Lotteries, Liberty, and Legislatures

by Lloyd R. Cohen[*]

Abstract:

The central purpose of this paper is to show that lottery play is not economically irrational and uninformed. The paper presents a theory of lottery tickets not as misguided inputs into wealth production as some critics believe but as valuable inputs in creating a sense of open-ended possibility, specifically the possibility of escaping one's current life by acquiring great wealth. In the course of the discussion the claim that the lottery is a regressive tax is investigated and a variety of empirical predictions are generated as to patterns of purchase both across groups and by individuals. Finally the insights gained from the earlier discussion are employed as a springboard to reground the normative use of the assumption of rational utility maximization.

Joke 1: **Week after week an old Jewish man goes to the synagogue and prays, "Please God let me win the lottery." Years pass and still he does not win. Finally, one day while asking God once more for deliverance he feels the floor tremble and sees the walls shake and then from the heavens above a deep and resonant voice calls out, "Abe, meet me half way; Buy a ticket!"**

Joke 2: **Every Friday night my friend Alex plays poker in the back room of Sam's Saloon, and every Friday night he loses. When I told him that those guys cheat. He said, "Hell, I know that, but it's the only game in town."**

Anecdote: **A friend's ten-year-old daughter after being told by a classmate the rudiments of sexual intercourse asked her father if this hideous activity could possibly be required for procreation. When he confirmed her account of the process, she expressed her disgust and incomprehension by reluctantly suspending her disbelief and asking with obvious distaste, "And you and mommy did this?" He said "Yes." She started to leave the room in bewilderment and then realizing that she was the second child turned around and asked with incredulity in her voice "Twice?" He once more responded in the affirmative. She turned to go and then realizing that but for his selfless willingness to engage in this obviously nauseating act she would not be here, she looked back and said "Thanks."**

Lotteries are interesting in their own right as somewhat controversial devices by which state governments have recently chosen to raise revenues.[1] But, like many relative, time-bound, otherwise mundane phenomena, when explored to sufficient depth they can reveal truths of a more absolute, enduring, and profound character. In this paper we shall focus on two distinct, but related questions about lotteries: first, the propriety of the lottery as a consumption activity; and second, the propriety of governments sponsoring lotteries. The endpoint of determining that lottery play is rational or irrational is less important than what can be learned along the journey of exploration. The first question in particular is a powerful vehicle for revealing how so much intellectual speculation on the nature of the good life and the proper public role in facilitating that life is problematic and flawed.

An Entry Point To The Lottery Puzzle: Are Lotteries A Regressive Tax?

Alan Karcher, an attorney and former Speaker of the New Jersey General Assembly, the author of <u>Lotteries</u>,[2] is representative of a broad group of commentators who do not approve of lotteries, state run or otherwise. His opposition has two roots: (1) a puritanical moral proscriptiveness; and (2) the income distribution concerns of a modern Democratic politician. On the first count he views the purchase of lottery tickets out of a desire to escape a life of menial toil as degenerate and the efforts of states to market their lotteries as a response to that desire as morally repugnant. On the second count Karcher repeats all the pejorative descriptions of lotteries

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[1]   For an erudite and well researched economic discussion of the lotteries see Reuven Brenner & Gabrielle A. Brenner, GAMBLING AND SPECULATION: A THEORY, A HISTORY, AND FUTURE OF SOME HUMAN DECISION (1990) [hereinafter GAMBLING AND SPECULATION].

[2]   Alan J. Karcher, LOTTERIES 116 (1989).

as a tax on, or exploitation of, the poor.

Let us enter the discussion by considering his second complaint, that lotteries are politically problematic because they are, in effect, a regressive tax. That is, the poor make a greater contribution to the state treasury through a lottery than they would under an equivalent proportional income tax.[3]

Lottery play is a discretionary recreational activity. Discretionary recreational expenditures display—as a class—a strong positive income elasticity, that is, expenditures on these activities rise as income rises, and rise at an increasing rate. But within the class, it is not surprising that some activities are abandoned for more attractive ones as income rises. Lottery play is one such activity. As a function of income, expenditures on lotteries first rise and then fall, and even at low incomes expenditures rise at a decreasing rate. If people purchase fewer lottery tickets as their incomes rise then, in the lexicon of economics, lottery play is an inferior good.[4]

While, almost by definition, recreational activity as a class cannot be an inferior good, it is

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[3]   Numerous commentators have characterized the lottery as a regressive source of revenue. *See, e.g.*, Michael H. Spiro, *On The Tax Incidence of The Pennsylvania Lottery*, 27 NAT'L TAX J. 57 (1974); Roger E. Brinner & Charles T. Clotfelter, *An Economic Appraisal of State Lotteries*, 28 NAT'L TAX J. 395 (1975); Daniel B. Suits, *Gambling Taxes: Regressivity and Revenue Potential*, 30 NAT'L TAX J. 19 (1977); Jerome F. Heavey, *The Incidence of State Lottery Taxes*, 6 PUB. FIN. Q. 415 (1978); Charles T. Clotfelter, *On The Regressivity of State Operated Numbers Games*, 32 NAT'L TAX J. 543 (1979); Charles T. Clotfelter & Philip J. Cook, *Implicit Taxation in Lottery Finance*, 40 NAT'L TAX J. 533 (1987); Mary O. Borg & Paul M. Mason, *The Budgetary Incidence of A Lottery to Support Education*, 41 NAT'L TAX J. 75 (1987).

[4]   In Canada, where both the national and provincial governments offer lotteries, and where some form of government lottery has been available since 1969, there is wider participation than in the United States. Not only the level of expenditure is greater, 0.44% of gross domestic product versus 0.14% in the U.S., but also the participation is more broadly based. In Canada lotteries are not an inferior good. The income elasticity of demand is between zero and one, that is, as incomes rise people tend to spend a greater amount, though smaller percentage of their income on lotteries. Francois Vaillancourt & Julie Grignon*, Canadian Lotteries as Taxes: Revenues and Incidence*, 36 CANADIAN TAX J. 369, tbls.2&3 (1988).

neither peculiar nor rare for any specific recreational activity to be an inferior good. Bowling, for example, is probably also an inferior good for people with incomes above the median. When we cast our gaze beyond recreational expenditures to other purchases, we find that many of the goods and services we consume are inferior goods. Potatoes are often cited as the archetypal inferior good. Assuaging hunger is a high priority for all of us. But once our hunger is satisfied most of us do not choose to markedly increase our caloric intake. Instead, we change the pattern and increase the variety of what we consume. Because potatoes are a cheap source of calories, in those countries where it is available, it is a prominent part of the diet of poor people. As incomes rise people substitute other more expensive sources of calories for potatoes. Thus, in general, the poor spend more money absolutely, and *a fortiori* relatively, on potatoes than the rich.

Whether it be lottery play or potatoes, the observation that the poor consume more than the rich need not excite much interest or surprise. After all it would be a very peculiar world if rich and poor spent their money in precisely the same proportions on precisely the same goods. It is hardly a source of wonder that there are both bowling alleys and yacht clubs, and that the frequenters of the former are generally not the members of the latter. What makes the different consumption patterns of the rich and poor somewhat problematic from a public policy perspective in the case of lotteries is: (1) that after decades of treating lottery play as a vice and outlawing it, legislatures across the country have now implicitly determined that not only is this activity no longer sinful but actually virtuous; but (2) that that virtue is peculiarly only present when the lottery is run for profit by the state government; and (3) given that the state has granted itself an exclusive

monopoly over lotteries it has used its monopoly power to extract monopoly rents from the enterprise and siphon these additional revenues into the state treasury.[5]

State run enterprises whether in this country or abroad do not have an enviable record of efficiency, and there is little reason to believe that lotteries are an exception. It is doubtful that the state could make a go of the lottery business—to say nothing of making a profit—if it had to compete against a legal private rival. But no such rival is permitted. And so state lotteries are free to charge more than their opportunity costs for their product and thereby add significantly to state coffers.[6] The monopoly rent extraction takes the form of offering prizes—or probabilities of winning—significantly below the break-even value. While large state lotto games would break even returning 92% of revenues received to the holders of winning tickets, they typically return only 50%.[7]

State lotteries are not without competition. Illegal lotteries, known colloquially as "the numbers game," have a long and profitable history in this country. Because they are subject to significantly greater costs than a legal enterprise in terms of fear of arrest, bribes of law enforcement officials, the necessity of employing less visible marketing devices, and the inability

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[5] With the qualified exception of Nevada the various state legislatures that permit lotteries have granted their own state government a monopoly over the enterprise. Article 4, section 24 of the Nevada Constitution provides that "no lottery may be authorized by this State, nor may lottery tickets be sold." NEV. CONST. art. IV, § 24. Nonetheless, as a practical matter, the private casino games within the state offer keno games that are the functional equivalent of state-run lotto games.

[6] Net lottery revenues in Illinois for example reached a $552 million in fiscal 1985-86 and were predicted to teach $950 million by fiscal 1990-91. Borg & Mason, *supra* note 3, at 81.

[7] In Illinois players receive 49.1% of the gross revenues in prize money. An additional 42% goes to the state treasury. The remaining 8.9% represent administrative and commission costs. *See id.*; For data from other state, see Allen D. Manvel, *State Lotteries—A Source of High-Cost Revenue*, 26 TAX NOTES 97 (1985).

to take advantage of scale economies[8] illegal lotteries undoubtedly must retain a higher percentage

of the revenues they receive to break even. Nonetheless illegal lotteries are more generous to

consumers than the state and typically pay a 60% return to the winning player.[9]

Despite offering a smaller expected payoff than the illegal lottery,[10] state run lotteries have

proven a great success at attracting consumer expenditures. Why? In addition to serving those

consumers who would, out of principle, fear, or lack of access, not participate in an illegal

lottery, state run lotteries offer something that illegal lotteries cannot credibly provide--enormous

grand prizes. Those who play the illegal numbers game can feel secure that daily payoffs of 600 to

1 will be payed, because to do otherwise would destroy goodwill and mean the end of future

sales. But when the promised payoff is an occasional 600,000, or 6,000,000 or 60,000,000 to one,

the consumer can no longer rely on the self-interest of the promoter to assure payment. The

consumer would reasonably fear that the promoter will simply fold up his tent and move

elsewhere when a winner surfaces. And, as will be clarified by later discussion, it is in these

enormous potential payoffs that the principal appeal and power of lotteries lie. The numbers game

simply cannot fill the same hole in the consumer's utility function as a lotto game.

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[8] The scale economies of lotteries over the relevant range are quite marked. See Larry Deboer, *Administrative Costs of State Lotteries*, 38 NAT'L TAX J. 479 (1985) (showing that high volume lotteries such as New Jersey, Pennsylvania, and Illinois have administrative expenses under 5%, while low volume states such Maine, Arizona, and Vermont have expenses in the range of 20%).

[9] The numbers game typically pays off 600 to 1 on gambles that offer a 1 in 1000 probability of winning. The wager is made on a prediction of the last 3 digits of a five or six digit number. Such numbers are usually published figures in the local newspaper, such as the attendance that day at a local horse track or volume on the New York Stock Exchange.

[10] Note as well that lottery winnings are ordinary income and thus subject to state and federal income tax. *See, e.g.*, *Virginia Lottery Cash Option*, (visited Feb. 17, 1999) <http://www.valottery.com/cashopt.html> ("The Virginia Lottery is required by law to withhold 28% federal tax and 4% state tax . . ."). While very small winnings of legal lotteries and all winnings of illegal lotteries will normally escape discovery by the taxing authorities, large winnings in state lotteries will not be so fortunate.

