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Michael S. Knoll
University of Pennsylvania Carey Law School

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*Michael S. Knoll**

INTRODUCTION

Although inflation-indexed notes have never been popular in the United States, such notes have been much more successful abroad, especially in countries with histories of variable and high inflation.[1] Economists call these notes index-linked or I-L notes,[2] but I prefer to call them price-level adjusted notes or PLANs.[3] PLANs are often tied to a national consumer price index (CPI) and promise the lender a return of its principal adjusted for inflation plus an additional amount of interest.[4] The latter is commonly a fixed annual percentage, and it is dependent on the real cost of capital and the riskiness of the loan.

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* Associate, Irell & Manella, Washington, D.C.; Assistant Professor, University of Southern California Law School (effective Fall 1990). The author would like to thank Pamela Aycock, Adam Handler, Gary Friedman, Susan Liebeler, Wesley Liebeler, Arthur Lowry, Ivan Mattei, José Scheinkman, and Susan Woodward for their willingness to discuss the many issues raised by inflation-indexed bonds. The views expressed in this paper are solely those of the author.

[1] *See* R. BREALEY & S. MYERS, PRINCIPLES OF CORPORATE FINANCE 520 (2d ed. 1984).

[2] In the last few years, many economists have studied I-L notes. *See, e.g.*, Eden, *Indexation and Related Issues: A Review Essay*, 16 J. MONETARY ECON. 259 (1985); Fisher, *On the Nonexistence of Privately Issued Index Bonds in the U.S. Capital Market*, in INFLATION, DEBT, AND INDEXATION 247-66 (R. Dornbush & M. Simonson eds. 1983); Hochman & Palmon, *A Tax-Induced Clientele for Index-Linked Corporate Bonds*, 43 J. FIN. 1257-63 (1988); Levhari, *The Effects of Government Intermediation in the Indexed Bond Market on Consumer Behavior*, in INFLATION, DEBT, AND INDEXATION, *supra*, at 281-307; Liviatan, *On the Interaction Between Wage and Asset Indexation*, in INFLATION, DEBT, AND INDEXATION, *supra*, at 267-80; Peled, *Stochastic Inflation and Government Provision of Indexed Bonds*, 15 J. MONETARY ECON. 291 (1985).

Edgeworth, Fisher, Jevons, Keynes, Marshall, Friedman, Modigliani, and Tobin are among the leading economists who have advocated the use of at least some indexed assets. *See generally* Peled, *supra*; Siegel & Warner, *Indexation, the Risk-Free Asset, and Capital Market Equilibrium*, 32 J. FIN. 1101 (1977).

[3] I prefer to call notes that are indexed for inflation PLANs because many different indexes can be used for I-L notes. For example, in 1988, the Magma Copper Company issued I-L notes that were linked to the price of copper. *As Good As — Well, Copper*, BUS. WK., Dec. 19, 1988, at 87. PLANs are simply those I-L notes that are tied to a general price level.

[4] Both the principal and the interest can be adjusted for inflation. *See* R. BREALEY & S. MYERS, *supra* note 1, at 520. Obviously, indexing both the interest and principal instead of just the principal provides greater protection from unanticipated inflation.

For several years, the Department of Housing and Urban Development (HUD) has been promoting PLANs for home mortgages.[5] Recently, several corporations have issued securities that are tied to U.S. price levels.[6] Although interest in the United States in PLANs is growing, their tax treatment has yet to be determined. The different ways that PLANs could be taxed under the U.S. federal income tax law, how they should be taxed, and how they should be designed for the U.S. market in light of their likely tax treatment are the subjects of this Article.

Part I contains a brief description of the relevant provisions of the U.S. federal income tax law, describes how these provisions could apply to notes indexed for inflation, and suggests how they should be applied. Parts II and III describe how to design PLANs for the U.S. market. Part II shows how PLANs should be designed to take into account the taxation of purely nominal gains,[7] and Part III catalogues some variations of the

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[5] *See* Bailey, *PLAM!*, FORBES, Jan. 23, 1989, at 38.

[6] See Woodward & Crowe, *A Power-Packed Mortgage*, 5 SECONDARY MORTGAGE MKTS. 2, 7 (1988). The economic arguments why corporations should issue PLANs are well-known in the literature. The major benefit from the use of PLANs is that they eliminate the effect of unanticipated changes in the rate of inflation on the real rate of interest, which benefits both borrowers and lenders, both of whom are often at risk from unanticipated inflation. *See* Fisher, *The Demand for Indexed Bonds*, 83 J. POL. ECON. 509 (1975); Hochman & Palmon, *supra* note 2, at 1257. Moreover, eliminating the risk from unanticipated changes in the rate of inflation will reduce the risk of bankruptcy, making it safer for the issuer to increase both its debt and the associated tax benefits. *See* Fisher, *supra* note 2, at 247, 249-50. The use of PLANs by corporations provides an additional benefit by offering a better correlation between the corporation's income and interest expense than with other debt instruments because the payments on a PLAN rise with inflation as the incomes of many corporations are likely to do, which will make it easier to pay the interest out of operating income. *See generally* Woodward & Crowe, *supra* at 3-4.

The virtual absence of PLANs from the U.S. market has been more difficult to explain. Liviatan has conjectured that wage indexation substitutes for asset indexation and satisfies the demand for indexation. Liviatan, *supra* note 2, at 267-68. Fisher and Eden have argued that innovation costs, especially the cost of educating the public about new instruments, are responsible. *See* Fisher, *supra* note 2, at 259 (citing I. FISHER, STABLE MONEY (1934)); Eden, *supra* note 2, at 263-64. Dornbush and Simonson argue that in low-inflation economies, such as the U.S. economy, the price level can reflect real shocks as much as nominal ones, so that indexation would not provide a very good hedge against inflation. Dornbush & Simonson, *Introduction* to INFLATION, DEBT, AND INDEXATION, *supra* note 2, at vii-viii. Although a variety of explanations have been offered, there is no consensus among economists as to why there are virtually no index-linked notes in the United States today. *See* Hochman & Palmon, *supra* note 2, at 1257 n.1.

[7] Although Congress is likely to consider indexing, at least for capital gains, again this year, it is unlikely, even if the indexing provision for capital gains is enacted, that debt instruments will be indexed for inflation anytime soon. *See* Rasky, *Democratic Effort on Tax Plan*, N.Y. Times, July 21, 1989, at D1, col. 6.

basic PLAN that, because of economic and tax considerations, could develop. Finally, Part IV describes a derivative product that might follow the introduction of PLANs.

I. THE TAXATION OF PLANS

Several basic tax issues, which concern the characterization and timing of payments, are raised by PLANs. The characterization issue is whether the payments that compensate for inflation are to be treated for tax purposes as a return of principal, capital gain, or interest. Two timing issues are also raised by PLANs. The first involves the time at which payments, other than those payments that are a return of principal, must be included in the income of the lender and deducted from the income of the borrower. The second timing issue asks when the principal is recovered on notes with multiple payments.[8]

A. The Taxation of Inflation Gains

With only a few exceptions, the provisions of the U.S. Internal Revenue Code of 1986 (the Code) are not indexed for inflation.[9] As a result, payments that either explicitly or implicitly compensate for the deteriorating effect of inflation are not treated as a return of principal but as either capital gain or interest, as the case may be.[10] Consequently, interest pay-

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[8] These questions all presume that a PLAN would be treated as debt for tax purposes. In Utility Trailer Mfg. Co. v. United States, 212 F. Supp. 773 (S.D. Cal. 1962), a PLAN was held to be a debt instrument. *Id.* at 791. Although this case is more than 25 years old, the tax law has generally expanded the scope of contingent obligations that are now treated as debt in the interim. *See* Hariton, *The Taxation of Complex Financial Instruments*, 43 TAX L. REV. 731, 733-40 (1988). Thus, a PLAN would probably be treated as debt for tax purposes. *See also* D. GARLOCK, A PRACTICAL GUIDE TO THE ORIGINAL ISSUE DISCOUNT REGULATIONS 123 n.5 (1988).

