OPTIONS AS DISGUISED FINANCINGS: THE DEMISE OF AN URBAN TAX LEGEND

Kevin J. Liss[*]

It appears to be an article of faith among leading tax practitioners and academics that the tax accounting rules governing options are obsolete. The rules are viewed as a relic of a bygone era in tax law, hearkening back to the days when concepts of present value accounting were little understood. Much of the tax law has evolved since those days, by adopting rules requiring, inter alia, issuers of debt instruments and their holders to report interest expense and income on an economic accrual basis. The historical tax rules governing options, however, remain strangely ensconced, in seeming defiance of the modern-day trend. Alas, by what logic do these rules maintain their foothold in the modern-day tax realm?

This article reconsiders the mechanics and underlying economics of options transactions with due regard for developments in modern finance theory. This article argues that, notwithstanding the consensus view that there is an implicit financing component to option premiums, the existing rules for options exhibit a remarkably firm grasp of fundamental principles of taxation — including time value of money concepts. Ultimately, this article concludes that current law, insofar as it does not require economic accrual of interest on option premiums, accurately reflects the underlying economics of options and should be retained not merely because the rules are longstanding and deeply entrenched, but because they are fundamentally right.

[*] Director, PricewaterhouseCoopers LLP; Columbia College, B.A., 1984; Columbia Law School, J.D., 1988; New York University School of Law, L.L.M. (Tax), 1994.

TABLE OF CONTENTS

I. INTRODUCTION

According to the conventional wisdom, there is a hidden financing transaction whenever an option contract provides for payment of an upfront premium, as options generally do. Assuming, arguendo, the truth of that proposition, one might have thought that federal tax law would require the parties to an option contract to account for the implicit interest on their disguised financing. That it

does not impose any such obligation is usually rationalized as a sensible, if economically unwarranted concession to option participants.[1] At best, it absolves them from having to engage in unduly burdensome tax compliance for transactions that are mostly nontax driven. By the same token, however, that seemingly innocuous accommodation has given rise to an unfortunate lacuna in the taxation of financial products, one that has long been the bane of tax lawyers because it appears to run afoul of economic reality.

The problem is that the tax law currently requires the accrual of interest on noninterest-bearing debt instruments, an approach that the Internal Revenue Service (Service) has lately been seeking to extend to total return swaps and other modern financial products. In contrast, certain other types of instruments, including options and prepaid forward contracts, which would seem to offer an equally compelling case for requiring the imputation of interest, have no such requirements. In evaluating the propriety of either of these approaches, one ultimately finds oneself confronting a more basic underlying concern. How can one justify not requiring interest accruals on options, the oldest-known and most basic form of derivative, when debt instruments and other more complex financial products are taxed on an economic accrual basis? That inquiry, in turn, begs an even more fundamental question, one which is the topic of this article. Do options truly give rise to an implicit financing, or is the belief that they do just an urban tax legend?

This fundamental issue has important ramifications for assessing the proper taxation of total return swaps and other relatively new types of derivative financial products, which are suspected of having an embedded financing component.[2] When the Service proposed a

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[1] A report of the Tax Section of New York State Bar Association on the taxation of options issued in 2001 simply assumes, without examination, that options entail a disguised financing – a conclusion which the authors of the Report evidently did not view as controversial. The Report then proceeds to made recommendations on how and whether current law should be revised to address this apparent disparity. Ultimately, the Report recommends that only prepaid forwards, deep-in-the-money options, and long-dated options should be accounted for as disguised financing transactions, arguing that imposing a more accurate tax regime would not justify the concomitant compliance burden. N.Y. STATE BAR ASS'N TAX SECTION, TAX REP. NO. 990, TIMING AND CHARACTER RULES FOR PREPAID FORWARDS AND OPTIONS (2001), http://www.nysba.org/Content/ContentFolders20/TaxLawSection/TaxReports/990report.pdf.

[2] The market for these products is large and each year continues to grow. As of the end of 2007, the outstanding notional volumes of equity derivatives was $10 trillion, an increase of 39% over the prior year. Int'l Swaps and Derivatives Ass'n,

complex new regime for taxing so-called contingent notional principal contracts (CNPCs),[3] a nascent financial product category that encompasses total return swaps and other new financial products vastly more complex than traditional options, the proposed regulations contemplated mandating an interest imputation approach. Yet, the proposed rules were met with vast resistance by leading commentators within the tax profession, and most conspicuously by some of their clients in the burgeoning hedge fund world.[4]

To this day, the Service and Wall Street remain at loggerheads on the proper approach to taxing these increasingly vital new financial products, and an end to that impasse is nowhere in sight. Ironically, the Service's suggested interest imputation approach is the very same approach that leading tax academics have long been advocating as the theoretically correct approach to the taxation of options.[5] The question considered here is whether the academic consensus is right, or contrariwise, whether longstanding assumptions about the true nature of options actually miscast these age-old instruments as entailing a disguised financing.

The purpose of this article, in short, is to reassess the traditional view of options as disguised financings. By deconstructing the essential elements of an option, including the reasons why parties enter into options and why they tend to pay option premiums upfront, the article ultimately finds that the traditional view does not accurately reflect the transaction dynamics of option transactions. The principal drawback, in the author's view, to a tax regime that would impute interest income to the option holder or interest expense to the option writer, is its inability to withstand scrutiny under a sophisticated legal and economic analysis.

First, this article relies on principles of contract law to explain why options, perhaps surprisingly, do not truly implicate advance

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2007 Year-End Market Survey, http://www.isda.org (follow "Surveys & Market Statistics"; then follow "Summaries of Market Survey Results").

[3] National Principal Contracts; Contingent Nonperiodic Payments, 69 Fed. Reg. 8886 (proposed Feb. 26, 2004).

[4] *See, e.g.*, N.Y. STATE BAR ASS'N TAX SECTION, TAX. REP. NO. 1062, REPORT ON PROPOSED NOTIONAL PRINCIPAL CONTRACT REGULATIONS (2004), http://www.nysba.org/Content/ContentFolders20/TaxLawSection/TaxReports/1062rpt.pdf; Gina Biondo & Allison Rosier, *The Effect of the Proposed Swap Regulations on the Hedge Fund Industry: Goodbye To Total Return Swaps?*, 2004 TNT 106-31 (May 31, 2004); David C. Garlock, *The Proposed Notional Principal Contract Regulations: What's Fixed? What's Still Broken?*, 2004 TNT 56–26 (Mar. 22, 2004).

[5] *See infra* Part II.

payments. The article proceeds with an analysis of why options are not properly viewed as appreciating assets. In the process, it resolves underlying confusion concerning notions of "future expected value," a term that has wide application in option valuation methodologies, but which, as explained later herein, is a bit of a misnomer. Finally, the article draws on important insights into the fundamentals of options derived from finance theory to demonstrate what finance experts have long fully understood, namely that options do not in fact implicate a financing running from the holder to the option writer.

II. THE FINANCING RATIONALE

From the time that an option is issued until the time that it is either exercised or allowed to lapse, the option writer, rather than the option holder, bears the ultimate tax burden on any investment income generated by the premium. Leading academic commentators have long questioned why this income tax burden should not properly be passed through to the holder.[6] The argument in favor of interest accrual on options, at least as a matter of principle, is seemingly as compelling as it is straightforward. The option writer receives money (i.e., the premium) at the time of grant, which, according to option pricing theory, represents the expected future value of the option discounted at the risk-free rate of return.[7] In other words, the writer receives proceeds that it can use during the term of the option, and has a future liability of equal value, properly discounted for the time value of money, consistent with a financing transaction.

Under the conventional analysis, current law misallocates the income from the option premium because premiums are priced (i.e., discounted) in the expectation that the writer will hold the proceeds throughout the entire term.[8] Accordingly, the party that truly realizes an accretion to wealth from the investment income on the option premium is the option holder, not the option writer. Under the circumstances, it would appear that the option holder, as the true beneficiary of the investment income, should bear the ultimate tax burden with respect to that income.

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[6] *See* Noel B. Cunningham & Deborah H. Schenk, *Taxation without Realization: A "Revolutionary" Approach to Ownership*, 47 TAX L. REV. 725, 735 (1992); Robert H. Scarborough, *Payments in Advance of Performance*, 69 TAXES 798 (1991).

[7] *See supra* note 6.

[8] *See supra* note 6.

Under a financing approach[9] to options taxation, the holder of the option would be treated as if she had loaned the writer an amount of money equal to the premium. Since this loan does not bear stated interest, interest income would have to be imputed to the holder, while the writer would have a corresponding amount of interest expense. As a result, the writer's tax burden would be substantially mitigated because the writer's investment income from the premium would be offset by a corresponding interest deduction. If the transaction were characterized in this fashion, the option holder, in its capacity as a lender, rather than the writer (i.e., the putative debtor), would effectively bear the tax burden associated with income from the option premium.

Under a financing analysis, the tax law would presumably assume appreciation in the value of the option on a constant yield-to-maturity basis, consistent with the approach applicable to debt instruments having original issue discount (OID). This approach would operate to redirect the incidence of taxation on the option writer's investment income to the option holder, and to treat the income so taxed as an additional cost of the option.[10] The holder would be deemed to derive a minimum rate of return on the option premium, and would be taxed on an economic accrual basis. The holder could be required to accrue income at the applicable federal rate (AFR)[11] multiplied by the outstanding "principal amount" of the loan, which would initially be the premium amount. The amount taxed would be added to the holder's basis in the option. The premium amount effectively would be periodically adjusted to its future value (at the same imputed interest rate) consistent with the fact that no interest payments are actually being made. An adjustment to the accrual would be made when the contingency is fixed upon either the lapse or exercise of the option, when the putative loan transaction would be closed out. In the event of exercise, an amount equal to the principal balance and accrued interest would be treated as part of both the seller's amount realized and the holder's cost basis of the underlying property. In the event of lapse, this amount would be treated as income to the seller

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[9] For a discussion of the financing approach outlined below, see N.Y. STATE BAR ASS'N TAX SECTION, *supra* note 1, at 32–34.

[10] A similar approach would be applied to an option providing for periodic premiums, with the option holder accruing income on each premium payment.

[11] A regime that taxes option premiums at the applicable federal rate (AFR) would be at odds with the rules applicable to contingent payment debt instruments, which tax the holder at the issuer's higher comparable yield.

and a loss to the holder.[12]

III. DOUBTS ABOUT THE FINANCING RATIONALE

The foregoing analysis of options, like most academic commentaries on options taxation, presupposes that a financing approach to options taxation is economically warranted. Central to the financing thesis is the notion that an option is a transaction in which one party has prepaid, or at least partially prepaid, its obligation under the contract.[13] If an option premium is properly viewed as an advance payment for property, an imputed loan analysis clearly has much to recommend it. From this perspective, an option premium is viewed as the economic equivalent of a loan from the holder to the writer from the time of payment until the time of economic performance.

The *sine qua non* of this approach is the apparent timing mismatch which arises because the option holder is required to pay to the option writer an amount representing a portion of the total purchase price upfront, even though the property will not be conveyed until some future date. In the meantime, the option holder is not receiving any stated interest in respect of the holder's advance payment. From that perspective, an option looks very much like a loan lacking any stated interest.

