

PREDICTION MARKETS FOR PROMOTING THE PROGRESS OF SCIENCE AND THE USEFUL ARTS

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INTRODUCTION

The U.S. Constitution authorizes federal lawmakers¹ "[t]o promote the Progress of Science and useful Arts."² In pursuit of that good, lawmakers have created federal copyrights³ and patents.⁴ But those intellectual properties for the most part stimulate only superficial research in, and development of, the sciences and useful arts; copyrights and patents largely fail to inspire fundamental progress.⁵ We thus face an undersupply of basic and useful ideas, principles, systems, concepts, discoveries, and facts. Fortunately, we might cure that failure with a new type of market: an exchange in skilled predictions about the sciences and useful arts.⁶ Unfortunately, state and federal laws threaten any such exchange—here called a "scientific prediction exchange" or "SPEX"—with potential bans and fines.⁷ This article discusses the benefits of scientific prediction exchanges and how to reduce the legal costs, *qua* legal risks, of setting up, running, or trading on such markets.⁸

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¹ I do not say merely "Congress" by design, on grounds that the Constitution empowers the President to veto routine legislation. U.S. CONST. art I, § 7, cl. 2. Only an act that wins two-thirds of the votes in Congress can overcome that executive hurdle. *Id.* The Constitution thus provides that Congress and the President generally share federal lawmaking powers and duties.

² U.S. CONST. art. I, § 8, cl. 8.

³ *See generally* Copyright Act of 1976, 17 U.S.C.A. §§ 101-1332 (2005).

⁴ *See generally* Patent Act, 35 U.S.C.A. §§ 1-376 (2002).

⁵ *See infra* Part I.

⁶ *See infra* Part II.

⁷ *See infra* Part II.C.

⁸ *See infra* Part III.B-C. Among the many potential legal remedies, the most effective would guarantee the free exchange of prediction certificates. *See infra* Part III.B.3(a).

Why tackle this subject at this time?⁹ Legal scholarship about prediction markets has begun to grow rapidly in recent years.¹⁰ That trend will doubtless continue, and probably accelerate. Scholarship tends to beget scholarship, after all, and a forthcoming book by prominent law professor, Cass R. Sunstein, will doubtless stimulate wider academic interest.¹¹ Out in the real world, too, prediction markets have begun taking off.¹² As real people increasingly stake real money on real (if still not clearly legal)¹³ scientific prediction exchanges, even lawyers, judges, and legal scholars will have to take note. Academics have hardly addressed the legality of prediction markets,¹⁴ however, and no one has given the topic the treatment it deserves.¹⁵ This article aims to help fill that need.

⁹ By way of disclosure, allow me to note that I have for many years worked off and on at launching a prediction market in claims about science, technology, and public policy. See *The Simon Exchange*, <http://www.simonexchange.org/> (last visited Mar. 7, 2006). That remains a purely academic exercise, however, and would at all events operate only as a tax-exempt, educational organization. In brief, I'm not in it for the money.

¹⁰ For the few extant such works, see, Cass R. Sunstein, *Group Judgments: Statistical Means, Deliberation, and Information Markets*, 80 N.Y.U.L. REV. 962 (2005); Michael Abramowicz, *Information Markets, Administrative Decisionmaking, and Predictive Cost-Benefit Analysis*, 71 U. CHI. L. REV. 933 (2004) [hereinafter Abramowicz, *Information Markets*]; JAMES SUROWIECKI, *THE WISDOM OF CROWDS* 17-22 (2004); Justin Wolfers & Eric Zitzewitz, *Prediction Markets*, J. ECON. PERSP., Spring 2004 at 107 (2004); Tom W. Bell, *Gambling for the Good, Trading for the Future: The Legality of Markets in Science Claims*, 5 CHAPMAN L. REV. 159 (2002); Michael Abramowicz, *The Law-and-Markets Movement*, 49 AM. U. L. REV. 327 (1999) [hereinafter Abramowicz, *The Law-and-Markets Movement*]. See also Robert J. Rhee, *Terrorism Risk in a Post-9/11 Economy: The Convergence of Capital Markets, Insurance, and Government Action*, 37 ARIZ. ST. L.J. 435, 524 (2005) (briefly describing the benefits of an information market in terrorism-related events).

¹¹ See CASS R. SUNSTEIN, *INFOTOPIA: HOW MANY MINDS PRODUCE KNOWLEDGE* 103-145 (2006).

¹² See Chris F. Masse, *Real Money Prediction Exchanges*, http://www.chrisfmasse.com/3/3/exchanges/#Real-Money_Prediction_Exchanges (last visited Mar. 7, 2006) (listing many real money prediction markets); AEI-Brookings Joint Center, *Policy Markets: Active Event Markets: Real Money Markets*, <http://www.aei-brookings.org/pages/index.php?id=37#active> (last visited Mar. 10, 2006) (same). See also Chris F. Masse, *Software*, <http://www.chrisfmasse.com/3/3/software/> (last visited Mar. 7, 2006) (describing the many commercial enterprises offering prediction market services).

¹³ See *infra* Part III (discussing legality of prediction exchanges).

¹⁴ For a preliminary discussion of some aspects of the problem, see Bell, *supra* note 10. This paper adds a new justification for prediction markets—as a complement to copyrights and patents—and many new and detailed legal strategies for legalizing prediction markets.

¹⁵ I've found only one other academic analysis of the legality of prediction markets: Robert W. Hahn & Paul C. Tetlock, *A New Approach for Regulating Information Markets*, 29 J. REG. ECON. 265 (2006). The authors, though not legal academics, give a creditable but questionable account of the legality of prediction markets and one particular strategy for regulating them. For a critical analysis of their work, see *infra* Part III.B.2.c(2). After this paper was accepted for publication, but not too late to preclude a citation, a brief, practitioner-oriented piece advocating CFTC regulation of prediction markets appeared. See Paul Architzel, *Event Markets Evolve: Legal Certainty Needed*, FUTURES INDUSTRY

After this introduction, Part I explains why patents, copyrights, and other extant institutions leave our hunger for progress in the sciences and useful arts unsatisfied. Part II offers scientific prediction exchanges as a promising new source of that public good, truth. It briefly describes scientific prediction exchanges, how they might succeed where patent and copyright laws have failed, and how U.S. law wrongly discourages them. Part III reviews a variety of cures for that legal failure. The article concludes with an all-too-apt illustration of how uncertainty about U.S. law currently discourages scientific prediction exchanges.

A note about terminology: I here join the trend in favoring "prediction markets"¹⁶ for the general class of financial institutions that reward accurate predictions about particular claims and that generate a price for each claim quantifying the consensus prediction among traders in that claim.¹⁷ Alternative and apparently equivalent terms include "information markets,"¹⁸ "decision markets,"¹⁹ and "idea futures markets."²⁰ I reserve "scientific prediction exchange" for a particular sort of prediction market: namely, one offering the exchange of claims payable in the event some claim about progress in the sciences or useful arts comes true.²¹ Why append "prediction exchange" to "scientific"? First, because "prediction" fits its subject, which deals in claims about the future resolution of present unknowns. Second, because "exchange" equates to "market" while nonetheless accurately con-

MAGAZINE, Mar./Apr. 2006 at 50, available at <http://agoraphilia.blogspot.com/2006/03/architzel-on-legality-of-prediction.html>. For a critical review, see Tom W. Bell, *Architzel on Legality of Prediction Markets*, AGORAPHILIA, Mar. 29, 2006, <http://agoraphilia.blogspot.com/2006/03/architzel-on-legality-of-prediction.html>.

¹⁶ See, e.g., Abramowicz, *The Law-and-Markets Movement*, *supra* note 10 (using "prediction market" exclusively). See also Sunstein, *supra* note 10 (using both "prediction market" and "information market").

¹⁷ See Abramowicz, *Information Markets*, *supra* note 10, at 935 (defining an information market as "any device that gives third parties financial incentives to make predictions or to improve upon others' predictions and that combines the predictions into a single consensus value").

¹⁸ *Id.* (using "information market" exclusively); see also Sunstein, *supra* note 10 (using both "prediction market" and "information market").

¹⁹ See, e.g., Saul Levmore, *Simply Efficient Markets and the Role of Regulation: Lessons from the Iowa Electronic Markets and the Hollywood Stock Exchange*, 28 J. CORP. L. 589 (2003) (using solely "decision market" as name for real-money prediction exchanges).

²⁰ Robin Hanson, *Could Gambling Save Science? Encouraging an Honest Consensus*, 9 SOC. EPISTEMOLOGY 3 (1995), available at <http://hanson.gmu.edu/gamble.html>.

²¹ Academics, at least, do not appear to have used "prediction exchange" to any noticeable extent. But terminology in this developing area remains fluid; noted commentator Chris F. Masse uses "prediction exchange" as a generic term for prediction/information/decision markets. See Chris F. Masse, *Real Money Prediction Exchanges*, http://www.chrismasse.com/3/3/exchanges/#Real-Money_Prediction_Exchanges (last visited Mar. 7, 2006).

noting the collaboration and communication that a market in claims about the sciences and useful arts would encourage.

I. THE SUPERFICIAL SUCCESS OF PATENTS AND COPYRIGHTS

Patents and copyrights promote the progress of the sciences and useful arts only imperfectly. In particular, those statutory inventions do relatively little to promote fundamental research and development ("R&D"). Part II.A explains why patent law falls short in providing that public good. Part II.B does likewise for copyright. Perhaps we should not worry about that statutory failure; perhaps extant market and political mechanisms can pick up the slack. Part II.C counsels against complacency, however, arguing instead that we should question whether alternative private or public programs have succeeded where patents and copyrights have failed.

A. Patents

Patent law²² aims to promote the progress of science and the useful arts²³ by creating property-like rights in certain discoveries. Qualifying inventors homestead patent rights²⁴ and trade them for money.²⁵ Patents thereby serve, among other things, to fund research and development. That benefit comes at the cost of a deadweight social cost: lost opportunities to use patented inventions.²⁶ When a patent expires, however, the public wins

²² By "patent" this article means "United States utility patent."

²³ I include both science and useful arts among the objects that art. 1, § 8, cl. 8 of the U.S. Constitution aims to promote via patent protection. That reading best fits the plain meaning of text and good policy. See Malla Pollack, *Unconstitutional Incontestability? The Intersection of the Intellectual Property and Commerce Clauses of the Constitution: Beyond a Critique of Shakespeare Co. v. Silstar Corp.*, 18 SEATTLE U. L. REV. 259, 282-83 (1995) (arguing for a broad reading of the clause on grounds of legislative history and canons of construction). The most recent Supreme Court opinions apparently read the Constitutional justifications for patents with like breadth. See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 730 (2002) ("The patent laws 'promote the Progress of Science and useful Arts' by rewarding innovation with a temporary monopoly.") (quoting U.S. Const., Art. I, § 8, cl. 8.); *Bonito Boats v. Thunder Craft Boats*, 489 U.S. 141, 146 (1989) (same). Perplexingly, however, some authorities argue for a narrower reading of the justifications for copyright protection, limiting it to science alone. See *infra* note 34.

²⁴ See 35 U.S.C.A. §§ 100-105 (2002) (amended 2004) (defining conditions for patentability of inventions under U.S. law).

²⁵ 35 U.S.C § 261 (2000) ("[P]atents shall have the attributes of personal property.").

²⁶ See Jonathan M. Barnett, *Private Protection of Patentable Goods*, 25 CARDOZO L. REV. 1251, 1269 (2004) (including among a patent's social costs, "supracompetitive pricing power exerted by the patent holder (or, more specifically, the deadweight loss resulting from the patent holder's output restric-

a positive externality: free enjoyment of a novel, non-obvious, and useful invention.²⁷

So described, patent law sounds like reasonably good public policy. Casual observation suggests that U.S. patent law can lay plausible claim to generating significant net private and public benefits. Although careful research offers a more equivocating assessment,²⁸ few people inveigh against patents as generally and grossly inefficient or inequitable.²⁹

Nonetheless, patent law and policy does not encourage all discoveries equally. By its own terms, it protects only a "process, machine, manufacture, or composition of matter"³⁰ As interpreted by courts and commentators, moreover, patents fall far short of protecting fundamental and abstract scientific discoveries, such as ones about the string theory of physics or the epidemiology of Avian flu.³¹ Researchers eager to uncover those sorts of profound and vital insights generally find patent protection unavailing.

Such pioneers may find inspiration, or at least incentives, in the pursuit of fickle research grants or prizes.³² More likely, they will give up the search for fundamental discoveries and instead focus on patentable, and therefore more remunerative, inventions. The rare foundational patent, issued at the birth of a new field of discovery, does not do as much as we might like to promote the progress of the science and the useful arts.³³ For-

tions"); Julie E. Cohen & Mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 CAL. L. REV. 1, 15 n.49 (2001) ("A patent prevents some who would otherwise want to use the patented invention at a competitive price from doing so. This effect is termed 'deadweight loss.'").

²⁷ See *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225, 230 (1964) ("[W]hen the patent expires the monopoly created by it expires, too, and the right to make the article—including the right to make it in precisely the shape it carried when patented—passes to the public.").

²⁸ See Thomas F. Cotter, *Introduction to IP Symposium*, 14 FLA. J. INT'L L. 147, 149 (2002) ("[E]mpirical studies fail to provide a firm answer to the question of how much of an incentive [to invent] is necessary or, more generally, how the benefits of patent protection compare to the costs."); Jonathan M. Barnett, *Cultivating the Genetic Commons: Imperfect Patent Protection and the Network Model of Innovation*, 37 SAN DIEGO L. REV. 987, 1008 (2000) ("There is little determinative empirical evidence to settle theoretical speculation over the optimal scope and duration of patent protection.") (footnote omitted).

²⁹ More narrow critiques abound. See, e.g., Pamela Samuelson, *Benson Revisited: The Case Against Patent Protection for Algorithms and Other Computer Program-Related Inventions*, 39 EMORY L.J. 1025 (1990) (arguing against software patents).

³⁰ 35 U.S.C. § 101 (2000).

³¹ *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980) (observing, with approval, "The laws of nature, physical phenomena, and abstract ideas have been held not patentable.").

³² For a discussion of such incentives, and their limitations, see *infra* Part II.C.

³³ See W. Lesser & Travis Lybbert, *Do Patents Come Too Easy?* 44 IDEA 381, 382 (2004) ("[T]he real purpose of a patent system is not to stimulate basic research for major products, but rather to encourage the production of mundane but practical products for which a monetary inducement is essential."); Barnett, *supra* note 28, at 993 (describing how "[i]ncomplete patent coverage of expected spill-

tunately, however, patents do not prove necessary, either; scientific prediction exchanges offer an alternative means of stimulating fundamental research and development.

B. *Copyrights*

Copyright law aims "To promote the Progress of Science and useful Arts"³⁴ by granting authors exclusive rights to their writings.³⁵ A qualifying author can trade those rights for money,³⁶ thereby winning a way to finance her writing.³⁷ The public gains legally limited access to new works and, at least in theory, eventually wins unregulated access to old ones.³⁸ Those benefits carry a price tag, however. Like patents, copyrights impose a deadweight social cost in the form of lost opportunities to use a public good: the expressions protected by the Copyright Act.³⁹

So described, copyright law does not sound like bad public policy. Notwithstanding occasional grumbling about the costs it imposes, copyright law surely deserves some credit for the historically unprecedented access to fixed expressive works that we currently enjoy. Quantifying that copyright

overs from basic-science innovation" requires other institutional supports for fundamental research and development).

³⁴ U.S. CONST. art. I, § 8, cl. 8. Here, as with regard to patents, I read the Constitution's justification of copyrights broadly. *See supra* note 23; *see also* Tom W. Bell, *Escape from Copyright: Market Success vs. Statutory Failure in the Protection of Expressive Works*, 69 U. CIN. L. REV. 741, 743 n.3 (2001) (arguing that "U.S. copyright law may constitutionally promote both science and the useful arts"). The Supreme Court has quoted the Constitutional justifications of copyright more narrowly, granted, but without argument or explanation. *See Eldred v. Ashcroft*, 537 U.S. 186, 193 (2003) (referring only to "the Progress of Science" as the Constitutional justification for copyright protection). Commentators have, however, expressly argued for a narrow reading of copyright's constitutional justification. *See, e.g.,* Lawrence B. Solum, *Congress's Power to Promote the Progress of Science: Eldred v. Ashcroft*, 36 LOY. L.A. L. REV. 1, 11-12 (2002).

³⁵ 17 U.S.C. §§ 106-122 (2000) (defining copyright rights).

³⁶ *Id.* § 201(d) (defining transferability of copyright rights).

³⁷ Relatedly, she might agree to work for hire, thereby vesting in another the authorship of her fixed expressions. *See id.* § 201(b).

³⁸ *See Dastar Corp. v. Twentieth Century Fox Film Corp.*, 539 U.S. 23 (2003) (protecting public access to works that have fallen out of copyright by limiting the scope of unfair competition law).

³⁹ *See* Glynn S. Lunney, Jr., *Fair Use and Market Failure: Sony Revisited*, 82 B.U. L. REV. 975, 995-96 (2002) (explaining that the economic rents afforded by copyright, because they allow a copy-right owner to price use of a work above the owner's marginal costs, create deadweight social losses); Neil Weinstock Netanel, *Market Hierarchy and Copyright in Our System of Free Expression*, 53 VAND. L. REV. 1879, 1905 (2000) (same).

generates net public benefits proves difficult, granted.⁴⁰ Nonetheless, copyright does not evidently inflict deep and wide social harm.⁴¹

Nonetheless, copyright law and policy offers scant solace for those who pursue basic R&D in the sciences and useful arts. The Copyright Act protects only "original works of authorship fixed in any tangible medium of expression . . ."⁴² The Act denies its benefits to "any idea, procedure, process, system, method of operation, concept, principle, or discovery . . ."⁴³ Courts have, moreover, read the Act to stop short of protecting mere facts.⁴⁴

Copyright best serves the authors of entertaining expressive works.⁴⁵ Those who author textbooks, maps, and computer software avail themselves of copyright protection too, of course. It fits their needs only awkwardly, however, because it leaves their original procedures, concepts, and discoveries free for the taking. Notwithstanding the Constitution's hard-nosed call for "the Progress of Science and useful Arts,"⁴⁶ therefore, copyright mainly promotes frivolities.⁴⁷

⁴⁰ See Tom W. Bell, *Escape from Copyright: Market Success vs. Statutory Failure in the Protection of Expressive Works*, 69 U. CIN. L. REV. 741, 787 (2001) ("Copyright does not strike a delicate balance between public and private interests. It will not and indeed cannot . . . Political authorities cannot measure even the economic factors that would have to go into such a calculation, much less the myriad fluctuating and intangible ones.") (footnotes omitted); Lloyd L. Weinreb, *Copyright for Functional Expression*, 111 HARV. L. REV. 1149, 1246 (1998) (describing causes and extent of "uncertainty about how much the added economic incentive of copyright increases the production of specific categories of authorial works or, as the matter now stands, how much the elimination of copyright would decrease it").

