

WILLINGNESS TO PAY VS. WILLINGNESS TO ACCEPT: LEGAL AND ECONOMIC IMPLICATIONS

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ABSTRACT

Do people value commodities more when they own the commodities than when they do not? Although economic models generally presume that economic agents evaluate commodities independently of whether the agents own those commodities—the “basic independence” assumption—researchers in economics and law are starting to doubt whether this assumption is true. Doubts about the soundness of the basic independence assumption challenge accepted economic doctrines. Most theoretical and applied models in economics use the basic independence assumption both to predict and to assess the operation of markets. In the relatively new discipline that combines law and economics, the basic independence assumption produces the Coase Theorem, which is the starting point for much economic analysis of legal rules.

This Article presents, organizes, and critiques the modern evidence on the basic independence assumption, drawing together the learning of economists and lawyers. The Article first investigates evidence on the divergence between willingness to accept (“WTA”) and willingness to pay (“WTP”) measures of value and possible explanations for this evidence. Next, the Article explores the implications of the divergence for analysis in law and economics. Finally, the Article shows that although the divergence between willingness to accept and willingness to pay measures of value may entail a substantial limitation on the role of

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cost/benefit analysis, the scope of those limits cannot be precisely determined without answering some difficult questions regarding the source of the disparity between WTA and WTP.

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PROLOGUE

In 1975, I (Matthew Spitzer) attended Professor Robert Ellickson's class on land development at the University of Southern California Law Center. Early in the semester, Professor Ellickson turned to the class and asked the students the following question: "For how little would you be willing to sell your casebook from first-year Torts class? Not just any copy, but the one that you underlined and the one that contains your notes in the margin." After eliciting responses from us, Professor Ellickson then asked: "Now, assume that you lost your Torts casebook, that someone turned it into the lost-and-found, and that the applicable rules governing finders would give undisputed title of the book to the lost-and-found. How much would you be willing to pay for your old, first-year Torts casebook?" Professor Ellickson collected the responses and compared them. Noticing that most students would demand much more to sell their old Torts casebooks than they would be willing to pay to buy the same books back, he frowned and shook his head from side to side. "This cannot be right," he said. "The responses are supposed to be the same. Some of you must not be telling the truth." But the students protested that they had responded to his query honestly. Professor Ellickson considered the possibility for a moment and then asked, "But if you would pay no more than one or two dollars to buy back your Torts casebook, why would you not sell it for less than five or ten dollars?" The class was stymied, managing only to convey the sense that the two situations seemed quite different. I, on the other hand, had completed first year introductory graduate courses in economics and had a pat answer. "Wealth effects," I shouted from the back of the classroom. Again Professor Ellickson frowned and shook his head. "Wealth effects are probably too small to produce this sort of result. There must be something else involved." I thought for a moment, decided that if my classmates had well-behaved, twice differentiable utility functions, Professor Ellickson was probably right. I resolved to follow Samuel Clemens' advice about keeping your mouth shut and letting people think you a fool—at least for the remainder of that class hour. Professor Ellickson shrugged and went on with his lesson plan.

I. INTRODUCTION

Do people value commodities more when they own the commodities than when they do not? Economic models generally presume that people evaluate commodities independently of whether they own those commodities—the “basic independence” assumption. Yet, scholars in economics and law are beginning to doubt whether this assumption is correct. Questions about the validity of the basic independence assumption challenge accepted economic doctrines. Most economic models utilize the basic independence assumption to predict and to evaluate the operation of markets. In the relatively new research area that combines law and economics,¹ the basic independence assumption produces the Coase Theorem,² which is the genesis for much economic analysis of legal rules. If the basic independence assumption fails, most economic models may also fail. To better understand the importance of the basic independence assumption, consider the following example. A homeowner lives next to a smelter. The smelter’s operations emit foul-smelling smoke that interferes with the homeowner’s view of the mountains. Under these circumstances, the law might give the homeowner a legal right to clean air, and thus require the smelter to buy the homeowner’s permission to emit smoke. Alternatively, the law might give the smelter the right to emit smoke, in effect requiring the homeowner to buy the right to clean air from the smelter.

If the distribution of ownership does not determine value (and several other assumptions are true),³ then in order to predict how much smoke the smelter will emit, one need only ascertain each side’s willingness to pay for air at different quality levels. If the homeowner will pay a large sum of money for relatively clean air and the smelter is not willing to pay very much to produce smoke, then the smelter will emit very little smoke, regardless of which party has the legal right to the air. If the law assigns the right to emit smoke to the smelter, the homeowner will purchase a large reduction in smoke from the smelter. If the law assigns the right to clean air to the homeowner, the smelter will not purchase rights to emit large quantities of smoke. Theoretically, the smelter will

1. The newly-formed American Law and Economics Association had its first meeting in 1991.

2. R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960). See also Elizabeth Hoffman & Matthew L. Spitzer, *The Coase Theorem: Some Experimental Tests*, 25 J.L. & ECON. 73 (1982) (discussing research on the Coase Theorem).

3. For the full set of needed assumptions, see Hoffman & Spitzer, *supra* note 2.

emit exactly the same amount of smoke, *regardless of which side is initially assigned the rights to the air.*⁴

This prediction—that whenever ownership does not determine value the final distribution of rights is independent of the initial assignment—is known as the Coase Theorem, and serves as the basis for many normative arguments.⁵ Some claim that the final distribution of rights in a perfect market should serve as a legal benchmark: when one side values the right more than the other side at every level of quality, the common law should assign property rights to those who would eventually own the rights. If values do not change based upon who initially owns the right, this normative prescription closely tracks the Kaldor-Hicks compensation criterion.⁶ Others claim that, regardless of whether the Kaldor-Hicks compensation criterion embraces the situation, the rights should be awarded to those who value them the most, thus saving the transaction costs of reallocating the rights.⁷ Still others suggest that damage-based rules instead of property rules are appropriate; damages would reduce the cost of reallocating.⁸ Damages rules themselves probably incorporate the basic independence assumption because damages rules usually define damages independently of who owns the rights.⁹ These argu-

4. If one side values control of the air more than the other side *at every relevant air quality level*, then the parties will transfer the entire right to the air to the party who values it more, regardless of which party the laws initially assigned the right. Therefore, if the homeowner values the right more than the smelter, the homeowner will end up with the right, regardless of which party the law first assigned the right. When the law originally assigns the right to the homeowner, the smelter will choose not to purchase the homeowner's permission to degrade the air. But when the law initially assigns the right to the smelter, the homeowner will pay the smelter to stop polluting—in essence purchasing the right to clean air. On the other hand, if at every level of pollution, the smelter values the right to emit smoke more than the homeowner values the right to clean air, the smelter will ultimately have the right to emit as much smoke as it desires.

5. Coase has recognized that this result was not really his "Theorem," but a device for emphasizing the importance of transaction costs. R. H. COASE, *THE FIRM, THE MARKET, AND THE LAW* (1988). Hence, those who attack Coase and his theorem are aiming at the wrong target. Nevertheless, because the term "Coase Theorem" is widely accepted, this Article will utilize it. Professor Coase's name will probably be linked to this prediction for many years.

6. See, e.g., Jules L. Coleman, *Efficiency, Utility, and Wealth Maximization*, 8 HOFSTRA L. REV. 509 (1980).

7. RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW* 45 (3d ed. 1986).

8. Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972); MITCHELL POLINSKY, *AN INTRODUCTION TO LAW AND ECONOMICS* 15-27 (2d ed. 1989); WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* 36-37 (1987); see also Richard Craswell, *Contract Remedies, Renegotiation, and the Theory of Efficient Breach*, 61 S. CAL. L. REV. 629 (1988) (recognizing that property rules may distort other decisions).

9. ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 344-54 (1988) (using reversible

ments, which are lengthy and complex, provide the focus of some of the most spirited debates in law and economics.¹⁰

If the basic independence assumption fails, however, all of the foregoing may change. Consider a variation of the previous example. If the law assigns clean air rights to the homeowner, he will not allow the smelter to degrade the air unless the smelter pays him enough money to offset the intrusion. "Willingness to accept" ("WTA") is the minimum amount that the homeowner would accept in exchange for his right to clean air. If, on the other hand, the law assigns the rights to clean air to the smelter, the homeowner will pay no more for clean air than such rights are worth to him. "Willingness to pay" ("WTP") is the maximum amount that the homeowner would pay for the right to clean air. Assume that the amount that the smelter would be willing to pay for the air rights is "S". This amount is exactly the same amount the smelter would accept to sell its air rights. In other words, WTA equals WTP ($WTA = WTP$) for the smelter.

Assume that the homeowner's WTA exceeds S, which is greater than the homeowner's WTP ($WTA > S > WTP$). If the homeowner initially owns the air rights, he will refuse to sell them to the smelter. If the smelter initially owns the air rights, the homeowner will refuse to buy. At a maximum, if $WTA > S > WTP$ at every air quality level, then the homeowner will neither sell any rights to the smelter (if the homeowner owns the rights), nor buy any rights to clean air (if the smelter owns the rights).

If WTA is greater than WTP ($WTA > WTP$), as described in the above example, then many normative arguments may change. For example, even if no transaction costs exist, there is no longer a unique, well-defined outcome of Coasian bargaining for those who argue that it provides a benchmark for the common law. The Kaldor-Hicks compensation criterion—and all versions of cost/benefit analysis deriving from it—

indifference curves to describe damages rules). See also LANDES & POSNER, *supra* note 8 (using damage functions that do not depend on the rights defined in the status quo); STEVEN SHAVELL, *ECONOMIC ANALYSIS OF ACCIDENT LAW* (1987) (same); WERNER Z. HIRSCH, *LAW AND ECONOMICS: AN INTRODUCTORY ANALYSIS* (2d ed. 1988) (discussing liability rules to make damages independent of the allocation of rights).

10. See *Symposium on Efficiency as a Legal Concern*, 8 HOFSTRA L. REV. 485 (1980); *A Response to the Efficiency Symposium*, 8 HOFSTRA L. REV. 811 (1980). See also Richard O. Zerbe, Jr., Comment, *Does Benefit Cost Analysis Stand Alone? Rights and Standing*, 10 J. POL'Y ANALYSIS & MGMT. 96 (1991) (noting both WTP and WTA measures without noting that the two measures may diverge).

similarly lose whatever precision they may have had. Normative theories now may require a reference to the status quo for their definition. Subsidiary arguments regarding saving transactions costs may either gain or lose force, depending upon how much emphasis is placed on them.¹¹ In addition, damages rules may also require reference to the status quo.

A small group of economists and other social scientists have scrutinized the basic independence assumption. Applied welfare economists have attempted to refine the methodology of cost/benefit analysis in order to better choose whether to undertake the provision of large-scale public goods such as environmental improvements.¹² Although these economists have devoted *some* attention to normative issues, their main concern has been the careful elucidation of the complexities and subtleties surrounding the disparity between willingness to accept and willingness to pay. In contrast, legal scholars—primarily Duncan Kennedy and Mark Kelman—have concentrated on the normative implications of presuming that willingness to accept is greater than willingness to pay. In their discussions, however, they have failed to address the subtle and intricate evidence from economics.¹³ Perhaps they were more concerned with undermining confidence in cost/benefit analysis—and the liberal vision of society under law that they claim rests (in part) upon cost/benefit analysis—than they were with evaluating the evidence that they used for their critiques.

This Article presents, organizes, and critiques modern evidence on the question of WTA and WTP. The Article first investigates the evidence on the divergence between WTA and WTP, and then examines possible

11. Transactions costs arguments might lose force because they are in essence justified by the Kaldor-Hicks compensation criterion, which is no longer well-defined. On the other hand, a pragmatist might argue that although one does not know who will end up with the right, one should save transactions costs in situations where one strongly suspects that one party will buy the right. This will reduce expending resources to achieve the inevitable.

12. See text accompanying notes 17-20.

13. See Duncan Kennedy, *Cost/Benefit Analysis of Entitlement Problems: A Critique*, 33 STAN. L. REV. 387 (1981); Mark Kelman, *Consumption Theory, Production Theory, and Ideology in the Coase Theorem*, 52 S. CAL. L. REV. 669 (1979). In fairness, both of these works were published before much of the work reviewed in this Article. However, Kelman's book, *A GUIDE TO CRITICAL LEGAL STUDIES*, repeated the arguments and was written several years *after* much of the economic work. MARK KELMAN, *A GUIDE TO CRITICAL LEGAL STUDIES* 145-48 (1987). The most recent legal article on this topic, Herbert Hovenkamp, *Legal Policy and the Endowment Effect*, 20 J. LEGAL STUD. 225 (1991), cited some of the studies contained herein, but did not critique them. Hovenkamp was interested in the implications of WTA exceeding WTP, particularly for wealth maximization. *Id.*

explanations for such evidence.¹⁴ Next, the Article explores the implications of such a divergence for analysis in law and economics. Finally, the Article shows that, although the divergence between WTA and WTP may entail substantially limiting the role of cost/benefit analysis, those limits cannot be precisely defined without answering difficult questions regarding the sources of the disparity between WTA and WTP.

II. EVIDENCE ON WILLINGNESS TO ACCEPT AND WILLINGNESS TO PAY

A. Survey Evidence

There are two sources of evidence pertaining to the divergence between WTA and WTP: surveys and experiments. Survey evidence was generated first. Economists frequently were given the task of estimating the costs and benefits of proposed large-scale projects such as power plants. To estimate costs, economists had to value the loss of environmental goods such as clean air and water. However, because of the absence of direct markets for spectacular views, economists were unable to observe any prices. Therefore, in order to value the environmental goods, economists developed new sources of data. They began by asking those people affected by such large-scale projects either how much they would be willing to pay to avoid potential environmental deterioration or how much they would have to be compensated to accept the same environmental deterioration.

Economists have known for many years that WTP and WTA might differ if the people selling their rights were wealthier than those buying them. But Robert Willig¹⁵ argued in a very influential work that under most circumstances the divergence between WTA and WTP would be small, probably less than five percent. Economists have assumed that Willig's analysis applied in the case of environmental goods. Therefore, they have proceeded to value environmental commodities by inquiring about WTP in consumer surveys.¹⁶ A typical environmental survey fo-

14. In this regard, it is responsive to Robert C. Ellickson, *Bringing Culture and Human Frailty to Rational Actors: A Critique of Classical Law and Economics*, 65 CHI.-KENT L. REV. 23, 35-40 (1989).

15. Robert D. Willig, *Consumer's Surplus Without Apology*, 66 AM. ECON. REV. 589 (1976).

16. See William D. Schulze et al., *Valuing Environmental Commodities: Some Recent Experiments*, 57 LAND ECON. 151, 151 (1981); Philip A. Meyer, *Publicly Vested Values for Fish and Wildlife: Criteria in Economic Welfare and Interface with the Law*, 55 LAND ECON. 223 (1979); Robin Gregory, *Interpreting Measures of Economic Loss: Evidence from Contingent Valuation and Experi-*

cused on a potential increase or decrease in visible air pollution, and contained photographs of both current air quality and how the air would look with increased or decreased pollution.¹⁷ The survey takers showed the pictures to subjects and asked them how much they would be willing to pay either to avoid a pictured increase or to enjoy a pictured decrease in air pollution.¹⁸ Some surveys then gave each subject the opportunity to change his answer: the surveyors often asked the subject if he would be willing to pay slightly more for the decrease in pollution, and contin-

mental Studies, 13 J. ENVTL. ECON. & MGMT. 325 (1986); W. Kip Viscusi et al., *Altruistic and Private Valuations of Risk Reduction*, 7 J. POL'Y ANALYSIS & MGMT. 227 (1988); Mark C. Berger et al., *Valuing Changes in Health Risks: A Comparison of Alternative Measures*, 53 S. ECON. J. 967 (1987); Trudy A. Cameron & Michelle D. James, *Efficient Estimation Methods for "Closed-Ended" Contingent Valuation Surveys*, 69 REV. ECON. & STAT. 269 (1987); Shelby Gerking & Linda R. Stanley, *An Economic Analysis of Air Pollution and Health: The Case of St. Louis*, 68 REV. ECON. & STAT. 115 (1986); Francis Antonovitz & Terry Roe, *A Theoretical and Empirical Approach to the Value of Information in Risky Markets*, 68 REV. ECON. & STAT. 105 (1986); M. W. Jones-Lee et al., *The Value of Safety: Results of a National Sample Survey*, 95 ECON. J. 49 (1985); Richard G. Walsh et al., *Valuing Option, Existence, and Bequest Demands for Wilderness*, 60 LAND ECON. 14 (1984); I. Majid et al., *Benefit Evaluation of Increments to Existing Systems of Public Facilities*, 59 LAND ECON. 377 (1983); see generally R. G. CUMMINGS ET AL., *VALUING ENVIRONMENTAL GOODS: AN ASSESSMENT OF THE CONTINGENT VALUATION METHOD* (1986); Richard T. Carson & Peter Navarro, *Fundamental Issues in Natural Resource Damage Assessment*, 28 NAT. RESOURCES J. 815 (1988); ROBERT C. MITCHELL & RICHARD T. CARSON, *USING SURVEYS TO VALUE PUBLIC GOODS: THE CONTINGENT VALUATION METHOD* (1989).

