Taxpayers' Prepayment Positions and Tax Return Preparation Fees*

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Abstract

Individuals who have their tax returns professionally prepared often overpay estimated income taxes, effectively giving the government an interest-free loan. To understand why tax professionals may place their clients in positive prepayment positions, we draw on mental accounting theory. Mental accounting theory suggests that by placing taxpayers in positive prepayment positions, tax professionals induce a favorable mental representation of tax return preparation fees, perhaps allowing them to collect larger fractions of billable time and costs incurred on taxpayers' behalves. Thus, we hypothesize that tax return preparation fees are higher for taxpayers in positive prepayment positions than for taxpayers in negative prepayment positions. Regression results using tax return data for 68,736 taxpayers provide strong support for this hypothesis. To more fully understand the general nature of the relationship between taxpayers' prepayment positions and tax return preparation fees, we adapt the prospect theory value function to the tax domain and formulate three additional hypotheses. Consistent with theory, regression results indicate that the relation between taxpayers' prepayment positions and tax return preparation fees is (1) positive, (2) stronger for taxpayers who receive refunds that are less than fees than it is for taxpayers who receive refunds that are greater than fees, and (3) stronger for taxpayers in negative prepayment positions than for taxpayers in positive prepayment positions.

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Keywords Mental accounting; Prepayment position; Prospect theory; Tax return preparation fees

JEL Descriptors H200, M400

Situations de paiement anticipé des contribuables et honoraires de préparation des déclarations fiscales

Condensé

En 2002, les fiscalistes ont préparé 60 pour cent de l'ensemble des déclarations fiscales des particuliers aux États-Unis, dont une vaste proportion ont donné lieu à des remboursements d'impôt. Une telle situation fiscale ne favorise cependant pas les contribuables, car les sommes versées en sus du minimum exigé par l'Internal Revenue Code (IRC) représentent, en fait, un prêt sans intérêt à l'État. Puisque les fiscalistes sont en mesure d'aider les contribuables à différer le paiement de l'impôt et à éviter les pénalités qu'entraîne un paiement insuffisant, il est plutôt étonnant que les contribuables dont les déclarations fiscales sont préparées par des fiscalistes tendent à payer des impôts sur le revenu estimatifs qui excèdent les impôts minimums exigibles.

Les recherches révèlent non seulement que les gens ont tendance à payer des impôts sur le revenu estimatifs excédentaires (sous forme de versements d'acomptes provisionnels au Canada), mais aussi que l'importance et la fréquence de ces paiements excédentaires ont augmenté au cours des dernières décennies (Jackson, 2004a ; Pechman, 1987). Jusqu'à maintenant, le comportement des contribuables, qui semblent préférer que leurs paiements anticipés présentent un solde positif, est le facteur que l'on a principalement invoqué pour expliquer ces paiements excédentaires (Ayers *et al*., 1999 ; Christian *et al*., 1994 ; Jackson, 2004a). Pour mieux comprendre le phénomène du paiement excédentaire, il faut déterminer et comprendre les facteurs susceptibles d'inciter les fiscalistes à placer les contribuables en situation de paiements anticipés excédentaires. Jusqu'à maintenant, les recherches comptables n'ont pas permis d'établir clairement le profil de ces incitatifs.

Dans la présente étude, les auteurs proposent une explication intuitive de ce qui amène les fiscalistes à vouloir placer les contribuables en situation de paiements anticipés excédentaires, et ils testent ensuite les conséquences de cette explication à l'aide de données fiscales d'archives. Selon la théorie de la comptabilité mentale, les contribuables envisagent les honoraires de préparation des déclarations fiscales sous un angle plus favorable lorsqu'ils reçoivent des remboursements d'impôt que lorsqu'ils doivent verser des impôts supplémentaires, en raison de la façon dont ils organisent mentalement (du point de vue du coût par rapport à la perte) les résultats en matière fiscale (les honoraires de préparation des déclarations fiscales et les impôts à recouvrer ou à payer). Au fil des relations qu'ils entretiennent avec les contribuables, les fiscalistes sont susceptibles de se familiariser avec la manière dont ces derniers envisagent les résultats fiscaux et tentent d'associer, aux yeux des contribuables, un avantage mental aux honoraires de préparation des déclarations fiscales. Les contribuables qui ont une représentation mentale favorable (défavorable) de ces honoraires peuvent être disposés (réfractaires) à payer des proportions plus importantes des heures facturables et des coûts engagés pour leur compte. En s'appuyant sur la théorie de la comptabilité

mentale, les auteurs énoncent l'hypothèse selon laquelle les honoraires de préparation des déclarations fiscales sont plus élevés pour les contribuables qui reçoivent des remboursements d'impôt que pour ceux qui doivent verser des impôts supplémentaires.

Pour mieux comprendre la nature de la relation entre la situation des contribuables en matière de paiements anticipés et les honoraires de préparation des déclarations fiscales, les auteurs adaptent au domaine fiscal la fonction de valeur de la théorie prospective et élaborent une fonction de valeur ajustée. Selon Thaler (1980, 1985 et 1999), les gens perçoivent les résultats sous l'angle de la fonction de valeur de la théorie prospective. Le rôle de la fonction de valeur de la comptabilité mentale est de décrire comment les événements sont perçus et mentalement codés. Selon la forme de la fonction de valeur ajustée, les auteurs posent l'hypothèse selon laquelle la relation entre la situation des contribuables en ce qui a trait aux paiements anticipés et les honoraires de préparation des déclarations fiscales est i) positive, ii) plus marquée pour les contribuables qui reçoivent des remboursements dont le montant est inférieur à celui des honoraires que pour les contribuables qui reçoivent des remboursements dont le montant est supérieur à celui des honoraires et iii) plus marquée pour les contribuables qui ont un solde négatif de paiements anticipés que pour ceux qui affichent un solde positif.

