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***AUCTIONS OF CAPITAL GOODS, ENTREPRENEURIAL PLANS
AND INFERENCES OF THE 'WINNER'S CURSE'***

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Running Head

AUCTIONS OF CAPITAL GOODS

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ABSTRACT

The *winner's curse* was 'discovered' in what appeared to be low rates of return on certain types of capital goods acquired in auctions. Hence, the inference that companies were erroneously and anomalously bidding amounts for capital goods in excess of their presumed 'common value.' Experimental auctions uncritically relied on this exogenous standard of assumed 'correctness.' But capital-good appraisals are necessarily endogenous to entrepreneurial plans that embrace creative and unique complementarities. Such plans are tested by investing in capital goods under conditions of uncertainty and change. Appearance of anomalous overbidding may simply reflect a failure of plans. The inquiry suggests a revised interpretation of the discovery of the winner's curse.

Possibly relevant JEL Codes: D44, D84, E22, G12, L21, M13

Key terms: auctions, winner's curse, capital goods, experiments, entrepreneurial plan

AUCTIONS OF CAPITAL GOODS, ENTREPRENEURIAL PLANS AND INFERENCES OF THE 'WINNER'S CURSE'

John Brätland¹

I. Introduction and overview

The winner's curse is said to characterize auctions in which winning bidders erroneously and systematically submit bids in excess of a capital good's 'true common value.' The discovery of the 'curse' arose from an inference of low returns on investment in petroleum leases acquired in competitive auctions. Further presumptive evidence of the overbidding phenomenon has been revealed in experiments involving objects that do in fact have a demonstrable common value. Some experiments involved the participation of 50 separate groups of people.² Each participant in each group was asked to bid for the monetary content of a transparent jar of coins. Jars were filled with coins of a single denomination. The actual content, unknown to bidders, was \$8.00. Groups of bidders were isolated and did not know the results of any other round of bidding. Average bid for the auctions was \$5.13 but the average winning bid was \$10.01 resulting in an average loss of \$2.01 per winner. Of particular note is the fact that the object auctioned actually had a value that was 'common' for each bidder.³ Apparent 'error' in bidding is gauged against a pre-existing 'common value.' Similar experiments with jars of coins have been conducted many times with similar results. Proponents of experimentation claim a general relevance of results to auctions of capital goods. However, this contention seems to ignore the plans and action behind the origin and nature of capital goods. Often unique entrepreneurial plans for uses of capital goods seem to negate the 'common-value presumption' central to the winner's curse. The common-value premise implies an external standard of 'correctness' in bidding that ignores the fact that the investment worth of capital goods inhere in the success or failure of the plan itself.

Unraveling the winner's curse requires a clear understanding of what capital goods are. Capital goods come into existence because of the plans of savers and entrepreneurial business enterprises. Savers forsake consumption in the present in exchange for the prospect of a net gain in the future. Savings allow the production of capital goods and may take the form of being unfinished consumer goods, tools, machinery, or plants used in the manufacture of consumer goods.⁴ Capital goods enhance productivity both in terms of the quantity of goods that can be

¹ John Brätland is a Ph.D. economist with the U.S. Department of the Interior in Washington, D.C. The views expressed in this study are strictly those of the author and do not necessarily reflect Departmental policy.

² Richard Thaler. 1992. *The Winner's Curse: Paradoxes and Anomalies of Economic Life*. New York, NY: The Free Press, p. 52.

³ One grants that a given amount of money can rank differently in the value rankings of each participating bidder.

⁴ Israel Kirzner. 1996. *Essays on Capital and Interest: An Austrian Perspective*. Cheltenham, UK: Edward Elgar Publishing Company, p. 124.

produced and the broader variety of goods availed through their employment processes. While the experiments described above did not involve a capital good, most experimental auctions have focused on items simply postulated to be capital goods. Auction experiments are thought to be a source of insight into circumstances actually faced by business firms in the competitive acquisition of capital goods. In the *ex ante* setting of the experimental auction itself, the capital good is assumed to have an uncertain value that in an *ex post* sense would prove to be common to all bidders. This ‘common value assumption’ is uncritically applied to examinations of actual auctions of capital goods in which the winner’s curse may befall winning bidders.

Acquisition of capital goods may involve either the winning of a formal auction or a competitive negotiation between competing firms. Auctions are employed by sellers in situations in which particular capital goods or capital-good combinations do not have ‘quotable’ market prices. But the winner’s curse alleges that in formulating bids based on their assessments, firms are thought to erroneously overbid. These supposed errors are seen as a ‘disequilibrium’ situation that is correctible as bidders adapt to the adverse selection associated with winning. But, again, this bidding disequilibrium is reliant on the notion that the assets sought must have an ostensibly true ‘common value.’⁵ Moreover, the theory of the winner’s curse, as it has been refined by controlled experiments, implicitly places heavy reliance on the notion that the bid is the principal decision variable available in the firm’s ability to profitably employ the capital good. In this sense, this research ignores the much broader scope of actions and plans of entrepreneurial enterprises in exercising the property rights implicit in the acquisition, ownership and deployment of the capital good.

This examination of the winner’s curse is prompted by several related questions. Have the events surrounding the ‘discovery’ of the curse been properly interpreted? Can auction experiments reveal results relevant to or analogous to the winning of auctions for capital goods? Can a capital good realistically have a value [investment worth] that is common to all entrepreneurial enterprises competing in an auction? Can purported uncertainty and disequilibrium in bidding for a capital good be realistically conjoined with the sort of static, deterministic equilibrium that is necessarily implied in the ‘common-value assumption’? If one allows for entrepreneurship and the conditions of the real world, how is one to discern and interpret what may appear to be overbidding for capital goods? Do the experiences of the petroleum industry in bidding for leases legitimately reveal error in bidding?

This paper will answer these questions by exploring the most plausible ways in which entrepreneurial firms actually ‘appraise’ the investment worth of capital goods within the context of their own business plans. The net appraisal of these plans by entrepreneurial firms establishes its capital and, hence, derives the ‘investment worth’ of the capital goods. These plans necessarily involve the grouping of capital goods to achieve desired complementarities. Acknowledgement of entrepreneurial planning suggests that at the time that the firm competes for the acquisition of capital goods, no ‘true common value’ can exist *a priori*. ‘Appropriate’

⁵ John H. Kagel and Dan Levin. 2002. “Bidding in Common Value-Auctions: A Survey of Experimental Results,” in eds. John H. Kagel and Dan Levin, *Common value Auctions and the Winner’s Curse*. Princeton, New Jersey: Princeton University Press, p. 1.

levels of bids for capital goods can only be revealed in the passage of time as the success or failure of an entrepreneurial undertaking unfolds. The restricted scope of property rights can explain low returns on investments in certain capital goods acquired in auctions. But do these ostensibly low returns necessarily reflect bidding error? Clearly an assessment of bidding strategies must take into account of the entire scope of entrepreneurial plans for the employment of capital goods that are won in auctions. The answer suggests a revised interpretation of the original bidding phenomena thought to reveal a winner's curse.

II. 'Discovery' of the Curse and 'Common-Value' Assumption in Experiments

The 'discovery' of the winner's curse was really a narrow interpretation of experiences of actual petroleum companies bidding in auctions of offshore petroleum leases. What appeared to be disappointing returns on investments in these capital goods drew early researchers to conclude that companies were erroneously overbidding for assets that presumably had a 'value' that somehow had to be the same for all competing bidders. The common-value assumption is ostensibly based on the supposition that the capital good, once 'efficiently' employed, would prove, in an *ex post* sense, to have the same investment worth for all bidders. Researchers have attributed what appeared to be low returns to irrational failure of bidders to account for adverse selection associated with winning an asset presumed to have a 'preexisting common value.' The assumptions of 'common value' and overbidding have been uncritically applied to much experimental research into the winner's curse. Not surprisingly, the results of experimental research have reinforced the erroneous notion that the amount of the bid is the principal determinant of profits or losses on investment in capital goods.

