STANFORD COMPUTATIONAL ANTITRUST 152

ARTICLE

The Psychology of Competition Agencies: Using Computational Tools to Address Motivated Skepticism

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Abstract. In this paper we present a theory to explain why competition enforcers may choose to sacrifice decision accuracy and instead adopt pessimistic beliefs; i.e. beliefs that overestimate the likelihood of infringement. Unlike models where beliefs are assumed exogenous, here beliefs are treated as potentially shaped by institutional or contextual factors. We argue that agencies' skepticism toward evidence contradicting their beliefs is not the result of misinformation, but rather driven by cognitive dissonance. Surprisingly, perhaps, their pessimism and skepticism may prove consumer and total welfare increasing, though at the expense of compliant firms. We conclude by discussing if and how computational tools and algorithmic decision-support systems may help debias regulatory decisions through systematic evidence processing. We argue they may do so successfully, if they embrace epistemic humility, acknowledge uncertainty and are revised regularly in light of new information. The legitimacy of computational antitrust does not depend on its technical sophistication, but on its reflexive capacity to aid agencies to learn, self-correct, and remain democratically accountable in our digital era.

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I. Introduction

The "more economic approach" to competition law[1] is being severely criticized for downplaying the economic and political cost of under-enforcement. It is also seen as unduly burdened by complex economic analyses and; and for its alleged pro-market ideological bias.[2] The target of most of these criticisms is not the use of economics *per se*. Rather most complaints focus on how the more economic approach has been implemented in practice and, in particular, on (i) the adoption of the consumer welfare standard as the ultimate goal of enforcement, and (ii) the requirement to establish the likelihood of anti-competitive effects.[3] The consumer welfare standard has been criticized as too narrow, failing to weigh appropriately the importance of preserving rivalry.[4] The need to prove likely anti-competitive effects is said to have lengthened investigations, turning them into excessively complex endeavors.[5]

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[1] *See, e.g.*, Jorge Padilla, 2025, "The 'Crisis' of Antitrust Economics," OXFORD REVIEW OF ECONOMIC POLICY, and references therein.

[2] *See*, *e.g.*, Jonathan B. Baker, 2015, "Taking the Error Out of 'Error Cost' Analysis: What's Wrong with Antitrust's Right," ANTITRUST LAW JOURNAL, 1. Cristina Caffarra, 2024, "Are Letta, Macron and Draghi Marking the End of Neoliberalism in Europe?" PROMARKET; Filippo Lancieri, 2024, "The Political Economy of the Decline of Antitrust Enforcement in the US," PROMARKET (2024); Tommaso Valletti, 2024, "What Have The Consultants Ever Done For Us?," PROMARKET (2024); Tim Wu, THE CURSE OF BIGNESS: ANTITRUST IN THE NEW GILDED AGE (Columbia, 2018).

[3] *See*, *e.g.*, Philip Marsden, 2018, "Who Should Trust-Bust? Hippocrates, Not Hipsters," CPI ANTITRUST CHRONICLE; A. Douglas Melamed, 2020, "Antitrust Law and Its Critics," ANTITRUST LAW JOURNAL, 269-292; A. Douglas Melamed & Nicolas Petit, 2019, "The Misguided Assault on the Consumer Welfare Standard in the Age of Platform Markets," REVIEW OF INDUSTRIAL ORGANIZATION, 741; Nicolas Petit & Lazar Radic, 2023, "The Necessity of a Consumer Welfare Standard in Antitrust Analysis," PROMARKET; Seth B. Sacher & John M. Yun, 2019, "Twelve Fallacies of the 'Neo-Antitrust' Movement," GEORGE MASON LAW REVIEW, 1491-1530 (2019); Carl Shapiro, 2018, "Antitrust in a Time of Populism," INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION, 721-31; Joshua D. Wright *et al.*, 2019, "Requiem for a Paradox: The Dubious Rise and Inevitable Fall of Hipster Antitrust," ARIZONA STATE LAW JOURNAL, 293; Tim Wu, 2018, "After Consumer Welfare, Now What? The 'Protection of Competition' Standard in Practice," CPI ANTITRUST CHRONICLE.

[4] *See*, *e.g.*, Lina M. Khan, 2017, "Amazon's Antitrust Paradox," 126 YALE LAW JOURNAL, 717–18. ("By fixating on short-term price effects, the current framework underappreciates the competitive significance of market structure and the preservation of rivalry.").

[5] *See*, *e.g.*, Damien Geradin, 2024, "Abuse of Dominance: Has the Effects-Based Analysis Gone Too Far?," 40 OXFORD REVIEW OF ECONOMIC POLICY 87, 94–96. ("The increasing insistence on detailed proof of anticompetitive effects has significantly increased the

Whether this pessimistic stance about enforcement is grounded in evidence is, at best, controversial. Some refer to certain macroeconomic developments in Europe and the US for support: the increase in concentration and profit mark ups in many industries, especially in the high-tech ones; the decline in the labor share; the reduction of investment and the fall in productivity; and the increase in inequality.[6] Not everybody agrees, though.[7] Some argue that the increase in concentration is negligible in most industries, likely driven by the use of incorrect statistical methods, and/or calculated at a level of sectoral aggregation that is meaningless. Others dispute the claimed increase in mark ups, or argue that it merely reflects a redistribution of rents between leaders and laggards within industries. Some others disagree that weak competition law enforcement is the cause of such changes. Rather they consider that, e.g., the decline in the labor share is the result of globalization (in particular the impact of the imports from China and other low-wage economies), technological change (which has displaced labor with capital), and the decline in union power.[8] Likewise, in their opinion, the alleged increase in

length and complexity of investigations."); OECD, 2024, *The Standard and Burden of Proof in Competition Law Cases* 9-11 (observing that effects-based enforcement "requires extensive economic evidence, which can delay proceedings and raise administrative costs."); and Heike Schweitzer, (2024), "How to Fix a Failing Art. 102 TFEU", 15 JOURNAL OF EUROPEAN COMPETITION LAW & PRACTICE. 1, 6-7 (arguing that demanding proof of likely effects "has contributed to slower and more resource-intensive enforcement").

[6] *See*, *e.g.*, Branco Milanovic, GLOBAL INEQUALITY: A NEW APPROACH FOR THE AGE OF GLOBALIZATION (Harvard Univ. Press, 2018); Thomas Philippon, THE GREAT REVERSAL (Belknap Press, 2019); Jan Eeckhout, PROFIT PARADOX: HOW THRIVING FIRMS THREATEN THE FUTURE OF WORK (Princeton University Press, 2021).

[7] *See*, *e.g.*, Jorge Padilla, "Neoclassical Competition Policy without Apology" in Adina Claici, Assimakis Komninos and Denis Waelbroeck (eds.) THE TRANSFORMATION OF EU COMPETITION LAW. NEXT GENERATION ISSUES, (Wolters Kluwer, 2023.) and references therein.

[8] *See*, Gregory J. Werden, 2021, "Concentration and Rising Market Power: Fears and Facts," in RESEARCH HANDBOOK ON ABUSE OF DOMINANCE AND MONOPOLIZATION, Pinar Akman, Or Brook, and Konstantinos Stylianou (eds). (Edward Elgar, 2021.) *See also* David H. Autor, David Dorn & Gordon H. Hanson, 2013, "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," AMERICAN ECONOMIC REVIEW, 2121-2168; Diego Anzoategui, Diego Comin, Mark Gertler, & Joseba Martinez, 2019, "Endogenous Technology Adoption and R&D as Sources of Business Cycle Persistence," AMERICAN ECONOMIC JOURNAL: MACROECONOMICS, 67-110; David H. Autor, David Dorn, Lawrence F Katz, Christina Patterson & John Van Reenen, 2020, "The Fall of the Labor Share and the Rise of Superstar Firms," QUARTERLY JOURNAL OF ECONOMICS, 645-709; Henry S. Farber, Daniel Herbst, Ilyana Kuziemko & Suresh Naidu, 2021, "Unions and Inequality Over the Twentieth Century: New Evidence from Survey Data", NBER working paper 24587; Jordi Jaumandreu, 2022, "The Remarkable Stability of the US Manufacturing Markups", available from

concentration and mark ups should be attributed to the emergence of the digital giants and the reduced rate at which technological innovation diffuses within and across industries.

The absence of clear-cut evidence about the link between competition enforcement and the abovementioned macro developments inevitably leaves room for diverging opinions and beliefs.[9] Competition agencies (the "enforcers," henceforth) appear to hold a pessimistic view about the track record of the more economic approach to competition law enforcement.[10] This essay seeks to understand why that is the case. In a nutshell, their pessimism towards the more economic approach reflects their pessimism about the likelihood and cost of infringement which biases their assessment of the plausibility of anti-competitive narratives relative to the pro-competitive narratives. As a result, they

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https://people.bu.edu/jordij/papers/markup_stability_09102022.pdf; and John C. Haltiwanger, Henry R. Hyatt & James R. Spletzer, 2022, "Industries, Mega Firms, and Increasing Inequality," IZA DP No. 15197.

[9] *See, e.g.,* Fernando Castillo de la Torre, "The Dwindling Law in Article 102 TFEU," in Assimakis Komninos and Ekaterina Rousseva (eds.), ARTICLE 102 TFEU: PAST - PRESENT – FUTURE, (Wolters Kluwer, 2025). Computational tools can identify patterns in enforcement outcomes and help test whether the "more economics approach" has indeed led to under-enforcement. *See, e.g.,* Lea Bernhardt & Ralf Dewenter, 2024, "The Impact of the More Economic Approach on EU Merger Decisions," STANFORD COMPUTATIONAL ANTITRUST, 202-232.

[10] *See, e.g.,* Margrethe Vestager, *Competition Enforcement in the Digital Age*, speech at the Bundeskartellamt 18th Conference on Competition (16 Mar. 2017) ("Competition law enforcement is not an econometric contest. Economics is a tool to help us understand markets, not an end in itself"); Joaquín Almunia, *The Role of Economics in Competition Policy*, speech at the CRA Annual Brussels Conference (10 Dec. 2013) ("Economic analysis cannot replace legal assessment, and more complex economic evidence does not necessarily lead to better or more accurate decisions"); UK Competition and Markets Authority, *The CMA's Approach to Competition Enforcement* (2018) para. 2.4 ("While economic analysis is essential, cases cannot depend on highly speculative or excessively complex modelling that risks obscuring rather than clarifying competitive harm"); Lord Tyrie, *Competition Policy, the Consumer and the State*, speech as Chair of the CMA (12 Feb. 2019) ("An over-reliance on elaborate economic theory risks paralyzing enforcement and weakening public confidence in competition policy"); Opinion of AG Wahl in Case C-413/14 P *Intel v Commission* EU:C:2016:788, para. 173 ("Competition law cannot be reduced to a purely quantitative exercise, nor can enforcement depend on economic models whose results are inherently contestable"). *See, also, e.g.*, Bernardo Mueller, 2024, "The Arc of Antitrust: A Text-based Measure of Antitrust Policy Beliefs and Attitudes," STANFORD COMPUTATIONAL ANTITRUST, 107-172; Sean Norick Long, 2025, "The Antitrust Stack: A Computational Analysis of Lina Khan's Legacy," STANFORD COMPUTATIONAL ANTITRUST, 97-150.

may wish to open too many cases, be overly optimistic about their theories of harm and the quality of evidence in their support and/or overly skeptic about any pro-competitive evidence produced by defendants, or both.

Enforcers' beliefs may respond to external influences. For example, they may "determined" politically through the process of appointing enforcers with the appropriate priors. Alternatively, they may be "designed" institutionally when scoping the enforcers' tasks and/or shaping their incentives (compensation, career progression paths). Or they may "influenced" by regulated companies *via* anticipated post-regulatory employment or overt transfers; or may be independently "adopted" by enforcers themselves as sources of direct utility. Our thesis in this paper is that enforcers' pessimistic beliefs about the likelihood and cost of infringement arise from internal, ego-defensive motivations and asymmetric information processing.

