

Implicit Taxes in Conventional Preferred Stock: Evidence from the 2003 JGTRRA Dividend Tax Reduction

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Abstract

This paper examines the extent to which investor level taxation affects the pre-tax returns of securities via implicit taxes. Specifically, we ask if prices of outstanding conventional preferred stock increased because of the reduced taxation of dividends enacted by the Jobs and Growth Tax Relief Reconciliation Act of 2003. Economic theory suggests that in equilibrium risk-adjusted after-tax returns should be the same. We control for issuer-specific risk by using trust preferred stock, a near pre-tax equivalent to conventional preferred stock, as a benchmark asset. A price increase would support our hypothesis that investors reacted to the new tax-favored status of conventional preferred stock relative to trust preferred stock by bidding up the price, thus creating an implicit tax cost that offsets the explicit tax benefit. We examine prices and yields on five selected dates in the five months before and three months after passage of JGTRRA. Comparison of yields on a particular issuer's trust preferred stock with yields on the same issuer's conventional preferred stock should isolate implicit tax. The level of implicit tax found suggests that individuals have become significant holders of conventional preferred stock, an update to the long-held belief that taxable corporations are the main holders of conventional preferred stock.

Current Draft: January 15, 2005

We appreciate the comments and suggestions provided by Jesse Dwyer, Clark Hampton, John Phillips and Gim Seow.

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1. Introduction

This paper investigates whether pre-tax returns on conventional preferred stock (CPS) decreased when the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA) reduced the tax rate on dividends to 15% for individuals, thus making CPS tax-favored relative to assets that generate returns subject to a higher tax rate. Economic theory suggests that in equilibrium risk-adjusted after-tax returns should be the same. Thus if a tax-favored asset has a higher after-tax yield than a similar but tax-disfavored asset, investors bid up the price of the tax-favored asset, thereby lowering its pre-tax yield until the investment's after-tax yield is equal to that of a tax-disfavored asset providing the same after-tax cash flow (Scholes et al. 2002, 92).

Whether and how much investor level taxes affect asset prices is difficult to assess because of the difficulty in finding an appropriate benchmark tax-disfavored asset that has similar risk characteristics to the tax-favored asset (Scholes et al. 2002, 104; Engel et al. 1999, 251). The extent to which shareholder taxes affect stock prices is a “difficult empirical question that has generated decades of research without reaching consensus” (Ayers et al. 2002, 934). As Graham (2003, 1120) states, “The profession has made only modest progress documenting whether investor taxes affect asset prices.”

One approach to isolating implicit tax is to examine price changes of one particular asset affected by a tax law change (Scholes et al. 2002, 104). This approach was used in Erickson and Maydew (1998), who studied abnormal returns and implicit tax on different forms of stock over the three days following a tax law proposal to reduce the dividends received deduction (DRD), a change applicable only to corporate stockholders. JGTRRA presents us with another quasi-experimental setting in which we can examine the impact on stock price of a tax law proposal as well as ultimate enactment of a change applicable to individual, but not corporate, shareholders.

Because of the difficulty distinguishing how common stock prices are impacted by a tax cut in the face of differing market and/or issuer-specific risk, we focus only on CPS. Relative to common stock, CPS has less upside potential (e.g., redemption value, fixed dividend) and less downside risk (e.g., cumulative dividend protection, priority before common stock) for investors.¹

Three papers have found varying levels of implicit tax in CPS. Erickson and Maydew (1998) estimated implicit tax rates ranging from 3.01% to 20% depending on the shareholder expectations of the likelihood of the tax law change and the type of raw returns used. Engel et al. (1999) found only small levels of implicit tax (5.2% using effective rates of retired CPS) in CPS of 28 firms that issued trust preferred stock (TPS) to retire existing CPS. Atwood (2002), who also used the approach of comparing yields across a given firm's issues, found implicit tax of 20.4% in "new money" utility CPS (which is subject to the 70% DRD).²

We combine the approaches of these papers. Similar to Erickson and Maydew (1998), we use a pre/post design, and similar to Engel et al. (1999), we compare prices across a given firm's issues of CPS and TPS. Because JGTRRA's dividend tax cut does not apply to TPS, a given firm's TPS yields serve as a control group against which to compare the same firm's CPS yields; using TPS and CPS from the same issuer controls for differences in issuer-specific risk, a problem in many studies seeking to compare a tax-favored asset to a benchmark asset.

We compare pre-tax effective yields on issuers' matched pairs of CPS and TPS on five dates surrounding JGTRRA's passage. The results support the existence of implicit tax (12.1%) in CPS before the details of the proposed dividend tax cut were announced by President Bush in

¹ By studying preferred stock, our paper does not extend the studies focusing on common stock, including Ayers et al. (2002), who studied stock price response to an increase in individuals' tax rates, and the Hanlon et al. (2003) / Dhaliwal et al. (2003) / Harris et al. (2001) papers regarding valuation of retained earnings and contributed capital.

January 2003 and increasing to 19.4% after. Because the dividend tax cut applies only to individuals, an increase in implicit tax in response to the dividend tax cut suggests that individual investors became significant purchasers of CPS, joining corporate investors, who have long been assumed to be the main holders of CPS.

This paper proceeds as follows. Section 2 briefly describes TPS, compares it to CPS, and discusses their respective tax treatment. Section 3 develops our hypothesis. Section 4 discusses the methods and sources used to identify the stock issues to be studied and explains the selection of dates on which to study CPS and TPS effective yields. Section 5 describes the 27 identified firms and their matched pairs of TPS and CPS, and estimates implicit tax. Section 6 summarizes and discusses limitations, generalizability of findings and potential additional research.

2. TPS, CPS and Applicable Tax Law

CPS and TPS provide similar risks and benefits, including pre-tax cash flow, to investors. These two versions of preferred stock, however, differ in form. Unlike CPS, which is issued by a parent company, TPS is issued by a parent's special purpose affiliate, such as a trust or limited liability company (LLC). The LLC lends proceeds received from its TPS holders to its parent, with interest set at the TPS dividend rate. Unlike CPS's typically indefinite maturity, TPS matures at the same time as the loan (e.g., 30 years). However, CPS and TPS often provide the issuer the right to redeem after a specified date, and some TPS issues provide for redemption if certain events occur, such as a change in accounting or tax rules. TPS often provides guarantees from the LLC's parent, so that TPS holders, like CPS holders, rely on the parent for ultimate payment. (See Engel et al. 1999 and Frischmann et al. 1999 for more details on TPS.)

