Employee Stock Options in Personal Bankruptcy: 
Assets or Earnings?

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All your friends are jealous. It’s the late 1990s and you’ve just landed a job with one of the fastest-growing high-technology companies in the country. In addition to a handsome salary and generous benefits, your forward-thinking employer has offered you stock options as an extra incentive. On your first day of work, you sign a contract with the firm providing you the right to buy up to 5,000 shares of its stock per year over the next five years at the preset price of $25—conditional on your continued employment. Because the current market price is $30 and rising, and with no end to this bull market in sight, you start to fantasize about retiring at age thirty. But only a fool puts all his eggs in one basket. So you decide to diversify. Because the market’s so hot (even Alan Greenspan is sounding giddy these days), you start borrowing to buy stocks—high-growth stocks—on margin. Maybe you even invest some money in your cousin’s “no-lose” real estate project. As the new millennium dawns, you’ve accumulated a veritable financial empire (at least on paper).

Then disaster strikes. In a few short months in 2000, the NASDAQ drops almost 2,000 points, losing nearly half its value. The Dow isn’t doing much better. Your brokerage firm starts calling about those stocks you bought on margin. It turns out you now owe them more than $1 million. You take stock of your assets. Since your real-estate-genius cousin isn’t returning your calls, you focus on your stock options. So far, 10,000 of your 25,000 options have vested and are available to pay off your massive debt. Your company has weathered the storm fairly well and its stock price is holding steady at around $35. If you exercised all your vested options today... you would still be $900,000 short.

With nowhere left to turn, you petition for relief under Chapter 7 of the Federal Bankruptcy Code. The trustee puts together a bank-
ruptcy estate comprising all your existing assets with which to pay off your creditors. Although it’s clear that your 10,000 vested options will be part of the estate, a dispute arises over the remaining 15,000 unvested options. The trustee moves to compel turnover of the unvested option rights. Your attorney objects—those unvested options are part of your compensation package, he argues. Because they vest postpetition, they should be treated the same as your postpetition salary and excluded from the estate. No, the trustee replies—the unvested options are prepetition assets and should become part of the estate.

The case law on this issue is divided. Bankruptcy courts have acknowledged that employee stock options (ESOs) have characteristics of both prepetition assets and postpetition earnings from services. Because of their dual nature, the courts have disagreed on how to treat ESOs in Chapter 7 personal bankruptcy and have developed two competing approaches. The first, the quantum meruit approach, focuses on the fact that the debtor’s postpetition employment adds value to the estate by allowing additional options to vest. As a consequence, the court allows the debtor to keep a pro rata portion of the options attributable to her postpetition employment. The second approach treats the options as pure assets, denies that the debtor’s postpetition employment creates any new property right, and retains all the options for the estate.

This Comment evaluates the effects of these two approaches pragmatically, in light of the goals of the Bankruptcy Code and with reference to the larger economic context. Given a competitive labor market and a debtor who engages in strategic behavior, it becomes clear that the debtor and the estate will often have incentives at odds with one another. This Comment presents a simple game theoretic model of the debtor’s employment decision and the bankruptcy court’s choice of ESO rule. This analysis reveals two important considerations for courts debating which rule to adopt. First, both rules can introduce inefficient levels of labor market mobility among debtor-employees, but socially-wasteful mobility will generally be greater under the pure asset rule. Second, the pure asset rule, although superficially appearing

some additional assets, but requiring the debtor to use future income to pay off creditors over the course of a three- to five-year plan. The Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, Pub L No 109-8, 119 Stat 23 (2005), codified in relevant part at 11 USC § 707(b)(2) (Supp 2005), contains provisions effectively requiring debtors with income above a certain amount to enter Chapter 13 rather than Chapter 7. However, moving to the Chapter 13 setting does not moot the issue of how to treat employee stock options (ESOs). Confirmation of the Chapter 13 plan depends critically on unsecured creditors receiving at least as much as they could expect under a hypothetical Chapter 7 liquidation. 11 USC § 1325(a)(4) (2000). Thus, the treatment of ESOs in Chapter 7 serves to establish a baseline by which bankruptcy courts evaluate the fairness of a proposed Chapter 13 plan.
to secure the greatest value for the estate, may, after the debtor's strategic response is taken into account, leave the estate poorer than the more debtor-friendly quantum meruit rule.

The Comment is organized as follows: Part I introduces employee stock options in more detail. Part II sets out the applicable law and discusses the competing approaches to ESOs in Chapter 7. Part III presents an economic model of the debtor's behavior under each of the legal rules and considers the effects of the debtor's actions on the bankruptcy estate. Part IV considers the efficiency and social welfare implications of these results and suggests private responses to the legal rules, concluding that a bankruptcy trustee often will prefer a rule that gives the debtor some stake in unvested ESOs.

I. EMPLOYEE STOCK OPTIONS

A. Stock Options Generally

An option is the contractual right (but not the obligation) to buy or sell an underlying asset at a preset price (the "exercise" or "strike" price) at a preset date (the "exercise" or "expiration" date). For example, one might purchase the option to buy one share of Microsoft stock for $75 (the strike price) ninety days hence. In ninety days, if the price of Microsoft is greater than $75, the owner will exercise the option and buy the stock at a bargain price. If the price of Microsoft is $75 or less, the option to buy at $75 is worthless, and the owner simply lets it expire.

The owner of a call option, like the option to buy Microsoft stock, faces asymmetric risks of gains and losses. Options offer a theoretically unlimited opportunity for gain if the market price at exercise is considerably greater than the strike price. On the other hand, the potential for loss is known and limited; that is, if the option expires unused, all the owner will have lost is the price paid for the option itself.

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3 A stock option is "[a]n option to buy or sell a specific quantity of stock at a designated price for a specified period regardless of shifts in market value during the period." Black's Law Dictionary 1459 (West 8th ed 2004).
4 A call option gives its owner the opportunity to buy some asset at a preset price, while a put option gives its owner the right to sell some asset at a preset price.
5 Options come in several varieties. The option described above is a European one—the owner can exercise the option only on a particular date. In contrast, an American option allows the owner to exercise the option at any time between the purchase and the exercise date (which, in the case of an American option, is the last day on which it can be used). Most ESOs are American options. However, we should not make too much of the distinction because as a practical matter, the optimal strategy is to hold American options until the last possible date, making their greater flexibility superfluous, at least to a risk-neutral owner. See Part III.A.3.
(the "premium"), which is usually quite small in relation to the price of the underlying asset.

If the strike price of a call option is less than the market price of the underlying asset, the option is said to be "in-the-money." In contrast, if the strike price of a call exceeds the market price, the call is said to be "out-of-the-money." Even the out-of-the-money option, however, is worth something; by the time the exercise date rolls around, the market price of the underlying asset may have increased so that the option is in-the-money.6

B. Employee Stock Options

Over the past two decades, ESOs have increased in importance as a means of compensation for workers in American corporations. Estimates for 2005 put as many as ten million American workers holding employer-provided stock options with an aggregate value on the order of several hundred billion dollars.7 According to a recent article, the two hundred largest U.S. companies grant options on approximately 3 percent of outstanding shares each year, with grants for some high-tech companies in excess of 10 percent per annum.8 As ESOs become more popular, bankruptcy courts will face with increasing frequency the issue of how to treat these assets.

Companies offer stock options to their employees for a variety of reasons. Employers often describe options both as an additional form of compensation and as an effort to align the employees' incentives with those of shareholders. One employer with a typical ESO plan described the purpose of the plan as to "attract and retain employees . . . and provide such employees . . . with an interest in the Company parallel to that of the Company's stockholders."9 Option grants that vest over a long period of time might also help reduce employee turnover as the longer one holds an option, the higher (on average) the return.10 If a bankruptcy court takes an employee-debtor's unvested options, it defeats the employer's efforts to create these incentives.

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6 The pricing of options is a complicated matter taken up in more detail in Part III.A.3.
9 DeNadai v Preferred Capital Markets Inc, 272 BR 21, 25 (D Mass 2001) (quoting from the ESO plan of Ziff-Davis, Inc.).
10 Christopher D. Ittner, Richard A. Lambert, and David F. Larcker, The Structure and Performance Consequences of Equity Grants to Employees of New Economy Firms 2 (Wharton
The options granted to employees under ESO plans differ from standard, market-traded options in several relevant respects. First, the employee is not entitled to exercise the options immediately. Typically, after signing up for the plan, the employee gains the right to exercise the options in a piecemeal fashion over a period of years according to a "vesting schedule." Typical vesting periods range from one to eight years. Second, the employee's right to a block of options is contingent upon her continued employment until the vesting date. If she leaves her job (or is fired), she forfeits all rights to unvested options. Moreover, when she leaves, she is required to exercise (or forfeit) any vested options immediately (or within a specified time period). Third, ESOs are typically American, rather than European, call options—once the option vests, the employee may exercise it at any time until the expiration date. Finally, ESOs are inalienable. The employee may not sell, transfer, or convey her option rights.

II. CURRENT LAW

Bankruptcy courts have adopted competing approaches to employee stock options in Chapter 7 bankruptcy proceedings. Generally, ESOs, even if unvested, become property of the bankruptcy estate, but courts disagree on whether the debtor retains a stake in the options that vest postpetition. One line of cases, typified by In re Allen, reasons that the debtor must perform personal services in order for the estate to realize the value of unvested options. These cases apply a

Working Paper 2002), online at http://ssrn.com/abstract=296275 (visited Aug 8, 2005) (“[T]he firms in our sample rank employee retention as the most important objective of their equity grant programs.”).


While some of the bankruptcy cases object to use of the term "vesting" to describe accrual of ESO exercise rights, this Comment uses the term "vesting" in its traditional business or financial sense: an option vests when the grantee gains the right to exercise it. See In re Dibiase, 270 BR 673, 677–79 (Bankr WD Tex 2001) (discussing the proper use of the term "vesting" as a legal concept). Nevertheless, this Comment will ignore this painstakingly drawn distinction and refer to vesting in its traditional, commonly understood business or financial sense.

Leonhardt, Stock Options Said Not to Be as Widespread as Backers Say, NY Times at Cl (cited in note 7).

The exceptional case is that of the corporate officer, for whom the stock options are treated as pure compensation. For these debtors, stock options become part of the estate only to the extent that they represent prepetition earnings. Because the end result of this special rule for corporate officers is identical to the quantum meruit outcome, this approach is discussed in Part II.C. See Part II.C, especially notes 51–55 and accompanying text.

226 BR 857 (Bankr ND Ill 1998).
quantum meruit theory to divide the ESOs between the estate and the debtor. A second school of thought, exemplified by *In re Dibiase*, rejects the quantum meruit theory and treats ESOs as pure assets to which the debtor has no postpetition claim.

A. The Bankruptcy Estate: Section 541

The filing of a bankruptcy petition creates a bankruptcy estate comprising all the debtor’s nonexempt assets, which the trustee then uses to satisfy the claims of creditors. The bankruptcy estate is governed by 11 USC § 541, which provides:

(a) The commencement of a case . . . creates an estate. Such estate is comprised of all the following property, wherever located and by whomever held:

(1) [A]ll legal or equitable interests of the debtor in property as of the commencement of the case.

. . .

(6) Proceeds, product, offspring, rents, or profits of or from property of the estate, except such as are earnings from services performed by an individual debtor after the commencement of the case.

The case law instructs bankruptcy courts to interpret § 541(a)(1) broadly, concluding that the estate comprises “everything of value the bankrupt may possess” and “every conceivable interest of the debtor, future, nonpossessory, contingent, speculative, and derivative.” The ultimate test for inclusion in the estate is whether the debtor’s property interest is “sufficiently rooted in the prebankruptcy past.”