The enforcers we describe below are biased because they are "motivated," not "captured," at least not captured by third-parties. A captured enforcer's bias arises from external, material incentives that directly compromise her independence.[11] A motivated enforcer is not captured. Her "motivation" comes from psychological factors: a strong attachment to her own self-image or to her or her institution's mission; political identity or ideological commitments; or fear of reputational damage, blame or embarrassment if she reverses herself.[12] Both motivation and capture can do harm, but the difference matters. While motivated enforcers believe (or convince themselves) to be acting in line with their duty, captured enforcers knowingly trade decisions for benefit. Motivated reasoning is harder to detect externally because there is no obvious *quid pro quo*; capture often leaves more tangible traces. Motivated pessimism can be reduced by organizational reforms, training, and changing incentives to admit error; instead, capture requires strong legal and institutional safeguards against corruption and conflicts of interest.

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[11] A captured enforcer, by contrast, is externally corrupted. She changes or maintains beliefs and decisions because of hard incentives supplied by interested parties—money, bribes, revolving-door promises of future employment, political pressure tied to career advancement. In this case the bias is not primarily psychological but instrumental: the enforcer knowingly adjusts behaviour to obtain or protect an external benefit.

[12] Not all regulatory agencies are equally susceptible to motivated reasoning. Its prevalence and practical significance may depend, among other factors, on institutional design, leadership ideology, and agency culture. *See*, *e.g.*, James Q. Wilson, BUREAUCRACY: WHAT GOVERNMENT AGENCIES DO AND WHY THEY DO IT, (Oxford University Press, 1991); Terry M. Moe, "The Politics of Bureaucratic Structure," in CAN THE GOVERNMENT GOVERN?, John E. Chubb & Paul E. Peterson (eds.), (Brookings Institutions Press, 1989).

Importantly, algorithmic decision-support tools may help to address motivated reasoning, by e.g. revealing inconsistent application of standards across similar cases, while they may have a limited impact if the root of bias is capture. Computational antitrust tools can reduce reliance on subjective or politically motivated reasoning by identifying complex collusive patterns, simulating competitive outcomes, and enabling more accurate analyses. However, these tools do not ensure neutrality, as they may encode existing institutional biases and/or conceal normative assumptions behind an appearance of algorithmic objectivity.

In Sections II and III of this essay,[13] we argue that enforcers, like all individuals, hold preferences over the beliefs they adopt; their beliefs are consciously or unconsciously shaped for affective or instrumental reasons. We explain how "motivated reasoning" leads to "motivated skepticism"[14] and, thence, causes enforcers to interpret evidence asymmetrically, retain sticky priors, and even develop narratives that protect their self-image, their statutory missions, or their institutional reputation at the expense of decision accuracy. We explain why competition authorities are particularly prone to pessimistic priors—overestimating infringement and underestimating compliance—because their missions, incentives, blame-avoidance motives, complex informational environments, and professional identities make selective updating and stereotyping easier to justify. This dynamic can generate cultural capture, entrenched distrust of outside experts, and "hero-villain" narratives in which enforcers cast themselves as protectors of consumers against industry and its advisers, thereby reinforcing biases rather than correcting them.[15] Although accountability mechanisms such as reason-giving, legislative oversight, or independence constraints offer limited relief, properly scoped judicial review may provide a more promising check, yet enforcers can also act to narrow that review. Importantly, we note that while debiasing enforcers' beliefs might

[13] In Section II we present the paper's thesis in narrative form. Section III provides formal back up.

[14] Motivated skepticism refers to a pattern of belief formation and evidence evaluation in which regulators apply asymmetric scrutiny to information in ways that protect prior commitments, professional identity, or institutional narratives.

[15] For the avoidance of doubt, we are not saying that every enforcer is motivated, or that every motivated enforcer exhibits motivated skepticism, or that every motivated skeptic behaves as above. All we are saying is that those behaviors are consistent with motivated reasoning and should be anticipated and addressed. Importantly, economic consultants', firms' internal and external lawyers are also likely to hold motivated beliefs. Furthermore, in our opinion, the risk of capture is much greater for those constituencies, especially if their compensation is contingent on the results of the competition assessment.

help firms and consultants, from a utilitarian perspective it may reduce consumer welfare, so allowing some degree of pessimism may be preferable.

While the origins of motivated skepticism are psychological, its practical significance is institutional, since it is effect on enforcement outcomes occur primarily when decision-making environments allow biased beliefs to remain implicit and insulated from challenge. This is why, despite its psychological origins, its implications can be addressed through institutional remedies, as we explain in Section IV. Out claim is not that motivated reasoning can be eliminated through governance reforms, but that its influence on enforcement outcomes is mediated by institutional context. Institutional designs that require explicit reason-giving, comparative modeling, auditability, and exposure to external scrutiny alter the decision environment in which biased cognition operates.

In Section IV, we argue that institutional reforms leading to the adoption of "hopeful pessimism" by competition agencies can yield superior outcomes in complex digital markets.[16] Unlike "motivated" or ego-defensive pessimism, which serves to protect the enforcer's self-image or power, hopeful pessimism combines a sober recognition of risks with a non-defensive commitment to decision accuracy and updating.

A hopeful-pessimistic authority would adopt cautious priors, publish its assumptions, invite challenge, pilot remedies, and reward staff for revising positions in light of new evidence. Concrete measures include aligning incentives with public duty, institutionalizing red-team reviews and public comment, investing in data and analytics to test pessimistic priors, and using simple debiasing checklists to distinguish evidence-based caution from self-protective bias. By embedding these practices, agencies can shift from motivated pessimism to hopeful pessimism—producing enforcers who start from prudent assessments, remain open to disconfirming evidence, and act with integrity under uncertainty. This in turn serves to protect consumers, promote civic equality, and defend the rule of law from interventions that, driven by motivated reasoning, are inherently arbitrary.[17]

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[16] We also discuss how to move decision-makers from ego-defensive "motivated pessimism" to value-driven "hopeful pessimism". *See* Section V below.

[17] Arguably, an enforcer that chooses its beliefs motivated by ego, peer pressure, or ideology is no less arbitrary that one that chooses its actions according to criteria other than the law. Also, in republican political theory, non-domination is a definition of freedom that goes beyond "non-interference." A person is free not only when no one interferes with them, but when no one holds the capacity to arbitrarily interfere with

In Section V, we explore the potential of computational antitrust tools to reduce the influence of subjective or politically motivated reasoning and support of a hopefully pessimistic stance. Such tools can identify subtle collusive patterns, simulate competitive outcomes, and test counterfactuals that exceed human cognitive capacity. Such methods enhance the accuracy, transparency, and replicability of antitrust analysis. They create a data-driven foundation for decisions that were once heavily reliant on narrative judgment and intuition. However, the deployment of computational tools does not guarantee impartiality; rather, it risks encoding and amplifying existing institutional biases. If historical enforcement data reflect systematic skepticism toward large firms, algorithmic models trained on those data may internalize and reproduce this motivated pessimism. Moreover, the apparent objectivity of machine learning systems can conceal normative assumptions and parameter choices that predetermine outcomes. Deep learning models, in particular, often function as opaque "black boxes," making it difficult to identify whether pessimistic conclusions arise from empirical evidence or from embedded institutional priors.

To prevent such re-biasing, competition agencies must adopt reflexive and transparent governance frameworks, ensuring explainability, independent auditing, and open data practices. Ultimately, computational antitrust should serve as a tool for augmenting, not replacing, human judgment. Algorithms are diagnostic instruments. They should not be given the role of adjudicators. A reflexive agency also keeps human judgment visibly in the loop. Decision-makers must give reasons when accepting or rejecting algorithmic recommendations, assume responsibility for model selection, and subject tools to internal review that distinguishes hypothesis testing from confirmation of priors. Reflexive agencies embrace epistemic humility, acknowledge uncertainty, and be revised regularly in light of new information.

We conclude in Section VI with a critical review of our proposal and a discussion of topics for further research.

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them at will. Freedom therefore requires institutional arrangements—laws, checks and balances, avenues for contestation—that prevent arbitrary or uncontrolled power, even if that power is not currently exercised. *See* Philip Pettit, REPUBLICANISM: A THEORY OF FREEDOM AND GOVERNMENT, 1997, p. 22.

II. Skeptic Enforcers: The Narrative

Individuals not only have preferences about outcomes, including policy outcomes, but also over their beliefs regarding those outcomes.[18] Moreover, they have some control over those beliefs and can manipulate them consciously or unconsciously. The reasons behind the choice of beliefs that depart from objective cognition may be affective ("they feel better") or instrumental ("they do better privately").[19] For example, people may shape what they believe to protect their self-image, reduce anxiety, sustain morale, or align with identity or ideology, often without conscious intent. Their choices are sticky—once beliefs are chosen they tend to persist over time—and therefore may have important economic consequences.[20] In particular, as explained by Benabou and Tirole (2016),[21] agents produce and consume beliefs that generate direct psychological utility, sometimes at the expense of accuracy. As Benjamin Franklin famously observed, "So convenient a thing it is to be a reasonable creature, since it enables one to find or make a reason for everything one has a mind to do."[22] This a pithy anticipation of what modern psychologists call "motivated reasoning"[23]—i.e., agents' use of cognitive resources to justify what they already want to believe or do.

Enforcers, economic consultants, and academics, are no different. They may all be subject to cognitive and cultural capture so that their priors and information processing are biased towards or against industry-friendly interpretations. They may internalize industry frames and nurture congenial narratives ("what's good for the sector is good for society") or, instead, may see market failure all around. Their beliefs are likely driven by

[18] Markus K. Brunnermeier & Jonathan A. Parker, 2005, "Optimal Expectations," AMERICAN ECONOMIC REVIEW, 1092-1118.

[19] Roland Bénabou, 2015, "The Economics of Motivated Beliefs," REVUE D'ECONOMIE POLITIQUE, 665 - 685.

[20] George A. Akerlof & William T. Dickens, 1982, "The Economic Consequences of Cognitive Dissonance," AMERICAN ECONOMIC REVIEW, 307 - 318.

[21] Roland Bénabou & Jean Tirole, 2016, "Mindful Economics: The Production, Consumption and Value of Beliefs," JOURNAL OF ECONOMIC PERSPECTIVES, 141 - 164.

[22] Benjamin Franklin, THE AUTOBIOGRAPHY OF BENJAMIN FRANKLIN (1791)

[23] Ziva Kunda, 1990, "The Case for Motivated Reasoning," PSYCHOLOGICAL BULLETIN, 480-498.

their "missions,"[24] which may be pursued zealously,[25] processing evidence asymmetrically, or willfully choosing to remain ignorant about certain facts or theories.[26]

However, unlike other agents' missions—e.g., those of economic and non-economic experts—regulatory *missions* are statutory and public. When an agency's mission is at stake, cognitive dissonance can subtly tilt analysis and enforcement posture.[27] Competition agencies' mission is generally the promotion of effective competition. This mission may pull consciously or unconsciously for or, perhaps more likely, against political enthusiasm for national champions or industrial policy.

Unlike single-objective agencies, such as food-safety enforcers, competition agencies and other economic enforcers typically operate under conflicting objectives: consumer prices vs. investment and quality; static efficiency vs. dynamic innovation; competition intensity vs. scale economies and competitiveness. These conflicts are institutional design features acknowledging real trade-offs. While they cannot be avoided, they create space for motivated reasoning. When missions collide, agency leaders and staff lean on values and narratives to rank goals in ways that reflect institutional reputation as much as evidence.

Enforcers, and competition agencies typically cultivate reputation and legitimacy with multiple audiences—politicians, courts, firms, and the public.[28] This can anchor high standards, but it may also lead to cultural capture, aligning the enforcers' views and

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[24] Their "mission" motivates civil servants to endure long careers, undergirds why legislators delegate authority to expert bodies, and, at times, explains why enforcers become either heroic problem-solvers or stubborn obstacles. *See, e.g.,* Canice Prendergast, 2007, "The Motivation and Bias of Bureaucrats," AMERICAN ECONOMIC REVIEW, 180 – 196.

[25] Enforcers, like other bureaucrats, are not mechanistic rule-followers. Anthony Downs's classic typology distinguishes between zealots, advocates, and statesmen, whose loyalties to particular policies, organizations, or society as a whole shape their behavior. Zealots, in particular, pursue narrow missions intensely, sometimes at the expense of administrative balance. *See* Anthony Downs, INSIDE BUREAUCRACY (1964.)