A. The story of how the winner's curse was 'discovered'

As capital goods, petroleum leases are unusual in the sense that the property rights acquired in auctions are highly attenuated. Leases in this case are rights to drill for oil and gas on particular tracts of land with the further right to produce what is discovered. These rights are highly circumscribed by regulations or lease terms that hold the lessee to very tight time limits with respect to the schedule of exploration development and production. Failure to pursue a 'diligent schedule' in exploration and development can mean forfeiture of the amount bid.

But did attenuated property rights account for what appeared to be overbidding by petroleum companies in acquiring petroleum leases? Oddly, the issue of fragmented property rights was not addressed in the studies leading to the so called discovery of the winner's curse in 1971. But of greater relevance to this inquiry was the complete neglect of the way in which entrepreneurial plans may affect bidders' assessment of investment worth. This neglect may be attributed to the professional orientation of those who stumbled onto the idea of the winner's curse. While the winner's curse has drawn a great deal of attention from economists, economists were not actually responsible for the discovery. Rather, three petroleum engineers with the unlikely names of Capen, Clapp and Campbell (hereafter CCC) were the first to suggest the winner's-curse idea. The results of their research are succinctly captured in their own words:

In recent years, several major companies have taken a rather careful look at their

record and those of the industry in areas where sealed competitive bidding is the method of acquiring leases. The most notable of these areas is the Gulf of Mexico. Most analysts come up with the rather shocking result that, while there seems to be a lot of oil and gas in the region, the industry is not making as much return on its investment as it intended. In fact, if one ignores the era before 1950, when land was a good deal cheaper, he finds that the Gulf has paid off at something less than the local credit union.⁶

Richard Thaler describes the results of this research in the follow way: “[t]hey [CCC] report that the ratio between the highest and lowest bids by what they call ‘serious competitors’ is commonly as high as 5 to 10 and can be as high as 100. ...” In focusing on one auction, Thaler notes

“...the sum of the winning bids was \$900 million, while the sum of the second highest bids was only \$370 million. The winning bid exceeded the second bid by a factor of 4 or more in 26 percent of the tracts, and by a factor of 2 in 77 percent of the tracts. While these figures don’t actually prove that anyone was acting irrationally, they certainly seem consistent with a winner’s curse scenario.⁷

Clearly the pattern of bidding reported by CCC does reflect a dramatic dispersion of ‘valuations’ of the part of bidders. However, does this dispersal necessarily reflect evidence the winner’s curse? One attempt to answer this question focused on subsequent efforts to estimate rates of return on the investment in these leases. A study by Mead et. al. involved the calculation of after-tax-rates of return for 1223 leases in the Gulf of Mexico. They conclude:

for all 1223 leases, firms suffered an average present value loss of \$192,128 per lease using a 12.5% discount rate [employing nominal values for costs and selling prices] ... 62% of all leases in our data base were dry. Consequently, the lessees had no revenue what so ever to offset their bonus and rent payments, or their exploration costs. Another 16% of the leases were unprofitable (on an after tax basis) although some production occurred. Only 22% of the leases were profitable, and these leases earned only 18.74% in aggregate on the after-tax basis. ... The low and negative rates of return ... appear to reflect excessive enthusiasm for the amount of oil likely to be found.⁸

Neoclassical theorists have been anxious to advance the notion that these results are an example of anomalous and erroneous overbidding on the part of bidders. This notion seems to suggest a type of ‘market failure’ in which bidders ignore the adverse selection of winning and, hence, fall victim to the ‘winner’s curse.’ This mindset has carried over into the use of experiments to

⁶ E. C. Capen, R. V. Clapp and W.M. Campbell. 1971. “Competitive Bidding in High-Risk Situations” *Journal of Petroleum Technology*, Volume 23, p. 641.

⁷ Thaler. 1992, p. 52.

⁸ Walter J. Mead, Asbjorn Moseidjord and Phillip Sorenson. 1983. “The Rate of Return Earned by Lessees Under Cash Bonus Bidding of Oil and Gas Leases,” *The Energy Journal*, Volume 4, 42-45.

examine the role of the winner's curse in auctions of capital goods.

B. Common-value and bidding disequilibrium: interpretation of experiments

While the interpretation of the above experience with auctions of petroleum leases can be described as the 'discovery' of the winner's curse, the more general theory of the winner's curse emerged out of experimental research. The subsequent experience with experimental auctions has only confirmed and affirmed the conclusion that the results reflect irrational behavior of the part of bidders? To give the concept of irrational bidding any precise meaning, neoclassical theorists had to advance the notion that a thing being auctioned must somehow have a '*value common to all the parties offering bids*'. But how is 'common value' to be interpreted? As noted above, the idea of a common value is premised on the belief that the capital good value, once employed, would necessarily prove to have the same *underlying* 'value' for all firms that could have won the leases. Put succinctly, "the ex post value of the item is the same for all bidders."⁹ One can readily accept the idea of a 'common value' as applied to auctions of jars of coins but can such an assumption be aptly applied to auctions of capital goods?

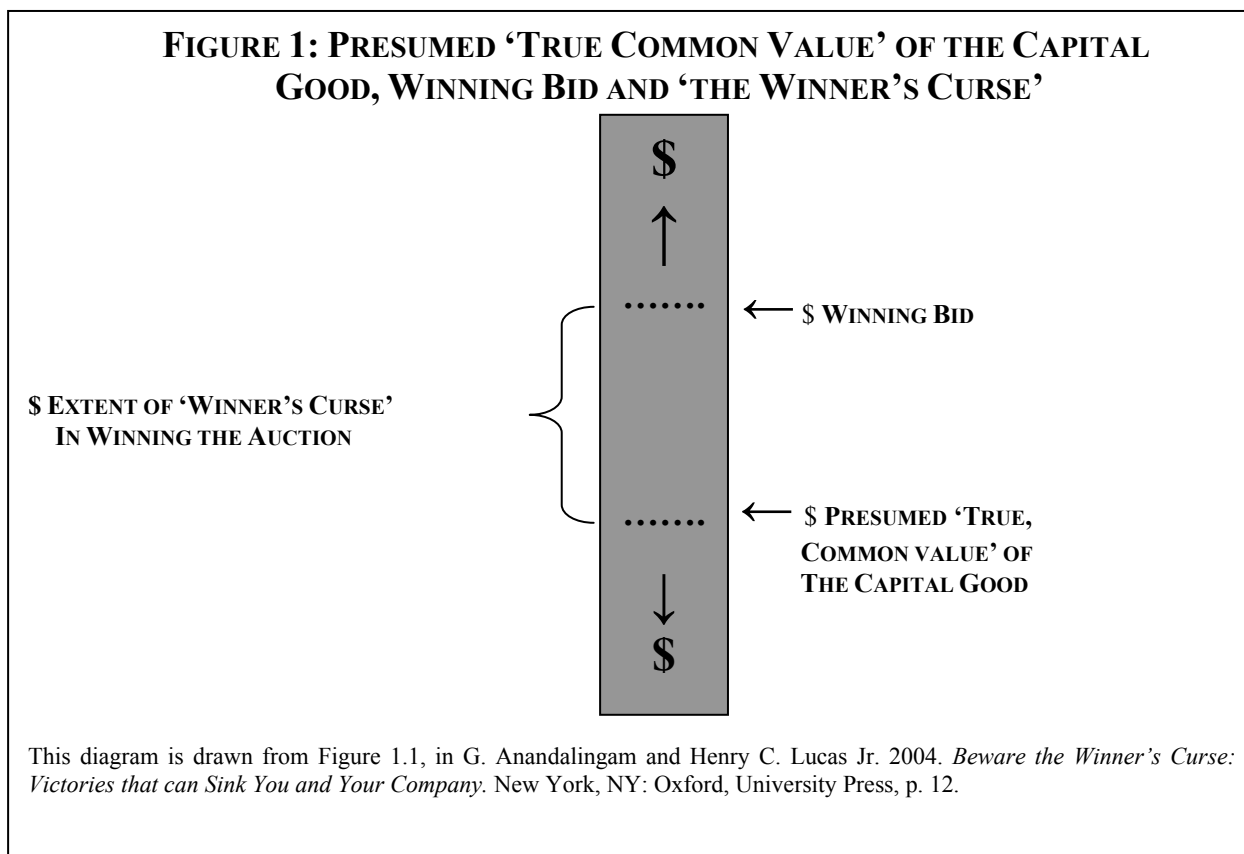
Clearly, if the bidding in auctions of petroleum leases is to reflect the winner's-curse phenomenon, other assumptions are required to make the case that these assets could have a common value. What emerges here is a model in which the size of the winning bid is the only decision variable available to the firm in its efforts to 'maximize profits.' A firm bidding 'too high' is disappointed. The disappointment may take the form of losses on the investment or a lower return on investment than was initially thought possible. Of note in this theory is the fact that, subsequent to winning the auction, the firm's planned – possibly differentiated use of the capital good seems to play no role in avoiding such disappointments. With reference to bidding for petroleum leases, Anandalingam and Lucas observe, "The problem was that the amount of oil underground was fixed and its value did not depend on what was bid for it. (Economists call this a *common value auction*.) Given that the winning oil company had to have been the most optimistic, there was a good chance that it bid more (sometime *much* more) than the lease was worth" (emphasis in original).¹⁰ In other words, the common value assumption is tied to the notion that the value of the petroleum lease is one dimensional and established solely on the basis of its physical nature, that is, the quantity of oil underground. This type of assumption has been applied to most instances in which the winner's curse is thought to be operative in the bidding for capital goods.