The concept of a prepayment, however, implies a payment that is

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[12] Suppose, for example, that *H* pays *W* a $50 premium for a three-year option to buy property for $1000 and that the risk-free rate of return is 10%. *H* would be treated as loaning *W* an amount equal to the $50 premium for the term of the option, with principal and interest in the amount of $133 due in three years on the exercise date. Each year the amount of interest that accrues would be taxable to *H* and added to the principal balance on the loan, which is equal to *H*'s tax basis in the option. *W* would be entitled to a corresponding interest deduction. Under this approach, *H*, not *W*, would effectively bear the burden of the tax. Although *W* would be taxed on the income produced by the $50 option price, he also would be entitled to annual interest deductions, substantially reducing net income. On the exercise date, if *W* exercises the option, he would have an amount realized of $1133, which would also be *H*'s tax basis in the acquired property. If the option lapses, *W* would have income, and *H* a loss, in the amount of $133.

[13] *See, e.g.*, Reed Shuldiner, *A General Approach to the Taxation of Financial Instruments*, 71 TEX. L. REV. 243, 309 (1992) ("[A]n option can be viewed as a bet where one side has prepaid its obligation."). For a rare dissent, see Edward D. Kleinbard, *Beyond Good and Evil Debt (and Debt Hedges): A Cost of Capital Allowance System*, 67 TAXES 943, 952 (1989) (criticizing the hidden loan analysis for imposing "a norm (of payments in arrears) that simply conflicts with commercial norms").

being made before it properly accrues economically. That premise has important implications for tax purposes, because there may be compelling grounds for imputing a loan for tax purposes if payments are made substantially in advance of performance.[14] Options at least appear to implicate prepayments, since premiums are generally payable at the time of the option grant, in contrast with other types of bilateral contracts which do not require any payment from one side to the other in advance of the closing date. If premiums truly represent prepayments, then it seems reasonable to infer that the proper time for paying an option premium, economically, must really be the date of exercise when the underlying property will be conveyed, or alternatively, when the option will otherwise be allowed to lapse.

If so, however, it seems strange that the vast majority of option transactions in the commercial marketplace require option premiums to be paid at the time of contracting. It seems highly doubtful that this longstanding practice is tax-driven, since options have traditionally been relatively short-dated instruments, with grant dates and exercise dates frequently occurring within the same taxable year. Nevertheless, even single-year options almost invariably call for upfront payments.

This apparent paradox should call into question the whole notion of treating upfront option premiums as constituting advance payments. The real challenge, under the circumstances, is ascertaining from an economic perspective what is truly the proper time for paying an option premium. In addressing this question, due regard should be paid to the fact that the longstanding business norm for option contracts has been to require an option premium to be paid upfront, at the inception of the contract. What importance, if any, should the tax profession derive from this longstanding commercial practice, and what implications might our understanding of these practices have for reassessing the traditional income tax treatment of option premiums?

In order to achieve a proper reckoning of the tax treatment of an upfront option premium, we ought, at the very least, endeavor to understand ab initio why option premiums are paid, and why they tend to be paid upfront, rather than at some later date, such as on the date of exercise. In short, the tax law should properly reflect both the economic reasons why option premiums are ordinarily paid to begin with, and why those premiums tend to be paid upfront.

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[14] David P. Hariton, *The Accrual of Interest on Derivative Investments: Where Do We Go From Here?*, 74 TAXES 1011, 1011 (1996) ("[S]ince there is no such thing as a free lunch, the corporation presumably compensates the investor in some way for the use of these funds."); *see also* Daniel I. Halperin, *Interest in Disguise: Taxing the "Time Value of Money,"* 95 YALE L.J. 506, 517–18 (1986).

IV. THE REAL ECONOMIC BASIS FOR UPFRONT OPTION PREMIUMS

Our understanding of the true economic basis for an option premium can be vastly enhanced by taking a short detour into the realm of contract law. An option, after all, is fundamentally a species of contract. Under the law of contracts, a party making an offer to contract with another person ordinarily has the right to withdraw that offer at any time prior to acceptance. The right of withdrawal is precious, because an offer, once made, exposes the offeror to potentially adverse fluctuations in market prices, not to mention any other adverse events which could make it uneconomic for the offeror to abide by the terms of the offeror's proposal. In the normal course of bargaining, whenever one person makes a formal offer, he or she is empowering the offeree to transform that offer into a binding commitment through the mechanism of acceptance. The offeror can protect itself from adverse price fluctuations (or any other contingencies) through its right of revocation prior to acceptance and by imposing a deadline for acceptance. Since the risk of some detrimental event that could render the offer uneconomical only increases with the passage of time, the ability to revoke an offer is a right that is not to be relinquished lightly.

Options accommodate the needs and desires of parties amenable to transacting with one another to allow, in appropriate circumstances, certain offers to be made irrevocable for a specific period of time. Because this transaction pattern represents a departure from the normal terms of bargaining, the recipient of such an offer must be willing to pay consideration to the other party in order to induce that party to relinquish his or her withdrawal rights. This need to induce the offeror to make such an offer irrevocable for a limited time furnishes the underlying economic basis for the option premium.[15] In exchange for a specified amount of consideration, the offeror is essentially promising to keep its offer relating to the underlying transaction open for a designated period of time.

In the context of an option, the premium payment is the glue that makes the underlying offer binding and irrevocable, thereby giving rise to a legally binding contract that is antecedent and ancillary to the

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[15] The notion that one of the identifying characteristics of an option is that it limits the power to revoke an offer can be found in the case law. Old Harbor Native Corp. v. Commissioner, 104 T.C. 191, 201 (1995) ("[I]t limits the promisor's power to revoke his or her offer."). For a more thorough analysis of what is the essence of an option, see Kevin Liss, *The Option Conundrum in Tax Law: After All These Years, What Exactly Is an Option*, 62 TAX LAW. (forthcoming Fall 2008).

underlying transaction. Consideration is required in order to make the contract legally binding, because the party promising to keep its offer open for a period of time is exposing itself to adverse fluctuations in prices as well as any other adverse events. Absent the receipt of consideration, state law generally does not presume that someone would expose oneself to that risk gratuitously.[16] In fact, if an offeror promises to keep an offer open, without being compensated, few, if any, courts would deprive the offeror of its right to rescind that offer at any time, due to the absence of consideration sufficient to make such a promise not to rescind legally binding.[17]

In sum, option writers are generally willing to accept the risks of making an offer irrevocable only if they are adequately compensated for doing so. The party that desires to induce its counterpart to enter into a position of comparative disadvantage generally must make a nonrefundable payment to the option writer to compensate for the exposure that the writer assumes by entering into the option contract. This payment must be sufficient in amount to counteract the present value of that potential liability.

What all of this means is that an option by its very nature is an unevenly balanced contract. The writer of an option contract, the party making an irrevocable offer, is essentially exposing itself to full liability for nonperformance because it has a binding obligation, while the other party has the right to decline the offer (nonexercise the option) without incurring any further liability. In order to rectify this imbalance in rights, the party so advantaged must make an inducement payment to its counterpart in order to induce it to abide by the contract's uneven terms.

The preceding analysis helps explain why an option contract is ordinarily granted in exchange for a premium, but it does not necessarily explain why the required premium must be paid upfront, although that is clearly the prevailing practice. From a present value perspective, it should not matter when an option premium is paid as

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[16] Ordinarily, consideration for the option must be given in order to make it binding, and a mere offer to sell without consideration being paid by the person to whom the offer is made is revocable at any time prior to the acceptance of the offer. *See* Koplin v. Bennett, 155 So. 2d 568, 572 (Fla. Dist. Ct. App. 1963); Melvin v. West, 107 So. 2d 156, 161 (Fla. Dist. Ct. App. 1958).

[17] An undated agreement purporting to give a purported optionee, who had paid no consideration, the right to purchase property at a fixed price within six months from the date of the agreement amounts to nothing more than an offer to sell by the property owner, not an option contract. Brown v. Commissioner, 15 T.C.M. (CCH) 709 (1956).

long as the amount of the premium is properly adjusted for the time value of money. Using a numerical example, an option granting the holder the right, in exchange for an upfront $3 premium, to purchase property for $100 on the date of exercise could just as easily be redrawn so that the putative purchaser unconditionally obligates herself to make a fixed payment on the exercise date of the future value of $3, in conjunction with a discretionary right to pay an additional $100 on that date if she wishes to acquire the underlying property. Indeed, it is not unusual in the professional sports sector for teams to pay option premiums long after the contract has been signed.[18]

The most basic explanation for why option premiums tend to be payable at the time of grant is because from an economic perspective, that is when the payment properly becomes due. As this Part explains, the rights and responsibilities of the two sides to an option contract are structurally imbalanced *from the moment of its inception*. In other words, there is an immediate transfer of value as soon as the option period commences, which ordinarily runs from the time of inception of the contract. This value owes its existence to the fact that an option contract by its very nature favors one party (the option holder) over the other (the option writer). An option grant immediately confers a valuable right upon the holder without any corresponding obligation. The writer has an obligation to perform its side of the contract, whereas the holder does not. The party so advantaged has unlimited upside potential from its position, with no downside risk exposure beyond the amount of the option premium. It stands to reason that an option ordinarily has some value as soon as it is granted, and the option premium appropriately represents compensation for this valuable right.

In sum, option premiums tend to be paid upfront because there is a current transfer of value as soon as the parties enter into an option contract. It follows that the proper time for paying the option premium, economically speaking, is at the inception of the contract.

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[18] To cite just one example, when outfielder Bernie Williams entered into a seven-year employment contract with the New York Yankees in November 1998, he also granted the Yankees an option for his services for an additional year (2006), which if exercised would have required the Yankees to pay Mr. Williams a $15 million salary in 2006. The $3.5 million option premium was not payable until the July 31, 2005 exercise date. The New York Yankees declined to exercise their option. *The Yankees Decline an Option on Williams*, N.Y. TIMES, Aug. 3, 2005, at D3. Outside of the world of professional sports, however, deferred payment of option premiums is exceedingly rare.

That observation helps explain why upfront payment has long been the standard commercial practice for option transactions.

To be sure, there are also other more practical considerations for option premiums to be made payable at the inception of the contract. If an option holder pays the option premium upfront and the option lapses, the holder is not entitled to a refund of the option premium. On the other hand, should the option holder elect to exercise the option, the holder will be required to make an additional, incremental payment to the writer. In short, the option writer is contractually entitled to the premium regardless of whether the option is exercised. Accordingly, the obligation to pay the option premium does not depend upon whether the option is ultimately exercised. Under the circumstances, there is no commercial reason to delay payment until some future date.[19]

In fact, in light of the foregoing analysis, one could fairly argue that if the holder were not required to pay the option premium upfront, the writer would essentially be extending credit to the option holder. Evaluating an option transaction from a credit risk perspective, it should be evident that the option writer is the one who is at risk of non-payment, not the option holder, based upon any leniency in the time of payment. If the option holder chooses to exercise the option, the writer can protect itself, if need be, by the simple expedient of refusing to convey the property until the holder tenders the exercise price. In contrast, if the option holder declines or otherwise fails to exercise the option, she has the right to simply walk away without having to pay the exercise price, and the option would

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[19] The aforementioned credit analysis is different with respect to cash-settled options, since the holder is not required to pay the exercise price on the exercise date; rather, the writer simply pays the holder the excess of the current value of the index over the strike price. Accordingly, the two sides have mutual credit risk concerns in the case of cash-settled options. Although there are less compelling grounds in this context, from a credit risk mitigation perspective, for the cash-settled option holder to make an upfront payment to the option writer, the writer does maintain the greater potential exposure because the writer's potential liability is unlimited, whereas the holder's liability is fixed. Moreover, as is true for a more conventional property-based option, the option itself constitutes a valuable interest in property as of the time of grant, which is worth whatever the holder has paid for it (assuming arm's-length dealings) and which may increase in value depending upon future fluctuations in the price of the underlying asset. By analogy, although contract rights do not invariably constitute property for tax purposes, they can become property whenever one side has fully performed its side of the contract, and awaits the other side's performance. By analogy, a debenture is property in this sense. *See* Commissioner v. Ferrer, 304 F.2d 125, 129–30 (2d Cir. 1962).

simply lapse. In that event, the writer would still be owed the option premium, but would now be at risk of nonpayment. Accordingly, requiring the option premium to be paid upfront has the virtue of eliminating credit risk exposure to the option holder. That risk arises because the option writer extends value to the holder at the time of grant, and unless payment is made at that time, it is essentially extending credit to the option holder.