Leaving aside the question of whether offering and playing the lottery are virtuous and reasonable or evil and foolish activities, given that the state is extracting revenues in the form of monopoly rent, what can we make of the criticism of lotteries that they are illegitimate because a tax on the poor? If lotteries were offered by private firms, and if the state lottery had to compete on a level playing field, and if the state were no less, but no more, efficient than its private competitors, then the state run lottery would in no meaningful sense constitute a tax. It would only earn a normal rate of return, that is it would only succeed in covering its long-run costs. Of course, if private competitors can offer consumers an identical good at the same or--as is more likely--at lower costs than the state, it is difficult to imagine a justification for the state to enter this industry. There are no readily apparent market failures that suggest that the public is any better served by a state lottery than a private one. Indeed, as I shall argue below, even setting aside the greater costs of a state enterprise, there are political constraints on state lotteries that apparently limit their lotto games to a pari-mutual format, resulting in a less attractive product for the consumer.

The implicit tax at play in a lottery derives from the monopoly rent earned by the state's prohibition of all competition. The state could generate the same sort of tax *cum* rent by granting itself the exclusive right to engage in any other business, from truffle gathering to yacht repair. What distinguishes lottery tickets from yachts or truffles as a source of revenue? The former appeals predominately to the working class, while the latter appeals to the rich. A lottery is either an inferior good, i.e., its income elasticity of demand is less than 0, or a normal good with an income elasticity substantially less than 1. In either case a proportional tax on lottery revenues seems--at least at first blush--to be a clearly regressive source of tax revenue, that is it extracts a

declining share of income as income rises. If true, is this a bad thing? The answer depends on one's point of view. Whether it is the poor or the rich who should be taxed is a matter of political philosophy about which reasonable men may differ. To the extent that one objects to regressive taxes one is at a first pass justified in objecting to state run lotteries.

On a closer second pass, however, this objection fades away. Lotteries are but one small source of state revenues.[11] Those who find virtue in progressive taxes are ultimately concerned that each of the various income classes pay their "fair" share for government services. Therefore it is the progressivity of the taxation system as a whole rather than a small part of it that is at issue. If there is either a politically or morally optimal degree of progressivity and the introduction of a state lottery lowers the actual progressivity below the ideal it is a relatively simple matter for the legislature to return the state to the ideal by increasing either: (1) the magnitude of an excessively progressive tax; or (2) the progressivity of any tax.

Nor is there any reason for those who favor a more equal distribution of income to fear that the lottery "tax" is a harbinger of a wave of regressive taxes. There is no evidence in the manner and enthusiasm with which state legislatures have adopted lotteries that exhibits a rising tide of sentiment in favor of regressive taxes. No one argues for it on that basis. Regressivity if it is present is a mere fortuity and, to some at least, an embarrassment.

But is the monopoly rent extracted by lotteries actually regressive? The answer is not nearly as obvious as most commentators assume. The regressivity or progressivity of the tax

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11   *See* Clotfelter & Cook, *supra* note 3, at 534 ("In the 18 states with lotteries operating in 1984, revenues from lotteries averaged just 2.7% of total own-source revenues.").

implicit in the monopoly rents collected by the state turns on the question of whether it is the

universe of lottery players who pay the tax or just the winners. Imagine that $10,000,000 is

wagered at $10 a person from 1,000,000 people and a single winner is paid $4,000,000 and the

state keeps $6,000,000 as a tax/rent. Who has paid this $6,000,000, the 1,000,000 purchasers or

the one winner? The answer is not a matter of mere semantics. Just as it is a fiction when the

federal government pretends that half the social security tax is paid for by the employer and half by

the employee, so too it would be a fiction to resolve the question of tax incidence merely by

labeling it as a 50% levy on each ticket sold (regressive), or alternatively a 50% levy on the

winning ticket (progressive). Both in the case of social security and the lottery, in order to

determine the incidence of the tax one must ask what the world would look like without the tax. If

with no tax the public would continue to wager $10,000,000 with all revenues going to a single

winner then the tax is extremely progressive; The winner is paying all of the tax. On the other hand

if the public would, in the tax-free world, wager only $4,000,000 with the revenues going to the

winner then the tax is regressive; It is being paid for by the players. This is ultimately an empirical

question and cannot be answered definitively in the absence of the requisite data. Nonetheless, a

bit of theorizing on the question is worth the effort not most importantly for the light it sheds on the

progressivity or lack of it of the lottery—a singularly unimportant question—but rather for the

insight it offers into what lotteries are about for the consumer.

Whatever deep meanings it may hold for the player, a lottery ticket is in its essence a rather

simple good. Ironically it is its very simplicity that has caused some commentators and critics to

be very confused as to what it is about. Perhaps a bit of formal economic modeling might aid us in

our quest to understand it better. A lottery ticket [**T**] has, for the consumer, four fundamental

characteristics that bear a fixed mathematical relationship to one another, and speak to how the

ticket enters the individual's utility function: (1) price [**Z**]; (2) value of a winning prize [**W**]; (3)

probability of winning [**P**]; and (4) the mathematical fairness of the bet it offers, that is the

expected rate of return to the purchase of a lottery ticket [**E(T)/Z**]. They stand in the following

simple relationship:

1.   **E(T) ∕ P x W**

2.   **Z > E(T).**

The value of a lottery ticket to a consumer can be captured by the following function:

3.   **U = U (Z, P, W, E(T)/Z)**, where,

4.   **∂ U / ∂ Z < 0,**

5.   **∂ U / ∂ P > 0,**

6.   **∂ U / ∂ W > 0,**

7.   **∂ U / ∂ [E(T)/Z] > 0,**

For those untutored in mathematics, all that this means is that a person's taste for lottery

tickets are a function of four things: how much a ticket costs--the less the better; the probability of

winning--the higher the better; the potential winning prize--the more the better; and finally the

fairness of the ticket, i.e., the proportion of the purchase price that is returned in expected payoff--

the greater the better.

For those too well tutored in mathematics there is something very odd about equation (3); it

seems to contain a redundant and superfluous term. The whole financial value of the ticket is

captured by any three of the four arguments on the right hand side of the equation. That is if you

know any three of the terms you can arithmetically derive the fourth. So, for example, if the

probability, **P,** = .000001, the prize, **W,** = \$500,000, and the price, **Z,** = \$1, then the fairness

E(T)/Z, must be .5. Or, if **P** = .0000005, the prize, **W,** = \$2,000,000, and **E(T)/Z** = .5, then **Z** must

equal \$2, and so on. Thus it seems intuitively incorrect to include all four variables in equation (3)

rather than just any three of them; The function appears to be over-determined. That intuition would

be perfectly correct if we were examining a production function for wealth rather than one for

utility. It is the meaning that the purchaser attaches to the various characteristics of a lottery ticket,

not merely, or, as I will argue, most importantly, how they contribute to his wealth, that give it

value to him. If the only meaning they had was the extent to which they generated expected wealth

then not only is it true that one of the four terms is superfluous, but also that no rational, minimally

informed person would ever buy a lottery ticket (except in the most peculiar of circumstances) for

the expected value of purchasing a ticket is universally negative. But, these four arguments, price,

probability, prize money, and fairness (or expected rate of return), each individually enter the

utility function directly and not merely, or even meaningfully, as part of a production function of

expected wealth.

The reader need fear no further major manipulations of the above equations. We will not

go through the exercise of mathematically deriving demand function and supply functions for

lottery tickets. Such a demonstration would be equivalent to the birth pangs of an elephant to

deliver a mouse, in that the formal mathematics would shed no more light on the nature of man's

demand for lottery tickets, or the state's optimal supply curve of tickets, than will some more

accessible discussion. So, let me try to provide an intuitive feel for how the function works.

Just as knowing that the clarity of the picture on your television is a function of many things, should not lead you to treat dusting the screen and replacing a faulty degausser as of equal value in improving the image, so too though the four terms in the utility function, **Z, P, W,** and **E(T)/Z** all play a role in determining utility and therefore demand for tickets, some do considerably more work than others. Let us begin with **Z,** the price of the ticket. Ticket price matters for all the same reasons and to exactly the same extent that the price of any good matters. We trade off each good we purchase against all other goods and the amount of other goods we must sacrifice for a unit of a new good is determined by the price per unit of that new good. If **Z** is the price that must be paid for a lottery ticket, we must search the other three variables for the compensating benefit that a ticket offers.

The naive "economic" view is to treat the buying of a lottery ticket as a species of investment decision rather than as a consumption decision.[12] If correct , then the relationship between the expected value of the ticket and its price, **E(T)/Z** would be of major importance. Although there have been the unusual "progressive" lotteries in which the prize money has grown so great after many weeks with no winner that a ticket offered a positive expected return, in the overwhelmingly more common case **E(T)/Z** < 1. A negative expected return clearly can not be a positive spur to anyone to purchase a lottery ticket. Therefore it must be those for whom the expected rate of return on a ticket is not an important consideration who constitute the army of

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[12]   *See, e.g.*, Edward J. McCaffery, *Why People Play Lotteries and Why it Matters,* 1994 WISCONSIN L. REV. 71 (1994); Milton Friedman & L.J. Savage, *The Utility Analysis of Choices Involving Risk*, 56 J. POL. ECON. 279 (1948); Edi Karni & Zvi Safra, *Rank Dependent Probabilities*, 100 ECON. J. 487 (1990).

lottery players. And so, small, or perhaps even large, changes in $E(T)/Z$ can be of no great consequence to the consumer of lottery tickets as long as $E(T)/Z$ remains below one. Consider joke 2 at the beginning of this paper about the dishonest poker game; it is not because of the unfairness of the game that one plays but rather in spite of it. Indeed, given the high degree of risk entailed in a binary distribution of results, $E(T)/Z$ would have to be well above 1 before it would seem a worthy investment to even the imprudent investor.

But people do buy lottery tickets, and some lotteries are more popular than others. So, one of the other two variables, either P, the probability of winning, or W, the potential winning prize must drive those purchases. As we economists never tire of repeating "there is no free lunch." Everything must trade off against something else. For a given price of ticket, Z, and a given fairness, $E(T)/Z$, P x W is fixed, and P and W bear a perfect inverse relationship to one another. The market reveals that a wide variety of relationships between P and W are acceptable to some segment of the public. Some "instant payoff" games offer tiny Ws of two to five times Z, while other games offer a multitude of intermediate Ws, and, finally and most importantly, some offer enormous multi-million dollar Ws. Although all of these products are called a lotteries and share surface similarities, it is misleading to consider them the same product. Consider joke one with which we began this paper. Do you suppose the old fellow was praying with such passion in the hope that he would win $5 in an "instant payoff" game? Each type of lottery has a fundamentally different appeal and serves overlapping, but hardly identical markets. We shall limit ourselves in the remainder of this paper to investigating the most popular and lucrative kind of lottery game, the giant lotto jackpot.

The gargantuan **W**s and lilliputian **P**s. of lotto games makes apparent what they are fundamentally about--the consumer is sacrificing the probability of winning, for the *possibility* of an enormous payoff**.** This is not to say that **P** counts for nothing. It matters at the margin, but not in the binary choice of whether one wants to play or not. When one purchases a lotto ticket one is sacrificing a dollar and purchasing an expected payoff of fifty cents because one is receiving something of value, an infinitesimal probability of an enormous windfall.Were **P** a close rival in importance to **W** in the player's utility function, he could raise **P** to 1 and garner the added bonus of doubling his expected value by simply declining to play.