Section 541 also plays a major role in implementing the Code’s “fresh start policy” for individual debtors by shielding postpetition
salaries and wages from creditors. This follows from § 541(a)(1)’s restriction of the estate to interests of the debtor as of the commencement of the case: if an individual debtor hasn’t earned the money as of the petition date, it cannot be part of the estate. Generally, if an asset becomes property of the estate and then produces further income, that income is also property of the estate. Section 541(a)(6) includes as part of the estate, “[p]roceeds, product, offspring, rents, or profits” of estate property. For example, if the debtor owned a share of stock that became part of the estate under § 541(a)(1), and the stock paid a dividend, the dividend would also be property of the estate. But § 541(a)(6) explicitly excludes such proceeds where they represent “earnings from services performed by an individual debtor after the commencement of the case.” The earnings exception in § 541(a)(6) often arises, for example, where the debtor is a doctor with a professional practice. While the practice itself becomes property of the estate, the postpetition fees the debtor earns from seeing patients are personal earnings (at least in part) that accrue to the doctor, not the estate.

Section 541(c)(1) allows the trustee to ignore restraints on alienation when bringing property into the estate; however, the trustee may reach only the property interests of the debtor “as of the commencement of the case.” The rights of the debtor set the outer limits of pressure and discouragement of preexisting debt”). However, the most recent amendment to the Bankruptcy Code suggests that Congress has intended to scale back the scope of the fresh start. The Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, 119 Stat at 23, amends § 707(b) to make Chapter 13, rather than Chapter 7, more or less mandatory for debtors with income over certain limits.

22 The cases are often unclear about whether postpetition wages and salaries of individual debtors are sheltered by § 541(a)(1) or § 541(a)(6). The correct answer seems to be that postpetition earnings that represent pure labor are excluded by § 541(a)(1), and that postpetition earnings that involve the combination of labor with assets of the estate are excluded by § 541(a)(6). However, courts often will refer to § 541(a)(6) as sheltering postpetition income from services regardless of whether any of the assets of the estate are implicated. See In re Hellums, 772 F2d 379, 381 (7th Cir 1985) (per curiam) (citing § 541(a)(6) for the proposition that “[p]ost-petition wages are not property of the estate of a Chapter 7 bankrupt”); Dibiase, 270 BR at 684 (holding that § 541(a)(6) does not shelter postpetition salary); In re Larson, 147 BR 39, 42 n 2 (Bankr D ND 1992) (noting the confusion).

23 Section 522 allows additional exemptions of property that would otherwise enter the estate, but that provision does not concern us here, as all courts that have considered the application of § 522 to ESOs have rejected exemption. See, for example, DeNadai v Preferred Capital Markets, Inc, 272 BR 21, 39–41 (D Mass 2001) (rejecting an analogy to ERISA pension benefits); Dibiase, 270 BR at 682 (holding that options cannot be sheltered under the “wild card” exemption in 11 USC § 522(d)(5), where the dollar value of the exemption is already used up on other assets, by claiming zero value for out-of-the-money options).

24 See, for example, In re Prince, 85 F3d 314, 322 (7th Cir 1996).

25 “[A]n interest of the debtor in property becomes property of the estate . . . notwithstanding any provision in an agreement, transfer instrument, or applicable nonbankruptcy law . . . that restricts or conditions transfer of such interest by the debtor.” 11 USC § 541(c)(1)(A) (2000).

26 11 USC § 541(a)(1).
of the rights of the estate. Thus, the estate takes property subject to
the same conditions and restrictions that applied to the debtor. So
while the trustee may ignore any nonalienation provisions in ESO con-
tracts when bringing ESOs into the estate (§ 541(c)(1)), the restraint is
not voided. The estate may take the options regardless of whether
the option-granting contract allows alienation, but the trustee may not
then sell the options to a third party. Moreover, the trustee is subject
to the same vesting schedule as the debtor and to the same rules about
forfeiture of unvested options should the debtor leave her job.

The question confronting courts in the ESO cases is essentially
this: are unvested ESOs more like salaries and wages or more like
dividends from shares of stock?

B. Employee Stock Options Are Part of the Bankruptcy Estate

All of the courts that have considered the ESO issue have agreed
that ESOs, whether vested or unvested, are assets that become part of
the bankruptcy estate under § 541(a). ESOs that have vested as of
the petition date are identical to standard market-traded options (ex-
cept for the restrictions noted in Part I.B) and sensibly enter the es-
tate just as would a standard option or any other financial instru-
ment. ESOs that have yet to vest are brought into the estate by the
broad reach of § 541(a)(1). The fact that exercise rights remain con-
tingent on the debtor’s continued employment with the grantor does
not remove the unvested ESOs from the reach of the estate. As the
court in Allen stated, “A contingency is no bar to a property interest
becoming part of the bankruptcy estate, even if the contingency re-
quires additional postpetition services, and even if the right to enjoy-
ment of the property may be defeated.” Nor does the fact that an
option is out-of-the-money exempt it from the estate. Even an out-of-
the-money option (one with zero value if it had to be exercised today)

27 Chicago Board of Trade v Johnson, 264 US 1, 11 (1924) (holding that an estate may take
property regardless of contractual restraints on alienation, but that the property enters the estate
subject to those restraints).

28 There is one exception: when the debtor is a corporate officer whose options make up a
large portion of her total compensation, courts have held that the options are property of the
estate only to the extent that they represent compensation for prepetition services. See Larson,
147 BR at 44. See also notes 51–55 and accompanying text.

29 This is true even where the options in question are not traded in any market, as with a
closely-held corporation, and are thus almost impossible to value. See In re Tobiason, 185 BR 59,
63 (Bankr D Neb 1995) (holding that a restricted, nonassignable option to buy shares in the
debtor's brother's closely-held corporation is an asset of the estate regardless of whether the
shares have ascertainable value).

30 226 BR at 865–66. See also In re Booth, 260 BR 281, 285 (6th Cir Bankr App 2001)
(“[A]n interest is not outside [the trustee’s] reach because it is novel or contingent.”).
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might have value in the future (contingent on an increase in the stock price).31

Courts have consistently held a variety of contingent interests in property to be part of the estate. For example, when a low-income debtor petitions for bankruptcy before the close of the tax year, her interest in receiving the Earned Income Tax Credit (EITC) becomes part of the estate. This is true even though the debtor’s receiving the EITC is contingent on her income remaining below the eligibility limits for the remainder of the tax year.32 Similarly, when a lawyer handling a case on a contingent-fee basis petitions for bankruptcy, her contingent interest in any recovery in the unresolved case becomes property of the estate.33 The case law offers many similar examples holding contingent interests to be property of the estate.34

The future right to the ESOs granted by the initial option agreement is itself a valuable right, albeit a contingent one. As one bankruptcy court stated:

The fact that some of the Options had not accrued and were not exercisable as of the petition date . . . is of no consequence to the issue of ownership[.]35

... The right to use Options owned (i.e. to exercise them and purchase stock) is distinct from ownership of the Options themselves (i.e. the contractual right(s) to purchase stock in the future).36

As a property right of value that is owned by the debtor, all ESOs, vested and unvested, become part of the bankruptcy estate upon filing of the Chapter 7 petition.37 But the fact that ESOs are

31 The options were out-of-the-money in In re Carlton, 309 BR 67, 70 (Bankr SD Fla 2004). Nonetheless, they were held to be property of the estate. Id at 73.
32 See, for example, In re Montgomery, 224 F3d 1193, 1195 (10th Cir 2000); In re Johnson, 209 F3d 611, 612 (6th Cir 2000).
33 In re Jess, 169 F3d 1204, 1208 (9th Cir 1999) ("Although [the debtor] may not have been able to sue his client for a portion of his fee at the time he filed his bankruptcy petition, he had an interest in the fee attributable to pre-petition work on the case.").
34 See, for example, In re Clipper International Corp, 154 F3d 565, 567 (6th Cir 1998) (contingent legal claim against a third party); Yonikus, 996 F2d at 869 (potential personal injury and workers’ compensation claims); In re Newton, 922 F2d 1379 (9th Cir 1990) (right to receive interest in trust contingent on surviving others); In re Ryerson, 739 F2d 1423 (9th Cir 1984) (contingent right to postpetition employment termination payment under a prepetition employment contract); In re Edmonds, 263 BR 828, 831 (ED Mich 2001) (debtor employee’s contingent interest in a company profit-sharing plan, where the right to receive payment was contingent upon the debtor’s continued employment and the company’s realizing a profit at the end of the year).
35 Carlton, 309 BR at 72.
36 The only exception to this rule is where stock options are granted to top corporate executives in lieu of salary. See notes 51–55 and accompanying text.
property of the estate under § 541(a)(1) does not end the inquiry. In many of these contingent interest cases, bankruptcy courts have invoked the spirit of § 541(a)(6) and their general equitable powers to give some portion of the property back to the debtor. Additional action on the part of the debtor to resolve the contingency can be seen as creating new value that is not, as Segal v Rochelle put it, “rooted in the prebankruptcy past,” and thus, should not be captured by the estate. The quantum meruit line of cases extends this logic to the ESO setting.

C. Employee Stock Options Have Characteristics of Both Assets and Wages: The Quantum Meruit Theory

Options still unvested on the petition date are contingent property rights that will only realize their value if the debtor continues to work for her current employer. The quantum meruit approach to ESO allocation rewards the debtor with a portion of the unvested options in recognition of her efforts to add to their value.

The quantum meruit approach to ESO allocation is associated with Allen and has since been followed by a number of bankruptcy courts. Quantum meruit (or quasi-contract) is the common law contract doctrine designed to provide restitution to those whose efforts have enriched another party, even in the absence of an enforceable contract. Applied to the ESO cases, the idea is that the debtor’s post-petition employment enriches the estate by allowing additional options

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38 Id at 380.
39 See, for example, In re Wick, 276 F3d 412, 416 (8th Cir 2002) (citing Allen for the principle that “the estate's interest [in unvested options] is limited to the pro rata portion of the proceeds that are related to the debtor's pre-petition services”); DeNadai, 272 BR at 34 (following the Allen formula to value, as contingent interests, options that were unvested at the time of bankruptcy); Lawton, 261 BR at 777-78. See also In re Taronji, 174 BR 964, 970-71 (Bankr ND Ill 1994) (dividing an employer's grant of restricted stock to the employee between the debtor-employee and the estate because the employee was required to maintain four continuous years of employment to gain unrestricted right to shares).
40 Black's Law Dictionary at 1276 (cited in note 3) defines quantum meruit as “[t]he reasonable value of services; damages awarded in an amount considered reasonable to compensate a person who has rendered services in a quasi-contractual relationship” and notes that “[q]uantum meruit is still used today as an equitable remedy to provide restitution for unjust enrichment. It is often pleaded as an alternative claim in a breach-of-contract case so that the plaintiff can recover even if the contract is unenforceable.” The classic hornbook case is Britton v Turner, 6 NH 481 (1834), in which the plaintiff had agreed to work for the defendant for one year, but left the job after only nine months. The court upheld the plaintiff's pro rata recovery for his nine months of labor on a quantum meruit theory to prevent the unjust enrichment of the defendant employer.
to vest. To avoid unjustly enriching the estate through the debtor’s postpetition actions, courts applying the quantum meruit rule give back to the debtor a fraction of the unvested options attributed to her postpetition services.

Allen and the other quantum meruit cases look to the spirit of the earnings exception of § 541(a)(6), which exempts from the estate “[p]roceeds, product, offspring, rents, or profits of or from property of the estate,” that result from “earnings from services performed by an individual debtor [postpetition].” On the one hand, ESOs are property rights that come into existence prior to bankruptcy with the signing of the option-granting contract, and would seem to be assets of the estate under § 541(a)(1); on the other, the estate’s ability to exercise the options is inextricably bound up with the debtor’s continued labor, proceeds of which are excluded from the estate by § 541(a)(6). The quantum meruit cases resolve this tension by concluding that to the extent that the ultimate value realized from the exercise of a stock option is a product of the debtor’s postpetition efforts, that amount should not enter the bankruptcy estate. As the Allen court put it:

The extent of the bankruptcy estate’s interest in property cannot exceed the interest possessed by the debtor at the commencement of the case. . . . The realized or realizable value of an interest that was contingent at the time of filing is property of the estate only to the extent that the subsequently realizable value is related to the pre-petition actions of the debtor. . . . Because the now-exercisable rights are a product of both pre-petition and post-petition efforts by the Debtor, the pro rata value of the options resulting from Debtor’s post-petition services comprise post-petition earnings that are excluded from the estate.