The preceding credit risk analysis provides further confirmation that there is no financing from the option holder whenever an option premium is required to be paid upfront. The upfront payment completely mitigates any credit risk exposure on the part of the writer to the option holder from the moment that the option is granted. Insofar as the premium economically accrues upfront, deferred payment of the option premium would actually give rise to a financing that runs in the opposite direction, from the option writer to the option holder, not, as is commonly supposed in the tax realm, from the holder to the writer. It follows that if the obligation to pay the option premium could be deferred until the date of exercise, a portion of the option premium payable at that time should arguably be treated as interest accruing from the writer to the holder during the term of the option, just the reverse of the conventional wisdom concerning option economics.

Suppose, for example, that instead of paying the option premium at the inception of the contract, *H* had agreed to pay *W*, the option writer, interest on the specified premium amount, while unconditionally agreeing to pay the bargained-for premium on the exercise date either as liquidated damages, or as a component of the purchase price. Under this scenario as well, *H* would properly be accruing interest deductions during the interval of time leading up to the exercise date. In effect, the option writer would be providing the option holder seller-financing, as the writer is agreeing to relinquish its right to a premium payable on the date of grant.

Alternatively, suppose that in lieu of making interest payments over the term of the option, *H* unconditionally agrees to pay *W* on the exercise date the future value of the original premium amount, regardless of whether the option is exercised. Under this scenario, the entire amount unconditionally payable on the option exercise date would presumably be accounted for as part of the option premium, notwithstanding that it includes an implied return on the original option premium, in the absence of any authority requiring a deferred option premium to be treated as a financing transaction for tax purposes. From an economic perspective, however, if the option

contract does not call for payment of the premium until the date of exercise, a portion of the premium payment economically represents interest that accrued over the term of the option on a financing, albeit one which runs from *W*, the writer, to *H*, the holder, contrary to the usual expectations.[20]

These examples further illustrate why the economically appropriate time for paying an option premium is on the date of grant. In fact, there is a substantial argument that an option contract allowing for deferred payment of the premium could plausibly be treated as a financing, albeit one which runs from the option writer to the option holder. Under this latter scenario, insofar as *H* is relieved from any obligation to pay the option premium until the option exercise date, *H* can continue to derive interest income from investing the deferred premium until the date of exercise, and will accordingly pay tax on that interest income during that intervening period of time. If the deferred payment of the option premium were itself treated as an imputed financing of *H* for tax purposes, constructively giving rise to additional interest expense to *H*, the result would be a wash for *H*, as the incremental interest expense would be netted against the incremental interest income derived from retention of the option premium until the exercise date. None of this is meant to argue that such an approach ought to be enacted into law. The foregoing analysis, however, is clearly inconsistent with the notion that options implicate a financing in favor of the option writer.

V. OPTION PREMIUMS AS CPDI WITH NO PRINCIPAL PROTECTION

Commentators who view option transactions as implicating a hidden financing tend to view the upfront premium payment in isolation, instead of analyzing it more broadly within the context of the transaction as a whole.[21] Viewed out of context, it may well appear as if the option holder, having invested capital for the term of the

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[20] To illustrate this principle with a numerical example, suppose that *W* allows *H* the option holder to defer paying a $100 option premium for three years, so that the premium becomes due (and unconditionally payable) on the three-year anniversary/exercise date. If *H* had made the $100 payment upfront, *W* would have been able to invest the proceeds and would have earned a return thereon. In order to maintain the same transaction economics when payment of the premium is deferred, *H* should either be required to pay $133 (assuming a 10% interest rate) on the exercise date, or else he should be charged interest of $33 on the $100 option premium. In either case, it appears that *W* has been financing *H*, rather than the other way around.

[21] *See supra* note 6.

option, is somehow being compensated accordingly. Insofar as no interest is explicitly provided for according to the terms of the option, the holder is generally thought to have interest income which should be imputed to him under economic accrual principles, at least in the absence of some other quid pro quo.

Leaving aside for a moment the presumed absence of any quid pro quo, the hidden financing analysis tends to overlook the important fact that an option holder is not entitled to a return of any portion of the option premium whenever an option expires worthless, which as a practical matter, tends to happen quite regularly. According to longstanding case law, in order for a putative loan to be recognized as bona fide indebtedness for tax purposes, the recipient of funds that have been advanced must have an unqualified obligation to pay a sum certain at a reasonably fixed maturity date.[22] In other words, a transaction is not viewed as a financing for tax purposes unless the purported borrower has promised to return a substantial portion of the advanced funds. This concept on its face appears to preclude the treatment of an option premium as indebtedness, as there is absolutely no obligation to refund any portion of the option premium, regardless of whether the option is ultimately exercised.

Moreover, in the case of a property-based call option, option exercise would at most result in a physical conveyance of the underlying property, not a return of the original premium. Insofar as there is something of value which is required to be repaid, "repayment" takes the form of a conveyance of property, rather than a sum of money. A forward contract to convey property in exchange for a cash payment has traditionally been viewed as a purchase and sale of property for tax purposes.[23] Moreover, the nature of exercise

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[22] Gilbert v. Commissioner, 248 F.2d 399, 402 (2d Cir. 1957) ("The classic debt is an unqualified obligation to pay a sum certain . . . ."); I.R.S. Notice 94-47, 1994-1 C.B. 357 (listing as first among several factors in determining whether an instrument is debt "whether there is an unconditional promise on the part of the issuer to pay a sum certain").

[23] Unconditional obligations to deliver property in the future are executory contracts to sell such property, not debt instruments, for tax purposes, even if the purchaser fully prepays its obligation. While there is some question as to whether a prepaid forward contract gives rise to an imputed loan, the amount of the prepayment in connection with an option, namely the option premium, necessarily constitutes only a small percentage of the total value of the underlying property (except when the underlying property is extremely volatile). Otherwise, the option would likely be a deep-in-the money option, since in that case the holder would be economically compelled to exercise the option. Deep-in-the money options do not qualify for the regular rules of options taxation.

requires the holder to make an incremental cash payment to the writer contemporaneously with the conveyance of the underlying property, which should be no less than the property's value at that time.[24] In that respect, the option premium payment bears some resemblance to a down payment relating to the acquisition of property.

It may be tempting to view the premium as involving an implicit loan, insofar as it represents a partial prepayment (a down payment) by the purchaser of amounts that relate to a future delivery of property, but there is generally no assurance that the property will actually be delivered, because the option may not be exercised. For that reason, an option writer's promise to deliver property at some time in the future should not be deemed to give rise to a corresponding obligation on the part of the buyer to pay for it prior to the closing date, because if the option is allowed to lapse, the writer is relieved of its obligation to deliver the property. In short, the obligation to pay for the underlying property does not economically accrue until the property has actually been conveyed to the buyer.[25]

Consistent with these considerations, the Supreme Court, in *Lucas v. North Texas Lumber Co.*,[26] held that income from the sale of property that was subject to an option does not accrue prior to the time when the underlying property is actually transferred. It stands to reason that the obligation to pay for it ordinarily should properly accrue from that time forward, dating from the time of a conveyance and not a moment beforehand. Under the circumstances there are no grounds for accruing interest on an option premium prior to the time when the property is actually conveyed.

In the case of a cash-settled option, the option writer may be required to return an amount corresponding to the option premium, and possibly a much greater amount, as part of the terms of any cash-settlement. For purposes of evaluating the debt characteristics of an option premium, it is useful to draw an analogy to the rules governing contingent debt instruments, especially those in which one party advances funds in exchange for either a payment at maturity of an amount that corresponds to an increase in the value of property, or

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[24] Were this proposition not true, the holder would presumably allow the option to expire unexercised.

[25] The standard for ascertaining whether a current sale has taken place focuses on the transfer of property from seller to buyer rather than on the transfer of funds from buyer to seller. Until the seller has performed, the object of the sale, the transfer of property, has yet to occur, and the transaction remains incipient.

[26] Lucas v. North Texas Lumber Co., 281 U.S. 11 (1930).

nothing at all. An instrument with these features would be a contingent payment debt instrument (CPDI) if in fact it were respected as indebtedness for tax purposes. A debt instrument is only regarded as such to the extent that it is, to a substantial degree, a "principal protected" investment, a notion which in no way encompasses an option.[27]

The conventional view among practitioners is that a taxpayer's investment in a financial instrument that pays a guaranteed return of at least 65% of the present value of the taxpayer's initial investment (discounted at the AFR or the issuer's comparable yield) may well constitute a debt instrument for tax purposes, although there is no explicit authority to that effect. Sixty-five percent represents the lower boundary of what most practitioners would view as bona fide indebtedness. Instruments providing for lower degrees of principal protection are unlikely to be respected as indebtedness. Options, however, have absolutely no principal protection whatsoever, because of their potential to expire worthless. In light of the highly leveraged nature of options, even a relatively small decline in the value of the underlying property, or for that matter, the failure of property to appreciate in value from its initial trading price, can easily erase the option holder's entire investment. Given the reluctance of the tax law to ascribe debt status to putative debt instruments having such poor prospects of repayment, it would be anomalous to characterize option premiums as giving rise to bona fide indebtedness for tax purposes.[28]

In sum, the simple fact that option premiums are nonrefundable and may expire worthless belies the notion that they may properly be regarded as loans for tax purposes. As noted above, the definition of indebtedness for tax purposes requires an obligation to pay a sum certain at some later fixed date.[29] In the absence of an obligation to

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[27] *See, e.g.*, FSA 199940007 (June 15, 1999) (determining that an instrument was not debt where there was no minimum amount payable at maturity). The concept of principal protection compares the net present value of the holder's guaranteed repayment or "principal protected" investment to its original investment.

[28] The tax law clearly accommodates contingent payment obligations in a variety of settings. *See, e.g.*, I.R.C. §§ 1275, 453, 483. However, these provisions imply that wholly contingent *increases* in purchase price can constitute indebtedness for federal income tax purposes; there must still be some threshold minimum amount payable apart from the contingent amount. The prospect that the lender will receive nothing would appear to take the obligation clearly outside the bounds of what is properly viewed as indebtedness for tax purposes.

[29] In *Gilbert v. Commissioner*, 248 F.2d 399, 402 (2d Cir. 1957), the court defined classic debt as "an unqualified obligation to pay a sum certain at a reasonably close fixed maturity date along with a fixed percentage in interest payable regardless of the

repay the amount that is borrowed there can be no bona fide indebtedness for tax purposes.