² A reduced DRD applies to "old money" public utility CPS, typically pre-1942 issues (or issues used to replace

The tax and accounting rules related to TPS and CPS differ significantly. For the issuer, interest paid on the TPS-related loan is tax deductible for the parent, which does not consolidate with the LLC. For GAAP accounting, the parent and LLC eliminate the loan and interest on their consolidated financial statements and, for TPS issued before 2003, the balance sheet does not treat TPS as debt.³ The TPS tax and financial reporting benefits to issuers led to its use in the majority of preferred stock public offerings after TPS was first sold in 1993.

For the investor, the TPS-related loan interest (but not TPS dividends) is taxable to TPS holders because the interest income is deemed to flow through the LLC to TPS holders. TPS interest and CPS dividends are taxable at marginal rates to individual and corporate holders, although a corporate holder of CPS enjoys a DRD of 70%.⁴ Enacted in May 2003, JGTRRA lowered the highest marginal tax rate for individuals from 38.6% to 35% and separately reduced to 15% the maximum rate paid by individuals on qualified dividends.⁵ Qualifying dividends include CPS dividends, but not TPS income. Other than the approximately 10% reduction in individuals' top marginal rates, JGTRRA did not change the tax effects of TPS income. Furthermore, JGTRRA did not alter taxation of corporate holders of CPS.

The following summarizes the top effective marginal tax rates, before and after JGTRRA, applicable to yields received by corporate and individual holders of CPS and TPS:

them).

³ FASB's issuance in May 2003 of Statement No. 150, *Accounting for Certain Financial Instruments with Characteristics of both Liabilities and Equity*, which generally requires TPS to be treated as debt, and FASB Staff Positions 150-1, 150-2, 150-3 and 150-4, released in October and November 2003, do not change the accounting for the pre-2003 TPS issues serving as our control group.

⁴ The DRD increases to 80% (100%) if a corporate holder's ownership of the issuer increases beyond 20% (80%).

⁵ The dividend tax cut sunsets after 2008. To qualify, the stock generally must be held for more than 60 of the 120 days surrounding an ex-dividend date. In certain cases, dividends from REITs and foreign firms may qualify; however, our sample does not include these issuers.

	CPS	TPS
<u>Pre-2003:</u>		
Individual holder	38.6%	38.6%
Corporate holder	10.5% ⁶	35.0%
<u>Post-2002:</u>		
Individual holder	15.0%	35.0%
Corporate holder	10.5%	35.0%

As shown above, individual and corporate TPS holders were taxed at the marginal rate, with the individual rate at 38.6% and the corporate rate at 35%; after JGTRRA, the rates are equal at 35%. Individual and corporate CPS holders, however, had very disparate treatment, with the corporate holders enjoying a DRD, which reduces the corporate marginal rate to 10.5% both before and after JGTRRA. The individual CPS holder, however, now enjoys a 15% marginal tax rate.

3. Hypothesis Development

Implicit taxes are paid by investors “indirectly in the form of lower before-tax rates of returns on tax-favored investments” (Scholes et al. 2002, 2). Scholes et al. (2002) define an investment’s explicit tax rate as the difference between its expected pre-tax and after-tax returns, divided by the expected pre-tax return to a “benchmark” investment that is not tax-favored, R_B . Thus, the explicit tax rate is $(R - \rho) / R_B$, where R is the pre-tax return on the tax-advantaged asset, and ρ is the after-tax return. The implicit tax rate is $(R_B - R) / R_B$. We expect the explicit tax rate plus the implicit tax rate to equal the marginal tax rate facing the marginal investor, an investor who is indifferent between the benchmark investment and the tax-favored investment because the after-tax returns from each are the same. In other words, the effect of tax favorable treatment

⁶ This rate is determined by multiplying 35% (the corporate tax rate) by 30% (the taxable portion of the dividend).

is to increase the implicit tax rate, which decreases the pre-tax rate of return rather than increases the after-tax rate of return.

We use an issuer's TPS as a benchmark asset against which to compare the same issuer's CPS. Not only is the TPS pre-tax yield, R_{TPS} , subject to an explicit tax rate equal to the marginal tax rate, but the use of matched pairs of CPS and TPS controls for issuer-specific risk. Credit agencies consider TPS tantamount to CPS (Irvine and Rosenfeld 2000). Similarly, Engel et al. (1999, 251) found ratings identical for firms' TPS/CPS pairs in nearly every studied case, noting that comparing an issuer's CPS and TPS yields provides the ability to hold risk constant while varying the tax treatment, which isolates implicit tax effects. Thus, in our study, $R_B = R_{TPS}$.

The CPS pre-tax return, R_{CPS} , is the pre-tax return on the tax-favored asset, CPS. Clientele issues make it difficult to predict the equilibrium CPS pre-tax return, R_{CPS} . Where individual and corporate investors have different tax treatment for asset returns, clienteles arise. Because explicit testing for clienteles is hindered by a lack of publicly available data as to ultimate owner identity, researchers must rely on the observed after-tax returns to determine who most likely is the marginal investor. In the case at hand, the marginal investor is the investor who is indifferent between CPS and TPS because the marginal investor's after-tax returns on CPS and TPS are the same. To illustrate, if a taxable corporate investor with a 70% DRD and a 35% marginal tax rate is the marginal investor, the after-tax returns from CPS and TPS must be the same. Thus, $R_{CPS} * (1 - .3 * .35) = R_{TPS} * (1 - .35)$. If $R_{TPS} = 8\%$, then $R_{CPS} = 5.81\%$. The implicit tax rate = $(R_{TPS} - R_{CPS}) / R_{TPS} = (8\% - 5.81\%) / 8\% = 27.4\%$. The explicit tax rate = $(R_{CPS} - \rho) / R_B = (5.81\% - 5.2\%) / 8\% = 7.6\%$. The explicit plus implicit tax rates total the marginal tax rate of the marginal investor.

Now assume a taxable individual investor with a 35% marginal tax rate is the marginal investor for CPS. In that case, $R_{CPS}*(1 - .35) = R_{TPS}*(1 - .35)$.and $R_{CPS} = R_{TPS} = 8\%$. If we observe that $R_{CPS} < R_{TPS}$, then we assume that corporations are the likely clientele for CPS because corporations enjoy the DRD.⁷ Erickson and Maydew's (1998) report of abnormal returns for CPS in response to a tax law proposal relevant only to corporate holders supports this view.

