Son of BOSS

ALAN L. TUCKER

ALAN L. TUCKER
is a professor of finance at Lubin School of Business, Pace University, in New York, NY.
atucker@pace.edu

A detailed description and analysis of the largest tax shelter ever utilized by individual U.S. taxpayers is provided, including a demonstration of how exotic foreign exchange options were instrumental in the manufacturing of the capital losses sought. This shelter, known as Son of Boss, represented an amalgamation of elements of partnership tax law, exotic currency options trading, and other legal and financial factors. The two keys to unlocking the tax treatment sought were the manufacturing of the appearance of contingent liability for the taxpayer, and obviating the counter party credit risk presented by the taxpayer's short positions in the exotic currency option trades.

For many U.S. high-net-worth retail investors and technology entrepreneurs, the technology and e-commerce boom of the late 1990s occasioned substantial capital gains. And such gains in turn prompted tax professionals to develop and market to these investors and entrepreneurs strategies to minimize their capital gain taxes, in return for fee income. Of these strategies, one—deemed "Son of BOSS" by the U.S. Treasury and Internal Revenue Service (IRS)—became the largest tax shelter ever marketed to and adopted by taxable U.S. citizens.[1] The IRS estimated that this strategy and its variants were utilized by over a thousand individual taxpayers in an attempt to collectively shelter over USD4 billion in capital gains during the late 1990s and very early 2000s.

The strategy's name, "Son of BOSS," was coined because the scheme was similar in design to the earlier Bond and Options Sales Strategy or BOSS tax shelter. BOSS, which was effectively shut down by the government in December 1999 through the issuance of Notice 99–59,[2] used a series of security transactions and a partnership vehicle to generate artificial tax losses. The government held that BOSS lacked economic substance and that its promoters and participants would be denied the tax treatment sought as well as be subject to possible civil and criminal penalties. Son of BOSS itself was effectively shut down a year later, in December 2000, when the IRS and Treasury issued Notice 2000–44.[3] However, litigation regarding this shelter continues today.

Key to the Son of BOSS strategy was its utilization of what was then Section 752 of the Internal Revenue Code (IRC). A technical interpretation of Section 752 permitted a partnership to assume a taxpayer's previously established positions in option trades, with long positions being treated as assets and short positions being treated as contingent liabilities. Within the partnership, the contingent liabilities were ascribed a zero value under Section 752, which in turn created for the taxpayer an artificially high basis in the partnership. A latent paper capital loss was thus created and eventually realized by the taxpayer upon the sale of his partnership's interest at nominal value or upon depreciation of the distributed

partnership assets at the expiration of the options and consequent dissolution of the partnership. This capital loss was used to offset the taxpayer's real capital gains for federal income tax purposes.

Here is an overly simplified version of the strategy: A taxpayer simultaneously buys plain vanilla calls and writes, for all intents and purposes, identical calls on some foreign currency (commonly either the euro or yen).[4] Ignore bid–offer spreads and other transactions costs. Also, assume that there is no credit risk. The long calls are contributed to a partnership as assets worth C. The short calls are also contributed to the same partnership, but are not treated as liabilities of C (or nearly C).[5] Instead, under Section 752 the short calls are treated as contingent liabilities and are ascribed a zero value.[6] Thus the taxpayer's basis in the partnership is C. Eventually, when the option positions expire (at time T), the long calls are worth $+\text{MAX}[0,S(T) - X]$ and the short calls are worth, for all intents and purposes, $-\text{MAX}[0,S(T) - X]$, where $S(T)$ is the options' underlying exchange rate at option maturity and X is the options' strike price. All of the calls will expire either in- or out-of-the-money. In either case, however, the assets and liabilities wash, thus ensuring that the taxpayer's basis is reduced from C to zero, for a loss of C. Again, the taxpayer either sells his interest in the partnership for a nominal value (zero here) or the partnership is dissolved. This loss of C is a capital loss (for reasons to be discussed momentarily), and is "transferred" to the taxpayer who uses the loss to offset a real gain of C for federal income tax purposes. The taxpayer's economic windfall is approximately $(C \times TR)$, less the fees paid to various parties, where TR is the taxpayer's relevant capital gains tax rate.[7] The various parties include the sponsor who markets the strategy to the taxpayer, a law firm that pens an opinion letter as to the sustainability of the tax treatment sought (an exercise that would presumably safeguard the taxpayer from penalty in the event that the strategy was not upheld by the IRS), and the investment bank/broker-dealer who serves as the counterparty on the derivative transactions, among others.

In the Son of BOSS strategy the "transfer" of the manufactured capital loss to the taxpayer was itself a bit of ingenious financial engineering. The taxpayer first formed a single-member limited liability company (LLC) before buying and writing the options. It was the LLC that became a partner in the aforementioned newly created general partnership vehicle. An S corporation was then created. The LLC contributed its interest in the general partnership to the S corporation in exchange for stock. The partnership terminated, the options expired, the S corporation's assets were then sold (technically the triggering event that occasioned the capital loss), and the loss passed to the investor, i.e., the stock was deemed worthless.[8]

The simplified strategy just described clearly presents no economic substance to the taxpayer; it constitutes an obvious wash sale and it would be anticipated that the sought-after tax consequences might not be upheld.[9] So in real Son of BOSS deals, exotic currency options were used, in part to present the appearance of economic substance when little or none existed and in part because of what was known as a "Section 98 transaction." The use of exotic options in general made it more difficult for regulators to reverse-engineer the transactions into their base components and in turn unmask their lack of economic substance. The use of exotic options traded on currency per se made even short-term holding periods (less than one year) qualify as capital (rather than ordinary) income under then Section 98 of the IRC. In other words, the use of currency options in the Son of BOSS strategy permitted the entire strategy to be established and brought to its fruition within a matter of weeks, and yet still produced a paper *capital* loss.[10] Short-term functionality of the strategy was important for taxpayers who faced an impending tax deadline.