Allen proposes an allocation formula to divide up the total number of unvested options in line with this pre-/postpetition distinction. The formula quantifies the time the debtor has worked toward vesting with reference to the time she filed her petition. The debtor keeps a

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41 Allen, 226 BR at 867 (“[W]ithout [the debtor’s] continued services post-petition the estate’s rights of exercise would not have been realized.”).
42 Id.
43 11 USC § 541(a)(6).
44 While the cases are somewhat unclear on the issue, it seems the quantum meruit cases do not directly apply the § 541(a)(6) earnings exception because of the tension with § 541(a)(1). Rather, the authority to create a pro rata allocation of unvested options seems to rest on the bankruptcy courts’ general equitable powers under § 105(a). See Dibiase, 270 BR at 687–88 (concluding that Allen must have relied on § 105(a) and that such treatment was inappropriate).
45 226 BR at 867.
46 Id at 867–68.
fraction of the unvested options equal to the ratio of the period between the petition and vesting to the total vesting period (the time between the option grant and vesting). For example, suppose the debtor signed an option-granting contract on January 1, with blocks of options vesting on January 1 in each of the succeeding years. Six months later, on July 1, she petitions for bankruptcy. The debtor will keep one-half of the first block of options because the postpetition time spent working toward vesting is six months and the total vesting period is twelve months. With regard to the second block of options (vesting after two years), the debtor would keep three-quarters (eighteen months worked toward vesting postpetition divided by a twenty-four-month vesting period).

Formally, the Allen formula calculates the debtor and estate shares of each block of unvested options, respectively, as

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P_{\text{debtor}} = \frac{t_v - t_B}{t_v - t_G} \quad \text{and} \quad P_{\text{estate}} = \frac{t_B - t_G}{t_v - t_G} \quad \text{for} \quad t_G < t_B < t_v. \tag{II.1}
\]

where

- \( t_G = \) time options are granted;
- \( t_B = \) time at which debtor files her petition; and
- \( t_v = \) time at which options vest.

Pro rata allocation of contingent property rights is not a novel idea. Bankruptcy courts have applied quantum meruit principles in many similar contexts to divide the value of some contingent property right between the debtor and the estate to account for postpetition efforts that increase the value of the property. For example, courts apply timing-based pro rata rules like Allen’s in the EITC and contingent attorney fee cases mentioned in Part II.B above.48 One of the most well-known examples of pro rata division occurs where the debtor is a doctor or lawyer with a professional practice. Courts have held that the practice itself is property of the estate, but have divided the practice’s postpetition income into that attributable to the capital

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47 Note also that \( P_{\text{estate}} = 1 \) and \( P_{\text{debtor}} = 0 \) for \( t_v < t_G \), that is, where the options have already vested prepetition. And that \( P_{\text{estate}} = 0 \) and \( P_{\text{debtor}} = 1 \) for \( t_G > t_v \), that is, where the debtor is first granted the ESO after the petition filing date.

48 In re Carlson, 263 F3d 748, 751 (7th Cir 2001) (holding that the fair value of the services rendered by a contingent-fee lawyer up to the date of his bankruptcy—though not after, by virtue of 11 USC § 541(a)(6)—is property of his estate in bankruptcy); Montgomery, 224 F3d at 1195 (dividing EITC between debtor and estate according to when during the tax year debtor filed petition).
of the practice and that attributable to the human capital of the debtor.\textsuperscript{49}

The cases offer many similar examples.\textsuperscript{50}

Courts have used an equivalent approach to allocating stock options between the estate and the debtor where the debtor is a high-ranking corporate officer such as a president, director, or chief executive officer.\textsuperscript{51} In this case, the result is the same as under the quantum meruit rule, but the reasoning is slightly different. Where the stock options are granted to a high corporate official, they are considered compensation, rather than assets, for the purpose of bankruptcy proceedings, but ultimately the division between the debtor and the estate is identical to that described above. The debtor in \textit{In re Larson},\textsuperscript{52} for

\begin{footnotesize}
\begin{enumerate}
\item while the precise rule varies across jurisdictions, the basic contours are consistent. the court must apportion the postpetition income of the practice into two streams: income produced by the capital of the practice itself (property of the estate) and income produced by the services of the debtor (fresh start property of the debtor). see \textit{prince}, 85 f3d at 322 (holding that an orthodontist's goodwill is capital of the practice and that returns to goodwill accrue to the benefit of the estate); \textit{in re fitzsimmons}, 725 f2d 1208, 1211 (9th cir 1984) (holding that, to the extent that an attorney-debtor's law practice's earnings "are attributable not to [the debtor's] personal services but to the 'business' invested capital, accounts receivable, good will, employment contracts with the firm's staff, client relationships, fee agreements, or the like, the earnings of the law practice accrue to the estate"); \textit{in re molina y vedia}, 150 br 393, 402 (bankr sd tex 1992) (holding that all postpetition earnings of a medical practice accrue to the debtor because the creditors had not met their burden of showing what portion of earnings were attributable to the practice's capital); \textit{in re cooley}, 87 br 432, 441-44 (bankr sd tex 1988) (holding that the postpetition earnings of a surgical practice are excluded from the estate by \textsection 541(a)(6) to the extent that they represent personal services performed by the debtor and returns to the debtor's personal goodwill, while returns to fixed assets and profits from the services of associate surgeons accrue to the estate).
\item other situations in which courts have applied a pro rata division of a contingent property interest include \textit{ryerson}, 739 f2d at 1425-26 (right to severance payment from an employer, where the petition was filed while the debtor was still employed); \textit{in re sportleder}, 456 f2d 1081, 1082-83 (9th cir 1972) (lump sum payments by a purchaser to a debtor who sold his small business and, as part of the sales agreement, undertook to work for a time for the new owners); \textit{booth}, 260 br at 283 (employer's annual profit-sharing plan); \textit{taronji}, 174 br at 971 (grant to employee of restricted stock that could not be sold prior to four years of continuous employment).
\item the test that distinguishes "eso's as assets" from "eso's as compensation" is "whether the options are awarded to an executive responsible for the company's success, as opposed to a general employee, so that the value of the options are [sic] directly tied to the company's success or failure." \textit{lawton}, 261 br at 778. if the eso's of a corporate officer are compensation, the implications are as follows: options representing postpetition earnings are exempted by \textsection 541(a)(6). by implication, that portion representing prepetition wages is part of the estate. this is functionally equivalent to the quantum meruit approach, at least from the debtor's point of view. however, the distinction might matter where the debtor is the option-granting employer because the priority of creditor-employees in the bankruptcy process will be affected. see \textit{in re baldwin united}, 52 br 549, 551-552 (bankr sd ohio 1985) (observing that if eso's are wages, then grantee-employees are entitled to administrative expense priority, but that if eso's are simply contractual debts owed to employees, then employees are general unsecured creditors).
\end{enumerate}
\end{footnotesize}
example, was a corporate director whose only compensation was stock options. The court concluded that the options should be considered purely compensation for personal services and would be divided pro rata with the portion of the proceeds attributable to prepetition efforts going to the estate. Since the debtor worked 117 days of the one-year vesting period before declaring bankruptcy, 32 percent (117/365) of the options became property of the estate and the remaining 68 percent were considered postpetition wages that remained in the hands of the debtor.

D. All Option Proceeds Belong to the Estate:

The Pure Asset Approach

The “pure asset” rule is a simple one: the estate gets all the options, whether vested or unvested, and the debtor retains nothing. This approach, originally developed in Dibiase and followed in In re Carlton, is largely a reaction to the quantum meruit theory of Allen and its progeny. Dibiase held that the right to exercise the options is not a new property right that the debtor earns via continued employment and concluded that “the Allen formula is simply wrong, and should not be followed by this or any other court.” The pure asset theory has two mutually reinforcing rationales: first, that the debtor’s postpetition efforts do not, as a legal matter, create any new property; and, second, even if that were the case, that bankruptcy courts lack the equitable power to reward debtors for their actions.

First, under the pure asset theory, the debtor is not legally entitled to any portion of the options or their proceeds because her continued employment does not, as a legal matter, add anything to the value of the options as of the petition date. Premised on the idea that the estate already owns the entire option (a premise with which the quantum meruit cases agree), Dibiase held that the right to exercise the option is not “some species of property independent of but somehow growing out of” ownership of the option contract itself. The exercise right is not a “proceed[] of property of the estate” that is exempted by § 541(a)(6) when it arises from the debtor’s postpetition efforts. Be-
cause the estate already owns the option, and because the vesting of the option does not add a legally cognizable benefit, the debtor's continued employment does not create any new property that can be rewarded under § 541(a)(6).

The reasoning behind this conclusion draws heavily on contract law's distinction between conditions precedent and conditions subsequent. The essence of this rather formalistic distinction is as follows: if the debtor's continued employment is a condition precedent to ESO vesting, the postpetition employment creates a "new" property right. In contrast, if the relevant condition is cessation of employment, this is a condition subsequent that defeats a preexisting property right; postpetition employment creates nothing "new."

A condition precedent is "[a]n act or event, other than a lapse of time, that must exist or occur before a duty to perform something promised arises." If the state of the world imagined by the condition does not occur, both parties are excused from performance. A classic example would be a simple contract for the future sale of goods: if A delivers a barrel of widgets on January 1, B will pay A $100 dollars. Delivery of the widgets is the condition precedent (precedent, that is, to the existence of B's obligation to perform and the existence of A's cause of action should B fail to do so). If A does not deliver, B is under no obligation to pay.

In contrast, a condition subsequent is "an event the existence of which, by agreement of the parties, discharges a duty of performance that has arisen." An existing duty of performance is excused if the condition comes to pass. The classic example of a condition subsequent is a covenant not to compete: A will pay B $100 per year provided that B does not open a pet store in Happyville. A has an existing duty to perform by paying B that is discharged if the condition subsequent (B's opening a pet store) occurs.

Under the reasoning of Dibiase, the debtor-employee has nothing to add to the estate's interest in the options because her continued employment up until the vesting date is not a condition precedent for exercise. Rather, if the debtor leaves (or is fired from) her job with the employer, that is a condition subsequent that triggers defeasance of the existing contractual right to purchase shares of stock at a preset price. As put by Dibiase:

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60 Black's Law Dictionary at 312 (cited in note 3).
61 Id. Conditions subsequent are usually associated with contract language such as "but if," "on condition that," "provided, however," or "if, however." Thomas F. Bergin and Paul G. Haskell, Preface to Estates in Land and Future Interests 50 (Foundation 2d ed 1984).
62 Arthur L. Corbin, 8 Corbin on Contracts § 30.7 (Lexis rev ed 1999):
The "condition precedent" that the Allen court presumed was the debtor's continued employment. But "continued employment" is not a new fact or event that creates the right to exercise the option. It is the status quo ante. The "new fact or event" that the option agreement contemplates is termination of employment, in which case the existing rights under the option are forfeited. That describes the operation not of a condition precedent, but of a condition subsequent.

... 
[Here, the rights and duties between the parties are fully earned and in esse, subject to defeasance by a later occurrence. The debtor does not earn the right to use the Option in this case at all. It was granted the Option at the outset. The debtor can forfeit some or all of the benefit of the Option by quitting (or lose the benefit by being fired), but absent the occurrence of these events, the Option has its full value on the day it is granted.]

Carlton clarified this analysis, suggesting that, were there a condition precedent to exercise, the debtor's efforts could reasonably be seen as creating a new property interest. However, the court viewed the potential for forfeiting an ESO by leaving employment or being fired as a classic condition subsequent, which it found to be "significant" in resolving the ESO ownership issue.

This line of argument is unusually formalistic. Typically, whether a condition is precedent or subsequent matters primarily for the burden of pleading and the timing of accrual of a cause of action, yet here the court uses the distinction in a substantive fashion to decide whether the debtor's postpetition employment creates a new property

Conditions [precedent] ... are those facts and events, occurring after the making of a valid contract, that must exist or occur before there is a right to immediate performance, before there is a breach of contract duty and before the usual judicial remedies become available. "Conditions subsequent" are traditionally those facts and events that occur after the breach of a contract duty. ... [T]hey terminate both the right to immediate performance and also the right to a judicial remedy. For the most part, provisions for "conditions subsequent" occur in surety bonds and insurance cases and the outcome depends on which party has to prove the loss and the facts surrounding the loss.