Les auteurs testent les hypothèses en recensant les contribuables qui, dans le fichier *Statistics of Income Individual Model File*, ont détaillé leurs déductions et fait état d'honoraires de préparation de déclaration fiscale durant toute la période allant de 1988 à 1991. À partir des 68 736 observations obtenues, les auteurs estiment les régressions transversales annuelles et une régression relative à l'ensemble de la période. Une fois contrôlés les déterminants connus des honoraires de préparation des déclarations fiscales, les données confirment toutes les hypothèses des auteurs, ce qui amène ces derniers à conclure que les facteurs psychologiques influent sur le montant des honoraires de préparation des déclarations fiscales que réclament les fiscalistes à leurs clients et sur le montant des honoraires que les contribuables sont disposés à verser en échange des services des fiscalistes.

Enfin, les auteurs font remarquer qu'il est impossible, à partir des données fiscales d'archives, d'établir de façon concluante les causes des relations observées entre la situation des contribuables en ce qui a trait aux paiements anticipés et les honoraires de préparation des déclarations fiscales, puisque ces données ne révèlent pas les intentions des fiscalistes ou les perceptions des contribuables. De façon plus générale, toute étude qui s'appuie sur des données d'archives pour mettre à l'épreuve une théorie est astreinte à des limites quant aux liens de causalité. Il serait donc inexact de conclure, à partir des résultats de la présente étude, que les fiscalistes concourent à ce que les paiements anticipés de leurs clients soient excédentaires afin de récupérer des proportions plus grandes d'heures et de coûts facturables. Il est possible que les fiscalistes facturent simplement à leurs clients des proportions plus grandes d'heures et de coûts facturables lorsque les paiements anticipés de leurs clients sont fortuitement excédentaires et que les contribuables soient disposés à verser des honoraires plus élevés dans ce cas. Les auteurs estiment néanmoins que leurs conclusions sont légitimes et qu'ils ont à tout le moins relevé des régularités empiriques qui méritent d'être étudiées plus avant.

1. Introduction

Tax professionals prepared 60 percent of all individual income tax returns in the United States in 2002, and a large percentage of those returns resulted in tax refunds.[1] However, such a tax position is not advantageous for taxpayers, because amounts paid in excess of the minimum required by the Internal Revenue Code (IRC) effectively gives the government an interest-free loan.[2] Because tax professionals can help taxpayers defer tax payments and avoid underpayment penalties, it is somewhat surprising that taxpayers who have their tax returns professionally prepared tend to pay estimated income taxes in excess of the safe harbor amounts.[3]

Research reveals not only that individuals tend to overpay estimated income taxes (tax installments in Canada), but also that overpayments have become larger and more frequent in recent decades (Jackson 2004a; Pechman 1987). To date, explanations for the overpayment of income taxes have generally focused on taxpayers and have attempted to explain why they apparently prefer to be in positive prepayment positions (Ayers, Kachelmeier, and Robinson 1999; Christian et al. 1994; Jackson 2004a).[4] In order to more fully understand the overpayment phenomenon, it is necessary to identify and understand any incentives that may encourage tax professionals to place taxpayers in positive prepayment positions. To date, a clear picture of those incentives has yet to emerge in the accounting literature.

In this study, we formulate an intuitive explanation of why tax professionals may want to place taxpayers in positive prepayment positions and then test the implications of this explanation using archival tax data. Mental accounting theory suggests that taxpayers view tax return preparation fees more favorably when they receive tax refunds than when they owe additional taxes because of the way they mentally frame (that is, cost versus loss) tax-related outcomes (that is, the tax return preparation fee and the tax refund/tax due).[5] Through repeated interactions with taxpayers, tax professionals are likely to become attuned to the manner in which taxpayers frame tax-related outcomes and attempt to create a mental benefit for taxpayers to match with tax return preparation fees. Taxpayers who have a favorable (unfavorable) mental representation of fees may be willing (unwilling) to pay larger proportions of billable time and costs incurred on their behalf. On the basis of mental accounting theory, we hypothesize that tax return preparation fees are larger for taxpayers who receive tax refunds than for taxpayers who owe additional taxes.[6]

To further understand the nature of the relationship between taxpayers' prepayment positions and tax return preparation fees, we adapt the prospect theory value function to the tax domain and develop a stylized value function. According to Thaler (1980, 1985, 1999), individuals perceive outcomes in terms of the prospect theory value function. The role of the value function in mental accounting is to describe how events are perceived and mentally encoded. On the basis of the shape of the stylized value function, we hypothesize that the relationship between taxpayers' prepayment positions and tax return preparation fees is (1) positive, (2) stronger for taxpayers who receive refunds that are less than fees than it is for taxpayers who receive refunds that are greater than fees, and (3) stronger for

taxpayers who are in negative prepayment positions than for taxpayers who are in positive prepayment positions.

We test the hypotheses by identifying taxpayers in the Statistics of Income Individual Model File (SOI Model File) who itemized their deductions and reported a tax return preparation fee during 1988 through 1991. Using the resulting 68,736 observations, we estimate year-by-year cross-sectional regressions and a pooled regression. After controlling for known determinants of tax return preparation fees, we find support for all of our hypotheses, which leads us to conclude that psychological factors influence the amount of tax return preparation fees that tax professionals bill their clients and the amount of fees that taxpayers are willing to pay for professional tax services.