[9] The standard deduction and personal exemption are, for example, both indexed for inflation. I.R.C. §§ 63(b)(4), 151(d)(3) (1990).

[10] The following example can help to explain this treatment. Consider a corporation that buys a hotel on January 1, 1990 for $1 million cash and sells it on December 31, 1990, for $1,081,600 cash. This corporation will have an $81,600 capital gain in 1990. Assuming a 34% marginal tax bracket, the corporation will pay $27,744 in federal income tax as a result of the transaction, leaving it with $1,053,856 at the end of the year. The tax treatment of the transaction does not depend on inflation during 1990. It does not matter that inflation is, say, 4% in 1990, so that the real value of the hotel at the end of 1990 is $1,040,000. With 4% inflation, the real value of the corporation's cash on hand at

ments that are intended to compensate for the deteriorating effect of inflation on the loan's principal are generally subject to tax as interest received by the lender and are deductible as interest paid by the borrower.

B. Original Issue Discount and Inflation-Indexed Notes

The taxation of debt instruments that do not pay all of their interest as it accrues is covered by the original issue discount (OID) rules.[11] These rules are contained in Sections 1271 through 1275 of the Code and the accompanying proposed regulations, which the Treasury Department issued in April 1986.[12]

In its simplest form, OID arises when a note is issued for less than its face value. For example, if a note is issued on January 1, 1990, for $1 million cash with a face value of $1,215,286 and a redemption date of December 31, 1991, the note will have $215,286 of OID.[13] The OID rules have two important consequences for the issuer (borrower) and the holder (lender) of the note. First, the OID rules require that $215,286 be

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the end of the year is $1,013,323. This is an effective tax rate of 67% on the real gain, and the effective tax rate is even higher when inflation is higher. For example, with 10% inflation and a 4% real return, the hotel could be sold at the end of the year for $1,144,000. The tax on that transaction would be $48,960, leaving $1,095,040. That amount would not even compensate for inflation and would make the effective tax rate on the real gain more than 100%. By way of comparison, in an inflation-free environment, the hotel could be sold at the end of the year for $1,040,000, which after paying taxes of $13,600 leaves $1,026,400, implying an effective tax rate on the real gain of 34%.

As the above example illustrates, the U.S. federal tax system is not neutral with respect to inflation and the lack of indexation can even cause a nominal tax rate of less than 100% to become a real tax rate of more than 100%. In the above example, the real income after compensating for the effect of inflation on the $1 million investment was $40,000 before taxes. If the tax system were indexed for inflation, the corporation would have paid $13,600 in real taxes (34% of $40,000) in all cases.

[11] PLANs accrue unpaid interest because the compensation for inflation is accrued before it is paid.

[12] The OID regulations are long, complicated, and difficult to get a handle on simply by reading them. *See* 51 Fed. Reg. 12,022, 12,022-097 (1986). Three good and accessible treatments of these rules are: D. GARLOCK, *supra* note 8; Lokken, *The Time Value of Money Rules*, 42 TAX L. REV. 1 (1986); N. Cunningham & D. Schenk, Coping with Original Issue Discount (N.Y.U. School of Law mimeograph) (1986). For a critical review of these regulations, including suggestions for how the final regulations should be written, see NEW YORK STATE BAR ASSOCIATION TAX SECTION, REPORT OF AD HOC COMMITTEE ON PROPOSED ORIGINAL ISSUE DISCOUNT REGULATIONS (December 30, 1986).

[13] OID is defined in section 1273(a)(1) as the difference between the stated redemption price at maturity of the note ($1,215,286 in this example) and the issue price of the note ($1 million).

treated by both parties as interest. Second, the rules require that both parties either include in income or, if allowable, deduct from income that interest as it *accrues* rather than as it is paid.[14] Thus, the OID rules require that the parties report $102,400 interest (as income to the lender and as an expense to the borrower) in 1990 and $112,886 interest in 1991.[15]

Of course, a PLAN differs from the note in the above example in that its redemption price is not known when the note is issued but can only be ascertained at maturity, when inflation over the term of the note can be calculated. Payments that are subject to contingencies are covered by a portion of the proposed OID regulations known as the contingent payment rules.[16] Although the mechanics of the contingent payment rules are peculiar to those rules, the principles are the same under the contingent payment rules as under the general OID rules. Accordingly, the increase in the value of the note over time is treated for tax purposes as interest, paid or received, not as a capital gain nor as a return of principal.

There are, however, two important distinctions in the contingent payment rules that affect the taxation of PLANs. The first distinction is between contingent and non-contingent payments. The rules first require that the contingent payments be separated from the non-contingent payments.[17] If the separated non-contingent payments equal or exceed the

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[14] For the purpose of the OID rules, interest is generally assumed to accrue at a constant rate over the term of the obligation. As applied to the hypothetical obligation, $1 million will grow into $1,215,286 at the end of two years if the rate of return is 10.24% a year. The OID rules require that the parties treat the transaction as if the note paid 10.24% annual interest (technically the OID rules would require semiannual compounding, *see* Prop. Treas. Reg § 1.1272-1(d), 51 Fed. Reg. at 12,049-050, but that is not relevant for this example) and that the interest be reinvested with the lender. Conceptually, the easiest way to visualize how the OID rules operate is to treat the note as a savings account into which interest is regularly paid and to assume that the borrower pays any tax due on the income not by withdrawing money from the account but from other sources.

[15] The difference between the redemption price and the issue price is characterized as OID, which is treated as interest, instead of as capital gain, because Congress recognized that parties operating at arms-length charge interest for the use of money. *See* Lokken, *supra* note 12, at 11-12. Congress also chose to force annual accruals based on economic compounding because it was unwilling to continue to suffer the revenue loss that resulted from allowing the parties to a transaction to defer some of the transaction's tax consequences simply by deferring repayment when the borrower's marginal tax rate was below the lender's marginal tax rate. *See id.* at 20-21.

[16] The contingent payment rules are among the most complex rules in the set of highly complex rules that constitute the OID regulations. Prop. Treas. Reg. § 1.1275-4, 51 Fed. Reg. at 12,087.

[17] Although there is always the possibility that the note will not be paid in full because the borrower will default, this possibility does not make a note subject to the contingent payment rules.

principal of the note, then the contingent payments are treated entirely as interest and the non-contingent payments are analyzed as a separate note as above.