Figure 1 shows a pictorial representation of the winner's curse as it is thought to occur in the auction of any capital good. The capital good has a presumed common value which is exceeded by the winning bid. The extent of the winner's curse is represented as the extent to which the winning bid exceeds the presumed, true, common value of the capital good. The degree to which

⁹ John H. Kagel and Dan Levin. 2002. "Bidding in Common Value-Auctions: A Survey of Experimental Results," in eds. John H. Kagel and Dan Levin, *Common value Auctions and the Winner's Curse*. Princeton, New Jersey: Princeton University Press, p. 2.

¹⁰ G. Anandalingam and Henry C. Lucas Jr. 2004. *Beware the Winner's Curse: Victories that can Sink You and Your Company*. New York, NY: Oxford, University Press, p. 6.

the winning bid exceeds the presumed true value of the capital good is an indication of the irrationality reflected in the winner's bid. Again, the implicit assumption driving the imputation of 'irrationality' on the part of bidders is that the capital goods must have some type of equilibrium 'value' common to all bidders. To convincingly make the case that a capital good such as a petroleum lease could ever have essentially an equal value to all bidders, one must rely

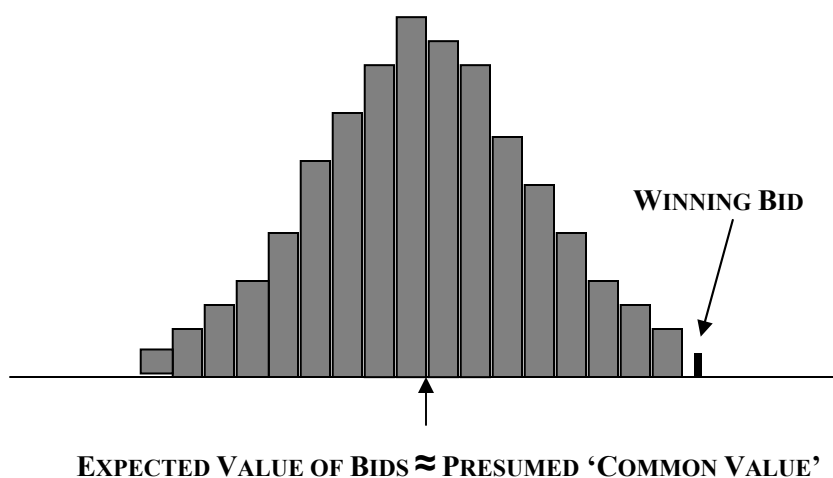


on blanket 'homogeneity' with respect to the abilities, circumstances and aspirations of all bidders. Some type of equilibrium must be assumed if one is to argue that successful returns on investments in leases would be solely contingent on not overbidding. By implication, one surmises that a 'true value' of a capital good is to be seen as essentially *exogenous* to the firm's intended or *planned* employment of the good. Also, this true-common-value assumption would also seem to further imply that the prospective use of the capital good must be essentially identical for all of the bidders. Identical use would further seem to imply an industry in which firms are essentially identical reflecting no distinctions in entrepreneurial strategies, or, possibly even an absence of entrepreneurs. Hence, for the individual bidder, the phenomenon of the winner's curse is seen as a 'pocket' of disequilibrium in bidding strategies reflecting a failure to account for the adverse self selection associated with winning. The disequilibrium is interpreted as a reflection solely of suboptimal bidding behavior.

Figure 2 is intended to illustrate the nature of the winner's curse phenomenon in a hypothetical

auction. The figure shows a distribution of histograms (vertical bars) each representing a range of bids submitted by a small group of bidders. The height of the respective histograms indicates the number of bidders submitting bids within each respective range of bids. The distribution itself reflects the uncertainty with respect to the ‘true common value’ of the capital good; bids submitted are assumed to directly reflect the valuations placed on the goods by the respective bidders. The expected value of the bids for all participating bidders is assumed to be approximately equal to the ‘true common value’ of the capital good. However, this assumption seems to imply that the winning bidder winning find himself on the extreme right tail of the bidding distribution as shown in figure 2. This situation suggests that, of those submitting bids,

FIGURE 2: DISTRIBUTION OF BIDDING STRATEGIES THAT IGNORE ADVERSE SELECTION OF WINNING



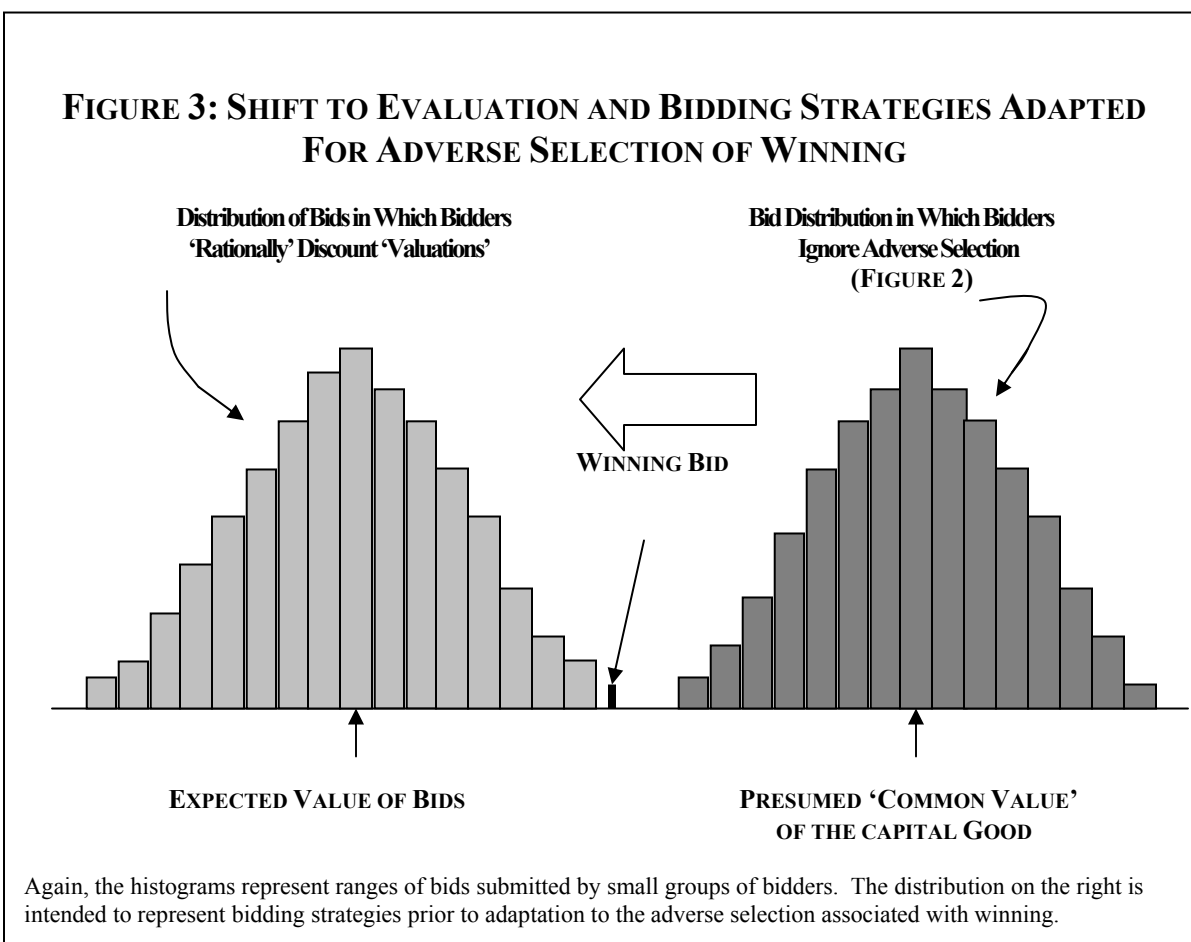
The width of the histograms or vertical bars represents the range of bids submitted by small groups of bidders. The height of the histogram indicated the frequency of the bids submitted within the respective ranges. The use of a distribution of histograms is intended to be strictly illustrative of the alleged overbidding phenomenon. It suggests a larger number of bidders than would likely be competing in an actual auction.