Returning to the case at hand, although JGTRRA lowered the tax rate on dividends, the corporate holder's after-tax return on CPS is still higher than the individual's post-JGTRRA after-tax return. Thus, one would expect taxable corporations to continue to be the primary tax clientele for CPS before and after JGTRRA. If corporate investors are the marginal investors in CPS, one would not expect the CPS price to be bid up post-JGTRRA, resulting in lower pre-tax returns and thus creating implicit tax, because JGTRRA did not alter taxation of corporate holders. In this case, R_{CPS} should not decrease because of implicit tax: both pre- and post-JGTRRA returns on CPS will impound the same level of implicit tax and be lower than TPS returns.

Now consider the possibility that the drop in the dividend tax rate induced individual investors to buy CPS. The existence of information providers catering to individual investors, such as *Quantumonline's* (QOL) free-access website for income investors, is evidence of this demand. Furthermore, during the months leading up to passage of JGTRRA, experts predicted that retail investor demand would increase (e.g., Wall Street Journal (May 22, 2003), citing tax analyst Robert Willens, "...preferred stocks will become more popular for the retail investor" if the dividend tax cut occurs). If individuals become the marginal investors, then R_{CPS} should

⁷ Tax differences should also induce a clientele effect resulting in individuals or institutions being the main holders

decrease, resulting in implicit tax: post-JGTRRA returns on CPS will be lower than pre-JGTRRA returns and lower than TPS returns.

Given that it is possible for either an individual or corporate investor to be the marginal investor, we follow Engel et al. (1999, 269) and determine the theoretical upper and lower bounds of the implicit tax, $R_{TPS} - R_{CPS}$, for both types of investors. We determine the bounds before and after JGTRRA. Before JGTRRA the lower bound of zero occurs if the marginal investor is an individual, while the upper bound occurs if the marginal investor is a corporation.

Pre-JGTRRA, in equilibrium the following holds for the marginal individual investor:

$$R_{CPS} (1-\tau_i) = R_{TPS} (1-\tau_i) \quad (2)$$

where τ_i is the marginal tax rate for an individual taxpayer. Because the individual investor did not pay higher explicit taxes on TPS relative to CPS, implicit tax is zero. Pre-JGTRRA, if the marginal investor is a corporation, we would expect R_{TPS} to be higher than R_{CPS} to reflect the additional TPS return to the corporate investor to compensate for the higher explicit taxes. In this case, in equilibrium the following holds for the marginal corporate investor:

$$R_{CPS} \{1-\tau_c(1-.7)\} = R_{TPS} (1-\tau_c) \quad (3)$$

where τ_c is the marginal tax rate for a corporate taxpayer. As shown in Engel et al. (1999, 270), the upper bound is $R_{TPS} \{1 - (1-\tau_c)/(1-.3\tau_c)\}$. If $\tau_c = .35$, then the implicit tax rate is .274.

Turning to theoretical bounds after JGTRRA, the tax landscape is the same for corporate investors. In equilibrium, if the marginal investor is a corporation, equation (3) still applies. Thus, there is no reason to expect a change in the upper bound of implicit tax, $.274R_{TPS}$, if the marginal investor is a corporation. For individual investors, however, CPS is now tax-favored and TPS continues to be tax-disfavored. Equation (2) now becomes:

of TPS (Scholes et al. 2002, 303). TPS is sold almost exclusively to individuals (Grinblatt and Titman 2002, 71).

$$R_{CPS} (1-\tau_d) = R_{TPS} (1-\tau_i)$$

where $\tau_d = .15$ and $\tau_i = .35$ (top rate dropped from .386 to .35). Solving for the implicit tax, ($R_{TPS} - R_{CPS}$), we find

$$R_{TPS} - R_{CPS} = R_{TPS} \{1 - (1-\tau_i)/(1-\tau_d)\}$$

If $\tau_i = .35$ and $\tau_d = .15$, the implicit tax rate is .235. Thus, if individual investors were indifferent pre-JGTRRA between TPS and CPS (not likely because CPS returns theoretically should impound implicit tax due to corporate holders), post-JGTRRA R_{CPS} would have to drop 23.5% before the marginal individual investor would again be indifferent. If JGTRRA prompts individuals to purchase CPS, we expect to see an increase in implicit tax, with an upper bound of $.235R_{TPS}$. If corporations remain the marginal investor, implicit tax will not change.

The foregoing discussion suggests the following hypothesis:

H1: Post-JGTRRA, pre-tax yield on CPS issues will decrease more than pre-tax yields on TPS issues, resulting in post-JGTRRA $R_{TPS} - R_{CPS}$ exceeding pre-JGTRRA $R_{TPS} - R_{CPS}$.

A decrease in pre-tax CPS yield would be consistent with the creation of implicit tax when the dividend tax rate was decreased relative to the marginal tax rate of individuals.

4. Process of Selecting Issuers, Issues and Dates

Identification of Issuers of Both TPS and CPS

To identify issuers' matched pairs of CPS/TPS publicly traded during our eight-month test period in 2003, we consulted December 2003 data from QOL. QOL has been repeatedly cited as a prime source of information for preferred stock investors (e.g., Wall Street Journal, August 19, 2003; Forbes, March 3, 2003; Journal of Financial Planning, December 2001;

Kiplinger's Personal Finance, September 2003). This process identified 27 issuers⁸ of matched pairs of CPS and TPS.

To test QOL for missing material CPS issues, we examined Compustat preferred stock balances for U.S. firms other than REITs. There were a few firms with over \$25 million of total preferred stock and for which issues of the firm did not appear on QOL's list. However, ValueLine indicates that (1) none of these firms' CPS issues was traded during the test period, (2) these firms did not have any TPS trading, or (3) none of these firms had taxable profits, as proxied by Compustat's quarterly tax expense.

To test QOL for missing relevant TPS issues, we reviewed Businesswire articles since 1997. As in Engel et al. (1999, 257), we searched for articles with titles that contained the term "trust preferred" or various TPS acronyms (e.g., "TRUPS," "TOPRS," "QUIPS," "MIPS"). To avoid articles related to TPS that was likely not publicly traded, we filtered the results by removing articles with the words "private" or "placement" in the title or lead paragraph. Although we found TPS issues not on QOL's list, ValueLine indicates that the vast majority was not traded during the test period. For the rare TPS issues that were traded, the issuer had no trading in its CPS.