Finally, we note that it is impossible to conclusively determine, on the basis of archival tax data, what causes the observed relations between taxpayers' prepayment positions and tax return preparation fees; such data does not reveal the intent of tax professionals or the perceptions of taxpayers. More generally, any study that relies on archival data to test theory is subject to limitations associated with causality. As a result, it would be inappropriate to conclude from the results reported in this study that tax professionals engineer overpayments for their clients in order to collect higher proportions of billable time and costs. It is possible that tax professionals simply charge their clients for larger fractions of billable time and costs when overpayments naturally arise, and taxpayers are willing to pay higher fees in that situation. Nonetheless, we believe that our conclusions are reasonable and, at a minimum, we have identified empirical regularities worthy of further investigation.

The remainder of this study is organized as follows. The next section discusses mental accounting and the prospect theory value function and develops the hypotheses that will be tested in this study. Section 3 describes the sample selection procedures and the research design. The results are discussed in section 4. The final section of this study summarizes the results and provides some concluding comments.

2. Theory and hypotheses

Mental accounting theory

Mental accounting refers to the cognitive process that individuals use to gather, compartmentalize, and sort the costs and benefits associated with events that involve multiple outcomes. Thaler (1985) argues that individuals form mental accounts to manage the financial transactions they encounter. Similarly, Ranyard and Abdel-Nabi (1993) indicate that individuals establish multiple mental accounts that divide up life's income and expenditure events by time and category. Mental accounting is a way of framing outcomes and the frame invoked influences individuals' perceptions of value.

Research supports the notion that individuals form mental accounts for outcomes, and the mental representation of outcomes depends on whether individuals view the outcomes as being related (Bonini and Rumiati 1996; Heath, Chatterjee, and France 1995; Kahneman and Tversky 1984; Linville and Fischer 1991; Thaler

and Johnson 1990). Bonini and Rumiati's results suggest that when outcomes are highly related, they are difficult for individuals to mentally segregate and are therefore likely to be captured within the same mental account.

To illustrate the concept of mental accounting and framing, consider the following examples from Kahneman and Tversky 1984 (347):

> *Example 1*: Imagine that you have decided to see a play and paid the admission price of $10 per ticket. As you enter the theater, you discover that you have lost the ticket. The seat was not marked, and the ticket cannot be recovered. Would you pay $10 for another ticket? Forty-six percent of the subjects indicated that they would pay for another ticket, while 54 percent indicated that they would not.
>
> *Example 2*: Imagine that you have decided to see a play where admission is $10 per ticket. As you enter the theater, you discover that you have lost a $10 bill. Would you still pay $10 for a ticket to the play? Eighty-eight percent of the subjects indicated that they would pay for a ticket, while 12 percent indicated that they would not.

Kahneman and Tversky (1984) attribute the difference between subjects' responses to the topical organization of mental accounts. Going to the theater involves a transaction in which the cost of a ticket is balanced against the experience of seeing the play. Buying a second ticket increases the cost of seeing the play without improving the experience. In contrast, the loss of the cash is not posted to the same mental account as the play and is therefore not viewed as a cost of seeing the play.

In the present context, tax return preparation fees and receipts from or payments to the IRS may be separated by several months, but this observation does not mean that taxpayers capture tax-related outcomes in separate mental accounts. Indeed, research shows that consumers mentally track the costs and benefits of transactions over time in order to reconcile those costs and benefits on completion of transactions (Gourville and Soman 1998; Hirst, Joyce, and Schadewald 1994; Prelec and Loewenstein 1998; Thaler 1985).[7] Prelec and Loewenstein's results suggest that mental accounts capture the costs and benefits of transactions even when those costs and benefits are simply known to consumers but have yet to occur. Thus, research provides support for our contention that taxpayers may capture tax-related outcomes in the same mental account and evaluate them jointly, even when those outcomes are separated by time.[8]

Mental accounting theory supports the view that taxpayers who receive a refund from the IRS have a benefit (the tax refund) to match (to place in the same mental account) with the expenditure (the tax return preparation fee), suggesting that they may frame the fee as a cost. On the other hand, taxpayers who owe the IRS additional taxes have no benefit to match with the expenditure, suggesting that they may frame the fee as a loss. Lipe (1993) follows a similar line of reasoning in the context of a variance investigation decision. She argues that the expenditure on

a variance investigation will be viewed more favorably when the system is out of control than when the system is in control because there is a benefit to match with the expenditure in the former case but not in the latter case.

Christian et al. (1994) cite anecdotal evidence that taxpayers evaluate the benefits of hiring tax professionals by the size of the refunds received. Some recent advertisements reinforce this perspective. Jackson Hewitt, a national tax return preparation service, claimed that its customers' "average refund is $200 more than H&R Block".[9] Hoffman and Company, a Utah-based tax return preparation service, stated, "We'll get you the biggest refund allowed by the IRS or your money back, period!"[10] Taxpayers who have a favorable (unfavorable) mental representation of tax return preparation fees may be willing to pay for higher (lower) proportions of billable time and costs incurred by tax professionals. This discussion suggests that the sign of taxpayers' prepayment positions may positively influence their perceptions about the value of services provided by tax professionals. The first hypothesis, stated in alternative form, is as follows:

HYPOTHESIS 1. *Tax return preparation fees are higher for taxpayers in positive prepayment positions than for taxpayers in negative prepayment positions.*[11]

In order to gain additional insights into the nature of the relationship between taxpayers' prepayment positions and tax return preparation fees, we turn our attention to the prospect theory value function.