the winning bidder has most overestimated the value of the capital good and has failed to take into account the *adverse selection* associated with winning.

Experimental evidence casts this overvaluation phenomenon as a type of ‘disequilibrium’ that is ‘correctible’ in subsequent auctions by bidders ‘rationally’ adjusting their bidding strategies to take account of adverse selection. But again, the extent of this correctible disequilibrium is assessed against the presumed ‘value’ of the capital good that, once revealed, would prove to be the same for all bidders. Disequilibrium is premised on a presumptive ‘common value’ that

bidders must rationally discover. Viewed in this light, disequilibrium in bidding is a kind of transitional anomaly that is presumably 'remedied' by bidders acting 'rationally.' Thaler goes so far as to say: "[t]he winners curse cannot occur if all the bidders are rational..."¹¹ According to received theory emerging from experimental research, this adaptation means that bids must be significantly discounted with respect the expected value of the capital good being auctioned.

Figure 3 depicts an adaptation of evaluations and a shift in bidding strategies as bidders discount the worth of capital goods in their efforts to avoid the dangers of adverse selection. The distribution with the black histograms reflects bidding strategies prior to any adaptation. The distribution to the left represents the corrective shift in the evaluation and bidding strategies that



avoids the adverse selection associated with the winner's curse. The need for this adaptation is premised on the existence of the alleged true, common value of the capital good and the supposition that the bidding strategy must be adapted to both the 'exogenously determined but uncertain value' of the capital good and the dangers thought to inhere in the winner's curse.

¹¹ Thaler. 1992, p. 51.

One other awkward and confused features of this line of reasoning is that the amount of the bid for the capital good becomes the sole decision open to the firm in determining the profitability of the investment. In other, words, no other decisions come into play in establishing the value of the capital good to the acquiring firm. Speculative strategy and entrepreneurial innovation play no role in establishing the worth of the capital good. Under this train of thought, rationality on the part of bidders hinges solely of the size of the bid without any particular regard to the success of the many other decisions made by the firm with respect to the way in which the capital good is employed subsequent to its acquisition.

III. Aspects and Implications of Heterogeneity in Capital-Goods ‘Appraisal’

As noted above, much of what is thought to be known about the winner’s curse has emerged from experimental research. While the intent of this experimentation is to highlight systemic errors made by business firms in bidding for capital goods, there are compelling reasons to challenge the relevance of this research and particularly its reliance of the ‘common-value premise.’ What seems to have been ignored in this research is the extent to which controlled experiments can ever faithfully replicate or simulate the circumstances and visions for the future that prompt actual firms to ‘appraise’ the investment worth of capital goods and compete in auctions or competitive negotiations for the acquisition of such goods. In part, this theoretical neglect is seen in the unwillingness or inability of researchers to understand the distinctions between the subjective valuation of a good as may be done by a consumer and the highly individualistic ‘appraisal’ of a capital good as would be conducted by a business firm planning the acquisition and productive use of such goods. The highly individualistic nature of the entrepreneur’s appraisal of the capital-good is described by Israel Kirzner: “An individual’s forward looking measure [appraisal] of a given stock of capital goods is thus highly individualistic, depending crucially on his own subjective expectations regarding the future.”¹² Understanding the economics of capital goods requires an understanding of entrepreneurial appraisal of capital goods and the concept of capital in the entrepreneur’s reckoning of a planned undertaking.¹³ *Only within the context of invariably unique or heterogeneous entrepreneurial plans can one assess the true nature of the bidding process and what constitutes overbidding.*

A. Inability of experiments to replicate auctions of capital goods

The experiment described at the beginning of this paper involving the auction of a jar of coins manages to establish the fact that the winner’s curse does exist and involves a degree of adverse selection of which the inexperienced bidder may be oblivious. Moreover, most of the research on the winner’s curse as it is thought to arise in the context of auctions for capital goods has been conducted in the context of such experimentation. The exceptions include essentially anecdotal references to what appear to be acquisitions involving overpayment for capital assets.¹⁴

¹² Israel Kirzner. 1996. *Essays on Capital and Interest: An Austrian Perspective*. Cheltenham, UK: Edward Elgar Publishing Company, p. 103.

¹³ The critical importance of the entrepreneurial plan is a central focus of Israel Kirzner’s research into capital theory; see: Israel Kirzner. 1996. *Essays on Capital and Interest: An Austrian Perspective*.

However, experimentation that purports to shed light on the process of bidding for capital goods is grossly in error and irrelevant. As noted above these experiments are conducted in such a way that the item being auctioned has a ‘pre-existing common value’ that is not known to the bidders participating in the experiment. One glaring absurdity that emerges from the conditions imposed in the context of experiments is that the bid itself becomes the only decision variable open to the participants in their efforts to earn profits or avoid losses. In real world business situations, many decisions made by the firm will ultimately establish the profitability of acquiring and employing particular capital goods.

While much of this experimental research is interesting, the fact remains that it cannot replicate the conditions and circumstances under which business firms actually compete in auctions of what are truly capital goods. This failure is not one of experimental design. Rather it is the fact that experiments can never duplicate the actual risks and requisite judgments of uncertainty inherent in the experience of committing resources to the implementation of an entrepreneurial plan that is not necessarily assured of success. An object auctioned in an experiment does not become a capital good simply by being labeled as such within the context of an experiment. Objects and services only become capital goods when they become an essential part of a plan undertaken by an entrepreneur under conditions of market uncertainty. There is no legitimate, authentic way to simulate this circumstance in the context of an experiment which relies on the pretence of a competitive business decision. This reality is further highlighted by the fact that in experimental auctions, the amount of the bid inevitably becomes the only decision variable available to the bidder in determining the profitability of the hypothetical enterprise. In fact, in any entrepreneurial undertaking, many types of decisions attend the use of a capital good and the profitability of chosen employments. In this sense, the investment worth of the capital good is essentially endogenous to an entrepreneurial enterprise.