As an added check for missing firms that had issued both publicly traded TPS and CPS, we consulted the Mergent Public Utility and Transportation Manual (2003) and the Mergent Bank and Finance Manual (2003). The listings of preferred stock by issuer in those sources did not reveal any issuers with matched pairs of CPS and TPS other than the 27 issuers we identified. Finally, we consulted ValueLine lists of all publicly traded securities for the 27

⁸Of these 27 issuers, eight are lower level affiliates of three larger publicly traded firms. For example, we treat Georgia Power Co., Gulf Power Co. and Mississippi Power Co. as three issuers, even though each is a subsidiary of Southern Co. Because the CPS (TPS) is of the lower level entity (lower level entity's special purpose affiliate) and ratings differ among affiliated issuers, we view the studied group as 27 issuers, not 22 "consolidated" issuers.

identified issuers and found no missing CPS or TPS issues that were traded during the test period.

Selection of Dates

It is possible that the market gradually impounds a tax change during the legislative process (Ayers et al. 2002, 937). Erickson and Maydew (1998, 449) advised that their findings should be “interpreted cautiously, as we have no way of knowing how likely the market thought it was that the proposal would pass.” For these reasons, we study prices (and thus effective yields) over several dates during an eight-month period. This window includes the five months before enactment of JGTRRA, a period for the market to study changes in the tax proposal and assess likelihood of passage, and three months after enactment, a period to digest JGTRRA’s impact on CPS and TPS issues. The discussion below explains the selection of January 2, January 9, March 31, May 30 and August 29 as the specific dates for study.

Although discussion of a dividend tax cut arose once at a 1999 George W. Bush presidential campaign meeting, President Bush made a final decision, with the plan kept tightly under wraps, in late December 2002, three weeks after the resignation of Treasury Secretary O’Neill, who opposed broad tax cuts (Davis et al. 2003). Table 1 details the reported progress of the dividend tax cut from December 2002 until May 2003, just after JGTRRA’s enactment. The entries are abstracted from articles related to the dividend tax cut published in the Wall Street Journal and Tax Notes Today, two key sources of daily information for investors and tax professionals.

January 2, 2003, is our first date because it is the first trading date after any year-end selling and is after most CPS issues’ ex-dividend dates. We also examine yields on January 9, the day after the long-rumored but cloaked dividend tax plan was finally announced by President

Bush. Reports in the first quarter of 2003, however, showed a battle looming for a President who insisted on full dividend tax exemption. In light of budget problems, compounded by pending Iraq war costs, compromise was needed. By March 2003, even members of the President's party did not support full exemption. By that point, it was clear that, at most, a 50% exclusion would be enacted. To test for reaction to a reduction of the planned exemption from 100% to 50%, we also examine yields on March 31, the final trading day in March.

On May 28, 2003, JGTRRA was enacted. We therefore examine yields on May 30, the final trading day of May. This date is also shortly after FASB released an accounting change for TPS (see footnote 3) that may have affected investor concerns about early redemption triggers in certain TPS issues. Finally, because of possible confusion over whether the dividend tax cut applied to TPS, we select August 29, the last trading day of August, as the end of the studied trading window. This date is after an August 19 Wall Street Journal article opining that TPS dividends would likely not qualify for the dividend tax cut. Also, by the end of August 2003, it is likely that any volatility in trading of utilities (a large portion of our studied issues) caused by the August 14 major electricity blackout in many parts of the U.S. had subsided.

See Table 1

5. Description of Studied Issues and Implicit Tax Results

Description of Identified Issuers of Matched Pairs of TPS and CPS

Of the publicly traded CPS and TPS issues outstanding at the end of 2002, QOL lists 595 CPS issues as eligible for the dividend tax cut and 325 TPS issues.⁹ Table 2 reports that 27

⁹ QOL provides a third list of TPS that involve an unaffiliated trustee, often an investment bank whose name appears in the issue. In light of their small number and potential confusion of investors, we ignore these issues. We also ignore convertible preferred stock issues.

issuers (20 utilities and 7 financial services¹⁰) had both CPS and TPS outstanding. During the first eight months of 2003, there was public trading in 122 (52) of their CPS (TPS) issues. The CPS (TPS) issues had an outstanding market value of approximately \$5 billion (\$16 billion) in January 2004. The TPS and financial services CPS traded on the NYSE. The utility CPS, many issues of which trade outside the NYSE (e.g., OTC Bulletin Board, pink sheets, regional markets), had fewer trades during the test period, and for many issues, there were certain test dates during the test period for which no actual trading occurred.

See Table 2

With rare exception, the CPS issues call for cumulative dividends and fixed quarterly dividend payments¹¹ during the test period. All CPS issues appear to be perpetual, while the TPS issues' average remaining maturity is over 20 years. Many issues are currently (or within several years) redeemable by the issuer, and some TPS issues allow the issuer to redeem upon detrimental change in tax or regulatory/accounting rules. Moody's Bond Ratings (January 2003) generally rate each TPS issue one notch above its CPS counterpart (e.g., an issuer's TPS is "Aa2," while its CPS is "Aa3"). This finding differs slightly from Engel et al.'s (1999) findings that the matched pairs typically had the same ratings.

¹⁰ SIC codes (49 for utilities and 60-63 for financial services) are obtained from ValueLine or prospectuses. Of the utilities' CPS issues we study, approximately 5% are "old money" (i.e., reduced DRD) according to Mergent Public Utility and Transportation Manual (2003). Given their small number and the fact that JGTRRA did not impact corporate CPS holders, inclusion of these issues should not have a serious effect on our results.

¹¹ Seven of the financial services CPS issues and three of the utility CPS issues have adjustable rate provisions that provide for variations in rate at some points during the life of the instrument. There are varying quarterly cycle commencement dates for payment of dividends, with January 1 the most frequent.

Impact of JGTRRA's Dividend Tax Cut and Estimates of Implicit Tax

Table 3 (Panels A and B) reports effective yields for the identified issues for the five selected dates. Using end of day prices, the effective yield is obtained by dividing annual dividends by the stock's selling price on a given date as indicated by ValueLine or, where unavailable, NYSE.com. Table 3 separately presents yields for utilities and financial services firms, as well as the combined totals for these two sectors. For each of the five selected test dates, the first (second) column indicates the mean yield on TPS (CPS). The third column indicates an estimate of implicit tax (i.e., difference in TPS and CPS means). Medians and standard deviations are also provided.

Panel A reports yields based on equal weighting of issues regardless of how many issues a given issuer has. Under this approach, the January 2 yield on all 52 TPS issues is 7.75%, whereas all 122 CPS issues is 7.22%. The pre-tax return difference suggests implicit tax of .53% in CPS before the President's January 7 dividend tax relief announcement. The implicit tax rate based on this difference is 6.8% ($.53/7.75$). Because results for the combined group are distorted by the fact that a vast majority of the CPS is utility CPS, whose yields are higher than those of the financial services, it is useful to separately look at the two groups. On January 2, utility CPS have an implicit tax of .70% and financial services CPS have an implicit tax of .88%. After eight months, the implicit tax has doubled in utility CPS to 1.43%. For financial services CPS, the implicit tax nearly doubled to 1.32%, with most of the increase occurring immediately after the President's announcement.