So now we must ask why and how does **W** matter, and how does it trade off against the probability of winning, **P**, in the mind of the player? As an investment in wealth creation only the hopelessly ignorant would purchase. And so, displaying a deficit of imagination, the misguided view of some critics is that lottery players are fools. Those critics are almost a perfect analog to the ten-year-old girl in the anecdote at the beginning of this paper. Either because of their station in life, or by an act of will they are thoroughly insensitive to the lust for the lottery. To understand the purchase of lottery tickets one must surrender the seductive but misleading notion that a lottery ticket is an investment in wealth creation.[13]

The joke about the old man and his prayers with which I began this paper makes transparent the motivation of lottery players. Rather than an input in wealth production, the lottery ticket is an input in creating a sense of open-ended positive possibility, specifically the possibility

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[13] Some scholars eschew the conclusion that purchasers are irrational, but nevertheless remain numb to the consumption value of the lottery. And so they are forced to contrive the most implausible investment rationale for the lottery. *See, e.g.*, Edward J. McCaffery, *Why People Play Lotteries and Why it Matters,* 1994 WISCONSIN L. REV. 71 (1994); Milton Friedman & L.J. Savage, *The Utility Analysis of Choices Involving Risk*, 56 J. POL. ECON. 279 (1948).

of escaping one's current life by acquiring great wealth.14 To "consume" the increased possibility one need not actually fantasize or daydream about what one would do if one acquired great wealth, but many, if not all, of us do fantasize and daydream about some better future for ourselves and our own. This better future can encompass a variety of themes including prominently, though not exclusively, romantic fulfillment, sexual conquest, career achievements, or the acquisition of great wealth. And wealth can play a facilitating role in advancing one or more of the other themes.

The connection between lottery tickets and creation of possibility is not as obvious as one might suppose. It is not merely that one could win the lottery and thereby become wealthy. Consider once more joke 1. Why is it funny? The old man's thoughts and prayers are consumed with a hope of financial escape from his current life. There is nothing funny about that. The joke is that he is praying for and dreaming about winning the lottery, despite the fact that he must be more aware than anyone else that he has failed to take the only reasonable path to having his dream fulfilled, buying a ticket. And so his particular prayer is a comic absurdity. What does this tell us about how lottery tickets function in human consciousness? It is not merely that a lottery provides a conceivable scenario in which the dream of great wealth might be fulfilled, and that the dream is more satisfying if such a scenario exists. For if that were all that were required there would be no humor in the old fellow's prayer. After all, perhaps he merely hoped he would be doubly lucky—or doubly blessed—and *find* the winning ticket.[15] If you laughed at the last line, you implicitly understand that not all longshots are created equal. In the world of hopes, dreams and

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14   I can not claim to be the first to suggest that lottery tickets are best viewed as consumption goods, or even that their appeal rests on a hope for some dramatic change in one's life. *See, e.g.*, CHARLES T. CLOTFELTER & PHILIP J. COOK, SELLING HOPE: STATE LOTTERIES IN AMERICA (1989).

15   I thank my sardonic friend, and fellow economist, David Haddock for this suggestion.

possibilities as the probability of the hoped for liberating event grows vanishingly small it becomes all the more important that it be undisputably real, and not simply rest on the metaphysical proposition that anything is possible. One is willing to pay hard cash that it be so real, so objective, that it is actually be calculable--by someone, even if not oneself.[16] So, though it may appear paradoxical to those not subject to its spell, it is a source of comfort to the player that his chance of correctly choosing the five numbers from one to fifty-five that will be drawn in the next Powerball game is but a scant one in 3,478,761. For the solidity of those odds derives from the absolute certainty that five out of fifty-five numbers will be drawn, and results in the equal certainty that he could get lucky as others have before him.[17]

In all things economic, there is a diminishing marginal something. In the case of " belief in possibilities," the most initially steeply diminishing marginal utility is that of probability. That is, one requires some real finite probability to support a belief in the possibility of escape, and while the more the better, the falloff in gain from additional probability is precipitous. On the other hand what is indispensable is a scenario that could conceivably be realized that satisfies the conditions of the hoped for fundamental transformation of one's life. And if the belief is of sufficient wealth to remove one entirely from one's current life, then **W** must be large, and the larger it is, the more expansive the dream of escape it can support. We will return to this theme later in the paper to further explore who purchases lottery tickets and when they do so.

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16   "[A]rticles on the winners of big prizes are front-page stuff and always point out the precise probability of winning." GAMBLING AND SPECULATION, *supra* note 1, at 47.

17   It is in the same spirit that the California Lotto game now asks at the time of purchase whether you wish to receive your prize as a 20 year annuity or a lump sum of its discounted present value. *See* Super Lotto Payment Option (visited Feb. 17, 1999) <http://www. calottery.com/payment_option.html>, and The Publisher's Clearing House Sweepstake asks the participant to choose which of several luxury cars he prefers to receive if his entry is drawn. The answers to these questions provide no direct benefit to the sponsor, but being required to answer serves the psychological purpose of making the possibility of winning seem even more indisputably real to the subject.

And so to summarize: $E(T)/Z$, the fairness, or rate of return to the play of the lottery is unimportant in driving the decision to play. P, or the probability of winning, must be undisputably real, but may be vanishingly small. W, the prize, must be large or why else dream, and why pay Z, the price of a ticket.

We are now ready to give some thought to the nature of the optimum lotto game. In essence we seek to discover the optimal set of Z, P and W and $E(T)/Z$. $E(T)/Z$ is generally set by legislatures at .5 and would in a competitive world rise to whatever level exhausted all returns above opportunity costs, perhaps .92 for a large efficiently operated multi-state lotto game.

As all consumers are not alike, no single ticket is ideal for all. Though you and I are both constrained by the same legislative or market determined expected return, $E(T)/Z$, my optimal choices, Z_1, P_1, W_1 will generally not be the same as yours, Z_2, P_2, W_2. Just as different people desire automobiles with different characteristics, so too they desire lottery tickets—even for multi-million dollar lotto games—with different characteristics. For each of us, at our optimal Z_i, P_i, and W_i the marginal utility of the last penny surrendered will just equal the marginal utility of the last unit of probability it can buy, and the marginal utility of the last unit of possible prize it can win. And for each of us there will be some loss in value if the best choice the market offers is not close to our personal optimum. If that loss is sufficiently large we will decline to play the lottery.

All businesses, lotteries included, can adjust their products on a variety of different margins to try to please the widest set of consumers. We will consider the three margins that are of obvious potential application to lotto games. First, the firm can offer consumers a wider variety of products. Second, it can offer a single product with characteristics that appeal to the widest set of

consumers. Third, it can offer a product that can be more easily adapted by the consumer to his individual needs. We shall consider each of these in turn. The first strategy is the most straightforward: if the consumers' tastes differ, a lottery producer, like an automobile producer, can offer a variety of different lotteries so that the consumer can choose the one that comes closest to his tastes. But, in lotteries, as in automobiles, there are economies of scale. It is considerably more costly to provide a variety of lottery games than a single one. As we will see in examining the second margin, and especially the third, because those margins offer so much opportunity for satisfying the widest set of consumers, lottery producers generally need not, and do not, offer a wide variety of lotto games.

The second margin calls for the firm to offer a product that is acceptable to the widest set of people. Neither in lotteries nor in automobiles is this likely to be the optimal choice of the median consumer. To illustrate with automobiles, let us assume that the median minivan consumer would prefer a vehicle with six seats, but there are those who only want five and still others that want seven. If the increase in cost and loss in utility for those who prefer five seats and get seven is much less than the loss to those who want seven and get six, the auto company will choose to make minivans with seven seats. How does this apply to lotteries?

The principal question for the firm is what tradeoff to make between **P** and **W**. Will the firm satisfy more customers by offering a prize above (and probability below) the choice of the median player or *vice versa*? Imagine that my dream of escape is to retire from my menial job, live a life of upper middle class comfort, and provide some security for my children; four million dollars will be ample. You on the other hand have a dream of retiring from your upper middle

class career, moving to a villa on Lake Como, and assuming the life of an Italian patrician,

servants and yacht included; Forty million dollars would not be excessive. While I would prefer a

$4,000,000 prize with a 1 in 8,000,000 chance of winning, my joy of dreaming of winning will not

suffer much with a tenfold increase in the prize and concomitant drop in probability. For you, on

the other hand, too small a prize means that you simply do not have a big enough hook on which to

hang your dream and thus a mere $4,000,000 prize robs the lottery of its principal attraction.

The final, and most important margin on which the lottery firm can operate is in facilitating

adjustments of the product by the consumer to suit his individual needs. Lottery tickets are uniquely

well suited to just such adjustments. A lottery ticket is in essence a probability **P** of a financial

prize **W.** While the particular configuration of **Z, P** and **W** offered by the promoter may not

correspond to a consumer's personal optima, the consumer has much flexibility in reaching those

optima by purchasing multiple lottery tickets or sharing in a single ticket. But this adaptability of

lottery tickets, though great, is not unlimited. Although **Z, P** and **W** can each be adjusted by the

consumer, they cannot be adjusted at equal cost or with equally satisfying results. While it is

possible to both purchase five tickets and share in the purchase of one ticket with four partners,

there is an asymmetry in the transaction costs of the two adjustments, and the benefits they offer.

The additional transaction costs of purchasing five tickets instead of one are trivial, but in order to

purchase 1/5 of a ticket one must find willing partners to assume the other 4/5. To evaluate the

benefits of purchasing multiple tickets or sharing in the purchase of one or more tickets we must

look to their respective effects on **Z, P** and **W**. As for **Z,** the effect is perfectly symmetrical. One

can adjust **Z** up or down with equally beneficial results; multiple purchases multiply **Z** while

fractional purchases fractionate **Z.** On the other side of the equation sit **P** and **W** in their perfect

inverse relationship, that is $\mathbf{Z} = \mathbf{P}$ x **W**. Can **P** and **W** be so easily and symmetrically adjusted?

No. It is incomparably easier for the player to move to his optimum combination of **P** and **W** if it is

W that is greater than the optimum and **P** less, than if it is *vice versa.* When **P** is low, he can

increase it through the simple act of buying more tickets in any single lotto game. If in addition he

wants to decrease **W** he can solicit partners. But what does he do if it is **W** that is below his

optimum? Purchasing more tickets in a single lottery only increases **P,** not **W.** While it is

conceivable that he might buy tickets in consecutive lotteries and pin his hopes and dreams on

winning several in a row, that will not result in the combination of **P** and **W** he desires, except as a

tiny subset of what he has purchased. That is, the probability that he might win one, two, three, or

four lotteries out of five is many billions of times greater than the joint probability that he will win

all five. Thus, there is no reasonable way for the player to increase a niggardly **W** to his personal

optimum.