Recent theoretical scholarship on consumers' willingness to pay for non-traded goods fails to consider disparity between WTA and WTP. See, e.g., Jon R. Neill, *Another Theorem on Using Market Demands to Determine Willingness to Pay for Non-Traded Goods*, 15 J. ENVTL. ECON. & MGMT. 224 (1988); Jon R. Neill, *Bounds on the Willingness to Pay for Non-Traded Goods: A Possible Theorem*, 30 J. PUB. ECON. 267 (1986). The WTP criterion also continues to be used unflinchingly in many other areas. Cam Donaldson, Note, *Willingness to Pay For Publicly-Provided Goods: A Possible Measure of Benefit?*, 9 J. HEALTH ECON. 103 (1990) (nursing home care); Dale Whittington et al., *Estimating the Willingness to Pay for Water Services in Developing Countries: A Case Study of the Use of Contingent Valuation Surveys in Southern Haiti*, 38 ECON. DEV. & CULTURAL CHANGE 293 (1990); Mary Jo Kealy et al., *Reliability and Predictive Validity of Contingent Values: Does the Nature of the Good Matter?*, 19 J. ENVTL. ECON. & MGMT. 244 (1990) (testing accuracy of hypothetical WTP at predicting actual willingness to pay to prevent acid rain in the Adirondacks); John C. Bergstrom et al., *The Impact of Information on Environmental Commodity Valuation Decisions*, 72 AM. J. AGRIC. ECON. 614 (1990); Per-Olov Johansson, *Willingness to Pay Measures and Expectations: An Experiment*, 22 APPLIED ECON. 313 (1990) (moose hunting permits). But see Paul S. Carlin & Robert Sandy, *Estimating the Implicit Value of a Young Child's Life*, 58 S. ECON. J. 186, 187 (1991) (noting that a parent's willingness to pay for a car seat to reduce the chance of death to a child does not equal the amount, adjusted for chance, that a parent would require to accept the loss of a child).

17. See, e.g., David S. Brookshire et al., *Valuing Public Goods: A Comparison of Survey and Hedonic Approaches*, 72 AM. ECON. REV. 165 (1982).

18. *Id.* at 166.

ued to ask the subject if he would pay a bit more until he refused.¹⁹ The survey takers then used the WTP responses as indicative of values in the target population and computed either the total damage from increasing pollution or the total value from reducing pollution by extrapolating from the WTP survey responses.²⁰

In a few surveys, however, researchers explicitly inquired about both WTP and WTA. The answers have diverged far more than theory would suggest.²¹ Economists have been skeptical in response to the divergence, suggesting that several types of errors affect the results. Such errors include: (1) strategic responses, where the respondents lie to the surveyor in an effort to manipulate the outcome in accord with the respondents' true preferences; (2) information biases, where the surveyors (perhaps inadvertently) manipulate the responses by supplying information about the proposed program; (3) instrument biases, where the surveyors' questioning techniques mold the results; and (4) errors produced by non-random sampling techniques.²²

In the last few years, some experimental economists and psychologists have started to design and run experiments to test whether WTA is substantially larger than WTP. This Article, which examines these experi-

19. See, e.g., Robert D. Rowe et al., *An Experiment in the Economic Value of Visibility*, 7 J. ENVTL. ECON. & MGMT. 1 (1980); Alan Randall et al., *Bidding Games for Valuation of Aesthetic Environmental Improvements*, 1 J. ENVTL. ECON. & MGMT. 132 (1974).

20. See, e.g., DOUGLAS A. GREENLEY ET AL., *ECONOMIC BENEFITS OF IMPROVED WATER QUALITY: PUBLIC PERCEPTIONS OF OPTION AND PRESERVATION VALUES* (1982).

21. See, e.g., Rowe et al., *supra* note 19, at 16; A. MYRICK FREEMAN III, *THE BENEFITS OF ENVIRONMENTAL IMPROVEMENTS* (1979).

22. See CUMMINGS ET AL., *supra* note 16, at 21-33; Robin Gregory & Donald MacGregor, *Valuing Changes in Environmental Assets, in ECONOMIC VALUATION OF NATURAL RESOURCES: ISSUES, THEORY AND APPLICATIONS* (R. L. Johnson & G. V. Johnson eds., 1990).

We made very similar arguments in an exchange with Mark Kelman. See Kelman, *supra* note 13, at 682 (stating that informal survey evidence showed that WTP and WTA substantially diverge); Matthew Spitzer & Elizabeth Hoffman, *A Reply to Consumption Theory, Production Theory, and Ideology in the Coase Theorem*, 53 S. CAL. L. REV. 1187 (1980) (agreeing that WTP and WTA might diverge, but contending that Kelman's informal survey evidence was so flawed that it was useless). However, as this Article clearly demonstrates, we now believe that reliable evidence suggests that Kelman's central intuition may have been correct. In addition, some articles report field data that suggests the disparity between WTA and WTP. See Russell S. Winer, *A Reference Price Model of Brand Choice for Frequently Purchased Products*, 13 J. CONSUMER RES. 250 (1986); Bernard Van Praag, *The Welfare Function of Income in Belgium: An Empirical Investigation*, 2 EUR. ECON. REV. 337 (1971); Raymond S. Hartman et al., *Consumer Rationality and the Status Quo*, 106 Q.J. ECON. 141 (1991); William Samuelson & Richard Zeckhauser, *Status Quo Bias in Decision Making*, 1 J. RISK & UNCERTAINTY 7, 26-33 (1988). For a recent extension and partial confirmation, see Huib van de Stadt et al., *The Relativity of Utility: Evidence From Panel Data*, 67 REV. ECON. & STAT. 179 (1985).

ments in some detail, finds that the experiments provide evidence that WTA may substantially exceed WTP. This result seems most likely to occur when consumers value consumption goods that are not repeatedly bought and sold.

B. Experimental Evidence

This section concentrates primarily on four questions. (1) Does WTA exceed WTP in real experimental markets? (2) Assuming that it does, is this true only for consumer goods, or is this also true for rights to income flows, such as securities? (3) Does repeated participation in markets for rights as a buyer and seller reduce an individual's WTA/WTP spread? (4) By what factor does WTA exceed WTP?

1. Does WTA Exceed WTP in Experimental Markets?

a. Coursey, Hovis and Schulze

Don Coursey, John Hovis and William Schulze conducted experiments that compared WTP to WTA in both surveys and experimental markets.²³ First, they devised a bidding mechanism to encourage subjects to reveal their true WTP and WTA values for agreeing to hold a one-ounce cup of sucrose octa-acetate ("SOA")—a safe but very bitter-tasting liquid—in their mouths for twenty seconds. The experimenters allowed each subject in these experiments to sample the SOA.²⁴

The experimenters asked each of eight subjects to state a willingness to pay to avoid tasting the SOA. The four highest bidders avoided tasting the SOA; the remaining four subjects had to taste it. The four highest bidders, however, had to pay the experimenters only the amount of the fifth highest bid.²⁵ Under these circumstances, it was in each subject's self-interest to bid his true willingness to pay to avoid tasting the SOA. Because the size of the subject's bid determined only whether it was ac-

23. Don L. Coursey et al., *The Disparity Between Willingness to Accept and Willingness to Pay Measures of Value*, 102 Q.J. ECON. 679 (1987). See also Robin Gregory & Lita Furby, *Auctions, Experiments, and Contingent Valuation*, 55 PUB. CHOICE 273 (1987); Don L. Coursey, *Markets and the Measurement of Value*, 55 PUB. CHOICE 291 (1987).

The discussion of experiments in the text of this Article is limited to those designs where the subjects' responses triggered outcomes that are important to the subjects. Thus, such experiments might pay subjects varying amounts of money based upon their responses and the interaction of random factors. In contrast, some "experiments" ask subjects entirely hypothetical questions. See, e.g., Samuelson & Zeckhauser, *supra* note 22, at 12-26.

24. Coursey et al., *supra* note 23, at 682.

25. *Id.* at 684.

cepted, not how much he would have had to pay if it was accepted, the subject gained nothing by bidding too high or too low.

To illustrate this, consider the costs and benefits of bid deception. The subject can either bid more than his true WTP value or less than his true WTP value. If the subject bids more than his true value and wins the auction, he neither gains nor loses if his true value is actually greater than or equal to the fifth highest bid. However, if his true value is less than the fifth highest bid, he eventually pays more than he is truly willing to pay to avoid tasting the SOA. He would have been better off by bidding his true WTP and placing lower than the top four bids, thereby keeping his money and tasting the SOA. Now consider what happens to the subject if he bids less than his true value and loses the auction. If his true value is actually less than or equal to the fifth highest bid, he neither gains nor loses by such bid deception. However, if his true WTP value is greater than the fifth highest bid, then he is forced to taste the SOA, even though he would have been willing to pay the fifth highest bid price to avoid tasting it. In sum, a subject never gains, but he can lose, by bidding other than his true WTP value. Coursey, Hovis and Schulze conducted these experiments several times with the same subjects to help the subjects learn these properties of the bidding mechanism.²⁶

In addition, Coursey, Hovis and Schulze performed experiments to reveal the subjects' willingness to accept. These experiments were identical to the WTP experiments, except that the experimenters asked subjects to reveal their willingness to accept payment for agreeing to taste the SOA, and accepted only the four lowest bids. The four lowest bidders were paid the amount of the fifth lowest bid in return for tasting the SOA.²⁷

The experimenters also collected survey data from their subjects regarding each person's hypothetical WTA and WTP values. Coursey, Hovis and Schulze first described the SOA to the subjects before asking for WTA or WTP. Then, after the experimenters allowed each subject to sample the SOA, they repeated the WTA or the WTP question.²⁸ In both types of surveys, WTA averaged between \$7.00 and \$15.00, but WTP only averaged between \$3.00 and \$4.50.²⁹ In contrast, in the incentive-compatible bidding experiments described above, WTA was much

26. Mechanisms that give subjects incentives to reveal their true values are termed "incentive-compatible."

27. Coursey et al., *supra* note 23, at 683.

28. *Id.*

29. *Id.* at 685-86.

greater than WTP in the first few rounds of the experiments; but as the subjects participated in additional rounds of the experiment, their WTA values dropped. By the last (tenth) round, WTA had fallen to an average of about \$4.00.³⁰ This was still slightly above the average WTP, but was close enough to be statistically indistinguishable. The average WTP was the same in the hypothetical and incentive-compatible rounds.

Coursey, Hovis and Schulze interpreted their result to mean that "true" WTP does not differ from "true" WTA.³¹ They also claimed that their results indicated that surveys regarding WTP data were most likely reliable indicators of individuals' true values for goods, but that WTA survey data was most likely substantially inflated.³² However, several alternative interpretations of their data remain. To illustrate these alternatives, their claims must be decomposed into four steps. They claim that: (1) WTP and WTA converge to the same value in the incentive-compatible auctions; (2) the final bids in the incentive-compatible auctions represent true values; and (3) the hypothetical WTP equals actual WTP in their experimental data. These three claims then show that: (4) respondents to hypothetical surveys of WTP also reveal their true WTP, which is identical to their true WTA. This Article shows that the first claim is probably incorrect.³³ Next, this Article demonstrates that the experimental results on the behavioral properties of second-price and fifth-price, sealed-bid auctions suggest that the second claim may also be unfounded. The third claim, which emerges from their data, is accurate. The fourth claim, however, is unsupported, since it stands upon the correctness of the first three claims. Thus, one cannot assume on the basis of Coursey, Hovis and Schulze's results that responses to hypothetical WTP surveys represent true WTP and WTA.

Claim (1). Because WTA remains slightly above WTP, true WTA may exceed WTP by a small amount. Robin Gregory and Lita Furby re-analyzed the data by excluding wildly aberrant responses before applying any statistical tests.³⁴ They concluded that WTA exceeded WTP by a statistically significant amount (approximately \$1.00), even on the final round of the auction.³⁵

30. *Id.*

31. *Id.* at 688.

32. *Id.*

33. Gregory & Furby, *supra* note 23 at 281.

34. *Id.*

35. *Id.*

Claim (2). Perhaps the iterative experiments failed to prompt subjects to reveal their true valuations. Gregory and Furby suggested that it is very difficult for most people to understand that the auction's bidding mechanism should lead them to reveal their true values.³⁶ If subjects do not understand that it is in their best interests to reveal true values, the bids might represent strategic bids in a (futile) effort to manipulate the auction. In this case, the convergence of WTA to WTP is best regarded as a convergence of strategies, rather than a convergence of true values.

This last criticism is supported by a careful re-analysis of the evidence linking bids in an incentive-compatible auction and true values. Coursey, Hovis and Schulze cite James Cox, Bruce Roberson and Vernon Smith,³⁷ as well as Don Coursey and Vernon Smith,³⁸ in support of their contention that responses in the incentive-compatible auctions represent true values.³⁹

Cox, Roberson and Smith studied the behavioral properties of second-price, sealed-bid auctions, in which each bidder submitted a sealed bid to purchase a coupon that is redeemable at a given price. In this auction the highest bidder won the auction, but paid only the second-highest bid price. In each auction the experimenters gave each subject a redemption value that specified the amount earned if he or she won that auction.⁴⁰ Cox, Roberson and Smith conducted a series of such auctions with the same subjects, with each subject receiving a randomly reassigned redemption value in each auction.⁴¹ This feature gave each subject an opportunity to win at least once during the series of auctions. Like the fifth-price auction discussed above, the second-price, sealed-bid auction should lead subjects to bid their true values because the winner of the auction pays only the second-highest bid price. However, Cox, Roberson and Smith found that, at first, bidders in these experimental auctions did not behave as predicted.⁴² In particular, subjects tended to bid less than

36. *Id.* at 279. See also Jack L. Knetsch & J. A. Sinden, *The Persistence of Evaluation Disparities*, 102 Q.J. ECON. 691, 692 (1987). Knetsch and Sinden criticized Coursey et al. for providing a \$10.00 cash payment for participation in the experiment to WTP subjects, but not to WTA subjects. *Id.* at 693.

37. James Cox et al., *Theory and Behavior of Single Object Auctions*, 2 RES. IN EXPERIMENTAL ECON. 1 (Vernon L. Smith ed., 1982).

38. Don L. Coursey & Vernon L. Smith, *Experimental Tests of an Allocation Mechanism for Private, Public, and Externality Goods*, 86 SCANDINAVIAN J. ECON. 468 (1984).

39. Coursey et al., *supra* note 23.

40. Cox et al., *supra* note 37, at 3.

41. *Id.* at 15-18.

42. *Id.* at 26.

their true values. But, over time, most participants learned that it was in their best interests to bid their true values. Thus, Cox, Roberson and Smith's results provide evidence that participants in an incentive-compatible auction eventually learn to bid their true values.