Prospect theory value function

Prospect theory (Kahneman and Tversky 1979, 1984; Tversky and Kahneman 1981) was developed as an alternative to the expected utility paradigm and seeks to describe and predict behavior rather than to characterize optimal behavior. The central feature of prospect theory is the value function, which has three important features. First, it is defined in terms of gains and losses relative to a neutral reference point, usually the status quo, rather than in absolute terms.[12] Second, the value function is S-shaped, concave for gains (that is, $v''(x) < 0$), and convex for losses (that is, $v''(x) > 0$).[13] Third, the value function is steeper for losses than for gains. That is, given gains and losses of equal magnitudes, losses have a greater emotional impact than gains.[14]

Thaler (1980, 1985, 1999) contends that individuals perceive outcomes in terms of the value function, and argues that the role of the value function in mental accounting is to describe how events are perceived and mentally encoded. Specifically, Thaler (1999, 195) states that the value function can be thought of as a "representation of some central components of the human perceived pleasure machine". Similarly, Linville and Fischer (1991, 6) state that the value function "may be thought of as a psychological function reflecting the anticipated pleasure or pain associated with each potential decision outcome".

The prospect theory value function is not domain specific, so it may be adapted to a variety of situations and used to understand the way individuals value outcomes subjectively in many contexts.[15] Figure 1 illustrates both a generic value

function (panel A) and a stylized value function (panel B). The generic value function has a horizontal axis that reflects gains and losses and a vertical axis that reflects value. The shape of the generic value function is consistent with its three primary features described above. The stylized value function in panel B illustrates a value function that has been adapted to the tax domain and is used as a basis to formulate hypotheses about the relationship between taxpayers' prepayment positions and tax return preparation fees. We propose the stylized value function as a plausible descriptor of the general nature of the relationship between taxpayers' prepayment positions and tax return preparation fees and then empirically examine its descriptive validity.[16]

The horizontal axis of the stylized value function reflects taxpayers' prepayment positions, which may be positive (right side) or negative (left side). The positive (negative) prepayment region in the stylized value function corresponds to the gain (loss) region in the generic value function. Positive and negative prepayment positions in the stylized value function are defined relative to a neutral reference point.[17] The vertical axis in the stylized value function represents tax return preparation fees after controlling for tax return complexity and demographic characteristics of taxpayers. For purposes of discussion, we refer to the vertical axis as "fees", although it should be understood that the vertical axis represents that portion of fees not explained by covariates of fees.[18]

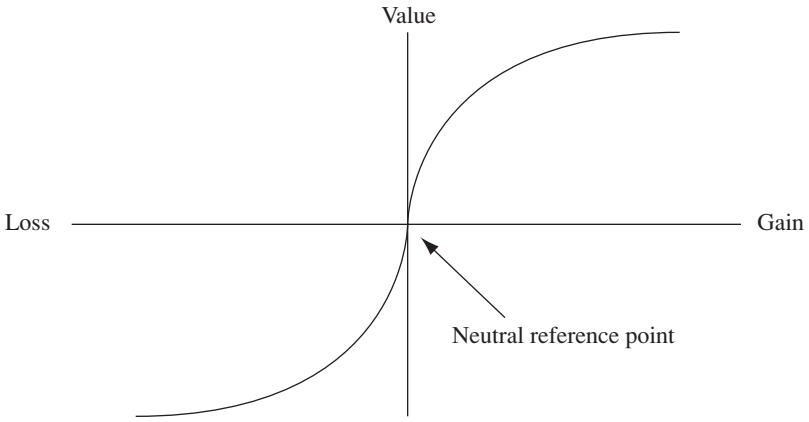
The stylized value function also contains three labeled positions.[19] The mixed gain (*MIXG*) position in the top right quadrant captures taxpayers who receive a refund in excess of the fee. These taxpayers experience a net cash inflow after the fee has been paid and the refund has been received. Taxpayers in the mixed gain position have a benefit (the tax refund) to match (to place in the same mental account) with the expenditure (the fee), so the expenditure is likely to be framed as a cost. The mixed loss (*MIXL*) position captures taxpayers who have a net cash outflow because their refund is less than the fee. These taxpayers are also likely to frame the fee as a cost because they receive a tax refund that partially offsets the fee. In contrast, the multiple loss (*MULL*) position in the lower left quadrant captures taxpayers who have multiple cash outflows because they owe both the fee and additional taxes. Taxpayers in the multiple loss position have no benefit to match with the expenditure, so the expenditure is likely to be framed as a loss.[20]

Taxpayers in the mixed gain and mixed loss positions of the stylized value function are likely to have a favorable mental representation of the fee (that is, they frame the fee as a cost) and therefore may be willing to bear a relatively larger fee. In contrast, taxpayers in the multiple loss position are likely to have a less favorable mental representation of the fee (that is, they frame the fee as a loss) and therefore may be willing to bear a relatively smaller fee. While the precise locations of the three positions on the stylized value function are unknown, their relative positions are known. Taxpayers in the mixed gain and multiple loss positions lie in the outermost regions of the stylized value function, while taxpayers in the mixed loss position lie in the top right region inside of taxpayers in the mixed gain position.