Let us convert this analysis into something approaching an optimal strategy for the lottery

firm (private or state). Imagine that it knows optimal choice of the median lottery player,

designated as $\mathbf{Z_m}$, $\mathbf{P_m}$, and $\mathbf{W_m}$ from this it wishes to chose an optimal **Z*, P*, W*** for the tickets it

offers. In order to make the tickets as attractive as possible to the widest set of consumers it must

choose **Z*, P*,** and **W*** so that the need and possibilities for, and costs of, accommodation and

adjustment of the non-median player are as modest as possible. It need not offer a large number of

different sorts of games, because lottery tickets more so than other products offer more benefits

and less costs from division and multiplication of purchases. But these possible consumer

adjustments are neither unlimited nor symmetrical. The cost to the player of increasing **W** to his

personal optimum are effectively infinite, while decreasing it requires the moderate cost of

forming a partnership. At the same time increasing the **P** of a ticket to the player's personal

optimum requires the trivial cost of purchasing more tickets, while decreasing it can only be

accomplished at the moderate cost of forming a partnership. Thus viewed from each side of the

joint choice of **P** and **W** it is clear that the firm should chose **P*** well below **P**$_m$ and **W*** well

above **W**$_m$**.** By the same reasoning that applied to **P***, **Z*** may be set considerably below **Z**$_m$**,** that

is it is considerably easier for the player to purchase more tickets than to form a partnership.

Given the fundamentally simple nature of the product, offering the optimal ticket outlined

above should be a straightforward matter for the firm. And so it would be were lotteries run as

private enterprises. But things are not so simple in the world of state run lotteries. Political

constraints on state lotteries make it far more difficult for them to reach the optimum a private

entrepreneur would achieve. The problem for the state is not in choosing **Z,** but having chosen **Z** in

setting **P** and **W.** In principle the lottery firm can offer a game with any *ex ante* probability and any

payoff it wishes. The only constraint it faces is the same one faced by an insurance company or a

casino, that is, that it be sufficiently well funded to easily weather a short bout of above the

expected number of payouts. In the long run if it is sufficiently well financed it can be assured of

coming vanishingly close to its mathematically expected rate of return. So if the optimal prize is

$100,000,000 and the optimal price for a ticket is $1, and the implicit tax rate is 50%, the firm

simply sets the prize at $100,000,000 and designs the game with 200,000,000 equally likely

possibilities and lets the chips fall where they may. Some weeks they will sell 200,000,000 tickets

and pay out nothing and other weeks they will sell the same 200,000,000 tickets and be forced to

pay out $400,000,000, but in the long run they will have gaming winnings of fifty cents on every

dollar wagered.

Such a course of action is apparently politically foreclosed to a state agency. All state

lottery authorities only offer lotto games that are parimutuel wagers,[18] that is, the holders of

winning tickets win the pool of bets-minus the state's share--nothing more, nothing less.[19] Thus the

size of **W** is not within the control of a state firm to the same degree as it would be for a private

firm. Why are the state lotteries so structured? I offer four candidate explanations, and leave it to

you to chose among them or offer another. First, it may be *ex ante* morally embarrassing; While the

electorate may find it acceptable for the state to foster gambling, it may not be so accepting of the

state itself engaging in gambling, that is submitting itself to the risk of even the very favorable bets

of operating a lottery with a $E(T)/Z = \frac{1}{2}$. Second, it may be *ex post* politically embarrassing for

the state legislature and the governor for the state to have a losing week, so it will not be

permitted. Third, given the agency costs of all enterprises, state enterprises in particular, perhaps

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18   The most common and well known use of the pari-mutual system of wagering is by race tracks. Because
the probability of a particular horse winning is not an "objective" fact that can be derived from a precise
mathematical formula, but rather is a function of a variety of factors about which one can have more or less
knowledge, the race track operator is unwilling to take the risk of setting the odds based on his own perceptions of
the probability of various outcomes; he fears that the gambling public knows more than his experts (handicappers).
So, instead he merely offers the patrons the opportunity to bet against one another and takes a share of the
proceeds. No similar danger is present in the lottery. The probability of five particular numbers being randomly
drawn from fifty-five can be derived from a precise mathematical formula. It is $1 / [55! / (50! \times 5!)] = 1 / 3,478,761$. And so, barring cheating, no one can know more than the promoter about the likelihood of a particular
outcome. As a result, there is no business necessity to offer lottery play as a pari-mutual wager.

19 There are minor exceptions to this rule. In California the Lotto game guarantees a minimum payoff of
$3,000,000 to the pool of winning tickets. *See* What's SuperLotto (visited Feb. 17, 1999) <http://www.calottery.com/superlotto_frame.html>. Such a guarantee
spurs sales and is essentially costless. Providing a concrete, minimum win aids people in crafting their fantasy, and, given the size of a typical semi-weekly pool in California, the winners' pool
will virtually always be above $3,000,000; in those instances when it is not because of low participation, no winner is likely to surface.

state officials fear cheating, and would prefer that if it takes place, the costs fall on the lottery

players rather than on the state treasury. Finally, perhaps state officials believe that the wagering

public has little faith in the honesty of the state government and so they wish to reassure the public

that the state authorities have no interest in rigging the game, beyond extracting its monopoly rent.

This constraint on the state's ability to offer anything other than a parimutuel lottery means

that **W** is a function of the size of the playing public, rather than within the discretion of the state

agency. The public response to lotteries and the transformation of the lottery industry over the last

decade can be explained by this constraint on **W**. If the constraint is binding, then one should

expect that lotteries with **W**s well below the optimum should get considerably less play than those

with **W**s close to, or above the optimum. Over the years, various lotto games have provided a test

for this hypothesis. When a week or more passes without a winner in a lotto game the pool is

preserved for the following week's lottery, and so the amount to be won rises with every week

that there is no winner. The evidence is that as the prize increases the play increases as well.[20] The

problem of course with this explanation is that the retention of the winning pool from previous

weeks not only increases **W** it also--*ceteris paribus*--increases **E(T)/Z.** Indeed, ignoring the

problem of multiple winning tickets sharing the prize, if the state deposits half of each bet in the

winners' pool then as soon as twice the number of bets have been made as there are possibilities

to be drawn, **E(T)/Z** will be greater than 1. Thus one could argue that it is the greater expected rate

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[20]   *See, e.g.*, Associated Press, *1998's biggest lottery jackpot attracts plenty of players*, DALLAS MORNING NEWS, Oct. 17, 1998, at A11 ("When we have a large jackpot on a Saturday, we see our sales really skyrocket . . . ." (quoting Leticia Vasquez, Texas lottery spokeswoman)); Janet Kelley, *'Busy day' for lottery sellers as Super 6 tops $40*, LANCASTER NEW ERA, Feb. 13, 1999, at A6 ("'Sales have been picking up each week,' that a winner hasn't hit the jackpot . . . ." (quoting Don Henry, a lottery retailer)); David L. Greene, *Have numbers will travel; Powerball: A $250 million frenzy drives lottery players, and even people who never play, across state lines to buy tickets*, The Baltimore Sun, at A1 (describing the dramatic increase in Powerball sales when the jackpot hit $250 million). There is evidence from other sources, both in the United States and abroad, that it is the large prizes that are most important in attracting play. *See* David Weinstein & Lillian Deitch, THE IMPACT OF LEGALIZED GAMBLING: THE SOCIOECONOMIC CONSEQUENCES OF LOTTERIES AND OFF-TRACK BETTING 36 (1974); Jean Desperts, *Quand Louis XIV jouait à la loterie*, 24 HISTOIRE 86 (1982); George Sullivan, BY CHANCE A WINNER—THE HISTORY OF LOTTERIES 111 (1972); John Cohen, BEHAVIOUR IN UNCERTAINTY 48 (1964); Michael Landau, A MANUAL ON LOTTERIES 34 (1968); Maureen Kallick, et al., A SURVEY OF AMERICAN GAMBLING: ATTITUDES AND BEHAVIOR (1979).

of return to a lottery ticket that is driving the increase in purchases rather than the increased prize money.

I believe that **E(T)/Z** is unimportant in driving the decision to purchase and so the fact that **E(T)/Z** generally rises with **W** when there is no winner in a lotto game – if it does so--is merely a coincidence and not the underlying explanation for the increase in ticket sales. There are two pieces of evidence that I leave to some enterprising reader to uncover that could shed empirical light on the question of whether it is the increase in **W**, or **E(T)/Z,** that drives increased purchases. First, it is possible that an increase in ticket sales following a drawing with no winner might be so great as to accompany an increase in **W** and yet cause a fall in **E(T)/Z.** The discussion above rested on the unrealistic *ceteris paribus* assumption of a single winning ticket. But the possibility of multiple winners is ever-present and its probability is a direct function of the amount of ticket sales in any given week. Therefore if the elasticity of demand with respect to **W** is sufficiently high over certain ranges**,** there will be lottery drawings when, because no winner is drawn and **W** rises that the increase in sales is so great that, taking into account the increased probability of multiple winning tickets with whom one must share the prize, **E(T)/Z** actually falls.

Second, the thesis that **E(T)/Z** is an important independent driving force rests on some notion of the purchase of a lottery ticket as an investment decision. If that view were correct then surely when **E(T)/Z** > 1, (including the probability of sharing the prize,) there should be extreme buyer interest in the lottery, such that **E(T)/Z** is driven below 1. Therefore finding any lotteries that offer **E(T)/Z** > 1 suggests that **E(T)/Z** is not an important motivating force in the ranges in which it

operates.[21]

The hypothesis that parimutuel lotteries create a binding constraint that prevents states from offering lotteries with optimal **W**s, is also supported by the evidence of the growth of multi-state "Powerball" games. These games have come about through various states combining their home grown lotteries into a single multi-state lottery. Once more there is an alternative explanation for this phenomenon. The scale economies on the cost side are driven by the same increased sales that drive the increase in **W.** Nonetheless, if it is **W** that is driving the process then one should observe increases in lottery sales within states that abandon their own state lottery to participate in Powerball.

So perhaps now we have learned enough about lotteries to say something informative about the rather mundane and fundamentally unimportant question of whether the government monopoly rents from a lottery are more properly characterized as a regressive or progressive tax. To remind you, the question is ultimately whether if the government left the lottery business to the private sector and surrendered its monopoly rents, would the amount spent by players fall, or would the amount won by winners increase. In order to simplify the analysis, let us ignore the entire previous discussion of the constraining effect of the parimutuel system on the state lottery and simply assume that either the state is free to offer the exact same lottery as a private firm, or that the multi-state Powerball game has allowed state run monopolies to reach an optimal size prize. The question it seems to me is which of the three factors **Z*, P*,** or **W*** will be most elastic with respect to

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[21] *See* Herman Chernoff, *How To Beat The Massachusetts Numbers Game: An Application of Some Basic Ideas in Probability and Statistics,* 3 MATHEMATICAL INTELLIGENCER 166 (1981).

E(T)/Z. That is removing the monopoly tax will raise **E(T)/Z** and the slack must be taken up with either a fall in **Z*** or rises in either **P*** or **W*.** The sizes of the various elasticities in the relevant range will in turn depend on the changes in marginal benefit and cost or in mathematical terms the magnitude in absolute value of the second partial derivatives of utility with respect to changes in percentage terms of **Z, P,** and **W**. Expressed mathematically we are asking, what is the order of magnitude of the following three mathematical expressions: (1) the rate of change in the marginal utility of a given percentage change in the price of a ticket, * ∂^{2}**U /** ∂**(**∂**Z/Z)*****;** (2) the rate of change in the marginal utility of a given percentage change in the probability of winning, * ∂^{2}**U /** ∂**(**∂**P/P)*****;** and (3) the rate of change in the marginal utility of a given percentage change in the prize,* ∂^{2}**U /** ∂**(**∂**W/W)*****.** If, as I believe, near the optimum combination of **Z*, P*,** and **W*** players' utility is most sensitive to changes in **W**, least sensitive to changes in **P**, with changes in **Z** lying in between, then the new competitive equilibrium should differ from the monopoly equilibrium in resulting in virtually no increase in the prize, a small drop in the price of a ticket[22], and a large increase in the probability of winning. What does this say about regressivity?