B. The valuation-‘appraisement’ distinction

The irrelevance of auction experiments is further highlighted by their neglect of the critical distinction between valuation and appraisement as they apply to the acquisition of goods. This distinction is critical in untangling some of the confusions that inhere in the theory of the winner’s curse. Valuation is a more general concept referring to the rankings made by an individual human being in choosing. The ranking may be of goods or different courses of action and is, nonetheless, subjective and unique to the individual. It is a subjective preference involving a choosing and forsaking or setting aside that which is less preferred. Valuation as a relative ranking is never quantitative and is obviously never observable or measurable; it refers only to choice made at a particular moment in time.¹⁵ In its narrowest context, valuation may refer to the choice that may be made by a consumer in choosing to purchase one consumer good as opposed to another. In such an instance, the purchase would only reflect the fact that the individual ranked the good chosen over the money relinquished in the exchange. But in a much

¹⁴ See: G. Anandalingam and Henry C. Lucas Jr. 2004. *Beware the Winner’s Curse: Victories that can Sink You and Your Company*. New York, NY: Oxford, University Press. Most of the book is a catalogue of anecdotal stories of instances in which the winner’s curse was thought to be operative.

¹⁵ Ludwig von Mises. [1949] 1998. *Human Action: The Scholar’s Edition*. Auburn, Alabama: The Ludwig von Mises Institute, pp. 119-123.

broader context, valuation may even refer to the choice of actions open to an individual human seeking any type of objective, be it sublime or ridiculous. While valuation need not actually involve a monetary exchange, it usually involves some action in which a less preferred situation is exchanged for a circumstance that is more preferred.

The term ‘valuation’ is inappropriately applied to a process by which a firm assesses (appraises) the investment worth of a capital good though it is commonly applied in that way not only in the literature focused on the winner’s curse. The term ‘valuation’ is inappropriate because the process of appraising the worth of a capital good is not an act involving a relative ranking but is rather one of judging the prospective profitability of acquiring and employing resources to earn a future profit. Ludwig von Mises introduces the admittedly infelicitous term ‘appraisement’ to suggest the requisite distinction:

Appraisement must be clearly distinguished from valuation. Appraisement in no way depends upon the subjective valuation of the man who appraises. He is not intent upon establishing the subjective use-value of the good concerned, but upon anticipating the prices which the market will determine. Valuation is a value judgment expressive of a difference in value [ranking]. Appraisement ... aims at establishing what prices will be paid on the market for a particular commodity or what amount of money will be required for the purchase of a definite commodity. ... [B]uying and selling on the market must not disregard the structure of market prices; they depend upon appraisement.¹⁶

While the literature on the winner’s curse is replete with the phrase ‘over valuation,’ valuation is not, in fact, what engages firms when they formulate bids for capital goods. They are, rather, engaged in a process of ‘appraisement’ which is essentially a judgment of investment worth. This distinction is entirely obscured by adopting the inappropriate notion of a ‘common value’ and attempting to apply it to capital goods. While experiments involving jars of coins represent legitimate examples of auctions in which the auctioned item could be said to have a common value, these are perhaps the only instances in which an item being auctioned could ever be legitimately characterized as have a common value. Hence, the requisite role of entrepreneurial appraisal of capital goods is fundamentally at odds with any common-value assumption. Moreover, appraisements involved in bidding are probably always unique to the individual bidder since they involves attempts to judge the future structure of prices in the market and the prospective net gain involved in employing the capital goods in an entrepreneurial plan.

C. Capital goods made such by entrepreneurial plans

What is the context in which a capital good is appraised? What makes a good a capital good? The theory of the winner’s curse provides no answers to these questions. In fact the theory of the

¹⁶ Ludwig von Mises. [1949] 1998. *Human Action: The Scholar’s Edition*, p. 262. The term ‘appraisement’ is admittedly awkward; one notes the fact that no contemporary economist bothers to employ it in referring to an enterprise’s assessment of the worth of a capital good employed as part of an entrepreneurial plan. Nonetheless, the distinction the Mises attempted to draw seems useful in the context of examining the winner’s curse.

winner's curse appears to foreclose the possibility of any reasoned answer to these questions. Why? The reason is that the 'common-value' assumption implicit in the theory of the winner's curse is totally at odds with any coherent understanding of the role of capital goods, capital and entrepreneurship in a real-world market economy. As previously noted, a common value for capital goods implicitly requires a static equilibrium in the industries in which the auctioned capital goods are to be employed. But the profit opportunities that drive entrepreneurial action would in most cases imply different appraisals of capital goods within the plans of competing entrepreneurs. In essence, the common value assumption of the winner's curse is simply inconsistent with differing entrepreneurial plans and with entrepreneurship itself.

The existence and perpetual reemergence of entrepreneurial plans highlights the fundamental distinction between capital and capital goods. Capital goods are objects that have been marshaled by the entrepreneur in the implementation of his particular business plan. These goods come into being and take on the role of being capital goods because of plans of savers and entrepreneurs. Ludwig Lachmann observes: "... capital goods have to exist in the minds of agents [entrepreneurs] ... In fact their significance for action derives from the places they occupy in individual plans, that is, from the mental acts by which plans are constituted."¹⁷ Capital, as distinct from capital goods, is in one sense, an accountant's reckoning of an enterprise's net worth which, itself, only has meaning within the plans and actions of individual entrepreneurs. The most succinct statement on the distinction between capital and capital goods has been offered by Ludwig von Mises: "*capital "is the sum of the money equivalent of all assets [capital goods] minus the sum of the money equivalent of all liabilities as dedicated at a definite date to the conduct of the operations of a definite business unit.* It does not matter in what these assets may consist, whether they are pieces of land [inclusive of extractive resources], buildings, equipment, tools, goods of any kind and order, claims, receivables, cash or what ever"¹⁸ (emphasis added).

In the above definition, capital emerges as an accountant's net appraisal of the business enterprise. But the business enterprise is the institutional embodiment of a particular entrepreneurial plan which means that capital simultaneously represents both a balance sheet reckoning and an entrepreneurial idea. As Mises notes "capital is a praxeological concept ... its place is in the human mind. It [capital] is a mode of looking at the problems of acting, a method of appraising them from the point of view of a definite plan."¹⁹ In other words, capital goods are made such by being an integral part of entrepreneurial plans undertaken to earn profit. Opportunities for profit in excess of entrepreneurs' requisite return for time and uncertainty (i.e.,

¹⁷ Ludwig Lachmann. 1986. *The Market as an Economic Process*. Oxford, UK: Basil Blackwell, Ltd., p 79.

¹⁸ Ludwig von Mises. [1949] 1998. *Human Action: The Scholar's Edition*, p. 262. Praxeology is the deductive science of human action; it is built upon axioms that emerge from the fact that individual human beings act in the present to attain their most highly ranked future goals; by acting, individuals bear subjectively reckoned opportunity cost of employing scarce means in to achieve chosen ends. See: Murray N. Rothbard. 1997 [1960] *Praxeology as the Method of the Social Sciences*, reprinted in *The Logic of Action One: Method, Money and the Austrian School*. Cheltenham, UK: Edward Elgar Publishing Company, p. 32.

¹⁹ *Ibid.*, p. 512.

interest) may involve a commitment of capital goods to a arbitrage opportunities arising from anticipated future shortages of certain consumer goods. Or capital goods may be employed in a plan, the success of which may hinge on the success of introducing a new product to the market. In any event, plans undertaken involving the use of capital goods will, in all reality, be appraised differently by competing entrepreneurs. While some capital goods can clearly have a market value, common appraisals of the investment worth of capital goods in particular entrepreneurial plans are simply out of the question. But plans cannot necessarily conceived in a way that assures success in all business endeavors which means that entrepreneurs can appraise capital goods too highly and thus overbid for the services for these goods. Hence, overbidding for capital goods is a phenomenon quite distinct from the purported basis of what is thought to be the ‘winner’s curse.’

IV. Bidding Seen in the Context of Ex Ante Prospects and Ex Post Failure

The above discussion clarified the way in which the distinctively individualistic nature of entrepreneurial plans disposes of the notion that capital goods can have a ‘common value’ for all bidders in auctions. *The true objectives sought in the bidding process and what may constitute rational bidding is must be judged in the context of the entrepreneurial plan, as conceived in the mind of the entrepreneur.* To the extent that overbidding for capital goods occurs, it can only be understood and reckoned within the scope of entrepreneurial plans and the success or failure of these plans. But in acknowledging this reality, how does this perspective shed light on the interpretation of events leading researchers to conclude that they have discovered or discerned evidence of the ‘winner’s curse’? Can overbidding necessarily be revealed as an empirically measurable phenomenon? The following discussion explores answers to these questions.