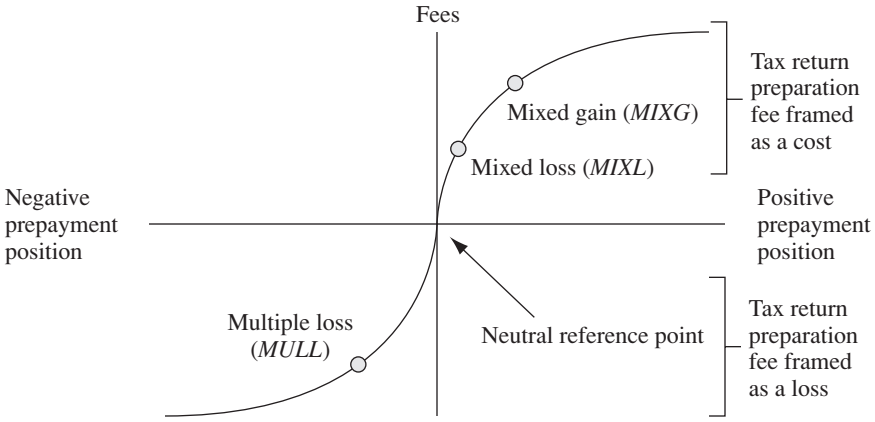
The experimental results of Jackson 2004b suggest that taxpayers who receive tax refunds versus those who owe additional taxes express greater satisfaction with

Figure 1 Illustrations of value functions

Panel A: Generic value function



Panel B: Stylized value function



Notes:

The axes and labeled positions on the stylized value function are defined as follows:

Positive prepayment position = taxpayers who have overpaid estimated income taxes and are due a refund from the IRS.

Negative prepayment position = taxpayers who have underpaid estimated income taxes and owe the IRS additional taxes.

Fees = tax return preparation fees after controlling for tax return complexity and demographic characteristics of taxpayers.

Mixed gain (*MIXG*) = prepayment position of taxpayers who receive refunds that exceed fees.

Mixed loss (*MIXL*) = prepayment position of taxpayers who receive refunds that are less than fees.

Multiple loss (*MULL*) = prepayment position of taxpayers who owe both additional taxes and fees.

tax professionals, attribute greater benefits to hiring tax professionals, and frame tax return preparation fees as costs rather than losses. Further, Jackson finds that taxpayers' prepayment positions positively influence taxpayers' willingness to bear higher tax return preparation fees. Through repeated interactions with taxpayers, tax professionals are likely to be attuned to the manner in which taxpayers mentally encode tax return preparation fees. As a result, tax professionals may bill clients for larger (smaller) proportions of billable time and costs when taxpayers are in positive (negative) prepayment positions.[21]

The hypotheses formulated in this section are based on the shape of the stylized value function as shown in panel B of Figure 1. The most obvious feature of the stylized value function is that there is a positive relationship between taxpayers' prepayment positions and tax return preparation fees. The second hypothesis, stated in alternative form, is as follows:

HYPOTHESIS 2. *There is a positive relation between taxpayers' prepayment positions and tax return preparation fees.*

Another feature of the stylized value function is that it increases at a decreasing rate in the top right quadrant. This means that the slope on the mixed loss position should be greater than the slope on the mixed gain position. The third hypothesis, stated in alternative form, is as follows:

HYPOTHESIS 3. *The relationship between taxpayers' prepayment positions and tax return preparation fees is stronger (more positive) for taxpayers in the mixed loss position than for taxpayers in the mixed gain position.*

The stylized value function is also steeper in the lower left quadrant (loss frame) than it is in the upper right quadrant (cost frame). This means that the impact of taxpayers' prepayment positions on fees is greater when taxpayers owe additional taxes than when taxpayers receive refunds. The fourth hypothesis, stated in alternative form, is as follows:

HYPOTHESIS 4. *The relationship between taxpayers' prepayment positions and tax return preparation fees is stronger (more positive) for taxpayers who owe additional taxes than for taxpayers who receive tax refunds.*

To augment the theoretical development of these hypotheses and to highlight certain contextual features of the relationship between taxpayers and tax professionals, we conducted informal discussions with practicing tax professionals. These discussions focused on (1) the influence of tax professionals on taxpayers' prepayment positions and (2) the fee-setting and client-billing processes. Appendix 1 summarizes the results of these discussions.

3. Sample and methodology

Sample selection

The source of information for this study comes from the Statistics of Income Individual Model File (SOI Model File) for 1988 through 1991. The SOI Model File is a stratified sample of federal individual income tax returns, numbering 95,713 in 1988, 96,589 in 1989, 89,401 in 1990, and 115,600 in 1991. To be included in our sample, taxpayers must have itemized their deductions and reported a tax return preparation fee as a miscellaneous itemized deduction on their tax return.[22] The number of annual observations after imposing these screening criteria is 17,202 (18 percent of the original sample) in 1988, 15,443 (16 percent of the original sample) in 1989, 16,199 (18 percent of the original sample) in 1990, and 19,892 (17 percent of the original sample) in 1991, resulting in a pooled sample of 68,736 observations. Readers are referred to the additional analyses in section 4 and Appendix 2 for additional information and analyses regarding the use of alternative taxpayer data bases.