Unfortunately, the results from the Cox, Roberson and Smith experiment have not been consistently replicated. Cox and Smith themselves, as well as others, have subsequently found that many high-valuation subjects actually bid more than their true values in these auctions; moreover, many low-valuation subjects bid less.⁴³

In addition, Coursey and Smith⁴⁴ and James Cox, Vernon Smith and James Walker⁴⁵ tested the behavioral properties of a fifth-price auction similar to the fifth-price auction used in the Coursey, Hovis and Schulze study.⁴⁶ Coursey and Smith and Cox, Smith and Walker assigned redemption values to subjects, as in the Cox, Roberson and Smith study,⁴⁷ and then conducted a series of sealed-bid auctions for four units that were to be sold to the four highest bidders at the fifth-highest bid price.⁴⁸ They found that some high-valuation participants bid more than their true values, while low-valuation participants generally bid less than their true values.⁴⁹ The average bid price was significantly below the average redemption value for the four highest valuation participants.⁵⁰

Thus, subjects tend to both overbid and underbid in both second-price and fifth-price, sealed-bid auctions, even though both auctions should theoretically induce subjects to bid their true values. These findings suggest that the revelations of value in the fifth-price auction for the SOA cannot be accepted as representing true value.

Many of the experimental works that we review below use some version of the fifth (or second, or "nth") price auction to derive values from subjects. To the extent that the value responses are not trustworthy,

43. See James C. Cox, Vernon L. Smith & James M. Walker, *Expected Revenue in Discriminative and Uniform Price Sealed-Bid Auctions*, in 3 RES. IN EXPERIMENTAL ECON. 183 (Vernon L. Smith ed., 1985); John H. Kagel et al., *Information Impact and Allocation Rules in Auctions with Affiliated Private Values: A Laboratory Study*, 55 ECONOMETRICA 1275 (1987)

44. Coursey & Smith, *supra* note 38.

45. Cox, Smith & Walker, *supra* note 43, at 183-84.

46. Coursey et al., *supra* note 23.

47. Cox et al., *supra* note 37.

48. Coursey & Smith, *supra* note 38, at 469.

49. *Id.* at 479-82.

50. "Column (4) in Table 1, reporting observed market clearing prices for the private good shows a strong tendency to be much below the demand revealing competitive equilibrium prices" Coursey & Smith, *supra* note 38, at 479.

many of the experiments' results are suspect. When we discuss the experimental results we will not repeat this criticism at each point. However, one should remember that this critique could apply to any of the experiments utilizing these demand-revealing mechanisms.⁵¹

In summary, Coursey, Hovis and Schulze contend that responses to hypothetical WTP surveys represent true WTP, which equals true WTA.⁵² Their conclusion, however, is unsupported and unfounded, since its validity rests on the accuracy of their other claims. Thus, based on the Coursey, Hovis and Schulze study, it is impossible to conclude that responses to hypothetical WTP surveys represent either true WTP or true WTA.

b. Boyce et al.

Rebecca Boyce, Thomas Brown, Gary McClland, George Peterson and William Schulze ("Boyce et al.") investigated whether WTA might exceed WTP for an irreversible choice concerning the preservation of animal or plant species, or of environmental amenities.⁵³ The environmental economics literature refers to such preservation value as "*existence value*" or "*option value*."⁵⁴

To identify existence value and test for any difference between WTA and WTP, Boyce et al. used a houseplant that resembled a pine tree in both appearance and growth rate. Due to previous criticism of the behavioral properties of fifth-price auctions, the authors decided to use a different incentive-compatible mechanism—termed "BDM"—for eliciting WTP and WTA values.⁵⁵

51. See also David W. Harless, *More Laboratory Evidence on the Disparity Between Willingness to Pay and Compensation Demanded*, 11 J. ECON. BEHAV. & ORG. 359-68 (1989) (issuing the same caution).

52. Gregory & Furby, *supra* note 23, at 688.

53. Rebecca R. Boyce et al., *An Experimental Examination of Intrinsic Values as a Source of the WTA-WTP Disparity*, 82 AM. ECON. REV. 1366 (1992).

54. Preserving a species or an unspoiled wilderness area might have value because of the irreversibility of species extinction or environmental deterioration. Preservation maintains the *option* for future use.

55. The BDM mechanism works as follows in this experiment. In the WTP experiments each participant was asked to name a willingness to pay for a specific Norfolk Island pine placed on his computer terminal. Gordon M. Becker et al., *Measuring Utility by a Single-Response Sequential Method*, 9 BEHAV. SCI. 226 (1964). After each participant indicated his WTP, a random bingo ball was drawn for each participant with replacement of prior drawn balls. Thus, each subject's reference value was independent of the other subjects' reference values, thereby eliminating one potential reason for misrepresentation in the fifth-price auctions. Each bingo ball represented a different dollar amount. The participants knew the schedule. If a participant's WTP was greater than or equal

Boyce et al. obtained WTP and WTA values in two types of experiments: *kill* and *no kill*. In the *kill* experiments, they told subjects that any trees not sold or kept would be *killed* at the end of the experiment. To maintain credibility without inflicting undue psychic pain, one randomly-chosen subject witnessed the tree killing and then reported to the other subjects that the trees had been destroyed. In the *no kill* version of the WTP and WTA experiments, Boyce et al. gave the subjects no information about the trees' prospects for survival, and no remaining trees were destroyed.⁵⁶ Each subject in the laboratory experiment participated in one of the following experimental treatments, using the BDM method for valuation:⁵⁷ (1) WTP/*kill*; (2) WTP/*no kill*; (3) WTA/*kill*; or (4) WTA/*no kill*.

Boyce et al.⁵⁸ found that WTA was slightly higher than WTP in the *no kill* experimental auctions. The mean WTA was \$8.00 and mean WTP was \$4.81.⁵⁹ In the *kill* experiments, on the other hand, the difference was substantially larger. Moreover, WTP/*kill* was greater than WTP/*no kill* and WTA/*kill* was greater than WTA/*no kill*. The mean WTA/*kill* was \$18.43 and mean WTP/*kill* was \$7.81.⁶⁰ Boyce et al.

to the dollar amount on his bingo ball, he paid his WTP and was allowed to take the houseplant home. If his WTP was less than the dollar amount on his bingo ball, he did not purchase the houseplant. *Id.* at 228. Participants in the WTP experiments were given an initial balance of \$40. After 10 trial auctions, the plants were actually sold in the eleventh auction.

The WTA experiments were symmetric, with 10 practice rounds followed by an actual sales auction. Each participant was given \$30 and a Norfolk Island pine and was asked to state a willingness to accept to sell the plant back to the experimenter. If the participant's WTA was less than or equal to the dollar amount on his randomly chosen bingo-ball he received his WTA, but did not keep the plant. If his WTA was greater than the dollar amount on his bingo ball he kept the plant, but received no additional money. Participants in the WTA experiments were initially given \$30 (\$10 less than in the WTP experiment). The difference was hypothesized to control for wealth effects: in the WTP experiments the participants started with cash only; in the WTA experiments they began with cash *plus* a plant. Boyce et al., *supra* note 53, at 1369.

56. Each participant completed a hypothetical questionnaire before the experiment began. Each participant was then shown a picture of a Norfolk Island pine and read a description of the plant. He was then asked to state either the most that he would pay to purchase one or the least that he would accept to sell one he owns. Participants in the *kill* experiments were told that the plants would be destroyed if they did not buy or keep them. Participants in the *no kill* experiments were given no information about the disposition of the plants that were not bought. Finally, to control for the emotional effect of the laboratory environment, the *kill* surveys were also administered to a sample of the University of Colorado staff and students in the workplace. The sample was designed to match the participants in the laboratory experiments.

57. Boyce et al., *supra* note 53, at 1369.

58. *Id.*

59. *Id.* at 1370.

60. All differences are significant at the five percent level; the hypothesis of equal means can be

interpreted their results as indicating that WTA exceeds WTP, especially when the preservation of the plant is at stake (existence value, in their interpretation).⁶¹ Moreover, both WTP and WTA are higher in the presence of existence value.

While we cannot yet evaluate the Boyce et al. results to the extent that we have analyzed the Coursey, Hovis and Schulze results,⁶² the two studies suggest an acute difference between WTP and WTA. Although Schulze and other coauthors have presented some preliminary findings suggesting that the BDM mechanism performs significantly better than the fifth-price auction,⁶³ the BDM mechanism has not yet received independent testing. This approach to elicitation of value requires further study. If the BDM mechanism survives further scrutiny, we would conclude on the basis of Boyce et al.'s results that WTA exceeds WTP in the context of this experiment.

c. Other Experimental Work

Daniel Kahneman, Jack Knetsch and Richard Thaler also tested whether WTA is greater than WTP in both experimental markets and in survey data.⁶⁴ Their experimental markets started by distributing a small consumer item—in some experiments, Cornell coffee mugs, and, in other experiments, boxed ball point pens with price tags indicating that the pens were for sale for \$3.98—to one half of an assembled group.⁶⁵ After each subject examined the consumer goods, the experimenters asked a series of questions. Kahneman, Knetsch and Thaler asked those who had received the mugs or pens if they would agree to relinquish the items at various prices. They also asked those who did not receive a consumer good if they would agree to buy the good at various prices. They told the

rejected at the five percent level of significance with a nonparametric Wilcoxon Rank Sum Test. *Id.* at 1371.

61. *Id.*

62. See *supra* note 23 and accompanying text.

63. Gary McClelland, Michael McKee, & William Schulze, *The BDM Lives: Task Transparency and Payoff Dominance* (Oct. 26, 1990) (paper presented to the Economic Science Association Annual Meetings, on file with the authors).

64. Daniel Kahneman et al., *Experimental Tests of the Endowment Effect and the Coase Theorem*, 98 J. POL. ECON. 1325 (1990). Jack L. Knetsch, *The Endowment Effect and Evidence of Non-Reversible Indifference Curves*, 79 AM. ECON. REV. 1277 (1989); see also David S. Brookshire & Don L. Coursey, *Measuring the Value of a Public Good: An Empirical Comparison of Elicitation Procedures*, 77 AM. ECON. REV. 554 (1987).

65. Kahneman et al., *supra* note 64, at 1330-31.

subjects that the actual price would be selected later.⁶⁶ The subjects participated in four identical markets in a row and were told before the experiment that one of the markets would be selected at random. Their responses in the selected market would determine whether or not they would buy (or sell) the consumer good at the price selected in the market.

Kahneman, Knetsch and Thaler argued that under these circumstances, subjects have very little incentive to misrepresent their preferences.⁶⁷ This argument is persuasive because, like the Coursey, Hovis and Schulze experiments, statements of WTP or WTA determined whether a bid or offer would be accepted but not the price at which it would be bought or sold. The market determined the price. Since many subjects participated in the Kahneman, Knetsch and Thaler experiment, no individual subject could reasonably believe that changing his own bid would likely affect the overall market price.⁶⁸

Kahneman, Knetsch and Thaler then argued that if subjects reveal their true WTA and WTP, and if WTA equals WTP, it is reasonable to expect, on average, that about one half of the consumer goods will trade hands in each experiment.⁶⁹ On the other hand, if WTA exceeds WTP, significantly fewer than half of the goods will trade. They found that only approximately one sixth of the consumer goods traded, rather than the one half predicted by the WTA equals WTP hypothesis. In addition, the buyers' median WTP tended to be less than one half of the sellers' median WTA.⁷⁰

Kahneman, Knetsch and Thaler conducted another set of mug experiments in which they divided subjects into three groups: buyers, sellers,

66. *Id.*

67. *Id.*

68. Of course, the criticisms of the responses found in Coursey, Hovis and Schulze's experiments apply here as well. *See supra* text accompanying notes 23-51.

69. Kahneman et al., *supra* note 64, at 1332.

70. Another possible interpretation of their data further illustrates the relationship between wealth effects and the possibility of a divergence between WTP and WTA measures of value. Suppose, for example, that in the absence of any wealth effects WTP equals WTA. Now suppose that half of the group is given consumer goods such as coffee mugs or pens. That group is now wealthier than the other group. If demand for the good increases in wealth, then the demand curve for the wealthier group should be higher than the demand curve for the poorer group. Similarly, viewing each subject's supply curve as the number that he is willing to part with at different prices, then the wealthier group will require a higher supply price to part with each successive unit. The combination of a low demand price from the poorer buyers and a high supply price from the wealthier sellers results in fewer trades than one would expect if there truly were no wealth effects. While it is arguably reasonable that wealth effects are not likely to be large, the extent of wealth effects is

and choosers.⁷¹ Just as in the first experiment, Knetsch et al. asked the buyers to establish buying prices (maximum WTP) and the sellers to state selling prices (minimum WTA). Then they told choosers to decide between the mug and a stated cash price at each possible price.⁷² Both the buyers and the sellers named indistinguishable relative prices from those in the previous experiment: mean selling prices were significantly higher than mean buying prices.⁷³ However, the mean price for choosers was the same as the mean price for buyers,⁷⁴ suggesting a real divergence between WTA and WTP, independent of any wealth effects.

Kahneman, Knetsch and Thaler also performed a set of Coasian bargaining experiments designed to test whether WTA exceeds WTP in a two-person bargaining setting. They paired off fifty-two subjects. The experimenters gave one person in each pair a coffee mug and told him that he could either keep it and take it home, or sell it to his paired-off partner.⁷⁵ Using their analysis, if WTA equals WTP, one would expect on average about thirteen trades (one half of the twenty-six pairs). But only six trades occurred,⁷⁶ suggesting that WTA exceeds WTP in this Coasian model.

2. *Does WTA Exceed WTP for Rights to Future Cash Flows, Such as Securities?*

Very little evidence on the relative valuation of securities exists, but what is known suggests that WTA equals WTP for the simplest form of security—the right to receive a certain cash payment. But for more complex securities, such as the right to receive the possible proceeds of a

undeterminable without assuming a cardinal utility measure. One simply cannot predict the magnitude of a “small” or “large” income effect in a world of ordinal utility.

Applying this reasoning to the observed divergence between WTP and WTA in environmental surveys is straightforward. Consider the issue of air quality in the Grand Canyon. If the air in the Grand Canyon is clean one is, in effect, wealthier than if the air is dirty. Thus, based on the above argument, one would demand more to “sell” some of that clean air than if one did not own it initially. And, symmetrically, if one did not already have clean air, then one would demand a price less than if one owned it originally. The authors wish to thank Vernon Smith for suggesting this idea for rationalizing the experimental results. See Robert Franciosi et al., *The Endowment Effect: How Discontinuous is Hicksian Excess Demand at the Origin?* (1992) (unpublished manuscript, on file with the authors). For a replication of Kahneman et al., see *supra* note 64.

71. Kahneman et al., *supra* note 64, at 1339.

72. *Id.*

73. *Id.*

74. *Id.*

75. *Id.* at 1340-41.

76. *Id.*

fairly simple gamble or the purchase of insurance, WTA may exceed WTP.

a. Simple Securities

Kahneman, Knetsch and Thaler conducted experiments in which subjects traded a security representing the right to an immediate and fixed cash payment.⁷⁷ These experiments took place in both an organized market and in a two-person Coasian bargaining setting. In both experimental forms, the evidence strongly suggested that WTA equals WTP.

In the market experiments, Kahneman, Knetsch and Thaler distributed index cards to subjects, and instructed as follows:

In this market the objects being traded are tokens [3x5 cards]. You are an owner, so you now own a token [You are a buyer, so you have an opportunity to buy a token] which has a value to you of \$x. It has this value to you because the experimenter will give you this much money for it. The value of the token is different for different individuals. A price for the tokens will be determined later. For each of the prices listed below, please indicate whether you prefer to:

- (1) Sell your token at this price and receive the market price. [Buy a token at this price and cash it in for the sum of money indicated above.][or]
- (2) Keep your token and cash it in for the sum of money indicated above. [Not buy a token at this price.]

For each price indicate your decision by marking an X in the appropriate column.

At a price of \$Y I will sell [buy] —. I will not sell [buy] —.⁷⁸

The stated redemption values on the 3x5 index cards produced one set of supply and demand curves, while the subjects' responses produced a second set of curves. The experimenters honestly informed the subjects that the price in the experimental market would be set at the intersection of the supply and demand curves produced by their responses, and that all offers to sell (buy) the token 3x5 index cards below (above) that price would be executed.⁷⁹ Kahneman, Knetsch and Thaler computed the expected price and quantity traded in the experimental market, assuming that WTA equals WTP, from the supply and demand curves produced by the stated redemption values. The experimenters then compared the expected price and quantity to the actual price and quantity, and found

77. *Id.* at 1329-30.