An important case decided by the Supreme Court in the early 1990s, *Commissioner v. Indianapolis Power & Light Co.*,[30] while not implicating options, is particularly instructive in illustrating the difference between an advance of funds that is properly regarded as a loan, and one that is not. In *Indianapolis Power* an electric utility required certain customers with poor credit to make deposits when commencing service in order to insure their prompt payment of future electric bills. These customers were entitled to a refund of their deposits once they had demonstrated their creditworthiness over a period of time. At that point they could either claim a refund of their deposit in cash, or else apply their deposited funds as a credit against future purchases of electric power.[31] The utility commingled the deposits with other receipts and exercised unfettered dominion and control over those funds. The question for the Court was whether the deposits should be regarded as advance payments immediately includable in income, or whether they were analogous to loans and therefore not taxable.

In some respects the deposit at issue in *Indianapolis Power* resembled an option premium because the customers had the option, but were under no obligation, to purchase power from the electric utility. For accounting purposes, however, the utility treated the deposits as if they belonged to the customers, by listing the deposits as current liabilities and by accruing interest. Under the circumstances, because the deposit was both fully refundable and was accruing interest, it clearly constituted a loan. By contrast, if the advanced funds had truly been in the nature of an option premium, they would have been nonrefundable even if the customer declined to purchase any electricity.

This case highlights one of the fundamental differences between a deposit, which is essentially a loan, and an option premium. Deposits, standing alone, are generally refundable if the buyer declines to make a purchase. By contrast, an option holder is not entitled to recover his option premium even if he declines to exercise his option privilege. The decisive factor in *Indianapolis Power* was the absence of any

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debtor's income or lack thereof."

[30] 493 U.S. 203 (1990).

[31] There is actually a third scenario, in which they could purchase, and separately pay for the power, while contemporaneously seeking a refund of the deposit, with accrued interest. This third scenario is economically equivalent to the first.

binding obligation on the part of the customers to purchase electricity and their concomitant right to fully recover the amount of their deposits. Under the circumstances, the Court found that the utility had no assurance that it would be allowed to keep the money, and accordingly, held that the utility had properly excluded the deposits from income.[32]

Option holders, like the customers in *Indianapolis Power*, are under no obligation to purchase the underlying property. Unlike the customers in *Indianapolis Power*, option holders also lack any right to recover their option premium.[33] The juxtaposition of this case, involving refundable deposits, and the nonrefundable nature of an option premium highlights the fact that there is no obligation to repay a sum certain in connection with the receipt of an option premium, a feature inconsistent with debt characterization.

VI. OPTIONS AS INTANGIBLE PROPERTY: THE INCREASING VALUE HYPOTHESIS

In the preceding Part, the presumed absence of any bona fide quid pro quo in connection with the upfront payment of an option premium was exposed as fallacy when viewed in the context of fundamental notions of contract law. It is possible to reach exactly the same conclusion from a property law perspective. In short, what the option holder receives in exchange for the premium is an intangible property interest equal in value to the premium payment. While that

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[32] The utility would have had the requisite assurance that it was entitled to keep the deposited funds had the arrangement been explicitly structured as an option on the part of the customers to purchase electricity. In that event, the deposited amounts would have been nonrefundable. Ironically, however, even under that scenario, the utility would have been relieved from having to report the deposited amounts as income under case law authority authorizing the exclusion of option premiums from income. *See* Virginia Coal & Coke Co. v. Commissioner, 99 F.2d 919 (4th Cir. 1938). For a thoughtful article questioning that line of authority, see Bruce Kayle, *Realization Without Taxation? The Not-So-Clear Reflection of Income From an Option to Acquire Property*, 48 TAX L. REV. 233 (1993). For a critique of Kayle's analysis, see Kevin Liss, *Rationalizing the Taxation of Options in the Age of Derivatives*, 61 TAX LAW. (forthcoming Spring 2008).

[33] Although an option premium in principle is nonrefundable, if the writer is in fact unable or unwilling to perform the writer's side of the agreement when the holder has exercised the holder's option, the writer should be required, at the very least, to refund the premium previously paid, and may presumably be held liable for full damages to the holder. As long as the writer is willing and able to perform, the premium is nonrefundable from the holder's perspective. By contrast, a deposit, like a true loan, is fully refundable at the behest of the depositor.

intangible property interest is not recognized as a separately cognizable property interest for purposes of triggering a taxable sale as of the time when the option is written, that interest surely constitutes a bona fide property interest from a purely economic perspective.[34] The case law on dispositions of property acknowledges that certain interests that are generally acknowledged to be property interests economically-speaking are simply not respected as such within the confines of the tax rules governing what constitutes a sale or exchange of property. These enduring tax law precedents, however, should not inhibit us from acknowledging that options are bona fide property interests from an *economic* perspective in order to properly assess whether there is in fact a hidden borrowing component in option transactions.

Leading academics who have embraced the implicit financing analysis falsely conflate the narrow view of property that prevails for purposes of the "sale or exchange" provisions of the Internal Revenue Code (Code) with more generic concepts of what constitutes property from an economic perspective.[35] The option privilege should be respected as a valuable property right for purposes of assessing whether there is a hidden borrowing inherent in an option transaction even if the existence of that property is not otherwise respected as such for purposes of triggering a taxable sale or exchange upon the grant of an option.

In terms of the aforementioned quid pro quo inherent in options transactions, when parties enter into an option contract in exchange for the payment of an upfront premium, they effectively swap the returns from their respective assets. One party is allowed to derive a return on the other party's cash, while the other side is allowed to derive a return on the underlying property, based upon its

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[34] The objective existence of an intangible property interest in this context seems irrefutable. The holder of an option benefits by locking in the purchase price of the underlying property, which may or may not be acquired at a future date, depending solely upon whether taking delivery operates to the holder's advantage. While the writer is legally bound to deliver the underlying property following the holder's tender of the previously agreed-upon exercise price, regardless of future price fluctuations, the holder is under no obligation whatsoever to acquire the property if prices move adversely from the holder's perspective. In short, the holder can pay the fixed price, if it is in its interest to do so, in which event it will acquire the property, or it can decline to exercise the option, at no further cost.

[35] According to case law, the term "property" has a restrictive meaning for tax purposes. Interests that are concededly property in the generic sense are not necessarily regarded as property for purposes of applying the capital gains provisions. Commissioner v. Gillette Motor Transport, Inc., 364 U.S. 130, 134–35 (1960).

appreciation in value over a specified threshold from the date of inception through the date of exercise. The option writer who invests the option premium does so at his or her own risk and reward and, accordingly, is properly taxable on any earnings derived from that investment. The option holder, by contrast, does not pay tax on any appreciation in the option prior to exercise, consistent with the tax rules generally applicable to other long parties to a contract to purchase property for a fixed price, or, for that matter, the actual owners of the underlying asset, who are similarly relieved from paying tax on any appreciation until they have disposed of the underlying asset.[36]

Consistent with those principles, the traditional tax treatment of options does not require the holder to accrue any expected increases in the value of the option. There is nonetheless a school of thought, referred to here as the increasing value hypothesis, which holds that an option is an asset whose value is expected to *increase* over time.[37] Impressively, the increasing value hypothesis appears to draw on the Black-Scholes formula for options valuation as its source of inspiration. Option pricing theory holds that an option can be valued by computing the present value of its "expected intrinsic value" as of the exercise date.[38] Assuming, for example, that the "expected intrinsic value" of an option to acquire property for $1000 in three years is $133, then, using a market rate of return of 10%, the appropriate price for that option today would presumably be $100.

According to this hypothesis, an option should reasonably be expected to increase in value over time and should yield, on average, positive returns at least equal to the risk-free rate.[39] Insofar as current

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[36] Under a realization-based tax system, taxation is generally not imposed on mere fluctuations in the value of physical assets until the taxpayer disposes of those assets. Under the circumstances, it would be inequitable, and inconsistent with notions of tax neutrality, to tax the option holder on increases in the value of an underlying asset over the term of the option when neither a contractual long party, nor the actual owner of the underlying asset is not taxed on any appreciation until the asset's ultimate disposition. See, for example, *Rhodes-Jennings Furniture Co. v. Commissioner*, 9 T.C.M. (CCH) 1019 (1950), and cases cited therein, where the purchase of accounts receivable at less than their face amount did not give rise to immediate gain recognition.

[37] *See, e.g.*, Cunningham & Schenk, *supra* note 6, at 735; Shuldiner, *supra* note 13, at 243.

[38] The intrinsic value of the option is the excess, if any, of the property's fair market value over its strike price on the exercise date.

[39] *See, e.g.*, Cunningham & Schenk, *supra* note 6, at 735; Shuldiner, *supra* note 13, at 243.

law requires the option writer to report income derived from investing the option premium, while not attributing any return to the option holder before the exercise date, proponents of this view argue that the option holder's income is effectively being underreported under a realization-based system of accounting. By the same token, an option writer's income is thought to be systematically overstated, insofar as the writer cannot constructively offset that income by reference to accretions to the value of the option. To rectify this disparity, advocates of the increasing value hypothesis believe that the option holder should be taxed on the option's expected increase in value, which should logically give rise to a corresponding deduction to the option writer.[40]

The increasing value hypothesis is based upon the observation that forward prices for commodities tend to be greater than spot market prices, which gives rise to the inference that the market must be expecting options to appreciate in value. While forward prices in fact are often higher than spot market prices, that relationship does not hold equally true across all commodities at all times. A large part of the historical return in some commodity markets is the convenience yield, which is the premium that buyers who require a commodity right away are willing to pay to control it relative to others who are willing to defer delivery into the future. Oil markets, for example, have historically exhibited "backwardation," meaning that at any given moment, the prices for delivery on various future dates may be lower than spot market prices.[41] In fact, traders in oil markets commonly seek to capture the so-called "roll yield" by selling the front month and buying later-dated contracts.[42]

In the more common situation, where forward prices do reflect a premium over spot market prices, there is a more vexing problem with this analysis. According to modern finance theory, forward prices of investment assets are determined on the basis of a "cash and carry" model. In other words, the relationship between the forward price and the spot price of investment assets is simply a function of the carrying

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[40] *See, e.g.*, Cunningham & Schenk, *supra* note 6, at 735; Shuldiner, *supra* note 13, at 243.

[41] In the commodity trading sector, backwardation is commonly used to describe the position of futures prices in relation to current spot prices (or to characterize the prices of futures contracts for the same commodity but with different maturities).

[42] Broadway theater tickets are another example of a commodity that often exhibits backwardation, as the price for next Saturday evening's performance for a popular show is often higher than the cost of tickets available for future performances.

costs of the underlying property rather than a genuine expectation of an increase in its value.[43]

More particularly, this relationship is driven by the property seller's need to continue to finance his or her position during the interval of time ending on the closing date when entering into a forward contract. These costs are offset to some extent by any income derived from owning the property. Accordingly, the forward price must be based on the current spot market price of the underlying property, adjusted for the cost of carry: namely, storage costs, insurance, taxes and interest expenses the seller will incur in holding the underlying property until the date of delivery, and any anticipated movement in the spot price of the underlying property. In short, the forward price should be greater than the spot market price by an amount reflecting the cost of carry.

According to finance theory, proof of this relationship can be demonstrated using a "no arbitrage" analysis.[44] If forward prices did not carry a premium reflecting these carrying costs, opportunistic traders would be able to engage in arbitrage strategies allowing them to derive risk-free profits by the simple expedient of entering into offsetting positions in the forward and spot markets. Arbitrage opportunities arise whenever there are discrepancies in prices between two different markets, enabling traders to take offsetting positions in the two markets to lock in a risk-free profit. The very pursuit of these strategies helps drive prices back into equilibrium, until no further profit opportunities are available. As a result, arbitrage opportunities tend to be very fleeting by nature. Fortuitously, however, the transient nature of these opportunities makes it possible to examine fundamental relationships between an option and the underlying asset on the assumption that prices are in equilibrium, i.e., based on the assumed absence of these arbitrage opportunities.