Thus the trading exotic currency options were paramount to the execution of the Son of BOSS shelter. Options, rather than cash market or other derivative securities, were needed in order to meet the contingent liability litmus test of then Section 752, which in turn facilitated the taxpayer's artificially high basis in the partnership vehicle, occasioning the paper loss sought. Currency options were the preferred option because, under Section 98, they produced a paper capital gain, rather than ordinary, even over short time periods. And, as explained more below, exotic currency options per se were favored because of their opaque nature, presumably making it more difficult for the taxing authorities to "drill down" to the true economic substance (or lack thereof) of the transactions undertaken. In addition, the use of options permitted a leveraging effect whereby trades that produced only limited real gains or losses could manufacture relatively huge paper losses.

The purpose of this article is to impart the Son of BOSS strategy in a detailed manner, examining the shelter through a mostly financial lens. This exercise should be

of interest to numerous audiences including tax strategists and attorneys, financial engineers, derivatives traders, business law and finance students, and others. It should be of particular appeal to those interested in global financial markets and products due to the key role that currency options played in the strategy.

The article presents a real Son of BOSS trade where the identities of the taxpayer and other parties have been redacted and then provides some alternative deal structures; these impart just some of the many ways in which the appearance of liability and, in turn, capital loss, could be manufactured. Finally, the article briefly discusses the disposition of these tax deals and concludes.

A SON OF BOSS DEAL

This section describes a real Son of BOSS transaction, focusing on a set of three exotic currency option transactions undertaken between the taxpayer (technically, his LLC) and the option dealer.[11]

Exotic Currency Option Transactions

On or about November 1, 1999, the taxpayer purchased from a broker–dealer (BD) a European-style single knock-in digital call option for a price of USD15,179,873. Let this be Option A. This call had a very low strike price of USD0.50 per EUR and a knock-in barrier price of USD1.1190 per EUR. The call provided the taxpayer the right to purchase EUR121,500,000 in exchange for USD60,750,000, on or about October 31, 2000.[12] Thus the call had an approximately 12-month maturity. The call provided the taxpayer with the aforementioned right if the USD price of the EUR hit or exceeded the aforementioned barrier price during the option's life. If the barrier price were not achieved during the 12-month life of the option, then the option would be worthless as it would never be knocked-in.[13]

Also on or about November 1, 1999, the taxpayer sold to BD a European-style 12-month double knock-in digital call option for a price of USD7,552,437. Let this be Option B. This call had a strike price of USD0.5010 per EUR, and the following two barrier prices: USD1.1190 (upper barrier) and USD1.0000 (lower barrier). The call provided BD the right to purchase EUR 121,500,000 in exchange for USD60,870,000, on or about October 31, 2000.[14] BD's right was contingent on the USD/EUR hitting or exceeding/breaching both barrier prices during the life of the option. If both barriers were not achieved during the 12-month life of the option, then the option expired worthless.

Also on or about November 1, 1999, the taxpayer sold to BD a European-style 12-month knock-in/knock-out digital call option for a price of USD7,552,437.[15] Let this be Option C. This call had a strike price of USD0.5010 per EUR, a knock-in barrier price of USD1.1190, and a knock out barrier price of USD1.0000. The call provided BD the right to purchase EUR 121,500,000 in exchange for USD60,870,000 on or about October 31, 2000.[16] BD's right was contingent on 1) the USD/EUR hitting or exceeding the knock-in barrier price during the life of the option and 2) the USD/EUR not hitting or breaching the knock out barrier price during the life of the option.

Stepping the Trades Together

Viewed separately, each of the three trades appears to present economic substance. Options B and C appear to present substantial potential liability to the taxpayer. Collectively, however, the set of three option transactions described above can be stepped together[17] to create the following very simple contract, economically speaking: The taxpayer paid BD USD75,000 upfront and in return the taxpayer receives (in one year) from BD USD120,000 if the USD/EUR hits or exceeds USD1.1190 during the 12-month period, else the taxpayer receives nothing.[18] Call this fictitious option, Option D. Either way, the taxpayer owed nothing to BD. Thus the taxpayer did not have an economic liability—contingent or otherwise—to contribute to the partnership vehicle.

There are four possible economic scenarios with respect to the barriers here. (In no particular order) the first scenario is that the USD1.1190 barrier is achieved while the USD1.0000 barrier is not achieved. In this case Options A and C would be exercised while Option B would expire worthless. The taxpayer would buy EUR121,500,000 for USD60,750,000, and BD would buy EUR121,000,000 back for USD60,870,000; thus the taxpayer would receive USD120,000. The second scenario is that the USD1.1190 barrier and the USD1.0000 barrier are both achieved. Here Options A and B would be exercised, while Option C would expire worthless. The outcome here is the same as that in the first scenario: the taxpayer would receive USD120,000 at option expiration. The third scenario is that the

USD1.1190 barrier is not achieved, while the USD1.0000 is hit or breached. In this case all three options expire worthless. The fourth scenario is that neither barrier is achieved, in which case all three options would again expire worthless. At the end of the day, the possible outcomes described here are precisely the same as those presented by the very simple contract labeled Option D. Namely, if the barrier of USD1.1190 is achieved, then the taxpayer receives USD120,000 in one year (having paid USD75,000 at contract inception), else the taxpayer receives nothing.

If the USD/EUR reaches or exceeds 1.1190 and the taxpayer receives USD120,000 (as in scenarios one and two from above), his paper capital loss would be USD15,059,873. If all three options expire worthless (as in scenarios three and four from above), his paper capital loss is USD15,179,873. So, if the taxpayer has a 35% capital gains tax rate, his economic windfall (before all fees) would be USD15,059,873 × 35%—USD75,000 = USD5, 195, 956 in scenario one or two; or USD15, 179, 873 × 35%—USD75,000 = USD5,237,956 in scenario three or four.