78. *Id.*

79. *Id.* at 1330.

that they were so close that they could not reject the hypothesis that WTA equals WTP.⁸⁰

Kahneman, Knetsch and Thaler's Coasian bargaining experiments proceeded somewhat differently. They designated subjects as either buyers or sellers and gave them personalized redemption values for the coupons the experimenters distributed.⁸¹ They divided the subjects into thirty-nine pairs—one buyer and one seller per pair—and distributed a coupon to each seller. All sellers had redemption values of \$3.00, while buyers had redemption values of \$5.00.⁸² Applying their previous argument, if WTA equals WTP, it is reasonable to expect the sale of all thirty-nine coupons. However, if WTA exceeds WTP by a significant amount, a lower sales volume would occur, because some sellers would value their coupons more than the buyers would be willing to pay. Twenty-nine out of thirty-five coupons were sold—a result clearly consistent with WTA equals WTP.⁸³

b. Securities Involving Risk

Peter Knez, Vernon Smith and Arlington Williams conducted experiments that suggested that hypothetical WTA may exceed hypothetical WTP for relatively simple securities.⁸⁴ They performed three sets of experiments, each consisting of several independent trading periods for a security that had a fifty percent chance to pay \$.50 and a fifty percent chance to pay \$2.00.⁸⁵ Hence, the expected value of this security was \$1.25 ($50\% \times \$.50 + 50\% \times \2.00). They gave each of the nine subjects in each experiment securities and cash. Before trading began in each period, the experimenters asked each subject to state his WTP and WTA for such a security. Trading then proceeded, securities changed hands, and the holders of the securities were paid their dividends.

They found that at the beginning of each experiment individual subjects typically stated a higher WTA price than WTP price.⁸⁶ However, the actual trading price was always less than or equal to the WTA price

80. *Id.* at 1332.

81. *Id.* at 1340.

82. *Id.*

83. *Id.*

84. Peter Knez et al., *Individual Rationality, Market Rationality, and Value Estimation*, 75 AM. ECON. REV. 397 (May 1985).

85. *Id.* at 400.

86. *Id.* at 401.

and greater than or equal to the WTP price.⁸⁷ This suggests that subjects may state different buying and selling prices but that they are willing to actually trade at a compromise price. Moreover, there was a tendency for WTA and WTP to converge as each experiment progressed. This suggests that repeated experience with the markets caused the subjects to reevaluate their responses, eventually bringing both WTP and WTA closer to actual trading prices.

Harinder Singh reported results of experiments very similar to those of Knez, Smith and Williams.⁸⁸ Using simple securities, Singh elicited WTA and WTP values in a survey and then conducted a market in the simple securities. Singh's subjects reported that their WTA exceeded their WTP in only one of Singh's two surveys. Yet, in both experimental markets WTA equalled WTP.⁸⁹

David Harless also reported the results of experiments (but not surveys) which tested WTA and WTP for simple securities.⁹⁰ Harless found that although WTA was slightly greater than WTP, the difference was not significant.⁹¹ No trend developed from the experience of repeated participation in experimental markets. This result is not surprising, given Harless' determination that WTA is equal to WTP from the beginning.

Gary McClelland and William Schulze conducted a series of experiments in which subjects could "either submit bids to buy (WTP) or offers to sell (WTA) either a lottery ticket (forty percent chance of winning \$10.00—a gain) or an insurance policy (against a forty percent chance of losing \$10.00—a loss)."⁹² In the WTP loss experiments, the experimenters initially gave each subject \$25.00; then the subjects participated in a fifth-price auction for the insurance policy. The four highest bidders purchased the policy for the fifth-highest bid price. After the auction, a chip was drawn from an urn containing forty percent red chips and sixty percent white chips. If a red chip was drawn the potential loss was deemed to have occurred and those who did not purchase the insurance

87. *Id.*

88. Harinder Singh, *The Disparity Between Willingness To Pay And Compensation Demanded: Another Look at Laboratory Evidence*, 35 *ECON. LETTERS* 263 (1991).

89. *Id.* at 265.

90. Harless, *supra* note 51.

91. *Id.* at 376.

92. Gary H. McClelland & William D. Schulze, *The Disparity Between Willingness to Pay Versus Willingness to Accept as a Framing Effect*, in *FRONTIERS OF MATHEMATICAL PSYCHOLOGY: ESSAYS IN HONOR OF CLYDE COOMBS* (Donald R. Brown & J.E. Keith Smith eds., 1991).

policy sustained the loss.⁹³

In the WTA loss experiment, the experimenters gave each subject \$25.00 and the insurance policy described above. They next asked each person to submit a bid for what he would be willing to accept to sell the policy. A fifth-price auction in which the four lowest offers sold the policy for the fifth-lowest price determined the market price for selling the policy. Those who sold their policies then sustained the loss if a red chip was drawn.⁹⁴

The gain experiments were symmetric. In the WTP gain experiments, subjects started with \$25.00 and submitted bids for lottery tickets for a forty percent chance to win a \$10.00 prize. The lottery tickets were then sold in a fifth-price auction. Those who purchased the tickets won \$10.00 if a red chip was drawn from the urn. In the WTA gain experiments, the experimenters gave each subject \$25.00 and a lottery ticket and four tickets were then sold back in a fifth-price auction.⁹⁵

McClelland and Schulze found that in three of the four experimental treatments (WTA gain, WTP gain, and WTP loss) both the mean and mode of individual bids or offers were only marginally above the expected value of \$4.00 (40% x \$10.00).⁹⁶ Moreover, between sixty percent and eighty percent of all bids were about \$5.00. In the WTA loss treatment, however, there was a bi-modal distribution with a fat tail on the high end. The two modes were at about \$5.00 and \$10.00, with substantial secondary modes at approximately \$12.50, \$15.00, \$20.00, and even \$30.00.⁹⁷ In other words, many subjects in the WTA loss experiments were essentially signalling either that they would only sell for the full value of the loss, if it occurred, or that they would not sell at any price. In the other three experimental treatments, subjects quickly learned the expected value of the insurance policy or lottery ticket.

Jack Knetsch and J.A. Sinden conducted several experiments that remain difficult to classify within this Article's framework.⁹⁸ They used

93. *Id.* at 173.

94. *Id.*

95. *Id.* at 174.

96. *Id.* at 177.

97. *Id.* at 179.

98. Jack L. Knetsch & J. A. Sinden, *Willingness to Pay the Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measures of Value*, 99 Q.J. ECON. 507 (1984) (reporting experiments involving trades of chocolate bars and cash in which WTA exceeded WTP); Jack L. Knetsch, *The Endowment Effect and Evidence of Nonreversible Indifference Curves*, 79 AM. ECON. REV. 1277 (1989).

lotteries involving the choice between vouchers for consumer goods or cash. In one experiment they gave lottery tickets to seventy-six subjects and offered one half of the subjects the opportunity to sell the tickets back to the experimenter for \$2.00, while the others were required to pay \$2.00 to keep their tickets.⁹⁹ They informed the subjects that the winner of the lottery would receive "either \$70 worth of merchandise vouchers redeemable at a local variety store or, at the choice of the winner, \$50 in cash."¹⁰⁰ Knetsch and Sinden claimed that, if WTA is equal to WTP and if wealth effects are negligible, the number of people who refuse to pay \$2.00 to keep the ticket and the number of people who sell the lottery ticket for \$2.00 will be equal. If WTA exceeds WTP, however, a fewer number of people should opt to sell the lottery ticket.¹⁰¹ Knetsch and Sinden observed that nineteen of thirty-eight subjects refused to pay \$2.00 for their lottery ticket, but only nine of thirty-eight agreed to sell the ticket back.¹⁰² Knetsch and Sinden performed four other sets of similarly designed experiments. In all but one of these experiments, Knetsch and Sinden found results which suggested that WTA exceeds WTP.¹⁰³ The exception was consistent with the hypothesis that WTA equals WTP.

Knetsch and Sinden designed another experiment to measure the disparity between WTA and WTP. Each of 128 subjects was given a lottery ticket entitling the winner to his choice of \$90.00 in bookstore vouchers or \$70.00 in cash. The experiment required one half of the subjects to pay to keep the tickets, while the other half was offered cash to give the tickets back. They divided buying subjects into four equally-sized groups and required the subjects to pay \$1.00, \$2.00, \$3.00, or \$4.00 for the ticket. They also divided the selling subjects into four equally-sized groups and offered them \$1.00, \$2.00, \$3.00, or \$4.00 for the tickets.¹⁰⁴ More subjects refused the compensation offer than agreed to pay for the tickets,¹⁰⁵ thus supporting Knetsch and Sinden's earlier findings. They also determined an expected value for WTA and WTP from this data by calculating the probability that a randomly-chosen individual would be willing to accept varying levels of payment, and by calculating the

99. Knetsch & Sinden, *supra* note 98, at 509-10.

100. *Id.* at 510.

101. *Id.* at 511.

102. *Id.*

103. *Id.* at 513.

104. *Id.* at 514-16.

105. *Id.* at 511-14.

probability that a randomly-chosen individual would be willing to pay various amounts. Next, they multiplied these probabilities by the amounts involved (\$1.00, \$2.00, \$3.00, or \$4.00) to obtain an expected value. They estimated that $WTP = \$1.28$ and $WTA = \$5.18$.¹⁰⁶ Thus, their evidence was consistent with the survey evidence that estimated that WTA is four to five times greater than WTP.

The summarized evidence above is mixed. Knetsch and Sinden's results suggest that WTA exceeds WTP for simple, risky securities. Knez, Smith and Williams' findings show that subjects learn over time to equate WTA to WTP, even when faced with risk.¹⁰⁷ However, McClelland and Schulze's conclusions suggest that WTA exceeds WTP for risky monetary assets under certain special circumstances, even after such learning.¹⁰⁸

3. *Does Repeated Participation in a Market Reduce the Spread Between WTA and WTP?*

This Article has already reviewed all of the studies dealing with the issue of whether repeated participation in a market reduces the divergence between WTA and WTP. Knetsch, Thaler and Kahneman found no trend toward WTA equaling WTP in their four-period experiments, but the multi-period experiments by both Coursey, Hovis and Schulze and Knez, Smith and Williams did produce evidence of such a trend. Moreover, McClelland, Schulze and Coursey found that WTA equals WTP when bidding for a lottery ticket, but WTA exceeds WTP when bidding for insurance against a loss. Thus, the results of experimentation on this issue are inconclusive and may depend on particular circumstances and contexts.

4. *By What Factor does WTA Exceed WTP?*

This Article has reviewed most of the evidence on the issue of determining the factor by which WTA exceeds WTP. The results of testing range from Coursey, Hovis and Schulze's conclusion that WTA exceeds

106. *Id.* at 515-16. Notice that this evidence for WTA exceeding WTP is much stronger than their evidence that fewer participants accepted \$2.00 to sell than were willing to pay \$2.00 to buy. If they are correct that average WTP is \$1.28 and average WTA is \$5.18, then the observed difference between willingness to buy and willingness to sell is indicative that WTA exceeds WTP.

107. Knez et al., *supra* note 84, at 401.

108. McClelland & Schulze, *supra* note 92.

WTP by a very small amount to the survey data that finds ratios of four to one, and sometimes even higher ratios.

III. EXPLANATIONS FOR THE EVIDENCE

This section of the Article reviews several explanations for the evidence presented in the section above. One explanation has been mentioned and is based on a reinterpretation of the wealth effect. The other explanations fall into two groups. First, there are psychological theories that represent alternatives to the mainstream economic assumption that individuals mentally convert all of their noncash holdings into cash and then choose, from all possible combinations of goods and services that they can afford, the one that maximizes their utility. All of these alternative explanations are more elaborate than the mainstream economic assumption, but their force is undercut by the need to categorize events, on an ad hoc basis, into separate psychological categories. We examine the following: prospect theory; value (or preference) uncertainty; existence values; the need to "close" transactions; and the "endowment effect." Second, we consider the possibility that subjects either interpret WTA and WTP questions in fundamentally different ways or misrepresent their true preferences to experimenters.

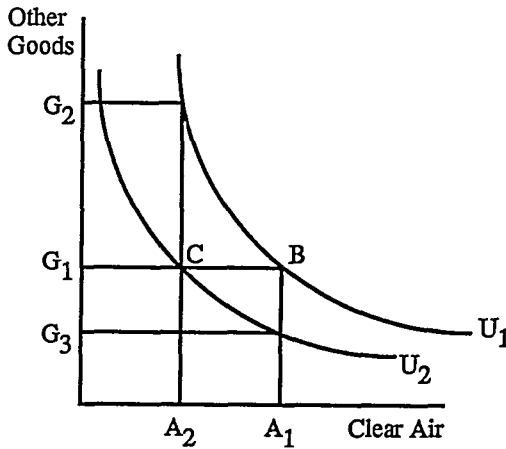
A. *Wealth Effects*

As we previously indicated, traditional wisdom held that wealth effects were small. The traditional notions, however, were based upon work that analyzed wealth effects due to *price changes*. Where *ownership* changes, however, wealth effects might be larger. Real, significant differences between WTA and WTP could result from a wealth effect associated with ownership. For example, a person who could view the Grand Canyon without smog might pay substantially more to preserve that unobstructed view than he would be willing to pay to obtain the view.

Figure 1 illustrates how such a wealth effect could be quite large. Figure 1 shows a set of "indifference curves" for clean air and other goods for a representative consumer. The consumer has G_1 of other goods to consume. If the consumer has relatively pristine air, he is at point B: consuming G_1 other goods and enjoying A_1 amount of clean air. However, if the consumer has relatively dirty air, he is at point C: on a lower indifference curve, still consuming G_1 other goods, but breathing A_2 . If asked to name the minimum that he would accept to move from point A_1

to point A_2 , the consumer endowed with pristine air would say G_2 minus G_1 . With G_2 in other goods, the “wealthier” consumer is able to remain on the same indifference curve (U_1) breathing dirtier air. If the same consumer had dirty air, however, he would say that G_1 minus G_3 was the maximum that he would pay to improve air quality from point A_2 to point A_1 . With G_3 other goods and clean air (A_1), this “poorer” consumer is on the same indifference curve (U_2) breathing cleaner air. WTA is greater than WTP for a consumer whose preferences accord with the standard economic model of consumer preferences.

FIGURE 1



W. Michael Hanemann¹⁰⁹ made this point in a recent article. He also showed that the difference between WTA and WTP can become extremely large if the income effect is positive and the elasticity of substitution between clean air and other goods is very small. “If there is zero substitutability between q and each of the private-market goods, it can happen that, while the individual would only be willing to pay a finite amount for an increase in q , there is no finite compensation that she would accept to forgo this increase.”¹¹⁰ In other words, if the elasticity

109. W. Michael Hanemann, *Willingness to Pay Versus Willingness to Accept: How Much Can They Differ?*, 81 AM. ECON. REV. 635 (1991). See JASON F. SHOGREN ET AL., EXPERIMENTAL SUPPORT FOR HANEMANN’S CONJECTURE ON THE DIVERGENCE BETWEEN WTP AND WTA MEASURES OF VALUE (Department of Economics, Iowa State University Working Paper No. 515, July 1991) (containing supporting experimental data).

110. Hanemann, *supra* note 109, at 637.

of substitution between clean air and other goods was zero, a person would be willing to pay nothing to obtain cleaner air, but he would demand infinite compensation to relinquish it. This is true because an individual with a zero elasticity of substitution is unwilling to substitute one good for another if the consumer is to remain on the same indifference curve. Thus, endowed with dirty air, the consumer will sacrifice no amount of other goods to obtain cleaner air. Any sacrifice of other goods would move the consumer to a lower indifference curve. In contrast, endowed with clean air, no amount of other goods can compensate for a deterioration in air quality since any sacrifice of air quality would move the consumer to a lower indifference curve.