Panel B presents mean yields on 27 matched pairs of CPS and TPS "combined" issues. For each of the 27 issuers, mean yields for their respective CPS issues and TPS issues are computed. For example, there are seven financial services issuers, which issued 20 CPS and 23

TPS issues. Instead of calculating the mean of all 20 CPS issues to obtain a CPS mean for this SIC group, as in Panel A, we first obtain the mean of all CPS issues of an issuer. That mean is then used as the combined issues' mean for that issuer. We perform this combined mean computation for each issuer, and then determine the mean of the issuers' combined issue means. By reporting the mean of the issuers' combined means, Panel B removes the distortion any one issuer has on the results in Panel A due to it having more or less issues than another issuer and/or more CPS issues than TPS issues.¹²

As indicated on Panel B, the January 2 TPS yield for the combined group is 7.85%, whereas the CPS yield is 6.90%. This difference of .95% is higher than Engel et al.'s (1999, 270) estimates of implicit tax of .52% determined using the pre-tax effective yields of new issuances of TPS to retire existing CPS. However, Engel et al.'s calculations assumed a risk premium for TPS of .3% to control for the likely need to induce investors to hold TPS, which, during their test period, was a newly developed security.¹³ The return difference on Panel B suggests that the mean implicit tax rate is 12.10% (.95/7.85) for all 27 combined issues shortly before the President's announcement. By sector, it appears that there is approximately 50% more implicit tax in utility CPS than in financial services CPS on January 2.

After eight months, Panel B shows that implicit tax for all 27 combined issues has increased by over 50%, from .95% to 1.49%. This increase appears consistent with results in the two sectors; utilities implicit tax increased from 1.03% to 1.64% and financial services

¹² Other possible approaches include weighted average yields based on market capitalization or dollar volume of trading. Also, note that the medians and standard deviations reported in the implicit tax column in Panel B represent calculations based on 27 matched pairs' implicit tax; they are not the differences between the first and second columns. This is consistent with Engel et al. (1999, 270). For Panel, B the implicit tax column is the difference between the first two columns, which also equals the average of the 27 issuer-specific implicit tax calculations. For Panel A, the implicit tax column is the difference between the first two columns; also, we cannot report implicit tax medians or standard deviations for Panel A because there is an uneven number of TPS and CPS issues.

increased from .69% to 1.07%. The mean implicit tax rate on August 29, 2003, is 19.42% (1.49/7.67).

If the marginal investor continued to be a corporation, we would expect the level of implicit tax to remain the same, but the implicit tax as shown in Panel B increases from .95% to 1.49%. As we stated earlier, if JGTRRA prompts individuals to purchase CPS, we expect to see an increase in implicit tax, with an upper bound of $.235R_{TPS}$. If we consider the last column in Panel B, the mean R_{TPS} is 7.67%. Multiplying by .235 results in a 1.8% upper bound. Thus our mean implicit tax estimate of 1.49% is again close to an upper bound of 1.8%. Thus, it appears that JGTRRA resulted in additional implicit tax in CPS over the eight months, supporting the conclusion that the clientele for CPS now includes individuals.

Detecting the precise dates each of the SIC groups was impacted does not appear possible. From January 2 to January 9, the day after the President's announcement, financial services implicit tax increased substantially, whereas utilities implicit tax increased significantly by March 31, when it was clear a full dividend exemption was not to occur. After enactment, May 30 implicit tax had not changed much from March 31, perhaps indicating that the market fully impounded anticipated tax law change in March. The market may have believed some dividend tax relief would pass (given that the President's party controlled both chambers of Congress), although not as much as the President initially sought. From May to August, utility implicit tax again rose, while financial services rose only modestly.

See Table 3

¹³ Because of TPS' maturation, it seems that the .3 premium is not warranted in our study; indeed, as noted earlier, we find that credit rating agencies generally rate TPS a notch above CPS. If Engel et al. had not decreased the TPS yield by the .3 risk premium, their implicit tax would have been .82%, closer to the January 2 levels on Panel B.

Table 4 tabulates the implicit tax rates and post-explicit-tax effective yields, using the mean effective yields based on the combined issues within each issuer, at each of the five selected dates. As stated above, the pre-JGTRRA average implicit tax rate was 12.10%, increasing to 19.42% on August 29. The theoretical upper bound for the implicit tax rate if corporations are the marginal investors remains 27.4% across the sample period because the tax-favored corporate treatment of CPS dividends does not change. On the other hand, the individual investor faced marginal tax rate taxation of a maximum of 38.6% pre-JGTRRA reduced to 15% post-JGTRRA. Thus, post-JGTRRA, the theoretical upper bound for the implicit tax if an individual is the marginal investor is 23.5%.

For January 2, May 30 and August 29, the post-tax yield calculations are based on actual explicit tax rates in effect: pre-JGTRRA for January 2 and post-JGTRRA for May 30 and August 29. For January 9 and March 31, we make assumptions about individuals' beliefs based on the analysis in Section 4. The January 9 rate assumes the full exemption on dividends, as initially proposed, while the March 31 rate assumes only a 50% exemption. For both January 9 and March 31, we assume investors were confident the ordinary tax rate reduction would occur (from 38.6% to 35%).

The post-tax yield analysis shows that before the proposal was announced, corporations enjoyed a far larger post-tax return on CPS (6.18% compared to 4.23% for individual investors), supporting the long-held belief that corporations are the main holders of CPS. Individuals received higher yields on TPS, which supports the belief that individuals are main holders of TPS. In other words, before JGTRRA corporate holders could afford to bid up the price of CPS to a point that individual holders were better off investing in TPS. If dividends had been fully exempted from individual explicit tax, the post-tax yield for individuals would have exceeded

the corporate yield (6.79% relative to 6.08%) as shown in the January 9 CPS column. By August 29, individual holders were netting only slightly lower post-tax yields than corporations.¹⁴

See Table 4

An alternate way to analyze whether shareholder tax considerations impacted stock prices is to review changes in CPS yields. For example, Panel B of Table 3 reports utilities CPS January 2 yield of 6.97% dropped to 6.19% by August 29. One might respond that non-tax factors could have caused this drop. However, the benchmark asset, TPS, did not see its yields change as much (8% to 7.83%). Similar results apply to the financial services and the combined group.