The situation becomes more complicated if the non-contingent payments are *less* than the principal of the note, because there is a possibility that the principal will not be repaid in full. In such a case, all non-contingent payments and a portion of the contingent payments are treated as principal. Except for a payment at maturity, the portion of any contingent payment that is treated as principal is the excess (if any) of the amount that becomes fixed over the interest that is deemed to have accrued but has not yet been paid. The OID rules assume that interest accrues regularly on such a note at a rate that is based on the interest rate that the federal government pays when it borrows, which is called the applicable federal rate (AFR).[18] According to the OID rules, contingent payments go first to pay accrued interest and then to pay principal.[19]

The second distinction determines when a payment becomes fixed. According to the proposed OID rules, contingent payments are generally taken into account when they become fixed. Thus, contingent payments that are treated as interest, rather than as principal, are included in income and deducted from income when they become fixed. When a payment is to be made within six months of when it becomes fixed, the full amount of the payment is treated for tax purposes as if it is made when it becomes fixed. On the other hand, if the payment is not to be made for at least six months, then the parties are treated for tax purposes as if they have issued a new note with a stated redemption price at maturity equal to the eventual payment. The issue price of this note is the discounted value of the payments to be made on the note; it is treated as interest and is accrued immediately. Moreover, if the interest rate paid on this new deemed-issued note is below the AFR, the issue price of the note will be calculated using the AFR. The OID on the deemed-issued note, which is the difference between the issue price and the stated redemption price at maturity, accrues over time in the normal fashion.

Prop. Treas. Reg. § 1.1275-4(b), 51 Fed. Reg. at 12,087.

[18] There are three AFRs: a long-term AFR, a mid-term AFR, and a short-term AFR. Which one is used depends on the term of the note. The Internal Revenue Service publishes the AFRs each month in a revenue ruling.

[19] *See* Prop. Treas. Reg. § 1.272-1(e)(2)(ii), 51 Fed. Reg. at 12,051.

Two more provisions in the Treasury's proposed regulations that give the Commissioner of Internal Revenue (the Commissioner) the authority to change the parties' characterization of the transaction increase the uncertainty surrounding the tax treatment of PLANs. Proposed Treas. Reg. § 1.1275-4(b)(1) states that the parties are bound by their characterization of a transaction as contingent but that the Commissioner can disregard a contingency that is remote and incidental.[20] Proposed Treas. Reg. § 1.1275-4(g) allows the Commissioner to reallocate interest in a manner consistent with the OID rules if the contingent payments are designed to either front- or back-load interest and if a principal purpose of such front- or back-loading is tax avoidance.[21]

1. Accrual of OID

To understand how the contingent payment rules could apply to a PLAN, consider a note issued on January 1, 1990, for $1 million with a redemption date of December 31, 1991, that pays no interest during its term but upon redemption will pay $1,081,600 in January 1, 1990, (real) dollars.[22] Furthermore, assume that inflation is 6% in 1990.[23] The important question is how much interest accrues in 1990. To help answer this question, some terminology will be useful. The OID rules classify all payments other than principal as OID except for those payments that are equal to the product of the outstanding balance of the loan and either a single fixed rate of interest or a qualified variable rate of interest and that

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[20] 51 Fed. Reg. at 12,087.

[21] *Id.* at 12,094

[22] The value of the dollar on January 1, 1990 will be considered to be the real value of the dollar. The real value of a given sum of money on a specific date is the quotient of the nominal amount of money and the ratio of a given price index on that date to that price index on January 1, 1990.

[23] If inflation is 6% a year through 1991, then at maturity the bond will pay $1,215,286. This amount is equal to the face value of the two-year bond issued for $1 million and accruing interest at 10.24% annually considered above. In addition, if in the previous example inflation were 6% a year, then the real value of the payment at maturity on the bond would be $1,081,600. Thus, if actual inflation is equal to the anticipated inflation of 6% a year, the two bonds will pay the same amount at maturity. Consequently, whether a PLAN generally accelerates or defers taxable income requires a comparison between the OID accruals on the two notes, assuming the actual rate of inflation equals the anticipated rate of 6% annually. Thus, if the OID for 1990 on the PLAN were less than the OID on the fixed-rate note (FRN), the PLAN would defer interest, but if the OID on the PLAN were greater than the OID on the fixed-rate note, the PLAN would not defer interest.

are unconditionally payable at fixed intervals of one year or less.[24] Such payments are known as qualified periodic interest payments (QPIP). Because there is no payment within one year of the note's issuance, there is no QPIP on the note, so the $215,286 paid upon maturity is OID. Thus, the interest paid in 1991 is OID not QPIP, regardless of when it is subject to tax.

Turning to the question of how much OID accrues on the note in 1990, the first step, according to the regulations, is to separate the contingent and non-contingent payments. Because the parties are bound by their characterization of the transaction, and because there is no limit on how far the price level can fall, the entire payment at maturity is contingent.[25] Consequently, the note is assumed to accrue interest at the AFR during 1990. Hence, if the AFR is, for example, 9%, there will be $90,000 of OID in 1990, but if it is 11%, then there will be $110,000 of OID. With this interpretation, there will in general be neither an acceleration nor a deferral of interest for tax purposes.[26]

It is unlikely that the price level on December 31, 1991, will be below its January 1, 1990, level. Thus, according to the authority granted in the OID rules, the Commissioner could declare that such a possibility is remote and incidental and that any contingencies based on the possibility of deflation will be ignored. In this case, the non-contingent portion of the note will be $1,081,600, which is greater than the issue price. Thus, there

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[24] Prop. Treas. Reg. § 1.1273-1(b)(ii)(A), 51 Fed. Reg. at 12,060.

[25] The only reported case I could find that addresses the taxation of PLANs, Utility Trailer Mfg. Co. v. United States, 212 F. Supp. 773 (S.D. Cal. 1962), supports this view. Although the court in *Utility Trailer* permitted the corporate taxpayer to deduct at maturity the inflation adjustment on the PLANs it issued, it denied the corporate taxpayer any deduction for the inflation adjustment during the life of the loan. *Id.* at 793. According to the court, such a deduction prior to maturity would not be permitted because the amount the taxpayer sought to deduct was uncertain and contingent. *Id.* at 793-94.

[26] The federal government's ability to borrow at a lower interest rate than most private businesses will often produce a deferral of interest. However, because many debt issuers are high-bracket taxpayers and many debt holders are tax-exempt, this approach would provide issuers with an opportunity to accelerate their interest deductions. When inflationary expectations are high, such that the AFR is high, issuers could call or purchase the PLANs they issued when the AFR was lower and then issue new PLANs. These new PLANs would produce larger tax deductions for their issuers, until the last period when an appropriate adjustment is made, but would not harm their holders, who are assumed to be tax-exempt. The incentives would be the opposite with tax-exempt issuers and high-bracket debt holders. In that case, the interest inclusions can be deferred by reissuing debt when the AFR falls.

will be deemed to be two notes, the first being a two-year note with an issue price of $1 million and a stated redemption price of $1,081,600. On this deemed note there will be $40,000 OID in 1990. The second deemed note is entirely interest, and it is composed of the payments in excess of $1,081,600. The second deemed note will produce OID in 1990 only if a payment on the second note becomes fixed in 1990. Because in this example the Commissioner is assumed to have declared that the possibility of deflation over the period January 1, 1990 through December 31, 1991 is remote and incidental, the increase in the payment due at maturity attributable to inflation in 1990 would probably be considered as fixed in 1990.[27] If this view is accepted, there will be additional OID in 1990 of $59,538,[28] for a total of $99,538 OID in 1990. There will still, however, be a deferral of interest for tax purposes because less than the full amount of inflation is accrued as OID in 1990, as a result of the discounting and the implicit assumption of no inflation in 1991.