[26] *See* below for a detailed discussion about "motivated skepticism."

[27] Akerlof & Dickens (1982) explain how cognitive dissonance may bend beliefs in settings with moral stakes. *See* George A. Akerlof & William T. Dickens, 1982, *supra* note 20.

[28] *See, e.g.,* Koen Migchelbrink, Pieter Raymaekers, Válerie Pattyn & Peter DeSmedt, 2024, "Public Officials' Motivated Reasoning and their Interpretation of Policy Information," PUBLIC MANAGEMENT REVIEW, 1-27.

beliefs with government, industry, or epistemic communities (such as, e.g., neo-classical economists, neo-Brandesians) rather than with statutory purpose. The risk of self-serving bias is compounded by enforcers' natural desire to avoid "blame."[29] Blame avoidance may shape conduct: a enforcer concerned with consumer harm may become over-precautionary; instead, one leaning into growth may under-enforce, rationalizing that "investment needs breathing room."

Enforcers' priors about firm behavior may be influenced by individual traits, past personal experiences, legal statutes, and case law. They can invest effort to test and refine these priors, but doing so is costly. Thus, they may opt to retain their beliefs to save costs or for deeper normative reasons, including consequentialist or non-consequentialist motivations shaped by legal and political contexts.[30]

Based on the formal analysis developed in Section III below, we expect that enforcers who care primarily about reducing the overall infringement rate will favor "pessimistic" beliefs that overestimate the likelihood of firm infringement and underestimate the likelihood of non-infringement, since these beliefs lower infringement incidence relative to those of unbiased enforcers. Similarly, those focused on minimizing Type 2 errors (under-enforcement) are likely to adopt pessimism, even at the expense of more Type 1 errors (over-enforcement). Welfarist enforcers—those maximizing consumer or total welfare—may also adopt pessimistic beliefs. Even if such enforcers recognize that pessimism can increase wrongful sanctions against compliant firms, and even encourage infringement by firms who otherwise would have been law-abiding, they may accept this trade-off because, in our model, consumer and total welfare correlate directly with lower infringement rates. Thus, welfare maximization can justify pessimism at the expense of decision accuracy.

Enforcers may also prefer pessimistic beliefs from a deontological perspective. A Kantian enforcer, guided by the categorical imperative ("firms must not infringe"), would choose pessimism to reduce the number of infringers.[31] In contrast, a enforcer

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[29] *See, e.g.,* Daniel Carpenter & David A. Moss, PREVENTING REGULATORY CAPTURE, (Cambridge University Press, 2014.)

[30] Consequentialism is an ethical theory that judges the morality of an action based on its outcomes or results. It asserts that an action is morally right if it produces more good consequences than bad ones, and wrong if it produces more bad consequences than good. The focus is on the end result rather than the action itself or the intent behind it.

[31] According to some authors, the idea of a Kantian competition enforcer is self-contradictory. White (2007) has convincingly argued that law focused on protecting

motivated by the Hippocratic imperative ("first do no harm"), or one primarily concerned with decision accuracy, would avoid pessimism, given the risk of over-enforcement and harm to compliant firms. Institutional incentives also matter. Enforcers concerned with personal or institutional blame may adopt pessimistic beliefs *if* the political or epistemic environment rewards strong enforcement (reducing under-enforcement risks). Conversely, if the context prioritizes avoiding wrongful convictions (Type 1 errors), enforcers may resist pessimism. Finally, enforcers' choices may also be affected by the nature, scope, and dynamics of judicial review. If, for example, infringement decisions are more likely to be appealed than non-infringement ones, enforcers may avoid pessimism to minimize the risk of quashed decisions and reputational damage. This pressure is particularly strong when the probability of appeal and reversal is high, since it is then when errors are exposed. When both types of decisions are equally appealable, the effect of judicial review on belief choice is less clear.

In short, while in principle motivated reasoning could bias enforcers' priors in favor or against intervention, our formal model below shows that enforcers may often begin from priors that are systematically tilted toward finding infringement, interpreting the same evidentiary signal through densities that overweigh the likelihood of a violation relative to non-violation. Such priors are not the product of pecuniary incentives—bribes, revolving-door prospects, or other "hard" rewards—but instead reflect the enforcer's mission, the consequentialist and non-consequentialist commitments embedded in it, and the epistemic and political environment in which she operates. These factors help sustain a self-image of vigilance and fairness, even when the beliefs themselves deviate from an unbiased benchmark.

When a third-party actor communicates to the motivated enforcer that her beliefs are unduly pessimistic and proposes alternative densities, the motivated enforcer may refuse to engage. A motivated enforcer is typically skeptic towards information that contradicts existing priors and may refuse to update them objectively.[32] An objective (Bayesian)

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abstract "competition," understood as a process, primarily through quantitative standards such as "consumer welfare," is clearly against Kantian deontology. Mark D. White, 2007, "A Kantian Critique of Antitrust: On Morality and Microsoft," JOURNAL OF PRIVATE ENTERPRISE, 161-190. On the other hand, Kantian philosophy was an essential inspiration for the intellectual founders of relatively interventionist ordoliberal competition policy. Kenneth Dyson, CONSERVATIVE LIBERALISM, ORDO-LIBERALISM, AND THE STATE: DISCIPLINING DEMOCRACY AND THE MARKET, (Oxford University Press, 2021.)

[32] *See e.g.,* Charles G. Lord, Lee Ross & Mark R. Lepper, 1979, "Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence," JOURNAL PERSONALITY & SOCIAL PSYCHOLOGY, 2098-2109; Timur Kuran &

enforcer would process the communication as new information and revise her priors accordingly.[33] If the enforcer regarded the actor as a fully informed expert, she might adopt the proposed densities wholesale; if she judged the information imperfect but valuable, she would still shift in a less pessimistic direction. In either case the updating reflects the informational content of the message rather than the enforcer's own psychological needs. By contrast, a motivated enforcer likely may display minimal or no adjustment. Information that contradicts her priors may be discounted, ignored, or selectively interpreted so as to preserve the perceived morality of her original stance. This behavior accords with the phenomena of motivated skepticism:" applying asymmetrically lenient criteria to evidence that corroborates her beliefs and stricter criteria to evidence that challenges them. Such asymmetric updating allows the motivated enforcer to maintain both her self-image and her preferred worldview even in the face of credible contradictory evidence.[34]

Motivated skepticism explains how motivated reasoning, self-deception, mission zealotry, and culture capture are sustained even in the presence of contradictory objective feedback.[35] This is not to say that objective feedback cannot influence the decisions of motivated enforcers, however. What the evidence shows is that, while positive feedback—i.e. feedback confirming motivated beliefs—has persistent effects on said beliefs, negative feedback—i.e. feedback inconsistent with those beliefs—may have an impact in the short-

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Cass R. Sunstein, 1999, "Availability Cascades and Risk Regulation," STANFORD LAW REVIEW, 683-768; and Dan M. Kahan, 2016, "The Politically Motivated Reasoning Paradigm, Part 1," EMERGING TRENDS IN SOCIAL AND BEHAVIOR SCIENCES.

[33] A Bayesian enforcer use Bayes' theorem to compute and update probabilities after obtaining new data. Bayes' theorem describes the conditional probability of an event based on data as well as prior information or beliefs about the event or conditions related to the event.

[34] *See, e.g.,* Peter H. Ditto & David F. Lopez, 1992, "Motivated Skepticism: Use of Differential Decision Criteria for Preferred and Nonpreferred Conclusions," JOURNAL PERSONALITY & SOCIAL PSYCHOLOGY, 568-84; and Peter H. Ditto *et al.*, 2003, "Spontaneous Skepticism: The Interplay of Motivation and Expectation in Responses to Favorable and Unfavorable Diagnoses," JOURNAL PERSONALITY & SOCIAL PSYCHOLOGY, 221-37.

[35] *See, e.g.,* W. Kip Viscusi, 1997, "Alarmist Decisions with Divergent Risk Information," ECONOMIC JOURNAL, 1660-75; *See also* Paul Pierson, 2000, "Increasing Returns, Path Dependence, and the Study of Politics," AMERICAN POLITICAL SCIENCE REVIEW, 251-67; and Joshua D. Wright & Douglas H. Ginsburg, 2012, "Behavioral Law and Economics: Its Origins, Fatal Flaws, and Implications for Liberty," NORTHWESTERN UNIVERSITY LAW REVIEW, 1057-65.

term, but that effect fades over time.[36] A motivated enforcer is likely to exhibit "selective recall," responding positively to feedback—e.g. court rulings, new empirical findings, etc.—that support her beliefs, and looking for ways to ignore or bypass feedback that contradicts them.[37] Thus, for example, a motivated enforcer may find it appropriate to issue "guidelines" codifying the case law when it endorses her beliefs, while re-interpreting it when it contradicts them.

Motivated skepticism may be more likely in economic enforcers than for other types of enforcers, or for the public in general, for several reasons. *First*, because their biased way of processing information is not just self-serving; it may benefit others.[38] As Adam Smith said in the *Theory of Moral Sentiments*, "How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it."[39] *Second*, because of the sheer complexity of the information that they have to analyze. Cognitive dissonance is more likely in complex scenarios or when dealing with complex information, or when decisions are particularly complex. Then, decision makers develop simplifying mental models. Different individuals likely will develop different models. While objective individuals will acknowledge "model uncertainty"—i.e. that her mental model may not be correct—a motivated agent will neglect such uncertainty. This is easier to justify and thus more

[36] *See, e.g.,* Florian Zimmerman, 2020, "The Dynamics of Motivated Beliefs," AMERICAN ECONOMIC REVIEW, 337-361. The evidence presented here does not pertain to competition agencies. The study provides experimental evidence on how individuals selectively update beliefs to maintain favorable self-views. In a controlled laboratory setting, subjects receive noisy feedback about their relative intelligence and subsequently update their beliefs about their ability. Zimmerman finds asymmetric updating: participants react more strongly to positive than to negative signals, consistent with motivated reasoning. Over repeated rounds, this bias leads to persistent overconfidence. The evidence demonstrates that belief formation is not purely Bayesian but shaped by psychological motives for self-image preservation, offering a dynamic framework for understanding biased learning and belief persistence.

[37] *See, e.g.,* Roland Bénabou & Jean Tirole, 2002, "Self-confidence and Personal Motivation," QUARTERLY JOURNAL OF ECONOMICS, 871-915; and Roland Bénabou & Jean Tirole, 2004, "Willpower and Personal Rules," JOURNAL OF POLITICAL ECONOMY, 848-886.

[38] *See, e.g.,* Scott S. Wiltermuth, 2011, "Cheating More When Spoils Are Split," ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES, 157-168.

[39] *See* Adam Smith, THE THEORY OF MORAL SENTIMENTS, Chapter 1, (Penguin Classics, 2009, 250th Anniversary edition.)

likely when the problem to solve and the relevant information are complex.[40] One reason for this is that people may feel more comfortable—feel more moral or ethically justified—believing something that is not true when it is more likely that it could have been true, which in turn is more likely in complex situations in which the truth is more difficult to discern.[41] *Third*, analytically sophisticated people, educated people, and numerate people are, more prone to making distorted inferences, rationalizing away contradictory evidence, and compartmentalizing knowledge to protect their self-serving beliefs.[42] Economic enforcers, as other public officials, are "professional information users who are experienced and skilled in the factual interpretation and use of policy information and [who] as part of their professional identity … are expected to hold higher standards of fact and neutrality compared to politicians and ordinary citizens."[43] *Last*, motivated enforcers can justify their reluctance to respond to feedback more reasonably than other individuals because the cost of verifying the truthfulness of that feedback is objectively high, given the complexity of the problems and environments they navigate and, importantly, the likelihood that the feedback is biased.

Of course, biased feedback is not a mere theoretical possibility: firms under scrutiny, their advisors, and in particular their economic consultants have the incentive to influence the enforcers' beliefs and, therefore, may be tempted to provide misleading information.[44] Yet, a motivated enforcer is likely to overstate the likelihood of biased feedback consciously or un-consciously. Motivated skepticism manifests itself not only by refusing to accept feedback, or by ignoring negative feedback while acknowledging positive feedback (confirmation bias), but also by wrongly attributing unethical or self-serving motivation to perfectly objective feedback. As explained by Bénabou, "motivated cognition is *emotionally charged*. This feature is revealed almost instantly by a 'fighting' response (agitation, anger, outrage, hostility) whenever a cherished belief … is directly challenged by evidence."[45] Not surprisingly, providers of contradictory feedback are likely to be chastised as "hired guns." If they are indeed biased providers of information, then disregarding their information is justified. However, motivated enforcers may

[40] *See, e.g.,* Robin Mussoff & Florian Zimmerman, 2025, "Model Uncertainty," CESIFO WORKING PAPER NO 12041.