Furthermore, comparison to other interest income generating securities is also instructive. Mergent Bond Record reports that yields of “a” rated taxable bonds of all utilities (not just those in our studied group) decreased from 7.06% in January 2003 to 6.78% in August 2003. This decrease is approximately one third of the decrease in utilities’ CPS yields. As to “a” rated municipal bond yields, which are typically free from federal income tax, their yields actually increased from January’s 5.05% to August’s 5.22%. During the same time period, the 20 (10) year U.S. Treasury yield, which is typically free from state income tax, increased from 5.05% (4.07%) to 5.33% (4.45%).¹⁵ The results among these differently taxed securities may evidence that JGTRRA’s 10% reduction in marginal rates was impounded into TPS and taxable bonds by

¹⁴ The now slight relative tax advantage to corporate holders after JGTRRA is perhaps nearly offset by two burdens: 1) corporate holders will expose the CPS dividend to yet another layer of tax when the corporate holder distributes earnings to its shareholders, and 2) corporate holders must hold CPS for 45 days to qualify for the DRD.

¹⁵ Yields as per www.ustreas.gov/offices/domestic-finance/debt-management/interest-rate/yield2003-01-12.html.

slightly lowering their yields in a period where tax-favored government obligations increased yields. The much larger drop in CPS yields, however, implies that JGTRRA impacted individual taxpayers and created additional implicit tax in CPS.

6. Conclusion

The steady reduction of CPS yields during the eight-month study period surrounding passage of JGTRRA's dividend tax cut implies that investor-level tax considerations impacted stock prices and that JGTRRA created implicit tax in CPS. More confidence in the existence of implicit tax is provided by the use of a given firm's TPS as a benchmark asset against which to compare the same firm's CPS. The level of implicit tax found suggests that individuals have also become significant holders of CPS, an update to the long-held belief that taxable corporations are the main holders of CPS. This suggests that investors may be willing to purchase a security as long as their tax attributes do not cast them significantly outside the theoretically ideal tax clientele.

The findings in this paper add insight into how individual investors value assets, adding to a stream that has not reached consensus on the existence of implicit taxes in equity securities, including CPS. This evidence is consistent with tax capitalization studies that challenge an assumption that investor taxes are value-irrelevant (Shackelford and Shevlin 2001, 351). More specific to CPS, by studying an enacted change, this paper extends Erickson and Maydew (1998), who studied a proposal that did not pass. Also, by studying all issuers with outstanding matched pairs of CPS and TPS, this paper extends Engel et al. (1999), who focused on a smaller set of issues at a time of TPS' relative infancy.

There are several limitations of this study. First, it is unclear how investors factored in the dividend tax cut's sunset provisions or the possibilities of repeal with a close 2004 presidential election expected. A full imputation of a tax benefit is not warranted if dividends for only six or less years will benefit from the tax cut. Second, it is unclear whether the FASB change related to TPS impacted trading of issues granting the issuer the right to redeem in light of that change. Third, reliance on QOL data, although extensively cross-checked, renders this paper vulnerable to the extent QOL erroneously categorized or described issues. For example, we did not independently check all issuer materials to confirm unique features of a given issue that may make a given TPS issue more or less secure than the standard TPS issue described in Section 2 (however, the consistency in Mergent credit ratings of the studied issues provides confidence here). Fourth, there was financial distress in the power utility sector in the years leading up to JGTRRA's passage (Energy Economist May 2003). Finally, many of the utilities CPS issues in our study group are thinly traded and are not traded on major exchanges.¹⁶ Thus, the results for the utility CPS should be viewed with some caution.

Furthermore, generalizability of this study's results to the larger securities market may be difficult. As noted in Shackelford and Shevlin (2001, 347) and Graham (2003, 347), the unique features of TPS may make the results in Engel et al. (1999) (and presumably our results) not generalizable to other securities. In addition, CPS has many characteristics that do not allow it to be easily generalized to common stock. For example, CPS was extensively issued by financial

¹⁶ Of the 102 utilities CPS issues, only 20% had trading on each of the five studied dates. On January 2, approximately 40% did not trade, and on August 29, over half did not trade (following a pattern of many days of no or quiet trading in August 2003). For the other three test dates, approximately 15-25% of the issues did not trade on one or more of those dates. For purposes of computing our yields, we used the last sold price as the current price for the given date. We researched the CPS stock price applicable at the close of trading on the next day on which there was trading. For the utilities CPS issues that did not trade on January 2, their price was, on average, \$1.50 higher on the next day it did trade (which may have been days, weeks or months later). For the issues that did not

services and utilities. Also, the market had not seen many new offerings of CPS in the years leading up to JGTRRA due to issuers' preference to use TPS. Furthermore, the ability to isolate another security, such as CPS, which has a benchmark asset (TPS) so similar in non-tax attributes is not often seen in the securities market. Thus, it is difficult to extend the Engel et al. (1999) approach because of the lack of other matched pairs of securities. However, one could compare a given issuer's CPS and TPS yields to the same issuer's bond yields, with perhaps a simultaneous use of the issuer's common stock as a control (see Plesko (2004) for a time series study of corporate bond yields compared to auction rate preferred stock yields).

trade on August 29, they traded at a price, on average, approximately \$2 lower on their next trade date. Thus, we continue to caution as to the results of this study as they relate to utilities CPS.

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Table 1

Abstracts of Wall Street Journal and Tax Notes Today Articles Related to Progress of JGTRRA Dividend Tax Cut

General notes:

During the time period below, the Executive branch was led by President George W. Bush, a Republican, while the Senate and House were majority-controlled by Republicans, although the number of Republicans was below 60%, the level viewed as required to avoid the risk of a filibuster.

“WSJ”: Wall Street Journal

“TNT”: Tax Notes Today

Dates of report are typically one day after occurrence of event.

2002

12/10 - WSJ: Bush administration tax and economic policy officials: “major reform of the corporate income tax code is in the works and economic growth must be the fulcrum on which overhaul hinges.”

2003

1/3 - WSJ: Bush will unveil plan on 1/7, including reducing taxes on dividends paid to individuals by taxing them as capital gains.

1/6 - TNT: On 1/3, incoming Democratic House Minority Leader Pelosi and Senate Minority Leader Daschle criticized 50% dividend tax reduction. WSJ: Bush to propose eliminating dividend tax, an extreme proposal providing “plenty of bargaining chips” in negotiations with Democrats. Plan “is certain to be controversial.”

