ever larger proportions of journal space. In the graduate program at my university, they are heavily crowding other elements of curriculum (and pushing the frontiers of econometric techniques, especially as applied to panel data). They raise methodological issues which, while technical, are often philosophically deep. (Consider, for example, what must be considered in choosing between a functional form for intertemporal consumption that collapses discounting and probability framing, such as prospect theory, and a functional form that separates them.) Students devoting large proportions of their time to worrying about sophisticated methods for data gathering and analysis might be surprised to find methodologists devoting most of their attention to the question of whether economists are interested in empirical reality.

My overall opinion, then, is that Hausman's third edition improves on the second (as the second did on the first) in its relevance to economists' activities and concerns. At least half the chapters it contains should be regarded as essential parts of every economist's knowledge portfolio. But I suggest that a best graduate curriculum in methodology would supplement it about 1:1 with other material, perhaps chapters from Richard Blundell, Whitney Newey, and Torsten Persson (2007).

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D   Microeconomics

Predictocracy: Market Mechanisms for Public and Private Decision Making. By Michael Abramowicz. New Haven and London: Yale University Press, 2007. Pp. xviii, 346. $50.00. ISBN 978–0–300–11599–4.

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Prediction markets are artificial stock markets where one can trade securities with values that depend on particular events happening. For example, on election eve, traders on *Intrade.com* could buy for around 92 cents a security that would pay $1 if Barack Obama was elected President. The probability of 92 percent implied by that price reflects traders' evaluation of all the polling, blogging, and bloviating then in the public domain. For spectators wishing to know the status of the race without consuming all that material, or for researchers later wanting an objective ex ante probability for a postelection analysis, prediction markets are great time savers.

There is growing interest, among academics and in business, in applying prediction markets in new ways. Firms such as Google and Microsoft are running internal markets predicting, for example, whether software will be released on time. Academics are using prediction markets to run better event studies, to estimate the cross-state correlation in political shocks, and as laboratories to understand how price manipulation or noise trading affects prices.

Prediction markets are a powerful tool—for some problems. *Predictocracy* is an exercise in reenvisioning problems as nails for this particular hammer. Michael Abramowicz discusses using prediction markets to write texts, software, and laws; to conduct discovery for and adjudicate lawsuits; to evaluate employees and fire underperforming CEOs and government officials; and to allocate resources in response to the next hurricane Katrina. "Predictocracy" is related to Robin Hanson's (2000) idea of "Futarchy," a system of government in which policymakers define a social welfare measure and decisions are made by prediction markets that forecast which policies will yield higher social welfare.

Abramowicz admits this is "political science fiction" (p. 309). The distinction between "science" and "science fiction" is a useful organizing principle for thinking about the appeal, and limitations, of the book. The science fiction of the 1950s played a useful role—it helped get a cohort, my parents among them, excited about doing scientific research. It was not overly concerned with grounding itself in the actual science, or with figuring out which ideas would come to fruition (e.g., wristwatch phones) and which would not (e.g., interstellar travel). Readers were invited to suspend disbelief, enjoy themselves, and then put

the book down and work on engineering what the science would allow.

So too with *Predictocracy*. If the thought of prediction markets writing books gets readers excited about figuring out what they can and cannot do, that could be quite useful. In the rest of the review, I will discuss what we know about the current limits of the prediction market technology to help figure out which of the ideas are the wristwatch phones and which are the interstellar cruisers. I will draw on my article with Justin Wolfers (2006), "Five Open Questions about Prediction Markets," since what we called open questions can also be called current limitations.

Liquidity

A quick look at it reveals the limits to what traders will pay modest commissions to trade. Contracts on the Presidential election and high-profile Senate races get heavily traded; those on House races, non-U.S. politics, or the passage of laws are much less liquid. Abramowitz foresees many markets in subjects that are far more esoteric, and argues that participation can be subsidized, such as via a loss-making marketmaker. This is a little like saying we can get to Alpha-Centauri by burning rocket fuel—it would be nice to do the math and see if it's plausible. In particular, how would the cost of a prediction market-written text compare with a ghostwriter? How would the cost of incenting trader-researchers to do discovery for a lawsuit compare with the current system?