[41] *See, e.g.,* Maurice E. Schweitzer & Christopher K. Hsee, 2002, "Stretching the Truth: Elastic Justification and Motivated Communication of Uncertain Information," JOURNAL OF RISK AND UNCERTAINTY, 185-201.

[42] *See* Roland Bénabou, 2015, *supra* note 19.

[43] *See, e.g.,* Koen Migchelbrink, Pieter Raymaekers, Válerie Pattyn & Peter DeSmedt, 2024, *supra* note 28, page 2.

[44] We plan to write about this in another essay.

[45] *See* Roland Bénabou, 2015, *supra* note 19, page 7, emphasis in the original.

disregard their information even when that is not justified. Even more so, motivated enforcers may refuse to engage with them altogether, especially in scenarios where their feedback is made public. Providers of contradictory information may be required to self-identify as lobbyists—biased providers of information—even when nothing indicates they are violating their deontological duties. Motivated enforcers may even seek to modify statutes, regulations, best practice guidance, etc., to minimize the frequency of feedback and the need for assessment.[46]

Information avoidance is one of the consequences of motivated reasoning.[47] Another is persistent stereotypical reasoning, a form of categorical thinking. Stereotypes are, according to the Oxford English Dictionary, widely held but fixed and oversimplified images or ideas of a particular type of person or thing. They are likely to cause distorted judgments and entrench motivated beliefs, incorrectly justify skepticism about persons' or groups' opinions and information, and can often lead to inter-group conflict. Motivated enforcers may regard those seeking to correct their beliefs as "evil."[48] They may see themselves as "jedis" confronting the "dark side of the force" where others—e.g. firms' advisors—militate. Stereotypes emphasize differences among groups (civil servants versus party advisors) and, importantly, minimize variability within groups ("*all* economists lie"). Not surprisingly, individuals, including enforcers, are likely to under-react, or completely ignore, information originating from individuals belonging to groups with negative stereotypes and over-react to information originating from the right stereotypes. They are also likely to over-react to information consistent with stereotypes (e.g. information about the financial support received by an academic) and under-react to information inconsistent with stereotypes (e.g. the academic endorsement of analyses provided within a dispute).[49] Whereas the use of stereotypes may be justified on occasion, the emergence of some stereotypes and their persistence over time may not only be unjustified but may also be socially detrimental; the by-product of motivated reasoning, mission creep, or cultural capture.

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[46] Let us restate that we are not saying that every enforcer is a motivated skeptic behaving in these ways. But such conduct is consistent with motivated reasoning and thus should not surprise us.

[47] *See, e.g.,* Russell Golman, David Hagmann & George Lowenstein, 2017, "Information Avoidance," JOURNAL OF ECONOMIC LITERATURE, 96-135.

[48] That would equally be the case with motivated consultants, lawyers and other advisors. Motivated reasoning is not the exclusive territory of enforcers. *See* note 10 above.

[49] *See, e.g.,* Pedro Bordalo, Nicola Gennaoili & Andrei Schleifer, 2016, "Stereotypes," JOURNAL OF POLITICAL ECONOMY, 1753-1794.

Motivated skepticism can rapidly spiral into blanket suspicion of everything and everyone. It may also result in the dissemination of a false "alternative reality," according to which an intellectual elite conspires against the people for self-serving reasons.[50] Motivated enforcers are likely to present themselves as the only ones protecting the interests of the people against the interests of big firms and the false messages of their advisors. Importantly, criticism of enforcers' decisions by firms and their advisors could be interpreted by the enforcer as confirmation of the alternative reality. Not only it does not serve to debias the enforcer but, rather, it serves to entrench the enforcer's beliefs, self-image and, possibly, popular support, thus reinforcing the asymmetric processing of the feedback received.[51] Motivated enforcers may see themselves as heroes protecting consumers and small businesses—the victims—in the narrative. Nothing to write home about here. By presenting those holding opposite beliefs as villains, motivated enforcers may find justification for their skepticism both in their eyes but also in the eyes of the victims, politicians, and the public in general. Cancelling the opinions of those defending accuracy, promoting the views of those aligned with their motivations, refusing to engage in debate, and using other means of entrenching their biases, are all initiatives consistent with motivated reasoning.

Debiasing motivated enforcers is not easy. One option is to make them accountable by requiring them to produce carefully motivated—infringement or non-infringement—decisions. However, motivated enforcers may have no difficulty in defending their actions, formulating narratives that endorse their views and justify their pessimism about the willingness of firms to act anti-competitively. Another option is to make them subject to scrutiny by the legislative and/or executive branches of government, *de facto* or *de iure* limiting their independence. We do not think that would work either. The available

[50] *See, e.g.,* Adam Seidl & Ferenc Szucs, 2025, "A Model of Populism as Conspiracy Theory," AMERICAN ECONOMIC REVIEW, 3214-3247.

[51] Whether this alternative reality is perceived as more real than reality itself depends on the "virality" of the underlying narrative. Recent research tends to show that the virality, and as a result the appeal and persuasiveness of a "narrative"—i.e., a structured interpretive account that organizes facts, events, and causal claims into a coherent story that gives them meaning and direction—and, in particular, of a "conspiracy theory"—a narrative that attributes significant events or outcomes to the secret, coordinated actions of a small and powerful group—depends on its articulation and, more precisely, its emotional language. Inclusion of archetypical characters—hero, victim and villain—fosters virality. Heros, especially naughty ones, foster virality; sympathetic victims too, "but the biggest virality boost stems from using villain roles and from combining other roles with villain characters." *See, e.g.,* Kai Gehring & Matteo Grigoletto, 2025, "Virality: What Narratives Go Viral, and Does It Matter?" CESIFO WORKING PAPER NO. 12064.

evidence shows that motivated politicians' biases are not mitigated by the requirement to provide justification for their policies.[52] On the contrary, such requirements seem to have the opposite effect, possibly because they increase their exposure to blame and, hence, make them even more concerned about their self-image and the consistency of their views with the cultural and political context. A third option is judicial review, but that would only produce desirable results if judges were not subject to the same epistemic and political influences, were less concerned about blame and self-image. For judicial review to successfully constrain the motivated reasoning of some enforcers though, it needs to be scoped properly. A mere review of legality is unlikely to deliver; a full review of facts, law and economic analysis is required. To debias enforcers, judges should not factor in their decisions the potential institutional implications of endorsing or contradicting the choices of enforcers. Of course, this mechanism may fail to deliver too. Judges may also be motivated skeptics. Moreover, motivated enforcers may try to limit the scope of judicial review; limiting it to a mere review of legality, setting a high standard of proof—e.g. manifest error of assessment—when their pessimistic beliefs are at stake; making it difficult for judges to assess complex economic evidence—e.g. limiting the role of oral hearings where there is opportunity for cross-examination of the enforcers' experts or for the concurrent examination of enforcers' and the parties' experts; etc.

One reason why enforcers' biases may not be corrected by legislative, executive or judicial scrutiny is because they may experience technically (and possibly also ethically) superior to politicians and judges. This "motivated superiority", to the extent that enforcers' expertise indeed overdoes the expertise of politicians and judges may allow enforces to mislead their interlocutors about enforcement reality.

And yet, importantly, debiasing enforcers need not be appropriate public policy. It will benefit complaint companies, especially those that have no incentive to behave anti-competitively. It will also benefit their advisors, including economic consultants. But, in the model below, it will harm consumers and total welfare. Thus, at least from a utilitarian perspective, it may be better to let enforcers to hold pessimistic effects.

[52] *See, e.g.,* Julian Christensen & Donald P. Moynihan, 2024, "Motivated Reasoning and Policy Information: Politicians Are More Resistant to Debiasing Information Than the General Public," BEHAVIORAL PUBLIC POLICY, 47-68.

III. Skeptic Enforcers: Formal Analysis

In this Section, we formally analyze an enforcer's choice of beliefs about the likelihood of competition law infringement and non-infringement. We consider first the implications of that choice for the infringement rate, consumer and total welfare, and decision accuracy. We then investigate which types of enforcers, if any, will find it privately optimal to adopt pessimistic beliefs about the competitive effects of firms' conduct. Finally, we discuss why those enforcers types are also likely to find it privately optimal to downplay decision accuracy in favor of self-serving bias.

A. Baseline Model

Consider an action a, which is investigated as potentially anti-competitive. A enforcer obtains a signal $x > 0$ of the competitive nature of that action.[53] The signal is consistent with action a being anti-competitive or pro-competitive. Let $g(x)$ be the density associated with that signal if the company is infringing the competition laws, and $\hat{g}(x)$ the corresponding density in case of no infringement.

Let $L(x) = \frac{g(x)}{\hat{g}(x)}$, be the Likelihood Ratio for a given x. $L(x)$ is the *plausibility ratio* for signal x. We assume that $L(x)$ exhibits the Monotone Likelihood Ratio Property (MLRP), so that it is decreasing in x. This implies the likelihood of infringement is greater for a lower x and, therefore, the signal x is informative—i.e. serves to discriminate between pro- and anti-competitive actions. Let $\hat{x}$ represent the *persuasion threshold* for signal x, so

[53] The model analyzed in this Section follows closely the formal model by Murat C. Mungan, Marie Obidzinski & Yves Oytana, 2023, "Accuracy and Preferences for Legal Error," *American Law & Economics Review*, 25(1), 190-227. The authors examine how improvements in evidentiary accuracy affect the trade-off between type-1 (wrongful conviction) and type-2 (wrongful acquittal) errors in legal systems. The authors show that greater accuracy does not necessarily reduce the likelihood of error and can lower social welfare (when the choice of accuracy reflects median-voter preferences). Like Mungan *et al.*, we find that accuracy - in our case belief accuracy - can lead to lower welfare. Our model differs in that the source of error bias shifts from exogenous preferences on accuracy (the median voter's tolerance for type-1 and type-2 errors) to endogenous belief formation within the decision-maker itself—the competition agency. In our model (belief) accuracy is endogenously chosen or distorted by the agency's cognitive and cultural environment.

that a signal $x < \hat{x}$ leads to a finding of infringement, whereas a signal $x \geq \hat{x}$ leads to a finding of no infringement.[54]

For a given $\hat{x}$, a Type 1 error—i.e. the probability of conviction in case of no infringement—occurs with probability $\alpha(\hat{x}) = \hat{G}(\hat{x})$, where $\hat{G}(x)$ is the Cumulative Distribution Function (CDF) corresponding to $\hat{g}(x)$, and is increasing in $\hat{x}$. A Type 2 error occurs with probability $1 - \beta(\hat{x}) = 1 - G(\hat{x})$, which is decreasing in $\hat{x}$, where $G(x)$ is the CDF corresponding to $g(x)$, and is also increasing in $\hat{x}$.

Because $\hat{G}(\hat{x})$ is increasing in $\hat{x}$, we can invert it so as to express the persuasion threshold as a function of the magnitude of the Type 1 error α: $\hat{x}(\alpha) = \hat{G}^{-1}(\alpha)$. That is, the persuasion threshold is lower if the probability of a Type 1 error is lower. *See* Figure 1 for an illustration. Therefore, selecting a persuasion threshold determines the probability of a Type 1 error, a Type 2 error, and the probability of conviction.

The *power of the legal test*—i.e., the probability that a company is convicted in case of infringement—is given by $\beta(\hat{x}) = G(\hat{x})$. The probability of a conviction can in turn be written as $\beta(\alpha) = G\left(\hat{G}^{-1}(\alpha)\right)$, which is increasing in α.[55]

It follows that a greater probability of a Type 1 error, α, implies a lower Type 2 error, $1 - \beta(\alpha)$, and *vice versa*. It is easy to see that $\alpha = 0$ implies $\beta(0) = 0$; $\alpha = 1$ implies $\beta(1) = 1$; and that for all $\alpha \in (0,1)$, $\beta(\alpha) - \alpha > 0$. Finally, due to the MLRP, we have that $\beta(\alpha)$ is a concave function of α.[56] Figure 2 below illustrates this function.[57]

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[54] *See* Samuel Karlin & Herman Rubin, 1956, "The Theory of Decision Procedures for Distributions with the Monotone Likelihood Ratio," ANNALS OF MATHEMATICS AND STATISTICS, 521-533.