1/7 - TNT: Pelosi says Democrats will oppose dividend tax cut.

1/8 - WSJ: Bush proposed to totally eliminate tax on dividends paid from already taxed corporate earnings. Preferred Stock would also benefit, but hybrids would not. TNT: Cites Council of Economic Advisers’ briefing paper and Treasury release, stating that dividends paid to individuals are to be 100% excluded.

1/9 - TNT: Senate Democrats who voted for Bush’s 2001 tax changes state that they will not support dividend cut as proposed.

1/14 - WSJ: Commentary that proposal cannot pass in current form; 50% exclusion may be the compromise.

1/15 - TNT: “After many well-orchestrated leaks from the White House, the stock markets had long been expecting [a 50% exclusion.] But over the [1/4 weekend], press reports began to appear that the exclusion would [be 100%. Many] analysts attribute the [1/6 stock price increases] to Bush’s proposal ...”, particularly those with high dividend yields. TNT: Republican senators Grassley and Kyl: dividend tax cut is most vulnerable piece of plan, “it probably won’t be easy.”

1/16 - TNT: A Treasury Fact Sheet describes plan as excluding dividends from tax.

1/17 - TNT: Several senators looking to modify dividend tax cut. WSJ: New bill could replace DRD with dividend exemption if payer is subject to income tax.

Table 1 (continued)

1/24 - WSJ: REITs and many preferred stocks will not benefit under current plan. [By stating that many preferreds are “technically debt,” the writer is likely referring to TPS.]

1/27 - WSJ: On national television, Daschle calls dividend tax cut “dead on arrival,” citing bi-partisan opposition to its current form.

1/28 - TNT: Treasury Assistant Secretary Olson’s 1/24 speech to ABA Tax section cites plan as 100% exclusion of dividends.

1/30 - TNT: Notes Bush’s brief mention of plan during 1/28 State of the Union address. Congress has given the dividend exclusion plan “a cold reception.” Democrats call it a “nonstarter.” Republican representative Portman doubts Bush is set on the dividend exclusion formula.

2/13 - WSJ: Cites Fed Chairman Greenspan 2/12 testimony in support of plan.

2/18 - TNT: New Treasury Secretary Snow on 2/14 says proposal is to exempt dividends from tax.

3/5 - TNT: Joint Committee on Taxation describes proposal as eliminating tax on dividends. In testimony to Ways & Means, Snow cites need to pass bill, but alternates between referring to “eliminating” and “reducing” double tax.

3/14 - WSJ: Citing defection by key centrist Republican and Democratic senators, elimination of dividend taxes “is in jeopardy.”

3/25 - TNT: Tax lawyer Mike Schler details provisions of latest bill, including a concern that preferred stock may be negatively impacted because dividends cannot be assured as tax free every year depending on issuer’s losses in one year impacting another year and other complications related to accounting for a newly to be required “EDA” account.

3/26 - WSJ: Senate budget amendment’s reduction of overall legislation’s price tag threatens or kills repeal of taxes on individual’s stock dividends.

3/27 - TNT: Republican Ways & Means Chair Thomas suggests reducing dividend tax to capital gain rate. Grassley desires no less than 50% exclusion.

4/3 - WSJ: Bush meets with stock market strategists, seeking full exemption of dividends. Thomas suggests tying dividend tax rate to capital gain tax rate.

4/14 - TNT: House passage of Republican budget conference report does not permit room for projected cost of full dividend exemption.

4/21 - WSJ: To meet budget constraint limits, Snow suggests 50% dividend exclusion for 2003, then phase in of 100% exclusion over next several years.

4/22 - TNT: Treasury Spokesman Nichols is committed to package that includes the 100% exclusion of the double tax on dividends.

4/23 - WSJ: Professor Hubbard, an “architect” of the dividend tax cut: “I’d be surprised if the president doesn’t get at least half of what he’s asking for.”

5/1 - WSJ: White House wants full exclusion, but may consider gradual approach; unhappy that House leaders support tying of dividend rate to capital gain rate.

Table 1 (continued)

5/2 - TNT: House leaders unveil details of bill that cuts dividend tax rate to that of a new reduced capital gain rate (15%), in effect through 2012.

5/7 - TNT: Ways & Means approves dividend tax cut to 15% through 2012. Bush spokesman Fleischer calls this progress. Olson calls it positive step. Senate is considering 33% exclusion in 2003, 66% exclusion in 2004 and 100% exclusion in 2005.

5/8 - TNT & WSJ: Senate Finance Committee votes to exempt \$500 in 2003, additional 10% or 20% of dividends in later years. House version gains momentum.

5/12 - TNT: House passes Ways & Means bill.

5/16 - TNT: Senate approves bill to exempt half of dividends in 2003, exempt all in 2004-2006. Bill sunsets in 2007. Bill sent to conference with House bill.

5/20 - WSJ: Bush presses Republican congressional leaders to eliminate tax on dividends, even if just temporarily.

5/22 - TNT: Thomas and Grassley agree on reduction of dividend tax rate to maximum 15% for 2003-2008. Needs to be scored by Joint Committee on Taxation before proceeding to houses for votes.

5/23 - TNT and WSJ: Bush said he would sign the package. Both bodies of Congress expected to pass it.

5/29 – TNT & WSJ: reports May 28 passage by House and Senate and signing by Bush.

8/19 - WSJ: dividends on TPS likely will not qualify for new tax law relief.

Table 2

Descriptive Statistics for Issuers of Both TPS and CPS

		<u>Number of Issues</u>		
	<u>Number of Issuers</u>	<u>CPS</u>	<u>TPS</u>	<u>Total</u>
Utilities (SIC code 49)	20	102	29	132
Financial Services (SIC code 60-63)	<u>7</u>	<u>20</u>	<u>23</u>	<u>43</u>
Total	27	122	52	175
Market Value (January 2004)		\$5 billion	\$16 billion	\$21 billion

Table 3
Comparison of Effective Yields on TPS and CPS and Estimates of Implicit Tax