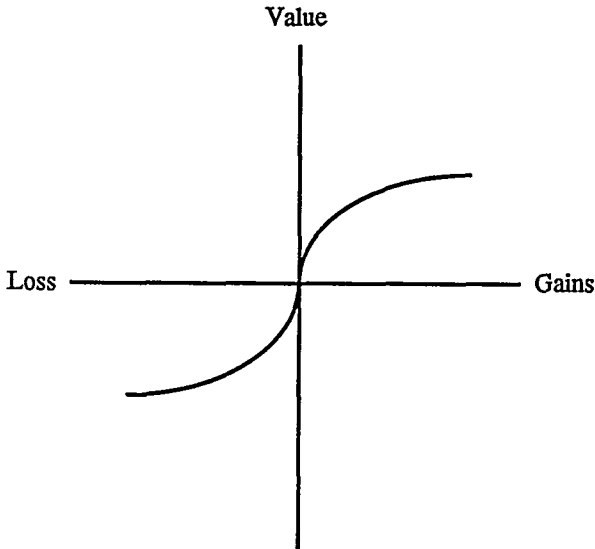
B. Prospect Theory and the Endowment Effect

Daniel Kahneman and Amos Tversky developed prospect theory to explain choice in risky situations.¹¹¹ Kahneman and Tversky posited that individuals have a "value function" defined with respect to the status quo.¹¹² This value function is pictured in Figure 2, which indicates that: (1) the value of the status quo is zero; (2) the value function for gains is positive and concave; and (3) the value function for losses is negative, convex and more steeply sloped than the value function for gains.

111. Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 263 (1979). Tversky and Kahneman recently formalized the prospect theory in riskless situations. Amos Tversky & Daniel Kahneman, *Loss Aversion In Riskless Choice: A Reference-Dependent Model*, 106 *Q.J. ECON.* 1039 (1991). They also extended it to choice situations that involve more than two options. Amos Tversky & Daniel Kahneman, *Advances in Prospect Theory: Cumulative Representation of Uncertainty*, 5 *J. RISK & UNCERTAINTY* 297 (1992).

112. Recently Daniel Kahneman, Jack L. Knetsch and Richard H. Thaler developed a theory of business fairness based on deviations from the status quo. Daniel Kahneman et al., *Fairness and the Assumptions of Economics*, 59 *J. BUS. L.* 285 (1986). See Samuelson & Zeckhauser, *supra* note 22, at 35 (discussing prospect theory under the heading of "cognitive misperceptions"). Yet the role for misperception in prospect theory is unclear.

FIGURE 2



This value function implies that a loss and a gain of equal size will not produce equal amounts of pain and pleasure; the loss will be felt more acutely.¹¹³ It also implies that a person will be risk averse regarding gains and seek risk with respect to losses.¹¹⁴ Although prospect theory is an ingenious way to explain choice in risky situations, we analyze only whether it assists in explaining the disparity between WTA and WTP.¹¹⁵

First Thaler¹¹⁶ and then Kahneman, Knetsch and Thaler¹¹⁷ adapted prospect theory to explain why WTA is greater than WTP. The com-

113. Assuming concavity of the utility function also generates the prediction that losses will be felt more acutely than gains. A concave utility function also creates the prediction that as an individual becomes wealthier the marginal utility of gains and the marginal disutility of losses become smaller.

114. This is a more extreme prediction which one could infer from concavity. A person with a concave utility function is risk averse at every point.

115. Prospect theory has been strongly criticized. See Ranald R. Macdonald, *Credible Conceptions and Implausible Probabilities*, 39 BRIT. J. MATH. & STAT. PSYCHOL. 15 (1986) (claiming that Tversky and Kahneman utilized the wrong version of probability in interpreting their subjects' responses, mis modeled the problems posed to their subjects, and failed to give proper regard to the ambiguous informational cues in the questions given to the subjects).

116. Richard Thaler, *Toward a Positive Theory of Consumer Choice*, 1 J. ECON. BEHAV. & ORG. 39 (1980); Richard Thaler, *Mental Accounting and Consumer Choice*, 4 MARKETING SCI. 199 (1985).

117. Kahneman et al., *supra* note 64.

mon theme is that losses have a larger impact than gains. Kahneman, Knetsch and Thaler argued that this theme can help explain why WTA exceeds WTP.¹¹⁸ If an individual owns a good and is offered money to relinquish it, he regards the potential sale as the loss of the good. If he does not own the good, however, and is considering purchasing it, he views the potential purchase as a gain of the good. Because losses loom larger than gains, the individual will demand more to part with a good he already owns than he will be willing to pay for the same good. In other words, WTA exceeds WTP.

Richard Thaler also adapted prospect theory, suggesting that WTA exceeds WTP because of the difference between "received income" and "opportunity cost." In order to buy a good an individual must use out-of-pocket money ("received income"). To keep a good he already owns, an individual must spend money that he would have received had he sold the good ("opportunity cost").¹¹⁹ Thaler claimed that people weigh received income more than opportunity costs, and that this difference in weighing causes people to "spend" opportunity costs more freely. Thus, a person would be willing to pay more in opportunity cost to keep a good that he already possesses than he would be willing to spend in received income to acquire the good. As a consequence, WTA exceeds WTP. Thaler referred "to the underweighing of opportunity costs as the endowment effect."¹²⁰

Prospect theory and the endowment effect provide useful social-scientific explanations for why WTA is greater than WTP. To use prospect theory or the endowment effect in normative, legal analysis, however, a search must commence for a more basic, deeper explanation. Such a deeper explanation is centered on psychological needs or perhaps sociobiological advantages of acting in accord with the prospect theory. For example, a sociobiological theory is grounded upon possible survival advantages of treating gains and losses differently. Perhaps when humans were hunter-gatherers, living at the edge of survival, significant losses threatened death and thus the failure to transmit one's genes to the next generation. Gains, on the other hand, might have produced no symmetrically greater chance of transmitting genes. Hence, from a genetic standpoint, perhaps losses were more important than gains of equivalent

118. *Id.* at 1342-46.

119. Richard Thaler, *Toward a Positive Theory of Consumer Choice*, *supra* note 116, at 44.

120. *Id.*

size.¹²¹ This explains why humans might evolve so that their decision making processes reflect a value function that is steeper for losses than for equivalent gains.

One could also reconstruct prospect theory and the endowment effect as a new explanation of why WTA exceeds WTP by relying on Margaret Radin's adaptation of Hegel's theory of property.¹²² Radin posited that property may become bound up with an individual's personality to such an extent that the person regards the property as part of his self.¹²³ Examples of such bound-up goods include one's wedding ring, favorite clothes, paintings and other home furnishings, and, perhaps, a house itself. Before such a good is purchased it has no such status; it is merely a fungible commodity. But after the good is acquired it may achieve bound-up status.

Radin's observation assists in explaining why WTA exceeds WTP. For example, if an individual, Ronald, seeks to buy a hat in the marketplace he regards hats as fungible commodities. He will be willing to pay only up to a maximum amount, WTP, for the hat. On the other hand, if Ronald already owns a hat, he will regard it as an expression of his personality. When another person, George, tries to buy that hat from Ronald, he will view parting with the hat as relinquishing some of himself, and therefore demand more money, WTA. Hence, this explains why WTA exceeds WTP.

Radin's theory of property and personhood may explain the results involving coffee mugs, pens,¹²⁴ and perhaps the right not to taste SOA,¹²⁵ but it does not explain why experiments observed a difference between WTA and WTP for securities that represent only the right to receive

121. An assumption of extreme risk aversion alone also will generate this prediction. Sociobiological explanations of individual preference patterns are now part of mainstream economics. See Ingemar Hansson & Charles Stuart, *Malthusian Selection of Preferences*, 80 AM. ECON. REV. 529 (1990).

122. Margaret J. Radin, *Property and Personhood*, 34 STAN. L. REV. 957 (1982). See Don L. Coursey & William D. Schulze, *The Application of Laboratory Experimental Economics to the Contingent Valuation of Public Goods*, 49 PUB. CHOICE 47, 55, 61 (1986) (proposing a similar theory). For an experimental test, see Don L. Coursey et al., *Fear and Loathing in the Coase Theorem: Experimental Tests Involving Physical Discomfort*, 16 J. LEGAL STUD. 217 (1987). One could recast Radin's theory as an argument about investment in consumption capital. Over time we learn how to get the most pleasure from our consumption goods. When asked for our WTA for owned goods, we include the value of new consumption capital needed to enjoy items that would replace the sold goods.

123. Radin, *supra* note 122, at 959.

124. See *supra* notes 64-70 and accompanying text.

125. See *supra* notes 23-26 and accompanying text.

cash flows. Furthermore, in order for Radin's theory to explain the coffee mugs, pens, and SOA experiments, the integration of marketplace goods into one's personality must take place almost instantaneously, because in Kahneman, Knetsch and Thaler's experiments the subjects owned the goods for only a few minutes before the experimenters asked them to reveal their WTA and WTP.¹²⁶

The endowment effect is problematic because in many circumstances it is unclear whether a change in ownership is a gain or a loss.¹²⁷ For example, assume that a grandmother tells her devoted granddaughter that when the grandmother dies she will leave her necklace to the granddaughter. Under endowment effect analysis, should the necklace be regarded as "owned" by the granddaughter while grandmother is still alive? If someone offers immediately to pay the granddaughter cash in exchange for the necklace when the grandmother dies, will the granddaughter demand WTA? On the other hand, is the necklace considered as not yet acquired, so that the granddaughter will demand less? The answers are unclear. Alternatively, assume that a person enters into a favorable contract to buy a car from a dealership, with delivery due in one month. Before the dealer delivers the car, the dealer goes bankrupt and the contract is canceled. Will the denied car buyer regard the car as a loss or as a foregone gain?

C. Closing Transactions

Mark Kelman suggested that people view an exchange as a psychological unit, and that they need to complete these psychological units by finishing transactions.¹²⁸ He concluded that this explains why people fail to ignore sunk costs. Kelman used an example of someone who paid \$100 to join a tennis club, developed a bad elbow, but continued to play with the pain even though he would not play tennis if he had not paid the

126. Kahneman et al., *supra* note 64. Outside the experimental laboratory one might observe an endowment effect as a consequence of the tax system. A person in the 30% marginal income tax bracket must earn \$100 of gross income to purchase a good that sells for \$70. Assume that he is only willing to pay \$70 to purchase it and that he does buy the item. Given that he now owns the good, he would require \$70 in *after tax* dollars to replace the good. If his tax basis in the good is less than \$70, then any that he receives over \$70 is capital gain which is taxed at ordinary income rates under the current tax regime. Hence, to produce \$70 in after tax dollars, the consumer must be paid more than \$70 for the good. Thus, he should not be willing to accept \$70 to sell the good.

127. In this context, see Peregrine Schwartz-Shea & Randy T. Simmons, *Social Dilemmas and Perceptions: Experiments on Framing and Inconsequentiality*, in *SOCIAL DILEMMAS* (David Schroeder ed., forthcoming).

128. Kelman, *supra* note 13, at 691-93.

\$100 to play tennis.¹²⁹ According to traditional utility theory, this consumer acted irrationally because \$100 is a sunk cost, which he cannot recoup and which is irrelevant to his future decisions. Kelman posited that the need to “close” transactions explains the consumer’s irrational behavior. “Consumers try to ‘close’ transactions: [he spent] \$100 . . . on tennis, and the consumer want[ed] \$100 of tennis value.”¹³⁰

Furthermore, Kelman claimed that the need to close transactions also helps to explain why WTA exceeds WTP. Once a person has acquired a good, he has closed the transaction. When someone later offers to buy the good, the person must consider reopening the closed transaction.¹³¹ The psychological need to close transactions, however, militates against reopening the transaction. The psychic cost of reopening an already closed transaction is compensated only if the person receives a larger price for sale of the good than he paid. In contrast, when the same person considers buying the same good, no transaction yet exists, and hence no psychic costs are associated with making an offer for the good. As a result, Kelman concluded that WTA exceeds WTP.

Kelman’s theory provides a good starting point to illustrate some, but not all, of the results reviewed in this Article. The theory is most persuasive when explaining results involving consumer items, such as coffee mugs or pens, where consumers habitually purchase the item, consume it, and do not resell it. The theory appears to lose persuasiveness when applied to securities, which are acquired for the instrumental purpose of making money, possibly by reselling the security if that seems most profitable. But even in the case of consumer items, Kelman’s theory applies to the experimental settings only if the experimental gifts of coffee mugs and pens represent closed transactions.

Outside of the experimental setting, Kelman’s theory is difficult to utilize. To use Kelman’s theory, one needs a precise definition of “transaction,” as well as an appropriate way to distinguish whether the transaction is closed or open. For example, assume that Ronald offered to buy a hat from George for \$10.00 and George replied that he would “think it over.” Under basic contract law doctrines, Ronald and George have formed no agreement. Yet, this does not determine whether or not Ronald has entered into a psychological transaction with George to sell the hat. If Ronald has entered into a psychological transaction, he may

129. *Id.* at 691.

130. *Id.*

131. *Id.* at 692.

feel required to close the deal. If this is the case, after a day or two he should be willing to offer more money to close the transaction. Even if one somehow knew whether Ronald had entered into a "transaction" one would also need to know how to distinguish between closed and open transactions. For example, if George agreed to sell Ronald the hat, when would the transaction close? The deal might close at the time of the agreement, or when George delivers the hat, or perhaps not until Ronald inspects the hat for defects and formally accepts it. Kelman's closing transaction theory uses intuitive answers to these questions.

D. Value (or Preference) Uncertainty

Ronald Heiner proposed a theory which has implications for understanding the disparity between WTA and WTP.¹³² He suggested that if preferences are uncertain, information is unreliable, or an individual's ability to process information is unpredictable, then economic agents tend to develop behavioral rules of thumb and institutions will generate predictable economic outcomes despite the underlying uncertainty.¹³³ Sometimes these predictable economic outcomes appear to result because agents behave "as if" they were making maximizing decisions, but other times they do not. Heiner focused on one nonmaximizing outcome which the literature by Arrow¹³⁴ and Kunreuther also discussed,¹³⁵ and which McClelland and Schulze studied in their experiments.¹³⁶ In this well-documented choice anomaly, people will insure against relatively high probability hazards, at actuarially fair prices, but will either not insure against very low probability hazards even at extremely favorable prices, or pay more than an actuarially fair price. For example, people must be subsidized to buy flood insurance in places where floods are relatively rare. In their studies, McClelland, Schulze and Coursey found that mean bids for insurance generally equaled the expected value of the loss when the loss probabilities fell between twenty percent and ninety

132. Ronald A. Heiner, *The Origin of Predictable Behavior*, 73 AM. ECON. REV. 560 (1983).

133. *Id.* at 561.

134. Kenneth J. Arrow, *Risk Perception in Psychology and Economics*, 20 ECON. INQUIRY 1 (1981).

135. HOWARD KUNREUTHER ET AL., *DISASTER INSURANCE* (1978).

136. McClelland & Schulze, *supra* note 92; see also Gary H. McClelland, William D. Schulze & Brian Hurd, *The Effect of Risk Beliefs on Property Values: A Case Study of a Hazardous Waste Site*, 10 RISK ANALYSIS 485 (1990); Gary H. McClelland, William D. Schulze & Don L. Coursey, *Valuing Low Probability Hazards: Experimental Evidence for a Bi-modal Response to Unlikely Events*, J. RISK & UNCERTAINTY (forthcoming).

percent. At a loss probability of one percent, however, twenty-five percent of the subjects bid zero and almost as many subjects bid double the expected loss value.

Richard Bishop, Thomas Heberlein and Mary Jo Kealy suggested one way in which preference uncertainty might lead to a divergence between WTA and WTP.¹³⁷ They claimed that when people are asked about WTA, they want to "play it safe," so they state amounts that are very high.¹³⁸ By stating a high WTA, respondents select an amount "at which they are relatively certain they really would sell."¹³⁹ However, this theory also fails to explain the persistence of why WTA exceeds WTP in a market setting because it does not explain how people resolve the uncertainty when they tender a genuine final offer. Unless this mechanism resolves uncertainty differently for buying and selling, the theory cannot explain the experimental results.

E. Prospect Theory, Regret Theory and Value Uncertainty

William Rankin combined regret theory, adaptive utility theory, and prospect theory into a single utility function in an effort to describe the disparity between WTA and WTP.¹⁴⁰ Regret theory, initially developed by Graham Loomes and Robert Sugden,¹⁴¹ posits that an individual makes a choice that ultimately produces a result. An individual's utility value depends not only on this result, but also on what the result would have been if he had chosen differently. If the result from a different choice would have been better than the result from the choice actually made, the individual feels *regret*. If the result from a different choice would have been worse than the result from the choice actually made, the individual *rejoices*. For example, assume that an individual must choose between buying stock *A* or stock *B*. The individual purchases stock *A* and the value of stock *A* rises, but the value of stock *B* increases

137. Richard C. Bishop et al., *Contingent Valuation of Environmental Assets: Comparisons with a Simulated Market*, 23 NAT. RESOURCES J. 619 (1983).