270 BR at 686-687.
309 BR at 74 ("The Allen court treated the exercise of the options as a vesting mechanism, such that the debtor essentially earned the options through continued employment. In this manner, the court was treating continued employment as a condition precedent to earning the options.").
Id at 75 ("The distinction between continued employment and termination of employment [is] significant as applied to the facts.").
Corbin, 8 Contracts § 30.7 (cited in note 62) ("[T]he outcome depends on which party has to prove the loss.").
right. At least one bankruptcy court has explicitly rejected the Dibiase reasoning. In In re Taronji, the debtor held restricted stock as of petition that he could not sell unless he maintained employment for about a year after bankruptcy. The trustee argued, along Dibiase lines, that the estate should take all of the stock because the debtor already owned the stock itself prior to filing, and that his ownership was merely subject to forfeiture in the event he did not remain employed. The court rejected the trustee’s argument, noting that “[t]he estate would not have been benefited by assuming Taronji’s rights in this restricted stock. . . . What was of value to the estate was unrestricted ownership of the stock, and this was contingent on Taronji’s postpetition services.” The Taronji court was thus unwilling to entertain abstract notions of property rights, but instead asked pragmatically what the estate would realize with and without the debtor’s postpetition efforts.

Perhaps the better justification for the pure asset rule is by way of analogy to bankruptcy’s treatment of covenants not to compete. For example, in In re Andrews, the Chapter 7 debtor had sold his business prepetition, subject to a covenant not to compete with the new owners. The buyers structured the deal so that the debtor received a series of payments over time, provided he did not compete with the new owners. Entering bankruptcy shortly after the sale, the debtor contended that these payments should be excluded from the estate under § 541(a)(6) as earnings from services performed postpetition. The court disagreed, holding that payments for refraining from performing personal services did not, as a matter of law, fall within the meaning of “earnings from services performed” in § 541(a)(6).” Application to the ESO case is clear: as the debtor need not take affirmative steps away from the prepetition baseline to maintain the right to the value of unvested options, these options are “sufficiently rooted in the prebankruptcy past” to become wholly property of the estate.

The second rationale for the pure asset approach is that a bankruptcy court may not follow the quantum meruit rule because it lacks the equitable power to do so: “The Allen court seems to have succumbed to the understandable, but dangerous, impulse to do what it

67 174 BR 964 (Bankr ND Ill 1994).
68 Id at 966–67.
69 Id at 971.
70 80 F3d 906 (4th Cir 1996).
71 Id at 908.
72 Id at 908–909.
73 Id at 912.
74 The classic test from Segal, 382 US at 380.
thought was equity in derogation of the plain import of the statute. This, a bankruptcy court cannot do.” The court cited United States v Sutton for the proposition that § 105 of the Bankruptcy Code “does not authorize the bankruptcy courts to create substantive rights that are otherwise unavailable under applicable law, or constitute a roving commission to do equity.” However, this assertion is questionable in light of the substantial body of case law dividing pro rata those contingent assets whose value depends on the debtor’s postpetition actions.

III. ANALYSIS

How might an appellate court decide between these two rules? One way to frame the fundamental issue, from a legal perspective, is whether the “vesting” of a block of options involves the creation of a new property right. However, the legal doctrines of contract and property law often yield contradictory results (compare Dibiase and Taronji) and turn on legal distinctions that have no economic significance. Rather than trying to wade through this difficult and highly abstract characterization problem, this Comment adopts a pragmatic approach and asks which rule better serves the goals of efficiency (social welfare) and estate maximization.

The taking of unvested ESOs can be viewed as a type of garnishment. The bankruptcy estate captures a portion of the debtor’s future income. However, this “garnishment” only applies to compensation from the original prepetition employer. If the debtor leaves her original job for another, the estate has no claim on any compensation, in whatever form, the new employer might provide.

The following analysis shows that the debtor’s ability to respond strategically to the legal rule regarding ESOs by changing employers leads to some unexpected results. In a simple model utilizing standard economic assumptions, the pure asset approach of Dibiase and Carlton, whatever its legal merits, has the potential to induce inefficient levels of labor market turnover and will often (paradoxically) diminish

75 Dibiase, 270 BR at 687.
76 786 F2d 1305, 1308 (5th Cir 1986).
77 11 USC § 105 (2000). Section 105(a) provides bankruptcy courts with general equitable powers:

The court may issue any order, process, or judgment that is necessary or appropriate to carry out the provisions of this title. No provision of this title providing for the raising of an issue by a party in interest shall be construed to preclude the court from, sua sponte, taking any action or making any determination necessary or appropriate to enforce or implement court orders or rules, or to prevent an abuse of process.

78 Dibiase, 207 BR at 687.
79 See examples cited in Part II.C, especially note 50.
the bankruptcy estate. In contrast, the quantum meruit (Allen) approach does a better job of preserving the efficient allocation of labor across firms and will likely lead to larger bankruptcy estates on average.

A. Assumptions

In order to look clearly at the phenomenon of interest, the model presented here necessarily abstracts from the complexity of the real world. The idea is to capture accurately the essential aspects of the employment and bankruptcy processes while ignoring factors that would make the analysis unwieldy or overly complicated but would not change the basic qualitative results.80

1. Timing, risk, and discounting.

In our simplified world, there are only two periods. Time is measured in discrete units and runs for two full periods, that is, from time \( t = 0 \) to time \( t = 2 \). For convenience, wages or salaries are paid annually; compensation earned in the period between \( t - 1 \) and \( t \) is paid at time \( t \). The model begins at time zero with workers already ensconced as employees at firms. The hypothetical debtor works both periods and declares bankruptcy at time \( t = 1 \), immediately after the first block of stock options vest.

This analysis makes three further simplifying assumptions: (1) all actors (workers, firms, creditors, and the trustee) are risk-neutral, (2) all actors attempt to maximize their expected lifetime wealth, and (3) the discount (interest) rate is zero—income today and income tomorrow are viewed as equivalent and there is no inflation.

2. Labor market.

The model world features a competitive labor market with many workers and many employers. Workers receive compensation in both wages \( (W) \) and stock options. Wages are constant over the two periods of the model. I further assume that an employee's compensation will be the same at any firm.81 Employees may switch employers, but doing so imposes positive switching costs \( C \) on the employees. There are at least two plausible explanations for why changing employers would impose positive costs on the employee. First, there are search costs

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80 See John L. Casti, 1 Reality Rules: Picturing the World in Mathematics vii (Wiley 1992) ("[A]ny mathematical model must necessarily throw away aspects of this 'real thing' deemed irrelevant for the purposes of the model.").

81 All firms have identical capital stocks and constant returns to scale production functions, so that the marginal product of an employee's labor (and thus, her compensation) is, ceteris paribus, the same at each firm.
associated with finding new employment (time spent looking for opportunities, costs of traveling and interviewing, and the like). Second, in leaving one employer for another, the employee forfeits any firm-specific human capital she has accumulated. Firm-specific human capital is the worker's stock of knowledge about the business of her employer, including: familiarity with the particular procedures and practices used in day-to-day business; knowledge of the business milieu in which the firm operates; and relationships with coworkers, clients, and suppliers. This knowledge translates directly into higher productivity on the job (and thus, in a competitive labor market in which workers are paid their marginal product of labor, greater compensation). To simplify the notation, I include both types of cost (direct search costs, and the costs associated with loss of firm-specific human capital) in the term $C$; switching costs then implicitly include any decrease in wages due to lower human capital.82


The ESOs modeled here are comparable to those described in the introduction—they are nonassignable contracts to buy shares of the employer's stock at a prearranged strike price ($S$), regardless of the market price ($P$) at the time the employee exercises the options. Assume the strike price ($S$) specified in the time-zero option grant is at or slightly below the then-prevailing market price ($P_0$). The ESOs are most likely American calls, meaning the owner can exercise the option at any time after it vests. If the employee leaves her job, she must exercise remaining vested ESOs immediately and she forfeits all unvested ESOs. These restrictions hold whether the options are currently owned by the employee or by the bankruptcy estate, because the estate takes the debtor's property subject to all restrictions that applied to the debtor.83

The employer makes an initial grant of options at time $t = 0$ when an employee begins to work for a firm, after which a portion of the options vest annually, at times $t = 1$ and $t = 2$. We will assume one particularly simple method of structuring the option grant: the straight-line method under which a constant portion of the total number of shares granted vests each period.84 At time $t = 1$, the employee gains the right

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82 Another way to specify the problem would be to posit different second-period wages for workers at original and alternative employers. However, this would introduce another set of terms into the analysis, complicating the results without making any substantive difference.

83 See Part II.A.

84 The ESOs were granted on a straight-line basis in DeNadai v Preferred Capital Markets, Inc, 272 BR 21, 25–26 (D Mass 2001); Carlton, 309 BR at 69; Dibiase, 270 BR at 675; and Allen, 226 BR at 859. In contrast, the four-year grant in In re Lawton, 261 BR 774, 777 (Bankr MD Fla
to purchase $N$ shares of stock at strike price $S$. At time $t = 2$, the right to another $N$ shares vests, for a total grant of options on $2N$ shares.

There are two ways to think of the value of an option at any point of time. The first is its immediate exercise value, what the employee-owner would realize if she exercised the option today. The exercise value is simply the excess (if any) of the market price over the strike price, or, formally, $X(P, S) = \max(0, P - S)$. If the current market price is less than the strike price, the option has zero exercise value.

But looking at the immediate exercise value alone neglects an important aspect of stock options mentioned earlier—the difference between the potential upside and the limited downside. Rather than looking at immediate exercise value, we could express the value of a call option at time $t$ with the Black-Scholes formula, which expresses the current market value of an option as a function of the current market price and the time to maturity.

The Black-Scholes option valuation formula incorporates two important economic insights about options. First, even an out-of-the-money option (one that would be worthless if the owner had to exercise it today) has value, as long as the expiration date is still in the future. Even if the current stock price is below the strike price, there's a chance that the price of the underlying stock will move in the future so that the option eventually becomes worth exercising. Second, the Black-Scholes value will always exceed the exercise value, up until the expiration date (at which time, the two values are necessarily equal). If $V$ represents the Black-Scholes value of an option, $V(P, S) > X(P, S)$ for all $t < t_x$. The intuitive explanation is straightforward: because the option is the right, but not the obligation, to buy at a preset price, the option holder faces a larger potential for gain than for loss. Even if one may exercise an American option before the expiration date, it pays, on average, to wait. Because we assume all actors are rational and risk-neutral, holders of American calls will retain their options as long as possible and exercise them only on the expiration date.

2001) was backloaded so that more options vested in each succeeding year: 993 options in 1999; 1,332 options in 2000; 1,625 options in 2001; and 1,983 options in 2002. Moving to a backloaded grant does not affect the qualitative results of the analysis.

85 The Black-Scholes formula is relegated to the Appendix. A good presentation can be found in Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance 606-08 (McGraw-Hill 6th ed 2000). The formula was originally published in Fischer Black and Myron Scholes, The Pricing of Options and Corporate Liabilities, 81 J Polit Econ 637, 644 (1973). The notation in the Appendix has been changed from Black and Scholes's original article to match the notation used in this analysis. It should also be noted that although Black and Scholes's pricing equation is for a European call option, if the underlying stock pays no dividends, then American and European calls are equivalent in value. See, for example, Peter Carr, Randomization and the American Put, 11 Rev Fin Stud 597, 597 (1998) ("American calls on non-dividend-paying stocks may be valued as European.").
An example may help illustrate. Suppose that an employee currently holds a vested option to buy her firm's stock at a strike price of $9. The current market price of one share of the stock is $10. Now suppose that before the option expires next year, there is an equal chance of the stock either gaining or losing $2 in value. If the employee exercises today, she realizes $1. If she waits until next year, she stands a 50 percent chance of seeing a stock price of $12, in which case she exercises the option and realizes $3, and a 50 percent chance of seeing a stock price of $8, in which case she simply lets the option expire and incurs no cost. Thus, the employee’s (known) value of exercising today is $1, while her expected value of exercising the option a year from now is $1.50 (($3 \times 0.5) + ($0 \times 0.5)) (ignoring the time value of money). It pays to wait. In the case where the call option is currently out-of-the-money (the stock price is less than the strike price), it will of course make sense to wait and hope that the stock price increases in the future. (Of course, the more in-the-money an option is—that is, the greater the degree to which the market price exceeds the strike price—and the less variable the stock price, the smaller the benefit of waiting.)