Panel A: Based on Equal Weighting of All Issues

	<u>January 2, 2003</u>			<u>January 9, 2003</u>			<u>March 31, 2003</u>			<u>May 30, 2003</u>			<u>August 29, 2003</u>		
	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax
Utilities															
<u>(Observations: 102 CPS; 29 TPS)</u>															
Mean	8.07	7.37	.70	7.96	7.31	.65	8.11	6.99	1.12	7.70	6.68	1.03	7.83	6.39	1.43
Median	8.05	7.44		8.02	7.26		8.00	7.06		7.78	6.86		7.87	6.65	
Standard Deviation	0.94	1.55		0.80	1.52		1.08	1.30		0.72	1.29		0.74	1.18	
Financial Services															
<u>(Observations: 20 CPS; 23 TPS)</u>															
Mean	7.34	6.46	.88	7.29	6.05	1.24	7.24	5.97	1.27	7.00	5.69	1.32	7.18	5.86	1.32
Median	7.09	6.53		7.14	6.02		7.03	5.90		6.94	5.51		7.09	5.88	
Standard Deviation	0.50	0.69		0.49	0.72		0.52	0.81		0.46	0.82		0.42	0.80	
Total															
<u>(Observations: 122 CPS; 52 TPS)</u>															
Mean	7.75	7.22	.53	7.67	7.10	.57	7.73	6.82	.90	7.40	6.51	.89	7.54	6.31	1.23
Median	7.57	7.19		7.52	7.10		7.50	6.90		7.26	6.72		7.33	6.40	
Standard Deviation	0.86	1.48		0.76	1.49		0.97	1.29		0.71	1.28		0.69	1.14	

Table 3 (continued)
Comparison of Effective Yields on TPS and CPS and Estimates of Implicit Tax

Panel B: Based on 27 “Combined” Issues

	<u>January 2, 2003</u>			<u>January 9, 2003</u>			<u>March 31, 2003</u>			<u>May 30, 2003</u>			<u>August 29, 2003</u>		
	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax	TPS Yield	CPS Yield	Implicit Tax
Utilities															
(Firm Observations: 20)															
<u>(Issue Observations: 102 CPS; 29 TPS)</u>															
Mean	8.00	6.97	1.03	7.92	6.94	0.98	7.98	6.71	1.27	7.70	6.40	1.31	7.83	6.19	1.64
Median	8.00	7.03	0.71	8.00	6.97	0.70	7.94	6.77	1.00	7.73	6.55	1.05	7.85	6.40	1.40
Standard Deviation	0.85	1.25	1.27	0.85	1.23	1.27	0.93	1.15	1.23	0.72	1.06	1.09	0.73	0.95	1.13
Financial Services															
(Firm Observations: 7)															
<u>(Issue Observations: 20 CPS; 23 TPS)</u>															
Mean	7.40	6.71	0.69	7.38	6.35	1.03	7.33	6.33	1.00	7.07	6.06	1.01	7.24	6.17	1.07
Median	7.40	6.60	0.91	7.34	6.11	1.47	7.33	6.12	1.40	7.01	5.77	1.27	7.27	5.98	1.34
Standard Deviation	0.50	0.69	0.82	0.48	0.77	0.90	0.49	0.95	1.02	0.42	0.95	1.05	0.36	0.90	0.99
Total															
(Firm Observations: 27)															
<u>(Issue Observations: 122 CPS; 52 TPS)</u>															
Mean	7.85	6.90	0.95	7.78	6.79	0.99	7.81	6.61	1.20	7.54	6.31	1.23	7.67	6.19	1.49
Median	7.85	6.89	0.81	7.86	6.84	0.86	7.70	6.64	1.03	7.49	6.29	1.05	7.65	6.26	1.39
Standard Deviation	0.81	1.13	1.16	0.74	1.15	1.17	0.88	1.09	1.17	0.70	1.02	1.07	0.70	0.92	1.10

Table 4
Comparison of Post-tax Effective Yields in 2003 on TPS and CPS

	<u>January 2</u>		<u>January 9</u>		<u>March 31</u>		<u>May 30</u>		<u>August 29</u>	
	<u>Pre-</u> <u>JGTRRA</u>		<u>Assume Full</u> <u>Exemption</u>		<u>Assume Half</u> <u>Exemption</u>		<u>Post-</u> <u>JGTRRA</u>		<u>Post-</u> <u>JGTRRA</u>	
	<u>TPS</u>	<u>CPS</u>	<u>TPS</u>	<u>CPS</u>	<u>TPS</u>	<u>CPS</u>	<u>TPS</u>	<u>CPS</u>	<u>TPS</u>	<u>CPS</u>
Mean effective yield (pre-tax) Per Table 3, Panel B										
Utilities	8.00	6.97	7.92	6.94	7.98	6.71	7.70	6.40	7.83	6.19
Financial Services	7.40	6.71	7.38	6.35	7.33	6.33	7.07	6.06	7.24	6.17
Total	7.85	6.90	7.78	6.79	7.81	6.61	7.54	6.31	7.67	6.19
Implicit tax rates:										
Observed utilities ^a		12.88		12.37		15.91		17.01		20.95
Observed financial ^a		9.32		13.96		13.64		14.29		14.77
Observed total ^a		12.10		12.72		15.36		16.31		19.42
Maximum corporate ^b		27.4		27.4		27.4		27.4		27.4
Maximum individual ^c		0		35.0		21.2		23.5		23.5
Explicit tax rates:										
Corporate holder	35.0	10.5	35.0	10.5	35.0	10.5	35.0	10.5	35.0	10.5
Individual holder	38.6	38.6	35.0	0	35.0	17.5	35.0	15.0	35.0	15.0
Post-tax yield - Total										
Corporate ^d	5.10	6.18	5.06	6.08	5.08	5.92	4.90	5.65	4.99	5.54
Individual ^{e-i}	4.82 ^e	4.23 ^f	5.06 ^e	6.79 ^g	5.08 ^e	5.45 ^h	4.90 ^e	5.36 ⁱ	4.99 ^e	5.24 ⁱ

^a Observed implicit tax rate = $(R_{TPS} - R_{CPS})/R_{TPS}$

^b Corporate upper bound implicit tax rate = $\{1 - (1 - \tau_c)/(1 - .3\tau_c)\}$

^c Individual upper bound implicit tax rate = $\{1 - (1 - \tau_i)/(1 - \tau_d)\}$

^d Corporate post-tax TPS yield = effective yield * (1 - .35); post-tax CPS yield = effective yield * (1 - .3*.35)

^e Individual post-tax TPS yield pre-JGTRRA = effective yield * (1 - .386); thereafter = effective yield * (1 - .35)

^f Individual post-tax CPS yield pre-JGTRRA = effective yield * (1 - .386)

^g Individual post-tax CPS yield January 9 = effective yield * (1 - 0)

^h Individual post-tax CPS yield March 31 = effective yield * (1 - .175)

ⁱ Individual post-tax CPS yield May 30 and thereafter = effective yield * (1 - .15)