138. *Id.* at 629.

139. *Id.* See also Ronald A. Heiner, *Experimental Economics: Comment*, 75 AM. ECON. REV. 260 (March 1985) (proposing that experimental economics be formulated to test theories with value uncertainty).

140. William F. Rankin, *Reconciling Willingness to Pay/Willingness to Accept Disparities* (1990) (unpublished Ph.D. dissertation, University of Michigan).

141. Graham Loomes & Robert Sugden, *Regret Theory: An Alternative Theory of Rational Choice Under Uncertainty*, 92 ECON. J. 805 (1982); Graham Loomes & Robert Sugden, *Disappointment and Dynamic Consistency in Choice Under Uncertainty*, 53 REV. ECON. STUD. 271 (1986).

a greater amount. The individual will receive utility from the appreciation in the value of stock *A*, but he will also regret not purchasing stock *B*. On the other hand, if the value of stock *B* decreases, the individual would receive utility from the rise in the value of stock *A*, and rejoice because he did not purchase stock *B*.

Adaptive utility theory, as developed by Richard Cyert and Morris DeGroot, allows individuals to be somewhat uncertain about their preferences.¹⁴² As individuals participate in the market, they gain information about their preferences and adapt their behavior to this new information.

Rankin combined adaptive utility theory with regret theory by making preference uncertainty the *only* source of regret or joy. One may suffer regret ("I could have had a V8!") or rejoice ("It could be worse") caused by the resolution of uncertainty about one's preferences. As the individual eliminates uncertainty about his preferences, he eliminates the possibility of regret or joy.

Finally, Rankin combined prospect theory and regret theory by establishing the status quo as the comparison point for the regret portion of his theory and by assuming that suffering regret is more important than rejoicing.¹⁴³ These assumptions produce the "kink" in the utility function at the status quo, at least as long as the individual is uncertain about his preferences. The kinked utility function produces a WTA that is greater than WTP. However, as the individual engages in market transactions, learns his own utility function, and eliminates the source of uncertainty, WTA converges to WTP.¹⁴⁴

Rankin's derivation that WTA exceeds WTP is directly dependent on prospect theory. By attaching prospect theory's kinked utility function to adaptive utility and regret theory, Rankin hoped to separate the situations in which WTA exceeded WTP from those in which WTA equaled WTP. Rankin argued that nonmarket goods are in the first category, while market goods are in the latter. Unfortunately, the correspondence between the two pairs of categories is unclear. In Rankin's formulation,

142. Richard M. Cyert & Morris H. DeGroot, *Adaptive Utility*, in *ADAPTIVE ECONOMIC MODELS* 223-46 (R. H. Day & T. Groves eds., 1975); RICHARD M. CYERT & MORRIS H. DEGROOT, *LEARNING APPLIED TO UTILITY FUNCTIONS*, *BAYESIAN ANALYSIS IN ECONOMETRICS AND STATISTICS* 159-68 (Arnold Zellner ed., 1980).

143. Rankin gave no weight to rejoicing in his formulation, but any formulation that weighted regret more than rejoicing would produce the same result.

144. Rankin, *supra* note 140, at 117-19.

WTA is greater than WTP because of preference uncertainty; but some of the experiments uncover the disparity even for common consumer items (such as candy bars or coffee mugs) and simple securities. Furthermore, some of the repeated participation in markets that appears to push WTA toward WTP does not involve repeated sampling of the result that would squeeze out preference uncertainty.¹⁴⁵

Despite these shortcomings, Rankin's approach is sound. It properly explains why WTA exceeds WTP in *some* situations, and it also appropriately explains why WTA and WTP will converge in *some* situations. To his credit, Rankin did not claim that his theory explains the disparity in all situations. Where it does apply, Rankin's approach is useful. To address the disparity in other situations, however, other explanations are necessary.

F. *Explanations Suggesting True WTA Equals WTP:*

1. *Misrepresentation*

Kahneman, Knetsch and Thaler suggested one possibility that may explain why true WTA equals WTP: individuals habitually misstate WTA as greater than WTP because in many contexts they are rewarded for this misstatement.¹⁴⁶ As a result, these habits spill over into contexts where no such rewards exist. If this explanation has validity, WTA should move closer to WTP in a market setting. Once the subject is confronted with a genuine final offer in a real market, gains from misrepresentation no longer exist.¹⁴⁷

As discussed above,¹⁴⁸ evidence on convergence in a market setting is mixed. Coursey, Hovis and Schulze and Knez, Smith and Williams concluded that WTA and WTP do converge when the good in question is the right to avoid tasting the SOA—the bitter tasting liquid in Coursey, Hovis and Schulze's experiment—or a security.¹⁴⁹ Kahneman, Knetsch and Thaler, however, arrived at the opposite conclusion when the transaction involved small consumer goods.¹⁵⁰ McClelland and Schulze

145. *E.g.*, Coursey et al., *supra* note 23 (subjects did not have to taste the SOA in each experimental market round).

146. Kahneman et al., *supra* note 64, at 1336. They attributed this theory to Knez et al., *supra* note 84, at 398.

147. Some of the strategy, however, might be preserved if people bargain over an asset with unknown value.

148. *See* Part II B.

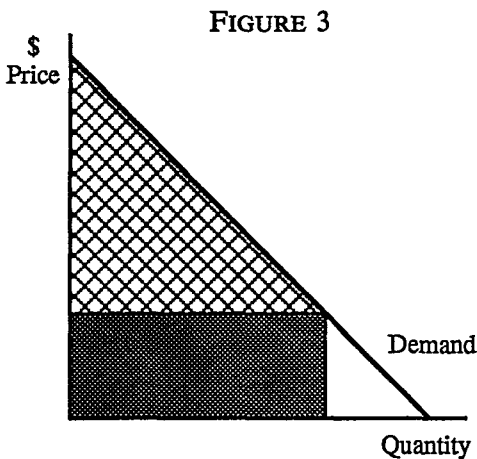
149. Coursey et al., *supra* note 23, at 688; Knez et al., *supra* note 84.

150. Kahneman et al., *supra* note 64.

found that WTA converges quickly to WTP for uncertain gains, but does not converge at all for uncertain losses.¹⁵¹ Boyce et al. concluded that WTA converges “close” to WTP when the transaction involved a tree that will not be destroyed, but does not converge at all for a tree that will be destroyed if not sold or purchased.¹⁵²

2. Experimenters Frame Questions Incorrectly

In hypothetical surveys, respondents might legitimately interpret WTA and WTP questions as seeking different responses. For example, suppose an individual has a normal downward-sloping demand for a good, as shown in Figure 3. When asked his willingness to pay, thinking of some number of units being sold, the individual responds with the lower, shaded rectangle. This is the amount that he would have to pay to obtain the good in a competitive market. On the other hand, when asked his willingness to accept compensation, the individual responds with the entire consumer’s surplus over those units (the area under the demand curve). This total includes the shaded rectangle and the cross-hatched upper triangle. While this area also represents the true maximum willingness to pay, the individual either does not interpret the WTP question as asking for consumer’s surplus or he does not want to reveal to the surveyor his maximum willingness to pay.



151. McClelland & Schulze, *supra* note 92.

152. Boyce et al., *supra* note 53.

While this explanation may help elucidate why survey responses to WTA and WTP questions sometimes differ, it also creates problems in interpreting those differences. First, in many surveys it is not clear in what units the experimenters denominated a good. Therefore, the surveyor may ask the subject the question for WTA and WTP over one unit, while the subject may interpret the question in terms of multiple units. If each individual assumes a different number of units, there is no comparability. Second, their explanation does not offer a conclusion regarding why subjects decreased WTA over the course of Coursey, Hovis and Schulze's auctions¹⁵³ or why they believed WTA was equal to WTP in McClelland and Schulze's WTA/gain auctions.¹⁵⁴ Why would subjects interpret the questions differently in one WTA experiment and similarly in another? Finally, this explanation fails to explain Knetsch and Sinden's experiments in which many fewer transactions than anticipated actually resulted.

IV. IMPLICATIONS

In this section, this Article discusses two different types of implications (positive and normative) that result from the WTA and WTP experiments. The positive implications center on differences in observed behavior.¹⁵⁵ The differential between WTA and WTP may suggest that both Coasian bargaining and organized markets operate differently than originally believed. The normative implications address the options that policy makers believe society ought to choose.

A. Positive Implications

1. The Coase Theorem

In two-person bargaining situations, WTA exceeding WTP would tend

153. Coursey et al., *supra* note 23, at 685-86.

154. McClelland & Schulze, *supra* note 92.

155. In an excellent article, Lewis Kornhauser noted that $WTA > WTP$ has occupied the center of the Critical Legal Studies ("CLS") assault on positive predictions of law and economics. Lewis A. Kornhauser, *The Great Image of Authority*, 36 STAN. L. REV. 349, 358-60 (1984).

This assault has had less impact than its authors, particularly Kelman, might have hoped for, because most economists regard the offer/asking price problem as a minor anomaly with which economics will eventually cope. After all, the offer/asking price problem arises not at a theoretical level but at a level of application. For any initial allocation of endowments, one can, in theory, calculate the resulting allocations of goods and services.

Id. at 360.

Regardless of whether WTA exceeds WTP is a minor anomaly, Kornhauser correctly concluded that one can compute market outcomes, given starting points. This Article does exactly that.

to reduce the number of voluntary trades. Specifically, if two parties bargained over a right, and if each party's WTA exceeded the other party's WTP, no trade would occur. In such a situation, a buyer is unable to offer enough money to persuade the owner to give up the right. For example, assume that George owned a hat and Ronald wanted to buy it. Further assume that George's WTA is \$15.00, but his WTP is only \$10.00, whereas Ronald's WTP is \$11.00 and his WTA is \$16.00. At most, Ronald would offer \$11.00 (his maximum WTP), while George would accept no less than \$15.00 (his minimum WTA). Consequently, Ronald and George will not trade. On the other hand, if Ronald owned the hat, he would accept no less than \$16.00 (his minimum WTA), while George would offer no more than \$10.00 (his maximum WTP). Based on these WTA and WTP values for both parties, the right to the hat is "sticky"—it will stick with whichever party originally owned it.¹⁵⁶

However, a profit-maximizing entrepreneur might significantly alter this scenario. Assume that Geraldine knows George's and Ronald's WTA and WTP. If Ronald owned the hat, Geraldine could do nothing to make money. But if George owned the hat, Geraldine could pay George \$15.00 (his minimum WTA), allow Ronald to use the hat as if he owned it, and then later threaten to take the hat away from him. If allowing Ronald to use the hat raised his valuation of the hat from WTP to WTA (and some explanations, particularly the version of the endowment effect suggested by Radin's work,¹⁵⁷ suggest that it would), then Geraldine could receive \$16.00 (Ronald's minimum WTA) in exchange for the hat. In this way Geraldine could make a profit and, regardless of who originally owned the hat, Ronald would ultimately own it. Furthermore, if George knew what Geraldine knew and if he had the same entrepreneurial skills, he could execute Geraldine's strategy himself. Hence, this simple scenario may restore the Coase Theorem's invariance result.

2. Markets

Recall that our simple model of organized markets utilizes supply and demand curves. The supply curve represents a graph of all the units that would be supplied in the market at each possible price. The demand

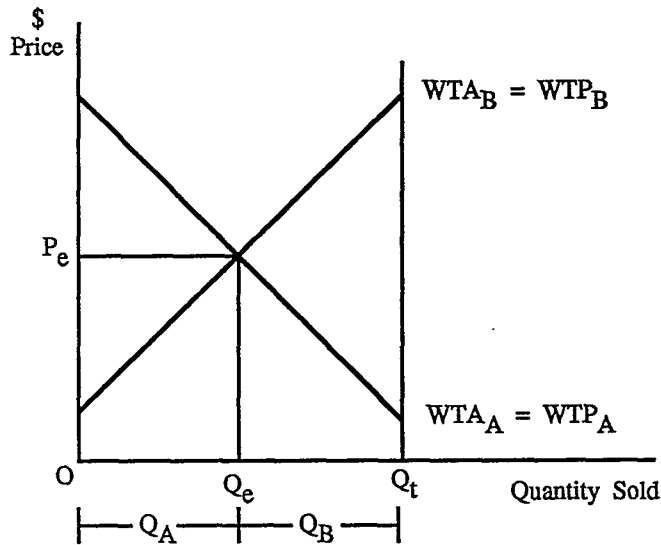
156. See Jack L. Knetsch, *Legal Rules and the Basis for Evaluating Economic Losses*, 4 INT'L REV. L. & ECON. 5, 10 (1984) (recognizing that rights are likely to remain where they are originally assigned because of transaction problems).

157. See *supra* notes 122-26 and accompanying text.

curve represents a graph of all the units that would be demanded at each possible price. Consider the situation, depicted in Figure 4, in which two individuals, *A* and *B*, are exchanging goods for money. The vertical axis represents the good's unit price and the horizontal axis represents units of the good. Q_t represents the total amount of the goods available for exchange. At point "0" on the horizontal axis, *B* owns all of the goods. Movements to the right along the horizontal axis represent transfers from *B* to *A*. At Q_t on the horizontal axis, *A* owns all of the goods. Movements from Q_t to the left along the horizontal axis represent transfers from *A* to *B*. The baseline condition, in which WTA equals WTP at every quantity for both *A* and *B* is represented by the curves $WTP_A = WTA_A$ and $WTA_B = WTP_B$. The graph is set up with *A* as the buyer and *B* as the seller, but since WTP equals WTA for each person, the roles could be reversed without changing the outcome.¹⁵⁸ Regardless of who initially owns the good, ultimately *A* will own Q_A units and *B* will own Q_B units. P_C will represent the price for the units exchanged, regardless of who is buying and who is selling.

158. Each curve in Figure 4 represents the rate at which each individual is willing to exchange goods for money. Starting at point 0 on the quantity axis, person *A* has money, but no goods. Person *B* has all the goods, but little money. Similarly, starting at Q_t on the quantity axis, *B* has money, but no goods. Person *A* has all the goods, but little money. Person *A*'s demand curve for goods declines from the left, while his supply curve rises from the right. Person *B*'s demand curve for goods declines from the right, while his supply curve rises from the left. At the point of equilibrium (Q_e, P_e), supply equals demand from either market perspective.

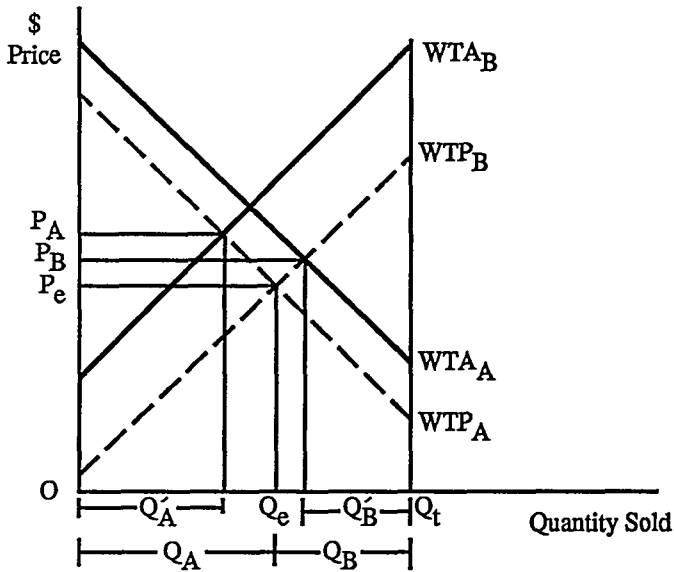
FIGURE 4



Now, suppose that WTA_A exceeds WTP_A and WTA_B is greater than WTP_B . This situation is depicted in Figure 5. The dashed WTP lines represent the baseline case illustrated in Figure 5 ($WTA = WTP$) and the solid WTA lines illustrate the effect of a WTA greater than WTP. Viewing the graph from left to right, A is the buyer, with the dashed demand curve WTP_A . B is the seller, with solid supply curve WTA_B . Now the equilibrium exchange shows B selling only $Q_A' < Q_A$ units to A at a higher price ($P_A > P_e$). Similarly, viewing the graph from right to left, B is the buyer, with the dashed demand curve WTP_B . A is the seller, with solid supply curve WTA_A . Now the equilibrium exchange shows A selling only $Q_B' < Q_B$ to B at a price of $P_B > P_e$. Thus A will ultimately own more of the goods, relative to the baseline case, if he owned all of the goods initially. Similarly, B ultimately owns more if he originally owned all of the goods. The final allocation of the good is not invariant to the initial distribution of rights. P_A might be greater than, less than, or equal to P_B . But, both prices will be higher than P_e as long as demand is downward sloping (supply upward sloping) for both individuals. Thus, in general, fewer units are transferred at a higher price if WTA exceeds WTP. These results—higher prices with fewer units transferred from owners—

assume that the buyer and seller are price takers. If they are price seekers, one could reinvent the Ronald/George/Geraldine scenario (involving the sale of a hat) previously discussed.¹⁵⁹ The price taking assumption seems appropriate, however, for extending these results to markets.