A. Prospective profits as *ex ante* justification of bids for capital goods

For the entrepreneur, the ‘appropriate bid’ capital goods must be understood in a way quite distinct from the purported basis of ‘common value’ as presumed in the theory of the ‘winner’s curse.’ In understanding this distinction, one must first appreciate the fact that in the planning undertaken by competing entrepreneurs, the market price of a capital good may not necessarily reflect its investment worth in the context of a plan. In an equilibrium setting, it is the habit of economists to assume that this market price is equal to the discounted marginal value product of the capital good in alternative competitive employments. But assumptions of equilibrium are always misleading in that they ignore the reality, rationale and circumstance of entrepreneurial action. For the enterprise, the market price of a capital good is always an important matter but in the context of a prospectively profitable entrepreneurial plan, this market price may well reflect an under-appraisal of the capital good. Kirzner highlights the role of prospects:

The highest price a person will pay for a capital good is set by his estimate of the present value to him of the addition to the flow of output that the capital good can make possible, taking into account the particular production process in which he envisages the capital good being applied and the particular manner in which he envisages it to be used in the process. ... The market price of a capital good [common value] expresses the quantity of capital that it represents to other

individuals in the market (the marginal buyer and marginal sellers), based on their expectations. [But] in the absence of an equilibrium situation there is not even a guarantee that the market price fully expresses the expectation of all market participants. ... So that an individual who has his own ideas as to the future, the market price does not provide the subjective measure in which he is interested.²⁰

In what sense could the market price of a capital good reflect an under appraisal in the context of a particular entrepreneurial plan? To answer this question one must keep in mind that two indispensable aspects of entrepreneurship are speculation and innovation. Innovation in this context can be loosely and most appropriately defined as the application of new ideas in ways that better serve the needs of consumers. The prospective profits associated with entrepreneurial plans hinge on the extent to which these consumer needs are served. All actions undertaken by the entrepreneur in the present will involve innovation and speculation but will be aimed at one target -- future profits. In the context of the entrepreneurial plan, profit represents the prospective success of the entrepreneurial plan for which the capital good is appraised, acquired and employed.

The way in which innovation and speculation come to bear upon an entrepreneurial plan is exemplified in efforts to employ capital goods in the introduction and production of a new good or service that has not been produced and marketed by anyone else previously. The introduction of the new product only reflects the entrepreneur's efforts to anticipate and better serve the need of the consumers. But, this new product, if successful, could create a whole new industry and a new market. Success in these innovative and speculative endeavors may be contingent on displacing products currently being produced by competitors and if successful will generate entrepreneurial profits.²¹ The appraisal of any particular capital good is conditioned by the prospects of success for such or similar entrepreneurial ventures. If successful, such an entrepreneurial plan may well mean that the appraisal of the capital good in the context of the plan may well be above the 'common' market price of the capital good. In an *ex ante* sense, a bid for the capital good exceeding a market value or even a commonly appraisal would be fully justified.

B. Bidding error or more common entrepreneurial failure?

In an *ex post* sense, can supposed overbidding for capital goods be discerned in any meaningful way from the failure of an entrepreneurial plan to earn a profit? This question has not been addressed in any of the research on the winner's curse. Answering this question requires some reflection on the nature and causes of entrepreneurial losses. All entrepreneurial efforts are undertaken with the goal of earning a profit. Such undertakings require the purchase of hiring of capital goods and other resources in the present with the intent of selling a finished product at some time in the future. Ludwig von Mises has observed: "Thus the total cost of production -- including interest on capital invested lag behind the prices which the entrepreneur receives for

²⁰ Israel Kirzner. 1996. *Essays on Capital and Interest: An Austrian Perspective*, p. 103.

²¹ Joseph A. Schumpeter. 1950 [1942]. *Capitalism, Socialism and Democracy*. New York, NY: Harper and Brothers Publishers, pp. 83-85.

the product. This difference is entrepreneurial profit.”²² But all such undertakings are fundamentally speculative in nature which means that failure can occur. Failure would be reflected in entrepreneurial losses. How do losses occur? Elsewhere, Mises has noted: “Like every acting man, the entrepreneur is always a speculator. He deals with the uncertain conditions of the future. His success or failure depends on the correctness of his anticipation of uncertain events. If he fails in his understanding of things to come, he is doomed.”²³ Of course, ‘doom’ in this case necessarily implies entrepreneurial failure which can take the form of either an outright loss or even a failure to earn a competitive rate of return on invested capital. One way of characterizing these losses is to infer a overcapitalization of capital goods or overbidding for the capital goods committed to the plan.

Mises views profit opportunity as arising from maladjustment, “a divergence between the actual production and the production as it should be in order to utilize the available material and mental resources for the best possible satisfaction of the wishes of the public. ... The greater the preceding maladjustments, the greater the profit earned by their removal.”²⁴ Within this context, entrepreneurial failure occurs because the entrepreneur fails to be a good arbitrageur. In this case, the entrepreneurial failure is presented as the inability or unwillingness to take advantage of a preexisting objectively definable opportunity to be perceived by the entrepreneur. From this perspective, the entrepreneur takes a rather passive role in that he is viewed as simply correcting an ostensibly disequilibrium situation. But this view of arbitrated profit does not present a sufficiently complete appreciation of losses that can befall the entrepreneur who may fail in an entrepreneurial endeavor. In the Misesian perspective, if the competing entrepreneur fails to arbitrate, he relinquishes a profit opportunity but has not necessarily sustained actual losses.

In fact the scope of possible entrepreneurial failure is much broader than the remarks offered by Mises suggest. In changing and uncertain markets, failure of entrepreneurial plans has more than one dimension. For example, internal mismanagement of the enterprise can be another source of loss for the entrepreneur. The number of dimensions depends of the number of alternative endeavors envisioned by the entrepreneur. The entrepreneur may attempt to be a visionary and a leader in creating, shaping and exploiting opportunities. For example, the entrepreneur may attempt to take the lead in introducing new products for which no preexisting demand exists. Such an endeavor may include attempts to harness new technologies in consumer goods, capital goods or previously non-existent services. These latter undertakings may involve attempts to introduce new materials in the manufacture of goods. Or, the entrepreneurial undertaking may involve attempts to open up new geographic or demographic markets. For example, efforts to create new markets for new products or services may be unsuccessful and lead to entrepreneurial losses.

Most of the entrepreneurial initiatives just mentioned require the commitment of capital goods

²² Ludwig von Mises. 1952. “Profit and Loss,” in *Planning for Freedom*. Libertarian Press: South Holland Illinois, p. 109.

²³ Ludwig von Mises. [1949] 1998. *Human Action: The Scholar's Edition*, p. 288.

²⁴ Ludwig von Mises, “Profit and Loss,” in *Planning for Freedom*, p. 119.

and, hence, an appraisal or capitalization of these goods. This appraisal of capital goods is based on the entrepreneur's ex ante conjecture of the realizable profits that can be reaped from success. These anticipatory profits are the driving force behind the entrepreneur's motivation in submitting certain bids for the services of certain capital goods. But the failure of the plan is the only context in which one can make any judgment that losses would have been less if less were bid for the capital goods. In any event, if such an entrepreneurial undertaking is rendered unsuccessful, either because of planning decisions, market change or mismanagement, the amount paid to acquire the services of the capital good may only appear to reflect overbidding if such services were availed in winning an auction. But clearly, a judgment that the entrepreneur has overbid for capital goods is a much too simplistic diagnoses for what occurred. *In fact, there can be no operational, empirically legitimate means of distinguishing allegedly anomalous overbidding for capital goods from the more general, and common-place phenomenon of entrepreneurial failure resulting in losses.*

V. A Retrospective Note on 'Bidding Error' in the Discovery Story

In light of the preceding discussion, how is one to interpret the events related in the 'discovery' of the so called winner's curse. Can one point to an institutional source of error in the discovery story involving auctions of petroleum leases? The discovery of the winner's curse focused what appeared to be low returns on these investments. Did attenuated and fragmented property rights account for what appeared to low returns on investment in leases? The following discussion suggests that the answer is 'no'. But the preceding discussion also leads one to conclude the initial analysis of returns on petroleum leases ignored the scope of entrepreneurial plans and the complementarities sought and achieved by bidders for capital goods. The capital base against which returns are legitimately reckoned must encompass the capital-good groupings implicit in the entrepreneurial plan. This latter reality calls into question the ability of any external observer to make presumptive empirical claims that the winner's curse is evident in particular auctions of capital goods. The scope of the entrepreneurial plan is known only to the entrepreneurial firm.