In all likelihood, the ISDA (International Swaps and Derivatives Association) Master Agreements[19] relating to the three option transactions A through C made the counter parties subject to a netting agreement—because netting agreements were standard business practice in the over-the-counter derivatives industry at the time of trading (1999). Essentially, the netting agreement would permit BD to withhold its payment due to the taxpayer upon exercise of the taxpayer's call should the taxpayer fail to make its payments due to BD upon BD's exercise of BD's calls. This netting agreement therefore implied that, economically speaking, the taxpayer did not present a credit risk to BD. BD was immune to the potential default risk of the taxpayer. BD had no economic exposure, and ergo, the taxpayer had no economic liability. Moreover, the contractual provisions of the trades conducted here prevented the taxpayer from selling or transferring his long option position to a third party without BD's written permission.[20]

Also supporting the notion that the taxpayer did not have an economic liability is the apparent fact that the broker–dealer did not demand some sort of collateral from the taxpayer. There is no evidence of a collateral/security agreement accompanying the trades. An investment bank presumably would never permit itself to be exposed to the credit risk presented by a retail-like trader (the non-credit-rated taxpayer in this case). The apparent fact that BD did not require a collateral/security agreement speaks volumes; it effectively states that BD did not believe that it had an economic exposure to the taxpayer, and therefore, the taxpayer did not have an economic liability—contingent or otherwise. If the taxpayer's long and short positions could be de-coupled without BD's authorization, then BD would have 1) required the taxpayer to pay for his long call (Option A), thus requiring the taxpayer to come up with over $15 million; 2) required the taxpayer to deposit into a margin account the proceeds from his two short call positions; and 3) required the taxpayer to post substantial additional capital to accommodate the possibility that BD's long call positions could increase in value over time. Had this set of three option trades been truly separate transactions, then the taxpayer would have required well over $20 million in capital in order to assume his trading positions.

Further supporting the argument that the taxpayer did not have a liability is the fact that the set of three option trades could have been readily collapsed into a single option trade wherein the taxpayer held the long position and thus owned an asset. Specifically, the taxpayer could have purchased (for USD75,000) a 12-month, European-style single knock-in digital call option having a barrier price of USD1.1190. This call would have a payoff of USD120,000 that could be captured by the taxpayer (at expiration) if the barrier was achieved during the year. This is a very simple trade that the broker–dealer in this case (or any of its competitors) could have readily accommodated. Such path-dependent barrier options have existed for about 20 years. This single trade is economically equivalent to Option D described previously. And this single trade strictly represents an asset to the taxpayer. Following best practices as they relate to derivative sales, an investment bank normally would educate the counterparty as to how a simpler trade could be executed—one that would step together three interdependent trades and, in all likelihood, lower the counterparty's trading costs. One dealer spread is better than three for the client.

Yet further supporting the argument that the taxpayer did not have a liability is the fact that the set of three options could have been re-characterized and executed as a single knock-in digital swap transaction. Call this Swap A. In one leg of this 12-month swap, the taxpayer would pay BD USD75,000 on or about November 1, 1999 (swap inception). And in the other leg, BD would make a contingent payment to the taxpayer. Specifically, BD would pay (at swap expiration) nothing if the barrier price of USD1.1190 were never hit over the 12-month life of the

digital swap; otherwise BD would pay (at swap expiration) USD120,000 (the barrier having been hit). Either way, the taxpayer never owes money to BD (once the initial USD75,000 was paid). Swap A strictly represents an asset to the taxpayer.[21]

Trade Size, Strike Price, and Option Price

Options A through C entailed a highly unusual number of euros. Ignoring (for now) any other related fees expended by the taxpayer, as well as ignoring forgone interest income, the taxpayer is in the following economic position: The taxpayer makes USD45,000 if the exchange rate hits or exceeds USD1.1190 over the next year. Since the exchange rate was USD1.0494 on November 1, 1999,[22] the taxpayer appears to hold a bullish view on the exchange rate, that is, a rising exchange rate or, equivalently, a depreciation of the dollar vis-à-vis the euro. A common trade to exploit such a view is to simply purchase a single knock-in call option. Suppose that the taxpayer purchased a one-year European-style single knock-in call with a strike price of USD1.0500,[23] and a barrier price of USD1.1190. Assuming that, at the time, the volatility of the USD/EUR was 10.7%, the one-year USD LIBOR was 6.00%, and the one-year EUR LIBOR was 5%,[24] then the price of this single knock-in option would be about USD0.0480 per EUR, inclusive of the dealer's fee.[25] If the exchange rate did reach USD1.1190 during the one-year life of the option, then, at that moment 1) the option would be knocked-in; 2) the option's intrinsic value would be USD0.0690 (the difference between the spot rate of USD1.1190 and the strike price of USD1.0500); and 3) the taxpayer could readily sell the option into a liquid secondary market for at least the intrinsic value of USD0.0690, and perhaps much more depending on the remaining maturity of the option.[26] This minimum selling price would occasion a profit of at least USD0.0210 per EUR—the difference between the minimum selling price/intrinsic value of USD0.0690 and the option cost of USD0.0480. In turn, this profit of at least USD0.0210 per EUR would occasion a profit of at least USD45,000—which is the same dollar profit (absent any other fees and ignoring forgone interest income) from the set of three options actually transacted—if the single knock-in option entailed just EUR2,142,875: USD0.0210 × 2,142,875 = USD45,000. Importantly, note that this contract size, approximately 2.14 million euros, is radically lower than the size of the three options actually transacted by the taxpayer. Collectively, Options A through C entailed EUR364,500,000, or more than *170 times* the size of the lone single knock-in option just described. And this lone single knock-in option, which entails fewer euros, offers greater profit potential (per Note 25). Each of the three options traded individually entailed nearly 57 times more euros than this single knock-in option. The actual options transacted entailed unusually large amounts of foreign currency in light of their profit potential.

Why? The answer is obvious: The actual options entailed such large amounts of euros in order to ensure that the taxpayer's short call positions were collectively priced at over USD15 million. Once these positions were contributed to the partnership entity, and ascribed a zero value under IRC Section 752, the Son of BOSS strategy would eventually produce a greater than USD15 million paper capital loss for the taxpayer.