FIGURE 5



The above discussion involving only two individuals extends immediately to competitive markets simply by considering the individual supply and demand curves as market supply and demand curves. There are, however, two caveats. First, in a market, the WTA and WTP of the marginal market participants determine the equilibrium price and quantity. Thus, in a competitive market, it is possible for some participants to have WTA exceeding WTP without affecting market prices or transactions. As long as a sufficiently large number of participants have a WTA that equals WTP for prices and quantities in the vicinity of the equilibrium, one might not observe a reluctance to trade from market data. If the marginal participants exhibit a reluctance to trade, however, the situation depicted in Figure 5 could result. Second, this analysis assumes that WTA

159. See *supra* Part IV.A1.

exceeds WTP on both sides of the market. However, in many markets for new consumer goods this assumption is probably incorrect. Assume that in most transactions sellers are firms, with WTA equal to WTP, while buyers are individuals. Hence, only the firms' WTP (which is equal to WTA) curve, and the individuals' WTP (which is less than WTA) curve are important. Consequently, Figure 5 would not apply. But in other markets, such as the residential real estate market, individuals appear in great numbers on both sides of the market. In these markets the analysis in Figure 5 applies.

Understanding the disparity between WTA and WTP may also generate more sophisticated analyses of "political markets." A rapidly growing segment of political science analyzes politics from a rational choice perspective. Voters, political representatives, bureaucrats and interest groups all maximize their own welfare, subject to institutional constraints.¹⁶⁰ Virtually all of the studies in this area use some form of the expected utility theory as the basis for human decision making. If gains and losses are viewed differently, at least by voters, the implications for the analysis of politics are potentially tremendous. Roger Noll and James Krier's recent article represents the first tentative steps in this direction.¹⁶¹ Their article attempts to gain insight into the politics of risk regulation, when voters are presumed to care more about losses than gains. One could extend such analysis to explain the particular political salience of military base or factory closings (as opposed to failing to open military bases or factories), increases in the unemployment rate, and many other issues.

B. Normative Implications

This section speculates on more general normative implications of

160. Michael E. Levine, *Revisionism Revised: Airline Deregulation and the Public Interest*, 44 L. & CONTEMP. PROBS. 179 (Winter 1981); Michael E. Levine & Jennifer L. Forrence, *Regulatory Capture, Public Interest, and the Public Agenda: Toward a Synthesis*, 6 J.L. ECON. & ORG. 177 (Special Issue 1990); DENNIS C. MUELLER, *PUBLIC CHOICE II* (1989); DANIEL A. FARBER & PHILIP P. FRICKEY, *LAW AND PUBLIC CHOICE* (1991); Matthew L. Spitzer, *Antitrust Federalism and Rational Choice Political Economy: A Critique of Capture Theory*, 61 S. CAL. L. REV. 1293 (1988).

For a theory of bias in favor of the status quo at the societal level that does not rely on WTA exceeding WTP in individuals, see Raquel Fernandez & Dani Rodrik, *Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty*, 81 AM. ECON. REV. 1146 (1991).

161. See Roger G. Noll & James E. Krier, *Some Implications of Cognitive Psychology for Risk Regulation*, 19 J. LEGAL STUD. 747 (1990); Matthew L. Spitzer, *Comment on Noll and Krier, Some Implications of Cognitive Psychology for Risk Regulation*, 19 J. LEGAL STUD. 801 (1990).

WTA exceeding WTP, suggesting that these implications may be extremely important.

1. *Resolving Disputes About Rights and Damages*

The courts must often determine which side of a dispute has the legal right to engage in a particular activity. For example, if a homeowner sued a smelter for polluting the air, the court would have to determine whether the smelter had the right to pollute or whether the homeowner had the right to clean air before the court could decide whether to issue an injunction¹⁶² or to award damages.¹⁶³

Guido Calabresi and A. Douglas Melamed have suggested that courts should resolve such disputes by estimating the level of pollution that maximizes the net social benefits and then assigning the rights so as to minimize the transaction costs associated with enforcing that level of pollution. Net social benefits are estimated by subtracting the smelter's cost of reducing pollution from the homeowner's benefits of reduced pollution. Net benefits are maximized when the marginal cost of further pollution reduction exactly equals the marginal benefit of further pollution reduction.¹⁶⁴

The possibility that WTA exceeds WTP is generally nonexistent in this analysis. Which value should a court use when WTA is greater than WTP to determine the homeowner's benefit of reduced pollution? The answer is crucial because it may determine which side will receive the right. For example, consider a situation in which air pollution is de-

162. *Boomer v. Atlantic Cement Co.*, 257 N.E.2d 870 (N.Y. 1970).

163. *Estancias Dallas Corp. v. Schultz*, 500 S.W.2d 217 (Tex. Ct. App. 1973).

164. Thus, Calabresi and Melamed would argue that if the air is highly polluted and if it would be difficult for homeowners to reach a private agreement with the smelter to reduce pollution, then the court should grant the right to clean air to the homeowners and then determine and enforce a damage assessment scheme. If there are many homeowners and only one smelter, however, it might reduce transaction costs to grant the homeowners the right to clean air and make the smelter pay, even if the pollution is moderate. On the other hand, if pollution is moderate and there is only one affected homeowner who has recently moved into the area, the court might grant the smelter the right to pollute and let the homeowner pay the smelter to reduce pollution. Calabresi & Melamed, *supra* note 8, at 1106-07. See also Robert Cooter, *Unity in Tort, Contract and Property: The Model of Precaution*, 73 CAL. L. REV. 1 (1985); POLINSKY, *supra* note 8, at 93-95.

If wealth effects associated with different distributions of rights are small, and if transactions costs are vanishingly small, then the Coase Theorem predicts that any distribution of rights will lead to a level of pollution which maximizes net benefits. However, transactions costs associated with differential bargaining power, with strategic behavior, or with information costs might make it easier and more efficient to reach the pollution level which maximizes net benefits by assigning rights to the appropriate party.

scribed in parts per million ("ppm"). Assume that the air is currently heavily polluted (1000 ppm), and the court must decide whether the smelter should install scrubbers to reduce pollution to 100 ppm and compensate the homeowner for past pollution. Now suppose that the homeowner would require (WTA) \$1000 to accept that reduction in air quality if the air quality was originally 100 ppm, but that he would only be willing to pay (WTP) \$100 to effect that reduction in pollution if the air quality was initially 1000 ppm. Further assume that the smelter will incur \$500 in costs to install the scrubbers.

If the smelter has the right to pollute, then the cost of reducing pollution (\$500) is greater than the benefit (\$100). Thus, the court should not require the smelter to install scrubbers and should not award compensation to the homeowner. The net benefit of installing scrubbers is $-\$400$ ($\$100 - \500). Conversely, if the homeowner owns the legal right to clean air, and if the legal right controls the choice of value, then the net benefit of reduced pollution is \$500 ($\$1000 - \500) and the court should order the smelter to install scrubbers. Moreover, the homeowner has incurred real damages equal to the cost of pollution control in the past. Which analysis is correct? Neither articulation is correct unless one knows the allocation of rights a priori. Yet, the valuation of net benefits is often part of the process of determining rights a priori. Such an analysis is therefore circular when WTA exceeds WTP.¹⁶⁵

This circuitous analysis hobbles legal doctrines that rely on estimates of net benefits. For example, when accidents produce damages, tort law frequently uses the negligence rule to allocate losses. One version of the negligence rule asks whether a defendant could have taken cost-justified steps to avoid the accident: if the defendant could have taken steps to avoid the accident such that the cost of prevention would have been less than the expected savings in accident costs, then the defendant is negligent and must pay for the plaintiff's damages.¹⁶⁶

165. See Kennedy, *supra* note 13; Hovenkamp, *supra* note 13 (containing proofs that implicitly extend value-maximization to a comparison of the sum of state-contingent values). In the smelter/homeowner example, Hovenkamp's procedure would assign the rights to the homeowner, for $WTA = \$1000$, the largest contingent value for the rights. What remains unanswered is *why* one should compare the state-contingent values as a welfare criterion. Hovenkamp proceeds to show that $WTA > WTP$ introduces many other problems for the use of his reformulated version of wealth maximization. *Id.* at 245-46.

166. See *United States Fidelity & Guaranty Co. v. Plovodba*, 683 F.2d 1022 (7th Cir. 1982); *United States v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir.), *reh'g denied*, 160 F.2d 482 (2d Cir. 1947).

This negligence rule is more easily understood with an example. In the famous case of *Bolton v. Stone*,¹⁶⁷ Bessie Stone was hit on the head by a cricket ball that was hit over the fence at a cricket club located across the street from her residence.¹⁶⁸ The batsman's blow was quite unusual since only a few balls had ever been hit out of the park before.¹⁶⁹ Ms. Stone sued the club, claiming that its failure to put up a higher fence constituted negligence.¹⁷⁰ In effect, Ms. Stone claimed that the club's cost of installing a higher fence would have been less than the expected reduction in accident costs to those standing in their front yards across the street from the club. Ms. Stone contended that because the club was negligent it should pay her medical expenses and other costs associated with her injury. To answer Ms. Stone's claim, the court compared the club's cost of installing a higher fence with the expected accident cost savings that a higher fence would prevent by catching cricket balls in the fence before they exited the club.¹⁷¹

The potential disparity between WTA and WTP adds a crucial element of moral ambiguity into the court's negligence calculus. To see this, assume that the cricket club would incur \$100 in costs to install a higher fence, and that Ms. Stone was willing to pay only \$50 to be free of the cricket ball risk eliminated by the higher fence, but that she would demand \$150 to agree to the imposition of such risk. If the court used the WTP values, then the club would not be negligent since \$100 is greater than the expected benefit of \$50: Ms. Stone would have no claim against the cricket club. On the other hand, if the court used the WTA values, the court would find that the club could have avoided \$150 of expected harm by spending only \$100: clearly a cost-justified expenditure on accident avoidance. The club would have been negligent and liable to Bessie Stone. The crucial question then becomes: should the court use WTA or WTP figures when resolving the negligence issue? Unfortunately, there is no easy or obviously correct answer.¹⁷²

167. *Stone v. Bolton*, [1950] 1 K.B. 201 (C.A.); *Bolton v. Stone*, [1951] A.C. 850.

168. *Stone*, 1 K.B. at 202.

169. *Id.*

170. *Id.*

171. *Id.* at 205-08.

172. Richard S. Markovits, *Duncan's Do Nots: Cost/Benefit Analysis and the Determination of Legal Entitlements*, 36 STAN. L. REV. 1169 (1984) (suggesting that cost/benefit analysis is inappropriate in situations where rights-based norms, such as fairness, justice, or settled expectations, determine allocations of rights). Hence, cost/benefit analysis will be of little value in *judicial* settings. But in legislative, and perhaps administrative settings, cost/benefit analysis may be useful, possibly in conjunction with other normative approaches, to make social policy. Markovits resolved the

Jack Knetsch suggests resolving the moral ambiguity by assigning special status to the benefits enjoyed by people in the status quo.¹⁷³ He posits that if people are currently enjoying clean air, water, or access to sunshine, then any net benefit assessment should use WTA figures, regardless of whether the people enjoy the legal right to these benefits. He states that one should discount the value of the resources they currently enjoy by the probability that they can continue to enjoy them. "The welfare associated with any set of expectations and entitlements will likely, all other things equal, reflect their security; more tenuous ones will be discounted relative to ones more certain of protection."¹⁷⁴ Thus, if a court is unlikely to uphold the legal right to enjoy the resource, then the value of enjoying the right should be discounted.

Knetsch's reference to "expectations and entitlements" injects ambiguity into the analysis. If one focuses on "entitlements," then Knetsch's resolution of the problem is essentially the "property rights" solution described above. Instead of determining whether the claimants have a legal right to use a resource that may be withdrawn (and using the WTA value if they have a legal right, the WTP value if they do not), Knetsch would presumably compute the probabilities of the alternative legal outcomes, multiply the WTA and WTP values by their probabilities, and then add these numbers to determine the value of the rights. In essence, Knetsch's value is grounded in whether the claimants have a legal right to the resource that they currently enjoy, but the right's value is discounted for

problem of $WTA > WTP$, at least as far as the disparity is generated by wealth effects, by evaluating a move from policy *A* to policy *B* in the following manner. He used WTP in state *B* for losers, and WTA in state *B* for gainers. *Id.* at 1179. He contended that this meets the expectations of policymakers and members of the public. *Id.* at 1180. These figures will match actual values if the change is made because no compensation will actually take place. *Id.* at 1180-81. Markovits claimed that this is the only "correct, nonarbitrary" way to measure the equivalent dollar benefits and costs that a policy will generate." *Id.* at 1182.

It is not clear why Markovits' approach is correct or nonarbitrary, although it may actually match the expectations of policymakers and the general public. The numbers that his approach generates may match the values that the individuals will hold if the move from *A* to *B* is effected, but why these are the normatively relevant figures is unclear. One could also easily argue that the numbers obtained with wealth levels in state of the world *A* are relevant, because the cost/benefit analysis is done *before* any change is made. In addition, Markovits claimed that his suggestion disposes of normative questions stemming from $WTA > WTP$, regardless of whether the disparity arises from wealth effects or from other psychological causes. *Id.* at 1178. Even if one accepts Markovits' approach to the wealth effects issue, it does not necessarily follow that the normative issues stemming from other sources of $WTA > WTP$ can be addressed in the identical manner.

173. Knetsch, *supra* note 156, at 11-12.

174. *Id.* at 11.

risk of loss. This theory, however, has the same basic problem we noted above. If one must rely on who has the right before commencing the cost analysis, then the process is circular.

However, if one focuses on "expectations," then Knetsch's theory is quite different. Knetsch claims that policy analysis and legal decisions should turn on values implied by individuals' true beliefs about the status quo, regardless of legal rules.¹⁷⁵ Such an approach might have promise, but it will face both practical and normative problems. On the practical side, it may be difficult to get disputants to reveal their honest beliefs about the status quo when they know that their rights or wealth depend upon their answers.¹⁷⁶ In addition, conflicting, inconsistent beliefs about the status quo exist. Should the analyst or judge prefer one or another of the beliefs, or construct a new, artificial belief based upon those honestly held by the involved parties? If the analyst or judge must choose the beliefs of one of the parties, then he must do so based upon a foundation other than the legal rights of the parties, lest the solution again become circular.¹⁷⁷ This requires a moral theory that explains why one *ought* to respect a particular view of the status quo. Such a moral theory might point to a particular view of the status quo that is not held by anyone—in effect requiring the analyst or judge to construct a new, artificial belief. This conclusion points out the inexorable link between practical and normative problems. Considering how to privilege certain beliefs over others requires an explanation regarding *why* one ought to consider *any* beliefs about the status quo. If there is a good reason to reject all beliefs about the status quo as unreasonable, then perhaps one should refuse to use such beliefs as the basis for a cost/benefit analysis that will support policy recommendations or judicial decisions.

The disparity between WTA and WTP may also figure into other arguments. In a recent working paper Knetsch and David Cohen contend that the common law, as well as some statutes, reflect the insight that

175. Jack L. Knetsch, *Environmental Policy Implications of Disparities Between Willingness to Pay and Compensation Demanded Measures of Values*, 18 J. ENVTL. ECON. & MGMT. 227, 235 (1990) (taking exactly this position).