If the change had been entirely in the prize then the tax would be progressive, for example, by reducing an $8,000,000 prize to $4,000,000, and making someone, who would otherwise be very rich, less rich. If entirely in the price of a ticket then the tax is regressive, for example, by charging relatively low income people $1 for a ticket that otherwise would cost $.50, and thereby making people who are poor somewhat poorer. But, if the change is in the probability of winning,

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22   More likely, given that all lotteries sell for the eminently convenient $1 per ticket, there is actually some discontinuity at that point and price will not change at all.

then I think we have the marvelously ambiguous effect that cannot fairly be described as either progressive or regressive, as it results in someone who would otherwise have won $4,000,000 now winning nothing; someone who would have become very rich now must remain poor.

As a sidelight I offer several minor points that flow from the prior analysis. First, in the truly large lotto games I offer the educated guess that there are likely even more monopoly rents for the state to extract without killing the goose that lays the golden egg. The demand for participation in the lottery appears to be rather inelastic with respect to **P**, thus the state can reduce **P** without a proportional loss in sales. The state may be able to extract 70, 80, or 90 percent of the revenues, without much falloff in consumer participation, as long as it keeps the price of a ticket at one dollar and has a winning prize in the $50,000,000 range.[23]

Second, given that it is the prospect of winning that supports a dream, and only one ticket is necessary to create a finite positive probability of winning, and thereby finance a dream, there is sharply diminishing marginal utility to the number of tickets one acquires in each particular lottery, but not much diminishing utility in ticket acquisitions that have serial decision dates. Thus, although one may be well satisfied holding one, or a few, tickets in each lottery, the more drawings there are during the course of a year, the more tickets one will purchase; each drawing is a separate occasion for a dream of wealth. On the other hand, one could conceivably finance a dream with a lottery ticket one has not yet purchased but intends to purchase. Thus I could dream

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23   "The Lottery, with its weekly pay-out of enormous prizes, was the one public event to which the proles paid serious attention. It was probable that there were some millions of proles for whom the Lottery was the principal if not only reason for remaining alive. It was also their delight, their folly, their anodyne, their intellectual stimulant. Where the Lottery was concerned, even people who could barely read and write seemed capable of intricate calculations and staggering feats of memory. There was a whole tribe of men who made a living simply by selling systems, forecasts, and luck amulets." George Orwell, Nineteen Eighty-Four (Irving Howe ed., 2d ed. 1982).

now about what I will do when I win next month's (or next year's) lottery and skip the four (or 52) between now and then.[24] If this latter strategy is not attractive to many players, that is if the sense of one's life as offering open-ended possibilities can not be generated by such an abstract speculation, and one can only support the dream with a ticket in hand, then it is in the state's interest to offer as many serial lotteries as possible, with very little time in which to pre-purchase a ticket.

Third, the preceding analysis of the supposed regressiveness of the government monopoly neglects a sub-surface issue with regard to progressive taxes. At least a major, and perhaps the sole, justification for progressive taxes is that they lead to more equal wealth and after-tax income distributions. In contrast, the very essence of the appeal of the giant lotto game is the creation of the possibility of a decidedly unequal wealth distribution with one person being a very great beneficiary and many others being slight losers. Thus permitting lotteries allows the public to create income and wealth distributions that are in opposition to the grandly equalitarian social ethic embodied in the tax code.

Why Do States Chose Lotteries To Monopolize?

The state does not have a very wide set of businesses over which it can grant itself an exclusive monopoly. It is politically unacceptable to either: (1) make illegal currently legal commercial activities while at the same time granting the government the right to engage in them and charge monopoly prices; or (2) to grant the government a monopoly to engage in a currently

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24   Ann Libecap, the wife of fellow economist Gary Libecap, reports that having purchased lottery tickets in the past, she now succeeds in daydreaming about winning even when she does not play for long periods at a time. Some people are more imaginative than others. Such efficient use of inputs is to be admired.

illegal commercial activity that is morally repugnant. Thus, neither shoe retailing nor murder for hire are likely candidates for state commercial monopolies. This leaves so-called victimless crimes or vices, sex, drugs, or gambling, as the remaining category of businesses for the state to muscle in on.

Returning for a moment to the question of regressivity, we should note that these activities do not necessarily or systematically appeal to any particular income class; were the state to grant itself an exclusive monopoly to operate high-class brothels it would garner monopoly rents from the top-end of the income distribution. That it is lotteries that have been chosen to occupy this peculiar category of an exclusive state monopoly seems to be purely a function of it being in that curious in-between moral status of no longer so morally odious as to defile the state by participation, while at the same time not so mundane and morally uncontroversial as to be a liberty of the citizenry that the state may not infringe. But what is it about lotteries that permits the state to avoid moral taint while engaging in it as a business?

Of all the victimless crimes gambling seems unique in that the state can more righteously engage in it than could a private entrepreneur. Imagine the state legislature contemplating legalizing prostitution. It is hardly conceivable that the public would find state operated brothels less morally problematic than the legalization of private brothels. If, however, for reasons of health or safety state ownership of the enterprise would be more salutary than state regulation of private enterprises, the moral objections, though they would not be eliminated, could be outweighed. No such practical argument has been made with respect to lotteries and it is difficult to imagine one that could be seriously offered.

The moral position of lotteries as an enterprise in which the state can grant itself an exclusive monopoly seems to have something to do with a morally cleansing character to gambling for a good cause. The same phenomena finds an echo in the acceptability of church raffles and bingo night.[25] Legislatures, either in order to gain greater moral legitimacy for their promotion of the lottery or to encourage wider participation almost always earmark the revenues received for a specific laudable purpose, usually education. This is, of course, a complete sham. The revenues generated by the lottery are a tiny proportion of total state revenues allocated to education and so the legislatures are not actually constrained from below in the funding that they provide, and show no compunction to reduce funding for education derived from other sources.[26] Nonetheless, the fact that the states purport to earmark the revenues generated by the lottery in this fashion reflects the morally suspect character of the underlying activity, gambling, and the state's promotion of it.

The state of course has alternative means by which it can extract monopoly rents from the vice industry other than shouldering out private firms. It can tax instead. While the economic effect will be the same–leaving aside the inefficiency of state-run enterprises--the moral tone can be precisely the opposite. For the state to operate the lottery requires a political acceptance of lottery play as an innocent diversion. Taxing the lottery makes no such demands; The honor of the state will not be sullied by seeming approval of a vice.[27]

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[25] I will discuss this further in the following section.

[26] *See* Borg & Mason, supra note 3, at 81, 82 (showing that in Illinois, although lottery revenues rose sharply in the late 1970s and early 1980s, net expenditure on education fell).

[27] A timely illustration of the state extracting monopoly rents from the taxation of a vice can be observed in recent proposed tobacco legislation. The purported justification for the tax was not to fill state coffers, but rather: (1) to discourage smoking; and (2) to make the tobacco industry (or smokers) pay for the externalities they impose on the rest of us. Both of these justifications are problematic. The demand for cigarettes is highly inelastic, indeed so inelastic that some describe cigarettes as clinically "addictive." Thus, the tax will have only a relatively small effect on the consumption of cigarettes but yield a great deal of revenue—very little behavioral bang but transferring lots of bucks!

The externality argument takes two forms. The first focuses on the visual, olfactory, and respiratory imposition of smoking on third parties. These impositions are real. How substantial they ever were is unclear, and, more importantly, they are now being regulated to oblivion. The second category of externality, which seems the principle basis for promoting the tax, is that the health related problems of smokers impose a negative externality on the rest of us. This is a more powerful argument. It has but one problem; it is almost the exact reversal of the truth. While it is true that smokers are sicker than non-smokers and incur greater medical expenses, some of which are imposed on the rest of us, it is also true that they die earlier than the rest of us, and save us more substantial social security expenses. *See* W. Kip Viscusi, SMOKING: MAKING THE RISKY DECISION (1992). Thus, perhaps the taxing of cigarettes is nothing more than

Granting for the moment that it is proper for the state to extract some sort of extra-normal return from the legalization of lotteries, both economic theory and the lessons of the collapse of state run enterprises elsewhere in the world, suggests that it is doubtful that it is efficient for the state to extract these rents through a state run monopoly rather than by charging a differential tax on lotteries run as private businesses. The appeal of the lottery to the legislature on that score seems to play on and reflect two widespread public illusions. First, a monopoly rent is simply not appreciated by the public to be the same as a tax. Were the state to legalize private lotteries and impose a surtax on the enterprise it would *seem* more like a tax to the public than when the state conceals the same burden in the price of the lottery ticket, the size of the payoff, or the probability of winning. Second, in the move from a regime in which lotteries are illegal to one in which they are state run monopolies, the public never gets a hint of an alternative regime of a privately operated lottery not subject to any peculiar tax. Not only has that regime never existed, it is not even a recognizable subset of the state-run monopoly regime, as it would be if the state imposed a surtax on privately operated lotteries.

Playing on these public illusions by employing a state monopoly rather than a tax is not costless. A monopoly has less incentive to control costs and provide a better service to the public than a competitive enterprise. And, a state-run monopoly is also subject to all the political forces, patronage and otherwise, that exacerbates the problem. There is no reason to suspect that if left to the market lotteries would not be a reasonably competitive business much like casinos in

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another instance, like lotteries, of opportunistic rent extraction by the government from those who participate in a "vice."

Nevada.[28] In such an environment those enterprises that survived would be the providers of either a better product, or the same product at a lower price. The state could then extract the same rent as a tax either on the sale of the tickets or the prizes awarded at less cost to the public.

More problematic than whether it should extract its rent through a tax or a monopoly, is the issue of whether the state has any proper function in participating in the lottery business at all. The strongest arguments against a government tax on lotteries is its inequity. As I argued above it is by no means clear that the tax is regressive, and even if it is the lottery tax is a tiny fraction of state revenues. Further, as a proxy for the poor, lottery players are both an under-inclusive and an over-inclusive class; neither are all poor people lottery players nor are all lottery players poor. But it is surely true that all lottery players play the lottery. The monopoly rent of the state-run lottery is a discriminatory burden placed on lottery players *per se*. Were their participation in the lottery something that imposed negative externalities on others such a tax could be defended on both equity and efficiency grounds. It could be designed to reduce the level of lottery playing to the socially optimal level, compel lottery players to internalize the externalities they are imposing on others, and shift wealth from those causing harm to those suffering it. But I have heard no credible externality argument, and doubt that one could be fashioned.[29] Instead the former illegality of lotteries and the current tax seem to rest on a paternalistic desire to eliminate or punish a vice.

Who Plays The Lottery? Why and When?

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[28] See, *infra* notes 18 thru 20 and accompanying text, discussing the difficulty state run parimutuel lotteries have in attracting a large enough customer base to generate the enormous prizes that appeal to lottery purchasers.

[29] Quasi-externality and pseudo-externality arguments of the sort that lotteries encourage crime, reckless spending, or idleness are periodically raised, but there is no evidence to support even these claims. *See* GAMBLING & SPECULATION, *supra* note 1, at 37-89. Indeed, lottery play appears to be associated with no vice other than itself.