Options A–C also exhibited highly unusual strike prices. The strikes were all about USD0.5000 when the spot rate at contract inception was about USD1.0500. Using deep in-the-money options was another way in which the taxpayer could inflate the price of the short calls in order to achieve the targeted capital loss. Buying Option A with its unusual strike price (USD0.5000) and size (EUR121,500,000) permitted the taxpayer to sell Options B and C for an aggregate premium of USD15,104,874, which in turn occasioned the appearance of substantial liability for the taxpayer.

A puzzling aspect of the trades was the fact that Options B and C exhibited the same price. An option's price is obtained by discounting its expected payoff. The discount factor for Options B and C is the same. Hence their prices could only be the same if their expected payoffs were identical (ignoring dealer fees). However, the payoff distributions of these two options did not overlap. The lower barrier (USD1.0000) that needed to be touched in order to produce a payoff for the double knock-in (Option B) was the same barrier that if touched would knock out Option C. Thus the two options' expected payoffs could not be the same. And yet these options had identical recorded prices.

Taxpayer's Prospects for Profit

A common litmus test for economic substance is whether or not the taxpayer has a reasonable prospect of profit absent tax considerations. To address this matter, utilize the following parameter values:[27]

USD/EUR Spot Rate:	1.0494
USD One-Year Interest Rate:	6.00%
EUR One-Year Interest Rate:	5.00%
USD/EUR Volatility:	10.7%

The interest rates are annual rates with continuous compounding. A volatility figure represents the standard deviation of the continuously compounded annual percentage change in the relevant exchange rate.

One relevant measure is the probability (prospectively speaking) of the exchange rate hitting or exceeding USD1.1190 within one year. This measure will in turn speak to the taxpayer's expected profit and return. There are several ways to quantify this probability measure. One is to compute the probability that is implied from the actual option prices. Recall that the set of three USD/EUR options could be collapsed into a single knock-in digital call option owned by taxpayer. The dealer price of this option was USD75,000. The potential payoff was USD120,000. This payoff would occur at option maturity if the barrier price of USD1.1190 were achieved during the option's life. The single knock-in digital call option price, C, is given by the present value of the following product: the payoff, P, times the probability of payoff, p. Of course, p also represents the probability of hitting or exceeding the barrier during the year. The present value interest factor is the USD interest rate of 6.00%, again expressed with continuous compounding. Thus one obtains:

$$C = e^{-rT}(P \times p) \tag{1}$$

where $T = 1$ (for one year). Thus one obtains:

$$\text{USD75,000} = e^{-(0.06)(1)}(\text{USD120,000} \times p)$$

And solving for p gives about 67%. In other words, the probability of payoff (p) implied from the actual option prices is about 67%.

Of course, the true probability of exercise (or, equivalently, hitting or exceeding the barrier of USD1.1190) ought to be lower than 67%, because the option price (USD75,000) presumably reflects a mark-up charged by BD. Comparing the option prices' implied probability $p = 67\%$ to the probabilities obtained through other methods will speak to the mark-up charged by BD.

Next compute a lower limit for p (prospectively). Multiply the USD/EUR spot rate of 1.0494 by its volatility, 0.107, to obtain a one-year "dollar vol."[28] Here the one-year dollar vol is 0.1123. One can conclude that a single standard deviation move in the USD/EUR is 0.1123 for a 12-month period. The barrier price of USD1.1190 is USD0.0696 away from the spot rate (at option inception) of USD1.0494. This 0.0696 difference is equivalent to 0.6198 12-month dollar vols: 0.0696/0.1123 = 0.6198. Based on this figure, one can compute the probability that the USD/EUR will be greater than or equal to 1.1190 *in* 12 months. This probability is $1 - N(0.6198) = 26.77\%$.[29] Since this is the probability that the exchange rate will hit or exceed the barrier *in* 12 months, the probability that the exchange rate will hit or exceed the barrier *at anytime* during the 12 months must be higher. Thus the probability p lies between about 27% and 67%.[30]

In order to obtain a more exact measure of the prospective probability of option payoff, one can simulate (numerically) how the exchange rate could evolve over the relevant time period. Two numerical approaches were used here—approaches that are consistent with the assumptions underlying the models that major banks would utilize to value the options at hand. One approach employs the binomial options pricing framework. The second approach invokes the geometric Brownian motion process. Both approaches are consistent with one another and should and, indeed do, lead to similar results. Namely, the probability of exercise, p, is, for all intents and purposes, 43.75%.[31] This probability figure lies between 27% and 67%, as expected.

The option price implied probability p is about 67%. This 67% probability is 54% greater than (or 1.54 times) the probability of 43.75% reported above. This result in turn implies that the dealer's collective mark-up on the set of three USD/EUR options was about 54%, or 18% per option contract/trade confirmation. This is a very large mark-up. The set of three options could have been collapsed into a single knock-in digital call option as described earlier (Option D), and, providing the dealer with a 5% fee—a fee that is more than standard for an over-the-counter derivative of this ilk at the time of trading— this digital call option's price should have been at most USD53,400: USD120,000 × 0.45 × e^(–0.06 × 1) × 1.05. Instead, the dealer price was about 40% greater at USD75,000. In other words, the taxpayer could have obtained the same, economically equivalent contract from a competing dealer at a substantially reduced price.[32]

The expected profit to the taxpayer, prospectively speaking and absent tax considerations, is given by the sum of the products of the two possible outcomes times their respective probabilities of occurrence, less the fees. That is:

USD1.1190 Barrier Hit: 0.4375 × USD120,000 = USD52,500
USD1.1190 Barrier Not Hit: 0.5625 × USD0 = USD0

Summing the two products above gives USD52,500, and subtracting the fees paid to BD alone (USD75,000) yields an expected profit of (USD22,500). The taxpayer's expected return was –30% per annum, based on fees paid to BD only. Of course, the expected profit and return were truly lower in light of the additional fees paid to the strategy sponsor, tax opinion law firm, and others. In addition, the taxpayer had forgone income that could have been earned over the year on his fees paid. The taxpayer had little prospect of profit after fees and absent tax considerations.[33]

ALTERNATIVE DEAL STRUCTURES

This section presents some alternative deal structures used in Son of BOSS shelters. The many variations illustrate how relatively simple it is to present the appearance of a liability when in fact no liability exists, economically speaking.