If forward prices are merely a function of current prices adjusted for the cost of carry, it follows that forward prices do not offer any insight into future prevailing prices. Forward prices simply reflect current prices for products scheduled for future delivery. Any inferences that may be derived from forward prices as to market expectations are unwarranted, because knowing the forward value of

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[43] JOHN C. HULL, OPTIONS, FUTURES, & OTHER DERIVATIVES 118–19 (6th ed. 2006).

[44] *See* JOHN C. COX & MARK RUBINSTEIN, OPTION MARKETS 60–62 (1985); HULL, *supra* note 43, at 14.

a commodity does not implicate any knowledge of the expected future value of that commodity. In short, forward prices are a function of the time value of money, not the genuinely expected future price of the commodity.

A numerical illustration involving the classic "cash and carry" scenario may be instructive. Suppose, for instance, that on July 1st, an investor takes a long position in gold by purchasing a fixed quantity on the spot market for $300 while contemporaneously going short in the forward market (i.e., by contracting to sell the same quantity of gold six-months forward for $316). At first blush, it appears that the investor has locked in an easy profit of $16, based on the spread between the forward price and the spot price. In truth, those one-day profits are completely illusory, a proposition easily demonstrated by considering the implications to the investor if he or she were to unwind both positions later on the same day, assuming that prices hold steady.

In that event, the investor would be able to sell the long position for $300 — the same amount that he paid earlier in the day. He or she could also close out the short forward position by entering into a long forward position for $316 — the same price that he or she had contracted for earlier. The net economic impact of these collective one-day transactions is zero. If instead prices had increased by a dollar with respect to the long position and by two dollars with respect to the short position, the analysis would be exactly the same, except that this time the investor would have an inherent gain of a dollar on the long position and a loss of two dollars on the short position, resulting in a net loss in value of a dollar — a far cry from the illusory $16 profit that seems to have vanished.

What happened to the overall $16 gain that the investor seemed to have locked in when he entered into the two offsetting positions, based on the spread between spot prices and future prices? Economically, the investor's elusive $16 return vanished because it did not truly reflect any appreciation inherent in the underlying property. The investor merely contracted to sell the property forward while contemporaneously making a spot market purchase for the same quantity. Both transaction prices represent current prices for transactions in gold. The $100 spot price represented July 1st price terms for taking immediate delivery of gold. The $116 forward price likewise reflected July 1st price terms for taking delivery of the same quantity of gold six months forward. Regardless of the scheduled delivery date, both price terms represented *current* prices for entering into transactions in gold.

What really accounts for the difference between the spot and the forward prices are the carrying costs of gold, which consist of the cost of financing a purchase of gold for six months and the cost of storing it, offset by any income derived from lending it out to short sellers. If net carrying costs are $16, and the spot market price of gold six months down the road proves to be $316, the investor should merely break even, rather than realize a $16 profit. Under the circumstances, the investor will only profit if the price of gold exceeds the $316 forward price. In short, in order to profit, the future price of gold will have to actually surpass its expected future value.

VII. EXPECTED VALUE — NOT A TRUE SOURCE OF RETURNS ON OPTIONS

In the preceding example the traders' nascent profit proved illusory because foreseeable trends in market conditions were already being taken into account in spot market prices. Since forward prices are derived from the spot market price and the carrying costs of property, forward prices reflect the same foreseeable market trends that influence spot market prices.[45] For that reason, expected movements in the spot market price cannot be a source of return to an investor looking to sell property forward. An investor in property will only profit if the spot price at maturity turns out to be higher than expected, and the investor will suffer losses if the spot price turns out to be lower than anticipated.

In light of the foregoing, a forward contract ultimately represents a bet on the future spot market price on the delivery date. Assuming arm's-length pricing, forward prices are the prices necessary to make that bet even between the two contracting sides. It is reasonable to infer that such a bet must be even because when transacting parties enter into a conventional bilateral sales contract at the commodity's forward price, neither side typically pays any upfront premium. The absence of any upfront payment is consistent with the fact that the parties are assuming equal and opposite risks of unexpected movements in the price of the underlying commodity.[46]

Forward pricing principles are crucial to properly understanding the relationship between an option's premium and its future expected value. It follows that if contracting parties enter into an option agreement instead of a conventional bilateral contract, the exercise

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[45] *See* HULL, *supra* note 43, at 99–104.

[46] *See* COX & RUBINSTEIN, *supra* note 44, at 59–60.

price of an at-the-money option should presumably be based on the forward price of the underlying property, rather than its current spot market price.[47] As noted earlier, spot market prices reflect the terms of sale for immediate delivery, whereas options by their nature implicate deferred delivery transactions. In the case of a European-style option, delivery of the underlying property will take place (if at all) on a future date. In that respect, such options are essentially a species of forward contract. Accordingly, the appropriate benchmark for the exercise price of an option that is intended to be at-the-money is the forward price, since the forward price is the price applicable to transactions scheduled for future delivery.[48]

If the spot market price for the underlying property is $100, and the six-month forward price is $104, then a six-month European-style option intended to be at-the-money should have an exercise price of $104. Although the $104 price exceeds the $100 spot market price on the date of grant, such an option should not be regarded as being out-of-the-money, since the appropriate benchmark exercise price of an at-the-money option under these circumstances is the forward price, not the spot market price.[49]

If the underlying property should happen to appreciate in accordance with the forward price curve at the time that the option was written, then the underlying property whose spot market price

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[47] The analysis here assumes a European-style option — i.e., one that is not exercisable prior to a specified future exercise date.

[48] It is possible to reach the same conclusion under a cash-and-carry analysis. In order to maintain a risk-neutral position, an option writer needs to cover the risk of adverse changes in the price of the underlying property. Acquiring that property, however, implicates a financing cost and, depending upon the commodity, possibly storage costs as well. These costs, net of any income derived from the property, comprise the carrying cost of the property. In order to break even economically, the option writer must charge the purchaser an amount sufficient to cover the writer's costs of carry. In short, the forward price of the underlying property must reflect the current spot market price, adjusted for these carrying costs.

[49] One might wonder how an option can possibly be viewed as being at-the-money at a time when the spot market price of the underlying asset is less than the option's exercise price. The answer is that while it is appropriate to compare the option exercise price to the current price of the underlying asset, the real challenge is ascertaining the true current price of the underlying asset in this particular context. The spot price clearly represents one measure of current pricing, but so too does the forward price. Both prices represent current prices; one relates to transactions for current delivery, the other for deferred delivery transactions. Insofar as an option is a European option, which by definition cannot be exercised until some later date, the relevant price point should be the current forward price, not the current spot market price.

was $100 on the date of grant should be worth exactly $104 as of the exercise date. Assuming, however, that the at-the-money option had an exercise price equal to the $104 forward price, the option should expire worthless, even if the underlying property increases in value exactly as projected. In short, if the forward price truly reflects the future price of the underlying property, and the property increases in value accordingly, then the option holder should derive no return whatsoever from such an investment. In other words, the future expected value of an at-the-money European-style option is zero.

VIII. UNEXPECTED RETURNS — THE TRUE SOURCE OF OPTION RETURNS

In light of the foregoing analysis, how should we account for the notion, deeply embedded in option pricing theory, that the value of an option is determined by reference to its "future expected value," discounted at the risk-free rate? After all, we have just observed that if the price of the underlying property increases exactly as projected, the option should expire worthless. By the same token, we know that options invariably have some positive value, so clearly something must be awry.

The real problem is the term "future expected value," which is in fact a misnomer. As previously noted, foreseeable market trends are not a source of return for option holders. Accordingly, the true value of an option must reside in its potential for unexpected returns, rather than its potential for expected returns. Under the circumstances, the term would be more aptly named — and less confusing — if it were refashioned as the "future unexpected value." While the foregoing example demonstrates that an at-the-money option has no future expected value, it does not prove that the option is worthless. The value of at-the-money options, as well as out-of-the-money options is attributable to what the financial sector refers to as time value, which pertains to the option's potential to finish in-the-money, notwithstanding that it has no intrinsic value at the time of grant.[50]

The term "future expected value" (and even the suggested term "future unexpected value") is also misleading insofar as it implies that there is some particular outcome that is more likely than all other possible outcomes. In fact, the future [un]expected value is simply a

[50] Adding further to the confusion, the term "time value" in the context of options sounds as if it relates to the time value of money. In fact, the two concepts are completely different. The time value of an option refers only to its potential to go in-the-money over the course of time due to volatility in the underlying asset.

probability-adjusted aggregate of all potential outcomes. In other words, it is the weighted average of all the possible unexpected payouts, whose weights are the respective probabilities, rather than the any single outcome that is more likely than all the others.

In the preceding example, the value of the underlying property could ultimately exceed the $104 forward (i.e., exercise) price or it may ultimately be worth less. For each given price in the universe of possible outcomes, there is some probability that the market will settle at that particular price on the exercise date. For example, there is some possibility that the price will settle at $105, another, presumably lower possibility that the price will be $106 and so on to infinity. On the downside, there is likewise some probability that the property will settle at $103, another probability that the price will be $102, and so on. The option, however, is asymmetrical around its exercise price, in contrast with a bilateral forward contract, and this means that any particular outcome that falls short of the $104 threshold exercise price results in a zero return to the holder, rather than a loss of varying degrees of magnitude. In calculating the expected value of the option, the valuation exercise essentially averages all of the probability-adjusted outcomes that represent varying degrees of positive economic returns together with a substantial number of zero outcomes. In other words, the potential outcomes will consist of $1, $2, $3, and up, assuming that the underlying has a final price of $105, $106, $107, or greater, along with a multitude of zero outcomes, relating to scenarios in which the underlying property has a final price of $104 or lower.

Because there are no potential negative returns to offset all of the potential positive returns, the option should always have some positive value that is greater than zero. Option value is ultimately a function of the intersection between volatility in the price of the underlying asset, on the one hand, and the fundamentally asymmetric nature of options valuation.[51] In short, the valuation exercise reflects

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[51] *See* RICHARD A. BREALEY, STEWART C. MYERS & FRANKLIN ALLEN, PRINCIPLES OF CORPORATE FINANCE 576–81 (9th ed. 2008). Due to the asymmetrical nature of an option, volatility is a fundamental driver of option values and option returns. High volatility, insofar as it entails a substantial prospect of extreme outcomes, operates to the benefit of the option holder because as volatility increases, the chances are greater that the asset will either appreciate or depreciate to a substantial degree. In the case of declining values, when an option expires out-of-the-money, the option will be worthless no matter how far the price falls below the exercise price. Regardless of the price, the option holder cannot lose more than the premium paid. With respect to increasing values, the option holder benefits from any increase in price above and beyond the exercise price. Accordingly, the more volatile

the fact that options are limited-risk instruments which have unlimited upside potential.

In light of the asymmetry inherent in an option, an option will either expire worthless or settle at some amount that will typically be greater, and possibly much greater, than the future expected value. This is because one of the most common potential outcomes, which must be weighted accordingly, is a zero outcome — the prospect of total worthlessness. In other words, whatever positive values an option might have in the event of payoff must be discounted by the prospect that it will expire totally worthless. Suppose, for example, that an option has a 25% chance of having a $50 payout, a 25% chance of having a $110 payout, and a 50% chance of expiring worthless. The future expected value is not $80 (the midway point between 50 and 110), but $40, which is derived by discounting the two possible payout values by the 50% prospect of total worthlessness.