[55] $\beta_\alpha(\alpha) = \frac{g\left(\hat{G}^{-1}(\alpha)\right)}{\hat{g}\left(\hat{G}^{-1}(\alpha)\right)} = L\left(\hat{x}(\alpha)\right) > 0.$

[56] $\beta_{\alpha\alpha}(\alpha) = L_x\left(\hat{x}(\alpha)\right)\hat{x}_\alpha(\alpha) < 0$, since $L_x\left(\hat{x}(\alpha)\right) < 0$ and $\hat{x}_\alpha(\alpha) > 0$.

[57] From Figure I, we have that $\hat{G}(x)$ First-Order Stochastically Dominates (FOSD) $G(x)$.

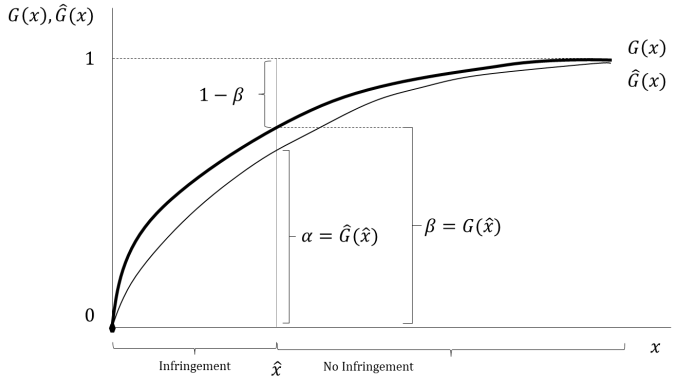

Figure I. Type 1 (α) and Type 2 ($1-\beta$) errors

Suppose there is a mass 1 of firms operating in the market. Companies differ in terms of the payoff derived from an action that infringes the competition laws, $b \in \left[\underline{b}, \underline{b}\right]$, with $\underline{b} < 0$ (so that some companies never break the laws) and $\underline{b} > 0$. Companies are distributed in that interval according to a CDF, $F(b)$ with density $f(b)$.

A company that is convicted pays a sanction $s > 0$. Thus, a company's expected payoff from infringement equals $b - s\beta(\alpha)$, while a company's expected payoff from no infringement is equal to $-s\alpha$. A company will find it privately profitable to infringe the competition laws if and only if

$$b > b(\alpha, s) = s(\beta(\alpha) - \alpha) > 0,$$

which is increasing in s. The infringement rate is then equal to $1 - F\big(b(\alpha, s)\big)$, and is decreasing in s. That is, increasing the magnitude of the sanctions has a deterrent effect.

The level of α that minimizes the infringement rate, α^b, is the one that maximizes the infringement threshold $b(\alpha, s)$, and is such that

$$\beta_\alpha\big(\alpha^b\big) = 1,$$

which is independent of s. Increasing α increases the power of the legal test which discourages infringement but also increases the probability of the Type 1 error which encourages infringement. The optimal α trades-off these two effects at the margin.

Since $\beta_\alpha(0) > 1 > \beta_\alpha(1)$ and $\beta_{\alpha\alpha}(\alpha) < 0$ for all $\alpha \in (0,1)$, the equation above has a solution $\alpha^b \in (0,1)$. That is, the likelihood of the Type 1 error that maximizes deterrence is interior—i.e. neither zero nor one. *See* Figure II.

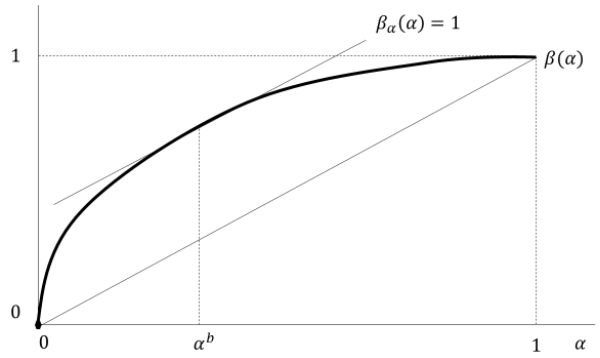

Figure II. The $\beta(\alpha)$ function and level of α that minimizes the infringement rate, α^b

Suppose that there is a mass $\mu \geq 1$ of consumers. Let us denote by H the harm caused by the infringement to consumers. We assume that $\mu H > \underline{b}$, so that the infringement generates a deadweight loss. Thus, consumer welfare, $CW(\alpha)$, equals

$$CW(\alpha) = -\mu H\left(1 - F\big(b(\alpha, s)\big)\right).$$

It follows that the level of α that maximizes consumer welfare is equal to the level that maximizes deterrence, $\alpha^{cw} = \alpha^b$. This is because $CW_\alpha(\alpha) = \mu H f\big(b(\alpha, s)\big)(\beta_\alpha(\alpha) - 1)$ and $\beta_\alpha\big(\alpha^b\big) = 1$. Consumers are worse off at $\alpha = 1$, since when a conviction is certain in case of no infringement, all companies with $b > 0$ would prefer to infringe. That is, Type 1 errors are costly for consumers, and not just for the non-infringing firms incorrectly sanctioned, because of their adverse incentive effects.

Our model likely underestimates the cost of Type 1 errors. Consider, for example, that firms' chose not only whether to infringe the competition laws but also whether to invest in improving the quality of their products. Firms' quality investments may be affected negatively by an increase in the probability of a Type 1 error, α. This may be the case, for example, when the infringement causes harm in the short term but may produce positive long-term effects in the long term.

In this simple model, α^b is not a function of s or H. It is also not a function of the distribution of the private benefits from infringement $F(\cdot)$ or its support $[\underline{b}, \underline{b}]$. It only depends on the shape of the $\beta(\cdot)$ function and, in particular, on the plausibility ratio since $\beta_\alpha(\alpha) = L(\hat{x}(\alpha))$.

Companies for which $b < b(\alpha^b, s)$ do not infringe the law and receive an expected payoff equal to

$$u(\alpha^b) = -s\alpha^b,$$

whereas companies for which $b > b(\alpha^b, s)$ infringe the law and receive an expected payoff equal to

$$v(\alpha^b, b) = b - s\beta(\alpha^b).$$

Thus, industry welfare equals:

$$IW(\alpha^b) = \int_{\underline{b}}^{b(\alpha^b,s)} u(\alpha^b) f(b)db + \int_{b(\alpha^b,s)}^{\underline{b}} v(\alpha^b, b) f(b)db = E\left(b > b(\alpha^b, s)\right)\left(1 - F\left(b(\alpha^b, s)\right)\right) - sn(\alpha^b),$$

where $E(\cdot)$ is the conditional expectations operator, and $n(\alpha^b)$ denotes the expected number of firms identified as infringers by the enforcer—i.e., the expected number of "sanctioned firms". This can be shown to equal

$$n(\alpha^b) = F(b(\alpha^b, s))\alpha^b + (1 - F(b(\alpha^b, s))\beta(\alpha^b) > 0,$$

where $F(b(\alpha^b, s))\alpha^b$ are incorrectly identified as infringers when they are not, and $(1 - F(b(\alpha^b, s))\beta(\alpha^b)$ are correctly identified as infringers.

Therefore, the sanctions collected by the enforcer equal $sn(\alpha^b)$. We assume that these are appropriated by the enforcer, and not distributed to consumers or the non-infringing firms. This assumption makes sense provided s is small. Then, total welfare,

$$TW(\alpha^b) = CW(\alpha^b) + IW(\alpha^b) + RW(\alpha^b)$$

equals:

$$-\left(1-F\left(b\left(\alpha^b,s\right)\right)\right)\left(\mu H-E\left(b>b\left(\alpha^b,s\right)\right)\right)<0,$$

since

$$E\left(b>b\left(\alpha^b,s\right)\right)<\underline{b}<\mu H.$$

That is, $TW\left(\alpha^b\right)$ is proportionate to the product of the infringement rate, $1-F\left(b\left(\alpha^b,s\right)\right)$, and the expected deadweight loss $\mu H-E\left(b>b\left(\alpha^b,s\right)\right)$.

B. A Pessimistic Enforcer

Suppose that the enforcer incorrectly perceives the density associated with that signal if the company is infringing the competition laws, and the corresponding density in case of no infringement, so that for each x it overestimates the likelihood that the company is infringing and underestimates the likelihood that it is not: $g_p(x)>g(x)$, and $\hat{g}_p(x)<\hat{g}(x)$. Then, the pessimistic enforcer employs a plausibility ratio $L_p(x)=\frac{g_p(x)}{\hat{g}_p(x)}$, , so that $L_p(x)>L(x)$ for all x.

Consequently, for a given persuasion threshold $\hat{x}$, (i) the probability of conviction in case of no infringement, or Type 1 error, with a pessimistic enforcer is $\alpha_p(\hat{x})>\alpha(\hat{x})$; and (ii) the probability of acquittal in case of infringement, or Type 2 error, is $1-\beta_p(\hat{x})<1-\beta(\hat{x})$. This in turn implies that $\beta_p(\alpha)>\beta(a)$ for all $\alpha\in(0,1)$. In particular, the likelihood of infringement for α^b—the optimal Type 1 error with an unbiased enforcer—is $\beta_p\left(\alpha^b\right)>\beta\left(\alpha^b\right)$, as illustrated in Figure 3 below.

Therefore, at the Type 1 error probability α^b that achieves optimal deterrence with an unbiased enforcer, $b_p\left(\alpha^b,s\right)=s\left(\beta_p\left(\alpha^b\right)-\alpha^b\right)>b\left(\alpha^b,s\right)=s\left(\beta\left(\alpha^b\right)-\alpha^b\right)$ and, therefore, since $F(\cdot)$ is increasing, the infringement rate with a pessimistic enforcer, $1-F\left(b_p\left(\alpha^b,s\right)\right)$, is smaller than the corresponding one with an unbiased enforcer, $1-F\left(b\left(\alpha^b,s\right)\right)$.

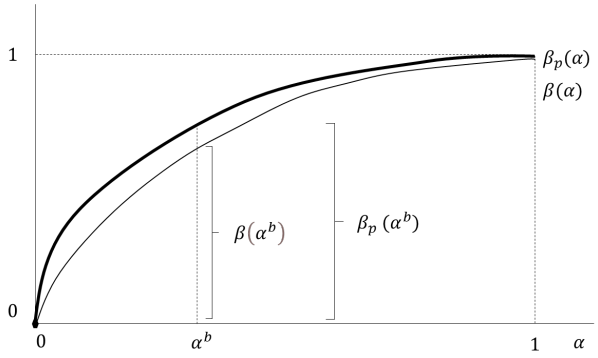

Figure III. Comparing $\beta_p(\alpha^b)$ and $\beta(a)$

The pessimistic enforcer generally will choose a different, but not necessarily larger, Type 1 error probability, α_p^b, than a realistic enforcer to maximize consumer welfare.

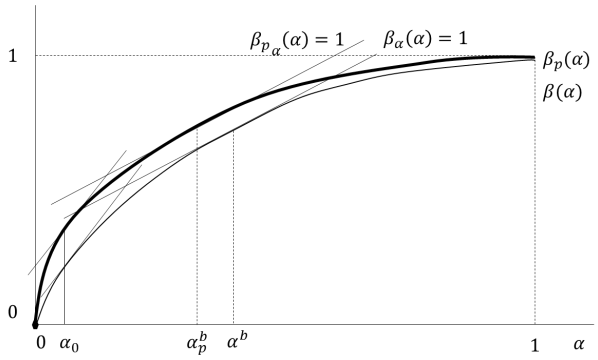

Figure IV. Comparing α_p^b and α^b when $\alpha^b > \alpha_0$

Result 1. The Type 1 error probability α_p^b that maximizes deterrence with a pessimistic enforcer is smaller (resp., greater) than the corresponding probability with an unbiased, α^b, when α^b is greater (resp., smaller) than α_0. (*See* Figure 4.)