Although the interpretations described above strictly follow the proposed regulations, none of them are consistent with the purpose of the OID rules, which is to force interest to accrue for tax purposes as it economically accrues.[29] A conceptually better approach would be to apply the principles contained in the variable rate rules of Prop. Treas. Reg. § 1.1275-5.[30] The variable rate rules provide that if the debt instrument states interest based on an objective interest index, the full amount of interest that accrues in a year will be subject to tax. As applied to the PLAN in the example, and treating the relevant price index as an objective interest index, the entire inflation adjustment plus the real interest will be subject to tax as OID each year.[31]

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[27] The same standard would not necessarily be used to make the two determinations. Consequently, it is possible that the increase in value because of inflation would not be fixed in 1990, in which case there would be only $40,000 OID in 1990.

[28] The OID for 1990 on the second deemed note is the payment that is considered fixed (6% of $1,081,600 = $64,896) discounted by the AFR of 9% because the payment is not due for one year, that is, $64,896 ÷ 1.09 = $59,538.

[29] The problem with using the contingent payment rules to tax PLANs is that they treat all interest as simple interest, even if the interest is subject to compounding. The contingent payment rules could be revised to take account of compound interest, in which case their application to PLANs would yield the correct economic result.

[30] 51 Fed. Reg at 12,095-096.

[31] To see this, let I be the interest index and let p be the realized rate of inflation expressed as a decimal. The interest index for the PLAN in the example is given by the equation $I = (1+p)(1.04) - 1$. Because inflation in 1990 is assumed to be 6%, the index for 1990 is $I = (1.06)(1.04) - 1 =$

According to the regulations, a PLAN is not subject to the variable rate rules. To be subject to the variable rate rules, a note must state interest based on current values of an objective interest index. An objective interest index is either an interest rate currently offered to unrelated borrowers by financial institutions or an average of current yields on a class of publicly-traded debt instruments. This requirement would not be met with a PLAN because a price index is not an objective interest index. A price index, such as the CPI, is an index of the change in the general price level, and although it is related to interest rates, it is not itself an interest rate or an average of current yields. Thus, a PLAN would not fall under the variable rate rules.[32] Nonetheless, because the OID rules give the Commissioner a lot of discretion in choosing a tax treatment, a PLAN could fall under the variable rate rules.[33]

2. *Amortization Schedule*

The discussion so far has been limited to PLANs with a single payment at maturity. Notes that call for more than one payment, or installment obligations, raise the additional characterization issue of how the principal is allocated among the payments. Consider, for example, a PLAN issued for $1 million on January 1, 1990, calling for five payments of $224,627 (real) due on the last day of each year from 1990 through 1994, which

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.1024, or 10.24%. Thus, in 1990, there will be OID of $1 million x 10.24%, or $102,400. This amount is the same as the amount of OID on the two-year, $1 million zero-coupon FRN paying $1,215,286 at maturity.

[32] If PLANs become common, lenders could issue debt instruments using the interest rates currently being offered by certain specified banks on their own PLANs. These notes would be the economic equivalent of PLANs, although they would have a different form. If properly designed, such notes could satisfy the requirement of stating interest based on current values of an objective interest index, in which case their tax treatment would be determined under the variable rate rules. Consequently, if the principles contained in the variable rate rules are not applied to PLANs, a potential tax arbitrage situation is created.

[33] The Commissioner could reach this result by exercising the discretionary authority granted him by the proposed regulations. Prop. Treas. Reg. § 1.1275-4(g), 51 Fed. Reg. at 12,094. Under this section, if the Commissioner concludes that the interest payments are designed to back-load interest and a principal purpose of such back-loading is tax avoidance, then he could make reasonable assumptions as to the amount of OID that would accrue on the note, including a consideration of extrapolations based on earlier experience. Consequently, if the Commissioner were to use this provision, he could calculate the OID for 1990 by assuming that inflation in 1991 will be equal to that in 1990 and by collapsing the two deemed notes. In doing so, $102,400 would be OID in 1990, the same result as on the original note.

implies a 4% real annual rate of interest. Assume initially that inflation in 1990 is 6% so that the payment made at the end of 1990 is $238,105 (nominal).

The OID rules establish a two-step procedure for distinguishing payments of interest from payments of principal. First, the payments of QPIP, which are always interest, must be identified. Second, after the payments of QPIP have been identified, the remaining payments are then divided between OID and principal. The approach contained in the OID rules for distinguishing payments of OID from payments of principal is given in Prop. Treas. Reg. § 1.1272-1(e)(2)(ii).[34] This provision treats a payment as first coming out of accrued but unpaid OID and only thereafter as a return of principal. This treatment is also used to distinguish payments of principal and interest from other installment obligations, such as the traditional home mortgage, that are not generally subject to the OID rules. Consequently, using this approach to distinguish the OID payments from the principal payments on PLANs, will subject PLANs to the same tax treatment as other debt instruments.

Applying the procedure outlined above to the five-year, self-amortizing PLAN described above, the 4% real annual interest is QPIP. Thus, $42,400, or 4 percent of $1,060,000, is QPIP in 1990. Of course, the amount of OID that is paid at the end of 1990 also depends on how OID accrues on PLANs generally. If, for example, the mechanics of the variable rate rules are applied to PLANs, both the entire inflation adjustment and the real interest rate will be subject to tax as interest. Using a hypothetical 6% inflation rate and 4% real interest rate would mean 10.24% interest, or $102,400.[35] Thus, the payment at the end of 1990 will consist of $42,400 QPIP, $60,000 OID, and $135,105 principal.

Another approach that has been proposed for distinguishing between payments of OID and principal is to use the amortization schedule of the underlying FRN for the associated PLAN.[36] One advantage of this ap-

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[34] 51 Fed. Reg. at 12,050.

[35] This amount is derived *supra* in note 31. Alternatively, if the entire note is treated as contingent, the interest accruing in 1990 on the PLAN will be the product of $1 million and the AFR, 9% for example, or $90,000, which implies that the payment made at the end of 1990 will consist of $42,400 QPIP, $47,600 OID, and $139,105 principal.

[36] Reed Shuldiner of the Office of the Tax Legislative Counsel of the Department of Treasury drew my attention to this approach.

proach is that the entire amortization schedule of a PLAN will be known when the instrument is issued. For example, the amortization schedule for the $1 million PLAN calling for five annual payments of $224,627 (real) will be the same as the amortization schedule for a $1 million fixed-rate note (FRN) calling for five annual payments of $224,627 (nominal), regardless of actual inflation. Thus, the payment on the PLAN at the end of 1990 will include $184,627 principal, the rest being interest, regardless of the size of the actual payment.

In the above example, when the mechanics of the variable rate rules are applied to PLANs, the payment made at the end of 1990 will include $42,400 QPIP and $11,078 OID, as well as $184,627 principal. Consequently, using this approach to calculate amortization will result in $48,922 OID being carried over to 1991.[37] Assuming that inflation occurs throughout the loan term, this approach, by characterizing larger portions of each payment as a repayment of principal and thereby forcing a carryover of accrued OID, will accelerate the return of principal and defer the payment of OID compared to the previous approach. This acceleration of principal payments and deferral of OID payments will generally have no tax consequences because the OID rules tax lenders and borrowers on the basis of economic accrual, not payment. However, certain borrowers that can deduct OID on certain notes only upon payment will be harmed by this approach, because their OID deductions will be deferred.[38] Consequently, the first approach for distinguishing between payments of principal and payments of OID works better than the second approach.