Cross-sectional regressions

This section specifies a cross-sectional regression that focuses on the relation between tax return preparation fees and the determinants of fees. The main determinants are tax return complexity factors and demographic characteristics of taxpayers. In order to test the hypotheses, we control for the fee effects of these determinants to isolate the fee effects of taxpayers' prepayment positions. The primary cross-sectional regression used to test the hypotheses is specified as follows.

$$\begin{aligned} FEE_i = {} & \alpha_0 + \alpha_1 TPI_i + \alpha_2 MTR_i + \alpha_3 PTPI_i + \alpha_4 NUMF_i + \alpha_5 NUMS_i + \alpha_6 STAX_i \\ & + \alpha_7 PMTS_i + \alpha_8 SEMP_i + \alpha_9 MARS_i + \alpha_{10} DEPS_i + \alpha_{11} AGE_i + \alpha_{12} POS_i \\ & + \alpha_{13} MIXG_i + \alpha_{14} MIXL_i + \alpha_{15} MULL_i + \varepsilon_{it} \end{aligned} \quad (1),$$

where

FEE = amount paid to the tax preparer;

TPI = total positive income, which is the sum of all positive income items reported on the return plus any portion of long-term capital gains excluded;

MTR = marginal tax rate;

PTPI = percent of *TPI* from wages;

NUMF = number of IRS forms attached to the return;

NUMS = number of IRS schedules attached to the return;

STAX = state income tax dummy variable, coded as 1 if the taxpayer is in a state with state income tax and 0 otherwise;

PMTS = percent of tax liability satisfied via estimated payments;

SEMP = self-employment dummy variable, coded as 1 if the taxpayer is self-employed and 0 otherwise;

MARS = marital status dummy variable, coded as 1 if the taxpayer is married and 0 otherwise;

DEPS = number of dependants claimed on the return;

AGE = age 65 or older dummy variable, coded as 1 if either the primary or secondary taxpayer is 65 years or older and 0 otherwise;

POS = prepayment position dummy variable, coded as 1 if the taxpayer receives a tax refund of $500 or more and 0 otherwise;

MIXG = prepayment position (sum of all taxes paid prior to filing minus the tax liability) of taxpayers who receive refunds that exceed tax return preparation fees;

MIXL = prepayment position of taxpayers who receive refunds that fall below tax return preparation fees; and

MULL = prepayment position of taxpayers who owe both additional taxes and tax return preparation fees.

Tax return complexity factors include *TPI*, *MTR*, *PTPI*, *NUMF*, *NUMS*, *STAX*, *PMTS*, and *SEMP*, while demographic characteristics of taxpayers include *MARS*, *DEPS*, and *AGE*.[23] We expect *TPI* and *MTR* to be positively related to tax return preparation fees because high-income taxpayers tend to have more complicated and time-consuming tax returns. Taxpayers whose income comes from wages tend to have simpler returns, suggesting that *PTPI* should be negatively related to fees. The variables *NUMF*, *NUMS*, *STAX*, *PMTS*, and *SEMP* are indicators of the amount of time tax professionals devote to preparing tax returns and the complexity of those returns, suggesting that they are positively related to fees. Both *MARS* and *DEPS* increase demands on household consumption and reduce discretionary income, suggesting that they have a negative relationship with fees. The variable *AGE* indicates that the taxpayer has more discretionary income and a smaller fraction of income from salaries and wages. This variable is expected to have a positive relationship with fees.

The empirical tests focus primarily on *POS* and *MIXG*, *MIXL*, and *MULL*, which partition taxpayers' prepayment positions into three meaningful groups. We can appropriately characterize (1) as a piecewise linear description of the relationship between fees and taxpayers' prepayment positions. Because taxpayers' prepayment positions are partitioned into three groups and the slope associated with each group is allowed to vary, we allow for a nonlinear relationship between fees and taxpayers' prepayment positions. Also, with respect to the empirical specification of *POS*, we require the refund to be $500 or greater. This specification of *POS* has been implemented because, for the effects of mental accounting to emerge, we believe that the tax refund must be a meaningful amount. That is, the tax refund must be of a sufficient magnitude to offset a substantial fraction of the tax return

preparation fee. We elect to use $500 as the cutoff amount because it is approximately equal to the median value for *FEE* ($490) as shown in Table 1.[24]

We estimate (1) using ordinary least squares and transform the data by either the natural logarithm or decile ranks.[25] The rank transformation is implemented by replacing original data values with their corresponding decile ranks. That is, the smallest observation for a variable is assigned a value of 1 and the largest observation is assigned a value of *N*. These ranks are then replaced with the decile value corresponding to their rank.[26] Thus, rank-transformed variables take on values ranging from 1 (lowest 10 percent of the observations) to 10 (highest 10 percent of the observations).[27]

Recall that Hypothesis 4 focuses on the slopes associated with prepayment positions in the two quadrants of stylized value function (see panel B of Figure 1). To unambiguously test this hypothesis, taxpayers in the two quadrants must have approximately equal absolute prepayment positions. To understand this point, notice that the slope associated with taxpayers in the multiple loss position will be somewhat flat if taxpayers have large negative prepayment positions. In contrast, notice that the slopes associated with taxpayers in the mixed loss and mixed gain positions will be somewhat steep if taxpayers have small positive prepayment positions. As a consequence, regression results could lead one to conclude that the top right quadrant of the stylized value function is steeper than the lower left quadrant, but that conclusion may be inaccurate due to possible asymmetrical clustering of taxpayers in the stylized value function.[28] To circumvent this problem, Hypothesis 4 is tested using rank-transformed data because clustering cannot persist after the data have been ranked within each quadrant of the stylized value function.

4. Results

Descriptive statistics

Table 1 presents the descriptive statistics for our sample of taxpayer data, including the mean, standard deviation, first quartile, median, and third quartile. The mean (median) tax return preparation fee (*FEE*) is approximately $2,000 ($490), and mean (median) total positive income (*TPI*) is approximately $958,000 ($243,000). These statistics indicate that our sample captures wealthy individuals who pay substantial tax return preparation fees. The mean (median) marginal tax rate (*MTR*) is approximately 27 percent (28 percent), and the percent of *TPI* from wages (*PTPI*) is approximately 51 percent (57 percent).