Plain Vanilla Currency Options

In this first alternative, a taxpayer has no view whatsoever on some foreign currency. Let the exchange rate be, say, USD1.0000 per share (S), with volatility, say, 20% per annum (v). Let there exist plain vanilla, European-style calls and puts traded on this currency. Let these options have a one-year maturity (T) and a strike price of USD1.0000 per share (X). The relevant domestic (r) and foreign (r_f) one-year rates of interest are both 5% continuously compounded, so the two currencies are at parity in both the spot and forward markets. The prices of the call and put are USD0.1045 and USD0.0557 per share, respectively, ignoring dealer spreads.

The following well-known formula (put-call parity) relates the call and put prices:

$$C = P + Se^{\wedge}(r - r_f) - B \qquad (2)$$

Where C is the call price, P is the put price, S is spot exchange rate, and B is the price of a pure-discount bond with face value X, maturity T, and yield-to-maturity r. In the current illustration we have:

$$\text{USD0.1045} = \text{USD0.0557} + \text{USD1}e^{\wedge}(0) - \text{USD0.9512},$$

where $B = [e^{\wedge}(-r \times T)](X) = [e^{\wedge}(-0.050 \times 1)](\text{USD1}) = \text{USD0.9512}$.

Equation 2 shows that a long call option position is equivalent to the following portfolio of securities: long the counterpart put option; long the underlying foreign currency; and short the pure discount bond. In other words, buying the call and assuming the portfolio are economically equivalent (ignoring credit risk). The two alternatives will lead to the same payoff irrespective of what happens to the exchange rate.

Now suppose that a taxpayer buys the call and shorts the portfolio; that is, he buys the call, writes the put, shorts the foreign currency, and buys the bond. Then the taxpayer is long a real call and is short a synthetic call and thus has no economic position whatsoever (ignoring credit risk). The trades are a wash. Ignoring dealer fees and credit risk, the taxpayer's overall cash flow is zero at both inception and one year hence. Suppose that the taxpayer pays a dealer say USD0.0100 per share (or 100 basis points of the exchange rate) in order to engage in these four trades. Moreover, the taxpayer "sizes" the trade to any level desired. For example, the trades involve 10 million units of foreign exchange, and so the dealer fee is USD100,000. At this point the taxpayer has no wager on the future value of the exchange rate, and yet the taxpayer "shows" two liabilities—the short put and the short currency positions. The put option's (absolute) value is USD557,000 (USD0.0557 × 10 million). The short currency position's (absolute) value is USD10 million (USD1.0000 × 10 million). The short put has the following potential liability: 10 million times the strike price of USD1.0000 (since the exchange rate could fall to zero), or USD10 million. And the short currency position has an unlimited potential liability, because the exchange rate can rise without bound. There is a USD10.557 million basis and the appearance of substantial liability. The apparent liabilities are contingent on the future rate of exchange.[34] And yet there is no economic exposure whatsoever (ignoring credit risk). Ignoring the USD100,000 dealer fee, the overall cost of the trades is zero and the overall payoff is zero.

The credit risk presented by the various transactions can be easily obviated. The taxpayer and the dealer simply agree to not separate the transactions. For example, both the taxpayer and dealer can simply deposit all of their various security positions into an escrow account in order to remedy credit risk. Or they can engage in assignment and assumption restrictions.

How is this long-real-call/short-synthetic-call strategy ostensibly imbued with economic substance? Well, in pretty much any manner one would like. For instance, suppose the pretense is to introduce a potential profit for the taxpayer if the foreign currency appreciates substantially. Then one just needs to tweak the real call option owned by the taxpayer. For instance, let the plain vanilla call option now have a "kicker" of USD0.0500 per share if the exchange rate in one year is greater than USD1.6000 per share. With this kicker the taxpayer has the prospect of a payoff of USD500,000, or five times the dealer fee paid. The taxpayer receives USD0.0500 per unit on 10 million units if the terminal exchange rate is greater than USD1.6000. This would represent a 400% per annum rate of return to the taxpayer.

However, in order for this rate of return to occur the exchange rate has to increase by at least three one-year dollar vols. The one-year dollar vol is USD1.000 × 20% or USD0.2000. The probability of the exchange rate being greater than USD1.6000 in one year (which is the same as the probability of increasing three or more one-year dollar vols) is just 0.001, or 1000-to-1 against. And so the taxpayer shows two liabilities (and yet has no downside economic exposure—price or credit risk) and shows the prospect of a 400% rate of return. But the reality is that a payoff of 5:1 (the ratio of the dollar payoff of USD500,000 to the fee paid) is remarkably low in light of the 0.1% probability of profit. And keep in mind that the dealer could readily hedge the risk of having to incur the USD500,000 payoff. The dealer could find a willing taker of this one-in-a-thousand risk (a wholly separate contract—not a transfer of any of the trades conducted with the taxpayer), if the dealer offers said taker, say, USD5000. After all, the fair price is just USD500 for assuming the risk (0.1% × USD500,000). In this way the dealer keeps USD95,000. To obviate the credit risk faced by the dealer on the new trade conducted with the third party, the dealer could engage in any number of simple means, such as requiring that the third party post as collateral a one-year Treasury bill with face value USD500,000.