ESOs generally present some difficult issues in pricing and valuation because they are subject to trading and exercise constraints, unlike traditional market-traded options. However, the focus here is on the realization of the options by the trustee or the debtor, so it is unnecessary to complicate the model with questions of employer or market valuation of outstanding ESOs.


Assume that financial markets are efficient in the sense that current stock prices \( (P) \) incorporate all information about the future.

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value of the stock. This assumption means that it is impossible to systematically “beat the market”: all changes in stock prices are purely random and the expected change in stock prices from one period to the next is zero. There is no discernable trend in stock prices—the best guess about tomorrow’s stock price is today’s price. By assumption, all information is public, so it is impossible for anyone to profit by trading stock on the basis of private (inside) information, even employees of the firm whose stock is at issue. This implies that the debtor and the trustee, when deciding what to do with ESOs, are in the same position as any other market participant. They value ESOs according to the Black-Scholes formula and they have no reason (such as insider information) to depart from the standard “hold and wait” strategy for optimizing expected option value.

B. Chapter 7 Personal Bankruptcy

This Part sets out the debtor’s lifetime wealth maximization problem and describes the composition of the bankruptcy estate when the debtor holds vested and unvested ESOs.

Between \( t = 0 \), when the future debtor begins working, and time \( t = 1 \), the debtor earns a wage \((W)\) and the right to exercise a block of \( N \) options. The price of the stock underlying the debtor’s options has changed from \( P_0 \) to \( P \), perhaps increasing, perhaps decreasing.

Now suppose that shortly before time \( t = 1 \) there is some shock to the employee’s wealth (for example, an unexpected illness resulting in major medical expenses or a bad investment made on margin\(^9\)) such that she becomes insolvent and qualifies for Chapter 7 bankruptcy. She files her petition at time \( t = 1 \), initiating bankruptcy proceedings.

The employee’s bankruptcy estate will include “all legal or equitable interests of the debtor in property as of the commencement of the case,”\(^{10}\) including, “[p]roceeds, product, offspring, rents, or profits of

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87 The Supreme Court has explicitly endorsed the efficient markets hypothesis. See Basic Inc v Levinson, 485 US 224, 246 (1988) (“Recent empirical studies have tended to confirm Congress’ premise that the market price of shares traded on well-developed markets reflects all publicly available information.”). A good summary of the debate about the efficient markets hypothesis can be found in Burton G. Malkiel, The Efficient Market Hypothesis and Its Critics 3–5 (CEPS Working Paper No 91, Apr 2003), online at http://www.princeton.edu/~ceps/workingpapers/91malkiel.pdf (visited Aug 8, 2005).

88 As would be the case if stock prices follow a random walk: \( P_t = P_{t-1} + u_t \), where \( u_t \sim f(0, \sigma^2) \), identically and independently distributed, as per Malkiel, The Efficient Market Hypothesis at 3 (cited in note 87).

89 The latter was the case in DeNadai, 272 BR at 27 (“In April 1999, DeNadai opened a margin account with Preferred for the purpose of trading stock and investment stock options.... After a single bad investment, DeNadai found himself owing Preferred about $1,982,115.”).

90 11 USC § 541(a)(1).
or from property of the estate, except such as are earnings from services performed by an individual debtor after the commencement of the case.  As an initial matter, the estate will include the following: (1) any amount saved out of the debtor’s prepetition wages; (2) any other nonexempt prepetition assets of the debtor; (3) all stock options that have vested up to the time of petition; (4) at least a portion of the unvested options to which the debtor is entitled.

Regarding the final item, the number of unvested options kept by the estate depends on the legal rule in place. Under the pure asset rule, the estate takes all the unvested options. Under the quantum meruit rule, the estate takes a pro rata portion of the unvested options.

This list suggests a formal expression for the total size of the bankruptcy estate. Let the sum of items (1) and (2) above be denoted $A$, (total debtor nonoption assets as of petition). Further, let $V$ represent the expected Black-Scholes value of a single stock option that vests at time $t$. This value depends on the current market price of the underlying stock ($P_t$). Using these assumptions, we can express the expected value of the bankruptcy estate as of time $t = 1$ as

$$\text{Estate} = A + N\times V(P_1, S) + (1-\pi)\times N\times V(S)$$

The estate comprises all nonoption assets plus the total Black-Scholes value of vested options plus the estate’s share of the total Black-Scholes value of unvested options. The term $\pi$ is the debtor’s pro rata share of the ESOs that vest at the end of the second period. Under the pure asset rule, where the debtor receives none of these unvested options, $\pi = 0$. Under the quantum meruit rule, the debtor’s share of the unvested options depends on how much of the total vesting period occurred prepetition. Here, the debtor has worked one year of the two-year vesting period before bankruptcy, so the debtor keeps half the options, that is $\pi = 1/2$.

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91 11 USC § 541(a)(6) (emphasis added).
92 11 USC § 522(d) (or state law) exempts certain assets of an individual debtor from the estate, including personal residences (homestead), § 522(d)(1); tools of the trade, § 522(d)(6); and household goods, § 522(d)(3).
93 Because the option-holder’s optimal strategy is to hold onto the options until the expiration date, assume that none of the options has been exercised.
94 The expression for $\pi$ follows from the formula for the debtor’s share of postpetition options given in Part II.C. Since the second block of options was granted at $t = 0$ and vests at $t = 2$, the debtor’s pro rata share of these options, when the petition is filed at $t = 1$, would be one-half. The estate’s share of the options that vest postpetition is then the complement of the debtor’s share, $(1 - \pi)$ or, again, one-half.
Under the fresh start policy, the debtor receives discharge of all her obligations.\textsuperscript{95} Her remaining wealth at the moment after bankruptcy comprises her remaining postpetition wages and any of the unvested stock options to which the prevailing legal rule entitles her. That is, she keeps half the unvested options under the quantum meruit approach, and none under the pure asset approach. Remaining lifetime postbankruptcy wealth is given by

\[ \text{Wealth}_t = W + \pi \times N \times V_2(P, S) \]  

(III.2)

This expression presumes that the debtor remains with her current employer. However, because some portion of her postpetition stock options is, in effect, "garnished" by the trustee, she may be able to increase her total wealth by switching employers. All compensation from a new employer would represent postpetition property and hence would be exempt from the bankruptcy estate. That employment decision is examined in the next Part.

C. The Debtor's Problem

After bankruptcy, the debtor faces a reduced compensation package if she stays with her current employer because at least part of the options vesting postpetition will have been absorbed into the bankruptcy estate for the benefit of creditors. However, the debtor may be able to engineer her own "fresh start" simply by switching employers, thereby freeing herself from the estate's claim on the options vesting at \( t = 2 \). In a competitive labor market, employees are paid according to their productivity. The debtor can realize comparable compensation with any employer.\textsuperscript{96} Since part of what the employee is being paid by her current employer is forfeited under either rule (though, of course, to different degrees), she may do better with a different employer, if the costs associated with switching jobs are not too great.

Even where total compensation for an employee is the same at different firms, the debtor incurs two costs associated with switching employers:

1. \textit{Switching costs (C)}: As mentioned in Part III.A.2, these include the costs of searching for suitable employment (including the informa-
tion costs of learning which firms are hiring and the effort involved in applying for a position), the cost of traveling to interviews, and the firm-specific human capital lost when changing employers (the effects of which are included in $C$ rather than operationalized as a decrease in wage).

2. **Forfeiture of unvested options and consequent loss of exercise value:** If the market price has increased ($P_i > P_0$), leaving for a new employer who pegs a new option grant at or near current market value will be quite painful. Of course, the debtor only cares about the stock price to the extent that she is entitled to any of the options that vest postpetition. Under Dibiase’s pure asset rule, the debtor loses all rights to postpetition options, so she will be indifferent to the current market price. In this situation, switching to a new job will always provide an expected increase in option-based compensation.

What is the debtor’s remaining postbankruptcy lifetime wealth when she decides to switch jobs? As set out in Part III.A.2, this analysis assumes that all employers pay identical wages and offer identical stock option grants. In the equation below, the value of a variable associated with the alternative employer is denoted with an asterisk (*). For example, if the original strike price is $S$, then the strike price associated with the alternative employer’s option grant is denoted $S^*$. Since there are only two time periods, if the debtor switches employment at all, she does so immediately after petitioning for bankruptcy (at time $t = 1$). The debtor’s remaining postbankruptcy lifetime wealth (assessed in the moment after bankruptcy) would then be the wage ($W^*$), plus the expected value of the options offered at the new job ($NV^*$), less the various costs of switching ($C$), which include direct search costs and the costs of lost firm-specific human capital. Formally, the debtor’s wealth in alternative employment can be expressed as:

$$\text{Wealth}^* = W + N \times V_2(P_1^*, S^*) - C$$

(III.3)

The debtor will compare her expected remaining wealth under both scenarios—remaining with the original employer and changing jobs. Whether it pays for the debtor to switch jobs depends on the magnitude of the different variables in the wealth equations (III.2 and

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97 “Identical stock option grant” implies the following: (1) the same number of options are granted—taking into account the reduced time the employee has to work for the new employer—on the same schedule ($N$ options per period, but with the new employer, there is only a single period in which to work); (2) the initial spread between the market price of the new employer’s stock and the strike price of the new options is the same as it was with the ESO grant from the original employer back at time $t = 0$ (formally, $P_0 - S = P_1^* - S^*$); and (3) the probability distribution function (including volatility) of the underlying stock of the two firms is identical, that is, $f(P) \sim f(P^*)$, which implies $\text{Var}(P) = \text{Var}(P^*)$. This last assumption is necessary to ensure that the stock prices of the two firms behave in the same manner so that the options of the two firms will be equal in value when the market price-strike price spread is equal.
III.3) and on the legal rule that determined treatment of her ESOs in bankruptcy. The debtor will switch jobs if and only if

$$N \times V_2(P^*, S^*) - \pi \times N \times V_2(P, S) - C > 0$$  \hspace{1cm} (III.4)

Under the pure asset rule, the decision is a simple one: the debtor should rationally switch jobs if $$NV^* > C$$, that is, if the value of the new option grant from the alternative employer exceeds the switching costs (which, recall from Part III.A.2, include any decrease in wages associated with the loss of firm-specific human capital). Because the estate gets all the unvested options, the only question facing the pure asset debtor is whether the value of the new options exceeds the costs of changing jobs.

The situation for the quantum meruit debtor is more complicated. Her decision depends, in addition to the magnitude of the switching costs ($$C$$), on the expected value of the original unvested ESOs, which, in turn, depends on the current stock price. If the original options are heavily in-the-money (a large $$P - S$$ spread), it may pay to stay with the original job and accept a smaller portion of these relatively valuable options.

The first thing to note in comparing these two wealth expressions is that the debtor potentially has an incentive to switch under both regimes, but that the incentive is always greater under the pure asset regime. This relationship always holds because the quantum meruit debtor needs to take into account the extra quantity representing one-half the value of unvested options. Because even out-of-the-money options have some expected value, the quantum meruit debtor will always have some additional incentive (even if small) to stay with the original employer. (In fact, if switching costs are small enough, the pure asset debtor will always switch jobs.) Switching jobs under the quantum meruit regime involves an extra cost to the debtor that does not come into consideration under the pure asset regime: that of forfeiting some unvested options.