⁴¹ Here, as with regard to patent law, more narrow critiques abound. See, e.g., Robert P. Merges, *One Hundred Years of Solicitude: Intellectual Property Law, 1900-2000*, 88 CAL. L. REV. 2187, 2236 (2000) ("Both public choice theory and empirical evidence suggest that some types of intellectual property legislation [including, notably, copyright legislation] may be prone to excessive private-interest influence, or rent-seeking.").

⁴² 17 U.S.C. § 102(a) (2000).

⁴³ *Id.* § 102(b).

⁴⁴ E.g., *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340 (1991).

⁴⁵ You can argue that, especially with regard to copyright law, the founders meant to protect less frivolous subjects. See Solum, *supra* note 34, at 53 ("The original understanding of the aim of the Copyright Clause was that Congress must aim at the encouragement of systematic knowledge or learning of enduring value. The contemporary understanding is quite different.").

⁴⁶ U.S. CONST. art. I, § 8, cl. 8.

⁴⁷ See Solum, *supra* note 34, at 53 ("The modern economic significance of copyright is centered on the entertainment industry. Blockbuster movies, hit records, and best-selling novels, not learned treatises, navigational charts, and maps, are the stuff that has driven recent copyright legislation.").

C. *Extant Failure in the Supply of Basic Research and Development*

Fortunately, although patents and copyrights do too little to promote fundamental progress in the sciences and useful arts, there remain other means to that end. Unfortunately, extant market mechanisms look unlikely to suffice. The truths uncovered by basic research and development ("R&D"), because all can easily access and consume them, qualify as public goods.⁴⁸ We cannot at present count on profit-maximizing, private parties to generate socially optimal amounts of those public goods.⁴⁹ Hence the claim that we suffer a market failure in the supply of basic R&D—hence, too, the putative justification for political action.⁵⁰

I describe this as a "market failure" in the supply of basic R&D only by convention, and with reservations.⁵¹ We would perhaps do better to speak of "market failings"—curable imperfections that make alternative institutions, whether private or public, attractive. Markets almost always work to *some* degree, after all. Rational policymakers will worry about market failure, and try to correct it, only when a better prospect sits ready at-hand.

But even with the caveat that we should chide its "failings" rather than its "failure," the extant market arguably undersupplies basic R&D. We can recognize that the market supplies *some* of that public good (just as we recognize that copyright and patent law supply *some*) without resting content. All else being equal, we would like *more* basic and useful ideas, principles, systems, concepts, discoveries, and facts. The market disappoints us only in that we can imagine a better world than the present one.

⁴⁸ See J. H. Reichman & Paul F. Uhler, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, 66 LAW & CONTEMP. PROBS. 315, 362 (2003) ("Public goods, unlike private goods, are characterized by their *nonrival* and *nonexcludable* properties.").

⁴⁹ *Id.* ("[S]cience itself, especially basic science, resembles a public good, which private enterprise could not adequately support.").

⁵⁰ *Id.* at 363 ("Because industry and business tend to under-invest in scientific production, government takes up the slack either by intervening directly or by providing incentives to the private sector to overcome market failure, in the form of legal monopolies falling within the domestic and international intellectual property systems.").

⁵¹ See I. Trotter Hardy, *Not so Different: Tangible, Intangible, Digital, and Analog Works and Their Comparison for Copyright Purposes*, 26 U. DAYTON L. REV. 211, 218 (2000) ("A 'market failure' means that unless something is done to fix things, people will produce either too much or too little of some good or service, where 'too much or too little' are defined in relation to what would be the optimal use of society's resources."). Professor Hardy goes on, in that same article, to express doubt about whether the subject matter of copyright—authors' expressive works—constitutes a public good. *Id.* at 222-32. I do not, however, read that critique to extend to the facts generated by basic R&D.

Does that market failing justify political action? Political actors evidently think so. They have stepped into the breach left by patents, copyrights, and extant private institutions, supporting basic research and development both via government-run laboratories and via research grants or procurement programs that subsidize the efforts of non-government parties.⁵² We might doubt the efficacy of socializing the inputs to basic R&D, however.⁵³ Indeed, we do well to doubt the efficacy of *all* extant mechanisms, private or public, for supplying fundamental progress in the sciences and useful arts.⁵⁴ The public and private benefits of winning improved data about our world—the goods of the truth—counsel us to seek more.

We cannot reasonably expect that we will enjoy a greater supply of basic R&D, and thus of useful truths, without incurring *some* costs. We can, however, aspire to escape from high *social* costs to low *private* ones. Surely we can improve on patents, copyrights, and other public R&D programs. Scientific prediction exchanges offer a fair prospect of promoting fundamental progress in the sciences and useful arts. The public goods generated by scientific prediction exchanges would, moreover, come at comparatively little social cost. As the next part explains, we largely need only to clear away a legal thicket and leave private parties free to exchange money for claims of fact.

II. TOWARDS A SCIENTIFIC PREDICTION EXCHANGE

What is a scientific prediction exchange? How would it promote progress in the sciences and useful arts? Why does state and federal law in the United States discourage scientific prediction exchanges? Parts II.A, B, and C take up each of those questions in turn. The answers, in brief and respectively: a prediction market in skilled claims about the sciences and useful arts; by encouraging and expressing discoveries; and for no good reason.

⁵² *Id.*; Barnett, *supra* note 28, at 994 ("Since World War II, the federal government has supplied basic-science research both directly, by maintaining government laboratories, and indirectly, through research grants or procurement programs that extend funds to universities, nonprofit research institutes, and private industry.").

⁵³ See Floyd Bloom, *Science and Technology Policy: A Scientist's View*, 33 CAL. W. L. REV. 63, 71 (1996) (decrying a "failure to understand the nature of fundamental research within the federal government"); Jay P. Kesan & Rajiv C. Shah, *Shaping Code*, 18 HARV. J.L. & TECH. 319, 367 (2005) (discussing "inherent inefficiencies in government funding of research and development for products").

⁵⁴ See Hanson, *supra* note 20, at 4 (critiquing academic institutions' supply of scientific progress).

A. *The Scientific Prediction Exchange: A Prediction Market in Skilled Claims about the Sciences and Useful Arts*

A scientific prediction exchange represents a species of prediction market; namely, one that supports trading in skilled claims about the sciences and useful arts. This Subpart briefly describes the primary attributes of scientific prediction exchanges. It does not attempt to nail down all the details of a functioning SPEx—details that would have little bearing on a legal or policy analysis of scientific prediction exchanges and that would in practice vary across markets and time. It suffices, for present purposes, to understand the basic features of prediction markets, in general, and the distinguishing features of scientific prediction exchanges, in particular.

Thankfully, because numerous scholars have already described how prediction markets operate, a quick review should suffice.⁵⁵ Prediction markets typically support the buying and selling of instruments payable in the event some associated claim holds true.⁵⁶ As on any market, the price associated with each claim fluctuates with supply and demand.⁵⁷ But on a prediction market, notably, supply and demand measure the extent to which traders—people willing to back up their opinions—judge a particular claim to be true or false.⁵⁸ A prediction market⁵⁹ therefore rewards the accurate

⁵⁵ See, e.g., SUNSTEIN, *supra* note 11, at 103-45; Abramowicz, *Information Markets*, *supra* note 10, at 943-49; SUROWIECKI, *supra* note 10, at 17-22; Levmore, *supra* note 19, at 589-91. See generally AEI-Brookings Joint Center, Policy Markets, <http://www.aei-brookings.org/pages/index.php?id=37#research> (last visited Mar. 10, 2006) (cataloging research about prediction markets).

⁵⁶ This general description holds true of all the various detailed models that prediction markets have adopted. See, e.g., Abramowicz, *Information Markets*, *supra* note 10, at 958-60 (describing a market scoring model designed to overcome the problems associated with thinly-traded prediction markets); DAVID PENNOCK, A DYNAMIC PARI-MUTUEL MARKET FOR HEDGING, WAGERING, AND INFORMATION AGGREGATION § 3.1 (2004), available at <http://dimacs.rutgers.edu/Workshops/Markets/pennock.pdf> (describing operation of dynamic pari-mutuel model used by the Yahoo! Tech Buzz prediction market); Iowa Electronic Markets, Trader's Manual: Objects Traded in the IEM, http://www.biz.uiowa.edu/iem/trmanual/IEMManual_2.html#What (last visited Mar. 2, 2006) (describing the double-auction model used by IEM). This paper's legal analysis thus should apply to all prediction markets in skilled claims about the sciences and useful arts. Perhaps entrepreneurs and researchers will create new and materially different prediction markets, markets that do not rely on the spot transfer of prediction certificates or some functional equivalent. Some few detailed points of this paper's analysis might not fully apply to such markets. Even then, though, most of the legal arguments, and all of the policy arguments, should continue to work.

⁵⁷ See, e.g., FX Claim Quak, <http://www.ideosphere.com/fx-bin/Claim?claim=Quak> (last visited Mar. 9, 2006) (showing variation, over a decade of trading, of market clearing price of claim that the U.S. West Coast will experience a major earthquake by 2010).

⁵⁸ See SUNSTEIN, *supra* note 11, at 121 ("When people are willing to put their money where their mouth is, there is an increased likelihood that they will be right.").

prediction of contested claims and generates prices for each claim that quantify the consensus prediction, at any given time, of those who trade in that claim.⁶⁰

By way of example, consider the "SLvl" claim traded on the Foresight Exchange, a prominent play-money prediction market.⁶¹ That claim reads, "By 2030, the greenhouse effect and other causes will have raised the average world sea level by 1 meter from its 1994 level."⁶² The Foresight Exchange facilitates trade in SLvl coupons, each worth one "FX-buck" in the event the SLvl claim proves true. Since trading opened in 1994, the price of SLvl coupons has fluctuated between about .1 and .5 FX-bucks apiece, indicating how traders' opinions about global warming have changed.⁶³ For more than a year, the price has hovered near .2 FX-bucks/coupon, demonstrating a consensus view the SLvl claim has only about a 20% likelihood of coming true.⁶⁴

Because prediction markets reward correct predictions, they encourage traders to develop truthful beliefs. This holds true not only of real-money markets, but also of play-money ones.⁶⁵ Some traders will invest time and effort in pursuit merely of prizes or bragging rights.⁶⁶ Evidence suggests, moreover, that play-money prediction markets do about as well as real-money ones in expressing information.⁶⁷ That same evidence also suggests,

⁵⁹ As observed above, *supra* p. 6, I here use "prediction market" as interchangeable with such alternative terms as "information market," "decision market," and "idea futures market."

⁶⁰ For a comparable definition, see Abramowicz, *Information Markets*, *supra* note 10, at 935 (defining an information market as "any device that gives third parties financial incentives to make predictions or to improve upon others' predictions and that combines the predictions into a single consensus value").

⁶¹ See FX Claim SLvl, <http://www.ideosphere.com/fx-bin/Claim?claim=SLvl> (last visited Aug. 4, 2006) [hereinafter FX Claim SLvl].

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ See, e.g., Chris F. Masse, *Play-Money Prediction Exchanges*, http://www.chrisfmasse.com/3/3/exchanges/#Play-Money_Prediction_Exchanges (last visited Mar. 8, 2006) (listing many various play-money prediction markets); AEI-Brookings Joint Center, *Policy Markets: Active Event Markets: Play Money Markets*, at <http://www.aei-brookings.org/pages/index.php?id=37#active> (last visited Mar. 10, 2006) (same).

⁶⁶ See, e.g., The Foresight Exchange Prediction Market, <http://www.ideosphere.com/> (last visited Mar. 9, 2006) (hosting the oldest extant and one of the most successful play-money markets, which tracks scores and ranks of players).

⁶⁷ See Emile Servan-Schreiber, Justin Wolfers, David M. Pennock & Brian Galebach, *Prediction Markets: Does Money Matter?*, ELECTRONIC MARKETS, 14-3 (Sept. 2004), available at http://www.newsfutures.com/pdf/Does_money_matter.pdf (offering evidence that play-money prediction markets predict as accurately as real-money ones and speculating that the former optimizes information aggregation whereas the latter optimizes information discovery). See also Levmore, *supra* note 19, at 594 (relating

however, that real-money markets best stimulate discovery.⁶⁸ Only if the Foresight Exchange offered real money trading in the SLvI claim described above,⁶⁹ for instance, could a climatologist use it to finance her research. Since, as described below,⁷⁰ scientific prediction exchanges promote progress in the sciences and useful arts with particular zeal, they have a particular need for real-money trading.⁷¹

Prediction markets offer a promising means of stimulating, aggregating, and quantifying accurate answers to difficult questions. Many questions remain as to exactly how prediction markets can best achieve those commendable goals, and how well they outperform alternative means to the same ends.⁷² We still have much to learn about this new and innovative institution. Little doubt exists, however, that prediction markets stand a fair chance of generating net public and private benefits.⁷³

To understand what prediction markets *are*, it helps to understand what they are *not*. Most notably, it helps to contrast prediction markets with other, more traditional markets. Sections 1 and 2 offer a variety of such comparisons, each offering a table helpfully summarizing the difference between prediction markets and their more conventional counterparts.⁷⁴ Section 1 focuses on ends, illustrating that prediction markets serve different policy goals than do futures markets, securities markets, or gambling markets. Section 2 focuses on means, demonstrating that prediction markets operate differently from those alternative financial institutions. Sections 1 and 2 discuss in passing how the general class of prediction markets differs from scientific prediction exchanges, the particular subject of this article. Section 3 focuses on that distinction, explaining that a SPEX concerns only

evidence in support of the "possibility that a fantasy market may convey information as well, or nearly as well, as a real market").

⁶⁸ See Servan-Schreiber, Wolfers, Pennock, & Galebach, *supra* note 67.

⁶⁹ See *supra* text accompanying notes 61-64.

⁷⁰ See *infra* Part III.A.1.

⁷¹ Hence the importance of clarifying the legality of real-money prediction exchanges under U.S. law. See *infra* Part III.

⁷² See, e.g., Justin Wolfers & Eric Zitzewitz, *Five Open Questions about Prediction Markets*, Jan. 21, 2005, <http://faculty-gsb.stanford.edu/zitzewitz/Research/Five%20Questions.pdf>.

⁷³ See SUROWIECKI, *supra* note 10, at 21 ("[G]iven the right conditions and the right problems, a decision market's fundamental characteristics—diversity, independence, and decentralization—are guaranteed to make for good group decisions.").

⁷⁴ Readers who access this paper via a service that does not duplicate tables, such as Lexis or Westlaw, can see Tables 1 and 2 at the version of the paper made available at <http://www.tomwbell.com/writings/SPEX.pdf>.

Only after I'd cast these tables in substantially their final form, complete with labels and shading, did I run across the fine table comparing gaming with securities transactions. See Christine Hurt, *Regulating Public Morals and Private Markets: Online Securities Trading, Internet Gambling and the Speculation Paradox* 86 B.U. L. REV. 371 (2006).

claims about the sciences and useful arts, places much greater emphasis on discovery than on entertainment, and invites subsidies mitigating the zero-sum effect of trading.

That prediction markets pursue unique ends, through unique means, suggests that they merit unique legal treatment. That holds still truer of scientific prediction exchanges, which possess features distinguishing them still more sharply from conventional markets. A full analysis of that suggestion, exploring whether and to what extent the laws regulating futures markets, securities markets, and gambling transactions apply to scientific prediction exchanges, follows later in this paper.⁷⁵

1. The Purposes of Prediction Markets v. Those of Other Markets

Prediction markets in general, and scientific prediction exchanges in particular, serve ends different from those of futures, securities, or gambling markets. Table 1 sums up the contrasts. It illustrates that prediction markets exhibit a unique concern for expressing prices and promoting discovery. The goals most important to other markets—hedging risks, raising capital, and entertainment—matter comparatively little to prediction markets as a class. The proper subset of prediction markets that concerns only skill-based trading in claims about the sciences and useful arts (i.e., scientific prediction exchanges) differ still more sharply from futures, securities, or gambling markets. This section explains why.

⁷⁵ See *infra* Part III.B.1-3 (analyzing fit of gambling laws, fit of commodities futures trading regulations, and fit of securities trading regulations).

| Purpose: Type: | Express Prices | Promote Discovery | Entertain | Hedge Risks | Raise Capital |
|----------------------|-------------------------|------------------------|-----------|------------------------|-----------------------|
| Prediction Market | primary | secondary | tertiary | tertiary? | N.A. |
| Futures Market | secondary ⁷⁶ | tertiary ⁷⁷ | N.A. | primary ⁷⁸ | N.A. |
| Securities Market | secondary ⁷⁹ | tertiary ⁸⁰ | N.A. | tertiary ⁸¹ | primary ⁸² |
| Gambling Market | N.A. | N.A. ⁸³ | primary | N.A. | N.A. ⁸⁴ |

Table 1: Market Type v. Market Purpose, Ranked by Importance

⁷⁶ See Commodities Futures Trading Commission, *The Economic Purpose of Futures Markets*, <http://www.cftc.gov/opa/brochures/opaeconpurp.htm> (last visited Feb. 27, 2006) [hereinafter CFTC] (saying of price discovery, "[t]his is considered to be an important economic purpose of futures markets").

⁷⁷ The prospect of successfully speculating on a futures market, by predicting the future more accurately than other traders, could encourage research into weather, financial trends, and other phenomena amenable to scientific scrutiny.

⁷⁸ CFTC, *supra* note 76 ("Futures markets are . . . designed as vehicles for hedging and risk management . . .").

⁷⁹ Third parties may regard the prices of publicly traded securities as a positive externality useful for, say, economic forecasts.

⁸⁰ As in futures markets, the prospect of successfully speculation could encourage some types of scientific research.

⁸¹ Investing in securities may help an investor hedge against loss by dint simply of diversifying her portfolio.

⁸² See U.S. Securities and Exchange Commission, *The Investor's Advocate: How the SEC Protects Investors, Maintains Market Integrity, and Facilitates Capital Formation*, <http://www.sec.gov/about/whatwedo.shtml> (last visited Feb. 27, 2006) ("The mission of the U.S. Securities and Exchange Commission is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.").

⁸³ A gambling transaction that affords skill a role in picking winners, such a bet on the horses, may promote a research of a narrow, and narrowly useful, nature. In no event, though, do such games aim at promoting research. That happens at best only as an unintended side-effect and never to any significant degree.

⁸⁴ States sometimes justify their lotteries as a means for funding for education or other worthy ends. See, e.g., California State Lottery, Supporting Education, <http://www.calottery.com/Support/LotteryFunds/> (last visited Feb. 27, 2006). That does not mean lotteries "raise capital" for investment, however; it means simply that that lotteries substitute for tax revenues.

Prediction markets aim primarily to aggregate and reveal prices—positive externalities that offer accurate, timely, and quantified consensus answers to important questions. As a consequent and secondary matter, prediction markets encourage efforts to discover such answers. Some parties may, of course, trade on the information ready-at-hand, or even on mere hunches. Because markets in skill-based claims reward research, however, they tend to stimulate it. Scientific prediction exchanges, in particular, aim at encouraging the discovery of truths about the sciences and useful arts. Just as promoting progress in those subjects justifies the statutory creation of copyright and patent rights, it justifies the creation, via scientific prediction exchanges, of rights associated with claims of fact.