Proof of Result 1. The Type 1 error probability α_p^b that maximizes deterrence with a pessimistic enforcer is given by $\beta_{p_\alpha}(\alpha_p^b) = 1$. Because $\beta_p(\alpha)$ and $\beta(\alpha)$ are both concave, $\beta_p(\alpha) > \beta(\alpha)$ for all $\alpha \in (0,1)$, $\beta_p(0) = \beta(0) = 0$, and $\beta_p(1) = \beta(1) = 1$, $\beta_{p_\alpha}(\alpha) \lessgtr \beta_\alpha(\alpha)$. In particular, $\beta_{p_\alpha}(\alpha) > \beta_\alpha(\alpha)$ when α is low and $\beta_{p_\alpha}(\alpha) < \beta_\alpha(\alpha)$ when α is high. Let us define $\alpha_0 \in (0,1)$ so that $\beta_{p_\alpha}(\alpha) > \beta_\alpha(\alpha)$ for $\alpha < \alpha_0$,

and $\tilde{\beta}_\alpha(\alpha) < \beta_\alpha(\alpha)$ when $\alpha > \alpha_0$. It follows that $\beta_{p_\alpha}(\alpha^b) < \beta_\alpha(\alpha^b)$ if $\alpha^b > \alpha_0$, and $\beta_{p_\alpha}(\alpha^b) > \beta_\alpha(\alpha^b)$ if $\alpha^b < \alpha_0$. ■

Arguably, $\alpha^b < \alpha_0$—i.e., in circumstances in which an unbiased enforcer would have optimally chosen a low Type 1 error probability—is the most relevant scenario in unilateral conduct cases, since the risk of deterring pro-competitive actions is higher for that type of conduct. On the contrary, $\alpha^b > \alpha_0$—when an unbiased enforcer would have optimally chosen a low Type 2 error—is the most relevant scenario in cartel cases or in the review of horizontal mergers in highly concentrated industries.

In any event, the infringement rate with a pessimistic enforcer will unambiguously be smaller than the infringement rate with an unbiased enforcer, and that consumer welfare will be increased.

Result 2. The infringement rate with a pessimistic enforcer, $1 - F\left(b_p(\alpha_p^b, s)\right)$, is smaller than the corresponding one with an unbiased enforcer, $1 - F\left(b(\alpha^b, s)\right)$.

Proof of Result 2. Note that $b(\alpha^b, s) = s(\beta(\alpha^b) - \alpha^b) < s(\beta_p(\alpha^b) - \alpha^b) < s(\beta_p(\alpha_p^b) - \alpha_p^b) = b_p(\alpha_p^b, s)$, since α_p^b maximizes $b_p(\alpha_p^b, s)$. Since $F(\cdot)$ is increasing, then $F\left(b(\alpha^b, s)\right) < F\left(b_p(\alpha_p^b, s)\right)$. ■

Result 3. Consumer welfare with a pessimistic enforcer, CW_p, is greater than with an unbiased enforcer, CW.

Proof of Result 3. This results follows from Result 2, since $CW_p = -\mu H\left(1 - F\left(b_p(\alpha_p^b, s)\right)\right) > -\mu H\left(1 - F\left(b(\alpha^b, s)\right)\right) = CW$. ■

Result 4. The effect of the pessimistic enforcer on *total welfare* is also positive.

Proof of Result 4. This is because (i) the smaller infringement rate (*see* Result 2 above) and (ii) the expected deadweight loss is smaller, since

$$E\left(b > b(\alpha^b, s)\right) < E\left(b > b_p(\alpha_p^b, s)\right). \blacksquare$$

The expected number of firms identified as infringers with a pessimistic enforcer, n_p, may be greater or smaller than the number of firms identified as infringers with an unbiased enforcer, n. This is because while the infringement rate is lower, the probability of being found infringing is greater for those infringing and may be greater or smaller for those note infringing. Indeed, the expected number of firms identified as infringers by the pessimistic enforcer is given by,

$$n_p = F(b_p(\alpha_p^b, s))\alpha_p^b + (1 - F(b_p(\alpha_p^b, s))\beta_p(\alpha_p^b),$$

where $F(b_p(\alpha_p^b, s))\alpha_p^b$ are incorrectly identified as infringers—Type 1 errors—when they are not, and $(1 - F(b_p(\alpha_p^b, s))\beta_p(\alpha_p^b)$ are correctly identified as infringers. While $F(b_p(\alpha_p^b, s)) > F\left(b(\alpha^b, s)\right), \alpha_p^b \gtrless \alpha^b$ and $\beta_p(\alpha_p^b) \gtrless \beta(\alpha^b)$.

Cui nocet? The answer to the question is not trivial. For a given Type 1 error probability, α, the pessimistic enforcer is more likely to catch and sanction infringers, as $\beta_p(\alpha) > \beta(\alpha)$. However, the pessimistic enforcer may choose a lower Type 1 error probability, $\alpha_p^b < \alpha^b$, which benefits non-infringers and, provided $\beta_p(\alpha_p^b) < \beta(\alpha^b)$, may benefit high-$b$ infringers too. This is the case when $\alpha^b > \alpha_0$. When $\alpha^b < \alpha_0$, then $\alpha_p^b < \alpha^b$ and only the low-b infringers are unambiguously made worse off by the pessimistic enforcer because the return from infringement is reduced: $b_p(\alpha_p^b, s) > b(\alpha^b, s)$.

The answer is simpler when $\alpha_p^b > \alpha^b$. In that case, non-infringers are worse off with a pessimistic enforcer, because they are more likely to be sanctioned incorrectly. And high-b infringers are also worse off since they are more likely to be caught and sanctioned: $\beta_p(\alpha_p^b) < \beta(\alpha^b)$.

C. Motivated Enforcers

Hitherto, we have compared intervention outcomes for an unbiased enforcer and a pessimistic enforcer "as if" their beliefs were exogenous. However, as explained above, the enforcer's beliefs need not be pre-determined and, instead, may be choice variables. In what follows, we investigate the types of enforcers who will choose to adopt pessimistic beliefs—i.e. beliefs that over-estimate the likelihood that the company is infringing and under-estimate the likelihood that it is not.

Before doing so, let us briefly discuss how to model the choice of beliefs. Suppose the enforcer's priors are given by $g_p(x)$ and $\hat{g}_p(x)$. These priors may reflect the individual traits of the enforcer selected or have an institutional character, reflecting the relevant statutes and case law. The enforcer may invest effort in learning whether those priors are accurate and should be retained or, instead, they should be updated to $g(x)$ and $\hat{g}(x)$. That effort is costly. The enforcer may then choose $g_p(x)$ and $\hat{g}_p(x)$ to avoid that cost or for various consequentialists or non-consequentialist reasons, again reflecting her preferences or the legal and political context.

The choice of consequentialist, non-welfarist enforcers. Enforcers who are concerned with the rate of infringement *per se* will choose to adopt pessimistic beliefs, since the infringement rate with a pessimistic enforcer is smaller than the corresponding one with an unbiased enforcer. (See Result 2 above.) When $\alpha^b < \alpha_0$, the same choice will be made by enforcers seeking to minimize the likelihood of under-enforcement Type 2 errors, even if that means more Type 1 errors. This is not necessarily the case when $\alpha^b > \alpha_0$. (*See* Result 1 above.)

The choice of welfarist enforcers. Pessimistic beliefs will also be chosen by *welfarist enforcers* seeking to maximize consumer welfare independently of the accuracy of their infringement decisions—i.e. even if they understand that they may end up sanctioning more non-infringing companies incorrectly. This is because consumer welfare is directly related to the infringement rate. (*See* Result 3 above.) These beliefs will also be chosen by enforcers seeking to maximize total welfare independently of the accuracy of their infringement decisions. (*See* Result 4 above.)

The choice of Kantian and other non-consequentialist enforcers. A Kantian enforcer seeking to uphold the categorical imperative "firms must not infringe the law" will prefer to adopt pessimistic beliefs, as that leads to a reduction in the number of infringers. Instead, a enforcer following the Hippocratic imperative "first do no harm" or a enforcer solely concerned with accuracy may not choose pessimistic beliefs.

The implications of "blame" avoidance. Enforcers concerned about blame may choose pessimistic believes if the political or epistemic context in which they operate rewards e.g. reducing the risk of under-enforcement. The opposite will be true if the political or epistemic context favors the minimization of Type 1 errors.

The impact of judicial review. Suppose the enforcer tries to minimize the likelihood that her decision is quashed under appeal. Suppose further that only

infringement decisions can be appealed, or that they are much more likely to be appealed than non-infringement decisions. Under these assumptions, the enforcer may choose to not adopt pessimistic beliefs in order to minimize the risk of false convictions, because those are the decisions that may be appealed with some (or greater) probability and (more likely) reversed by the appeal courts. This concern is much more likely when $\alpha^b < \alpha_0$. The impact of judicial review is less clear-cut when both infringement and non-infringement decisions can be appealed.

D. Motivated Skepticism

Let us suppose that the enforcer holds pessimistic beliefs and interprets signal x using densities $g_p(x)$ and $\hat{g}_p(x)$—infringement and non-infringement, respectively. Suppose, in addition, that her choice of beliefs is driven by consequentialist and/or non-consequentialist motivations, which are anchored in her mission, or that they respond to desire to protect her self-image within the epistemic and political environment in which she operates. Importantly, her choice of beliefs is not driven by hard incentives (money, bribes, future employment). Suppose, finally, that a third-party actor communicates to the enforcer that her beliefs are too pessimistic and that she should use densities $g(x)$ and $\hat{g}(x)$, instead.

The choice of an objective enforcer. An (objective) Bayesian enforcer would process that information to update her beliefs. She may adopt $g(x)$ and $\hat{g}(x)$ is she believes the third-party actor to be a true expert with full information, or at least she move away from $g_p(x)$ and $\hat{g}_p(x)$, adopting less pessimistic beliefs, if she thinks that the information provided is valuable but imperfect.

The choice of a motivated enforcer. Instead, a motivated enforcer may not adjust her beliefs much, if at all. The information may be totally disregarded or processed to justify the morality of her self-serving motivations.[58]

Motivated skepticism. A motivated enforcer will use differential decision criteria to assess information depending on whether it corroborates or contradicts her beliefs, and will require less information to accept the former than the latter. In short, a

[58] *See, e.g.,* Francesca Gino, Michael I. Norton & Roberto Weber, 2016, "Motivated Bayesians: Feeling Moral While Acting Egotistically," JOURNAL OF ECONOMIC PERSPECTIVES, 189-212.

motivated enforcer will exhibit "motivated skepticism" towards information and third-party actors that reveal errors in her worldview.[59]

IV. From Motivated Skepticism to Hopeful Pessimism

Competition agencies in the digital era confront unprecedented uncertainty. Digital and platform markets exhibit tipping dynamics, self-reinforcing network effects, and vast asymmetries of information. Under such conditions, naïve optimism—assuming markets will self-correct—risks entrenching monopoly power, while pessimism can lead to skepticism and paralyze agencies and chill innovation. The right approach may be to adopt a position of "hopeful pessimism."[60] Although the language sounds similar, hopeful pessimism differs sharply from the forms of "motivated" or "defensive" pessimism documented in psychology and behavioral economics. Motivated pessimists adopt or maintain negative beliefs because these beliefs serve a self-interested or ego-protective function. By contrast, hopeful pessimism is not about self-justification. It is a conscious orientation that starts from a realistic appraisal of risks and losses, but retains a commitment to decision accuracy. Because it is not ego-defensive, a hopeful-pessimistic enforcer is more likely to accept and integrate credible information that contradicts her priors than a motivated enforcer would be.

In a regulatory context, hopeful pessimism would push an agency to acknowledge uncomfortable evidence of market power and structural harm without lapsing into fatalism, but also to adapt or roll back interventions when evidence shows risk is lower than expected. A hopeful-pessimistic enforcer may start from sober priors, but is more willing to update than a motivated enforcer, precisely because her stance is not ego-

[59] *See, e.g.,* Peter H. Ditto & David F. Lopez, 1992, "Motivated Skepticism: Use of Differential Decision Criteria for Preferred and Nonpreferred Conclusions," JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY, 568-584.