I have presented a theory of lottery play resting on the desire that one have a sense that there be open-ended positive possibility in one's life, a dream of escape. Some economists may turn up their noses at such a thesis. There is within the profession an exaggerated concern with "refutable hypotheses,"[30] and mine may appear not to be one. But appearances can be deceiving. On closer examination one discovers a variety of empirical hypotheses about lotteries that can be derived from this theory. If lottery tickets are inputs in dreams of escaping one's current life by acquiring great wealth there are certain patterns of purchase both across groups and by individuals that one should expect to observe, and some of these expectations will either run counter, or orthogonal, to those predicted by rival theories.

All economic goods and all inputs to their creation have substitutes and complements. And the willingness to purchase a good will depend on the availability and price of those substitutes and complements. Thus for example those people who have ready access to cheap butter will purchase less margarine than those who do not, and those who have available cheap bread will purchase more. So too with lotteries. If the thesis of this paper is correct about the motivation for lottery purchase one would expect that: (1) the dream of great wealth would resonate more with some than with others, (2) the device of purchasing a lottery ticket will be a more attractive path to anchoring that dream for some than for others; (3) different markets for complementary goods would follow from some motivations than others; (4) and different patterns of purchase would be more consistent with some motivations than others.

Let us now derive some specific empirical predictions, and, see whether the world

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30 See Deirdre N. McCloskey, THE RHETORIC OF ECONOMICS (2d ed. 1998). An earlier edition of the same book recites the authorship of Donald McCloskey.

accords with the theory. Rather than keep you in suspense, I am pleased to report that where data are available all empirical observations are consistent with the theory. I must admit, however, that when dealing with a demand for something as peculiar as a sense of open-ended possibility there is some play in the joints, indeed so much play, that a clever reader might—with some ingenuity—derive and defend empirical predictions the reverse of my own. Some savvy readers may harbor further suspicions about these uniformly confirming empirical observations, and wonder which came first the observation or the prediction. In one or two cases I must admit that these suspicions are justified. But do not be overly cynical. The truth is that it is often difficult, not so much to predict, as to imagine. That is, generating predictions requires imagining how the population may be sliced and characterized to capture those for whom the dream of winning the lottery will have a numinal appeal, and for whom not. After the pattern is revealed, the reason becomes clear. So I ask that you judge the hypotheses below from the stance neither of the skeptic nor the sympathizer, but instead from that of the serious investigator and ask whether the predictions seem strained or reasonable, *ad hoc* or derived from theory. Further I invite you to derive, and if possible test, your own empirical hypotheses based on the theory, or test those of mine for which I provide no evidence.

The lottery ticket is an input into the dream of wealth. A dream of wealth will only be liberating to the extent that one believes that it will fundamentally transform one's life. Can you imagine Bill Gates praying passionately, "God, let me win the lottery."? I can not. Do not misunderstand me. I am not suggesting that Gates is not interested in acquiring more wealth. It is rather that his motivation in that regard is the one already incorporated in the traditional economic

model--wealth is good, the more the better. It is inconceivable that he harbors any hope that more wealth will fundamentally transform his life for the better. It is not merely that for Gates even a Lotto jackpot would be a drop in the bucket, but more importantly, that given his current command over resources, no amount of additional wealth, no matter how great, will afford him a significantly greater freedom of action. Generalizing from this, the wealthier one is, the less likely one will fantasize about acquiring still more wealth. And if dreams of great wealth have less appeal, it follows that lottery play will as well. Therefore, lottery expenditure should decline as a share of income, and perhaps even in absolute amount, as wealth increases. And so it does.[31]

Given that one has some demand for the *possibility* of great wealth, how is that demand affected by the presence of substitutes either: (1) for lottery tickets as a path to wealth; or (2) to wealth itself as a path to liberation.[32] The cheaper and more available are substitutes for any good the less will be the demand for the good in question. There are many fundamental transformations of one's current life that, depending on personal circumstances, one might find plausible and attractive aside from acquiring great wealth, and many paths to great wealth other than the lottery. But not everyone is equally well placed to avail themselves of these substitute hopes and substitute paths to their fulfillment. A satisfying dream of escape requires some root in reality, either a reasonable probability of being fulfilled, or, if that is not to be, at least an indisputably objective probability of coming to fruition. Those people who have fewer plausible dreams and paths to

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[31]   *See supra* note 4 and accompanying text; GAMBLING & SPECULATION, *supra* note 1, at 25 tbl.2.1.

[32]   At a still higher level of generality the dream of winning the lottery is a means of escape from consciousness of one's current life, and thus may substitute for other means of escape from consciousness of that life. Brenner and Brenner, summarizing a Canadian survey, state that when unemployment in Quebec reached an all time high "[p]eople reported that the money that had previously allocated to beer and wine was now allocated to lottery tickets." GAMBLING & SPECULATION, *supra* note 1, at 33.

fulfilling those dreams will, *ceteris paribus,* play the lottery more frequently.

Let us consider non-financial dreams of escape. Two of the more obvious are: romance, and career advancement. Young women are said to dream of a Prince Charming who will rescue them from their mundane existence and carry them off on his white charger. But not all women are equally well placed to harbor such a dream. Young, attractive, unmarried, innocent women might reasonably hope for such a rescue. But the old, unattractive, married, and jaded are less inclined to hold out such hope. Therefore one should expect that the latter are more likely to play the lottery; their demand curve is further to the right and more inelastic because they lack this substitute dream. While there is no data on attractiveness and lottery play, older married women do play the lottery more frequently than younger unmarried women.[33]

More generally it should not be the young that play the lottery, but the middle-aged. At the beginning all is potential, every manner of success in life is conceivable, and so escape from one's current life seems an ever-present possibility (my ten-year-old wonders whether he will ever play basketball better than Michael Jordan) requiring no artificial totem. With time, as we get more rooted into a life with a predictable undramatic plot, the dream of escape becomes more difficult to maintain. And so it is that the middle-aged play the lottery more frequently than the young.[34]

But it is not just age that robs us of realistic dreams of escape, our choice of careers does so as well. Just as it is the unmarried woman who can more readily dream of romantic deliverance than the married mother of three children, so to it is those whose careers still offer a possibility for

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[33] Controlling for age, unmarried women are 2/3 as likely to gamble as married women. Otto Newman, GAMBLING: HAZARD AND REWARD (1972).

[34] This prediction is supported by the relative frequency with which various age groups show up among the winners of major lottery jackpots. *See* GAMBLING & SPECULATION, *supra* note 1, at 29 tbl.2.2.

dramatic transformation or advancement, either financially or in some other dimension who will less often play the lottery. Even holding income constant I predict that factory workers, the unskilled, and union members will play the lottery more than academics and entrepreneurs[35] and the less well educated will play more than the more educated.[36] The principle is clear, the easier it is, given your position in life and society, for you to generate plausible attractive dreams of escape either financial or otherwise, the less you will play the lottery. Once more, I invite the reader to employ this principle to conjure up his own specific empirical hypotheses.

Next, let me suggest some hypotheses or at least explicable observations with respect to the use of complements and strategies in lottery play. Recall again that the very essence of the lottery is the sacrifice of probability, **P,** in order to provide the hope of enormous wealth, **W**. The critics of lottery play are correct in pointing out how pitifully small **P** is. The player would like **P** to be larger, but he cannot make it so without sacrificing the more important component, **W**. But remember we are talking here about financing a dream, not an annuity. Therefore any device which allows the lottery player to *believe* that his probability of winning is higher than that implied by the laws of probability will do the trick of making the dream more satisfying. Consider once more the joke of the old man's prayers with which we began this paper. If one believes that there is a personal God who will intercede on one's behalf to bring success it makes the dream more plausible and lottery play more appealing.[37] This suggests that the religiously observant would

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[35]   Otto Newman reporting from Great Britain states that it "can be stated with confidence that gambling is a predominantly proletrarian activity." Newman, *supra* note 33, at 85. Reuven and Gabrielle Brenner report that "[o]ccupations (when the winner was not retired) were all characteristic of the poor and lower middle class: The winners were janitors, factory workers, and so forth." GAMBLING & SPECULATION, *supra* note 1, at 28-34.

[36]   *See* GAMBLING & SPECULATION, *supra* note 1, at 31 tbl.2.4.

[37]   Note also that in this respect lottery play is a kind of act of faith in which one affirms one's faith that the world is governed not by mechanical rules, but by God's benevolence.

play the lottery more often than atheists. But the issue is more complicated than that. On the other side of the scales we have two significant forces. First, many, if not most, religions frown on gambling. Second, the truly pious are less likely to dream of salvation in the form of acquiring great wealth. Among the major religions Catholicism is exceptional in not only tolerating, but accepting and indeed sponsoring gambling. Thus it is no surprise that Catholics play the lottery more frequently than non-Catholics.[38]

A hope that one's probability of winning might be affected by unseen forces will also show itself in other ways, for example in a belief that some numbers may be luckier for you than others. And so there is a pervasive pattern of people choosing the birthdates of children and grandchildren in the lottery.[39] It is generally comforting, and in this case specifically encouraging, to believe that all of one's life is linked in some magical benevolent way to the basic forces of the Universe.[40] One further manifestation of this phenomena in lottery play is the presence of a cottage industry in dream interpretation, etc., to help one pick winning numbers.[41]

Another empirical hypothesis concerns the range of quantity of purchase across players. There is some common range of quantity of consumption for consumer goods across families. That is, some families purchase a quart of milk per week, and others purchase 5 gallons per week, but none purchase 500 gallons, regardless of their income and wealth; the diminishing marginal utility

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[38] *See* GAMBLING & SPECULATION, *supra* note 1, at 34 and sources cited therein.

[39] Charles T. Clotfelter & Philip J. Cook, *Lotteries in the Real World,* 4 J. RISK & UNCERTAINTY 227 (1991). I note in passing that this suggests that to maximize the probability of not sharing a winning prize one avoid choosing numbers below thirty-two.

[40] The winner of the $190,000,000 Powerball jackpot in May 1998 claimed that her dead son caused the winning numbers to be drawn.

[41] *See* Clotfelter & Cook, *supra* note 13, at 77-80 (1991); Jerry M. Burger, *The Effects of Desire for Control in Situations With Chance-Determined Outcomes: Gambling Behavior in Lotto and Bingo Players,* 25 J. RES. PERSONALITY 196 (1991); Ronald J. Rychlak, *Lotteries, Revenues, and Social Costs: A Historical Examination of State Sponsored Gambling,* 34 B.C. L. REV. 11, 60 n.300 (1992).

of all consumer goods kicks in early and sharply. This is not so for investment vehicles. Thus I

may deposit $50 per month into a mutual fund while you deposit $50,000, and no one would think

it odd. Therefore, if lottery players are treating ticket purchases as a consumption activity, one

should expect a narrower dispersion of expenditure across individuals than if they are treating it as

an investment activity.

Finally, we have the question of pattern of purchase. All goods display a particular timing

and concentration of purchase. For example, though my family consumes Cheerios and milk daily,

and has done so for a number of years, we neither purchase the inputs on a daily basis, nor a yearly

basis, nor do we purchase them at the same rate. Our frequency of purchases of these goods, like

that of all other goods, is a function of the benefits and costs of any particular pattern. Buying in

bulk has the advantage of reduced transaction costs, but the disadvantage of increased storage and

spoilage costs, as well as the loss in the time value of money. So we buy Cheerios in monthly

quantities and milk in weekly quantities, the latter having higher storage and spoilage costs.