Consider the SLvl claim discussed earlier.⁸⁵ It offers payment (albeit only in play money, for now) in the event that the mean ocean level increases by at least one meter between 1994 and 2030.⁸⁶ The fluctuating price of that claim faithfully quantifies the varying consensus among people willing to trade on their opinions about global climate change. Many such people doubtless place unwarranted confidence in their own opinions. The market tends to punish those who trade based on mere guesses or blind ideology, however, and reward those who trade based on the facts. Over time, then, the price of SLvl coupons can tell us something very useful about whether sea levels will actually rise. Were real-money trading in SLvl coupons possible, moreover, experts in climatology might profit from their foresight. They might then use the market to finance their research, further promoting progress in the sciences and useful arts.

Some prediction markets—especially those that offer only play-money payoffs—evidently aim to entertain those who trade on them.⁸⁷ They fairly well have to offer entertainment, given that they cannot lure traders with the promise of lucre. Even in that, though, prediction markets differ from gambling markets, which entertain primarily *because* they put players' money at risk, rather than *instead* of doing so. In any event, and for better or worse, the sorts of claims about basic R&D traded on a scientific prediction exchange would probably not offer much entertainment value.⁸⁸ Even

⁸⁵ See *supra* text accompanying notes 61-64.

⁸⁶ See FX Claim SLvl, *supra* note 61 (describing claim that, "[b]y 2030, the greenhouse effect and other causes will have raised the average world sea level by 1 meter from its 1994 level").

⁸⁷ See, e.g., Chris F. Masse, *Play-Money Prediction Exchanges*, http://www.chrisfmasse.com/3/3/exchanges/#Play-Money_Prediction_Exchanges (last visited Mar. 8, 2006) (listing many various play-money prediction markets); AEI-Brookings Joint Center, *Policy Markets: Active Event Markets: Play Money Markets*, <http://www.aei-brookings.org/pages/index.php?id=37#active> (last visited Mar. 10, 2006) (same).

⁸⁸ See Bell, *supra* note 10, at 169 ("[T]he dry subject matter and slow pace of a market in science claims seems quite unlikely to encourage the sort of compulsive or underage gambling that worries critics of the gaming industry."); Hanson, *supra* note 20, at 16 ("[S]cience questions are generally too

if real money were at stake, for instance, we would not expect *T.V. Guide* to report fluctuations in the price of SLv1 coupons. Scientific prediction exchanges thus look likely to differ even more from gambling markets than do prediction markets generally.

Only as a tertiary matter at best, and only in some instances, might a scientific prediction market support hedging functions. Only some of the claims traded on prediction markets would suit that end. No one would invest in claims about the rest mass of the electron neutrino, for instance, in order to counter-balance an off-market risk.⁸⁹ The owner of beachfront resort properties, in contrast, might hedge her investments by purchasing real-money equivalents to the SLv1 claim traded on the Foresight Exchange, thus guaranteeing her compensation in the event that ocean levels surge.⁹⁰ Or, leastwise, she might try. That sort of significant financial hedging, which typically falls within the jurisdiction of the Commodity Futures Trading Commission ("CFTC"), requires quite thick markets. It looks unlikely that a market in claims about the sciences and useful arts would attract enough trading to offset large monetary risks.⁹¹ Nonetheless, as a safeguard against venturing into the CFTC's jurisdiction, a SPEx could bar trading above certain levels of capitalization, revenues, or volume.⁹² That would assure that the exchange does not support significant financial hedging, yet leave it free to pursue its primary purposes: expressing prices and promoting discoveries about the sciences and useful arts.

2. The Functions of Prediction Markets v. Those of Other Markets

Prediction markets use means different from those of conventional markets. Table 2 summarizes the distinctions. It illustrates that prediction markets alone offer skill-based spot trading of conditional claims (rather than of underlying assets)—usually on a zero-sum basis—without exposing

long term to be a problem [for compulsive gamblers], offering no more 'action' than long-term stock investments.").

⁸⁹ See Foresight Exchange Prediction Market, Claim Neut—Neutrino Mass >0, <http://www.ideosp.com/fx-bin/Claim?claim=Neut> (last visited Feb. 27, 2006) (describing claim that, "[t]he rest mass of the electron neutrino is greater than 0.01 eV in ordinary space").

⁹⁰ See FX Claim SLv1, *supra* note 61.

⁹¹ Indeed, prediction markets run some risk of supporting trading too thin even to generate accurate predictions. See Abramowicz, *Information Markets*, *supra* note 10, at 957 (explaining why prediction markets "may be less effective when markets are thin"). But see Levmore, *supra* note 19, at 601 ("We are accustomed to thinking of a thick market, like a familiar securities market, as efficient, and a small market, like the IEM, as inefficient and prone to manipulation. But the opposite is likely to be true.").

⁹² See, e.g., Hahn & Tetlock, *supra* note 15, at 277 (suggesting that the CFTC should exempt from regulation prediction markets that are limited in the size of investment).

traders to losses greater than their investments. That collection of features distinguishes prediction markets from futures, securities, and gambling markets. Prediction markets in claims about the sciences and useful arts (i.e., scientific prediction exchanges) differ still more sharply from those other markets. This section expands on and explains those distinctions.

| Feature: Type: | Skill-based Trading | Spot Trading | Zero-Sum Trading | Underlying Assets | Risk of Loss Greater than Investment |
|-------------------|---------------------|-----------------------|------------------|-------------------|--------------------------------------|
| Prediction Market | yes | yes | usually | no | no |
| Futures Market | yes | no | yes | usually | yes ⁹³ |
| Securities Market | yes | usually ⁹⁴ | no | usually | sometimes ⁹⁵ |
| Gambling Market | no | yes | yes | no | sometimes ⁹⁶ |

Table 2: Market Type v. Market Feature

Prediction markets, like futures and securities markets, host trading in which skill predominates over chance in determining profits. That serves as the primary dividing line, albeit a notoriously fuzzy and wending one,⁹⁷ between non-gambling and gambling transactions. It matters not that some incautious investors may fail to exercise skill; it matters only that, in principle, a skilled investor can routinely do better than an unskilled one.⁹⁸ That

⁹³ CME, *About Futures: Futures vs Stocks*, <http://www.cme.com/edu/course/intro/futrvsstck9697.html> (last visited Feb. 27, 2006) (explaining that, "[d]epending on price changes, more than the initial investment can be lost").

⁹⁴ Although routine securities transactions take place on a spot basis, security derivatives assume a variety of forms. See Wikipedia, *Derivative (finance)*, http://en.wikipedia.org/wiki/Derivative_%28finance%29 (last visited Mar. 1, 2006).

⁹⁵ A security purchased on a margin can expose an investor to the risk of losses greater than the amount invested. CME, *supra* note 93.

⁹⁶ Although most gambling transactions put only a bettor's stake at risk of loss, a bettor who makes a spread bet without a "stop loss" limit may lose more than his or her stake. See Wikipedia, *Spread Betting*, http://en.wikipedia.org/wiki/Spread_betting (last visited Mar. 1, 2006).

⁹⁷ See Thomas Lee Hazen, *Rational Investments, Speculation, or Gambling? Derivative Securities and Financial Futures and Their Effect on the Underlying Capital Markets*, 86 NW. U. L. REV. 987, 1002 (1992) ("Speculative investing has long been viewed as tantamount to gambling.").

⁹⁸ See *infra* Part III.B.1 (explaining role of skill and chance in defining gambling transaction).

holds generally true of prediction markets, which count on traders' skill to make expressed prices not statistical noise but rather a useful externality. It holds especially true of scientific prediction exchanges, which deal in scientific and technological questions particularly amenable to expert resolution.⁹⁹ Those who trade in the SLvl claim,¹⁰⁰ for instance, will find that expertise in climatology serves far better than dumb luck.

"Spot trading" means "present payment for immediate delivery."¹⁰¹ We engage in spot trading when we simultaneously pay for and win the right to a pack of gum, a house, a lottery ticket, or a unit of foreign currency.¹⁰² In spot trades, we aim to win something at least as valuable as what we have parted with. We must admit, however, that misjudgment sometimes thwarts our aims. A spot trade thus sees an exchange of money for the present delivery of something having only *conditional* value. Conditional on what? Conditional not on a buyer's hopes, but rather on the hard facts about his bargain.

So understood, "spot trading" fits the sort of trading hosted by a prediction market. Traders on a prediction market buy or sell, in the present, instruments payable in the future on certain conditions. These instruments—call them "prediction certificates"—function like freely assignable financial documents, each giving its bearer the right to demand payment from a particular party, of a particular sum, in the event that a particular condition holds true.¹⁰³ In that, a prediction certificate resembles a lottery ticket (the value of which typically varies with chance and the number of tickets sold)¹⁰⁴ or a unit of foreign currency (the value of which varies with the exchange rate).¹⁰⁵ To use a term that would court paradox under article 3 of the Uniform Commercial Code,¹⁰⁶ but that common law does not for-

⁹⁹ See Bell, *supra* note 10, at 167.

¹⁰⁰ See *supra* text accompanying notes 61-64.

¹⁰¹ See BLACK'S LAW DICTIONARY 1402 (6th ed. 1990) (defining "spot trading" as "cash sales for immediate delivery in contrast to trading in futures").

¹⁰² See *Commodity Futures Trading Comm'n v. Zelener*, 373 F.3d 861, 867 (7th Cir. 2004) (affirming that exchange of present payment for right, conditional on demand, to present delivery of foreign currency qualifies as "spot" rather than "futures" trade).

¹⁰³ See *infra* Part III.C.1 (defining "prediction certificate").

¹⁰⁴ See Bell, *supra* note 10, at 171 (explaining prediction certificates as "akin to lottery tickets—albeit tickets for a 'lottery' where skill or knowledge predominates over chance in determining which coupons win") (footnote omitted).

¹⁰⁵ See *CFTC*, 373 F.3d at 869 (saying that foreign currency transactions "were, in form, spot sales for delivery within 48 hours").

¹⁰⁶ See U.C.C. § 3-104(b) (2002) ("'Instrument' means a negotiable instrument."); *id.* § 3-104(a) (providing generally that "'negotiable instrument' means an unconditional promise or order to pay a fixed amount of money . . ."). See also Janine S. Hiller, *The Check is . . . on the Telephone?* 47 S.C.L. REV. 305, 319-20 (1996) (explaining that Article 3 represents, at best, only persuasive authority con-

bid,¹⁰⁷ we might most accurately characterize prediction certificates *negotiable conditional* notes.¹⁰⁸ At any rate, no matter how you style them, prediction certificates allow the immediate transfer of rights for money. Table 2 thus indicates that a prediction markets offer spot trading.

Spot trading contrasts with futures trading, the subject of the CFTC's regulatory attentions. Whereas a scientific prediction exchange would offer the *present* delivery of *conditional* rights, a futures market offers the *future* delivery of *unconditional* rights.¹⁰⁹ For instance, a commodities futures trader might deal in unit contracts to purchase 40,000 pounds of frozen pork bellies, six months hence, at the then-prevailing price.¹¹⁰ That contract gives its owner the unconditional right—and obligation—to take delivery of that commodity, in that quantity, at that time.¹¹¹ Table 2 thus indicates that commodities futures markets alone support futures trading.¹¹²

Prediction markets also typically offer zero-sum trading. In other words, traders profit only at the expense of other traders.¹¹³ In that, prediction markets resemble all but securities markets, in which all traders may

cerning non-negotiable instruments, and that courts sometimes deal with them using principles of contract law).

¹⁰⁷ See *Garnett v. Assocs. Disc. Corp.*, 233 Miss. 849, 852-53 (1958) (upholding enforceability of a "negotiable conditional sales contract and note"); *Morris Plan Bank v. Faulds*, 47 N.Y.S.2d 920, 922, 925 (N.Y. County Ct. 1944) (finding void on grounds of usury "a negotiable conditional sales note"), *rev'd on other grounds*, 269 A.D. 238, 55 N.Y.S.2d 372 (N.Y. App. Div. 1945).

¹⁰⁸ They would qualify as "negotiable" not under the particular provisions of U.C.C. Article 3, but rather under the more general understanding that negotiation is, "The transfer of an instrument in such form that the transferee becomes a holder." BLACK'S LAW DICTIONARY 1036 (6th ed. 1990). Prediction certificates could be made still more freely transferable by being made "payable to bearer"; *see id.* ("[I]f payable to bearer it is negotiated by delivery.").

¹⁰⁹ See *CFTC*, 373 F.3d at 865 ("A futures contract, by contrast, does not involve a sale of the commodity at all. It involves a sale of the contract.") (emphasis in the original).

¹¹⁰ See, e.g., Chicago Mercantile Exchange, *CME Frozen Pork Bellies Futures: Contract Specifications*, http://www.cme.com/trading/prd/contract_spec_PB659.html (last visited Feb. 27, 2006).

¹¹¹ See Chicago Mercantile Exchange, *About Futures: What Are Futures?*, <http://www.cme.com/edu/course/intro/whatfutr9695.html> (last visited Feb. 27, 2006). See also *CFTC*, *supra* note 76, ("Standardized terms include, the amount of the commodity to be delivered (the contract size), delivery months, the last trading day, the delivery location or locations, and acceptable qualities or grades of the commodity."). A futures contract may also call for cash settlement, of course, and most futures markets participants offset their contracts rather than hold them until termination. *Id.* Still, though, the description offered here illustrates the fundamentals of a futures contract.

¹¹² Granted, though, there remains a non-negligible risk that a court might classify trading in prediction certificates as "futures trading." See *infra* Part III.B.2.a-b (explaining the probable scope of CFTC jurisdiction over prediction markets).

¹¹³ See, e.g., Foresight Exchange, *FX — Frequently Asked Questions: Concepts*, <http://www.ideosp.com/fx/docs/FXfaq.cgi#spread> (visited Mar. 9, 2006) ("[W]hen one player wins another player loses.").

simultaneously win or lose.¹¹⁴ Notably, however, scientific prediction exchanges appear especially likely to invite subsidies that would mitigate the impact of zero-sum trading. Someone particularly interested in measuring the consensus opinion about a question of science or the useful arts, and perhaps in stimulating R&D on the topic, might find it worthwhile to subsidize trading in that claim on a scientific prediction exchange.¹¹⁵ Various funding mechanisms exist, but all boil down to attracting traders by pumping money into a market.¹¹⁶ The scientific prediction exchange's focus on questions about the science and useful arts—matters that have long benefited from public and private subsidies—make it an especially likely target for such largess. Strictly speaking, such subsidies would not make overall trading on a SPEx positive-sum. The subsidizing party would, after all, intentionally lose money on the market. Functionally, though, that financial support of progress in the sciences and useful arts would make trading on a scientific prediction exchange better than zero-sum for average, profit-seeking participants.

Finally, prediction markets deal not in underlying assets, but rather in intangible questions of fact. Put another way, prices on a prediction market vary not according to the value of something that can be bought or sold elsewhere, off the market, but rather only according to traders' opinions about the truth of various forecasts. In that, prediction markets resemble gambling markets, where parties trade on such things as the outcome of a forthcoming lotto drawing or dog race. In contrast, prices on securities and commodities markets typically track the values of underlying assets, such as equity in a corporation or a bushel of wheat.¹¹⁷

3. Prediction Markets v. Scientific Prediction Exchanges

As the prior two sections indicated in passing, scientific prediction exchanges represent a discrete subset of prediction markets. Notably, their

¹¹⁴ See Hazen, *supra* note 90, at 1006 (contrasting securities markets with futures markets).

¹¹⁵ See Abramowicz, *Information Markets*, *supra* note 10, at 960 (suggesting that prediction markets in relatively dry but important topics "may require additional subsidies to create sufficient interest").

¹¹⁶ See *id.* at 960-62 (describing how to subsidize in a market scoring system); Hanson, *supra* note 20, at 14, 17 (suggesting the use of market makers).

¹¹⁷ Exceptions exist with regard to each market, however. Securities markets support trade in weather, environmental, and economic derivatives based on nothing having independent market value. See Norman Menachem Feder, *Deconstructing Over-The-Counter Derivatives*, 2002 COLUM. BUS. L. REV. 677, 682 n.7. Commodities markets likewise support trade in contracts based on weather forecasts. See Chicago Mercantile Exchange, *CME Weather Products*, <http://www.cme.com/trading/prd/env/cme-weather14270.html> (last visited Mar. 9, 2006).

characteristics make scientific prediction exchanges especially distinct from futures, securities, and gambling markets. Since those differences may ultimately shape the legal treatment of scientific prediction exchanges, they bear emphasis. This section briefly recaps how scientific prediction exchanges differ from prediction markets and, thus, from futures, securities, and gambling markets.

Prediction markets can usefully address any question in which skill affords a trading advantage.¹¹⁸ A scientific prediction exchange, in contrast, would concern only questions about the sciences or useful arts in which skill predominates over chance in determining a prediction's success. Delineating which questions fit those criteria may prove tricky, granted. It should not prove impossible, however, and it would certainly prove worth the effort.¹¹⁹ Properly defining skills-based trades on questions of the sciences and useful arts would ensure that scientific prediction exchanges promote the same laudable aims as the Constitution's Patent and Copyright Clause¹²⁰ and would protect scientific prediction exchanges from anti-gambling laws.¹²¹

Prediction markets aim primarily at quantifying the current consensus about unresolved questions of fact. Scientific prediction exchanges support that end. Consonant with the goal of filling gaps in patent and copyright policy,¹²² however, scientific prediction exchanges also aim to stimulate new discoveries in the sciences and useful arts.

The somewhat dry (if worthy) subject-matter of trading on scientific prediction exchanges makes them particularly unlikely, compared to more free-wheeling prediction markets, to draw participants looking for mere entertainment. Thus virtue exacts its toll. In compensation, however, scientific prediction exchanges look especially likely to attract subsidies from the many generous parties who share an appreciation of the public goods afforded by fundamental research and development.

¹¹⁸ It would not make sense to use a prediction market to trade in claims resolved wholly by chance, such as a claim about the outcome of a lottery drawing. Since no one would have superior information about such a claim, no one would have an incentive to trade in it.

¹¹⁹ For one attempt at a legally workable definition of the scope of trading on prediction exchanges, see *infra* Part III.C.1 (proposing a Scientific Prediction Exchange Act).

¹²⁰ See *supra* Part II.A-B.

¹²¹ See *infra* Part III.B.1.

¹²² See *supra* Part I.A-B.