The existing evidence is not that encouraging. Google's prediction markets are reasonably liquid with a prize budget of about $500 per business-related market they run, but they limit themselves to topics of widespread interest within the company (Bo Cowgill, Wolfers, and Eric Zitzewitz 2008). A set of subsidized markets on Intrade sponsored by software engineer Peter McCluskey designed to estimate the effect of the Presidential election on the number of troops in Iraq and the government debt attracted very little trading.[1]

Calibration

Many Predictocracy applications, such as those evaluating multiple policies, would require markets to estimate small probabilities accurately. While prediction and betting markets predictive track record is quite respectable overall, it is less so for small probabilities. There is a large literature on the longshot bias that suggests that small probability events are overpriced, and it was easy to find examples of arguably near-zero-probability events trading between 5–10 percent on Intrade in the 2008 election cycle (Ron Paul to win the GOP nomination; Sarah Palin or Joe Biden to be dropped from the ticket). Indeed, in data collected from Intrade from September 2007 to November 2008, securities priced between 0 and 10 percent had an average trade price of 4.3 percent and a payoff of only 3.4 percent. While fees and concerns and concerns about the security of and lack of interest paid on money deposited at Intrade may contribute to these mispricings, the presence of longshot biases in many domains suggests a challenge for applications pricing small probabilities.

Causal Inference

Predictocracy would make use of prediction markets that estimated an outcome conditional on a choice being made. For example, the McCluskey-funded markets estimated government debt conditional on Obama and McCain presidencies, and a fiscal hawk might have checked these markets in early 2008 and been tempted to support the candidate with the lower conditional debt. Of course, a third-factor like a recession might hurt the incumbent-party candidate politically and also affect the future path of government debt. Or decision influencers might have private information; Obama may get more endorsements from Republicans if they conclude the state of the economy is worse than publicly understood. So the election outcome and future debt might be correlated for reasons other than the causal effect of the future President on the debt.

As in empirical research, the solution to this problem is to find contexts in which it is minimized. In the above example, interpreting the market prices on election eve would be easier,

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[1] The subsidy provided by McCluskey is up to about $8,000 per contract, and only approximately $40,000 in contracts have changed hands.

since there would be a much smaller window for third-factor events to affect both the debt and the election. More generally, there may be event windows (e.g., election nights, debates, Congressional votes) in which one is confident that the news arriving affects the outcome variable only through affecting the policy choice. One might also minimize the problem by choosing outcome variables carefully (e.g., looking at a deficit measure that attempts to adjust for business cycle effects). As in empirical research, there is no guarantee that an acceptable solution will be found, or that analysts will agree on a solution's acceptability.

Price Manipulation

Suppose a Predictocratic market was run to estimate the effect on human life expectancy of doubling the life of pharmaceutical patents. Given that the stakes in the market are likely to be small relative to implications for industry profits, if pharmaceutical firms thought the market would influence policy, they would have a strong incentive to trade so as to influence the prediction market prices.

In laboratory markets, the impact of manipulators on prices appears to depend on whether participants are told to expect it (Hanson, Ryan Oprea, and David Porter 2006; Helena Veiga and Marc Vorsatz forthcoming). When manipulation is anticipated, traders trade against in and push prices back towards their efficient levels. In the field, there have been several episodes in election markets that appear like attempted price manipulation. We are aware of these episodes largely due to the lack of skill of the presumed manipulators. In 2004, an apparent manipulator drove the price of Bush's reelection contract from 65 to 10 during the middle of the night. In 2007, an apparent manipulator drove the price of the "Clinton to win the Presidency" contract up from 25 to 40, but did not also move the prices in related markets, creating arbitrage opportunities. In 2008, an apparent manipulator drove up the price of the McCain to win contract by 10 percentage points in various short periods of time on Intrade, but did not also move the price of the same contract on other exchanges such as Betfair. While mean reversion of prices was fairly rapid in 2004 and 2008, in the 2007 episode, it took longer than one

month. Successful price manipulation occurs in deeper financial markets too; examples include "leaning for the tape" (the manipulation by fund managers of closing prices at quarter ends) and manipulation of the cash settlement of the S&P and municipal bond futures.