[60] *See,* Mara van der Lugt, HOPEFUL PESSIMISM, (Princeton University Press, 2025.) *See also* Daniel Innerarity, THE FUTURE AND ITS ENEMIES: IN DEFENSE OF POLITICAL HOPE, (Stanford University Press, 2012.); and Daniel Innerarity, A THEORY OF COMPLEX DEMOCRACY: GOVERNING IN THE TWENTY-FIRST CENTURY, (Bloomsbury Academic, 2025.) As a hopeful pessimist, Innerarity criticizes political systems that either deny uncertainty (through overconfident planning) or dramatize it (through alarmist narratives). His pessimism reflects epistemic modesty, not disbelief in institutional capacity. In addition, he criticizes those political institutions and actors treat complexity as something to be conquered rather than managed, and supports those acting "as if" they might be wrong and design decision-making processes that allow correction. Legitimacy arises from the capacity to revise decisions, integrate new information, and absorb error without systemic breakdown.

defensive. Her goal is to improve the public good despite uncertainty, not to defend the agency's ego or mission. This distinction matters because superficially similar behaviors– caution, early intervention, pessimistic priors—can be normatively very different. A competition authority that practices motivated pessimism might exaggerate threats to justify expansion of its powers or to protect itself from political criticism, while resisting evidence that contradicts its stance. A hopeful-pessimistic authority would also take threats seriously, but would welcome contestation, publish its assumptions, and adapt if evidence changes. In this way, hopeful pessimism supplies a kind of ethical and epistemic discipline that motivated pessimism lacks.

By prioritizing decision accuracy over self-interest (or utilitarian welfare) hopeful pessimism secures competition enforcement against the risk of arbitrary power and regulatory opportunism. In this sense, hopeful pessimism complements the republican institutional perspective of Pettit (1997).[61] Republicanism as articulated by Pettit defines freedom not as the absence of interference, but as the absence of domination. Because domination can never be eradicated entirely, republican institutions aim to minimize it through transparency, checks and balances, and avenues for contestation. This already presupposes a form of "pessimism:" a cautious recognition that power tends to accumulate and that vigilance must be ongoing. Yet it is also "hopeful," because it invests in civic virtue and institutional design as means of limiting domination even when perfection is unattainable. Lovett (2010, 2022) identifies the three core principles of a republican society—non-domination, the empire of law, and popular control—and explains how economic structures can embody domination just as much as political ones, extending republican concern beyond overt political coercion to structural forms of economic power.[62] He emphasizes that regulatory institutions must be subject to legal constraint and democratic accountability. Both hopeful pessimism and republicanism reject illusions of automatic progress and insist that action remains meaningful even under bleak conditions. The combination raises further obligations for enforcers: to address structural economic domination, to anchor their discretionary power in law, and to ensure popular control and transparency over their activities and policies.

[61] *See* Philip Pettit, REPUBLICANISM: A THEORY OF FREEDOM AND GOVERNMENT, (Oxford University Press, 1997.).

[62] *See* Frank Lovett, A GENERAL THEORY OF DOMINATION AND JUSTICE, (Oxford University Press, 2010); and Frank Lovett, THE WELL-ORDERED REPUBLIC, (Oxford University Press, 2022). *See* references to earlier political philosophers in TZVETAN TODOROV, IMPERFECT GARDEN: THE LEGACY OF HUMANISM, (Princeton University Press, 1998.)

A competition authority inspired by republicanism and hopeful pessimism would view entrenched market power and gatekeeping by dominant firms as threats to economic freedom and civic equality. A hopeful-pessimistic stance would reinforce the agency's willingness to act in the face of uncertainty, to design reversible remedies, and to maintain transparency about trade-offs. Together, republicanism and hopeful pessimism yield a normative framework for enforcers who neither indulge in naïve optimism about markets nor lapse into the temptation to regulate "everything that moves," but instead act steadily to reduce domination, whether this originates in the market or the administrative state.

A hopeful-pessimistic competition agency would invest in early detection systems, data analytics, and stakeholder consultation to detect nascent harms. It would publish the error-cost assumptions underpinning its decisions, enabling external contestation and judicial review. It would favor remedies with sunset clauses or pilot phases to avoid entrenching mistaken pessimism. And it would justify decisions not only in utilitarian terms but also in terms of accuracy, fairness, and civic equality—values at the core of republican non-domination. At the same time, the agency would guard against the psychological traps of motivated reasoning and motivated skepticism, which lead decision-makers to demand more evidence for beliefs that contradict their priors than for those that confirm them. Hopeful pessimism can function as a counterweight to such biases by encouraging enforcers to acknowledge unpleasant facts, without losing the will to act. Lovett's (2022) insistence on the empire of law and popular control complements this by embedding independent review, transparency, and contestability, making it harder for an agency's pessimistic priors to ossify into unchecked discretionary power.

Because motivated skepticism is a pattern of belief formation and evidence evaluation with psychological origins, it may not be eliminated through institutional design. However, its effects are most likely when the agency governance isolates decision-makers from challenge. While institutional arrangements that require explicit reason-giving, comparative evaluation, and exposure to adversarial scrutiny may not remove bias, they are likely to constrain its behavioral expression. Therefore, the relevant "turning point" is not a psychological conversion on the part of the decision-maker, but a procedural moment in which private belief maintenance must be translated into public justification subject to challenge.

So, how to induce ego-defensive and skeptical decision-makers to act as value-driven "hopeful pessimists?" *First*, align incentives with public duty. How? Recognizing and rewarding staff who revise decisions in light of new evidence instead of penalizing them

for changing position. Building in formal mechanisms for explaining reversals so they are seen as responsible governance, not failure. Separating evaluation of process from outcome so that, for example, performance reviews measure diligence, transparency, and fairness, and not only "win rates" in litigation. *Second*, develop the right normative framework explicitly. How? Providing regular workshops on "hopeful pessimism" and "non-domination" values. Publishing internal standards that explain why acting under uncertainty can be legitimate and how to avoid ego-defensive pessimism. Adopting measure to ensure that fear of failure is not the driver of action. *Third*, increase epistemic capacity and transparency. How? By investing in analytics and market intelligence so pessimistic priors can be tested and revised. Requiring every major decision to include a short note explaining assumptions, potential error costs, and what evidence would change the decision. Sharing these assumptions with internal review boards and, where possible, external stakeholders. *Fourth*, foster a culture of contestation and learning. How? Creating red teams to make the strongest case for the opposite view.[63] Creating incentives for individuals or teams who demonstrate learning from past cases and updating of priors. Institutionalizing public comment or peer review stages to bring in disconfirming evidence early. Comparing predicted effects with realized outcomes and publishing "what we learned" reports and tying learning to guidance updates to break narrative lock-in. *Fifth*, adopt simple, crisp "debiasing" checklists for decision-makers. Are my priors pessimistic because of evidence or because of self-protection? Have I actively sought credible evidence that contradicts my view? Is the proposed remedy reversible or adjustable if new information emerges? Have stakeholders had a fair chance to contest my assumptions? Does my public explanation frame the action in terms of our values rather than expected success? *Last*, institutionalize measures to avoid cultural, epistemic or political capture so that reputation depends on performance. How? Inviting academics and practitioners to review methods (without steering outcomes), Strengthening epistemic independence. Cultivating legitimacy not just with industry and specialist communities but with courts, consumer groups, and politicians.

By reducing ego-defensive incentives, increasing transparency and data, rewarding updating and contestation, and anchoring decisions in civic values, agencies can shift from motivated pessimism to hopeful pessimism. This will produce enforcers who start from sober assessments, remain open to disconfirming evidence, and act with integrity under uncertainty; exactly the qualities needed for effective competition policy today.

[63] For a conceptual study that calls for 'devil's advocacy' to be integrated into organizations, *see* David Ellerman, 2025, "Devil's Advocacy Within Organizations," TEORIJA IN PRAKSA, 641-655.

A possible objection is that, whether hopeful or not, unbiased skepticism toward claims of market self-correction anyways risks collapsing into the forms of motivated or defensive pessimism documented in behavioral economics and political science. That concern is misplaced in our opinion. Motivated pessimism describes a biased belief-formation process in which agents apply asymmetric evidentiary standards to preserve prior commitments and resist disconfirming feedback. By contrast, hopeful skepticism, as defended here, is explicitly probabilistic, and responsive to evidence. It treats pessimistic hypotheses as candidates for testing rather than conclusions to be defended. Far from licensing narrative entrenchment, hopeful pessimism disciplines enforcement by requiring that pessimistic assessments of market power or harm remain contestable and reversible in light of new evidence.

V. Computational Tools and Hopeful Pessimism

Over the last decade significant advances in computational power, data availability, and algorithmic modeling have given rise to the use of computational tools by competition agencies.[64] The emerging field of "computational antitrust" leverages machine learning (ML), artificial intelligence (AI), and computational economics to assist enforcers in detecting collusion, evaluating mergers, and designing remedies with greater speed, precision, and consistency. The promise of computational antitrust lies in its potential to overcome some of the limits and biases of human judgment. By automating the detection of patterns and integrating vast datasets—ranging from price movements to communication traces—computational tools could, in theory, make enforcement less prone to motivated reasoning.

In this Section, we explore whether and how computational methods might debias agencies' pessimism. We first provide a brief overview of computational antitrust, describing the applications of computational techniques in antitrust enforcement, from cartel detection to merger simulation. Then, we evaluate whether computational tools are likely to mitigate or reinforce agencies' pessimism and skepticism. Finally, we propose a framework for "reflexive" computational antitrust that enhances accountability, interpretability, and epistemic humility in digital-age competition policy.

[64] Thibault Schrepel & Teodora Groza, 2025, "Computational Antitrust Worldwide: Fourth Cross-Agency Report," STANFORD COMPUTATIONAL ANTITRUST, 1-97.

A. Computational Antitrust

The concept of computational antitrust refers to the use of computational models, algorithms, and data-driven analytics in the design and execution of antitrust enforcement. It uses computer science to improve the way competition authorities, courts, and firms understand and apply competition law.[65]

Computational methods are, and are likely to be more often, employed at multiple stages of the enforcement process: the detection of infringements (e.g. identifying patterns of parallel pricing, communication, or network structure consistent with collusion); the assessment of the impugned conduct (e.g. quantifying market power, consumer harm, or efficiency effects in mergers and abuse of dominance cases); and the design of remedies (e.g., developing algorithmic monitoring systems that ensure compliance and adjust to evolving markets). Overall, these methods have the potential to make enforcement more consistent, efficient, and transparent. However, algorithmic enforcement may also risk opacity, overreach, and bias replication, especially when applied in politically charged contexts.

B. Can Computational Tools Debias Motivated Pessimism?

The answer depends on how these tools are designed, governed, and interpreted. Computational systems, when properly constructed, can improve objectivity, replicability, and data completeness, mitigating several cognitive distortions. Algorithmic models force authorities to specify assumptions explicitly. Unlike narrative reasoning, computational modeling requires clear definitions of market boundaries, competitive parameters, and welfare metrics. This transparency can expose hidden biases and promote accountability. Moreover, computational systems can process large datasets that exceed human cognitive capacity. This mitigates availability bias, replacing anecdotal intuition with comprehensive empirical evidence. Simulation tools can test multiple scenarios, making it harder for agencies to anchor on pessimistic priors. By showing both harm and benefit distributions, these methods facilitate and encourage balanced assessment.

[65] Thibaut Schrepel, 2021, "Computational Antitrust: An Introduction and Research Agenda," STANFORD COMPUTATIONAL ANTITRUST, 1-15.

However, computational methods can also reproduce, conceal, or amplify the very biases they seek to eliminate.[66] Machine learning systems learn from past enforcement data. If historical cases reflect an institutional bias toward targeting large firms, the algorithm will inherit that pattern. Thus, computational antitrust may automate motivated pessimism rather than correcting it. Furthermore, every computational model embodies assumptions. The objectivity of those models will depend on the objectivity of the adopted assumptions. If those assumptions reflect ideological priors (e.g., concentration as proxy for harm), their models will predict harm more frequently. The apparent objectivity of algorithms may thus mask deeper motivated reasoning.[67]

Note, in particular, that many machine learning systems, especially deep learning models, function as "black boxes."[68] This may make it easy to conceal biases. When the model outputs confirm pre-existing suspicions, enforcers may accept them uncritically; when they contradict those suspicions, they may dismiss them as unreliable. The epistemic authority of the algorithm thus becomes contingent on institutional belief, not evidence. In a nutshell, computational antitrust risks creating an illusion of neutrality while entrenching institutional pessimism in automated form.