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[37] This number is derived as follows: Of the $238,105 payment at the end of 1990, $42,400 is characterized as QPIP and $184,627 as a return of principal, leaving $11,078 characterized as a payment of accrued OID. Because $60,000 OID accrued in 1990, $48,922 is carried over to 1991.

[38] Congress, for example, is considering denying corporate taxpayers a deduction for OID that has accrued but has not yet been paid on bonds that substantially defer payment, which could cover PLANs. *See* Birnbaum, *House Panel May Cut Benefit of 'Junk' Bonds*, Wall St. J., June 23, 1989, at A2, col. 4. In addition, the personal use exception to the OID rules denies cash method taxpayers a deduction for OID that has accrued but has not yet been paid on debt used to carry property held for personal, as opposed to business or investment, use. This provision, which applies to home mortgages as well as to certain other notes, will defer a borrower's deductions relative to a lender's inclusions — a potentially significant economic penalty — if OID accrues as inflation occurs. Thus, using the amortization schedule of the underlying FRN for the associated PLAN can increase the penalty imposed by the personal use exception. For a discussion of some of the potential tax problems that could be encountered by using PLANs for home mortgages, see Knoll, *The Taxation and Marketing of Price-Level Adjusted Mortgages*, 6 J. TAX. INVESTMENTS 179 (1988).

One more issue that should be addressed is the possibility of deflation. Treating the real interest component of a PLAN as QPIP will cause problems when deflation occurs. Consider the previous example and assume that there is 2% deflation in 1990, which implies that the payment at the end of 1990 is only $220,134. This deflation also implies that the outstanding balance of the note just prior to payment is $980,000, which is a decline in value of $20,000. If the 4% real interest is QPIP, there will be $39,200 QPIP in 1990,[39] which will be deductible by the borrower and includible by the lender. However, the nominal economic interest on the note in 1990 is only $19,200, because the nominal value of the obligation has declined by $20,000. Thus, the borrower will have to include the $20,000 deflation adjustment in income to get a net deduction of $19,200. Presumably the inclusion would arise as a discharge of indebtedness under section 108 of the Code. If, however, the borrower's interest deductions are limited, then the $20,000 inclusion and $20,000 deduction will not wash because the discharge of indebtedness will have to be included in the borrower's income while the interest will not be deductible from the borrower's income. Similarly, for the lender to have a net inclusion of $19,200, it will have to get a $20,000 deduction. The only source for this deduction is section 166 of the Code, which allows taxpayers a deduction for bad debts. Section 166, however, applies only to business debts as opposed to investment debts and gives capital loss rather than ordinary loss treatment. Thus, if the note is held as an investment, which is very likely to be the case, there will not be a wash on the lender's side.[40]

A better result is obtained if the 4% real interest is not treated as QPIP.[41] In this case, only $19,200 will be interest, which is the correct amount, and all of it will be OID.[42] An alternative approach is to limit the amount of QPIP to the net amount of economic interest, taking into

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[39] Four percent of $980,000 is $39,200.

[40] The possibility of deflation is of more than theoretical interest. The Bureau of Labor Statistics' producer price index (PPI), which measures prices of finished goods, fell by four-tenths of a percent in July 1989, following a slight decline in June. Thus, issuers and holders of PLANs tied to the PPI that adjust balance and payments monthly would have had too much QPIP in June and July 1989.

[41] Note that treating the real interest component of a PLAN as QPIP will not affect the accrual of interest when deflation does not occur. In such a case, what would otherwise be QPIP becomes OID.

[42] The interest index when there is 2% deflation is given by the equation I = (.98) (1.04) - 1 = .0192, or 1.92%. Taking 1.92% of $1 million yields $19,200.

account any decrease in the outstanding balance of the loan. In this case again, $19,200 will be interest, but all of it will be QPIP, because the $20,000 decline in value offsets a portion of the $39,200 payment.[43]

3. Summary

In summary, the conceptually correct way to tax PLANs is to use the principles of the variable rate rules to determine the accrual of interest, to not treat the real interest component as QPIP (or limit the amount of QPIP to the net amount of economic interest), and to use the mechanics of section 1.1272-1(e)(2)(ii) to distinguish payments of OID and principal. Such an approach subjects PLANs to the same tax treatment as other debt instruments. The approach neither accelerates nor defers interest for tax purposes; rather, it taxes interest on the basis of economic accrual, which is the goal of the OID rules. Such an approach also distinguishes principal from interest in the usual way and avoids problems caused by deflation.[44]

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[43] The problem identified above is not limited to PLANs. It can occur whenever a note calls for regular payments that satisfy the definition of QPIP in Prop. Treas. Reg. § 1.1273-1(b)(1)(ii)(A), 51 Fed. Reg. at 12,060, and also accrues interest using an index or a contingency that can lead to a decline in value. Consider, for example, a note that pays 5% QPIP annually and in addition accrues either 5% interest if the issuer has positive net income for the year or 3% negative interest if the issuer has zero or negative net income. In any year in which the issuer has negative net income, the note will have 5% QPIP, but the real return on the note will be only 2%. In such a case, the economic interest for the accrual period, which is the economic return from holding the note over the period, is the payment of QPIP less the decline in value, which will be less than the payment of QPIP.

[44] On January 9, 1990, the U.S. Treasury Department issued regulations providing guidance on how price-level adjusted mortgages (PLAMs) are to be taxed. 55 Fed. Reg. 729 (1990). A PLAM is a self-amortizing mortgage that has a fixed rate of interest, a fixed maturity, and makes periodic adjustments to the monthly payment and outstanding balance of the mortgage to correspond directly to a broad-based general price index so that the purchasing power of the payments is constant over the mortgage term. The Treasury Department will accrue interest on a PLAM by using the variable rate rules. Prop. Treas. Reg. § 1.1275-6(c), 55 Fed. Reg. at 733. The regulation also provides for the standard interest stacking rule, treating a payment as coming out of principal only to the extent that it exceeds accrued but unpaid OID. Prop. Treas. Reg. § 1.1275-6(e)(1), 55 Fed. Reg. at 733-34. In addition, the regulation provides that the amount of QPIP cannot exceed the interest that accrues. Moreover, the recently-released regulation package anticipates taxing other inflation-adjusted debt instruments in accordance with these principles. Prop. Treas. Reg. § 1.1275-6(b)(1)(ii), 55 Fed. Reg. at 732. There is no reason for treating the OID accruals on a PLAM any differently than the accruals on other PLANs. What a borrower does with the proceeds of the loan should have no impact on how the OID accrues on the loan. Therefore, in light of the Treasury Department's release covering PLAMs, it is very likely that PLANs will generally be subject to the same tax treatment, which is

II. THE DESIGN OF PLANS

In many countries, inflation gains are not subject to tax but are treated as a return of principal by both the borrower and the lender. In the United States, however, payments made by the borrower to the lender to compensate for the deteriorating effect of inflation on the loan principal are treated as interest by both the borrower and the lender. The usual suggestion for the design of PLANs in the U.S. market ignores this tax treatment. When the tax system is indexed for inflation, the real, after-tax rate of interest on a PLAN paying a fixed real rate of interest is independent of the realized rate of inflation.[45] However, when the tax system is not indexed for inflation and both the borrower and the lender have positive marginal tax rates, the real, after-tax rate of interest on a PLAN for both the borrower and the lender will fall as the rate of inflation rises, and the converse is also true.[46] Thus, unless the tax system is indexed for

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also the treatment recommended in this Article.