The descriptive statistics also indicate that the tax returns tend to be complex and time-consuming to prepare. The mean (median) number of forms (*NUMF*) is approximately 2.30 (2.00), and the mean (median) number of schedules (*NUMS*) is also 2.30 (2.00). The majority of taxpayers in our sample come from states that have income tax (*STAX*) (approximately 94 percent at the mean and 100 percent at the median). The mean (median) fraction of the total tax liability satisfied via estimated payments (*PMTS*) is approximately 40 percent (15 percent), and the mean (median) fraction of self-employed taxpayers (*SEMP*) is approximately 34 percent (0 percent). In the third quartile 100 percent of taxpayers are self-employed. Most

TABLE 1
Descriptive statistics for sample*

Variable†	Mean	s.d.	1st quartile	Median	3rd quartile
FEE ($)	2,001.44	6,038.00	165.00	490.00	1,585.00
TPI ($)	957,641.20	2,693,178.00	69,249.00	242,790.00	1,006,426.00
MTR (%)	27.16	7.11	28.00	28.00	31.00
PTPI (%)	50.66	41.18	2.32	56.61	94.20
NUMF	2.31	1.65	1.00	2.00	3.00
NUMS	2.33	0.91	2.00	2.00	3.00
STAX (%)	94.09	23.57	100.00	100.00	100.00
PMTS (%)	40.28	43.98	0.00	14.75	96.27
SEMP (%)	33.70	47.27	0.00	0.00	100.00
MARS (%)	81.99	38.43	100.00	100.00	100.00
DEPS	1.75	1.35	1.00	1.00	3.00
AGE (%)	17.91	38.34	0.00	0.00	0.00
PP ($)	−31,472.70	400,774.10	−6,464.50	471.00	4,970.00
MIXG ($) ($n = 34{,}913$)	32,113.67	115,808.40	1,470.00	4,500.00	22,296.00
MIXL ($) ($n = 3{,}992$)	1,930.49	5,512.67	40.00	270.00	1,359.50
MULL ($) ($n = 29{,}831$)	−110,361.00	585,917.00	−62,440.00	−10,500.00	−1,981.00
POS (%) ($n = 34{,}105$)	49.62	50.00	0.00	0.00	100.00
PPOS ($) ($n = 38{,}280$)	29,490.22	110,935.39	1,231.00	3,805.00	18,760.00
PNEG ($) ($n = 30{,}456$)	−108,095.79	580,084.84	−60,005.00	−9,870.00	−1,758.50

(The table is continued on the next page.)

TABLE 1 (Continued)

Notes:

* The sample is obtained from the Statistics of Income Individual Model File (SOI Model File). To be included in the sample, taxpayers must itemize deductions and pay a professional tax preparer. The descriptive statistics are computed using a total of 68,736 observations (unless stated otherwise) from 1988 (17,202), 1989 (15,443), 1990 (16,199), and 1991 (19,892).

† All variables reported in this table are untransformed. Variables are as defined in the text.

taxpayers in our sample are married (approximately 82 percent at the mean and 100 percent at the median) and have at least one dependant (1.75 at the mean and 1.00 at the median). Only a small fraction of our sample is over age 65 (18 percent at the mean and 0 percent at the median).

Taxpayers' prepayment positions (*PP*) are partitioned into three groups: (1) taxpayers who receive refunds that exceed tax return preparation fees (*MIXG*), (2) taxpayers who receive refunds that fall below tax return preparation fees (*MIXL*), and (3) taxpayers who owe additional taxes in addition to tax return preparation fees (*MULL*). The prepayment position of the mean (median) taxpayer is approximately −$31,500 ($470). It is interesting to note that mean *PP* is significantly negative ($p < 0.0001$) and median *PP* is significantly positive ($p < 0.0001$). This is because some taxpayers have extreme negative tax liabilities. The means (medians) for *MIXG*, *MIXL*, and *MULL* are approximately $32,000 ($4,500), $1,930 ($270), and −$110,000 (−$10,500), respectively. The mean (median) percent of taxpayers who receive a tax refund of $500 or more (*POS*) is approximately 50 percent (0 percent). The mean (median) refund for taxpayers who have positive prepayment positions (*PPOS*) is approximately $29,500 ($3,800), while the mean (median) liability for taxpayers who have negative prepayment positions (*PNEG*) is approximately −$108,100 (−$9,870).

Table 2 reports correlations among regression variables. The upper triangle reports Pearson correlations among rank-transformed variables, and the lower triangle reports Pearson correlations among logarithmically transformed variables. These univariate correlations between fees and independent variables are usually significant in the direction predicted by prior research. In both the upper and lower triangles, *FEE* is positively correlated with *TPI*, *MTR*, *NUMF*, *NUMS*, *STAX*, *PMTS*, *SEMP*, *MARS*, and *AGE*, and is negatively correlated with PTPI and *DEPS*. The test variables (*POS*, *MIXG*, *MIXL*, and *MULL*) are significantly correlated with *FEE*, although the directions of some of the correlations are counter to predictions. However, these univariate correlations are likely to change when they are conditioned on determinants of tax return preparation fees.[29]

Regression results

Tables 3 and 4 report regression results to test the hypotheses. In both tables, regressions are estimated on a year-by-year basis and on a pooled basis. The