Suppose instead that the pretense is for the taxpayer to profit from low volatility (a "vol play"). Here the call option's kicker would be an additional payoff of USD500,000 if the exchange rate at expiration lies above the strike but below a specified barrier price. It would be a simple task to determine where to set the barrier price in such a way that the probability of receiving the kicker is once again 0.1%. Indeed, the barrier price here must be set at USD1.0050.[35] Or, instead, let the pretense be that the taxpayer expects the foreign currency to depreciate significantly. Here one simply needs to add a USD500,000 kicker to the payoff on the long bond position (thus making it an currency-linked structured note); this kicker would be subject to the terminal price of the stock being USD0.4000 or less. And so on.[36]

Barrier Currency Options

Barrier currency options present another vehicle for facilitating Son of BOSS trades. It is a fairly straightforward exercise to demonstrate that a real call (plain vanilla and European-style) is equivalent to a long position in a down-and-out call (European-style) plus a long position in a down-and-in call (also European-style). These barrier options would have the same maturity and strike price exhibited by the plain vanilla call. If the barrier is attained the down-and-out call's life is over, but the down-and-in call's life begins, thus replacing the down-and-out. Thus the plain vanilla call and the portfolio of two barrier options are one in the same. So let the taxpayer buy the plain vanilla call and write both the down-and-out and down-and-in calls. In other words, the taxpayer is long a real call and short a synthetic call. Thus, ignoring dealer fees and credit risk, the taxpayer once again has no initial investment and no payoff. The overall position for the taxpayer is economically empty, and yet he shows two potentially unlimited, contingent liabilities (the two short barrier options). Then the taxpayer sizes the trades, pays fees to the dealer, and injects a kicker to present the appearance of a "view" on the foreign currency. But the wager's odds are low and the kicker's expected payoff is disparately small in proportion to the taxpayer's fees. The taxpayer and the dealer pledge their securities positions to an escrow account or engage in assignment and assumption restrictions so that none of the positions can be sold, transferred, or hypothecated, and the dealer lays off the price risk of the kicker with a hedge fund.

Digital Currency Options

Consider yet another Son of BOSS variant. In this structure the underlying is the USD/EUR exchange rate. It is a fairly straightforward exercise to show that a plain vanilla call is equivalent to a long position in an asset-or-nothing call and a short position in a cash-or-nothing call (whose cash payoff is the same as the strike price on the plain vanilla call). Both the asset-or-nothing call and the cash-or-nothing call are digital (or binary) options. The asset-or-nothing call pays off the value of the underlying asset at expiration, if the strike is exceeded. The cash-or-nothing call pays off a specified, fixed amount of cash at expiration, if the strike is exceeded. So the taxpayer buys the plain vanilla call, shorts the asset-or-nothing call, and buys the cash-or-nothing call. The taxpayer has a long position in a real call and a short position in an equivalent, synthetic call. The trades are sized, fees are paid to the dealer, the positions are secured against counterparty credit risk, and a low-probability kicker is added to ostensibly imbue the trades with economic substance.

Specifically, let the USD/EUR exchange rate and strike price both be 0.9000. Let all options be six months in maturity. Let the USD and EUR interest rates be 6% and 5% respectively (annual rates with continuous compounding). Let the vol be 12.5%. Let the trades entail 50 million units of currency. Let the dealer fees be USD1,000,000. Let the kicker on the long call be USD3,236,068 if the exchange rate in six months is greater than 1.03086. The price of the plain vanilla call is USD0.0331 per currency unit or USD1,655,000 for the contract. The price of the asset-or-nothing call is USD0.4741 per currency unit or USD23,705,000 for the contract. The price of the cash-or-nothing call is USD0.4410 per currency unit or USD22,050,000 for the contract. Again, the taxpayer buys the plain vanilla (with added kicker), writes the asset-or-nothing, and buys the cash-or-nothing. The basis on the liability is USD23,705,000. And yet ignoring the initial fees and any cash flow at maturity from the kicker, there is no cash flow at inception or expiration. The per annum rate of return to the taxpayer is 500% if the kicker is triggered. But the probability of receiving the kicker is just 5%.

The various trades described in this section are analogous to the actual trades conducted between the taxpayer and the broker–dealer as described earlier in this article (Options A–C). Simply put, all of these sets of trades represent what should have been a simple trade that was instead reversed-engineered into a series of more complex yet economically equivalent trades in order to present the appearance of taxpayer liability. These and other variants were used in actual Son of BOSS deals. Highly compensated personnel employed at sophisticated dealers are well schooled in such financial engineering. Indeed, just like the actual trades conducted between the taxpayer and BD could have been collapsed into a single knock-in digital option or swap that strictly represents an asset to the taxpayer, so too can the alternative trades described here be re-characterized as a digital option or digital swap. By engaging in such engineering, however, dealers can increase their fee income, facilitating the sponsor's client.

DISPOSITION OF SON OF BOSS

Beginning with *Gregory v. Helvering* [(1935) 293 U.S. 465] and continuing through *Knetsch v. United States* [(1960) 264 U.S. 361], *Rice's Toyota World v. Commission* [(4th Cir. 1985) 752 F.2d 89], *ACM Partnership v. Commissioner* [T.C. Memo 1997-115], *Salina Partnership v. Commissioner* [T.C. Memo 2000-352], and *Diversified Group, Inc. v. Daugerdas* [(2001) 139 F. Supp 2d 445, 450], among others, the courts have applied a variety of well-known tests or principles to determine whether a tax strategy is legitimate or merely a shelter.[37] IRS Notice 2000-44[38] codifies these principles as applied to Son of BOSS type transactions and states:

> *"... a loss is allowable as a deduction for federal income tax purposes only if it is bona fide and reflects actual economic consequences. An artificial loss lacking economic substance is not allowable."*

IRS Notice 2000-44 in effect shut down Son of BOSS and its close variants. Shortly thereafter the IRS offered taxpayers who used the strategy a settlement wherein taxpayers would pay their taxes owed plus penalties (usually either 10 or 20% unless taxpayers came forward, in which case they were given amnesty and penalties were often waived). Most strategy users opted to accept the settlement. Others litigated to retain the tax treatment sought, but to no avail.[39] In 2005, the IRS estimated that they had collected approximately USD3.2 billion in taxes, interest, and penalties from the 1,165 taxpayers involved in the Son of BOSS settlements. The typical taxpayer settlement was almost USD1 million, with 18 taxpayers paying over USD20 million each and

one taxpayer paying more than USD100 million.[40] In July of 2005, the IRS anticipated collecting a total of USD4 billion by the conclusion of the settlement initiative.[41] More recently, taxpayers have brought litigation against Son of BOSS sponsors, the derivative dealers, tax opinion law firms, and other parties.[42] The fallout from Son of BOSS continues today [in 2008].