The different incentives facing the pure asset and quantum meruit debtors lead to:

**Proposition 1:** The probability of a debtor changing jobs post-bankruptcy is always greater under the pure asset rule than under the quantum meruit rule.*

Further, the alignment of the debtor's interests with the creditors' interests is different under the two rules. The creditors' ultimate payoff depends on the value of the ESOs from the original employer.

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98 The proof of Proposition 1 is presented in the Appendix.
While the quantum meruit debtor takes this quantity into account when deciding whether to switch jobs, the pure asset debtor does not. Under the pure asset rule, the debtor's incentives involve only the value of the ESOs at the alternative job and the switching cost; the debtor and the creditors have no interests in common. In contrast, under the quantum meruit rule, both the debtor and the creditors have an interest in the debtor remaining with her original employer where the original options appear as though they will be valuable once they vest.

D. Implications for the Estate

The goal of the trustee is to put together the largest possible bankruptcy estate with which to satisfy creditors' claims. Consider the effects on the estate (and thus on the creditors) if the debtor chooses to switch jobs: first, the estate must exercise (or forfeit) all the vested options immediately, thus losing the value of waiting described above; second, the estate must forfeit its unvested options in their entirety.

Qualitatively, there are three potential outcomes for the trustee and the bankruptcy estate. The most favorable outcome for the estate obtains where the court applies the pure asset rule (so all the unvested options enter the estate) and the debtor stays with her original employer so those ESOs eventually vest and can be exercised for the benefit of creditors. The second-best outcome for the estate is to receive half the unvested options (the quantum meruit rule) and for the debtor to stay with the original employer. The trustee's worst outcome, regardless of the legal rule in place, is for the debtor to leave her original employer. When the debtor changes jobs, the estate suffers in two ways. First, the estate loses all its interest in unvested options. Second, the estate is forced into early exercise (or expiration, if out-of-the-money) of the vested options. The remaining estate is the same under either rule: the exercise value of the vested options, or $NX_r$. Table 1 summarizes the potential outcomes for the estate in terms of the model variables.

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99 To see this mathematically, set $\pi = 0$ in equation III.4.
Employee Stock Options in Personal Bankruptcy

Table 1: Bankruptcy Estate ESOs, by Legal Rule and Whether the Debtor Changes Employers

<table>
<thead>
<tr>
<th>Debtor changes employers?</th>
<th>Legal Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pure Asset</td>
</tr>
<tr>
<td>No</td>
<td>$NV_1 + NV_2$</td>
</tr>
<tr>
<td>Yes</td>
<td>$NX_1$</td>
</tr>
</tbody>
</table>

If the debtor’s decision whether to stay with her original employer or to change jobs is completely independent of the legal rule applied in bankruptcy, then the trustee would clearly prefer the pure asset approach, as it would maximize the expected value of the bankruptcy estate. However, as stated in Proposition 1, the debtor’s employment decision relies crucially upon whether she is subject to the pure asset or quantum meruit rule, with the debtor being more likely to switch jobs and push the estate to the “worst” outcome (the smallest estate) under the pure asset rule. In a sense, then, the pure asset approach constitutes a “riskier” bet than the quantum meruit approach: the potential “good” payoff is greater (that is, the estate captures all, rather than only one-half, the unvested options), but the “bad” payoff ($NX_1$, the smallest estate) is also more likely.

This theoretical approach, without more, does not allow us categorically to prefer one rule to another. Each rule will tend to secure the greater amount of assets for the estate under particular conditions. For example, when switching costs are very large, the trustee need not worry about the debtor leaving her original employer, and will prefer the pure asset rule. Conversely, when such costs are negligible, retaining the debtor with her original employer becomes the trustee’s priority, and he will prefer the quantum meruit rule.

However, we can make a number of categorical statements about the relative efficacy of the two rules in different situations. The following propositions consider the effects on the estate under each rule of the key model variables.\(^{100}\)

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\(^{100}\) It might also be feasible for the pure asset trustee to reduce his exposure by bargaining with the debtor to remain with her original employer until all options vest. If low-cost bargaining is feasible, then the initial allocation of property rights (that is, who has the legal right to the options) should be largely irrelevant because parties will bargain to the jointly-efficient outcome. This possibility is taken up in some detail in Part IV.C.  

\(^{101}\) The proofs of these propositions are presented in the Appendix.
Proposition 2: When the market price of the underlying stock \( (P) \), increases, the expected (probabilistic) value of the quantum meruit estate increases by more than the expected value of the pure asset estate.

The implications are straightforward. First, consider the case where the bankruptcy estate would be larger under the pure asset rule than under the quantum meruit rule. An increase in the stock price will narrow the gap between the two hypothetical estates. On the other hand, if the quantum meruit estate would already be larger than the pure asset estate, an increase in price will further widen the gap. These results follow from the fact that a higher stock price dissuades the quantum meruit debtor from changing jobs, thus benefitting the estate (at least in a probabilistic sense), but a higher stock price will have no effect on the pure asset debtor’s employment decision.

Proposition 3: The larger the switching costs \( (C) \) facing the debtor, the larger the expected pure asset estate relative to the quantum meruit estate.

The more costly it is to switch jobs, the less likely the employee is to do so. When the employee does not switch, the quantum meruit rule captures a portion of the unvested options for the estate, but the pure asset rule captures the whole bundle.

Proposition 4: For a given wage and initial market price-strike price spread \( (P_0 - S) \), the more options granted \( (N) \), and thus the greater the portion of the total compensation package attributable to options rather than wages, the greater the expected quantum meruit estate relative to the pure asset estate.

Proposition 5: The more volatile the stock market \( (\sigma) \), the more valuable is any individual option, regardless of the prevailing market price. Where the unvested options are more valuable (in expectation), the quantum meruit rule will tend to outperform the pure asset rule in maximizing the estate.

These final two propositions require a somewhat subtler logic. While the number of options and the volatility of the price of the underlying stock are, by assumption, identical in the original and the new jobs, the quantum meruit debtor and the pure asset debtor process this information differently. The pure asset debtor gives up only the fixed costs of switching. For a pure asset debtor, more options or greater market volatility only make the new job more attractive. The quantum meruit debtor, on the other hand, gives up a portion of her

\[102 \] The assumption is set out in note 97.
existing unvested options. More options and greater volatility do make the new job's option grant more attractive, but it also makes the debtor's remaining portion of the unvested options from the original job more valuable, and thus makes keeping the original job more attractive as well. An increase in either of these factors will tend to push the quantum meruit debtor toward switching, but the push is weaker than in the case of the pure asset debtor.

Basically, the more important ESOs are as part of the employee's compensation package, the more likely the debtor is to feel his loss and go to another job if the court takes them away. This intuition might be what the "executive compensation" cases picked up on when adopting their quasi-quantum meruit rule where the debtor is a high-ranking executive who will often receive much of her compensation in the form of options.

In summary, a larger stock grant or a more volatile market makes the new job slightly more attractive to the quantum meruit debtor, but a lot more attractive to the pure asset debtor. Other things equal, a large number of options or a highly volatile stock market will tend to favor the quantum meruit estate over the pure asset estate. As always, it is impossible to categorically prefer one rule to another. However, as ESOs increase in importance as a portion of total compensation, the marginal benefit to the estate from keeping the debtor at her original job dwarfs the marginal benefit from adding more unvested options to the estate.

In conclusion, creditors (through their representative, the trustee) might prefer one rule or the other, depending on the particular facts of an individual debtor's case. However, even courts of equity must declare a general rule and follow it in every case. The next Part attempts to generalize these results and concludes that both the creditors' interests and social welfare are better served by the quantum meruit rule.

IV. IMPLICATIONS

Any consideration of efficiency in the context of legal rules affecting bankruptcy necessarily must ask two questions. First, how well do the legal rules currently in place serve creditors' interests? Second, do the legal rules serve social welfare as a whole, or do they distort incentives and reduce social welfare? This Part attempts to answer these questions and considers possible extrajudicial responses to the existing bankruptcy rules.

103 Again, assuming there's no feasible debtor-trustee bargaining, a subject considered in Part IV.B.
A. Practical Considerations Suggest the Bankruptcy Trustee Will, on Average, Prefer the Quantum Meruit Rule

It is impossible to prefer categorically one rule to another on the basis of the abstract analysis presented thus far. However, there are practical reasons to think that the quantum meruit approach will, across a large number of bankruptcies, best serve the trustee's goal of amassing the largest possible estate for creditors. The intuitive reason is straightforward: the pure asset rule tends to create a larger estate than the quantum meruit rule only when there is relatively little at stake. In contrast, where the estate has a lot to lose if the debtor changes jobs, the quantum meruit rule manages to secure at least a moderate amount for the estate.

While the pure asset approach offers the potential for the best possible outcome (from the creditors' point of view), it generally secures this outcome only where the stakes are relatively low. Where the pure asset rule has the potential to add a great deal of value to the estate (in the form of unvested options), it also provides the greatest incentive for the debtor to switch jobs, thus destroying that value. Recall that the pure asset debtor will change jobs as long as the value of the new options gained exceeds the switching costs incurred (that is, if $NV_2(P_j^*, S^*) > C$). There are two situations in which the debtor will choose not to switch jobs. First, when the number of options granted is very small, so that they represent a minor proportion of the debtor's total compensation. Second, when an individual debtor faces particularly high switching costs. However, although legal rules must apply broadly to all debtors, there is no good reason to think that switching costs are uniformly large across the general population.

A trustee in a pure asset jurisdiction is caught on the horns of a dilemma. The rule secures the maximum amount of assets for the creditors if the debtor stays with her original employer. However, given a moderate value for the average switching costs ($C$), this result is likely only where future ESOs represent a minor aspect of the compensation package. Where options represent a major portion of the debtor's expected wealth, the debtor will have a strong incentive to change jobs, even if that means incurring switching costs. The pure

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104 Where the stakes for the estate are great, the pure asset trustee may be able to bargain with the debtor to get her to stay with her original employer until all ESOs vest. This possibility is examined in Part IV.B below. That Part shows that if the debtor has private information about her costs of switching, the trustee's optimal offer to the debtor resembles the debtor's take under the quantum meruit rule. The further implication is that if the costs of bargaining are nontrivial, the trustee may prefer courts to simply implement a general rule granting all debtors some portion of unvested options, as under the quantum meruit rule.
asset rule garners the most assets for the estate when, on average, it is least worthwhile to do so.

Although the pure asset approach is self-defeating in this regard, the quantum meruit approach does a good job of keeping the debtor with her original employer when the stakes for the estate are greatest. This is true because the quantum meruit rule aligns the debtor's interest with the estate's interests by giving the debtor a share of the proceeds of options that vest postpetition. As seen in equation III.4 above, the quantum meruit debtor finds it least attractive to change jobs when there is a lot of potential wealth tied up in unvested ESOs (that is, where \( N \) and \( P \) are such that \( NV/P \) is large). This is precisely the situation in which the trustee wants to keep the debtor from switching jobs. In direct contrast to the pure asset rule, the quantum meruit rule makes the debtor less likely to switch jobs precisely when the estate has the most to lose from such a switch.\(^\text{106}\)

The pure asset rule, which seems to secure the greatest possible benefit for the estate, risks—once the debtor's strategic response is taken into account—leaving the estate and the creditors worse off than the quantum meruit rule. The empirical question remains whether the pure asset rule or the quantum meruit rule will lead, on average, to larger bankruptcy estates. Unfortunately, the limited number of ESO cases and the lack of information on what happens after these cases are decided preclude empirical analysis. But perhaps the most convincing argument in favor of the quantum meruit rule becomes apparent when one considers what happens to the division of ESOs in a pure asset jurisdiction when the debtor and the trustee can bargain.

B. If Bargaining is Feasible, a Rational Pure Asset Trustee Will Divide the Unvested Options with the Debtor

Change hats for a moment and consider the position of the trustee in a jurisdiction that uses the pure asset rule. Suppose he is concerned that the debtor will leave her original job for greener (more remunerative) pastures if the estate claims all her ESOs. If the trustee wants to create the largest possible bankruptcy estate, he should be willing to bargain with the debtor to try to preserve the value tied up in unvested ESOs. Even a risk-neutral trustee\(^\text{106}\) will avoid "leaving

\(^\text{105}\) Formally, the probability of keeping a debtor with the original employer is positively correlated with the value to the estate of doing so under the quantum meruit rule, but negatively correlated under the pure asset rule.