As the preceding example implies, an option's "future unexpected value" can, in principle, be mathematically derived by averaging all of the probability-adjusted unexpected outcomes. Once this average is determined, it should be possible to calculate the option premium by discounting the resulting future unexpected value on a present value basis using an assumed (risk-free) rate of return.[52] The term "future

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a commodity or security, the more expensive is an option on that asset. *Id.*

[52] If the range of possible outcomes from an option transaction were finite and their associated probabilities reasonably ascertainable, the option valuation exercise would be relatively straightforward. The value of the option would simply be a probability-weighted average of all of the possible outcomes. In the real world, however, there is a virtually limitless range of possible outcomes of indeterminate probability. Nevertheless, one of the fundamental tenets of finance theory is that option pricing does not require actually knowing the probabilities of all the possible outcomes or the risk preferences of the investors. In fact, as explained more fully *supra* Part VII, forward prices and expected future value do not depend on forecasts of future price fluctuations, but rather, are derived from current spot market prices.

Since the price of an option is dependent on the current price of the underlying property, it should be possible, according to finance theory, to set up equal and offsetting positions in an option and the underlying property to create a risk-free position, making it possible to value the option by reference to the price of the underlying property. Insofar as the probability of future price movements is equally relevant to the values of both the option and the underlying asset, the relationship between the option price and the price of the underlying asset does not depend on the probabilities of the various outcomes, or on investors' attitudes toward risk. In other words, since the various probabilities are already inherent in the price of the underlying asset, they do not need to be separately factored into an option pricing model. For that reason, options valuation methods do not involve any variables that depend on the risk preferences of particular investors. HULL, *supra* note 43.

expected value" tends to obscure the significant variation in potential outcomes, ranging from complete worthlessness to values significantly greater than future expected value. In sum, the future expected value reflects probability discounting as well as time-value-of-money discounting when considering the probability-adjusted price distribution of the underlying asset that is driving the option value.

Ultimately, the sole potential source of economic return to the option holder will be appreciation in the value of the underlying property in excess of the expected amount of appreciation. If appreciation is limited to the expected increase in value, an at-the-money option holder will realize nothing, as the option should expire worthless. Under the circumstances, it makes no sense to assume, as some commentators have,[53] that an option should reasonably be expected to move inexorably along a path that ultimately results in a payout based upon its future expected value. The true future *expected*

Insofar as options valuation is independent of investor risk preferences, those preferences do not affect the solution to the option valuation equation. This insight leads readily to the oft-stated assumption in finance theory that investors can safely be regarded as risk-neutral for purposes of valuing options. Accordingly, the relationship between an option and its underlying property should be the same as that which would hypothetically exists in a risk-neutral world. This principle of risk-neutral valuation vastly simplifies the option valuation exercise, because in a risk-neutral world, the expected return on investments would have to be the risk-free rate of interest in order to eliminate any arbitrage opportunities. In other words, an option's expected payoff can be derived by assuming a risk-neutral world, which makes it appropriate to discount this expected payoff at the risk-free rate of interest.

Under the risk-neutral valuation model, the expected price distribution for an option is calculated not with respect to the actual probability distribution of the potential payouts, but rather with respect to an alternative probability distribution, referred to as the risk-neutral distribution. This distribution is the one which the payouts would have in a risk-neutral economy, where the expected rate of return on all assets is the risk-free rate. The risk-neutral valuation model is not based on assumptions that the world is truly risk-free. Rather, one may safely disregard risk for purposes of deriving option value, because the expected growth rate and the discount rate in a risk-free world are inversely related and therefore cancel one another out. That means that the resulting option value should hold equally true in a real, risk-averse world, as it does in a theoretical risk-free world. Accordingly, the probability distribution of possible outcomes is determined by assuming that the underlying asset appreciates on average at the risk-free rate, rather than at its own actual expected rate of return.

Risk neutral valuation yields the same option valuation as would be derived under a no-arbitrage analysis. Once there are no remaining arbitrage opportunities, it is safe to assume that investors are risk-neutral, and risk-less portfolios must earn the risk-free rate of interest. HULL, *supra* note 43.

[53] *See supra* note 39.

values of at-the-money and out-of the money options are zero. That is not to imply that the option is worthless. The point is that whatever value is inherent in the option privilege is entirely attributable to unexpected fluctuations in prices, meaning the potential for the underlying property to appreciate in value above its forward price. A methodology for taxing options that clearly reflects income, and thus, clearly reflects underlying economics, should logically focus on expected, rather than unexpected, returns. Accordingly, the prospect of unexpected returns should not be relevant to the taxation of options.

Insofar as options, other than in-the-money options, have an expected return of zero, it follows that options are not destined to appreciate in value at the risk-free rate. The assertion that options should be presumed to increase in value over time for purposes of taxing the parties to an option contract is based on a misunderstanding of basic option economics.

IX. In-the-Money Options and Positive Expected Value

If at-the-money options have a zero expected value, it seems reasonable to assume that in-the-money options should have some positive amount of expected future value. Suppose, for example, that an option has an exercise price that is a dollar lower than the forward price for the underlying property. If the underlying property increases in value in accordance with its forward price, the option would be expected to have a one dollar payout and a one dollar expected return. Accordingly, an in-the-money European-style option, unlike at-the-money or out-of-the-money options, should presumably have some future expected value apart from any future unexpected value that the option may have.

The same issue is relevant to American-style options that have an exercise price equal to the current or spot market price of the underlying property. Since forward prices, whether published or not, tend to reflect a premium over current or spot market prices, whereas the exercise price on an option is fixed, such an option will tend to gradually move into-the-money with the passage of time. Strictly speaking, such an option may merely be at-the-money at the time of grant, but in light of the foregoing, and the prospect that the exercise period will remain open for some period of time, these options should be viewed, economically, as tantamount to in-the-money options

Does it follow from this analysis that there is invariably a financing component to in-the-money options? After all, the option

holder makes an upfront premium payment to acquire the option, and the option is expected, at least in the example just given, to yield a one-dollar return. On the surface, it appears that there may well be a financing component in this context, at least to the extent of an in-the-money option's future expected return, which resembles somewhat a repayment of principal. Insofar as an in-the-money's option payout should happen to exceed the expected yield, the incremental payout could be viewed as analogous to contingent interest. In that respect, the embedded financing component begins to resemble a contingent payment debt instrument.

Before drawing any inference, however, that there may truly be an embedded financing in the context of an in-the-money option, one must be mindful of the full implications of the prospect that the option will yield unexpected returns, since as we previously noted, there is in fact a broad range of potential outcomes for options, ranging from total worthlessness to infinite value. Just as it is possible for future payouts to exceed the expected yield, it is possible for even in-the-money options to expire worthless if unexpected price fluctuations turn negative. In short, the putative embedded financing is completely lacking in principal protection, as the entire amount that is "borrowed" might have to be forfeited if prices move the wrong way from the holder's perspective. Although the absence of principal protection is not necessarily fatal to debt classification, there must at least be a likelihood of returning substantially all of the original amount borrowed, a prospect that is likely to be absent unless the option is significantly in-the-money in light of the volatility of the underlying property.[54]

Because options by their nature are inherently leveraged instruments, even a modest decline in the price of the underlying asset may suffice to give rise to a total loss of the option holder's investment.[55] On the other hand, the risk of total worthlessness clearly

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[54] In *Gilbert v. Commissioner*, 248 F.2d 399, 402 (2d Cir. 1957), the court concluded that the first prerequisite of an interest deduction is indebtedness — an existing, unconditional and legally enforceable obligation to pay a sum certain at a fixed maturity date. *See also* I.R.S. Notice 94–47, 1994–1 C.B. 357. If there is no promise to pay a principal amount, there is no indebtedness on which interest can be paid. Johnson v. Commissioner, 108 F.2d 104, 107 (8th Cir. 1939); *see also* TIFD III-E, Inc. v. United States, 459 F.3d 220, 236 (2d Cir. 2006) ("[T]he closer the amount owed comes to being a sum certain , the more it would tend to indicate debt.").

[55] Suppose stock of GM is trading at $34.65 in July, and that you can buy a September 35 call for $1.05 for 100 shares, which gives you the right to buy the shares at $35 each. At the current price of $34.65, the premium paid amounts to 3.03% of the current trading price. If the stock stays under $35 when the option expires, the call

diminishes the greater the extent to which the option is in-the-money, which is a function of several factors, including the magnitude of the gap between the fair market value of the underlying property and the option exercise price, the volatility of the underlying property, and the term of the option.

For that reason, one can make a compelling argument that at some level, a deep-in-the-money European-style option bears a strong resemblance to a true financing.[56] In that event, the main challenge would be ascertaining when that threshold has been crossed. A possible approach that references existing case law guidelines would be to inquire whether the option has a substantial likelihood of exercise,[57] based upon the aforementioned factors.[58]

On the other hand, to the extent that a European-style option can be said to have a high likelihood of being exercised, it bears the trappings of a partially prepaid forward contract, where the relevant partial prepayment is the option premium.[59] Under current law, however, the conflation of a deep-in-the-money option with a prepaid forward contract would appear to be of little moment, as prepaid forward contracts are not regarded as financing transactions for tax purposes. Accordingly, as long as the current policy with respect to

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option expires worthless, resulting in a total loss of investment even if the price of the underlying stock remains stable through that time.

[56] In the case of American-style options, Internal Revenue Service (Service) ruling policy currently treats deep-in-the-money options as implicating an upfront sale, rather than a financing transaction. Rev. Rul. 82-150, 1982-2 C.B. 110.

[57] *See, e.g.*, Comtel Corp. v. Commissioner, 376 F.2d 791, 794 (2d Cir. 1967), *aff'g* 45 T.C. 294 (1965) (treating option holder as owner where holder was economically compelled to exercise the option); Belz Inv. Co. v. Commissioner, 72 T.C. 1209, 1226–27 (1979) (transfer recognized as bona fide sale where option to repurchase was not certain to be exercised); Penn-Dixie Steel Corp. v. Commissioner, 69 T.C. 837, 844 (1978) (no sale due to insufficient certainty of option exercise).

[58] While the inquiry is highly fact-dependent, it is possible to make a few generalizations for situations where all of the indicators are pointing in the same direction. In particular, it is probably fair to say that an option on a highly volatile commodity that is only slightly in-the-money is not a true borrowing, while an option whose underlying commodity has low volatility that is deep-in-the-money may for all intents and purposes resemble a true financing.

[59] It is commonly assumed that an option is issued "at-the-money" if the exercise price equals the value of the underlying property on the date that the option is issued. While that may be true for American-style options, which are immediately exercisable, this assumption is plainly wrong with respect to European-style options which are not exercisable until a future date. Accordingly, a ten-year option whose exercise price is equal to the value of the underlying property on the date that the option is issued may very well be deep-in-the-money.

prepaid forwards remains in effect, the argument that even deep-in-the-money options should be accounted for as an implied financing would appear to be for naught.[60]

Even if the rules governing prepaid forwards were modified to explicitly account for their implicit financings,[61] another important caveat bears consideration before fully embracing financing treatment for even deep-in-the-money options. It bears special emphasis that option premiums implicate probability discounting as well as time value of money discounting. As we have previously seen, the value of an option does not move inexorably along a path that follows the forward price curve. Volatility of the underlying index or property will typically dwarf in economic importance any interest that might be imputed on account of the upfront payment. In terms of economic risk and reward, an option transaction is fundamentally a bet,[62] not a financing, as taking opposing views of the market is the essence of what the parties are transacting. Under the circumstances, any attempt to impute financing treatment to the upfront option premium may be tantamount to allowing a rickety old cart pull a mighty thoroughbred horse. In other words, such a view may at once be technically accurate but economically senseless. As such, in a reasoned approach to the situation, we are best advised to obey common sense and logic rather than slavishly follow economic accrual principles wherever they may lead us.