A. Attenuated property rights and low returns on incremental investments

Recall that discoverers of the curse thought they had uncovered evidence that the rate of return on petroleum leases was too low to justify the investments in these capital goods. They drew the inference that the firms bidding on these leases were erroneously and systematically overbidding for these capital goods. But there is another, more convincing explanation of these returns. There are definite aspects of mineral leasing that tend to drive down returns on marginal investments in these capital goods. Petroleum leases are issued under conditions granting severely fragmented and attenuated property rights. It is true that the issue of property-rights was totally ignored in the analyses leading to the so called discovery of the winner's curse.

As issued, the mineral lease grants the lessee the right to explore the tracts specified in the lease contract. If the lessee makes a discovery, the lessee holds the lease as a capital good and is granted the right to develop the property and proceed with production. But attendant to these narrowly defined rights are timing constraints that appear to foreclose post-auction adaptation and reduce the latitude attendant to the exploitation of certain complementarities in the

employments of the capital good. For example, very brief lease terms prevent lessees from building inventories of leases to accommodate grouping to achieve economies of scale in petroleum production. Moreover, truncated lease terms, foreclose the ability of lessees to adapt to market change. These constraints are a much more likely source of lower returns to marginal investments in petroleum leases than the overbidding thought to be reflective of the winner's curse.²⁵ The neglect of these constraining institutions accounts, in part, for the fact that neoclassical economists were able to entertain the notion that capital goods can have an 'investment worth' common to all bidders and that lower returns were attributable to the winner's curse.²⁶

Attributing low returns to bidding error ignored the way in which entrepreneurial plans can be thwarted by the absence of 'functional' property rights.²⁷ But these issues don't shed much light on the presence of absence of the winner's curse in bidding for these goods. Why? The narrowly defined property rights were known to bidders at the time that the bids were submitted. The appraisal of the investment worth of these rights was already implicitly reckoned within the context of an entrepreneurial plan. Nothing should have emerged as a surprise once these capital goods were won in auctions. At the moment of the auction, the attenuated property rights already reflected a diminished capital appraisal of the goods being auctioned.

B. Capital-good appraisals contingent on complementarities within plans

The companies bidding on these capital goods have somehow adapted to the fragmented attenuated property rights by acquiring leases and integrating them into entrepreneurial plans characterized by significant complementarities and larger groupings of heterogeneous capital goods. Ludwig Lachmann addressed the role of capital-good groupings in the implementation of

²⁵ Unfortunately, the laws governing the leasing of public lands have codified the essentially anti-industry covenants. The constraints imposed by leasing laws reduce the profitability of employing these capital goods once they are acquired. But these problems would be resolved if petroleum resources were developed under circumstances unimpeded by these covenants. A decision to expedite exploration or development would only be made if expediting these investments were to increase the estimated capital value of the project. This objective could be achieved if the discovered petroleum deposit were to become the sole, exclusive property of the extractive enterprise making the discovery. In this latter case, ethically and functionally legitimate ownership would be achieved by applying the principle of 'original appropriation' of discoveries or what is commonly referred to as 'homesteading.' Court-imposed covenants would no longer impinge on the discovering firm's ability to engage in speculative timing in the scheduling of investments in the project. This situation would represent the normative ideal from both an allocative and ethical perspective. This proposal was first put forward by Murray Rothbard. See: Rothbard, Murray. 1998 [1982]. *The Ethics of Liberty*. New York: New York University Press, pp. 71-72. A version of the Rothbard proposal has been provided by Bradley; see: Robert Bradley, *Oil, Gas and Government: The U.S. Experience* (1996, 69-74).

²⁶ The idea that a capital good has a 'common value' is, of course, untenable. But in this odd assumption one notes a surprising echo of the 'theory of natural value' as developed by Friedrich von Wieser. As described by Jörg Guido Hülsmann, Wieser's "theory of value completely dissociated the value of goods from any context of human action." See: Jörg Guido Hülsmann. 2007. *Mises: the Last Knight of Liberalism*. Auburn, Alabama: The Ludwig von Mises Institute, p. 384.

²⁷ In addition to the right of possession, functional property rights would accord the owner of the capital good complete latitude in the disposition and use.

entrepreneurial plans in which a ‘structure of capital’ emerges. In his book, *Capital and its Structure*, Ludwig Lachmann observed:

Each plan is a logical structure in which means and ends are coordinated by a directing and controlling mind. In the functional variety which is of the very essence of capital utilization plans, capital resources [capital goods] exhibit those *structural* relationships. ... production plans are the primary object of capital theory ... the theory deals with the way in which capital goods are used in plans, i.e. with the capital structure of such plans.²⁸

The plans to group capital goods are fundamentally speculative undertakings by entrepreneurs. As noted, a critical feature of this speculative process involves the grouping of capital goods on the basis of complementarities discovered and envisioned by the entrepreneur. Obviously, as Lachmann suggests, the significance attached to a complementary grouping of capital goods can only be gleaned in an understanding of entrepreneurial plan.

The winning of petroleum leases in competitive auctions represents only the earliest stages of what Israel Kirzner refers to as an unfinished entrepreneurial plan.²⁹ The further implementation of these plans necessarily will involve the acquisition of complementary capital goods as firms construct infrastructure and build portfolios of additional leases.³⁰ One may note parenthetically that this reality is not limited to the petroleum industry nor to mineral industries but to all industries. The scope of the entrepreneurial plan may and usually does embrace several complementary dimensions of capital goods. These may include: 1) economies of scope or the net advantages accruing to the entrepreneurial firm through vertical integration;³¹ 2) investment

²⁸ Ludwig M. Lachmann. 1956. *Capital and Its Structure*. London, UK: London School of Economics: G. Bell and Sons, Ltd, pp. 53- 54.

²⁹ Israel Kirzner. 1996. *Essays on Capital and Interest: An Austrian Perspective*, pp. 17- 48. Obviously Kirzner’s discussion of unfinished plans does not deal specifically with the post-auction decision making of lessees having won petroleum leases. However, one of the points implicit in Kirzner’s examination is the fact that entrepreneurial plans always entail a series of critical decisions and actions subsequent to the implementation of the plan. These subsequent choices are as critical to the profitability of the plan as the initial choice of the plan itself. But clearly the ability to make these decisions is contingent on the scope of property rights in the capital goods that are accorded the entrepreneur in their acquisition.

³⁰ Lachmann refers to this complementarity as a *praxeological category*; see: Ludwig M. Lachmann. 1956. *Capital and Its Structure*, p. 55. Praxeology being the science of goal-oriented human action, Lachmann is emphasizing that the complementarity achieved in any specific circumstances is the specific consequences of a particular entrepreneurial plan.