So what of lotteries? Should we expect the frequency and concentration of purchase to be

different if the purchaser views this as an investment in dream production rather than in wealth

production? There are a number of factors--transaction costs, opportunity costs, spoilage and

storage costs--that affect the frequency and concentration of purchase generally but not

differentially between these two rival motivations. The transaction cost of purchasing lottery

tickets are reasonably low; The lines to purchase tickets are not usually very long and the purchase

can be made on the occasion of some other outing to the same location. On the other side of the

equation the storage and spoilage costs are essentially zero. As for opportunity cost, as with all

investment and consumption expenditure, given, that one's income is a flow over one's lifetime, and that capital markets are imperfect, it would be very costly to make one's entire lifetime lottery purchases at a single point in time early in life. For to do so would mean a disproportionate sacrifice of other goods and services at and near the period of lottery purchase because of the concentrated reduction in liquid wealth.

There are two considerations, however, that should lead to different patterns of purchase depending on whether tickets are being purchased for consumption or investment: (1) the utility yielded by equivalent increases in the probability of winning, and (2) the gain to learning the outcome of an investment with certainty. If lottery purchase is an investment activity--whether a sensible one or not--these two factors argue for earlier and more concentrated ticket purchases. As an investment in wealth, each ticket adds the same expected utility because it adds the same probability of winning. And, *ceteris paribus* it is preferable to invest in lottery tickets as early as one possibly can, for establishing the outcome of the investment with certainty allows one to better plan one's expenditures over the rest of one's life; Consider all the missed opportunities if one wins the lottery at eighty rather than thirty. On the other hand if one's goal is dream production rather than wealth production, then: (1) there is a declining marginal utility to increases in probability of winning; and (2) the expected value of winning does not enter one's utility function directly and so there are no *ex ante* losses from winning late in life rather than early and thereby having foregone preferable ways of spending one's winnings. So, it is more sensible to spread one's purchases over many lottery drawings spanning a longer period of time.

Unfortunately one cannot derive a precise empirical test from these timing considerations.

Although we should expect purchases of tickets to be more concentrated and earlier in life if they are an investment in wealth creation than in dream creation, we lack a ready standard of comparison. That is, we do not know how frequent and concentrated the purchases should be if one model or the other were correct, only the relative position of the two. That said, given the small amount of yearly income that the typical lottery player spends on tickets,[42] my intuition is that if it were wealth production that drove ticket purchases, one would expect players to purchase a relatively large number of tickets only once or twice a year, rather than purchase one or a few tickets many times throughout the year.

None of these empirical propositions is intended to be a definitive test of the theory of lottery purchases as fostering a sense of possibility in one's life, but rather merely suggestive that there is empirical content to the theory and that the evidence, such as it is, is not inconsistent with the theory.

Summary & Extension: Utility Maximization and Rationality Reconsidered

Consider once more the story of the ten-year-old girl at the beginning of this paper. Viewed from the outside, sex, like lotteries, indeed like all recreational activities is incomprehensible. But, that is an error of perspective, not a fault of the activity. From the outside the only explanation one could possibly derive is a narrowly utilitarian one, and that is the wrong place to look. Reducing sexual intercourse to a utilitarian act, while useful for some purposes, misses entirely its

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42   Even the lowest income group, which spends the greatest portion of their income on lotteries, spends only 0.3%. GAMBLING & SPECULATION, *supra* note 1, at 25 tbl.2.1. Indeed the British Royal Commission reports that the total amount spent on all forms of gambling is considerably less than the amount spent on liquor or cigarettes. ROYAL COMMISSION ON BETTING, LOTTERIES AND GAMING, REPORT 49-50 (London: H.M.S.O. 1951).

inner sense. Imagine a world in which academics had the sexual sensibilities of ten-year-olds. If

you asked those academics why people engaged in sexual intercourse to such excess given their

limited desire to procreate, they might puzzle over it for a while and then respond that those who

did so were benighted fools who did not understand the process. Were public policy being made

by those altruistic academics, the law would likely incorporate an elaborate set of prohibitions

and restrictions on recreational sex, even between married couples, designed to protect them from

their folly.

And so it is with lotteries. A central purpose of this paper was to show that lottery play is

not economically irrational and uninformed. The judgment of some critics that it is, merely reflects

their own limited sensibility and understanding. Because by training, character, or circumstance

they are as numb to the desire to play the lottery, as the ten-year-old girl is to sex, they can only

ascribe lottery play to some functional goal, wealth production. And as such they of course either

find it wanting,[43] or alternatively must go through implausible intellectual contortions to justify

it.[44] I hope that I have succeeded in making my case that a lottery ticket is an investment in dream

production not in wealth production and so criticisms of it as a device to accomplish the latter are

completely inapposite.[45]

That said, I doubt that I have persuaded many of those who oppose lotteries. For I do not

think that their opposition and willingness to impose their disapproval legislatively are rooted in

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[43] The critics are either explicitly or implicitly aware of both the expected financial return of lotteries to the consumer and the risk aversion implications of the diminishing marginal utility of wealth. So the critic can only explain participation in the lottery as error. The players must fail to realize that the expected value of a one dollar wager is often less than fifty cents; and they do not appreciate that because of the diminishing marginal utility of wealth the expected utility of the wager is substantially less than the utility of its expected value.

[44] McCaffery, *supra* note 12, at 71 (hypothesizing indivisibilities in consumption and impediments to savings as explanations for lottery play).

[45] A British Royal Commission concluded that gamblers are as aware of the unprofitable nature of commercial gambling as non-gamblers. ROYAL COMMISSION ON BETTING, LOTTERIES AND GAMING, REPORT (London: H.M.S.O. 1951), *cited in* GAMBLING & SPECULATION, *supra* note 1, at 37.

the belief that lottery players are foolish in the simple sense of not understanding that the lottery is a bad bet. Instead, it is based on the belief that lottery players are foolish in the deeper sense of lusting after a sterile dream, a dream that will not ultimately satisfy.

This deeper criticism is the sort that economists usually do not address. Indeed we are professionally as numb to it as is the misguided financial analyst to lotteries, or the ten-year-old girl to sex. We have our model of utility maximization, which effectively assumes away the problem; People have desires and seek to satisfy them, 'that is all ye know and all ye need to know!' But such a narrow understanding of the pursuit of happiness is not a theology adhered to by thoughtful people outside the profession. In the absence of some argument that people's choices are actually likely to bring them satisfaction we are left with the kind of economic arguments that can only convince others who treat utility maximization as a religion rather than a useful tautology.

The challenge clearly goes well beyond lotteries. To state it simply it is the assertion that people are sometimes (or often, or always) not really very smart about what is ultimately in their interest. This is a much broader and deeper claim than some notion of a discrete informational failure. Nor can it be cabined as an imputation of irrationality in a narrowly analytic sense. Claims of this sort surface in a variety public policy arguments and are normally accompanied by the suggestion that a voluntary contractual activity be prohibited because it is not in the best interest of one or both of the consenting parties. It has been invoked against everything from breast augmentation,[46] to dwarf throwing,[47] to surrogate motherhood.[48] But such a list of examples while useful as

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[46] *See* Marcia Angell, SCIENCE ON TRIAL: THE CLASH OF MEDICAL EVIDENCE AND THE LAW IN THE BREAST IMPLANT CASE (1996).

[47] *See* Robert W. McGee, *If Dwarf Tossing is Outlawed, Only Outlaws Will Toss Dwarfs: Is Dwarf Tossing a Victimless Crime?*, 38 AM. J. JURIS 335 (1993).

[48] *See* Margaret F. Brinig, *A Maternalistic Approach to Surrogacy: Comment on Richard Epstein's Surrogacy: The Case for Full Contractual Enforcement*, 81 VA. L. REV. 2377 (1995).

illustration is fundamentally misleading. For, once we admit that human consciousness has content and character and is not merely an empty box, there is no limit to the range of human activity that can be found wanting. A claim of human irrationality in this deeper sense is a challenge to any pretensions of a normative economic analysis.

The assumption of rational utility maximization, that is, that people know there own interests and seek to satisfy them, has been treated as central to both the social wealth maximization and Paretian standards of efficiency. In our social welfare calculus we value any economic effect as those who are affected value it, either aggregating the dollar valuations in the case of social wealth maximization, or asking whether each affected person believes himself better or worse off in the Paretian analysis. But where is the basis for those social valuations if people do not know their own interests?

In the remainder of the paper I will attempt to reconcile the seemingly irreconcilable. It is my position that the critics are more right than they know, that virtually all of our non-instrumental desires are the pursuit of shadows, that people systematically do not know what their lives are about, that they do not know what is in their own interest. Yet, I will argue, that the *assumption* of rational utility maximization emerges unscathed not only as a useful descriptive tautology, but as a legitimate and powerful tool of normative economic analysis as well.

Let us begin by clarifying the role that rational utility maximization plays in normative economics. In a social wealth calculus we attempt to measure losses and gains that result from various policies, for example, imposing tariffs, minimum wage laws, or rent control, or prohibiting lotteries, smoking, or prostitution. The effect of each of these policies will be to change prices and

quantities exchanged in the market. The increase or decrease in quantity of the good exchanged must be valued from a social perspective, the losses to some and the gains to others must each be weighed. The traditional social wealth calculus and social wealth maximization standard values all dollar losses to the losers on a par with all gains to the winners, and values all units of goods lost at the dollar price that the erstwhile purchaser would have been willing to pay, and all resources at the erstwhile provider's self-perceived opportunity cost. Thus implicitly or explicitly all social gains and losses are assigned the same weight as the private gains and losses as each person experiences them.[49]

Pervasive irrationality cuts off all direct connection between the private calculus and the social one. For why should the social calculus weigh private gains and losses at their privately perceived weight when the people experiencing them are not to be trusted to know where their interests lie? Returning to case of the lottery: In the traditional economic analysis the voluntary purchase of a ticket for a dollar implies that the purchaser is getting at least his money's worth-- and likely more. Therefore outlawing lotteries reduces social wealth and *a fortiori* is a Pareto inferior move. But if lottery players are making a foolish error in seeking satisfaction in the lottery when they should be spending their money and energy elsewhere then they are actually getting less than a dollar's worth of benefit, and so, the argument runs, one may well improve their welfare and increase social wealth by outlawing the lottery.

But let us dig a little deeper and explore the meaning of "social" wealth and welfare. The traditional normative use of rational utility maximization described in the paragraph above cannot

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49   For the purpose of this discussion nothing turns on whether we measure value in utility or dollars.

rest solely on an assumption of people exercising rational self-interest. For why should I care that you know what is in your self-interest? Unless I believe that your interest is to count in the normative calculus, your rational pursuit of your own interest is simply a normative irrelevancy. And, unless I believe that your interest is to count on a par with mine, neither a Paretian nor a social wealth maximization standard will be compelling. So what counts more, and is more fundamental, than rationality is some notion of the equality of our interests in the social calculus. Belief in such an egalitarian principle is widely shared and thoroughly independent of the discipline of economics. Ronald Dworkin the renowned liberal philosopher titles his version of it 'the principle of equal concern and respect';[50] It requires that the interests of each member of the social group for whom general rules and policies are being made shall count on a par with one another. That ethical principle--whether correct or not--emerges unscathed from any assault on human rationality.

Unless the principle of equal concern and respect is abandoned, calculating social welfare requires that we give weight to the effect of social policy on individual welfare. And, the alternative sources of those weights are severely limited. If we do not accept the self-perceived weights supplied by the individuals themselves, (e.g. treating the value of the lottery ticket as at least the dollar price the player is willing to pay for it) then "we" must supply them ourselves. But who is the "we" in the previous sentence? As we are talking here about public policy "we" must necessarily be political in character, that is, a state legislature, executive, agency or appointee.