B. *How Scientific Prediction Exchanges Would Promote Progress in the Sciences and Useful Arts*

The scientific prediction exchange would promote progress in the sciences and useful arts in a variety of ways. By rewarding skilled claims about those public goods, the SPEx would promote basic research and development.¹²³ By aggregating, quantifying, and disseminating traders' consensus opinions about disputed questions of fact, moreover, the scientific prediction exchange would produce a vital input for promoting the sciences and useful arts: accurate and timely information about progress in those fields.¹²⁴ Even those of us who merely watch trading from the sidelines stand to learn something about the drama and value of scientific disputes. Reporters would find claim prices on a scientific prediction exchange offer a quick, objective, and neatly packaged way to follow esoteric debates. Consider, for instance, how journalists might use the real-money price of a claim like SLv1 to clarify the controversy over global climate change.¹²⁵ Scientific prediction exchanges would thus fund, measure, and publicize progress in the sciences and useful arts.

Scientific prediction exchanges also offer to deliver those public goods at little or no public expense. In contrast to patent and copyright rights, the rights created by scientific prediction exchanges do not impose deadweight social costs.¹²⁶ Those who buy prediction certificates get only the right to receive payment in the event an associated claim holds true—not the right to prevent anyone from enjoying progress in the sciences or useful arts. Far from enclosing public goods, prediction markets help to create and share them.

We have sound reasons to expect net gains from scientific prediction exchanges. Available evidence strongly suggests that scientific prediction exchanges could outperform experts in generating accurate answers to questions about science and technology.¹²⁷ Due to the difficulty of setting up an adequate control group, conclusive experimental proof of the superiority of prediction markets remains elusive. We lack, and will probably never get, an objectively superior process for selecting the experts we would pit against a prediction market.¹²⁸ Nonetheless, studies of functioning

¹²³ See generally *supra* Part II.A.1 (discussing how scientific prediction exchanges encourage and reward research).

¹²⁴ See generally *id.* (discussing discovery functions of prediction markets and prediction exchanges).

¹²⁵ See *supra* text accompanying notes 61-64.

¹²⁶ See *supra* Part I.A-B.

¹²⁷ See Abramowicz, *Information Markets*, *supra* note 10, at 949-52.

¹²⁸ See *id.* at 951.

prediction markets indicate that they at least sometimes best the sorts of experts that we would ordinarily rely upon.¹²⁹ Practice thereby confirms what theory suggests: prediction markets, because they link incentives to accuracy rather than to credentials, offer a promising alternative to traditional means of resolving disputed questions of fact. It hardly takes a leap of faith to suppose that scientific prediction exchanges would promote the progress of the sciences and useful arts.

Neither the available evidence nor our fervent hopes show that scientific prediction exchanges, or indeed prediction markets generally, will work perfectly. They will not work perfectly. What institution does? They may not work at all.¹³⁰ If scientific prediction exchanges fail, however, they will do so only at the expense those who deliberately participate in them. The public at large risks nothing by the endeavor, and may gain a great deal. As Professor Sunstein puts it,

The simple upshot is that in many cases, private or public institutions might create markets to provide information on crucial questions; and public institutions might take that information into account in making judgments about policy. In Hayek's spirit, the best way to start is with the predictions markets run by the private sector, which has made productive use of such markets in the past, and which promises to do much more of the same in the future. Prediction markets need not be a substitute for deliberation. But if deliberators choose to ignore what they say, they ought to have a good reason for doing so.¹³¹

To paraphrase the good Professor: We might as well give prediction markets a try.

C. *The Legal Failure Threatening Scientific Prediction Exchanges*

To launch a scientific prediction exchange under present law would call for an unlikely combination of charity and daring. It would rely on

¹²⁹ See, e.g., Kay-Yut Chen and Charles R. Plott, *Information Aggregation Mechanisms: Concept, Design and Implementation for a Sales Forecasting Problem* 13 (California Institute of Technology Social Science Working Paper No. 1131, 2002), available at <http://www.hss.caltech.edu/SSPapers/wp1131.pdf> (visited Feb. 16, 2006) (reporting that a prediction market for predicting Hewlett Packard printer sales beat HP's official forecast six of eight times); Joyce Berg, Forrest Nelson & Thomas Rietz, *Accuracy and Forecast Standard Error of Prediction Markets* 11-13 (2003) (unpublished manuscript, <http://www.biz.uiowa.edu/iem/archive/forecasting.pdf>) (last visited Feb. 16, 2006) (offering data and analysis showing that the Iowa Electronic Market did better than polls in making long-term predictions of electoral outcomes). See generally, Abramowicz, *Information Markets*, *supra* note 10, at 950-51 (reviewing experimental data).

¹³⁰ See Abramowicz, *The Law-and-Markets Movement*, *supra* note 10, at 408-30 (discussing potential problems of, and cures for, prediction markets).

¹³¹ SUNSTEIN, *supra* note 11, at 145.

philanthropic impulses because operating a market in claims about the sciences and useful arts is not likely to generate considerable profit. To break even, such an exchange would almost certainly require the tax-exemptions afforded to qualifying educational or research institutions. It would probably also require donations from individuals or foundations interested in promoting the progress of science and the useful arts. Nobody associated with a scientific prediction exchange stands to make a great deal of money.

U.S.-based scientific prediction exchanges might nonetheless flourish if they faced only the prospect of low or no profits. Enough people probably care about fundamental research in science and technology to support the establishment and operation of a modest, tax-exempt SPEX. Or, rather, their gifts and fees would probably suffice if the legal risks of setting up or trading on such an exchange were not so formidable.

As matters now stand state and federal laws in the United States unduly chill the development of prediction markets in claims about the sciences and the useful arts.¹³² That would prove unfortunate in any event. It proves especially unfortunate, however, that U.S. law threatens real-money prediction markets for no good reason.

The gambling and financial laws that menace scientific prediction exchanges do so almost accidentally. Those statutes and regulations arose in response to quite different transactions, long before anyone had even conceived of prediction markets. The plain text of laws restricting gaming, commodities futures trading, and securities exchanges fits prediction markets badly. The policies behind those restrictions do not fit prediction markets at all.¹³³

That a law fits badly does not, however, bar its application; it means only that the law will blunder about doing more harm than good. So, too, with regard to the law's application to prediction markets. Extant legal restrictions on gambling, commodities futures trading, and securities exchanges probably do not, and certainly should not, reach scientific prediction exchanges. Yet the vagaries of prosecutorial discretion, the fuzzy boundaries of regulatory jurisdiction, and the uncertainties inherent in any new venture combine to discourage U.S.-based, real-money scientific prediction exchanges with daunting legal perils.¹³⁴

¹³² See Hahn & Tetlock, *supra* note 15, at 11 ("The status quo is a patchwork quilt of regulation and law that is likely to discourage the emergence of useful information markets.")

¹³³ See generally *infra* Part III.B.

¹³⁴ It appears that no fully operational, real-money prediction exchange exists in the U.S. at present. See Chris F. Masse, *Real-Money Prediction Exchanges*, at http://www.chrisfmasse.com/3/3/exchanges/#Real-Money_Prediction_Exchanges (last visited Mar. 9, 2006); AEI-Brookings Joint Center, Policy Markets: Active Event Markets: Real Money Markets, <http://www.aeibrookings.org/pages/index>.

An entrepreneur might face down those legal perils if operating a prediction market offered the prospect of commensurate gains. As noted, however, markets in claims about the sciences and useful arts do not stand to make anyone a great deal of money. Even apart from the problem of inspiring someone to launch and operate a scientific prediction exchange under extant U.S. laws, there remains the problem of convincing people to use it. The prospect of entrusting their funds to a legally shaky operation, and of perhaps committing crimes by so doing, would likely scare off many would-be customers.

A legal failure thus looms. As with its better known counterpart, market failure, legal failure imposes unnecessary inefficiencies on society at large. By discouraging scientific prediction exchanges, the law makes us lose an opportunity to enjoy progress in the sciences and useful arts. That inefficiency alone counsels legal reform. The law's failure to respect scientific prediction exchanges adds a sting unknown to mere market failures, however: it inequitably restricts our liberties to exchange peaceably opinions backed by consideration.¹³⁵ The next Part offers suggestions about how scientific prediction exchanges, and we along with them, might escape that legal failure.

php?id=37#active (last visited Mar. 10, 2006). The closest candidate appears to be the Iowa Electronic Markets, which offer trading on political and economic claims via accounts capped, for legal reasons, at \$500. *See* Iowa Electronic Markets, FAQ: Are the participants playing with real money?, <http://www.biz.uiowa.edu/iem/faq.html#Real> (last visited Mar. 9, 2006). *See also* Inkling, <http://inklingmarkets.com/> (last visited Mar. 7, 2006) (offering a play-money prediction market). Inkling evidently hopes to overcome the legal barriers to real-money trading; *See* Inkling, http://inklingmarkets.com/post/public_post_show/8 (last visited Mar. 7, 2006) ("For now, the point is to have fun. We're working with the lawyers to finalize the details of our rewards system. Eventually, (we hope) you'll get cash for trading wisely."). *See also* The Ticket Reserve, <http://www.theticketreserve.com/Tritone/home.html> (last visited Jan. 24, 2006) (offering the functional equivalent of a prediction market in sporting events); Poolitics, Science/Technology, <http://www.poolitics.com/open/scitech> (last visited Jan. 24, 2006) (offering pooled pari-mutuel betting on several scientific and technological questions). Poolitics does not qualify as a prediction market, however, because it by design does not offer price discovery features. Telephone Interview with Brett Michelson, Owner and Operator, Poolitics, in New York, NY (Feb. 13, 2006).

¹³⁵ Despite that claim, it looks unlikely that current constitutional jurisprudence would hold that legal restrictions on prediction exchanges violate the First Amendment. *See* *McCannell v. FEC*, 540 U.S. 93, 134-35 (2003) (upholding constitutionality of restrictions on financial support of another's political speech). Query, though, whether the purchase of a prediction certificate more represents a campaign expenditure, and thus protected speech, *id.*, than it does a mere financial contribution to another speaker.

III. FREEING SCIENTIFIC PREDICTION EXCHANGES FROM LEGAL FAILURE

Freeing scientific prediction exchanges from the failure of U.S. law takes a fair amount of work. It gives appeal to the prospect of escaping U.S. law altogether. As Part III.A explains, though, there remain convincing reasons to endure and ultimately redeem U.S. law. In pursuit of that worthy goal, Part III.B describes and evaluates several legal strategies for liberating scientific prediction exchanges from the risk of unduly burdensome regulations or outright prohibitions. Because each of those strategies leaves success uncomfortably doubtful, however, legal uncertainties would continue to haunt scientific prediction exchanges. Part III.C thus offers a statutory cure: The Scientific Prediction Exchange Act.

A. *Why Bother with U.S. Law?*

Prediction markets thrive under the laws of other countries.¹³⁶ Thanks to the Internet, citizens and residents of the U.S. have little trouble accessing and using those markets.¹³⁷ Why, then, should we bother with the federal and state laws that hinder the development of domestic, real-money scientific prediction exchanges? Why not simply flee U.S. law? This subpart gives three reasons to grapple with U.S. law.

First, it looks unlikely that scientific prediction exchanges will ever reach their full potential if they remain of dubious legality in the U.S.¹³⁸ Many domestic scientists and researchers would look askance at illegal trading, decline to join in, and thereby deprive scientific prediction exchanges of a vital source of information. Domestic commentators, reporters, and policy makers would probably discount or ignore price information generated by such apparently suspect means. If we want prediction markets to work well, and work well for us, we will want them to enjoy clearly legal status under U.S. law.

¹³⁶ See Chris F. Masse, Real-Money Prediction Exchanges, http://www.chrisfmasse.com/3/3/exchanges/#Real-Money_Prediction_Exchanges (last visited Mar. 7, 2006) (cataloging a wide variety of overseas prediction exchanges); AEI-Brookings Joint Center, Policy Markets: Active Event Markets: Real Money Markets, <http://www.aei-brookings.org/pages/index.php?id=37#active> (last visited Mar. 10, 2006) (same).

¹³⁷ See Hurt, *supra* note 74, at 39-40 (describing wide extent and ready availability of overseas gambling services).

¹³⁸ See Bell, *supra* note 10, at 179 ("[G]iven that a market in science claims touts as one of its main benefits the dissemination of soberly accurate measures of experts' consensus views on matters of pressing concern, having a market located in the Internet equivalent of the Las Vegas strip threatens to largely defeat its purpose.")

Second, the domestic legality of scientific prediction exchanges offers an interesting academic puzzle, one that can teach us much about the ends and means of extant laws. Scientific prediction exchanges fall in the gaps between, and thus illustrate the limits of, commodities futures, securities, and gaming regulations. Studying how scientific prediction exchanges fit into U.S. law would thus help us to better understand the world we live in even if it did nothing to make real-money domestic scientific prediction exchanges a reality.

Third, we who live under U.S. law rightly care about its efficiency and fairness. It would not speak well of domestic political institutions were they to crush scientific prediction exchanges under burdensome regulations and unjustified prohibitions. Like a choking canary in a poisonous atmosphere, the scientific prediction exchange's fate says a great deal—too much, alas—about how well federal and state laws respect our freedoms to assemble, debate, and vouch for our views of the world. Those liberties evidently face threats. Perhaps, though, by tracing a path out of the legal thicket that now ensnares scientific prediction exchanges, we might discover new hope for, and pride in, the U.S. legal system.

B. *Strategies for Legalizing Scientific Prediction Exchanges under Extant Law*

This subpart describes and evaluates several strategies for legalizing scientific prediction exchanges under extant U.S. law. Section 1 clarifies why scientific prediction exchanges should fall outside the scope of anti-gambling laws, while admitting that some risk of prosecution remains. Section 2 tackles CFTC regulation, reviewing strategies ranging from the staunch denial of CFTC jurisdiction to embracing a "lite" version of CFTC oversight. Section 3 describes the prospect of SEC jurisdiction over scientific prediction exchanges, an outcome unwarranted in history and theory but not impossible in practice.

The legal strategies discussed in this subpart largely take the present law as a given, something that scientific prediction exchanges must avoid,¹³⁹ outwit,¹⁴⁰ or accommodate.¹⁴¹ We here, in other words, discuss how to engineer solutions to the legal failure threatening scientific prediction

¹³⁹ See *infra* Parts III.B.1, III.B.2.a., and III.B.3.

¹⁴⁰ See *infra* Part III.B.2.b.

¹⁴¹ See *infra* Part III.B.3.

exchanges.¹⁴² Only in the following subpart do we devote considerable attention to changing the law itself.¹⁴³

Not even the most libertarian of these legal strategies aims at leaving scientific prediction exchanges entirely beyond the reach of U.S. state or federal law. That would be neither possible nor desirable. It would not be possible because, by knowingly transacting with people who enjoy the protection¹⁴⁴ of U.S. state and federal laws, a SPEx would, even if based overseas, almost certainly render itself subject to the jurisdiction of U.S. courts.¹⁴⁵ Exercising jurisdiction over such a defendant would prove especially apt if it "expressly aimed" its behavior at the United States.¹⁴⁶ We would not want matters otherwise. Rather, we rightly smile on giving domestic courts jurisdiction over fraud committed on parties protected by U.S. law.¹⁴⁷

Ensuring that scientific prediction exchanges do not commit fraud under U.S. law by no means requires an administrative agency's regulation, however. As Judge Easterbrook had recent occasion to explain, U.S. law offers other, more direct and less burdensome legal tools, for combating fraud: "a mail-fraud or wire-fraud prosecution, a civil or criminal action

¹⁴² As that use of "engineer" suggests, the structure of a prediction exchange can change its legal treatment. Sometimes, at least, statutory formalities mark jurisdictional boundaries. *See* CFTC v. Zelenner, 373 F.3d 861, 866-67 (7th Cir. 1998). And disembodiment of a prediction exchange's functions, distributing them in a network, would deny prohibitory laws a ready target. *See infra* Part III.B.3.b.

¹⁴³ *See infra* Part III.C.

¹⁴⁴ That protection covers both citizens of the U.S. and resident aliens lawfully admitted to the U.S. *Graham v. Richardson*, 403 U.S. 365, 371 (1971).

¹⁴⁵ *See* *United States v. Cotten*, 471 F.2d 744, 749 (9th Cir. 1973) (describing the "'objective territorial principle' which condones jurisdiction of an offense committed elsewhere but taking effect within a sovereign that proscribes the conduct and is asserting jurisdiction") (footnote omitted). *See also* John M. Holcomb, *Corporate Governance: Sarbanes-Oxley Act, Related Legal Issues, and Global Comparisons*, 32 DENV. J. INT'L L. & POL'Y 175, 228 (2004) (claiming that federal prosecutors "have jurisdiction over overseas companies based abroad that are listed on the New York Stock Exchange and may have engaged in fraud that harmed U.S. investors") (footnote omitted).

¹⁴⁶ *See* *Calder v. Jones*, 465 U.S. 783, 789 (1984) (holding that California court properly exercised jurisdiction over out-of-state defendants where "their intentional, and allegedly tortious, actions were expressly aimed at California"); *Bancroft & Masters, Inc. v. Augusta Nat'l, Inc.*, 223 F.3d 1082, 1087 (9th Cir. 2000) ("[T]he [express aiming] requirement is satisfied when the defendant is alleged to have engaged in wrongful conduct targeted at a plaintiff whom the defendant knows to be a resident of the forum state."); *People v. World Interactive Gaming*, 714 N.Y.S.2d 844, 859-60 (1999) (holding exercise of jurisdiction proper over Internet casino based overseas because "[t]he act of entering the bet and transmitting the information from New York via the Internet is adequate to constitute gambling activity within New York State").

¹⁴⁷ Obtaining relief from overseas defendants, who commit fraud on parties protected by U.S. law, raises different and difficult questions. *See generally* Jack L. Goldsmith, *Against Cyberanarchy*, 65 U. CHI. L. REV. 1199, 1216-21 (1998) (describing the difficulties of enforcing regulations on Internet behavior originating outside a jurisdiction's boundaries).

under RICO, or fraud litigation in state court. Consumers or state attorneys general could invoke consumer-protection laws as well. It is unnecessary to classify the transactions as futures contracts in order to provide remedies for deceit.¹⁴⁸ Judge Easterbrook, denying the CFTC jurisdiction over the transactions before his court, concluded with a rhetorical question that we might do well to ask, too: Why allow novel financial instruments to "be swept into a regulatory system not designed for them—when other remedies are ready to hand?"¹⁴⁹

1. Rebuffing the Application of Anti-Gambling Laws

A real-money prediction market in claims about science and technology should run little risk of violating the various prohibitions that U.S. law imposes on unlicensed gaming transactions. Uncertainty persists, however, due to the vagaries of anti-gambling laws and the still-untested question of their application to prediction markets. Furthermore, even if courts would in all likelihood not classify trading on scientific prediction exchanges as gaming, judicial exoneration might come only after a bruising legal battle. State and federal prosecutors, because they enjoy broad discretion to enforce anti-gambling laws, could threaten scientific prediction exchanges with even ill-considered and ultimately futile claims. While pure legal theory would put scientific prediction exchanges well outside the scope of anti-gambling laws, therefore, the rough-and-tumble of actual practice makes complacency unwise.¹⁵⁰

As a general matter, a gambling transaction must exhibit three elements: prize, chance, and consideration.¹⁵¹ Trading on a scientific prediction exchange would undoubtedly satisfy the first and third elements, since those who risk money on accurate predictions would reap profits in return.¹⁵² Whether a SPEX classifies as gambling thus turns on the "chance" element. Most legal authorities agree that chance must predominate over

¹⁴⁸ CFTC v. Zelener, 373 F.3d 861, 867 (7th Cir. 2004).

