{t-1}$ so the same conditions holds in all subsequent periods, implying that ideology remains laissez faire and K_{t+n} converges to zero.

Conversely, for $K_{t-1} > \bar{K}$, namely $(1 - d)K_{t-1} > \kappa$, we have $\kappa_t < 0$, so by Lemma 1 a unique ideological equilibrium exists (for s above a large enough but fixed threshold) and it is statist, with $\tau_t = \bar{\tau}$. As a result,

$$K_t = (1 - d)K_{t-1} + \bar{\tau} > (1 - d)\bar{K} + \bar{\tau} = \kappa + \bar{\tau} > \kappa/(1 - d), \qquad \text{(A.26)}$$

by equation (29). So the same conditions hold in all subsequent periods, implying that ideology remains statist and K_{t+n} converges to $\bar{\tau}/d$.

For $K_{t-1} \in [\underline{K}, \bar{K}], \kappa_t \in [0, \bar{\tau}]$ so the conjunction of Lemmas 1 and 2 implies that (again, for s large enough) both $L \to H$ and $H \to L$ ideological equilibria exist.   □

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