Again, IRS Notice 2000-44 in effect shut down Son of BOSS and its close variants by eliminating certain provisions of Section 752. Still, perhaps the simplest and best way to have de facto shut down the shelter would have been to force the partnerships to ascribe fair (mark-to-market) values to all options—both long and short—contributed by the taxpayer. Here valuation would be consistent with FAS 133 (the principle accounting treatment applicable to derivatives, which was first adopted in January 2001) and would therefore ensure that the taxpayer's initial basis was, for all intents and purposes, zero. An alternative mechanism would have been to force the partnership to treat the long option positions contributed by the taxpayer as contingent assets and thereby force the partnership to ascribe a value to such assets that would be quite close to the value ascribed to the short options contributed; in other words, simply eliminate the puzzling asymmetry whereby short positions were treated as contingent while long positions were not.

CONCLUSION

This article provided a detailed examination (from a mostly financial perspective) of the largest-ever individual taxpayer shelter, Son of BOSS. This shelter represented an amalgamation of elements of partnership tax law, exotic currency options trading, and other legal and financial factors. The two keys to unlocking the tax treatment sought were the manufacturing of the appearance of contingent liability for the taxpayer and obviating the counterparty credit risk presented by the taxpayer's short positions in the exotic currency option trades. The latter lifted the comfort level of the option dealer by assuring that the otherwise credit-risky taxpayer presented no true liability to said dealer. Without this, the dealer would have never accommodated the sponsor's client.

Son of BOSS represents a rather remarkable exercise in financial engineering as applied to taxation, a "team sport" that necessitated the input of financial, legal, tax, and other experts. Such engineering will almost assuredly continue. The real question is whether or not it will outpace the government's efforts to change the calculus of the tax-sheltering industry.

ENDNOTES

The author thanks Stephen Figlewski and Cara Marshall for helpful comments.

[1]See Department of Treasury, *Media Release LS-831* (August 11, 2000), at http://www.treas.gov/press/releases/ls831.htm.

[2]See Note 1.

[3]See 26 CFR Part 1, at http://www.irs.gov/pub/irs-regs/td9062.pdf and http://www.irs.gov/pub/irs-utl/notice_2000–44.pdf.

[4]For example, the calls purchased and sold might differ by only one trading day in their respective maturity. Or, the calls purchased and sold might have strike prices that differ by just one "pip" (one ten-thousandths of a penny).

[5]It is highly unusual to contribute liabilities to a partnership.

[6]As opposed to cash market securities or contractual claims, e.g., forwards or swaps, it is imperative that options are used so as to ensure that the liabilities are regarded as contingent and thus qualify under Section 752.

[7]The fees paid may have been expensed for tax purposes.

[8]See Paul Braverman, "Helter Shelter," *The American Lawyer* (2003): http://www.law.com/jsp/article.jsp?id=1069170446899; and Paul Braverman, "The COBRA Uncoiled," *The American Lawyer* (2003): http://www.law.com/servlet/ContentServer?pagename=OpenMarket/Xcelerate/View&c=LawArticle&cid=1069801657674&t=LawArticle. COBRA stands for "Currency Options Bring Reward Alternatives," which is a nominal variant of the Son of BOSS strategy.

[9]Beginning with *Gregory v. Helvering* (1935) 293 U.S. 465 and continuing through *Salina Partnership v. Commissioner* T.C. Memo 2000–352, among others, there is a large body of case law which basically holds that if transactions lack economic substance, then their tax consequences will not be upheld. Of course, what constitutes economic substance is a somewhat nebulous issue. From a financial economic perspective, economic substance is commonly regarded as transactions that present the prospect of a reasonable degree of risk and reward absent tax considerations.

[10]See Bankman [1999] for more detail on Section 98 transactions.

[11]For some detailed illustrations of corporate tax sheltering transactions, see Bird and Tucker [2002]; Graham and Tucker [2006], and Tucker [2002], among others.

[12]Whether or not this exchange (and other exchanges) would have to occur is discussed more later.

[13]For determining whether or not a barrier was hit or exceeded, the exchange rate was sampled more or less continually by the calculation agent on the deal.

[14]See Note 13.

[15]Thus the net premium paid by the taxpayer to BD on all three options was USD75,000. Note that Options B and C had the same initial price. This puzzling fact is further discussed in the section called Trade Size, Strike Price, and Option Price.

[16]See Note 13.

[17]Essentially, the step transactions doctrine holds that while separate transactions in a series of related transactions (steps) may have independent economic purpose, the transactions, once stepped together, must also have economic substance absent tax consideration.

[18]One cannot discern from the trade confirmations whether the options called for physical settlement or cash settlement. Under the former, the taxpayer would have to pay USD60,750,000 in order to receive EUR 121,500,000, and BD would have to pay USD60,870,000 in order to receive EUR 121,500,000 (collectively under the three trades, and if the barrier price of USD1.1190 was achieved). But in practice the counter parties could agree that these cash flows be netted, meaning that no party would trade EUR or USD; rather, BD would simply pay the taxpayer USD120,000 in order to settle-up (effectively, cash settlement). Even if the option trades originally called for physical settlement, the contracting parties could have later amended the trade terms so as to permit cash settlement.

[19]ISDA Master Agreements contain the legalese relating to most over-the-counter derivative transactions.

[20]In other words, the taxpayer was subject to an assignment and assumption restriction.

[21]By embedding a digital option into an otherwise plain vanilla swap, digital swaps are readily created. The large banks/broker-dealers have been making markets in digital swaps for many years.