C. Towards a Reflexive Computational Antitrust

The relationship between computational modeling and antitrust reasoning must be understood as recursive and non-hierarchical; each informs and reshapes the other through ongoing feedback loops. Therefore, computational tools should not be treated as

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[66] *See, e.g.*, Kevin D. Ashley, 2017, ARTIFICIAL INTELLIGENCE AND LEGAL ANALYTICS (Cambridge University Press, 2017), 53–78. Ashely shows that legal algorithms necessarily encode normative and epistemic assumptions through feature selection and training data.

[67] *See, e.g.*, George E. P. Box, 1976, "Science and Statistics," JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION, 792- Box famously stated: "All models are wrong, but some are useful." *See also* Judea Pearl & Dana Mackenzie, THE BOOK OF WHY, (Penguin, 2018), 27–45. The authors show that all statistical and machine-learning models embed causal and structural assumptions.

[68] *See, e.g.*, Jenna Burrell, 2016, "How the Machine 'Thinks': Understanding Opacity in Machine Learning Algorithms," BIG DATA & SOCIETY 1-12. She explains that complex machine-learning systems used in domains such as credit scoring, risk assessment, and regulatory enforcement operate as "black boxes," because their internal logic is not meaningfully interpretable by decision-makers or affected parties, a concern directly applicable to data-driven antitrust screening and enforcement tools. *See also* Frank Pasquale, THE BLACK BOX SOCIETY, (Harvard University Press, 2015).

final arbiters of truth but as epistemic interlocutors. Their outputs must be constantly interrogated, contextualized, and re-interpreted in light of both economic reasoning and legal principles. This mirrors Anthony Giddens's (1991) notion of "reflexive modernity:" institutions capable of learning from their own self-observation.[69] A reflexive approach to computational antitrust rejects the idea that algorithms should replace human judgment.

For competition agencies, this implies adopting the following principles. Algorithms should be continuously tested against real-world case outcomes, for example by conducting retrospective studies regularly. If model predictions diverge from observed market evolution, the discrepancy must trigger systematic review of the underlying assumptions. Agencies should maintain transparent records of how datasets are curated, annotated, and updated. Since data encode historical biases, reflexivity demands awareness of how enforcement history shapes future detection patterns. Decision processes should combine algorithmic screening with human deliberation, ensuring that computational results are treated as inputs for judgment rather than outputs for action. The aim is not automation, but augmentation. Reflexive computational systems must feed insights back into policy design, enabling adaptive learning about market dynamics, enforcement efficacy, and error correction. Through such mechanisms, computational antitrust can embody epistemic humility, acknowledging uncertainty and revising itself in light of new information.

A reflexive agency therefore treats algorithmic results not as certainty, but as probabilistic evidence, open to contestation. Instead of using computational findings to justify pessimistic narratives about market power, enforcers should interpret them as part of a plural evidentiary ecology, including qualitative insights, market feedback, and economic theory. Reflexivity entails epistemic pluralism; the recognition that no single methodological lens captures the full complexity of market behavior. Reflexivity embeds accountability into the computational architecture itself. Algorithms used in

[69] Anthony Giddens, 1991, MODERNITY AND SELF-IDENTITY. SELF AND SOCIETY IN THE LATE MODERN AGE, Stanford University Press. Anthony Giddens's notion of reflexive modernity, as described in his 1991 work, refers to a phase of modern society characterized by the constant questioning and monitoring of social life, traditions, and even one's own identity. Unlike traditional societies, which are guided by routine, modern life is marked by an ongoing revision of practices in light of new knowledge and changing social contexts. This process is a double-edged sword, creating new opportunities and freedoms but also producing anxiety and a heightened awareness of risk.

enforcement should generate audit trails documenting how inputs were processed, how thresholds were chosen, and how human interventions shaped outcomes. In this sense, reflexivity bridges the gap between technocracy and democracy. It acknowledges that enforcement is not merely a technical optimization problem but a normative judgment about the fair structure of markets. By keeping human reasoning visibly in the loop, reflexivity preserves the public legitimacy of antitrust law. It ensures that decisions are explainable, and remain contestable and open to revision.

To harness their benefits without reproducing or amplifying institutional biases, enforcers could adopt a set of deliberate safeguards. *First*, "explainability." Algorithms used in enforcement should be intelligible not only to their designers, but also to courts, defendants, and independent experts. This does not require full transparency of every line of code, but it does require that the core assumptions, data sources, variable choices, and decision thresholds are made explicit. Otherwise, computational outputs risk becoming black boxes. *Second*, "comparative modeling." This means running parallel models using different plausible assumptions. Comparing outcomes across these variants would force enforcers to confront the robustness of their conclusions, which may reduce the risk that a single model simply confirms a prior worldview. *Third*, "separated decision-making." Separating analytical units from enforcement divisions helps insulate model design from case-specific pressures. Analysts are then rewarded for robustness and methodological integrity, rather than for producing results that support a pre-determined enforcement outcome. *Finally*, "replicability." Replication serves as a powerful discipline. Models that cannot withstand external scrutiny are unlikely to be reliable guides for policy.

VI. Concluding Remarks

Although "hopeful pessimism" represents an attractive middle path between naïve optimism and motivated pessimism, it faces various conceptual and practical challenges. *First*, the concept itself is ambiguous. The difference between value-driven, non-defensive form of caution and ego-defensive, self-justifying pessimism may be more rhetorical than practical. Motives, incentives, professional identities may be driven both by virtuous and self-protective caution and determining which form of caution dominates may be difficult, if at all possible. Without clear diagnostic criteria or behavioural indicators, "hopeful pessimism" could easily collapse into a legitimizing label for existing practices. *Second*, the proposed reforms—red-team reviews, public notes on assumptions, "what we learned" reports, internal workshops on non-domination, checklists for debiasing—are resource-intensive and procedurally demanding. Many

competition authorities operate under tight budgets, staff shortages and heavy caseloads; layering additional steps could slow enforcement and reduce agility in fast-moving markets. Publishing assumptions and inviting contestation, while laudable in theory, might also expose agencies to strategic manipulation by powerful firms, consultants or lobbyists who can flood processes with selective evidence, litigate every assumption or weaponize transparency to delay decisions. Similarly, building in sunset clauses and reversibility may reduce deterrence by signaling that remedies are temporary or negotiable, encouraging firms to wait out interventions. Constant updating could also produce regulatory instability, undermining firms' ability to plan or invest and eroding confidence in the agency's steadiness. *Third*, the framework presumes that enforcers can consciously adopt and sustain a hopeful-pessimistic stance, yet a large literature in psychology shows that motivated reasoning, groupthink and identity-protective cognition are largely unconscious and remarkably sticky. Training, checklists and awareness campaigns may help at the margin but rarely neutralize deep-seated biases, especially those linked to professional missions or organizational culture. *Fourth*, the treatment of courts as a relatively bias-free backstop is questionable: judicial decision-making is itself shaped by ideology, heuristics and political incentives. Expecting judges to be immune to the same pressures that shape enforcers risks replacing one imperfect actor with another. *Fifth*, prioritizing "decision accuracy" over welfare may shift agencies away from their statutory objectives and raise legitimacy concerns. Competition authorities are generally created and funded to protect consumers, not simply epistemic purity. *Sixth*, embedding republican non-domination inside technocratic agencies could paradoxically entrench unelected power rather than constrain it, especially if those agencies become self-appointed interpreters of non-domination. *Finally*, without clear metrics for success, it is unclear how anyone—courts, legislators or the public—would know whether an agency has moved from motivated to hopeful pessimism, leaving the concept vulnerable to rhetorical misuse.

These criticisms, while serious, do not defeat the core idea behind our proposal insofar as it does not aim to change the psychology of any given agency, but simply aims at creating institutional conditions that make evidence-based updating and transparency more attractive and ego-defensive rigidity more costly. Even modest interventions—such as publishing error-cost assumptions, piloting remedies before full roll-out, or running internal red-team exercises—can make biases visible, generate learning and be scaled to agency resources. The fear of strategic manipulation is precisely why the proposal draws on republican principles of contestability, checks and balances, and judicial review. It seeks to broaden the range of actors who can scrutinize assumptions, not narrow it. Nor does hopeful pessimism necessarily undermine deterrence or welfare. By clarifying

assumptions, designing reversible remedies and encouraging learning, an agency can build long-term credibility and predictability, which benefits both consumers and firms. Expecting complete self-debiasing is of course unrealistic, but incremental improvements are both possible and worthwhile. Checklists and workshops may not eliminate motivated reasoning, but can mitigate it, make it more transparent, and give internal and external reviewers clearer hooks for critique. Likewise, recognizing that courts have biases does not mean abandoning external review; rather it supports designing multi-layered oversight, so no single actor's biases dominate.

Turning "hopeful pessimism" from a normative aspiration into an empirically grounded model will require further research. Scholars should develop measurable indicators of hopeful versus motivated pessimism—such as patterns of evidence weighting, rates of updating after new information, or use of reversible remedies—and test whether procedural interventions actually shift behaviour. Comparative studies across agencies or jurisdictions could examine whether transparency tools, red-team exercises, or error-cost disclosures correlate with more accurate or welfare-enhancing outcomes. Behavioral experiments could test whether training, incentives and organizational design affect enforcers' willingness to revise priors. By grounding the concept in data and testing its mechanisms, researchers can determine whether it genuinely improves competition enforcement or merely rebrands existing caution under a more appealing name.

Seen through the lens of republican theory, the debate over "hopeful pessimism" is more than a question of regulatory style; it is about how competition authorities exercise and constrain public power. The criticisms outlined above highlight the risk that an appealing concept can blur into rhetoric, generate procedural burdens, or even entrench technocratic domination rather than reduce it. Yet the republican framework also supplies the evaluative yardstick for judging and refining the idea: transparency, contestability, and non-domination. By embedding these principles in the design and assessment of hopeful pessimism—measuring updating behaviour, limiting mission creep, and ensuring judicial and public oversight—researchers and policymakers can test whether this stance truly enhances freedom from domination in the marketplace and within the administrative state, or whether it simply rebrands motivated bias. In his celebrated book, *The Well-Ordered Republic,* Frank Lovett states:[70] "Given the dynamic complexity of modern economies, it is difficult to imagine that an antitrust agency could succeed in its aim of breaking up concentrations of market power without having some

[70] Frank Lovett, 2022, *supra* note 62, section 4.4.

range of discretionary authority to judge when and where intervention is appropriate. However, this discretion need not constitute domination if … three conditions … are properly met. First, its authority might be limited to certain types of intervention, and only against firms that have grown to a certain magnitude. Second, its aims—promoting competitive markets, say—might be clearly articulated in public law. And third, there might be institutional mechanisms for holding the agency to account in respecting those aims and limits. Provided the three conditions have been met, we should not say the agency dominates the owners of firms. People might not agree whether there should be a public antitrust agency, or they might dispute its decisions in this or that particular case. But it will be generally understood what the agency's aims are and how it will go about its business, and it will be easy enough to steer clear of its reach should one desire to do so." This essay's contention is that it will not be easy to steer clear of the agency's path if that agency is not compelled to prioritize accuracy over mission, self-image, and consistency with the epistemic zeitgeist.

The emergence of computational antitrust may help in that regard by enhancing objectivity, consistency, and efficiency in enforcement, but it also risks entrenching existing institutional and cognitive biases, particularly enforcers' motivated pessimism toward firms with significant market power. We propose a reflexive model of computational antitrust grounded in epistemic humility, transparency, and institutional pluralism, where algorithms function as decision-support systems rather than substitutes for human judgment, enabling continuous feedback between empirical modeling and legal reasoning. The legitimacy of computational antitrust depends not on its technical sophistication but on its reflexive capacity to aid agencies to learn, self-correct, and remain democratically accountable in our digital era.