\(^\text{106}\) As the trustee will usually represent large institutional creditors with diverse portfolios, risk-neutrality is a sensible assumption.
money on the table.” If bargaining is possible and transaction costs are small, the precise legal rule is largely irrelevant; parties will bargain to ensure the economically efficient division of options regardless of the initial allocation of property rights. Where unvested ESOs are at stake, the trustee should be willing to compensate the debtor for staying with her original employer, at least when the current stock price suggests that the unexercised options will eventually pay off handsomely, and when it looks as though the debtor might otherwise have a strong incentive to change jobs.\textsuperscript{107}

Consider first the case in which the trustee has perfect information. The trustee knows that the debtor who changes jobs gains the options offered by the new employer, but incurs the costs of switching (which the trustee can observe). If the trustee offers her an amount at least this large (that is, $NV^* - C$), the debtor will remain with her original employer and the estate will realize the value tied up in unvested options (minus the payment to the debtor and any costs of transacting).

However, the presence of asymmetric information might limit the benefits to bargaining. In the real world, the trustee will not have perfect information about all the variables affecting the debtor’s decision. While some important variables, such as the current market price of the employer’s stock, will be observable, others, particularly the debtor’s cost of changing jobs, likely will not. The debtor has an incentive to represent her switching costs as being very low in order to maximize the trustee’s offer. Indeed, the debtor may go so far as to (wastefully) obtain an alternative offer of employment in order to buttress her bargaining position vis-à-vis the trustee.\textsuperscript{108}

This asymmetric information case is analogous to that of a government regulator attempting to set a price for the output of a monopolist utility where the regulator cannot perfectly observe the monopolist’s costs. The monopolist has an incentive to pretend to have high costs in order to induce the regulator to approve a high price for

\textsuperscript{107}Note that any such payment (whether in the form of cash or as a portion of the unvested options) would probably require court approval as use of property of the estate “other than in the ordinary course of business” under 11 USC § 363(b)(1). Compare the process for approval of Key Employee Retention Plans (KERPs) in Chapter 11 cases, where the trustee, subject to court approval, may authorize a debtor-employer to make additional payments to crucial employees in order to prevent them from seeking alternative employment. For examples of KERP plans and the approval process, see \textit{In re Aerovox, Inc}, 269 BR 74 (Bankr D Mass 2001); \textit{In re America West Airlines, Inc}, 171 BR 674 (Bankr D Az 1994); \textit{In re Interco, Inc}, 128 BR 229 (Bankr ED Mo 1991).

\textsuperscript{108}In fact, § 331 of the recent Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, 119 Stat at 23, amends the Bankruptcy Code to require proof of a bona fide job offer from another employer before the court may approve a KERP payment to an employee of the debtor. See 11 USC § 503(c)(1)(A) (Supp 2005).
its output. The well-known result in such cases is that the utility is able to capture a price in excess of its average cost ("information rents"); the regulator effectively bribes the utility to reveal its cost structure. We can expect a similar result to follow in the bankruptcy setting where the debtor has private information about the magnitude of the switching costs she faces.

A risk-neutral trustee who knows only the population distribution of switching costs, and not those faced by an individual debtor, should still be able to calculate a payment that will, on average, maximize the size of the estate. The optimal "bribe" will equalize the marginal loss to the estate from the payment with the marginal probabilistic gain to the estate from the decrease in the probability that the debtor changes jobs. If the offer takes the form of a proportion of the unvested options, the trustee's problem can be stated as

$$\text{Max}_\omega E(\text{Estate}) = [1 - J(\omega)][NV + (1 - \omega)NV] + J(\omega)X. \quad (IV.1)$$

$$J$$ is the probability that the debtor changes jobs, a probability that is sensitive to the magnitude of the trustee's offer. Under a further assumption about the distribution of switching costs in the population, the solution to the trustee's problem is the optimal offer $$B$$, defined as

$$B = \text{Min}(\omega NV, NV_*), \text{ where } \omega = \frac{1}{2} \left( 2 + \frac{V_* - X}{V} - \frac{2\gamma}{NV} \right). \quad (IV.2)$$

The optimal offer will be the smaller of (1) the fraction of the unvested options that sets expected marginal cost equal to expected marginal benefit, and (2) the "100 percent acceptance offer" ($$NV_*$$). Because the trustee can get even a zero-cost debtor to stay with a bribe of $$NV_*$$, he will never offer more than this amount. What is interesting is that the payment the trustee is willing to make under asymmetric information looks a lot like the quantum meruit rule, though depending on the values of relevant variables, the optimal proportion of options ($$\omega$$) may be more or less generous than the fraction ($$\pi = 1/2$$) under the quantum meruit rule.

Note that the optimal offer (assuming it is less than $$NV_*$$) does not guarantee debtor acceptance; it simply maximizes the expected

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110 Assume that switching costs are distributed uniformly with mean $$\gamma$$, that is $$C \sim U(0, 2\gamma)$$.

111 This solution follows from taking the first order condition for equation IV.1, applying the assumption for $$f(C)$$ in note 110, and solving for $$\pi$$. The "min" and "max" operator is necessary to incorporate the corner solution at $$NV_*$$.

112 For purposes of this discussion, I assume that $$\omega$$ is positive.
(probabilistic) value of the estate over many bankruptcies. Where there is private information, rational and risk-neutral trustees will accept that some debtors will be overcompensated to stay and, in other cases, the debtor and the trustee will never reach an agreement at all. Thus, the presence of asymmetric information may place considerable limits on the practical effectiveness of any bargaining process between the trustee and the debtor. Where the debtor has private information, the rational, risk-neutral trustee will make an offer that looks a lot like what the debtor would get under the quantum meruit rule. Moreover, in order to determine the optimal offer to make, the trustee will need to incur information costs to learn about the variables of interest. If information costs and costs of bargaining are other than negligible, it may make sense for courts to instate a rule of general application that gives the debtor some share of the options, rather than incurring these costs in each and every case involving ESOs. If we think of the pro rata formula (equation II.1) as a rough approximation to the optimal offer in this bargaining game, we can view courts' adoption of the quantum meruit rule as an effort to minimize information and transaction costs in situations of asymmetric information.

C. Aggregate Social Welfare is Greater Under the Quantum Meruit Rule

Legal rules have the potential to generate deadweight loss by distorting incentives. In the present case, the capture of unvested ESOs by the bankruptcy estate can induce the debtor to make a socially-costly job change when there is no fundamental economic rationale for doing so. The hypothetical debtor is no more productive in alternative employment than at her original firm. Indeed, she may be less efficient, at least initially, if she has sacrificed some firm-specific human capital in the move. Because switching jobs is costly, the debtor would rarely do so in the absence of a legal rule that appropriates postpetition options.

113 It will be more efficient to grant the debtor a portion of the options rather than a cash payment, since, in the latter case, courts must engage in costly monitoring and enforcement to ensure that the debtor holds up her end of the deal (that is, that the debtor does not take the money and run to another employer). In contrast, if the debtor is compensated in unvested options, the agreement is self-policing.

114 Note that society as a whole loses nothing when options are forfeited. Any derivative contract, options included, necessarily has two parties to the transaction. The gains of one party are losses to the other party. Here, while the debtor and/or the bankruptcy estate may forfeit the value of unvested options if the debtor changes jobs, the employer (or, more accurately, its stockholders) realizes an equal and offsetting gain because it is no longer liable to the employee. Society as a whole has neither gained nor lost.
Both the quantum meruit and pure asset rules induce excess labor market volatility. Both rules can lead to an inefficient level of debtor job-switching, though the pure asset rule proves the more inefficient of the two. This follows from Proposition 1, which states that a given debtor is more likely to change jobs under the pure asset rule. For a large population of debtors, there will be more debtors changing jobs under a pure asset rule than under a quantum meruit rule. This excess mobility is costly to both the bankruptcy estate and to society as a whole. If the debtor simply remained with her original employer, society would save the costs \( C \) associated with changing employment.

It is probably impractical to eliminate the deadweight loss associated with excess employment change without offending other aspects of bankruptcy policy. The Ninth Circuit has described the two traditional policy goals of Chapter 7 as: "(1) giving the individual debtor a fresh start, by giving him a discharge of most of his debts; and (2) equitably distributing a debtor's assets among competing creditors." Since the question of who keeps the ESOs is zero-sum from society's point of view, social welfare would be maximized when no debtors changed jobs. However, if courts were to set \( \pi \) so large that debtors never changed employers, creditors would be shortchanged. With such a generous rule inside bankruptcy, creditors would seek to levy on debtors' assets outside of bankruptcy. There would be a "rush to the courthouse" in which creditors attempt to get as much as possible under state debtor-creditor law before the debtor petitions for bankruptcy. Avoiding this sort of wasteful and inequitable race is one of the prime goals of federal bankruptcy law.

Or consider an approach under which the court tries to give the debtor incentives to act efficiently. One such approach would be for the court to (1) value unvested options as of the petition date (using the Black-Scholes or some other formula), (2) abandon the unvested options to the debtor, and (3) make the debtor liable to the trustee for the estimated amount (or a pro-rated portion of that amount). The debtor would owe the estate a dollar amount equivalent to whatever the estate would expect to receive if it kept some or all of the options. This approach forces the debtor to internalize the costs of changing

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115 Sherwood Partners, Inc v Lycos, Inc, 394 F3d 1198, 1203 (9th Cir 2005) (outlining the policies behind Chapter 7 before determining that a state statute conflicted with the bankruptcy code).
116 I implicitly assume that bankruptcy courts would rather, all else equal, give a dollar to creditors than to the debtor. Of course, the analysis of ESO rules involves the case in which the amount the debtor receives affects the total amount of assets to be divided.
117 "Bankruptcy is designed to provide an orderly liquidation procedure under which all creditors are treated equally. A race of diligence by creditors for the debtor's assets prevents that." HR Rep No 95-595, 95th Cong, 1st Sess 340 (1977), reprinted in 1978 USCCAN 6296.
jobs and leads to an efficient outcome. However, saddling the debtor with postbankruptcy obligations also compromises the other main policy goal of the Bankruptcy Code: the fresh start for individuals.\textsuperscript{118}

While some social welfare loss is perhaps unavoidable in bankruptcy proceedings without offending other important policy goals, a rule that results in smaller deadweight loss is preferable to one that is more socially inefficient. On this ground, the quantum meruit rule is preferable to the pure asset rule.

D. Private Sector Solutions

The \textit{Dibiase} pure asset rule has negative implications for both the estate and social welfare in general. Does this suggest the urgent need for a change in legal rules? Not necessarily. Private action can potentially abate the problems associated with the pure asset rule. Employers and debtors seeking to avoid the relatively harsh \textit{Dibiase} outcome might consider drafting option-granting instruments with explicit conditions precedent or granting options on a rolling basis. Neither choice imposes significant costs on employers and each might help retain employees who happen to enter bankruptcy.

1. Option grants with explicit conditions precedent.

First, it might be possible to write option-granting contracts to satisfy the formalistic demands of the \textit{Dibiase} rule by making employment on the vesting date a condition precedent to the contractual right to the option. In \textit{Carlton}, the court, applying the condition precedent/subsequent framework from \textit{Dibiase}, stated that the vesting schedule’s reliance on a condition subsequent, rather than a condition precedent was “significant as applied to these facts.”\textsuperscript{119} This passage seems to suggest that option contracts that incorporated a true condition precedent would compel application of the quantum meruit formula.

Thus, the option-granting agreement could include a provision resembling the following:

Upon completion of $T$ continuous years of full-time employment with \textsc{Employer}, \textsc{Employee} shall be entitled to purchase $N$ shares of \textsc{Employer} stock at the price $S$, with such contract right vesting $T$ years from the date of this agreement.