[45] To see this, consider a $1 million loan made on January 1, 1990, calling for a real payment of $1,040,000 on December 31, 1990. If there is no inflation during 1990 and the borrower and lender both have a marginal tax rate of 34%, the interest paid by the borrower and received by the lender will be $40,000 before taxes and $26,400 after the payment of $13,600 in taxes by the lender (with a similar reduction in the borrower's taxes). Assume that at the beginning of the year, anticipated inflation for 1990 is 4%. If actual inflation is 4% during 1990, the final payment will be $1,081,600. Hence, if the tax system is indexed for inflation, $1,040,000 will be treated as a return of principal and $41,600 will be treated as interest. The tax paid on the interest will be $14,144, leaving $27,456 after taxes with a real value of $26,400. If, however, actual inflation is not 4%, the real value of the after-tax interest is still $26,400. For example, if actual inflation is 6%, the payment at the end of the year will be $1,102,400, with $1,060,000 treated as a return of principal and $42,400 as interest. Tax on the interest is $14,416, leaving $27,984, which has a real value of $26,400. Similarly, if actual inflation is 2%, the payment at the end of the year will be $1,060,800, with $1,020,000 treated as a return of principal and $40,800 as interest. After payment of $13,872 tax on the interest, the lender will have $26,928 interest with a real value of $26,400. Thus, when the tax system is indexed, the real, after-tax interest on the basic PLAN is not affected by the realized rate of inflation.

[46] To see this, consider a $1 million loan made on January 1, 1990, to be repaid on December 31, 1990, and assume that anticipated inflation is 4% and the marginal tax rate for both the lender and the borrower is 34%. The real payment is set so that if the realized rate of inflation is 4%, the real, after-tax interest will be $26,400. Assuming 4% inflation, a real payment of $26,400 has a nominal value of $27,456. To have $27,456 after taxes at 34% and $40,000 inflation compensation requires a before-tax payment of interest of $102,206 and a total payment of $1,102,206. The real value of this payment is $1,059,814 on December 31, 1990. A non-indexed tax system will yield the same expected real, after-tax interest as a PLAN calling for a real payment of $1,040,000 in an indexed tax system, assuming 4% expected inflation and a marginal tax rate of 34%. If, however, inflation is higher than expected, the real after-tax interest will be lower in the non-indexed tax system, and higher with the PLAN. For example, if inflation is 6%, the nominal payment at maturity will be $1,123,402. After paying taxes of $41,957, after-tax interest of $81,445 remains. Of this

inflation, a PLAN would not fully eliminate the risk of inflation. Consequently, if PLANs appear in the United States, they might take a different form than they usually do abroad. Instead of setting a real, before-tax rate of interest, lenders and borrowers could set both a real, after-tax rate of interest and a marginal tax rate to be used to calculate the after-tax rate of interest. I call a PLAN with such a tax gross-up provision a PLAN+T. The advantage of a PLAN+T over a basic PLAN is that a PLAN+T reduces the impact of inflation on the real, after-tax interest rate and can eliminate this effect entirely when the borrower and lender have the same marginal tax rate.

With a PLAN+T, the tax gross-up is made when the interest accrues for tax purposes, and the amount that is subject to the gross-up is the interest that accrues for tax purposes. Consequently, the mechanics of the tax gross-up will depend on how OID accrues.

To see how a PLAN+T would work, consider again the $1 million PLAN issued on January 1, 1990, maturing on December 31, 1991, and calling for a real, before-tax rate of interest of 4% and setting a marginal tax rate of 14%.[47] If OID accrues each year on the note as inflation occurs, then at the end of 1990, the borrower will get a tax deduction and the lender will have a taxable inclusion for the OID that has accrued during the year.[48] Consequently, to compensate for the tax, the gross-up should be made each year that OID accrues for the amount of OID that accrues. In effect, with a note which has accrued but unpaid OID, the lender makes an additional loan to the borrower equal to the lender's

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$81,445, $60,000 is compensation for inflation, leaving nominal interest of $21,445, which has a real value of $20,231. Similarly, if inflation is 2%, the nominal payment at maturity will be $1,081,200. After paying taxes of $27,453, $53,657 of after-tax interest is left, which includes $20,000 compensation for inflation. The remaining $33,657 interest has a real value of $32,997. Thus, although the real, before-tax interest on a PLAN is independent of the realized rate of inflation, the real, after-tax rate of interest is a declining function of the realized rate of inflation. In general, the real, after-tax interest on a basic PLAN will not be constant whenever the issuer or holder has a positive marginal tax rate. Moreover, the rate of decline increases as the the marginal tax rate increases.

[47] Tne calculations called for by the note assume that the lender and the borrower both have a marginal tax rate of 14%. The borrower and lender do not actually have to have a 14% marginal tax rate to use the PLAN+T. The payments on the PLAN+T are simply calculated *as if* they each had a 14% marginal tax rate.

[48] As a result, for a given annual, after-tax rate of return, the redemption price at maturity on a PLAN+T is higher when there are annual accruals of OID than when OID accrues only upon payment.

yearly tax liability attributable to the accrued OID, which is also the reduction in the borrower's yearly tax liability.[49]

For example, assuming the variable rate rules are applied to PLANs and there is no inflation over the two years that the note is outstanding, OID will be $40,000 in 1990 before the gross-up. That figure includes $5,600, which represents both the borrower's decrease and the lender's increase in taxes for 1990. Upon maturity, the note pays $1,081,600, including $41,600 interest, and results in $5,824 of taxes. The after-tax payment of $1,075,776 can be divided into a payment of $1,069,983 on the original note and a payment of $6,024 on the $5,824 invested in 1991. This amounts to a return of 3.44% compounded annually for two years on the initial $1 million investment and a return of 3.44% compounded annually for one year on the $5,824 paid in taxes in 1990.

The principle is the same when there is inflation. Assuming a 14% marginal tax rate and an annual inflation rate of 6%, the 1990 accrual of OID is $112,167, and the lender's 1990 taxes will rise and the borrower's taxes will fall by $15,703. In 1991, the accrued OID, which is paid at maturity along with the OID for 1990 and the principal, is $124,749. The total payment at this time is $1,236,916, which is $1,219,452 after paying tax of $17,465. The after-tax payment has a real value of $1,085,307 and can be viewed as a real payment of $1,069,983, which is a real return of 3.44% compounded annually for two years on the initial investment of $1 million, and a real payment of $15,324, which is a real return of 3.44% compounded annually for one year on the 1990 taxes attributable to the accrual of OID.[50]

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[49] If OID accrues with inflation, the balance of a PLAN+T with a single payment at maturity will rise more rapidly than the rate of inflation, which could create default problems. Thus, more equity would probably be required with PLAN+Ts than with PLANs.