The underlying logic for employing politically supplied weights rests on an attractive

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50   *See* Ronald Dworkin, Taking Rights Seriously 273 (1977).

analogy. In the same sense that parents restrict and direct their children's activities with the greater

knowledge of the path to a satisfying life, so too a wise and caring state could, by restricting and

penalizing foolish choices, redirect people to a life that has the prospect of satisfying the

fundamental demands of human consciousness in a more permanent and comprehensive way.[51]

These are the two polar choices: revealed preference or political weights. Economists

have traditionally adhered to the first, employing each person's self-perceived weight in the

social calculus. The profession justified this choice by resort to the assumption of rational utility

maximization. That assumption, if not a tautology, is an empirical proposition. As such it is at a

minimum unproven and somewhat controversial. I believe that more than that, the assumption of

rational utility maximization is unjustified, perhaps not even meaningful, and--most important--

certainly not necessary to support the use of revealed preference in either a social wealth or

Paretian calculus. If the assumption of rational utility maximization is so problematic, why has it

been so tirelessly invoked to support revealed preference?

Utility maximization has functioned as a mantra of sorts, meant to capture and at the same

time obscure a deeper, more normative justification for the use of revealed preference. This self-

deceptive concealment of the true postulates of the social wealth and Paretian calculus resulted

from the misguided effort to make even normative economics "scientific" and value-free. The

political and moral values that drive the normative use of revealed preference are by definition not

"value free" and therefore appear to taint a putatively scientific analysis. Assuming that people are

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51   "[I]f economics is to maintain its prescriptive power as a classically liberal doctrine, it is crucial that
rationality be the norm. Should we concede that individuals frequently act against their own better interests, the
ideal of consumer sovereignty loses much of its force, and we would be well on the way to paternalism."
McCaffery, *supra* note 12, at 73.

rational utility maximizers had the "virtue" of supporting and justifying the normative use of revealed preference without giving recognition to its true normative roots.

Abandoning the assumption of rational utility maximization, though it at first appears devastating to normative economics, is in fact liberating. Recognizing the philosophical propositions on which the normative use of revealed preference actually rests means that rational utility maximization need not be taken literally, but can instead be treated as an "as if" proposition, thus freeing both economists and those political "liberals" who wish to employ a social wealth or Paretian calculus from empirically defending the proposition that people actually know and rationally pursue their own interests.

But if utility maximization is not the basis for employing individual revealed preferences in the social calculus, what is? There are four separate but related reasons to prefer revealed preference to politically imposed weights. Each is, I believe, more compelling than the assumption that we all actually know our own interests and seek to satisfy them. As I will briefly outline below these more substantial justifications are drawn from a variety of intellectual and moral disciplines: economics, epistemology, moral philosphy, and political philosophy.

The first--and least fundamental--reason to prefer revealed preference as a source for social weights is prudential and economic. The economic problem with a political/paternalistic source of weights is that unlike in the suggested analogy of parents making decisions for their children, those who hold the reigns of political power are not our parents and there is little reason to believe that they place our interests above their own. The only reliable means to see that any weight at all is given to a person's interests is to weigh them on his own scale. The alternative of

granting an agent of the state the power to employ his vision of the path to the good life on behalf

of us all would give free reign to every imaginable self-interested abuse of political power.[52]

The second reason to employ revealed preference is epistemic and by far more

fundamental. This is not the forum in which to address the deep nature of human consciousness.

Economics is a shallow discipline. And that is its virtue! It rests on essentially simple but sturdy

truths. But while economics *qua* economics can not--and should not attempt to--address the

profound questions of life, it would be a serious error to pretend that that profound dimension does

not exist. Thus in addressing the question of man's rationality in this deeper, more substantive

sense we will not engage in our own inquiry but instead rely on the teachings of major

philosophical and religious traditions to suggest what wise men might say about the assumption of

rational utility maximization.

In Plato's allegory of the cave man is depicted as seeing the shadow of the sublime in the

everyday and mistakenly taking the shadow to be the reality. While in the Buddhist teaching of

Samsara and Nirvana man is seen as seeking the world of perfection (Nirvana) but looking for it in

the spatial-temporal world (Samsara). Both traditions teach that we are all desperate for our

salvation, but harbor an illusion as to the nature of the world and ourselves, and so we cannot

correctly conceive of the form that salvation might take; We are profoundly mistaken about what

will satisfy our deepest and most essential longings. Do not suppose from all this fancy talk that

this criticism is meant to apply only to some small discrete set of spiritual concerns but that more

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52   I also note in passing that the very open-endedness of a paternalistic standard means that it would, as a
practical matter, leave economics silent. It suggests no enduring principle by which to measure social welfare.

mundane everyday choices are free of fault. Both traditions view life as of a single piece and that fundamental error infuses all our desires.

This less than thumbnail sketch is hardly meant to persuade you of the correctness of this pessimistic view of man's rational pursuit of his own self-interest. It is instead meant only to suggest that that pessimistic view is not some bizarre current fad of a tiny disturbed minority, but rather is a widely shared teaching of a variety of profound religious and philosophical traditions. At first blush it appears that this bleak epistemic vision of man's understanding of his own interests and the path to their satisfaction demolishes rather than supports the use of revealed preference in the social welfare calculus. But that appearance is misleading. While it makes rubble of the traditional utility maximization bedrock of revealed preference, in that very act of destruction, it creates a more secure and durable basis for the principle.

Remember the choices before us. It is only because we believe that all people within the relevant social group are to count, and to count equally that any concern with social welfare arises, and if we are to count the interests of those people then we must weigh them either with the weights they reveal by their actions or with weights provided by the state. But, the state is not a thing but merely a name that we give to the collective political authority. That authority is exercised by people, members of the very same genus whose ability to understand the path to their own satisfaction we question. The more open and general the claim of human epistemic failing the more difficult it is to justify politically imposed weights. A belief in a state with the knowledge, tools, and will to lead us to enlightenment, is a far grander and more pernicious fantasy than any dream of winning the lottery.

It is an implicit appreciation of this problem that makes the implausible argument that lottery players simply do not know the odds so seductive. The presumptive regulator would like to retreat to a safe harbor by pointing to a discrete informational failure that others are subject to and he is not. But once we open ourselves to the argument that the assault on human rationality is elemental then the critic has no more solid place to stand than his subjects, no pedestal from which to criticize the choices of others and substitute his own. And, holding the reins of political power or seeking to grab those reins are at best not positive signs that someone has a clearer vision of the path to enlightenment than the rest of us, or that he will be selflessly motivated to exercise his limited wisdom on our behalf. This epistemic argument and the prior economic one do not so much support the normative use of revealed preference as undercut the alternative of politically supplied weights. To positively justify revealed preference we must look to moral and political philosophy.

The third argument in favor of employing revealed preference to derive social weights is that doing so satisfies a legitimate human preference in the only fashion, and to the limit that it can be satisfied in political decision making. There is a widely shared notion that we have a meta interest in pursuing our own interests. In other words, even if I knew that you could make choices for me that were better than my own, I would still prefer to make my own choices; I desire personal autonomy. The very nature of living in a political community means that some decisions that affect our individual lives and property must be made politically. Of necessity therefore full autonomy cannot be maintained. But, even those who recognize the virtue of some collective political decision making do not wish to surrender all autonomy. In fact, the concept of diminishing marginal utility suggests that precisely because the constraint of collective decision

making limits the extent to which we can satisfy the desire for personal autonomy, we become even more anxious to preserve what little measure of it we can. The clarion call of the American colonists, "No taxation without representation," exemplifies the form that the egalitarian claim of personal autonomy makes in the political sphere. It demands that my vision of my interests count on a par in the political calculus with others' perception of their interests. If it is your perception of my interests rather than my own that are weighed in the social calculus, I am to that extent diminished in my sense of personal autonomy. The normative application of revealed preference satisfies the preference for personal autonomy in the only fashion that it can be uniformly satisfied in the political decision making process.

The final, and perhaps most important, argument is one of political philosophy related to the economic, epistemic, and moral arguments above. It rests on widely shared political beliefs in liberty and equality. An adherence to the value of equality of liberty suggests that as between a weight assigned by a stranger--ignorant or knowing--or an ignorant actor, the greater claim of dignity for the choice of the actor is that it is the only one consistent with the principle of equal concern and respect. It is the only one which in its actualization grants equality to all, and not a special privilege to some to decide what is best both for themselves and for others. The normative use of revealed preference in effect grants a political right to ignorant people to make their own mistakes.

To the extent that the assumption of rational utility maximization is merely an as-if proposition meant to lead us to apply revealed preference as a normative tool for any, or all, of the reasons outlined above it is almost devoid of economic content. Of the four arguments used to

support it only the first, least fundamental, and least compelling, is derived from economics. The

others are bottomed on epistemology, ethics, and political philosophy. The assumption of rational

utility maximization is thus no more than a shorthand way of saying whose interests shall count and

how they shall be counted in the political calculus. The political liberal answer (that is, that which

follows from a widely shared interpretation of the principle of equal concern and respect) is that

all accepted members of the political group count equally and all interests are weighed on a

universal neutral scale of perceived self-interest either in dollars or in some other measure of

value.

To see more clearly that as a normative principle the assumption of utility maximization is

fundamentally a political rather than an economic concept, consider the exceptions that we carve

out to the rule that each person's interests count in the calculus with the weights he himself assigns.

The criminal's evaluation of his own welfare--as best as we can determine it--normally will count

with either a reversed sign, or as zero in the calculus of the community, and foreigners either count

as zero or at a fractional rate. These weights do not derive them from economics. Economics has

no theorems or postulates that could speak to such questions. Such weights must instead have their

root in the preferences and perceived interest of the body politic for whom policy is being

developed and evaluated.

Finding the assumption of rational utility maximization to be not an economic principle, but

a shorthand for a political principle need compel no one who opposes lotteries to abandon his

position. If one is persuaded: (1) of the foolishness of lottery play; and (2) of one's own right to

legislate that others not engage in such foolishness, then favoring its prohibition is a perfectly

consistent position. To say that such a position is not a liberal one merely defines where one

stands on the issue of the equality of liberty, an issue over which reasonable men can, and have,

differed.

But, for both economists and "liberals" the force of this discussion is to lift a heavy, and

superfluous burden. For the liberal it removes the necessity to rest the use of revealed preference

in the political calculus on any notion that people understand their own interest. The true basis is

revealed instead to be a minor variant of the moral and political principle of equality of the right to

chose. Similarly for economists the use of a Paretian or social wealth calculus in no fundamental

sense relies on or requires adherence to any rich notion of human rationality. The normative

adherence to revealed preference comes not from inside the profession but outside of it. It is no

more than the application of the normative political standard that one might guess is widely shared

in a modern liberal state, and is thus employed to calculate the normative political preferences of

society not necessarily, and certainly not only, those of economists. If transported to a theocracy,

an oligarchy, or caste state the economist could just as well employ a different social calculus

resting on a different set of political and moral values.

Let us return one final time to lotteries. It seems clear now that the propriety of lottery play

and government prohibition or sponsorship has little or nothing to do with the economics of the

activity. Playing the lottery is a recreation. And all recreations–skiing, golf, sex--analyzed with

sufficient wisdom, intellect, and vigor may be found wanting and misguided. The widespread

intellectual disapproval of lotteries does not even rest on such a deep analysis but instead on a

numbness to the symbolic appeal of the activity. It is no more than the deaf and blind seeking to

legislate in the best interest of the merely blind.