¹⁴⁹ *Id.*

¹⁵⁰ See generally Bell, *supra* note 10, at 165-69.

¹⁵¹ See, e.g., *Midwestern Enters. v. Stenehjem*, 2001 ND 67, ¶17, 625 N.W.2d 234, 237 (2001) ("The three elements of gambling are generally recognized as consideration, prize, and chance."); Anthony Cabot & Robert Hannum, *Gaming Law and Technology: Advantage Play and Commercial Casinos*, 74 MISS. L.J. 681, 682 n.3 (2005) ("Generally, a bet or wager occurs when a person risks something of value on the outcome of an uncertain event (1) in which the bettor does not exercise any control; or (2) which is determined predominately by chance.").

¹⁵² See Bell, *supra* note 10, at 165-66.

skill in determining the outcome of a gambling transaction.¹⁵³ They further agree that the test must consider the *potential* of skill to determine a transaction's outcome, ignoring the fact that some parties may choose to blindly guess and rely on chance.¹⁵⁴ As one court explained, "It is the character of the game rather than a particular player's skill or lack of it that determines whether the game is one of chance or skill."¹⁵⁵

On that, the prevailing view of the law, a prediction market in claims about science and technology could easily avoid the scope of gambling prohibitions. By design, such a market concerns only questions susceptible to resolution by dint of skill rather than chance. A prediction market aims, after all, to promote progress in the sciences and useful arts—not merely to reward good luck.¹⁵⁶

Consideration of gaming policy compels the same conclusion. Lawmakers have prohibited or tightly regulated gaming for fear of compulsive or underage gambling, to discourage risks created solely for entertainment, and because gambling appears to offer no significant social benefits.¹⁵⁷ Prediction markets in claims about science and technology raise no such concerns. The dry subject matter and slow pace of trading in such markets would hardly make pulses race.¹⁵⁸ Far from creating unnecessary risks for

¹⁵³ See Opinion of the Justices No. 373, 795 So.2d 630, 635-36 (Ala. 2001) (collecting authorities in support of the "American rule" that chance must dominate over skill in a gambling transaction); R. Randall Bridwell & Frank L. Quinn, *From Mad Joy to Misfortune: The Merger of Law and Politics in the World of Gambling*, 72 MISS. L.J. 565, 646-60 (2002) (describing origins and content of "American rule" that chance must predominate over skill in gambling transactions); Cabot & Hannum, *supra* note 1151, at 682 n.3 ("The prevailing rule in the United States is that the element of chance is met if chance predominates, even if the activity requires some skill."). See also Bell, *supra* note 10, at 166. *But see* Boardwalk Regency Corp. v. State, 457 A.2d 847, 852 (N.J. Super. Ct. Law Div. 1982) (holding that backgammon tournament constituted gambling because "chance plays at least a material role in determining the outcome of this activity on which money is risked, no matter how much it is claimed that the role of skill predominated . . .").

¹⁵⁴ See *People ex rel. Ellison v. Lavin*, 71 N.E. 753, 754 (1904) ("[A]n event presents the element of chance so far as after the exercise of research, investigation, skill, and judgment we are unable to foresee its occurrence or non-occurrence, or the forms and conditions of its occurrence."); *Rouse v. Sisson*, 199 So. 777, 779 (Miss. 1941) ("[I]t is the character of the game, and not the skill or want of skill of the player, which brings it into or excludes it from the prohibition of the [anti-gambling] statute." (quoting *Wortham v. State*, 59 Miss. 179, 182 (1881))); Bridwell & Quinn, *supra* note 153, at 649-50 ("[T]he possession of skill should enable the skilled person in a true game of skill to win with regularity.").

¹⁵⁵ *Finster v. Keller*, 96 Cal. Rptr. 241, 246 (Cal. Ct. App. 1971).

¹⁵⁶ See *supra* Part III.B.1.

¹⁵⁷ See William R. Eadington, *Socioeconomic Impacts and Public Policy: Contributions of Casino-Style Gambling to Local Economies*, 556 ANNALS AM. ACAD. POL. & SCI. 53 (1998) (discussing policy justifications for gambling laws).

¹⁵⁸ See Hanson, *supra* note 20, at ¶ 79 ("[S]cience questions are generally too long term to be a problem [for compulsive gamblers], offering no more 'action' than long-term stock investments.").

fun, scientific prediction exchanges would help us to assess and manage risks that already exist. Most importantly, and in sharp contrast to gambling, trading on scientific prediction exchanges would generate a significant positive externality: claim prices quantifying the current consensus about disputed and important controversies.¹⁵⁹ The policy reasons that support the prohibition or regulation of gambling thus do apply to scientific prediction exchanges.

Notwithstanding what law and policy strongly suggest, however, an over-ambitious prosecutor might decide to accuse a scientific prediction exchange of illegal, unlicensed gambling. Even if, as seems likely, such claims fail in court, defending against them would undoubtedly prove harrowing and expensive. It says something that no extant prediction market appears to have suffered prosecution under anti-gambling laws.¹⁶⁰ That offers no guarantee against future prosecutions, however. The risk posed by anti-gambling laws must therefore give pause to anyone interested in setting up, running, or trading on a scientific prediction exchange.

2. Dealing with the CFTC

The means and ends of prediction materially differ from the means and ends of commodity futures markets.¹⁶¹ The message of Subsection (a) should thus come as no surprise: The CFTC lacks statutory authority to regulate scientific prediction exchanges. That bold claim comes with a caveat, however: in practice, the CFTC's jurisdiction eludes bright lines. Subsection (b) thus offers, as a fall-back strategy, an argument that scientific prediction exchanges would qualify for the obscure "hybrid instrument" exclusion from CFTC jurisdiction. If those efforts to avoid entirely CFTC oversight fail, Subsection (c) may prove of use; it discusses various ways to try to mitigate the potentially crushing burdens of CFTC regulation.

a. *Denying that the CFTC has Jurisdiction*

The plain language of the CEA Act,¹⁶² which alone authorizes CFTC regulation of commodity futures markets, should suffice to put scientific prediction exchanges outside of the CFTC's jurisdiction.¹⁶³ The CEA Act

¹⁵⁹ See *supra* Part III.B.

¹⁶⁰ See *supra* Part II.C (discussing extant prediction markets).

¹⁶¹ See *supra* Part II.A.

¹⁶² 7 U.S.C. §§ 1-25 (2000).

¹⁶³ See generally Bell, *supra* note 10, at 170-72 (analyzing scope of CEA Act over prediction markets).

defines the "commodities" subject to CFTC jurisdiction as "all services, rights, and interests in which contracts for *future delivery* are presently or in the future dealt in."¹⁶⁴ That definition thus excludes the sort of spot transactions—the simultaneous purchase and transfer of claims—effectuated by a SPEX.¹⁶⁵ Claims traded on a scientific prediction exchange should not qualify as futures contracts under the CEA Act.¹⁶⁶

Perhaps in an ideal world that argument from the statutory text would suffice.¹⁶⁷ In our world, however, and in practice, the scope of CFTC's jurisdiction eludes bright-line definitions or characteristic elements.¹⁶⁸ Prudence thus suggests that any attempt to deny the CFTC jurisdiction over scientific prediction exchanges rely not just on the plain meaning of the CEA Act, but also on the cunning use of an obscure statutory exclusion. The next subsection offers exactly that, describing the "hybrid instruments primary a security" loophole.¹⁶⁹ But that perhaps casts the legal strategy in an unfairly dubious light. It is not as if the CFTC begins with a very plausible claim to regulate markets in claims about science and the useful arts. Rather, this and the next subsection aim only to offer good legal arguments for good public policy: confirming that trading in prediction certificates, because it materially differs from trading in commodities futures, does not fall within the jurisdiction of the CFTC.

b. *Winning the "Hybrid Instruments" Exclusion*

The CEA Act contains a little-known provision that promises to afford prediction markets a double benefit: freedom both from federal and state regulation. It expressly excludes certain hybrid instruments from CFTC

¹⁶⁴ 7 U.S.C. § 1a(4) (emphasis added).

¹⁶⁵ See *supra* Part II.A.2 (explaining why prediction markets deal in spot claims rather than futures contracts).

¹⁶⁶ See *Chicago Mercantile Exchange v. SEC*, 883 F.2d 537, 542 (7th Cir. 1989) ("A futures contract, roughly speaking, is a fungible promise to buy or sell a particular commodity at a fixed date in the future. Futures contracts are fungible because they have standard terms and each side's obligations are guaranteed by a clearing house.").

¹⁶⁷ See *CFTC v. Zelener*, 373 F.3d 861, 865-67 (7th Cir. 2004) (disparaging CFTC's multi-factor, intention-dependent tests for determining what constitutes a futures contract in favor of a bright-line test based on statutory language).

¹⁶⁸ See, e.g., *CFTC v. Standard Forex, Inc.*, No. CV-93-0088 (CPS), 1996 U.S. Dist. LEXIS 14778, at *30 (E.D.N.Y. July 25, 1996) (claiming that futures transactions have no "bright-line definition or list of characterizing elements"). See also *CFTC, Statutory Interpretation Concerning Forward Transactions*, 55 Fed. Reg. 39188, 39190 (Sept. 25, 1990) ("there is no definitive list of the elements of a futures contract").

¹⁶⁹ See *infra* Part III.B.2.b.

jurisdiction.¹⁷⁰ Specifically, § 2(f)(1) of the Act provides, "Nothing in this chapter (other than section 16(e)(2)(B) of this title) governs or is applicable to a hybrid instrument that is predominantly a security."¹⁷¹ That bars the CFTC from regulating qualifying instruments. The lingering applicability of § 16(e)(2)(B), far from giving the CFTC regulatory authority, merely guarantees the continuing federal preemption of state gaming and bucket shop laws.¹⁷²

The "predominantly a security" qualification in § 2(f)(1) should not rule out its application to the sorts of claims traded on a scientific prediction exchange. Those claims do not look at all like a "security" as we normally use that term. A prediction claim does not, for instance, give its holder a property interest in a business enterprise.¹⁷³ A prediction claim does, however, resemble a broader, less common definition of "securities": "Instruments giving to their legal holders rights to money or other property"¹⁷⁴ Fortunately, federal law defines "a hybrid instrument predominantly a security" to include claims traded on a SPEX. Unfortunately, it is not clear whether those claims would evade the SEC's jurisdiction.¹⁷⁵

The CEA Act sets forth a four-factor test for determining whether a hybrid instrument is predominantly a security; to wit:

- (A) the issuer of the hybrid instrument receives payment in full of the purchase price of the hybrid instrument, substantially contemporaneously with delivery of the hybrid instrument;
- (B) the purchaser or holder of the hybrid instrument is not required to make any payment to the issuer in addition to the purchase price paid under subparagraph (A), whether as margin, settlement payment, or otherwise, during the life of the hybrid instrument or at maturity;
- (C) the issuer of the hybrid instrument is not subject by the terms of the instrument to mark-to-market margining requirements; and
- (D) the hybrid instrument is not marketed as a contract of sale of a commodity for future delivery (or option on such a contract) subject to this chapter.¹⁷⁶

Transactions on a scientific prediction exchange probably would satisfy all four of those requirements as a matter of course. Claims would trade on a "spot" basis, with money for claims swapped "substantially contemporaneously" in satisfaction of condition (A).¹⁷⁷ That would conclude the pur-

¹⁷⁰ 7 U.S.C. § 2(f) (2000).

¹⁷¹ *Id.* § 2(f)(1).

¹⁷² *See id.* § 16(e)(2)(B) ("This chapter shall supersede and preempt the application of any State or local law that prohibits or regulates gaming or the operation of bucket shops (other than antifraud provisions of general applicability) in the case of— . . . (B) an agreement, contract, or transaction that is excluded from this chapter under section . . . 2(f) . . . of this title . . .").

¹⁷³ BLACK'S LAW DICTIONARY 1354 (6th ed. 1990) (defining "securities" as "stocks, bonds, notes, convertible debentures, warrants, or other documents that represent a share in a company or a debt owed by a company or government entity").

¹⁷⁴ *Id.* (continuing to state that "they [securities] are therefore instruments which have intrinsic value and are recognized and used as such in the regular channels of commerce").

¹⁷⁵ *See infra* Part III.B.3.

¹⁷⁶ 7 U.S.C. § 2(f)(2) (2000).

¹⁷⁷ *See supra* Part II.A.1.

chaser's liability, thus meeting (B)'s subtest. The mark-to-market margin frowned on in (C) would have no role in the exchange.¹⁷⁸ Given that it offers spot transactions, a scientific prediction exchange would have no reason to market its claims as futures, thus meeting sub-test (D). Even if it does not do so as a matter of course, a SPEx could easily adopt a design ensuring that it deals only in claims that meet the CEA Act's definition of "hybrid instrument predominantly a security." Though formulaic, that approach ought to suffice to exempt a scientific prediction exchange from CFTC liability.¹⁷⁹

Federal regulations implementing the CEA confirm that a scientific prediction exchange should qualify for the "hybrid instrument" exemption from CFTC regulations.¹⁸⁰ Those regulations clarify the definition of hybrid instruments by providing, in relevant part, that such instruments must transfer subject to a one-time payment,¹⁸¹ must not be marketed as futures contracts,¹⁸² and must not provide for settlement under the rules applicable to designated contract markets.¹⁸³ Although the terms of the CEA Act would of course control disposition of the question,¹⁸⁴ the CFTC's own regulations confirm that a scientific prediction exchange could easily arrange to deal only in claims that, thanks to the "hybrid instrument" exception, escape the

¹⁷⁸ Why not? Because, in brief, a prediction exchange would not require ongoing payments to be made after the executed exchange of a claim. *See* *Greene v. United States*, 79 F.3d 1348, 1350 (2nd Cir. 1996) (defining "mark-to-market" in tax context as a system that "determines taxable income by making reference to changes in the actual market value of a taxpayer's futures contracts even when the taxpayer has not yet sold or exchanged the contracts or otherwise realized a gain or a loss").

¹⁷⁹ *See* *CFTC v. Zelener*, 373 F.3d 861, 866 (7th Cir. 2004) (explaining that, in the context of defining the SEC's jurisdiction over securities, "[b]y taking form seriously the Supreme Court was able to curtail, if not eliminate, that uncertainty and promote sensible business planning," and that "securities laws are *about* form, and one can say much the same about the commodities laws").

¹⁸⁰ *See* 17 C.F.R. § 34.3 (2006).

¹⁸¹ *Id.* § 34.3(a)(3)(i) (requiring that when trading in a qualifying instrument "[a]n issuer must receive full payment of the hybrid instrument's purchase price, and a purchaser or holder of a hybrid instrument may not be required to make additional out-of-pocket payments to the issuer during the life of the instrument or at maturity").

¹⁸² *Id.* § 34.3(a)(3)(ii) (requiring that a qualifying instrument "not [be] marketed as a futures contract or a commodity option, or, except to the extent necessary to describe the functioning of the instrument or to comply with applicable disclosure requirements, as having the characteristics of a futures contract or a commodity option").

¹⁸³ *Id.* § 34.3(a)(3)(iii) (requiring that a qualifying instrument "not provide for settlement in the form of a delivery instrument that is specified as such in the rules of a designed contract market").

¹⁸⁴ *See Zelener*, 373 F.3d at 867.

[W]hen deciding what is (or isn't) a "security," courts have not deferred to the SEC; there is no greater reason to defer to the CFTC when defining futures contracts When Congress has told an agency to resolve a problem, then courts must accept the answer. When, however, the problem is to be resolved by the courts in litigation—which is how this comes before us—the agency does not receive deference.

CFTC's regulation while winning its preemptive protection from state gaming and bucket shop laws.¹⁸⁵

Suppose that a scientific prediction exchange escaped CFTC's frying pan thanks to the hybrid instrument exception. Would it thereby fall into the SEC's regulatory fire? Perhaps not. The CEA Act does not hand jurisdiction over the hybrid instruments it exempts from the CFTC to the SEC.¹⁸⁶ Federal regulations implemented under the CEA Act make SEC jurisdiction only one of several ways to define a hybrid instrument,¹⁸⁷ thereby confirming that SEC jurisdiction operates as a sufficient but not necessary qualification for the statutory exemption from CFTC jurisdiction. It is less clear whether other federal laws would give the SEC independent grounds for regulating the sorts of claims traded on a scientific prediction exchange. Part III.B.3 takes up that question and concludes that the SEC almost certainly *should* not, and most likely *would* not, win jurisdiction over scientific prediction exchanges.¹⁸⁸ The "hybrid instrument" exemption thus offers a fair prospect of freeing scientific prediction exchanges from regulation by the CFTC and state law without entangling them in SEC regulations.

c. *Limiting CFTC Regulation*

What if, contrary to the above arguments,¹⁸⁹ courts conclude that scientific prediction exchanges fall within the jurisdiction of the CFTC? In that event, scientific prediction exchanges could only try to avoid as much regulation as possible. Unfortunately, the success of that effort would depend almost entirely on the CFTC deciding to treat prediction markets with extraordinary leniency. Although prediction markets would probably find it quite congenial to operate as excluded electronic trading facilities under the CEA Act, for instance, Part III.B.2.c.(1) explains that prediction markets could qualify as such only by grace of a special dispensation from the CFTC. Prediction markets would have no grounds to demand they be treated as excluded electronic trading facilities. For similar reasons, Part III.B.2.c.(2) finds many pitfalls in the proposal of some commentators that prediction markets seek CFTC regulation. When and if the CFTC wins

¹⁸⁵ See 7 U.S.C. § 16(e)(2)(B) (2000).

¹⁸⁶ See *id.* § 2 (assigning jurisdiction solely to the CFTC). *But see id.* § 2(a)(1)(D)(iii) (specifying that the CFTC may vest in the SEC jurisdiction over certain stock index futures contracts); *id.* § 2(a)(1)(D)(v)(IV) (requiring futures commission merchants to conform with SEC regulations in certain instances).

¹⁸⁷ See 17 C.F.R. §§ 34.3(a)(1), (4) (2006) (defining "hybrid instrument").

¹⁸⁸ See *infra* Part III.B.3.

¹⁸⁹ See *supra* Part III.B.2.a, b.

jurisdiction over prediction markets, they will exist almost entirely at its mercy.

i) Scientific Prediction Exchanges as Excluded Electronic Trading Facilities

The Commodity Futures Modernization Act of 2000¹⁹⁰ comprehensively restructured the regulation of commodity futures exchanges under U.S. law.¹⁹¹ Thanks to those reforms, the CEA Act now authorizes five types of exchanges to host transactions in commodities futures.¹⁹² Of those five, only the type called an "excluded electronic trading facility" would both suit the operations of a scientific prediction exchange and largely free it from CFTC oversight.¹⁹³ However, a SPEx would find it very difficult to qualify as an excluded electronic trading facility.