176. See Allan Gibbard, *Manipulation of Voting Schemes: A General Result*, 41 ECONOMETRICA 587 (1973); Mark A. Satterthwaite, *Strategy-Proofness and Arrow's Conditions: Existence and Correspondence Theorems for Voting Procedures and Social Welfare Functions*, 10 J. ECON. THEORY 187 (1975); Theodore Groves & John Ledyard, *Optimal Allocation of Public Goods: A Solution to the "Free-Rider Problem,"* 45 ECONOMETRICA 783-809 (1977).

177. If legal rights imply beliefs about the status quo, which imply values, which in turn imply legal rights, then a circuitous causation exists.

WTA exceeds WTP.¹⁷⁸ Legal rules can be understood, they claim, as attempts to maximize fairness or efficiency, given the disparity between WTA and WTP.

Cohen and Knetsch's argument can be refined using this Article's insights. They build an argument based upon the presumption that WTA exceeds WTP in all places, for all people, and at all times. Thus, they "explain" and justify the law of adverse possession,¹⁷⁹ recovery of lost profits in tort and contract,¹⁸⁰ contract modifications,¹⁸¹ gratuitous promises,¹⁸² opportunistic conduct in contractual performance or negotiation,¹⁸³ and repossession,¹⁸⁴ with reference to the same disparity between WTA and WTP. However, some of the parties are individuals, while others are corporations. In addition, the subject matter of the disputes that Cohen and Knetsch reviewed range from extremely personal items (such as jewelry or furniture) to completely fungible items (such as aluminum ore or money).¹⁸⁵ The evidence reviewed above suggests that the disparity between WTA and WTP may vary widely between these cases. Consequently, Cohen and Knetsch's analysis should either explain how the law tracks the disparity variations, or else explain why the law fails to do so.

A similar critique applies to the most prominent attacks upon cost/benefit analysis. Duncan Kennedy and Mark Kelman advance many of the same arguments previously discussed based upon the presumption that WTA is greater than WTP. They suggest that cost/benefit analysis lacks legitimacy.¹⁸⁶ However, their analysis rests upon a rather blunt notion that WTA exceeds WTP, without any notion of the limitations of the evidence on that question. Moreover, the legal

178. The disparity between WTA and WTP may also figure in other arguments. See DAVID COHEN & JACK L. KNETSCH, *JUDICIAL CHOICE AND DISPARITIES BETWEEN MEASURES OF ECONOMIC VALUES* (Simon Fraser University Working Paper, 1990).

179. Cohen & Knetsch are deliberately unclear about exactly what determines expectations about the status quo. They also exhibit a strongly positive flavor in their paper. They devote a great deal of effort to trying to demonstrate that the courts have decided disputes in accord with their theory of fairness; they assert that when this fact is understood many of the "puzzles" of law can be explained. Any rights-protecting theory should appear to protect the status quo. A theory of how to identify the rights by using WTA exceeds WTP would make Cohen and Knetsch's paper conclusive.

180. COHEN & KNETSCH, *supra* note 178, at 18-21.

181. *Id.* at 21-22.

182. *Id.* at 22-25.

183. *Id.* at 21-33.

184. *Id.* at 33-36.

185. *Id.*

186. See Kennedy, *supra* note 13; Kelman, *supra* note 13.

articles that cite to Kelman and Kennedy also adopt the same blunt proposition that WTA is greater than WTP.¹⁸⁷

This leads to the central normative insights of the Article. If evidence

187. See Christopher H. Schroeder, *In the Regulation of Manmade Carcinogens, If Feasibility Analysis is the Answer, What is the Question?*, 88 MICH. L. REV. 1483, 1502-03 (1990) (citing Kelman and Kennedy for the proposition that WTA exceeds WTP); John J. Donohue III, *Diverting the Coasean River: Incentive Schemes to Reduce Unemployment Spells*, 99 YALE L.J. 549, 606 (1989) (citing Kelman for the proposition that some would claim "that the power of the market is so great and unyielding that it resembles a surging river that overruns all obstacles"); David M. Frankford, *Creating and Dividing the Fruits of Collective Economic Activity: Referrals Among Health Care Providers*, 89 COLUM. L. REV. 1861, 1871 (1989) (citing both Kelman and Kennedy on wealth effects); William W. Fisher III, *Reconstructing the Fair Use Doctrine*, 101 HARV. L. REV. 1659, 1699 n.196 (1988) (citing Kelman for the proposition that WTA and WTP diverge); Michael A. Fitts, *The Vices of Virtue: A Political Party Perspective on Civic Virtue Reforms of the Legislative Process*, 136 U. PA. L. REV. 1567, 1572 (1988) (describing, but not relying upon, Kelman and Kennedy); Joseph W. Singer, *The Reliance Interest in Property*, 40 STAN. L. REV. 611, 720 (1988) (citing both Kennedy and Kelman for the proposition that WTA is greater than WTP); Louis Michael Seidman, *Public Principle and Private Choice: The Uneasy Case for a Boundary Maintenance Theory of Constitutional Law*, 96 YALE L.J. 1006, 1023 (1987) (citing Kelman for the proposition that WTA exceeds WTP); Stewart E. Sterk, *Neighbors in American Land Law*, 87 COLUM. L. REV. 55, 71 (1987) (citing Kelman as questioning the Coase Theorem); Jeffrey L. Harrison, *Egoism, Altruism and Market Illusions: The Limits of Law and Economics*, 33 UCLA L. REV. 1309, 1358 (1986) (assuming that WTA exceeds WTP and citing Kennedy in support of that proposition); Mark Sagoff, *The Principles of Federal Pollution Control Law*, 71 MINN. L. REV. 19, 53 (1986) (citing Kelman for the proposition that WTA exceeds WTP); Robert E. Scott, *Error and Rationality in Individual Decisionmaking: An Essay on the Relationship Between Cognitive Illusions and the Management of Choices*, 59 S. CAL. L. REV. 329, 339-40 (1986) (citing Thaler and Kelman for the proposition that WTA exceeds WTP in the consumer, but not producer, context); Cass R. Sunstein, *Legal Interference with Private Preferences*, 53 U. CHI. L. REV. 1129, 1150-51 (1986) (citing Thaler, Kelman, and Kennedy for the proposition that WTA is greater than WTP, and then speculating on the psychological explanations); Duncan Kennedy, *The Role of Law in Economic Thought: Essays on the Fetishism of Commodities*, 34 AM. U. L. REV. 939, 963 (1985) (restating Kelman's thesis on a more general level); Saul Levmore, *Explaining Restitution*, 71 VA. L. REV. 65, 77 (1985) (citing Kelman and Kennedy for the proposition that "[e]conomic actors may be more concerned with tangible losses than with missed opportunities of equal or greater value"); Lewis A. Kornhauser, *The Great Image of Authority*, 36 STAN. L. REV. 349 (1984) (noting that the emphasis upon WTA is greater than WTP distinguishes CLS attacks upon the efficiency norm from economists' critiques); Richard S. Markovits, *supra* note 172, at 1178 (claiming to find many errors in Kennedy's attack on cost/benefit analysis, but accepting that WTA is greater than WTP); Carol M. Rose, *Mahon Reconstructed: Why the Takings Issue is Still a Muddle*, 57 S. CAL. L. REV. 561, 583 (1984) (citing Kelman for the proposition that wealth effects are changing economic allocations); Joseph W. Singer, *The Player and the Cards: Nihilism and Legal Theory*, 94 YALE L.J. 1 (1984) (citing Kelman as a critic of law and economics); Michael L. Ziegler, *Takings Law and the Contract Clause: A Takings Law Approach to Legislative Modifications of Public Contracts*, 36 STAN. L. REV. 1447, 1465 (1984) (applying WTA is greater than WTP to covenants in land); Donald H. Gjerdingen, *The Coase Theorem and the Psychology of Common-Law Thought*, 56 S. CAL. L. REV. 711, 750-52 (1983) (extensively discussing Kelman's examples); Note, *Subjects of Bargaining Under the NLRA and the Limits of Liberal Political Imagination*, 97 HARV. L. REV. 475, 489 (1983) (citing Kelman for the proposition that a union will value rights more if it already has the rights).

were to show that WTA is greater than WTP under all circumstances, then Kelman and Kennedy's critique of cost/benefit analysis, and Cohen and Knetsch's explanation of legal doctrines, might represent appropriate arguments. But evidence suggests a far more complex pattern relating WTA to WTP and leaves many of the details of this relationship unresolved. If one applied the evidence that we reviewed in this Article to the normative issues involving either assignments of legal rights or determinations of damages, then one might produce different conclusions by resolving the issues left unanswered by the experimental evidence. If it is ultimately shown that only consumers have a WTA greater than their WTP, then one need not worry about this source of change in valuation in disputes between commercial actors.¹⁸⁸ In addition, if it results that WTA equals WTP for securities representing rights to receive cash flows, then one need not consider this source of change in valuation in legal disputes about financial instruments. Resolving questions such as whether repeated participation in markets causes WTA to converge to WTP, how long it takes for consumers to shift from WTP to WTA for newly-acquired rights, exactly why people have a WTA greater than their WTP, and so forth, could help to further define the circumstances in which courts should consider using the cost/benefit definition of negligence in torts. In these situations an individual's valuation of his goods could be the measure of damages and the cost/benefit approach to the allocation of rights might be used with some confidence.¹⁸⁹ Similarly, Cohen and Knetsch should use these guidelines to further develop and enhance their explanations of legal doctrines.

Of course, none of this shows that cost/benefit analysis is the appropriate mode of moral discourse for resolving any class of disputes. Critics of the various forms of cost/benefit analysis have launched extremely powerful attacks upon that norm.¹⁹⁰ Those who have already renounced

188. In a contrary implicit assumption, Knetsch argues that subsidies and effluent charges will be regarded differently (as gains foregone and losses avoided) by potential polluters, without addressing the issue that many polluters are businesses. Knetsch, *supra* note 175, at 234; see also COHEN & KNETSCH, *supra* note 178, at 32 (applying WTA exceeds WTP to Essex Aluminum and Alcoa). In addition, in the debate over mandatory commercial warranties, one need not be concerned about whether WTA is greater than WTP due to wealth effects, provided that consumers are fairly homogeneous. See Richard Craswell, *Passing on the Costs of Legal Rules: Efficiency and Distribution in Buyer-Seller Relationships*, 43 STAN. L. REV. 261 (1991).

189. This presumes that cost/benefit analysis has normative appeal when WTA is equal to WTP. Kennedy and Kelman would certainly quarrel with that proposition.

190. See C. Edwin Baker, *Starting Points in Economic Analysis of Law*, 8 HOFSTRA L. REV. 939 (1980); Lucian A. Bebchuk, *The Pursuit of a Bigger Pie: Can Everyone Expect a Bigger Slice?* 8

cost/benefit analysis will regard this Article's suggestion—that one should narrow the domain of cost/benefit analysis—as irrelevant. After all, one can hardly restrict the use of a totally unused norm. But for those who still believe that cost/benefit analysis *might* have utility, the data that we reviewed in this Article provides crucial, cautionary guidance.

2. *Governmental Shaping of Preferences*

In the long run, governmental policies shape individuals' preferences. For example, public provision of interesting, effective, challenging schools may eventually lead to a desire for better education in the next generation. Laws that require dog owners to clean up after their pets may result in stronger preferences for clean streets. Laws preventing people from selling babies or beating their spouses and children may mold our attitudes towards the family.

Economists have usually ignored the interactions between laws and preferences.¹⁹¹ In order to make analysis tractable, economic analysis has taken individuals' preferences as a given and then inquired what laws and social institutions would best serve those preferences. In fact, microeconomics texts explicitly state that economics is not concerned with good or bad preferences. Instead, economic theory accepts people's preferences and then asks how people behave when guided by these preferences.¹⁹² Economic analysis of law has been no exception to this rule—it has treated preferences as if they were fixed by other forces.

Evidence that WTA exceeds WTP may ultimately force economists to stop avoiding the interaction between policies and individuals' preferences. If the Kahneman, Knetsch and Thaler results are correct then the

HOFSTRA L. REV. 671 (1980); Mario J. Rizzo, *The Mirage of Efficiency*, 8 HOFSTRA L. REV. 641 (1980); Lewis A. Kornhauser, *A Guide to the Perplexed Claims of Efficiency in the Law*, 8 HOFSTRA L. REV. 591 (1980).

191. Some scholarship contends that preferences are endogenous. See T. A. Marschak, *On the Study of Taste Changing Policies*, 68 AM. ECON. REV. 386 (1978); Peter J. Hammond, *Changing Tastes and Coherent Dynamic Choice*, 43 REV. ECON. STUD. 159 (1976); Peter J. Hammond, *Endogenous Tastes and Stable Long-Run Choice*, 13 J. ECON. THEORY 329 (1976); Robert A. Pollak, *Habit Formation and Dynamic Demand Functions*, 78 J. POL. ECON. 745 (1970); W. M. Gorman, *Tastes, Habits and Choices*, 8 INT'L ECON. REV. 218 (1967); John C. Harsanyi, *Welfare Economics of Variable Tastes*, 21 REV. ECON. STUD. 204 (1954).

For a slightly different approach, see Edi Karni & David Schmeidler, *Fixed Preferences and Changing Tastes*, 80 AM. ECON. REV. 262 (May 1990).

192. See, e.g., BRIAN R. BINGER & ELIZABETH HOFFMAN, *MICROECONOMICS WITH CALCULUS* (1988); JACK HIRSHLEIFER, *PRICE THEORY AND APPLICATIONS* 9 (3d ed. 1984).

disparity between WTA and WTP arises very quickly. This suggests that preferences might change rather quickly as a result of policy changes. The ratio of WTA to WTP ranges between one and a half to one (1.5:1) and five to one (5:1), a disparity too large to ignore. For example, consider the hypothetical example of a homeowner and a smelter discussed above. If the smelter's operations degrade the environment enjoyed by the homeowner, a court must decide (in the simplified example used in this Article) whether or not the smelter's operations violate the homeowner's right to a clean environment. If the homeowner has the right to a clean environment, his WTA equals \$1000, but if he has no such right, then his WTP equals \$100. Economic analysis of this law cannot avoid the fact that choosing a legal rule simultaneously affects the homeowner's preferences. Economic analysis will have to confront the question whether the homeowner should value the environment highly. Today an economist would not address such a question. Philosophers have studied this topic,¹⁹³ and economists may soon have to become familiar with the discourse.

V. CONCLUSIONS

Experimental evidence and some theoretical analysis clearly suggest that WTA *may* exceed WTP by substantial amounts. Exactly when this will occur is not yet evident, nor are the explanations for this phenomenon clear. In market settings, the WTA/WTP disparity tends to raise prices and reduce the number of profitable transactions. In a two-person bargaining setting, WTA exceeding WTP is one reason why rights may be "sticky"—tending not to be traded once assigned. Despite the evidence summarized above, however, the extent of the difference between WTA and WTP is unknown. First, many instances exist in which consumers engage in trade: buying and selling of used cars, flea markets, and garage sales. Consumers readily trade in their old cars for new or newer models, even when a private sale may have generated a better price for them. Similarly, consumers sell used clothing and housewares at flea markets and garage sales for far less than the cost of replacement. Second, experimental evidence needs further independent replication before it will be considered fully sound and convincing.

193. Barry Holden, *Liberal Democracy and The Social Determination of Ideas*, 25 *NOMOS: LIBERAL DEMOCRACY* 289 (J. Roland Pennock & John W. Chapman eds., 1983); Aaron Wildavsky, *Choosing Preferences by Constructing Institutions: A Cultural Theory of Preference Formation*, 81 *AM. POL. SCI. REV.* 3 (1987).

If one concludes that WTA is greater than WTP in specific circumstances, then the basic normative implications are reasonably clear: courts cannot *always* legitimately use the cost/benefit definition of negligence, nor *always* rely upon individuals' values as unproblematic measures of damages, nor *always* use cost/benefit analysis to assign rights. The Kelman and Kennedy critiques anticipated these implications. But in some circumstances, WTA might equal WTP, and under those circumstances courts *might* be able to utilize individual values and the various forms of cost/benefit analysis based upon those values. Further research should help trace the boundaries of these circumstances.