X. A FINANCE THEORY TEST OF THE "OPTIONS AS FINANCING" THESIS

In light of the foregoing analysis, and perhaps as a test of its validity, there is surely some virtue in trying to reconcile the tax profession's traditional understanding of option economics with the

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[60] If current law were ever modified to require that the implicit financing in prepaid forwards be given full force and effect for tax purposes, then by extension, deep-in-the-money options should merit equivalent financing treatment for tax purposes. Liss, *supra* note 32.

[61] A recent bill, H.R. 4912, introduced in December 2007 by Congressman Richard Neal, would require holders of prepaid forward contracts, but not issuers, to include an amount equal to the "interest accrual amount" in taxable income each year, treating it as interest income. H.R. 4912, 110th Cong. (2007). That same month, the Service issued Notice 2008-2 soliciting comments from taxpayers on whether parties to prepaid forward contracts should be required to accrue income or expense during the term of the contract. I.R.S. Notice 2008-2, 2008-2 I.R.B. 252.

[62] For a more complete discussion of the analogy of an option to a bet or wager, and the implications for tax policy, see Liss, *supra* note 32.

conclusions reached by other leading academic disciplines, especially those in which accurately gauging option economics is a matter of commercial necessity.[63] Given the widespread acceptance of options valuation methodologies in the financial sector, tax professionals might profitably draw on some fundamental insights into options that have been developed by modern finance theory to see what these relationships reveal about the fundamental nature of options for purposes of tax analysis.

In order to bring the lessons of the finance discipline into play for purposes of this analysis, it is necessary to engage in a brief discourse on basic finance theory. Modern finance theory long ago demystified the true essence of option transactions by positing exact transactional equivalences between a call option on stock, on the one hand, and a portfolio of related financial products, including a "mirror image" put option.[64] The critical insight behind modern finance theory, propagated by Fischer Black and Myron Scholes,[65] is that mirror image put and call options bear a fundamental relationship allowing each one to be restated in terms of the other and certain related investments, assuming the presence of active trading and the absence of significant transaction costs. These relationships serve as the foundation of modern finance theory as well as option valuation methodologies.[66]

The underlying premise of options valuation models is that it is possible to mathematically derive the value of an option by constructing a synthetic option, consisting of a portfolio of equivalent value consisting of some combination of borrowing money and the

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[63] Professor Warren was among the first to recognize that the treatment of options as loans is untenable under modern finance theory. *See* Alvin C. Warren, Jr., Commentary, *Financial Contract Innovation and Income Tax Policy*, 107 HARV. L. REV. 460 (1993).

[64] I have coined the term "mirror image options" to refer to put and call options relating to the same underlying property and bearing the same expiration date and strike price.

[65] Fischer Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 J. POL. ECON. 637 (1973).

[66] The price of a derivative asset must relate to the price of the underlying one. Options valuation involves valuing one asset, namely the option, by reference to the value of another underlying asset. For example, the payout on a call option on a common stock is determined solely by the value of the underlying stock. It consists of the excess, if any, of the closing asset price over the strike price of the call if exercised. Since the payout on a call option on a stock depends on the stock price, the price of the call must be a function of the stock price.

purchase of varying amounts of the underlying property.[67] Options valuation, in short, is premised upon the ability to create a perfectly hedged position consisting of a call option on the one hand, and a portfolio consisting of a long position in an underlying stock combined with a borrowing. As long as it is possible to ascertain the precise makeup of what would constitute an equivalent portfolio, it should be possible to value it, and in the process of doing so, to indirectly derive the value of the equivalent option.[68]

The basic financial theorem known as the put-call parity theorem holds that the value of a call option with a specific exercise price and exercise date can be derived from the value of a mirror image put option, the price of its underlying stock, the value of the cash dividends paid by the stock, and prices of risk-free bonds.[69] In particular, this theory holds that for any given option exercise price, the purchase of a call option and a zero coupon debt instrument which earns the risk-free rate and pays an amount sufficient to yield the exercise price of the option on the exercise date is equivalent to the purchase of a put option having the same strike price and strike date together with ownership of the underlying asset. Expressed mathematically, the theorem asserts that the values of the underlying asset, a zero coupon bond, a call option, and a mirror image put option on the exercise date having these terms must bear the following relationship to one another:

$$\text{CALL} + \text{ZCB} = \text{PUT} + \text{ASSET}(0),$$

where CALL is the value of the call option, PUT is the value of the corresponding put option, ASSET(0) is the current spot price of the underlying asset, and ZCB is a zero coupon bond[70] paying the exercise price of the options on their strike date and bearing a discount rate equal to the risk-free rate.[71]

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[67] BREALEY, MYERS & ALLEN, *supra* note 51, at 589–93.

[68] COX & RUBINSTEIN, *supra* note 44, at 47 ("If we can find some dynamic stock and bond portfolio which will require no subsequent investment and will be worth exactly max[0, S(*) – K] on the expiration date, then the current value of that portfolio must be the fair market value of the call. . . . If we can duplicate a call, then we can duplicate any other type of option position as well."); MARK RUBENSTEIN, RUBENSTEIN ON DERIVATIVES (2000).

[69] HULL, *supra* note 43, § 7.4.

[70] ZCB can be further defined as ZCB = Xe (–rt), where X is the strike price, e is the mathematical constant 2.71828 that is used for continuous compounding, r is the risk-free annual interest rate, and T is the duration in years. Collectively, Xe (–rt) represents the issue price of a zero coupon bond bearing interest at the risk-free rate.

[71] If the effect of price fluctuations in the underlying stock is neutralized, the

This equation furnishes the basis for concluding that it is possible to replicate a risk-free investment using stock and call options by purchasing some amount of the stock and selling off some amount of call options, such that the net value of the combined positions after a specified period of time would be the same regardless of any fluctuations in the stock price.[72] In other words, holding a call option and a zero coupon bond in an amount sufficient to generate the cash needed to exercise the call option is equivalent to holding the stock along with a right to sell the stock. On the exercise date, the investor is assured of having funds equal to either the exercise price or the value of the stock on that date, whichever is greater.[73]

The ultimate significance of this formula, for purposes of our analysis of options, is that it makes it possible to isolate the economic elements of an option by rearranging the terms of the equation.[74] We

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portfolio becomes risk-free, which means that it should have the same present value as a bond maturing on the strike date with the same value as the portfolio on that date.

[72] Proof of these equivalencies depends on arbitrage principles. If the value of one side of the equation were greater than the other, active trading would quickly drive the two sides back into balance, as arbitrageurs would have an incentive to sell the more expensive position while contemporaneously buying the cheaper position, thereby locking in risk-free profits to the extent of any such differential. In short, the prospect of arbitrage opportunities keeps the relationship in balance. HULL, *supra* note 43, at 212–14.

[73] If the asset has appreciated over and above the strike price as of the exercise date, the owner of the instruments on the right-hand side of the equation will own the underlying asset and a worthless put option, and the owner of the instruments on the left side of the equation will have a bond whose proceeds should yield the strike price of the call option. If the asset declines in value and is worth less than the exercise price, the owner of the instruments on the right-hand side will have an incentive to exercise the put option which should yield cash proceeds equal to the face amount of the bond (to go along with a worthless call option).

[74] The equation can be rearranged to yield an algebraic equivalence for each of the other individual components. For example, the theorem can be expressed algebraically as follows

$$ZCB = ASSET(0) + PUT - CALL$$

where ZCB is a zero coupon bond, ASSET(0) is stock (or another asset), PUT is a put option with respect to that stock, and CALL is a call on the stock, each option having identical strike prices and exercise dates. The minus sign indicates a sale.

By rearranging the equation further, it becomes evident that owning an asset is equivalent to holding a risk-free right to receive a certain amount *(K)* on a certain date in the future, buying a call on the asset with a strike price of *K* on the same date, and writing a put for *K* on the same date:

$$ASSET(0) = ZCB[k] + CALL[k] - PUT[k].$$

can readily define a call option by expressing the relationship in the following manner:

$$CALL = PUT + ASSET(0) - ZCB.$$

This equation, which is the basis for option valuation models, asserts that the purchase of a call option is equivalent to the purchase of a mirror image put option and the underlying asset, and the sale[75] of a zero coupon bond whose payment at maturity is the exercise price of the put and call options.[76]

The portfolio investment on the right hand side of the equation should have downside price protection akin to a call option since the minimum value of the asset always covers the debt obligation and has unlimited upside potential insofar as the value of the asset exceeds the fixed amount of the debt. In short, this equation tells us that there is some ideal combination of debt and the underlying property (stock) that should exactly replicate a call option. Any profit or loss on the call option should be completely matched by the profit or loss on the tandem consisting of a long position in the underlying asset and a borrowing.

What this equation shows, in short, is that it is possible to construct a synthetic call option by combining a borrowing with the purchase of some quantity of the underlying asset. At any given moment,[77] there is some combination of borrowing plus stock ownership that is equivalent in outcome to owning a call option. What implications do options valuation methodologies have for purposes of understanding the taxation of options?

To the extent that the put-call parity relationship posits that a call option is economically equivalent to the forward purchase of some quantity of the underlying asset coupled with borrowing, it undermines the notion that a call option holder is lending an amount equal to the option premium to the writer. In that respect, it poses a theoretical challenge to the treatment of a call option premium as a financing that requires the economic accrual of interest. If finance

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In that respect, the positions on the right-hand side of this relationship comprise a synthetic commodity, since they should in all events have in the aggregate the same return.

[75] For purposes of this equation, subtraction of an asset is tantamount to selling it.

[76] Selling a bond is economically equivalent to borrowing money.

[77] The stated equivalencies are fleeting, which is why construction of a synthetic option is sometimes called dynamic hedging, as the positions will have to be changed over time.

theory holds that an option can be replicated by a series of investments in the underlying property partly financed by borrowing, one can infer from these equivalencies that the option holder economically stands in the position of a borrower — just the opposite of the position traditionally taken by leading tax commentators. In short, the conventional tax analysis does not hold up to the scrutiny of modern finance theory, at least in the context of call options.