[50] The results are slightly different if PLANs are taxed using the contingent payment rules and no OID accrues before payment. In this case, the note has a real, after-tax return of 3.45% compounded annually, not 3.44% [.04 x (1-.14)] compounded annually, because the 4 percent interest earned in 1990 is not taxed until 1991. If there is no inflation during 1990 and 1991, the note will pay $1,081,600 at maturity. With a marginal tax rate of 14%, a tax liability of $11,424 results in 1991, leaving $1,070,176. Assuming the marginal tax rate of 14%, for each 1% rise in the price level over the two years, the nominal interest paid on the note will increase by $12,443.91. After the payment of tax at the rate of 14%, $10,701.76 will be left, which will just compensate for each 1% rise in the price level.

To see how such a note would work, assume, for example, that inflation is 6% a year over the two years, which is a total fall in the price level of 12.36%. In nominal terms, the total interest payment is

III. VARIATIONS OF THE BASIC PLAN

This section describes two variations of the basic PLAN. These variations, which can apply to the basic PLAN as well as to the PLAN+T, illustrate the flexibility of PLANs.

A. PLAN with a Variable Real Rate (PLAN+V)

The basic PLAN and PLAN+T both set a real rate of interest that is constant over time. Of course, the real interest rate can and does in fact vary over time.[51] Conceptually, it would be a simple matter for the real interest component of a PLAN to vary as the anticipated real rate of interest varies.[52] The only difficult part is applying this idea. The difficulty arises because market interest rates are not set in real terms, but rather in nominal terms; therefore, the expected real rate of interest is not offered in the market. To arrive at the expected real rate of interest, anticipated inflation must be subtracted from the nominal rate of interest. Consequently, PLAN+V would require the development of an index for the anticipated rate of inflation.[53]

B. PLAN with Adjustments for Real Shocks (PLAN+R)

PLANs are designed to eliminate the effect of unanticipated inflation on the loan. To the extent, however, that the economy and the issuer are affected by real shocks, PLANs insulate lenders from their effect by providing them with a guaranteed real return. Borrowers may be reluctant to

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$235,407 and the tax is $32,957, which leaves $202,450. Of this $202,450, $123,600 compensates for the deterioration of the principal caused by inflation and the remaining $78,850, which has a real value of $70,176, is the real, after-tax payment of interest.

[51] Rose, *Is the Real Interest Rate Stable?*, 43 J. FIN. 1095 (1988).

[52] The real rate of interest on the PLAN+V would be OID, not QPIP, because the real rate is not a qualified variable interest rate as required by Prop. Treas. Reg. § 1.1273-1(b), which defines QPIP. *See* 51 Fed. Reg. at 12,060. Although this distinction could affect the mechanics of the tax calculations, it is unlikely to have any real effect, absent deflation, on either the borrower's or the lender's taxes.

[53] If PLANs become common, a lender could use the currently-offered real interest rate on certain specified banks' PLANs, which would be directly available, to set the real rate on the PLAN+V. In this case, the real rate of interest on the PLAN+V would be QPIP.

insure lenders against real shocks, and lenders may not be willing to pay borrowers what they would demand to provide this insurance.[54] Consequently, borrowers and lenders might choose to share these risks, which can be done by incorporating into the PLAN an additional variable for real shocks. For example, in addition to the normal inflation adjustment, the real return on the PLAN could be an increasing function of the annual growth rate of the economy. Thus, if economic growth during the year is high, the real return on the PLAN will be high, and if economic growth is slow, the real return on the PLAN will be low.[55] Assuming the corporation's real income is directly related to economic growth, such a PLAN+R spreads the risk of variable economic growth between borrowers and lenders. For example, if there were a recession, borrowers and lenders would both suffer, instead of borrowers alone suffering until default with lenders suffering thereafter.[56]

IV. FISHER-EFFECT SWAPS

PLANs that set a real, after-tax rate of interest and a marginal tax rate to be used to calculate the payment of interest, that is, PLAN+Ts, raise the possibility of a new swap technique which will be referred to as Fisher-Effect swaps.[57] Fisher's theory of interest postulates that nominal interest rates rise to reflect anticipated inflation.[58] By extension, when the marginal tax rate on interest is positive, the nominal rate of interest will rise by more than the rate of inflation, which is necessary in order to compensate the lender for the tax paid on the payments that will compen-

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[54] *See* Dornbush & Simonson, *supra* note 6, at vii.

[55] The real rate of interest on the PLAN+R would be OID, not QPIP, because the rate is not fixed as required by Prop. Treas. Reg. § 1.1273-1(b), which defines QPIP. Absent deflation, this distinction is unlikely to have any real consequences on the taxes paid by the borrower or the lender. *See supra* notes 41-43 and accompanying text.

[56] This version of PLAN+R raises a number of interesting possibilities because the positive correlation between the issuer's income and the return on the bonds is likely to reduce the risk of bankruptcy to the issuer, thereby making it possible for the issuer to increase its leverage. Of course, many different indexes could be used for the real interest component of PLAN+Rs.

[57] Economist Irving Fisher, for whom the Fisher-Effect swap is named, is also associated with PLANs. In 1925, the Rand Kardex Corporation, on whose board of directors Fisher served, unsuccessfully tried to issue PLANs to the public.

[58] The Fisher Effect is the tendency for changes in the anticipated rate of inflation to produce equivalent changes in the nominal interest rate.

sate for the deteriorating effect of inflation on the loan principal. However, when the marginal tax rate on interest income varies across taxpayers, there is no unique tax rate that can be used to gross-up the interest payments. The unanticipated changes in the rate of inflation will still result in winners and losers among the holders and issuers of PLAN+Ts. Fisher-Effect swaps are intended to eliminate the effect of unanticipated changes in the rate of inflation on the real, after-tax rate of interest paid by borrowers and received by lenders.

To understand how the Fisher-Effect swap works, return to the example of the $1 million PLAN but assume that the note will mature after only one year. This note calls for the payment of $1,034,400 in real, after-tax dollars at the end of 1990, assuming a 14% marginal tax rate. If the borrower is in a 34% tax bracket, the lender is tax-exempt, and on January 1, 1990, anticipated inflation is 4 percent for 1990, the nominal, before-tax rate of interest will be 8.81% if the realized rate of inflation is 4% in 1990. The borrower will pay $58,154 of after-tax interest, the lender will receive $88,112 of tax-free interest, and in both cases $40,000 will be compensation for the effect of inflation on the principal and the rest will be interest. In real dollars, the lender will pay after-tax interest of $17,227 and the borrower will receive tax-free interest of $46,262 on December 31, 1990.[59] Hence, the borrower will pay real, after-tax interest of 1.72% and the lender will earn tax-free a real return of 4.62%.[60]

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[59] The real, after-tax interest paid by the borrower is ($56,154 - $40,000) ÷ 1.06 = $17,227 and the real interest received by the lender is ($88,112 - $40,000) ÷ 1.06 = $46,262. The difference between $18,154 and $17,227, or $927, reflects the effect of inflation over 1990 on the interest paid at the end of 1990. Similarly, the difference between $48,112 and $46,262, or $1,850, compensates for the effect of inflation on the year's interest. In this example, the numbers are the same whether the contingent payment or variable rates rules are applied because the rate matures at the end of the first year.

[60] The Tax Reform Act of 1986 eliminated the lower tax rate for capital gains. Consequently, the calculations do not depend on whether the gains and losses are capital or ordinary. However, other provisions in the tax law, such as the limitations on the deductibility of capital losses, could cause how the gains and losses from the swap are treated for tax purposes to have important economic consequences.