The remarkable thing about the attempted manipulations of the Intrade election markets is that they occurred in markets whose influence on decision making is so minimal. If markets play the greater role in decision making that Abramowicz envisions, the incentives to manipulate increase. How that will affect the markets is an unanswered empirical question.

Contractability

Whether the outcomes of interest can be contracted upon plays a large role in the organization of firms and economic activity more generally. In many of the applications Abramowicz discusses, success would be hard to define in advance, but people would agree upon when they saw it. His general approach to this problem is to use markets to predict future judgments. For example, in late 2002 one could have contracted with Gallup to run a poll in 2008 asking whether going to war with Iraq has been wise. A prediction market could have been used to forecast the results of the poll, and perhaps the pre-war price in that market would have forecast future public opinion better than pre-war public opinion alone. One could likewise imagine running markets on the future approval ratings of Presidents. For examples where the outcome of interest is difficult to define in advance and the issue is of sufficient popular currency that one could have the market predict a nationally representative poll, this approach is quite promising.

Who should read this book? The book is not a great introduction to the subject for newcomers to prediction markets, as it contains only a limited and oddly organized overview of the field before moving on to the applications Abramowicz is advocating. Newcomers would be better served by starting with one of a number of survey articles, or the relevant sections of James Suroweicki's *Wisdom of Crowds* or Cass Sunstein's *Infotopia*. My suggestion would be to read Hanson's (2000)

"Futarchy" article and then buy this book if you decide you want more. For readers already interested in prediction markets who what a slew of provocative ideas, *Predictocracy* will be an enjoyable read.

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F   International Economics

Termites in the Trading System: How Preferential Agreements Undermine Free Trade. By Jagdish Bhagwati. Council on Foreign Relations Book series. Oxford and New York: Oxford University Press, 2008. Pp. xviii, 139. $24.95. ISBN 978–0–19–533165–3.   *JEL 2008–1241*

The world trade system has faced several "historical moments" in its sixty-year history—moments when profound global changes threatened to undermine the GATT/WTO centricity. The WTO now faces such a "historical moment." The most notable is the growing pervasiveness of regionalism. Rich nations' increasingly rely on bilateralism to open foreign markets. Emerging markets, notably China, India and Brazil, have had worryingly favorable experiences with regionalism while their commitment to WTO-centricity is relatively untested. Developing nations are rapidly embracing freer trade but doing so via unilateral tariff cuts, or regional trade agreements among themselves or with richer nations.

Given the importance of the topic, Jagdish Bhagwati's highly readable book—*Termites in the Trading System*—is a very welcome and very timely contribution. I recommend it as required reading for anyone interested in the future of the global trade system.

The book is short—one hundred pages in all (probably only eighty if one skips the footnotes and photographs)—but the four chapters cover the essentials: What are preferential trade agreements (PTAs)? Why are they spreading? Why are they bad? And finally, What can be done? It is an easy read; each chapter contains wonderful examples of the author's well known "light touch"—anecdotes about famous economists ranging from John Maynard Keynes and Joan Robinson to Paul Krugman and Larry Summers, and everyday stories that perfectly illustrate the point at hand.

Why is Regionalism Spreading?

When it comes to explaining the rapid spread of regionalism, there is no single overriding cause according to Bhagwati. It is due partly to confusion (policymakers seeking free trade signed free trade agreements without realizing their discriminatory effects), partly to legal weakness (the GATT/WTO disciplines on preferential trade deals were weak to begin with and got weaker with time), and partly due to bandwagon effects (nations sought to imitate the EU and U.S. initiatives).

Here the book fails to mention the main empirical studies of the determinants of regionalism. Scott L. Baier and Jeffrey H. Bergstrand (2004), in their keynote empirical study in the field, estimate cross-sectional linear probability models that stress economic factors as predictors of agreements, things like the partners' GDPs, distance, relative factor endowments, etc. The other major line of empirical studies left out stresses the notion that regionalism is "contagious," i.e., the signing of one can trigger a domino-like process of additional agreements among the signers' neighbors (e.g., Andre Sapir 2001). The most recent contribution, Peter Egger and Mario Larch