More precisely, a scientific prediction exchange would qualify as an excluded electronic trading facility only at the discretion of the CFTC. The problem arises because the CEA Act defines an excluded electronic trading facility so as to allow transactions only between "eligible contract participants."¹⁹⁴ That, in turn, the CEA Act defines so as to rule out anyone who has less than \$5,000,000 in assets and who trades on his or her own behalf.¹⁹⁵ In other words, the CEA Act would effectively forbid a SPEx from both operating as an excluded electronic trading facility and transacting with an appreciable number of scientists, researchers, or educated lay people—the very participants essential to exchange's goal of promoting progress in the sciences and useful arts.

The CEA Act's definition of "eligible contract participant" does contain a small loophole. That definition includes "any other person that the Commission determines to be eligible in light of the financial or other qualifications of the person."¹⁹⁶ Someone eager to run a scientific prediction

¹⁹⁰ Commodity Futures Modernization Act of 2000, Pub. L. No. 106-554, 114 Stat. 2763 (2000) (codified as amended at 7 U.S.C.A. §§ 1-25 (West Supp. 2004)).

¹⁹¹ See generally CHARLES W. EDWARDS ET AL., COMMODITY FUTURES MODERNIZATION ACT OF 2000: LAW AND EXPLANATION (2001).

¹⁹² See id. at 21.

¹⁹³ See 7 U.S.C. § 2(d), (e)(1) (2000) (defining electronic trading facility exclusion); EDWARDS ET AL., *supra* note 191, at 26-27 (explaining the regulation of excluded electronic trading facilities); Bell, *supra* note 10, at 172-76 (analyzing why and how a prediction market in science claims might qualify as an excluded electronic trading facility).

¹⁹⁴ See 7 U.S.C. § 2(d)(2)(B); Bell *supra* note 10, at 174 (tracing the problem to the definition of "eligible contract participant").

¹⁹⁵ 7 U.S.C. § 1a(12).

¹⁹⁶ 7 U.S.C. § 1a(12)(C).

exchange as an excluded electronic trading facility might thus plead that the CFTC should require only that traders on the exchange tout certain educational qualifications, or that anyone who risks only relatively small amounts should qualify to trade on the exchange. The CFTC would, however, have little to gain by granting that request and would enjoy very wide latitude to deny it.¹⁹⁷

ii) Hahn and Tetlock's Proposal

In one of the few academic papers to address the legality of prediction markets,¹⁹⁸ Robert W. Hahn and Paul C. Tetlock argue that the CFTC should have the power to regulate the field.¹⁹⁹ The authors argue that extant law gives the CFTC sufficient authority to act on their suggestion.²⁰⁰ Should that prove infeasible, however, they would welcome new legislation clearly giving the CFTC jurisdiction over qualifying prediction markets.²⁰¹ Hahn and Tetlock's proposal would at all events preempt state regulation of prediction markets and clarify their legality under federal law, subject to various regulatory conditions. In that, the authors deserve credit for setting forth a relatively detailed and plausible account of how prediction markets might escape from the legal failure that now inhibits their development.

The law can fail in many ways, however. Although Hahn and Tetlock's regulatory scheme would certainly dispel much of the legal uncertainty surrounding prediction markets, it would do so only by imposing significant legal burdens on them. Perhaps, on net, we would come out ahead. We might rationally favor a few heavily regulated but clearly legal prediction markets to none at all. So, at least, Hahn and Tetlock appear to reason.²⁰² That supposed policy bargain overlooks, however, a less extreme

¹⁹⁷ See *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 844 (1984) (holding that, where lawmakers have implicitly delegated rule-making powers to a federal agency, "a court may not substitute its own construction of a statutory provision for a reasonable interpretation made by the administrator of an agency.").

¹⁹⁸ For the only other apparent one, see Bell, *supra* note 10.

¹⁹⁹ See Hahn & Tetlock, *supra* note 15.

²⁰⁰ See *id.* at 272-73 (arguing that the CFTC already exercises authority over markets similar to information markets and over contracts identical to information market contracts).

²⁰¹ *Id.* at 278 ("If our proposed regulatory fix for information markets were not viewed as legal, Congress could provide more explicit guidance on the type of markets it wants to CFTC to regulate. We do not think this guidance is necessary for information markets, but we are not legal experts.") (footnote omitted).

²⁰² See *id.* at 279 (arguing that the benefits of their proposal outweighs its costs because, in relevant part, "the proposal is designed to facilitate the introduction of information markets" and "there may be modest cost savings associated with having a single federal regulatory agency oversee regulation of

alternative: the option, described here in various guises, of clarifying the legality of prediction markets and regulating them with little more than generic contract and anti-fraud laws.²⁰³

Hahn and Tetlock probably never even considered that third, relatively light-handed approach to legalizing prediction markets. It would have been ruled out by the two questionable assumptions driving their legal analysis: first, that prediction markets would necessarily qualify as gambling under state law,²⁰⁴ thus compelling the need for federal preemption; and second, that winning preemption would require a fair amount of regulation by some federal agency.²⁰⁵ Hahn and Tetlock thereby both misdiagnose the legal disease afflicting prediction markets and prescribe an unnecessarily painful cure.

Because they express certitude that courts would place prediction markets at the mercy of state gaming laws,²⁰⁶ Hahn & Tetlock overestimate the likelihood of that legal result. Granted, there remains the risk that an over-eager attorney general might attack prediction markets as illegal gambling conspiracies.²⁰⁷ A cool-headed analysis of gaming law and policy indicates, however, that courts would probably protect prediction markets from such grandstanding.²⁰⁸ That understanding of gambling law limits Hahn and Tetlock's primary justification for seeking the preemptive protection of CFTC regulation.

Nonetheless, we cannot fault Hahn and Tetlock for wanting to protect prediction markets from whatever uncertainties state law threatens. Nor can we fault them for seeking shelter under federal preemption. The problem arises when they assume the necessity and propriety of having the CFTC regulate prediction markets largely as the agency regulates existing futures markets.²⁰⁹ Granted, Hahn and Tetlock would have the CFTC hold off, at

economically important information markets, rather than the current system in which many state regulators are involved").

²⁰³ For discussion of legal strategies pursuing that goal, see *infra* Parts III.B.1-2.b. and *supra* Parts III.B.3-C.

²⁰⁴ See Hahn & Tetlock, *supra* note 15, at 268 ("At the state level, these markets are generally governed by laws and regulations on Internet gambling."). See also *id.* at 269-72 (discussing state gambling laws and enforcement under the apparent assumption that they would reach information markets).

²⁰⁵ They suggest the CFTC as the best candidate, though they admit the SEC as another possibility. *Id.* at 272 n.53. And, at all events, they would give the CFTC and SEC joint regulatory authority over some aspects of qualifying prediction markets. *Id.* at 278.

²⁰⁶ See *id.* at 268-72.

²⁰⁷ See *supra* Part IV.B.1.

²⁰⁸ See Bell, *supra* note 10, at 165-69 (analyzing the reach of gaming law and policy over prediction markets).

²⁰⁹ Their willingness on that count proves somewhat surprising, given that they elsewhere express concern about the costs of CFTC regulation. See Robert W. Hahn & Paul C. Tetlock, *Using Information Markets to Improve Public Decision Making*, 29 HARV. J. L. & PUB. POL'Y. 213, 278 n. 189 (2005)

least presumptively, from burdening all prediction markets with the full weight of its regulatory authority.²¹⁰ In particular, they advocate two exemptions that would give fairly free rein to small-stakes prediction markets:²¹¹ one exemption for those that sharply limit the size of investments,²¹² and another for prediction markets that stay below certain volume or revenue caps.²¹³ Of any prediction claim that falls outside of those limits, however, Hahn and Tetlock say, "[T]he CFTC should regulate it as a futures contract."²¹⁴

Should it, though? Probably not. Hahn and Tetlock err in giving the CFTC too broad a jurisdiction over prediction markets. They would define the agency's authority over such markets based on an "economic purpose test."²¹⁵ Their test would authorize the CFTC to regulate any prediction claim either that provides significant financial hedging opportunities or the price of which "is likely to provide valuable information for improving economic decisions."²¹⁶ The first criterion should cause no alarm; it basically echoes the current test for establishing CFTC jurisdiction.²¹⁷ The second criterion, however, would extend CFTC jurisdiction far beyond its current limits to dangerously uncertain bounds. What contract price does *not* provide "valuable information for improving economic decisions"? Hahn and Tetlock try to justify their second economic purpose test as "a logical extension" of the price discovery and dissemination functions that at least in part justify CFTC regulation.²¹⁸ However beneficial, though, price discovery and dissemination cannot alone suffice to define the agency's jurisdiction.²¹⁹ Under the CEA Act, as written and interpreted, those represent at most necessary but not sufficient conditions for CFTC authority.²²⁰

(noting that submitting prediction markets to CFTC regulation would require such markets "to endure a long and costly designation process in order to demonstrate that market transactions are safe and secure").

²¹⁰ Hahn & Tetlock, *supra* note 15, at 276 ("A key feature of our regulatory approach is to allow for broad exemptions.")

²¹¹ The other two exemptions would not benefit prediction markets in science and technology claims. One would apply only to trading by institutions or high worth individuals, while the other would apply only to over-the-counter trading. *Id.*

²¹² *Id.*

²¹³ *Id.*

²¹⁴ *Id.*

²¹⁵ *Id.* at 274.

²¹⁶ Hahn & Tetlock, *supra* note 15, at 11.

²¹⁷ As the authors say, "[t]he first criterion mirrors the hedging requirement in the Commodity and Futures Modernization Act." *Id.* at 274.

²¹⁸ *Id.*

²¹⁹ In *id.* at 276 n.63, in support of their second criterion, Hahn & Tetlock cite not the conclusive authority of the CEA Act's definition of the CFTC's jurisdiction, 7 U.S.C. § 2, but rather two decidedly second-rate legal authorities: general legislative findings designed to justify regulation of transactions

To their credit, Hahn and Tetlock recognize that they may have misjudged the extant authority of the CFTC. "[W]e are not legal experts," they confess.²²¹ Foreseeing that the law might block their proposed regulatory fix, Hahn and Tetlock wisely suggest, as a fallback strategy, that "Congress could provide more explicit guidance on the type of markets it wants the CFTC to regulate."²²²

Having thereby dealt with the legal objections to their proposal for regulating prediction markets, Hahn and Tetlock turn to defending it on grounds they doubtless find more familiar: via cost/benefit calculations.²²³ Like their legal analysis, however, their economic analysis suffers from some oversights. Hahn and Tetlock recognize only two costs to their proposed regulatory program: an increase in the CFTC's workload²²⁴ and a slight risk that legalized prediction markets might generate some of the same social costs allegedly associated with gambling.²²⁵ They propose increasing the CFTC's budget to cure—or at least shift to tax-payers—the first cost,²²⁶ and discount the latter cost as easily outweighed by the many benefits that would follow from legalizing CFTC-regulated prediction markets.²²⁷

Hahn and Tetlock thus do not consider the largest cost that their proposal would impose: The opportunity cost of burdening prediction markets with unnecessary regulations. That lacuna in their economic analysis follows directly from a lacuna in their legal analysis. As noted above, the authors apparently assume that prediction markets face a choice between prohibition by state gambling laws or regulation by federal agencies.²²⁸ In fact, the law admits several alternative strategies for legalizing prediction markets, strategies that chart a course between the rock of outright prohibition and the hard place of heavy-handed regulation.

Hahn and Tetlock evince little concern that the CFTC might, despite the authors' well-reasoned call for regulatory restraint, impose ill-fitting and overly-burdensome rules on prediction markets. The CFTC's past record of

otherwise subject to the CEA Act, 7 U.S.C. § 5(a), and the CFTC's guidelines for approval of contracts offered on CFTC-regulated board of trades, 17 C.F.R. Part 40 Appendix A, Guideline No. 1, § (4) (2004).

²²⁰ See *supra* Part III.B.2.a-b (discussing current limits on CFTC jurisdiction).

²²¹ Hahn & Tetlock, *supra* note 15, at 278.

²²² *Id.* (footnote omitted).

²²³ *Id.* at 279.

²²⁴ *Id.* at 278.

²²⁵ *Id.* at 279.

²²⁶ *Id.* at 278 ("Congress may want to consider increasing the CFTC budget to cover the additional costs of administration and enforcement.").

²²⁷ Hahn & Tetlock, *supra* note 15, at 279.

²²⁸ See *id.* at 270-72.

aggressive—and even of unconstitutional—enforcement should, however, give us pause before we entrust it with life-or-death power over prediction markets.²²⁹ Once we concede jurisdiction to the CFTC, after all, we will have little power to oppose its regulations. The deference that the Supreme Court voiced in *Chevron*²³⁰ renders it extraordinarily difficult to win judicial review of agency rule-making. Fortunately, courts have subjected the CFTC's jurisdictional claims to more exacting scrutiny.²³¹ To avoid the CFTC's jurisdiction thus looks both desirable and doable.

3. Escaping the SEC's Jurisdiction

In theory, scientific prediction exchanges should run no risk of falling within the SEC's jurisdiction. Practical considerations counsel against too firm a conclusion on that count, however. Here, as throughout the legal failure that inhibits prediction markets, the uncertainties of what *might* happen threaten to prevent what *should* happen. Subsection (a) explains the cause of that risk and defines its relatively narrow scope. Subsection (b) describes a regulatory exemption and the legal engineering necessary to exploit it.

a. *Prediction Certificates (not) as "Securities"*

From the viewpoint of history and policy, scientific prediction exchanges would deal in financial instruments fundamentally different from those that federal lawmakers designed the SEC to regulate. Securities markets, when run properly, create wealth by making capital available for pro-

²²⁹ See *Taucher v. Born*, 53 F. Supp. 2d 464, 482 (D.D.C. 1999) (finding in violation of First Amendment registration requirements imposed by CFTC on websites and on software offering advice about commodities futures trading), *appeal dismissed per stipulation, sub nom.* *Taucher v. Rainier*, No. 99-5293, 2000 WL 516081, at *1 (D.C. Cir. March 28, 2004).

²³⁰ *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 842-43 (1984).

²³¹ See *Commodity Futures Trading Comm'n v. Zelener*, 373 F.3d 861, 867 (7th Cir. 2004), *reh'g denied*, 387 F.3d 624, 625 (7th Cir. 2004) ("[W]hen deciding what is (or isn't) a 'security,' courts have not deferred to the SEC; there is no greater reason to defer to the CFTC when defining futures contracts."). See also Lars Noah, *Interpreting Agency Enabling Acts: Misplaced Metaphors in Administrative Law*, 41 WM & MARY L. REV. 1463, 1516-29 (2000) (arguing against extending *Chevron* deference to an agency's determination of its own jurisdiction). Granted, though, the Supreme Court has spoken somewhat equivocally about *Chevron* doctrine's applications to questions of agency jurisdiction. *Id.* at 1520 ("The Supreme Court has provided confusing signals on this question.").

ductive purposes.²³² All investors can gain in a rising securities market, just as all may lose in a sinking one.²³³

Prediction markets, in contrast, operate in a fundamentally different manner. They pit each trader against another; no trader can profit except at the expense of another, less foresighted one.²³⁴ In other words, prediction markets merely transfer wealth, whereas securities markets amass it. In that, prediction markets resemble the sorts of markets that fall under the jurisdiction of the CFTC more than they do those subject to SEC jurisdiction.²³⁵ History and policy thus strongly suggest that the SEC should have no authority over scientific prediction exchanges.

What about when we move from considering the reasons for the SEC to considering the laws that define its jurisdiction? Although it remains uncertain and untested whether federal law empowers the SEC to regulate scientific prediction exchanges, it looks, on balance, unlikely. The Securities Act of 1933²³⁶ and the Securities Exchange Act of 1934²³⁷ (collectively, the "1933 and 1934 Acts") which together define the authority of the SEC,²³⁸ give essentially the same²³⁹ definition to the sort of "security" subject to that agency's jurisdiction,²⁴⁰ to wit:

any note, stock, treasury stock, security future, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit-sharing agreement, collateral-trust certificate, preorganization certificate or subscription, transferable share, investment contract, voting-trust certificate, certificate of deposit for a security, fractional undivided interest in oil, gas, or other mineral rights, any put, call, straddle, option, or privilege on any security, cer-

²³² See Hazen, *supra* note 97, at 1006-07.

²³³ *Id.* at 1006.

²³⁴ See *supra* Part II.A.2 (discussing operation of prediction markets).

²³⁵ See HAZEN, *supra* note 97, at 1006 ("Unlike traditional equity, debt, and commodity markets, futures and options markets represent a zero-sum game. Futures and options markets involve two investors at opposite ends of a contract. In contrast, the equity and debt markets are comprised of individual securities, with every security representing an interest in the issuer.") (footnotes omitted).

²³⁶ Securities Act of 1933, 15 U.S.C. §§ 77a – 77bbbb (2000).

²³⁷ Securities Exchange Act of 1934, 15 U.S.C.A §§ 78a – 78nn (2006).

²³⁸ See THOMAS LEE HAZEN, 1 TREATISE ON THE LAW OF SECURITIES REGULATION §§ 1.2[3][A]-1.2[3][B], at 27-30 (4th ed. 2002) (describing general purposes of and relationship between the Securities Act of 1933 and the Securities Exchange Act of 1934).

²³⁹ Although their language varies slightly, the Supreme Court regards the Acts' definitions of "security" as functionally identical. See *Reves v. Ernst & Young*, 494 U.S. 56, 61 n.1 (1990) (reaffirming the virtual identity of the two provisions); *Tcherepnin v. Knight*, 389 U.S. 332, 335-36 (1967) (calling the Acts' definitions "virtually identical").

²⁴⁰ See *Matassarini v. Lynch*, 174 F.3d 549, 559-60 (5th Cir. 1999) ("A cause of action falls under the 1933 Securities Act and the 1934 Securities Exchange Act only if the interest involved constitutes a 'security' under [the 1933 or 1934 Acts]"); HAZEN, *supra* note 238, § 1.6[1], at 61-62 ("In order to establish a violation of the securities laws, the plaintiff must first establish that a security was involved.").

tificate of deposit, or group or index of securities (including any interest therein or based on the value thereof), or any put, call, straddle, option, or privilege entered into on a national securities exchange relating to foreign currency, or, in general, any interest or instrument commonly known as a "security," or any certificate of interest or participation in, temporary or interim certificate for, receipt for, guarantee of, or warrant or right to subscribe to or purchase, any of the foregoing.²⁴¹

That statutory definition of "security" reaches far more broadly than the ordinary, everyday sense of the word.²⁴² Exactly how far it—and thus the SEC's jurisdiction—reaches has given rise to a great deal of uncertainty.²⁴³ Still, it looks reasonably unlikely to reach the sort of certificates traded on a scientific prediction exchange.