[22]According to the Federal Reserve Bank of New York (FRBNY).

[23]Such an option is struck "spot at-the-money," meaning that the strike price and spot exchange rate are approximately equivalent.

[24]LIBOR rates represent the interest rate input commonly used when pricing currency options. The LIBOR and volatility figures presented here comport with actual data at the time of trade.

[25]Any number of standard option pricing software programs would ascribe a value to this option of about USD0.0458 per EUR, absent the dealer's fee.

[26]Unlike the options actually transacted by the taxpayer, the knock-in option described here is not a digital option. It therefore provides the advantage of offering a theoretically limitless dollar profit or percentage return (because the dollar could depreciate without bound relative to the euro). Put another way, if the exchange rate exceeds the barrier of USD1.1190, then in the actual trades conducted the taxpayer's payoff is limited to USD120,000; but with the knock-in described here, the payoff increases with the exchange rate.

[27]Again, the spot rate of USD1.0494, prevailing on November 1, 1999, was provided by the FRBNY. Also according to the FRBNY, the 12-month volatility of the euro was 10.4% bid, 10.7% ask on October 29, 1999. I use the ask volatility of 10.7%. The Federal Reserve Statistical Release (FRSR) reported that the 6-month Eurodollar deposit rate was 6.00% on November 1, 1999. This is an annualized rate using a 360-day year (bank interest). The one-year rate should not differ substantially from this reported 6-month rate, and the matter of the use of continuous compounding versus daily compounding is trivial at most. At the time, short-term interest rates in Europe were running about 100 basis points (1%) lower than comparable U.S. rates. For example, according to the Central Bank of Europe, the yield for short-term Euro government bonds in October 1999 was 4.02%. The yield for one-year U.S. Treasury bills traded in the secondary market was 5.16% on November 1, 1999, according to the FRSR. Thus, I use 6% and 5%, respectively, for the USD and EUR interest rates. Results obtained are highly insensitive to reasonable changes in these rates.

[28]A "dollar vol" is a measure of volatility in dollar terms. It is a common risk metric in the derivatives industry.

[29]$N(x)$ refers to the standard normal cumulative distribution function with upper limit of integration x. The computation of 26.77% assumes a zero mean, that is, that the USD/EUR is not expected to increase or decrease for the 12-month period. This is reasonable in light of the small interest rate differential between the two national economies. The spot and forward exchange rates should be similar.

[30]Note that the spot rate and the strike prices of the three transacted options were nearly *five* one-year dollar vols apart.

[31]It is assumed that the reader is familiar with the binomial option pricing model as well as geometric Brownian motion. Under the former, a tree size of 40 periods was used. Under the latter, a daily time increment and 10,000 price paths were used under a Monte Carlo simulation method. The results of these test procedures are available upon request. It should be noted that the probabilities obtained under these procedures are risk-neutral probabilities; however, the difference between said probabilities and true probabilities should be unimportant in this context. Finally, a similar probability measure can be obtained using the closed-form barrier option formula.

[32]Potential dealers at the time included Citigroup Global Markets Inc., Deutsche Bank AG, Lehman Brothers Inc., JP Morgan Securities Inc., UBS Securities LLC, and several others.

[33]At the time of trading (1999), it was rumored that the fee for a tax opinion for a deal of this size was about USD250,000. This fee alone would have assured a 100% probability of taxpayer loss, as it exceeded the potential payoff on the option transactions (USD120,000).

[34]This is certainly true of the short put option position under the strict interpretation of Section 752 in the Son of BOSS strategy. Whether or not the short currency position would qualify as a contingent liability and ascribed a zero value is a more nebulous matter.

[35]A proof of this barrier figure is available upon request.

[36]The modern structured note marketplace began in 1973 with the issuance by PEMEX (a Mexico-based petroleum company) of a floating rate bond whose coupon was tied to the price of oil. Currency-linked bonds have existed for decades too.

[37]These tests or principles include the sham transaction doctrine, the economic substance doctrine, the business purpose doctrine, the substance-over-form doctrine, and step transaction doctrine. For a discussion of the application of these principles to tax shelters, see for example Donald Korb, "Shelters, Schemes, and Abusive Transactions: Why Today's Thoughtful U.S. Tax Advisors Should Tell Their Clients to 'Just Say No' ", Presentation at the University of Cambridge, England (December 14, 2005).

[38]See http://www.irs.gov/pub/irs-utl/notice_2000-44.pdf.

[39]For an example, see *Jade Trading, LLC v. United States*, No. 03-2164T, 2005 U.S. Claims LEXIS 110, at *1-2 (April 22, 2005). The court's decision in *Jade Trading* was finally handed down in December 2007 and was a victory for the government. See http://news.lawreader.com/?p=1453.

[40]See http://www.irs.gov/newsroom/article/0,,id=137095,00.html.

[41]See http://www.irs.gov/newsroom/article/0,,id=141014,00.html.

[42]For an example, see Henry Camferdam's case against Ernst and Young discussed at http://www.law.com/jsp/article.jsp?id=1046833529273. The Camferdam case is well known as Camferdam discussed his experience on the popular news program "60 Minutes." See http://www.cbsnews.com/stories/2003/10/16/60minutes/main578497.shtml.

REFERENCES

Bankman, Joseph. "The New Market in Corporate Tax Shelters." *Tax Notes*, 83 (1999), pp. 1775–1795.

Bird, Robert, and Alan Tucker. "Tax Sham or Prudent Investment? A Case Study of Salina Partnership v. Commissioner of Internal Revenue." *Virginia Tax Review*, 22 (2002), pp. 231–272.

Graham, John, and Alan Tucker. "Tax Shelters and Corporate Debt Policy." *Journal of Financial Economics*, 81 (2006), pp. 563–594.

Tucker, Alan. "Trafficking in Foreign Tax Credits: The Case of Compaq Computer." *Global Finance Journal*, 13 (2002), pp. 1–15.