Interestingly, it is equally possible to rearrange the terms of the equation to derive corresponding relationships for put options. Thus,

$$\text{PUT} = \text{CALL} - \text{ASSET}(0) + \text{ZCB}.$$

This equation asserts that the purchase of a put option is equivalent to the purchase of a call option with the same strike price and strike date, a sale of the asset, and the purchase of a zero coupon bond whose payment at maturity is the strike price of the put and call. Since the purchase of a zero coupon bond is equivalent to lending the principal amount of the bond, with interest and principal payable at maturity, a put option is equivalent to a portfolio combining a short position in the stock with lending an amount greater than the value of the short sale.[78]

In light of the equivalencies established by the put-call parity theorem, it is possible to analyze the sale of a put option as the disposition of a portion of the underlying property together with a financing transaction. Thus, in contrast with a call option, the purchaser of the put option constructively sells a portion of the underlying property and acts in the capacity of a lender. Insofar as buying a put option is equivalent to taking a short position in the underlying asset while lending the proceeds of the sale, a put option holder may properly be viewed, economically, as financing the option writer. In this respect, ironically, the put-call theorem actually supports the conventional wisdom concerning options, which generally treats the option holder as making an implied financing of the option writer. The amount of the implicit financing suggested by the put-call theorem, however, is not limited to the amount of the option premium; it encompasses as well the entire value of the underlying property.[79] For that reason, assessing an imputed interest

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[78] "The total amount loaned can be divided into two parts: an amount equal to the value of the stock sold short and an amount equal to the value of the put." COX & RUBINSTEIN, *supra* note 44, at 51.

[79] From the option writer's perspective, writing a put option is equivalent to buying the stock by borrowing its entire value, and then borrowing some more. The amount of this additional borrowing is equal to the value of the put. *Id.*

charge with respect to a put option premium would not truly capture the economics of put options, since the option premium represents only a small portion of the overall financing element inherent in put option writing.

XI. CORRELATION EFFECTS FROM THE PUT-CALL THEOREM

The put-call parity equations are also useful for demonstrating that the value of a call option is positively correlated with, inter alia, current asset prices, time to expiration, volatility of the underlying asset, and the risk-free interest rate. Of particular interest here is confirmation that, with respect to call options, the price of the option always increases along with interest rates. In contrast, the value of a loan tends to decline as interest rates increase. The fact that option values are positively correlated with interest rates is at odds with the conventional portrayal of options as loans from the option holder to the option writer. If the option holder were truly the financing party, one would have expected the holder's returns to be inversely correlated with interest rates.

The relationship between option values and interest rates makes sense intuitively because a call option holder has effectively locked in the price to be paid for the underlying asset, at the time the option is acquired, while the option holder is only required to pay a relatively small amount of the total purchase price in advance. The deferred payment obligation entailed by the exercise price is obviously more valuable the higher the prevailing interest rates and the longer the time to expiration. As interest rates increase, the present value of the exercise price declines, making the option relatively more valuable. For that reason, it makes sense that the value of a call option should increase along with both the rate of interest and the time to expiration. In effect, a higher interest rate has the same effect on valuation as a lower exercise price. In short, higher interest rates tend to imply higher call option values.[80]

Similarly, it is evident from the formula that the value of a put option is positively correlated with the exercise price, the time to expiration, volatility of the underlying asset, and any increase in income from the underlying asset, and is inversely correlated with current prices for the underlying asset and increases in the risk-free interest rate. That means that, other things being equal, put options

[80] BREALEY, MYERS & ALLEN, *supra* note 51, at 576–81; COX & RUBINSTEIN, *supra* note 44, at 35.

should be more valuable the lower the asset price, the higher the strike price, and the lower the interest rate — the opposite of a call option. It seems intuitively correct that rising interest rates should be inversely related to the value of put options because rising interest rates reduce the present value of any future cash flows to be paid to the option holder. In addition, the increased rate tends to put upward pressure on the price of the underlying asset. These relationships reinforce the notion that put options do in fact implicate implied loans from the option holder to the option writer, consistent with our earlier analysis.

The aforementioned relationships, brought to light by the put-call theorem, also help explain why options are highly leveraged instruments, in the sense that for a given investment, the use of options magnifies the financial consequences. An investor needs to put up only a small portion of the total value of the underlying property, in the form of an option premium, when initiating a position.[81] On that basis, options allow a trader to control a large quantity of the underlying commodity or other property by only paying the premium for the options. In that respect, entering into an option to purchase is economically analogous to acquiring property on a leveraged basis, with the option premium functionally resembling a down payment.[82]

A call option holder effectively locks in the price to be paid for the underlying asset as soon as the option is written, and the option holder generally pays only a relatively small percentage of the total purchase price in advance. Accordingly, parties transacting on these terms are essentially betting on whether the underlying property will outperform the risk-free rate.[83] The option holder makes money if the

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[81] When engaging in naked option writing, sellers must put up margin similar to the requirement for futures contracts.

[82] HULL, *supra* note 43, at 212–14. To illustrate how leverage magnifies the return on an option, suppose that natural gas is trading at $5.00 MMBtu six months forward, and that a trader pays $0.16 for ten of the $5.10 calls for a total cost of $16,000 (i.e., 10 x 10,000 MMBtu x $0.16 = $16,000). If natural gas is trading $5.50 at expiration, and the trader sells them for a profit of $0.40 (instead of exercising the calls), the trader will realize total proceeds of $40,000. The net profit of $24,000 represents a 150% return on the trade at a time when futures prices increased less than 8%, which is indicative of the substantial degree of leverage inherent in an option. The option strategy represents only a $16,000 investment of capital, but allows him to control $500,000 worth of the underlying property.

[83] An option that is priced at-the-money at the time of grant should in principle have an exercise price that is equal to the forward price (assuming the availability of forward pricing data). The forward price is essentially the currently prevailing price

underlying property is worth more than this amount on the exercise date, and the writer makes money if the property is worth less. Forward prices typically carry a premium over the current spot market price because the putative buyer (the "long") is deriving the economic return on the underlying property from the date of contracting, but does not have to pay the exercise price until the date of exercise. In effect, the party with the long position is borrowing the exercise price from the counterparty (called the "short") and must pay interest in the form of a premium above the spot market price.

Leading treatises on corporate finance leave little doubt as to which party is truly the financing party in the context of an option transaction. Brealey, Myers, and Allen, for example, literally describe investors who acquire property by way of a call option as buying on "credit," because "they pay the purchase price of the option today, but they do not pay the exercise price until they actually take up the option."[84] Applying deferred payment sales principles to an option, it appears that the option writer is furnishing credit to the option holder, not the other way around. In short, the loan runs in the reverse direction relative to what is commonly assumed to take place in the course of an option transaction.[85] This observation is consistent with the put-call theorem, which holds that call option writing is equivalent to taking a short position in the stock combined with lending the proceeds, except that the total amount of lending is less than the value of the stock sold short (the difference being the value of the call).[86]

XII. CONCLUSION

Much of the academic literature on options taxation simply accepts the premise that there is a hidden financing component in option premiums as revealed truth. As such, the historical tax treatment of options has frequently been taken to task, amidst laments about how the tax law fails to accurately capture the true essence of these transactions by not paying due regard for the

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for transactions that are not scheduled for delivery until the exercise date. It is derived from the current price of the underlying property, increased by an amount that is based on the risk-free return. Assuming, for example, a spot market price of $100, and a risk-free rate of 4%, the two-year forward price would be $108.16.

[84] BREALEY, MYERS & ALLEN, *supra* note 51, at 578.

[85] Of course, such a "loan" would not qualify as bona fide indebtedness for tax purposes, because unless the option is exercised, the option holder has no obligation to pay the exercise price. Because the holder is free to allow the option to lapse, he is not indebted to the writer in any way prior to the time of exercise.

[86] HULL, *supra* note 43, at 212–14.

presumed embedded financing. This assessment has inspired a virtual cottage industry of proposals on how to fix what is widely regarded as a broken system relating to the taxation of financial products generally. In contrast, this article undertakes to explore the heretofore unexamined contours of option contracts to determine whether the financing hypothesis can really withstand a rigorous legal, economic, and financial analysis. In the final analysis, it concludes that it does not.

Wholly apart from the conceptual failings of the conventional financing approach, there are also good policy reasons for not imputing interest on option premiums. The vast majority of options transactions are relatively short-dated and are not tax-driven transactions. Moreover, an implicit financing analysis has the potential to create character mismatches, because the parties to the option would be required to account for the implied financing as ordinary income or expense, whereas the ultimate settlement of the option may give rise to capital gain or loss if the underlying property is capital in nature. Taxing option holders on deemed borrowings and allowing interest deductions for option writers would also have adverse collateral consequences, such as potentially giving rise to withholding tax issues whenever options are held by non-U.S. persons. Such a rule could conceivably give rise to advantageous cross-border arbitrage opportunities since other jurisdictions lack a similar rule.[87]

Ultimately, however, the best reason for not accounting for options as a disguised financing is the fact that it reflects a flawed understanding of option economics. The principal fallacy in the traditional assessment of options is the assumption that option premiums are paid prematurely. In fact, they are not. Not only do commercial norms belie traditional assumptions about the proper time for paying option premiums, there is in fact a substantial economic basis for requiring option premiums to be paid at the time of the option grant, which goes beyond mitigation of credit risk. Most notably, the option writer confers value upon the option holder, in the form of the option privilege, as of the time of grant, since option contracts by their nature are unevenly balanced between the two sides. On that basis, an upfront payment of the premium is fully warranted, economically, and any delay in payment beyond that date necessarily implicates a financing from the option writer to the option holder.

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[87] David Miller, *Taxpayers' Ability to Avoid Tax Ownership: Current Law and Future Prospects*, 61 TAX LAW. 795 (1998).

In addition, accepted notions of an implied financing running from the option holder to the writer are at odds with the traditional tax view of indebtedness as implicating a substantial likelihood of repayment of principal. In contrast, option holders, whose payment of option premiums is often likened to an advance of funds, bear a substantial risk of losing their entire investment. Alternatively, insofar as option holders may be viewed as paying premiums as the initial installment on an installment purchase of property, the implicit financing runs in the opposite direction from what is commonly supposed to occur in an option transaction, as it appears as if the option writer is financing the option holder.

Modern financial theory has identified certain transactional equivalencies that allow certain types of instruments, including options, to be reconstructed using dynamic combinations of other financial instruments. The Black-Scholes option pricing model, which is used to value call options, is premised on the equivalence between owning a call option, on the one hand, and borrowing and buying a certain amount of the underlying asset. The assumptions implicit in the famous Black-Scholes model of options valuation, however, do not support, and in fact, actually undermine, the premise that there is a hidden loan component in every option transaction which calls for an upfront payment. If modern financial practice treats a call option as a synthetic loan from the writer to the option holder, then it seems past time to inquire into the logic that would allow the tax law to treat the transaction as implicating a borrowing running in the opposite direction.

The point of this analytical exercise is not to argue in favor of literally treating an option in accordance with its transactional equivalents under modern finance theory, as some commentators have argued.[88] Rather, the point is that options transactions should be taxed in a manner that at least is consistent with their underlying economics. The primary utility of the put-call parity theorem lies in its capacity to fully expose the underlying economics inherent in a call option. The consequences of doing so are to confirm what already appears evident in evaluating options from a contractual and legal

[88] David Hasen, for example, argues that some form of mark-to-market taxation is necessary for options because the Black-Scholes model of dynamic hedging treats an option as equivalent to a series of on-market transactions. Hasen argues that insofar as the transactional equivalents for options are known and have a well-established tax treatment, a quasi-mark-to-market approach to options taxation has considerable merit. David M. Hasen, *A Realization-Based Approach to the Taxation of Financial Instruments*, 57 TAX L. REV. 397 (2004).

perspective, namely that options confer value upon the option holder from the time of their creation, and that option writers are effectively financing option holders, rather than the other way around. Insofar as this analysis undermines the premise that an option premium should properly be viewed as a loan to the option writer, it may be time to relegate that premise to the realm of urban tax legends. In short, the time has come for the tax profession to acknowledge a point that seems well-established to other academic disciplines, namely that a call option does not implicate a disguised financing.