As a general matter, courts regard investors' expectations as a significant factor in determining whether a particular transaction concerns a "security" subject to SEC jurisdiction.²⁴⁴ Judicial authorities have read that word in light of the need to protect consumers from the fraudulent marketing of instruments similar to those traditionally regulated by the SEC.²⁴⁵ The claims offered on a scientific prediction exchange would not resemble

²⁴¹ Securities Act of 1933, 15 U.S.C. § 77b(a)(1). *See also* Securities Exchange Act of 1934, 15 U.S.C. § 78c(a)(10) (2000) (same); 15 U.S.C. § 77c(a) (defining exemptions from definition of "security"); 15 U.S.C. § 78c(a)(12) (same).

²⁴² *See* Thomas A. Russo & Marlisa Vinciguerra, *Financial Innovation and Uncertain Regulation: Selected Issues Regarding New Product Development*, 69 TEX. L. REV. 1431, 1449 (1991) ("To laypersons, the term 'security' is associated with either equity instruments, such as IBM stock, that represent shares in the ownership of corporations, or debt instruments, such as corporate, municipal, and U.S. Treasury notes and bonds.") (footnote omitted).

²⁴³ *See* David J. Gilberg, *Regulation of New Financial Instruments under the Federal Securities and Commodities Laws*, 39 VAND. L. REV. 1599, 1622 (1986) ("[The Securities Act Definition if a Security] 'has been the subject of extensive judicial and legal debate and has spawned probably the most extensive literature in the areas of securities and commodities regulation.'") (footnote omitted).

²⁴⁴ *See* HAZEN, *supra* note 238, § 1.6[1], at 62 ("The investors' perceptions and expectations will be a significant factor In a close case, the existence of a parallel federal regulatory scheme may lead a court to find that the securities laws are not necessary for investor protection.") *Id.* (footnotes omitted). It by no means appears, however, that the absence of such an alternative regulatory scheme would condemn prediction exchanges to the SEC's jurisdictions. There is no presumption, in other words, that every financial transaction requires some sort of federal regulation.

²⁴⁵ *See* *Reves v. Ernst & Young*, 494 U.S. 56, 64-65 (1990) (adopting a "family resemblance" test for determining whether a note qualifies as a security governed by the 1934 Act); *Landreth Timber Co. v. Landreth*, 471 U.S. 681, 687 (1985) (adopting a definition of "stock" that would fit it within the definition of "security" because "an investor [buying that stock] would believe he was covered by the federal securities laws").

SEC-regulated securities,²⁴⁶ and could easily come with sufficient disclaimers to make that fact undeniably clear.²⁴⁷

Delving into the details of the statutory definition of "security" confirms that scientific prediction exchanges would probably fall outside the scope of the SEC's authority. Of the many financial instruments included within that definition, two look most likely to apply to the sort of claim traded on a scientific prediction exchange: investment contracts and notes. Unfortunately, questions about those sorts of instruments have generated most of the uncertainty that surrounds the definition of "security."²⁴⁸ Nonetheless, nothing traded on a SPEx would resemble an "investment contract"²⁴⁹ or "note,"²⁵⁰ within the statutory definition of "security."

The Supreme Court has interpreted "investment contract," for purposes of determining the SEC's jurisdiction, to require a showing that investors expect to profit solely from others' efforts in a common enterprise.²⁵¹ Those who trade on a scientific prediction exchange would expect to profit primarily from their own foresight, however, rather than from others' labor.²⁵² Furthermore, those profits would come from winning a decidedly antagonistic competition rather than from an enterprise pursuing common ends.²⁵³ Not even the most flexible reading of "investment con-

²⁴⁶ See *Chicago Mercantile Exch. v. Sec. & Exch. Comm'n*, 883 F.2d 537, 543 (7th Cir. 1989) ("A security, roughly speaking, is an undivided interest in a common venture the value of which is subject to uncertainty.").

²⁴⁷ See *infra* note 311 (offering an example of a prediction certificate with such a disclaimer).

²⁴⁸ See *Russo & Vinciguerra*, *supra* note 242, at 1449.

²⁴⁹ See generally *HAZEN*, *supra* note 238, § 1.6[2], at 63-65 (describing judicial interpretation of "investment contract" under the 1933 and 1934 Acts).

²⁵⁰ See generally *id.* § 1.6[14], at 101-08 (describing judicial interpretation of "note" under the 1933 and 1934 Acts).

²⁵¹ *Sec. & Exch. Comm'n v. W.J. Howey Co.*, 328 U.S. 293, 298-99 (1946).

²⁵² See *Sec. & Exch. Comm'n v. Life Partners, Inc.*, 87 F.3d 536, 545-48 (D.C. Cir. 1996) (holding instrument whereby investor receives death benefits of life insurance policy taken out on terminally ill patient not a security because others' efforts were ministerial rather than substantive); *Noa v. Key Futures, Inc.*, 638 F.2d 77, 79 (9th Cir. 1980) (holding that the *Howey* "others' efforts" test was not met where "the profits to the investor depended upon the fluctuations of the silver market, not the managerial efforts of [the promoter]"); *HAZEN*, *supra* note 238, § 1.6[2][D], at 69-70 ("Where the efforts of others are de minimus in assuring the success of the investment, the *Howey* test will not be satisfied.") (footnote omitted).

²⁵³ See *Sec. & Exch. Comm'n v. Unique Fin. Concepts, Inc.*, 196 F.3d 1195, 1199 (11th Cir. 1999) ("[A] common enterprise exists where 'the fortunes of the investor are interwoven with and dependent on the efforts and success of those seeking the investment or of third parties.'") (quoting *Villeneuve v. Advanced Bus. Concepts Corp.*, 698 F.2d 1121, 1124 (11th Cir. 1983)); *HAZEN*, *supra* note 238, § 1.6[2][B], at 66 ("The common enterprise requirement focuses on the question of the extent to which the success of the investor's interest rises and falls with others involved in the enterprise.") (footnote omitted).

tract," as used in the 1933 and 1934 Acts, reaches so far as to put scientific prediction exchanges within the scope of the SEC's jurisdiction.²⁵⁴

Nor do scientific prediction exchanges appear to deal in "notes" as used in the 1933²⁵⁵ and 1934 Acts.²⁵⁶ Courts interpreting those statutes have evidently limited the term to its primary sense: an instrument containing an *unconditional* promise to pay a definite sum of money at a specified time.²⁵⁷ They do not appear to have considered whether the SEC might have jurisdiction over *conditional* notes.²⁵⁸ The SEC has not shown any interest in regulating that species of note,²⁵⁹ much less the rare legal animals that a scientific prediction exchange would deal in: negotiable conditional notes.²⁶⁰

Prior commentators have evidently not yet considered whether prediction certificates qualify as "securities" under the 1933 and 1934 Acts. Professor Michael Abramowicz, granted, calls claims about government policies, "securities."²⁶¹ He uses that term only as an explanatory device, however, not as a legal conclusion.²⁶² In that, Abramowicz's use of "securities" mirrors others' use of "futures contracts"²⁶³ or "bets"²⁶⁴ to describe the sorts of claims traded prediction markets. It operates, in other words, as an illustrative metaphor rather than as a legal conclusion. Legally speaking, it

²⁵⁴ See HAZEN, *supra* note 238, § 1.6[3], at 74 (contrasting the "risk capital analysis" alternative to the *Howey* test of "investment contract" but noting that the former still requires a showing of "dependency upon others for the success of the enterprise and the promotion of the activity as an investment vehicle").

²⁵⁵ Securities Act of 1933, ch. 38, 48 Stat. 74 (codified as amended at 15 U.S.C. § 77b(a)(1) (2000)).

²⁵⁶ Securities Exchange Act of 1934, ch. 404, 48 Stat. 881, 883 (codified as amended at 15 U.S.C. § 78c(a)(10) (2000)).

²⁵⁷ See BLACK'S LAW DICTIONARY 1060 (6th ed. 1990) (giving first definition of "note" as "[a]n instrument containing an express and absolute promise of signer (*i.e.* maker) to pay to a specified person or order, or bearer, a definite sum of money at a specified time"). See also U.C.C. § 3-104(e) ("[a]n instrument is a 'note' if it is a promise . . ."); *id.* at § 3-104(b) ("Instrument' means a negotiable instrument."); *id.* at § 3-104(a) ("[N]egotiable instrument' means an unconditional promise or order to pay a fixed amount of money . . .").

²⁵⁸ LEXIS search of March 5, 2006 in "Federal & State Cases, Combined" database using search, "(conditional note)" and "(Securities Act" or "Securities Exchange Commission")."

²⁵⁹ See generally HAZEN, *supra* note 238, § 1.6[14], 101-08 (discussing which "notes" qualify as "securities" under the 1934 and 1935 Acts).

²⁶⁰ See *supra* Part III.A.

²⁶¹ See, e.g., Abramowicz, *Information Markets*, *supra* note 10, at 934, 943.

²⁶² Email from Michael Abramowicz to Tom W. Bell, (Feb. 9, 2006, 7:06:19 PST) (on file with author).

²⁶³ See Hanson, *supra* note 20, at 3.

²⁶⁴ See Robin Hanson, *Shall We Vote on Values, but Bet on Beliefs?* 6 (Sept. 2003) (unpublished manuscript, <http://hanson.gmu.edu/futarchy.pdf>) (last visited Mar. 11, 2006).

looks rather unlikely that scientific prediction exchanges would deal in securities subject to SEC jurisdiction.

b. *The Tax-Exempt Issuer Exemption*

But what if the SEC convinces courts to treat prediction certificates as "securities" within its jurisdiction? Even then, a tax-exempt institution issuing prediction certificates might largely escape SEC authority. Section 3(a)(4) of the 1933 Act frees from the Act's registration requirements, "[a]ny security issued by a person organized and operated exclusively for . . . educational . . . purposes and not for pecuniary profit, and no part of the net earnings of which inures to the benefit of any person, private stockholder, or individual" ²⁶⁵

That little-used exemption could speak more clearly, granted. It rules out instruments that profit "any . . . individual," a label that fits even someone who merely purchases a tax-exempt organization's note. So wide a reach would give the statute an absurd meaning, however, since it would effectively close the exemption entirely. No competent investor would buy a "security issued by a person organized and operated exclusively" for tax-exempt purposes, and donors evidently prefer to fund tax-exempt organizations directly, via gifts. ²⁶⁶ Courts have thus not read § 3(a)(4) to exclude securities issued by tax-exempt organizations and sold to profiting investors. ²⁶⁷

In other words, if a scientific prediction exchange won tax-exempt status under federal tax laws, it would probably enjoy the Securities Act of

²⁶⁵ 15 U.S.C. § 77c(a)(4) (2000). *See also* 15 U.S.C. § 78l(g)(2)(D) (2000) (exempting "any security of an issuer organized and operated exclusively for religious, educational, benevolent, fraternal, charitable, or reformatory purposes and not for pecuniary profit, and no part of the net earnings of which inures to the benefit of any private shareholder or individual" from 1934 Act's registration requirements).

²⁶⁶ Although the tax code's application in all circumstances defies characterization, as a general matter an outright donation to a tax-exempt organization would qualify as a tax-deductible gift, whereas investment in a tax-exempt's non-profit securities would qualify as, at best, an offset to profits. Both qualifications reduce taxable income, and the former, more direct means of funding a tax-exempt seems by far the more common.

²⁶⁷ *See, e.g.,* *Secs. & Exch. Com. v. Children's Hosp.*, 214 F.Supp. 883, 891 (D. Ariz. 1963) (explaining in a case involving the sale of interest-bearing bonds that § 3(a)(4)'s prohibition on profits "is not intended to allow promoters or managers of any institution to bring offerings of securities to the public, without registration, in order to realize profits *for themselves*") (emphasis added). *See also* *E. H. I. of Fla., Inc. v. Ins. Co. of N. Am.*, 499 F.Supp. 1053, 1062 (E.D. Pa. 1980) (applying the "virtually identical" provision in the 1934 Act and recognizing that a tax-exempt organization may issue debt securities that profit investors by paying interest on bonds), *aff'd on other grounds*, *E. H. I. of Fla., Inc. v. Ins. Co. of N. Am.*, 652 F.2d 310 (3d Cir. Pa. 1981).

1933's indifference toward tax-exempt organization.²⁶⁸ A SPEx might readily win that status; other exchanges, such as the New York Stock Exchange²⁶⁹ and the Chicago Board of Trade,²⁷⁰ have done so. Because the 1933 Act also exempts from its registration requirements "transactions by any person other than an issuer, underwriter, or dealer," those who merely buy or sell prediction certificates-qua-SEC-regulated-securities would not have to worry about that particular statute.²⁷¹

The 1933 Act's exemptions do not offer a regulatory cure-all, however. Fraud would, and should, remain subject to state and federal sanctions.²⁷² Furthermore, the Act does not preempt state regulation of security offerings by tax-exempt organizations, leaving them subject to a hodge-podge of restrictions.²⁷³ Most troublingly, no analogous exemption appears to protect tax-exempt organizations from the 1934 Act's far-reaching restrictions on transactions in securities.²⁷⁴ If prediction certificates qualified as "securities" under federal law, therefore, a scientific prediction exchange would escape SEC jurisdiction only with regard to *issuing* those securities—not necessarily with regard to *trading* in them.²⁷⁵

Even under that grim regulatory scenario, all is not lost. Although, scientific prediction exchanges face daunting legal costs, prediction *claim issuers* need not. The good work of scientific prediction exchanges might continue in a distributed network, via open trade in prediction certificates.²⁷⁶

²⁶⁸ HAZEN, *supra* note 238, § 4.5, at 324.

²⁶⁹ Until very recently, the NYSE was a tax-exempt organization. See Wikipedia, *New York Stock Exchange*, http://en.wikipedia.org/wiki/New_York_Stock_Exchange (last visited Mar. 2, 2006).

²⁷⁰ Like the NYSE, the CBOT recently converted from a tax-exempt to a for-profit corporation. See Chicago Board of Trade, *About CBOT: Our History*, <http://cbot.com/cbot/pub/page/0,3181,942,00.html> (last visited Mar. 2, 2006).

²⁷¹ 15 U.S.C. § 77d(1).

²⁷² See *supra* Part IV.B (discussing the application of fraud laws to prediction exchanges); 15 U.S.C. § 77l(a)(2) (providing for liability for fraud notwithstanding an exemption from the 1933 Act); *id.* § 77q(c) (same); *id.* § 77r(c)(1) (providing that, notwithstanding the 1933 Act's exemptions and preemptions, "the securities commission (or any agency or office performing like functions) of any State shall retain jurisdiction under the laws of such State to investigate and bring enforcement actions with respect to fraud or deceit, or unlawful conduct by a broker or dealer, in connection with securities or securities transactions").

²⁷³ 15 U.S.C. § 77r (b)(4)(C).

²⁷⁴ The 1934 Act's counterpart to 15 U.S.C. § 773(a)(4), 15 U.S.C. § 78l(g)(2)(D), shares its narrow concern with registration requirements. It does not exempt qualifying securities from 1934 Act's primary goal of "regulating all aspects of public trading of securities." HAZEN, *supra* note 238, § 1.2[3][B], at 28.

²⁷⁵ See HAZEN, *supra* note 238, § 1.2[3][A]-[B], at 27-30 (describing, contrasting, and comparing the 1933 and 1934 Acts).

²⁷⁶ For intimations of that institutional design, see Bell, *supra* note 10, at 171 ("Better yet, the market could function as a peer-to-peer network wherein coupons transfer directly to and from participants' computers via the Internet, without passing through the market's servers at all.").

In addition to dodging legal risks, divvying up a scientific prediction exchange's work might make good business sense. The jobs of authoring and judging prediction claims demand different services that the job *exchanging* prediction claims demands.²⁷⁷ Why assume that one organization can do all three efficiently? Of course, a prediction claim publisher (as we might call a tax-exempt issuer of securities-*qua*-prediction-certificates) would not be able to count on the funds generated by an exchange's transaction fees. Rather it would, like other publishers, sell artfully written, limited-edition expressive works.²⁷⁸ The works sold by a prediction claim publisher would, in addition, come with money-back guarantee: "If one of our published claims comes true, you can redeem it for its full, face value!"

But I digress. This subsection's legal engineering would probably not prove necessary, even if it proves useful. It proceeds, after all, on the assumption that "prediction certificates" qualify as "securities" subject to SEC jurisdiction. And, for reasons discussed in the prior subsection,²⁷⁹ that looks unlikely.

C. *Legalizing Scientific Prediction Exchanges via New Laws*

U.S. law should not threaten to punish the free exchange of skilled claims about our future. Yet the law does. Perhaps it does not pose as much of a threat as most people think, granted. As Part III.B explained, there exist sound arguments that legal restrictions on commodity futures, securities, and gambling markets should not apply to scientific prediction exchanges, and clever strategies to ensure that result. Nonetheless, it seems fair to say that federal and state laws currently inhibit the development of robust, well-regarded, and trustworthy markets in science claims.²⁸⁰ That does not mean no such market *could* arise under the current legal regime; it means only that we should worry that no such market *will* arise.²⁸¹

That legal failure proves especially unfortunate because a scientific prediction exchange would promote one of the public goods that justified

²⁷⁷ Most notably, a well-authored prediction certificate would preclude the need for judging services; publicly available information would suffice to render the truth of the certificate's claims irrefutable and evident.

²⁷⁸ See Hanson, *supra* note 20, at 19 (suggesting that copyrights might protect claims, and that, "[c]laim authors would then compete with each other for royalties from investors, who would prefer authors with reputations for writing clear and interesting claims").

²⁷⁹ See *supra* Part IV.B.3.a.

²⁸⁰ Hahn & Tetlock, *supra* note 209, at 278 ("The current regulatory environment is highly uncertain for information market contracts, which is a barrier in itself.").

²⁸¹ See *supra* Part III.C for a description of the legal failure responsible for that condition, and *supra* Part IV.B for descriptions of the expensive or shaky legal responses.

ratification of the Constitution: "promoting the progress of science and useful arts."²⁸² Fortunately, U.S. law can cure itself effectively and simply.²⁸³ This subpart describes that cure: The Scientific Prediction Exchange Act ("SPEX Act").²⁸⁴ Were the SPEX Act passed into federal law, it would protect our rights to debate claims about science and the useful arts and reward correct predictions. Even a state version might prove useful.

Section 1 offers the text of a federal version of The Scientific Prediction Exchange Act, together with commentary in the accompanying footnotes and following text. That Act would prove ideal in theory. Because a federal statute might prove unobtainable in practice, however, Section 2 touches on the merits of winning a state-level version of the SPEX Act.

1. The Scientific Prediction Exchange Act, Federal Version

This section proposes and explains a U.S. statute, The Scientific Prediction Exchange Act (or "SPEX Act"). The Act clarifies the legality of prediction markets in skilled claims about the sciences and useful arts. It also frees such markets from ill-fitting regulations. The present section discusses the federal version of the SPEX Act; Section 2, below, discusses the prospect of a state-level one.