A Fisher-Effect swap would probably be a capital asset, in which case any gain or loss would be a capital gain or loss. But if the transaction is entered into in the ordinary course of the taxpayer's business as a hedge against shifts in interest rates or prices, and if the taxpayer makes the appropriate election under Code section 1256 when the taxpayer enters into the transaction, any gain or loss would be subject to ordinary income treatment. For a discussion of the taxation of derivative financial instruments and hedging transactions, see Rachleff & Solway, *Taxation of Derivative Financial Instruments*, 6 J. TAX. INVESTMENTS 198 (1989).

The real, after-tax rate of interest paid by the lender and the real, tax-free rate of interest received by the borrower varies with the rate of inflation. For example, if inflation is 6% instead of 4%, the nominal rate of interest will be 11.22%, making the after-tax interest paid by the borrower $74,030, the tax-free interest received by the lender $112,167, and in both cases leaving $60,000 as compensation for the effect of inflation on the loan principal. In real dollars, the borrower will pay after-tax interest of $13,236 and the lender will receive tax-free interest of $49,214 on December 31, 1990. If realized inflation exceeds anticipated inflation, both the borrower and the lender will be better off, with the borrower paying a lower real, after-tax rate of interest of 1.32% and the borrower earning a higher real, tax-free interest rate of 4.92%. On the other hand, if the realized rate of inflation for 1990 is only 2%, the nominal rate of interest will be 6.41%, which means the borrower will pay after-tax interest of $42,277 and the lender will receive tax-free interest of $64,056, of which $20,000 will be compensation for inflation. In real dollars, the borrower will pay after-tax interest of $21,840, or 2.18%, and the lender will receive tax-free interest of $43,192, or 4.32%. Thus, if actual inflation is less than anticipated inflation, both the borrower and the lender will be worse off.

The gross-up provision provides for an additional payment of interest at the end of 1990 of $12,028 for every point by which the realized rate of inflation exceeds 4% and a similar reduction in interest for every point that inflation falls short of 4%.[61] From the perspective of the tax-exempt lender, an increased payment of only $10,344 will compensate for the effect of each percentage point increase in the rate of inflation above 4%. Similarly, a reduction in the payment of only $10,344 will compensate for each percentage point decrease. Thus, the lender will have an additional $1,684 for each point that inflation in 1990 exceeds 4% and an equivalent shortfall for each point that inflation falls short of 4%.[62] A risk-averse

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[61] The figure $12,028 is derived as follows. Letting RP be the redemption price, p the realized rate of inflation expressed as a decimal, and t the tax rate, the redemption price can be written as:

$RP = \$1{,}000{,}000[1+[(1+p)\ (1.0344)-1] \div (1-t)]$.

Differentiating the above expression with respect to p (and dividing by 100) yields:

$dRP/dp = \$10{,}344 \div (1-t)$.

The note sets a marginal tax rate of 14%, which yields $12,028.

[62] The number is derived by setting $t = 0$ in the expression for dRP/dp, which yields $10,344, and subtracting $10,344 from $122,028, which yields $1,684.

lender would benefit by exchanging $1,684 for each point that inflation exceeds 4% for $1,684 for each point that inflation falls below 4%. Similarly, a risk-averse borrower would benefit by exchanging $3,645 for each point that inflation exceeds 4% for $3,645 for each point that inflation falls below 4%.[63]

The Fisher-Effect swap is a promise by a party to pay a specified amount for every point that inflation differs from a specified level in exchange for the right to receive the same amount for every point that inflation moves in the opposite direction. In the example described above, for the borrower and lender to eliminate the impact of unanticipated inflation on their real returns, the lender will take the high side of the swap for $1,684, and the borrower will take the high side of the swap for $3,645.

The possibility of making such an exchange arises when other notes have the same term but are either with borrowers in tax brackets below the marginal tax bracket on their notes or lenders in tax brackets above the marginal tax bracket. This second set of borrowers and lenders would benefit by agreeing to make a payment when inflation is low in exchange for receiving a payment when inflation is high.[64]

V. CONCLUSION

According to the proposed regulations, PLANs are taxed under the contingent payment rules. However, because the application of these rules to PLANs generally leads to a deferral of interest for tax purposes, the contingent payment rules do not provide a theoretically appropriate frame-

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[63] The number is derived by setting t = .34 in the expression for dRP/dp, which yields $15,673, and then subtracting $12,028.

[64] The expected value of the swap in real dollars may not be zero because each dollar received, if inflation is high, is worth less in real terms than each dollar paid if inflation is low. However, one side's expected gain is equal to the other side's expected loss, which will affect the pricing of the swap, but should not interfere with its marketability. The expected value of the swap will also depend upon expectations for inflation.

The question of whether a demand for Fisher-Effect swaps exists with variable-rate notes (VRNs) remains open. Such a demand will exist when the interest rate on a VRN is determined by market forces that effectively cause the interest rate to adjust to reflect changes in the anticipated rate of inflation and to gross-up the adjustment because of taxes. The difficulty in using a Fisher-Effect swap with a VRN would be in extracting the tax-free interest rate and the marginal tax rate from the VRN.

work for the taxation of PLANs. The variable rate rules provide a better framework, even though PLANs technically fall outside of the coverage of these rules. The application to PLANs of the principles contained in these rules subjects to tax both the real interest that has accrued during the year and the entire year's inflation adjustment. The sum of these amounts is the interest that economically accrues with a PLAN each year. In addition, the amortization schedule for PLANs should be determined according to Prop. Treas. Reg. § 1.1272-1(e)(2)(ii), which covers installment obligations. This provision treats a payment as first coming out of accrued OID and only thereafter as a return of principal. The other proposed alternative, that is, to use the amortization schedule from the underlying FRN for the associated PLAN, accelerates principal payments and defers interest payments to the detriment of some borrowers. Deflation can cause both borrowers and lenders to pay too much tax when the stated real interest on a PLAN is characterized as QPIP. A conceptually cleaner result occurs if the real interest component of a PLAN is not treated as QPIP, or if the amount of QPIP is limited to the net amount of economic interest that is earned in an accrual period.

If PLANs become popular in the United States, they are likely to develop beyond their traditional form of accruing real interest at a fixed rate. Because most provisions of U.S. tax law are not indexed for inflation, the portion of a borrower's payments that compensate for the deteriorating effect of inflation on the original loan balance is subject to tax as interest. Consequently, one variation of the basic PLAN that could appear in the United States is a PLAN with a tax gross-up (PLAN+T). The advantage of this instrument is that it can reduce the impact of unexpected changes in the rate of inflation on the real, received or paid after-tax interest rate when both parties' marginal tax rates are positive. Because taxpayers have different marginal tax rates, currently ranging from zero to 39% on the federal level,[65] the appearance of the PLAN+T might be followed by a demand for the Fisher-Effect swap. The Fisher-Effect swap, by allowing borrowers and lenders to swap payment streams using different tax rates for the gross up, will permit lenders and borrowers to reduce still further the impact of unexpected changes in the rate of inflation on the real, after-tax rate of interest. Finally, in order to better allocate real economic risks between borrowers and lenders, PLANs may ap-

[65] *See* I.R.C. §§ 1, 11(b) (1990) (for individual and corporate rates, respectively).

pear that adjust the real rate of interest they pay as the underlying real interest rate in the economy varies (PLAN+V) or as real economic shocks occur (PLAN+R).