This type of contract provision, by highlighting the “magic words” associated with conditions precedent, would seemingly qualify under the \textit{Dibiase} and \textit{Carlton} requirements. \textit{Dibiase} unfavorably compared

\textsuperscript{118} The fresh start policy was discussed in Part II.A.

\textsuperscript{119} 309 BR at 75.
the debtor's option grant to "true" retirement benefits, which suggests that the more the contract language for the option grant could be made to resemble that commonly used for retirement benefits, the better the chances of courts finding such language to create a condition precedent.

Redrafting of the option-granting contract has merit as a solution to the problems of the pure asset rule in that it is not very costly. However, bankruptcy courts that apply that rule are likely to look past the language of such a contract to its fundamental nature and reach the same conclusion as in the existing cases. Employers may be able to find a more robust fix by restructuring the schedule of their option grants, as discussed below.

2. "Rolling" option grants.

Rather than rewriting its contracts, the option-granting employer may be able to use a series of rolling option grants to protect its employee from forfeiture of options in bankruptcy. A rolling grant would work as follows: instead of signing a single contract that provides for vesting of \(N\) options each year for several years, the rolling grant would employ a series of annual contracts. Each contract would involve a smaller number of options vesting in each of several succeeding years. At any given time, the employee would be receiving options under several different granting contracts. The total number of options vesting would be the same as under a one-time grant, but the contractual rights to those options would be staggered.

A rolling grant would start with a single option-granting contract and an additional contract would come into force each successive year, while keeping the total number of options vesting each year constant. For example, rather than granting 1,000 options per year over four years with a single contract, the rolling grant would employ four separate contracts executed in successive years. The first contract would grant 1,000 options the first year, 500 options the second year (when two contracts of 500 options each are in effect), 333 options the third year (when three contracts are in effect), and so forth. Each year a new contract will come into effect to keep the total number of options vesting each year at 1,000.

The beauty of the rolling grant is that it obtains the quantum meruit result even in a pure asset world. It even offers improvement

120 Dibiase, 270 BR at 678–79.
121 A drawback of this approach is that the employee is merely relying on the employer's promise to execute additional contracts in the future. If this promise is not credible, the incentive mechanism may break down.
(from the debtor's point-of-view) over the one-time grant under the quantum meruit rule. Table 2 illustrates this effect for a hypothetical four-year grant of 4,000 options, effected as either a one-time grant or as a rolling grant. The rolling grant returns 834 options to the debtor under the pure asset rule—the same amount as the one-time grant does under the quantum meruit rule. Moreover, when the quantum meruit rule is applied, the debtor keeps approximately 68 percent more options if she uses a rolling grant than if she uses a one-time grant.

Table 2: Comparison of One-Time and Rolling Option Grants, Under Quantum Meruit and Pure Asset Regimes

<table>
<thead>
<tr>
<th>Total Number of Options—</th>
<th>One-Time Grant</th>
<th>Rolling Grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granted to Debtor</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Kept by Debtor:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantum Meruit Rule</td>
<td>834 (20.9%)</td>
<td>1,401 (35.0%)</td>
</tr>
<tr>
<td>Pure Asset Rule</td>
<td>0 (0.0%)</td>
<td>834 (20.9%)</td>
</tr>
</tbody>
</table>

Regardless of which legal rule prevails, the rolling grant provides superior outcomes for the employee-debtor. There is no need to worry about whether an option-granting contract provision represents a condition precedent or subsequent because, as a legal matter, the later segments of the rolling grant do not exist as property rights that could become part of the bankruptcy estate under § 541(a)(1).

V. CONCLUSION

The microeconomic approach to analysis of employee stock options in bankruptcy shows that the pure asset rule of Dibiase and Carlton can be criticized on two grounds. First, the pure asset rule may, in many cases, actually reduce the average or expected size of the bankruptcy estate relative the quantum meruit rule. The pure asset rule does so by encouraging strategic job-change behavior on the part of the debtor. This job change penalizes the estate in two ways. First, vested options that should be retained until expiration must be exercised immediately. Second, and more importantly, the estate forfeits all options that have yet to vest. In contrast, the quantum meruit rule, by giving debtors a stake in the options, is more successful at keeping debtors with their original employers, particularly when a great deal of potential wealth is tied up in options.

122 Derivation of these results is presented in the Appendix.
The second ground on which to reject the pure asset rule is that it induces a socially-inefficient level of labor market mobility among debtor-employees. The quantum meruit rule of *Allen* and its progeny shares this latter vice, but to a lesser extent. A rule that results in smaller deadweight loss is, all else equal, preferable to one that is more socially inefficient.

A bankruptcy court considering the ESO issue as one of first impression (or an appellate court reviewing the issue de novo) will best serve the twin goals of economic efficiency and estate maximization by choosing a rule like that in *Allen* that gives the debtor some interest in ESOs that vest postpetition. Moreover, the quantum meruit rule, by allowing the debtor to keep some unvested ESOs, may better comport with the Bankruptcy Code's goal of giving the individual debtor a fresh start.

In jurisdictions where the pure asset approach of *Dibiase* is the rule, extrajudicial solutions may reduce inefficiencies. On the one hand, a rational trustee may be able to bargain with the debtor, offering her a share of the options to induce her to stay with her original employer. On the other hand, employers who offer ESOs can protect their employees from the total forfeiture of options in two ways: by framing their option grant agreements to create a condition precedent to vesting, or by moving to a system of rolling option grants.
The Black-Scholes formula:

\[
V(P,t) = P\Phi\left(\frac{\ln(P_t/S) + \left(\frac{r + \sigma^2}{2}\right)(t_x - t)}{\sigma\sqrt{(t_x - t)}}\right) \\
- Se^{-r(t_x - t)}\Phi\left(\frac{\ln(P_t/S) + \left(\sigma^2\right)(t_x - t)}{\sigma\sqrt{(t_x - t)}}\right)
\]  

(A.1)

The new terms are:

- \(\Phi(\cdot)\) is the standard normal cumulative distribution function.
- \(\sigma\) is the historic standard deviation of stock returns.
- \(r\) is the risk-free interest rate (here assumed to be zero).
- \(e\) and \(\ln\) are the natural exponent and natural log functions, respectively.

Proof of Proposition 1:

Define \(J\) as the probability that the debtor changes jobs after bankruptcy. Then, from III.6, \(J\) is simply the probability that her expected lifetime wealth will be higher in the new job.

\[
J = \text{Pr}[NV_2^*(P_t^*) - NV_2(P_t) - C > 0] = \text{Pr}[C < NV_2^*(P_t^*) - \pi NV_2(P_t)]
\]  

(A.2)

Define the switching costs \(C\) as a random variable with distribution \(f(C)\) with support \(\mathbb{R}^+\) and mean \(\gamma\). Further, assume that \(f(C)\) is “well-behaved” in the sense that \(\exists c \in (NV_2^* - \pi NV_2, NV_2^*) : f(c) > 0\), that is, there is some positive probability that someone faces switching costs that would dissuade them from changing jobs under one rule, but not the other.

\[
J = \int_{\pi NV_2(P_t) - NV_2^*(P_t)}^{NV_2^*(P_t) - \pi NV_2(P_t)} f(C)\,dC
\]  

(A.3)

Recall that \(\pi = \frac{1}{2}\) under the quantum meruit rule and \(\pi = 0\) under the pure asset rule. The Black-Scholes theorem (A.1) implies \(V(P, X) > 0, \forall P, P^*, X, X^*\). Then:

\[
J_{QM}(P_1, N, C) = \int_{0}^{NV_2^*(P_t^*) - (1/2)NV_2(P_t)} f(C)\,dC < \int_{0}^{NV_2^*(P_t^*)} f(C)\,dC = J_{PA}(N, C)
\]  

(A.4)
The probability of changing jobs is always greater under the pure asset rule than under the quantum meruit rule. Further, although the probability of changing jobs under the quantum meruit regime depends (negatively) on the stock price $P$, the corresponding probability under the pure asset regime does not.

Sketch of Proofs of Propositions 2-5:

The expected value of the bankruptcy estate as of time $t = 1$ is (using Table 1 and suppressing arguments) will be:

$$E_1(Estate) = (1 - J)(NV_1 + \pi NV_2) + JNX_1$$

(A.5)

Define

$$\theta = N^{-1}[E_1(Estate(QM)) - E_1(Estate(PA))]$$

(A.6)

Assume that there is at least a minimal amount of variation in stock returns ($\sigma$) such that a $1$ increase in the stock price implies a 67 cent increase in the value of a stock option when the market price and the strike price are equal: $\frac{dV}{dP} \geq 2/3$ for $P = S$. Also assume the values of $N, f(C), P$, and $\sigma$ are such that the following two regularity conditions hold:

$$V \geq \frac{2(1 - JPA)}{N \cdot f(NV^* - \frac{1}{2}NV)}$$

(A.7)

and

$$V \geq \frac{(1 - JPA) \frac{\partial V}{\partial \sigma}}{N \cdot f(NV^*) \frac{\partial V^*}{\partial \sigma}}.$$

These two technical conditions essentially require that there is enough potential value in the options to make them worth worrying about.

Then using the results that (1) $J^{PA} > J^{QM}$ for all $P$ (Proposition 1); (2) $V_t \geq X_t$ for all $t$ (strictly greater when $t < t^*$) (Part III.A.3); (3) $\frac{\partial J^{QM}}{\partial P} > \frac{\partial J^{PA}}{\partial P} = 0$ (Part III.C); (4) $\frac{\partial V}{\partial \sigma} > 0$ (from equation A.1); and (5) $E_t(V_t) = E_t(V_t)$ (same); it can be shown that:

$$\frac{\partial \theta}{\partial P} > 0, \frac{\partial \theta}{\partial N} > 0, \frac{\partial \theta}{\partial Y} < 0, \text{ and } \frac{\partial \theta}{\partial \sigma} > 0.$$  

(A.8)
Derivation of Rolling Asset Grants:

### Table A.1: Number of Options Vesting

<table>
<thead>
<tr>
<th>Date</th>
<th>One-Time</th>
<th>Rolling</th>
<th>Contract 1</th>
<th>Contract 2</th>
<th>Contract 3</th>
<th>Contract 4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 1, 2000</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan 1, 2001</td>
<td>1,000</td>
<td>1,000</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>1,000</td>
</tr>
</tbody>
</table>

### Table A.2: Number of Options Retained by Debtor Under Pure Asset Rule

<table>
<thead>
<tr>
<th>Date</th>
<th>One-Time</th>
<th>Rolling</th>
<th>Contract 1</th>
<th>Contract 2</th>
<th>Contract 3</th>
<th>Contract 4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 1, 2000</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
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<td></td>
<td>0</td>
</tr>
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### Bankruptcy Petition Filed

<table>
<thead>
<tr>
<th>Date</th>
<th>One-Time</th>
<th>Rolling</th>
<th>Contract 1</th>
<th>Contract 2</th>
<th>Contract 3</th>
<th>Contract 4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 1, 2002</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
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<tr>
<td>Jan 1, 2003</td>
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<td>0</td>
<td>334</td>
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<td>334</td>
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<tr>
<td>Jan 1, 2004</td>
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<td>250</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Total</td>
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<td>0</td>
<td>0</td>
<td>584</td>
<td>250</td>
<td></td>
<td>834</td>
</tr>
</tbody>
</table>
Table A.3: Number of Options Retained by Debtor Under Quantum Meruit Rule

<table>
<thead>
<tr>
<th>Date</th>
<th>One-Time</th>
<th>Rolling</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contract 1</td>
<td>Contract 2</td>
<td>Contract 3</td>
<td>Contract 4</td>
<td></td>
</tr>
<tr>
<td>Jan 1, 2000</td>
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<td>0</td>
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<td></td>
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</tr>
<tr>
<td>Jan 1, 2001</td>
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<td>0</td>
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</tr>
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<td>167</td>
<td>250</td>
<td>250</td>
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<td>792</td>
</tr>
<tr>
<td>Total</td>
<td>834</td>
<td>237</td>
<td>330</td>
<td>584</td>
<td>250</td>
<td></td>
<td>1,401</td>
</tr>
</tbody>
</table>