³¹ ‘Economies of scope’ may not usually be associated with vertical integration. Vertical integration is normally thought to be a manifestation of ‘economies of sequence.’ Economic of scope are present if, the judgment of the firm, the combined cost of producing two or more products by the single firm are less than if the products were produced separately by multiple firms. See: William Baumol, John C. Panzar and Robert D. Willig. 1988 [1982]. *Contestable Markets and the Theory of Industry Structure*. New York, NY: Harcourt Brace Jovanovich, pp. 71-72. However, economies of sequence can be described as being present when the total cost to the firm of producing both upstream products and the downstream products are less than if the goods were produced separately by different firms. See: Daniel F. Spulber. 1989. *Regulation and Markets*. Cambridge, Massachusetts: The MIT Press, pp. 118-

in the additional capital goods that make up the infrastructure attendant to the employment of capital goods acquired in auctions; and 3) post auction groupings of other similar capital goods, in this case, leases, that must be acquired to achieve economies of scale in production.

The economies of vertical integration play an important role in determining the most ‘profitable’ timing of exploration, development and production from petroleum leases. In the petroleum industry, vertical integration necessarily includes upstream capital goods committed to refining. Upstream refining, for example, requires the availability of regularly time feedstock of crude petroleum to maintain efficient operations. Of course, the entrepreneurial petroleum firm is always in a position to buy crude petroleum on the spot market or perhaps the futures market. This alternative provides feedstock for the operation of existing upstream refineries. But the purchase of petroleum from other sources may, in part, defeat the purpose of vertical integration. The principal purpose of vertical integration is to provide the firm’s own feedstock from its downstream production – that is production from its own leases. The latter production can presumably be availed at an opportunity cost below the cost involved in open market purchases. But again, a full reckoning of the economies available to the firm is made evident in the complementarities existing between the various capital goods employed in the operations. The individual capital goods must coherently fit into this system of complementarities. The appraisal of the capital good within the entrepreneurial plan is conditioned by these complementarities.

These actions are costly undertakings which frequently involve substantial investment in additional adjoining leases, transportation facilities for the petroleum itself, transportation for personnel and supplies, processing facilities, housing and even recreation outlets. The infrastructure required for such undertakings will involve additional investment in complementary capital goods once discoveries warrant the considerable investments required to bring reserves into production. Clearly, the appraisal of capital goods acquired in auctions such as mineral or petroleum leases must be done in a context that embraces the full scope of an entrepreneurial plan that always involves the employment of a broad category of disparate but complementary capital goods. This net appraisal of the entire plan defines for the entrepreneur the capital against which returns must be reckoned.

In the above description of the ‘discovery story,’ the assessments of rates of returns on petroleum leases treated these investments as ‘stand-alone projects’ rather than elements of entrepreneurial plans involving complementary groupings of capital goods. The analytical mistake made by the ‘discoverers’ of the winner’s curse was to focus on the marginal investment in the particular capital goods in question rather than focusing on the full integrated scope of an entrepreneurial plan involving many capital goods. John Mathews has trenchantly observed:

The point is that complementarities are not created automatically. They have to

119. Spulber’s focus is on regulation and, hence, he defines *economies of sequence* in terms of cost reductions achievable through vertical integration. However, for purposes addressed here economies of sequence can be more appropriately defined as an increase on return attainable on the full scope of capital represented by the net appraisal of the entrepreneurial plan. What must be clarified in making reference to both economies of sequence of economies of scope is that these are not empirical, measurable phenomena as is assumed by Baumol, et. al. or Spulber. See: John Brätland. 2003. “Contestable Market Theory as a Regulatory Framework: An Austrian Postmortem” *The Quarterly Review of Austrian Economics*, 7(3): 3-28.

be found. Indeed discovered, as part of a strategizing endeavor. ... Now the conventional statement ... does not seem to make clear whether resources are to be evaluated individually or in terms of the total bundle. The search for complementarities, on the other hand, makes it abundantly clear where the emphasis should lie. Complementarities can only be achieved in a bundle, and so it is the bundle as a whole that should conform to the conventional criteria of being valuable rare and hard to imitate. But this then opens the issue of how resources as individual entities ought to be evaluated by the entrepreneur, ... [I]t is not the individual resources that are important but the resource bundle taken as an aggregate, and what management does with this aggregate. ... If it is the resource bundle as an aggregate that is important, then it makes sense for firms to acquire extra resources that may not be distinctive in themselves but that when added to existing bundle, can lend the firm an advantage if synergies can be extracted from the new bundle. [I]t is up to the entrepreneur, or the firm acquiring the resources, to package them and extract synergies, so as to earn positive entrepreneurial profits.³²

Judging the rationality of bidding and assessing rates of return must be done within the context of the full scope of an entrepreneurial plan encompassing a structure that takes full account of the complementary groupings of capital goods. Motivations for bidding certain amounts for auctioned capital goods must be seen in the context of the full scope of entrepreneurial plans. *The true objectives sought in the bidding process and what may constitute rational bidding is conditioned by the complementarities between capital goods as reckoned in the entrepreneurial plan.* To the extent that overbidding for capital goods occurs, it can only be understood within the success or failure of entrepreneurial plans. Hence, “resources do not possess any objective value [appraisement] in and of themselves: their value is contingent on the synergies or complementarities that can be captured. This is why it is essential to keep the resource bundle in view, rather than the attributes of the individual resource.”³³ But this reality further implies that no empirical standard exists by which to discern whether the phenomenon of the winner’s curse has been operative in any entrepreneurial bid for capital goods.

VI. Conclusions

The theory of the winner’s curse is premised on the largely fallacious notion that capital goods offered in competitive auctions or in competitive negotiations have a ‘true investment worth’ that is common to all bidders. In other words, these goods have a ‘common value.’ The theory rests, in part, on the assumption that the average of bids submitted in such auctions will be approximately equal to this ‘true investment worth.’ But awkwardly, this supposition would only be valid if all firms were somehow locked into one identical, equilibrium use of the capital good. However, if average bid were equal to the true worth of the capital good, it means that the winning bidder has most overestimated the investment worth of the capital good and, in so

³² John A. Mathews. 1996. *Strategizing, Equilibrium and Profit*. Stanford, California: Stanford University Press, pp. 89-90.

³³ *Ibid.* p. 90.

doing, has fallen prey to the winner's curse.

This overbidding-inference arose from a study of the experiences of firms bidding on and winning capital goods in the form of petroleum leases in competitive auctions. Low rates of return on these investments were attributed to anomalous bidding error as bidders ignored the adverse selection involved in being the winning bidder. Bidders are thought to be able to avoid the winner's curse by making allowance for the bidding strategies of competing bidders. By such a strategic discounting of bids, the entire bidding distribution in auctions is supposedly shifted to the left such that a bidder can win and still earn attractive rates of return on these investments.

This theory of the winner's curse emerges out of experiments that purport to be dealing with auctions of capital goods. But such experiments can yield absolutely no insight into auctions of actual capital goods and, in fact, are totally irrelevant to such concerns. One first notes that the common-value is used as a standard of correctness and, hence, is an absurdity in the context of entrepreneurial appraisals of capital goods. A good becomes a capital good because it is a component of an entrepreneurial plan. Moreover, the investment worth of the capital good is established within the context of the entrepreneurial plan which is another way of saying that the appraisal is essentially based on the entrepreneur's judgment of the prospective profitability of the project. However, entrepreneurial plans may reflect misjudgments of profitability which can mean that entrepreneurs may appear to have anomalously over-appraised a capital good obtained in competitive auctions. But in this sense, this allegedly anomalously over-appraisal cannot be separately distinguished from the failure of an entrepreneurial plan in which losses are incurred.

This exploration of entrepreneurial appraisal and acquisition of capital goods prompts a reexamination of the context in which the winner's curse was thought to have been discovered. This context was the acquisition of petroleum leases by firms bidding in competitive auctions. Low rates of return on investments in these capital goods were attributed to overbidding. However, the restricted scope of property rights associated with petroleum leases is a more likely source of low profits and depressed rates of return. For petroleum firms, post-acquisition flexibility is critical to achieving the highest marginal revenue product of petroleum leases. Broadly defined property rights accommodate the broader variety of entrepreneurial plans that account for legitimate differences in the way which competing firms appraise capital goods such as petroleum leases. These entrepreneurial differences in appraisals of leases are further reflected in particular facts of geography and its implications for capital-good infrastructure are critical in the deployment of these capital goods.