The federal version of the SPEX Act removes the threats that state and federal laws currently pose to U.S.-based prediction markets in skilled claims. The SPEX Act deals with the former by preempting the reach of state laws pertaining to gambling, bucket shops, insurance contracts, or the like.²⁸⁵ Similar preemption clauses already protect markets regulated by the CFTC.²⁸⁶

²⁸² U.S. CONST. art. I, § 8, cl. 8.

²⁸³ I do not, however, claim that we should expect a cure at once good, fast, and cheap. As an apocryphal bit of management advice puts it: "Good, fast, cheap: Pick two of three." See, e.g., Jason Kottke, *Pick Two* (Apr. 5, 2005), <http://www.kottke.org/05/04/pick-two> (last visited Jan. 30, 2006) (describing it as "an old [software] designer's adage").

²⁸⁴ For a blog post offering an early draft of such an Act, and a modest amount of accompanying commentary, see Tom W. Bell, *The Prediction Exchange Legalization Act of 2006*, AGORAPHILIA Nov. 13, 2005, <http://agoraphilia.blogspot.com/2005/11/prediction-exchange-legalization-act.html> (last visited Jan. 30, 2006).

²⁸⁵ Proposed Scientific Prediction Exchange Act § 104, *infra* Part III.C.1.

²⁸⁶ See 7 U.S.C. § 2(a)(1)(A) (2000) (granting the CFTC exclusive jurisdiction over any transaction regulated by the Commission); *FTC v. Ken Roberts Co.*, 276 F.3d 583 (D.C. Cir. 2001) (analyzing effect of exclusive jurisdiction provision on regulation by other federal bodies); *Thrifty Oil Co. v. Bank of Am. Nat'l Trust & Sav. Ass'n*, 322 F.3d 1039 (9th Cir. 2003) (analyzing preemptive reach of CFTC exemptions); *Am. Agric. Movement, Inc. v. Bd. of Trade of City of Chicago*, 977 F.2d 1147, 1156 (7th Cir. 1992) (holding state common law actions against commodities brokers preempted when they would "directly affect trading on or the operation of a futures market").

The Act does not, however, vest the CFTC or other federal agencies with authority to regulate prediction markets in science claims. To the contrary, the SPEX Act bars federal authorities from expanding their extant jurisdiction to reach the sorts of scientific prediction exchanges covered by the Act. By default, only state and federal laws of general application, such as state contract law or the FTC Act, would regulate markets protected by the SPEX Act. That calls for careful legal line drawing, so the Act defines both what it protects and what it prohibits.

Section 101. Short Title

This Act may be cited as "The Scientific Prediction Exchange Act."²⁸⁷

Section 102. Scientific Prediction Exchange Policy

It is the policy of the United States Government to:

- (a) Promote the general welfare²⁸⁸ through the necessary and proper²⁸⁹ regulation of interstate commerce;²⁹⁰
- (b) Promote the progress of the sciences and useful arts;²⁹¹
- (c) Encourage the development of market-based mechanisms for resolving questions of science, technology, and public policy;
- (d) Clarify the legality of qualifying scientific prediction exchanges;
- (e) Protect such exchanges from state and federal regulation to the fullest possible extent.

Section 103. Definitions²⁹²

- (a) A "scientific prediction exchange" is a forum that uses instrumentalities of interstate commerce²⁹³ to facilitate the buying and selling of prediction certificates.
- (b) A "prediction certificate" is a document promising to pay its bearer a specified amount of money on condition that a designated prediction judge names as true the document's prediction claim or claims.
- (c) A "prediction claim" is an answer to an unresolved question of science, technology, or public policy that can be resolved primarily by the application of skill. A prediction claim is not an answer to an unresolved question about the outcome of a sporting event or contest,²⁹⁴ or the future

²⁸⁷ The term here used to describe the subject markets, "prediction exchange," both distinguishes the type of prediction market at issue from other types and offers rhetorical benefits. See *supra* Part I for further comments on terminology.

²⁸⁸ This phrase borrows language from the Constitution's preamble to clarify that a prediction market in science claims would afford public benefits. U.S. CONST. pmb1.

²⁸⁹ This phrase acknowledges that the present Act intends to satisfy the limitations imposed by the Necessary and Proper Clause. U.S. CONST. art. I, § 8, cl. 18.

²⁹⁰ This phrase invokes the sole federal power that justifies the proposed Act: the Interstate Commerce clause. U.S. CONST. art. I, § 8, cl. 3

²⁹¹ This language harkens to that of U.S. CONST. art I, § 8, cl. 8. The legislative power described in that clause does not justify the present act, however; rather, the interstate commerce clause does.

²⁹² Stultifying those these definitions may appear, they do a lot of heavy legal lifting. Here, as with the title of the bill, I adopt somewhat idiosyncratic usages.

²⁹³ This clause establishes the constitutionality of exercising federal legislative power in this area: as part of the power to regulate interstate commerce. U.S. CONST. art I, § 8, cl.3. It moreover establishes the sole plausible justification for the exercise of federal legislative power, given that Art. I of the U.S. Constitution contains nothing else likely to justify the Act.

²⁹⁴ This exception ensures that no transactions currently outlawed under the Federal Wire Act (18 U.S.C. § 1081) (2005) or related state laws will win legality under the guise of the proposed Act.

value of a securities transaction currently regulated by the Securities Exchange Commission,²⁹⁵ or the future price of a commodity transaction currently regulated by the Commodity Futures Trading Commission.²⁹⁶

(d) A "prediction judge" is a person, persons, organization, or entity designated by a prediction certificate and authorized, subject to any limits or requirements specified on that certificate, to name as true the certificate's prediction claim.

Section 104. Preemption

(a) No Federal agency, State, political subdivision of a State, or political authority of 2 or more States may enact or enforce any law, regulation, or other provision that has the force or effect of law and that relates to any scientific prediction exchange except as otherwise provided in this chapter.²⁹⁷

(b) No provision of this chapter shall in any way abridge or alter rights and remedies now existing at common law.²⁹⁸

The Scientific Prediction Exchange Act concludes with its most difficult task: defining the scope of its preemptive power. The version of § 104 offered above draws a fairly bright line, protecting qualifying scientific prediction exchanges from all but state common law. This is not to say that they would thereby operate without legal regulation. The common law principles of contract, tort, and property law would ensure the exchanges' fairness and efficiency.²⁹⁹ The common law of which state? Presumably, that of a state chosen by those who trade on the exchange.³⁰⁰

²⁹⁵ This exception intends to ensure that the proposed Act does not affect the established authority of the SEC. It errs on the safe side, given the improbability that any court would regard prediction certificates as securities subject to SEC jurisdiction. Why, then, include the exception? Because prediction certificates run some risk of falling within the CFTC's jurisdiction, and because the CFTC and SEC have sometimes asserted conflicting claims to exercise exclusive jurisdiction over futures contracts involving securities. See Willa E. Gibson, *Are Swap Agreements Securities or Futures?: The Inadequacies of Applying the Traditional Regulatory Approach to OTC Derivatives Transactions*, 24 J. CORP. L. 379, 388-92 (1999) (describing that and other jurisdictional conflicts between the SEC and CFTC).

²⁹⁶ This exception intends to ensure that the proposed Act does not affect the established authority of the CFTC.

²⁹⁷ This language largely follows that of the preemption provision in the Federal Aviation Administration Authorization Act of 1994, Pub. L. No. 103-305, § 601, 108 Stat. 1569 (1994) (amending 49 U.S.C. § 11501): "[A] State, political subdivision of a State, or political authority or 2 or more States may not enact or enforce a law, regulation, or other provision having the force and effect of law related to a price, route, or service of any motor carrier . . . or any motor private carrier with respect to the transportation of property." The provision was found constitutional and effective in *Oklahoma Corp. Comm'n v. United States*, 1994 U.S. Dist. LEXIS 21439, at *32 (W.D. Okla. 1994).

²⁹⁸ This savings clause clarifies the scope of the preemption defined in SPEx Act § 104(a) by dint of an *expressio unius* argument: "[W]hen Congress meant to vest additional regulatory authority in the States it did so explicitly." *Transcon. Gas Pipe Line Corp. v. State Oil & Gas Bd.*, 474 U.S. 409, 422 (1986) (concluding thereby that Mississippi lacked authority to re-regulate gas pipeline transactions deregulated under federal law).

²⁹⁹ That allowance, offered grace of proposed SPEx Act § 104(b), does not re-open the door to state regulation. Addressing similar statutory language after the deregulation of the Civil Aeronautics Commission, the Supreme Court said, "A general 'remedies' saving clause cannot be allowed to supersede the specific substantive pre-emption provision" in the same statute. *Morales v. Trans World Air-*

That sort of preemption reaches very far. It reaches so far, in fact, that success might exceed the SPEx Act's grasp. The problem with that strong version preemption arises not so much from law as from politics. Whether from a noble love of public service or the crass love of power, regulators tend to resist deregulation. The CFTC might thus object to the SPEx Act on grounds that the Act would diminish its authority over commodity futures trading. The FTC, too, might object that no scientific prediction exchange should escape the same general consumer protection laws that apply to businesses generally.

Right or wrong, the claims of those and other regulators might hinder passage of The Scientific Prediction Exchange Act. On the principle that some legalization would prove better than none, it thus behooves us to hold some alternative versions of the SPEx Act in reserve. I here offer two amendments that might smooth the Act's passage while still offering useful protections to a qualifying scientific prediction exchange.

First, were the CFTC to worry about losing some of its traditional authority over commodities futures trading, I would suggest adding SPEx Act § 104(c): "The CFTC may regulate trades on a scientific prediction exchange undertaken only for purposes of significant commercial hedging." That should suffice to preserve the traditional scope of the CFTC's jurisdiction.³⁰¹ Although it is not likely that many claims on scientific prediction exchange would attract sufficiently thick trading to support hedging functions, some claims, sometimes, might. SPEx Act § 104(c) would authorize the CFTC to regulate claims traded by certain parties, for certain purposes, and in certain volumes.

Second, were various other would-be regulators to worry about their power over scientific prediction exchanges, I would suggest adding SPEx Act §104(d):

A federal agency or state may enforce against any scientific prediction exchange a law or regulation that has the force or effect of law as of the effective date of this Act, that has general applicability to commercial transactions, and that does not pertain to gambling, commodities futures,

lines, Inc., 504 U.S. 374, 385 (1992). The savings clause here merely intends to assure that, for instance, a prediction exchange could be held liable for violating the common law of fraud.

³⁰⁰ See Restatement (Second) of Conflict of Laws § 187 (1988) (providing for enforceability of a contractual choice-of-law provision in most cases).

³⁰¹ See *Chicago Mercantile Exch. v. Sec. Exch. Comm'n*, 883 F.2d 537, 543 (7th Cir. 1989) ("[O]ne could think of the distinction between the jurisdiction of the SEC and that of the CFTC as the difference between regulating capital formation and regulating hedging. Congress conceived the role of the CFTC in that way when it created the agency . . ."). See also GAO, CFTC AND SEC: ISSUES RELATED TO THE SHAD-JOHNSON JURISDICTIONAL ACCORD, REPORT TO CONGRESSIONAL REQUESTERS, 5-7 (2002) (describing the origins and codification of the Shad-Johnson Jurisdictional Accord of 1982), available at <http://www.gao.gov/archive/2000/gg00089.pdf>.

securities, bucket shops, insurance contracts, contests of skill or chance, or related transactions.

That provision would ensure, for instance, that the FTC would retain authority to prosecute a scientific prediction exchange for unfair trade practices. To prevent abuse of that reserved power, §104(d) discourages the creation of new legal restrictions particularly targeting scientific prediction exchanges. The new section also bars the application of extant laws better suited to other, materially different transactions.

2. The Scientific Prediction Exchange Act, State Version

The benefits of winning a federal Scientific Prediction Exchange Act, though considerable, would not come easily. Given the difficulties of passing federal legislation, they might not come at all. It would undoubtedly prove easier (if still not "easy") to convince a state to pass its own version of the bill. It would prove easy to write, too; one need only edit the federal version set forth above³⁰² to fit the narrower scope of a state's power.³⁰³ As the need for such editing suggests, however, a state the SPEx Act would afford fewer benefits than a federal one.

In contrast to federal lawmakers, state lawmakers can neither preempt other states' laws³⁰⁴ nor limit the proper authority of federal regulatory agencies.³⁰⁵ A state version of the SPEx Act could, though, clarify the legality of scientific prediction exchanges under at least one state's laws. That alone would improve on the present, murky legal environment. If passed by a populous state such as California, New York, or Texas, moreover, a state version of the SPEx Act might reassure enough potential traders to encourage reasonably thick markets.

Suppose that California lawmakers passed a state-level version of the SPEx Act. The Constitution's full faith and credit clause³⁰⁶ would by no means bar another state from restricting its own residents' online access to a

³⁰² See *supra* Part III.C.1.

³⁰³ Specifically, a state version of the SPEx Act would: refer to the appropriate state government rather than the "U.S. federal" one in § 102; drop "interstate" from § 102(a) and § 103(a); drop "and federal" from § 102(e); and in § 104(a) change "Federal agency, State, political subdivision of a State, or political authority of 2 or more States" to simply "state agency or subdivision."

³⁰⁴ That power belongs only to the United States "Constitution, and the laws of the United States which shall be made in Pursuance thereof; and all Treaties made . . . under the Authority of the United States," which qualify as "the supreme Law of the Land . . ." U.S. CONST. art. VI, cl 2.

³⁰⁵ What legal authority federal regulatory agencies enjoy comes only by dint of the powers the Constitution vests in the federal legislature, *id.* art. I, or the federal executive, *id.* art. II—powers not exercised at the discretion of state lawmakers.

³⁰⁶ U.S. CONST. art. IV, § 1.

scientific prediction exchange operating legally in California.³⁰⁷ It would, however, require other states to enforce California court judgments pertaining to legal rights arising out of transactions on California-based scientific prediction exchanges.³⁰⁸ And even regardless of its binding effect outside of its borders, California's enactment of the SPEX Act would serve as persuasive legal authority in other jurisdictions that have occasion to ponder the proper legal characterization of scientific prediction exchanges. Such a state-level SPEX Act, even if not as beneficial as a federal one, would thus still prove better than nothing.

CONCLUSION

This article measured copyright and patent law against the Constitution's call for promotion of "the Progress of science and useful Arts," and found those traditional forms of intellectual property lacking. It offered the scientific prediction exchanges as a promising cure for that policy failure. Unfortunately, however, state and federal laws covering commodity futures, securities, and gambling transactions have hitherto cast a discouraging pall of uncertainty over prediction markets. As a cure for that legal failure, the article offered a variety of legal strategies designed to ensure the legality of scientific prediction exchanges under U.S. law.

But such talk, if not exactly cheap,³⁰⁹ costs far less than action. My mouthings would surely prove more convincing if I matched them with money. I proposed to do just that in an earlier version of this article, wherein I offered to sell, for \$2 each, up to 100 prediction certificates, each containing the following promise:

Tom W. Bell promises to pay \$10 to the bearer of this certificate on June 30, 2010, if a federal or state court in the United States rules before January 1, 2010, that a scientific prediction exchange conforming to the definition set forth in SPEX Act § 103 violates state or federal laws regulating commodities futures, securities, or gambling transactions.

³⁰⁷ See Goldsmith, *supra* note 147, at 1217 (explaining that regulations on Internet transactions "apply primarily to Internet service providers and Internet users with a physical presence in the regulating jurisdiction").

³⁰⁸ See *Fauntleroy v. Lum*, 210 U.S. 230, 234, 236-38 (1908) (holding that a Missouri judgment pertaining to trading in commodity futures was entitled to full faith and credit recognition in Mississippi, though Mississippi's gambling laws prohibited such trading).

³⁰⁹ Every scholar faces opportunity costs, after all. Those of us who live in lovely Southern California, a region that taunts the desk-bound academic with three seasons of spring in a year, can find writing law review articles especially costly.

I proposed that, upon receipt of payment, I would issue to each purchaser an appropriate number of signed and numbered certificates, printed on fine paper and attractively embellished.³¹⁰ Apart from its suitability for framing, that format would leave room for the inevitable fine print.³¹¹ Although I spoke light-heartedly, I did not speak in jest. I genuinely intended to stake \$1000 on my claim that U.S. courts should not, and more importantly *would* not, find prediction markets illegal under U.S. law.³¹² (More precisely, if less boldly, my asking price shows that I vested that forecast with 80% of my confidence.)

You might fault the simplicity of the transaction I proposed. Granted, it would hardly have matched an online prediction market in terms of flash and convenience. Nonetheless, I felt duty-bound to offer my readers proof of my convictions. Besides, none of those fancy online markets will as yet allow a U.S. resident such as myself to offer terms like those I proposed. The uncertainties of U.S. law apparently prove too daunting

Alas, though, I cannot follow through on my plan to back this article's claims with cold, hard cash. In an all-too-apt illustration of the stifling effects of U.S. law, the editors of this fine publication required me to rewrite my article so as to not offer to sell any prediction certificates. I cannot fault their risk aversion, even though I do not share it. I regarded my proposed offer as a harmless, instructive, and amusing device. The editors, with little to gain from allowing the transaction and much to lose in the event it were to create legal problems, evidently regarded the matter differently. I am thus left demonstrating not how scientific prediction exchanges work in practice, but rather why they as yet do not: due to the uncertainties of U.S. law.

The law should not, however, inhibit scientific prediction exchanges. As carefully detailed above,³¹³ convincing arguments and subtle strategies can largely mitigate the perils that the commodities futures, securities, and gambling laws of the U.S. inadvertently pose to scientific prediction ex-

³¹⁰ Taking a lead from the sort of art that once proudly decorated stock certificates, I thought I might employ an image such as the one reproduced by James Lileks, *The Bureau of Corporate Allegory*, <http://www.lileks.com/money/bureau/12.html> (last visited Mar. 10, 2006) (showing a goddess-like figure standing amidst roiling clouds, resting the Earth on her hip).

³¹¹ Among the additional terms: means for resolving controversies about whether the claim has or has not proven true; a choice of law provision; contact information; and a disclaimer: "This instrument is not subject to regulation by the Commodity Futures Trading Commission or Securities Exchange Commission."

³¹² Here as elsewhere, Robin Hanson precedes me. See Robin Hanson, *Idea Futures: Encouraging an Honest Consensus*, EXTROPY, Winter 1991-92, at 7, available at <http://hanson.gmu.edu/ifextropy.html> (last visited Mar. 9, 2006) (offering, in the original hardcopy version of his paper, a claim certificate allegedly redeemable for cash).

³¹³ See *supra* Part III.B.

changes. There remains some risk, of course; hence the desirability of a Scientific Prediction Exchange Act.³¹⁴ But even absent such a protective statute, we would have good reason to take our chances. Prediction markets will in all likelihood win legal status under U.S. law by default, thanks to what people come to accept as an ordinary and beneficial practice rather than what courts, politicians, or regulators proclaim. It falls to us, if we want to enjoy progress in the promotion of the sciences and useful arts, to take up the work of promoting the progress of prediction markets.

³¹⁴ See *supra* Part III.C. Query whether that proposed statute would cover the transaction I propose, concerning (we might say) the jurisprudential sciences.