TABLE 2
Correlations among regression variables*

	FEE	*TPI*	*MTR*	*PTPI*	*NUMF*	*NUMS*	*STAX*	*PMTS*	*SEMP*	*MARS*	*DEPS*	*AGE*	*POS*	*MIXG*	*MIXL*	*MULL*
FEE	—	0.73†	0.35†	−0.44†	0.55†	0.46†	0.13†	0.47†	0.11†	0.06†	−0.04†	0.19†	0.20†	−0.12†	0.12†	0.03†
TPI	0.70†	—	0.48†	−0.39†	0.55†	0.43†	0.20†	0.44†	0.09†	0.15†	0.04†	0.12†	0.16†	−0.21†	−0.03†	0.10†
MTR	0.28†	0.45†	—	−0.11†	0.30†	0.34†	0.07†	0.19†	0.01†	0.06†	−0.01	0.03†	0.05†	−0.21†	−0.07†	0.18†
PTPI	−0.44†	−0.41†	−0.05†	—	−0.28†	−0.32†	−0.06†	−0.79†	−0.19†	0.12†	0.26†	−0.45†	−0.03†	0.16†	−0.06†	−0.01†
NUMF	0.55†	0.54†	0.28†	−0.31†	—	0.43†	0.10†	0.35†	0.21†	0.16†	0.11†	0.00	0.21†	−0.04†	0.04†	0.00
NUMS	0.49†	0.47†	0.25†	−0.36†	0.48†	—	0.07†	0.31†	0.08†	0.06†	−0.03†	0.12†	0.14†	−0.08†	0.04†	0.03†
STAX	0.13†	0.20†	0.08†	−0.06†	0.10†	0.08†	—	0.07†	0.00	0.02†	0.02†	0.01	0.03†	−0.03†	−0.01†	0.02†
PMTS	0.45†	0.43†	0.15†	−0.83†	0.36†	0.34†	0.08†	—	0.15†	−0.09†	−0.20†	0.39†	0.14†	−0.06†	0.03†	0.00
SEMP	0.11†	0.09†	0.00	−0.19†	0.20†	0.09†	0.00	0.15†	—	0.12†	0.08†	−0.03†	0.04†	−0.02†	0.00	0.00
MARS	0.05†	0.15†	0.08†	0.10†	0.15†	0.07†	0.02†	−0.08†	0.12†	—	0.61†	−0.11†	0.01†	−0.06†	−0.02†	0.06†
DEPS	−0.07†	0.00	−0.01†	0.24†	0.06†	−0.06†	0.02†	−0.19†	0.04†	0.35†	—	−0.35†	0.03†	0.01	−0.03†	0.02†
AGE	0.19†	0.11†	0.00	−0.43†	0.01†	0.14†	0.01	0.38†	−0.03†	−0.11†	−0.36†	—	0.00	−0.06†	0.04†	0.00
POS	0.05†	−0.03†	−0.08†	0.09†	0.08†	0.00	0.00	0.04†	0.00	−0.02†	0.03†	−0.04†	—	0.84†	−0.01†	−0.61†
MIXG	−0.01†	−0.12†	−0.40†	−0.02†	−0.06†	0.00	−0.02†	0.01†	0.00	−0.05†	−0.01†	0.02†	0.24†	—	−0.24†	−0.73†
MIXL	0.05†	−0.03†	−0.14†	−0.03†	−0.01†	0.02†	−0.01	0.02†	−0.01	−0.02†	−0.00	0.02†	0.01	−0.01†	—	−0.18†
MULL	−0.02†	−0.07†	0.02†	0.22†	0.01	−0.03†	0.00	0.03†	−0.06†	0.03†	0.03†	−0.05†	0.30†	0.08†	0.02†	—

Notes:

* The upper triangle reports Pearson correlations among rank-transformed variables, while the lower triangle reports Pearson correlations among logarithmically transformed variables. Correlations are calculated using all observations (68,736) during the four-year period 1988 through 1991. Variables are as defined in the text.

† Significant at $p < 0.01$ or better.

pooled regressions contain year dummy variables, but the coefficients and *t*-statistics for these variables are not reported in the tables. Table 3 reports regression results using logarithmically transformed data and Table 4 reports regression results using rank-transformed data. All *t*-statistics are computed using the heteroscedasticity-consistent covariance matrix (White 1980) because the null hypothesis of homoscedasticity is rejected in all regressions. As shown in Tables 3 and 4, the results for the year-by-year regressions are similar to the results for the pooled regressions, so we focus our discussion on the pooled regressions.

The regression results in Tables 3 and 4 reveal that the independent variables explain a substantial amount of the variation in tax return preparation fees. The adjusted R^2 in the pooled regressions in Table 3 and Table 4 are 0.58 and 0.62, respectively. In Table 3 and Table 4, the control variables are generally significant ($p < 0.05$) in the predicted direction. The only exceptions in Table 3 are *MTR* (significant in opposite direction) and *STAX* (significant in opposite direction), and the only exceptions in Table 4 are *MTR* (insignificant), *STAX* (significant in opposite direction), and *SEMP* (significant in opposite direction).

Hypothesis 1 predicts that tax return preparation fees are higher for taxpayers in positive prepayment positions than for taxpayers in negative prepayment positions. In terms related to (1), Hypothesis 1 predicts that $\alpha_{12} > 0$. In Table 3, the coefficient on *POS* is 0.15 and the related *t*-statistic is 17.98 ($p < 0.0001$). Similarly, in Table 4, the coefficient on *POS* is 0.33 and the related *t*-statistic is 12.46 ($p < 0.0001$). These results provide strong support for Hypothesis 1.

Hypothesis 2 predicts that there is a positive relation between taxpayers' prepayment positions and tax return preparation fees. In terms related to (1), Hypothesis 2 predicts that $\alpha_{13} > 0$, $\alpha_{14} > 0$, and $\alpha_{15} > 0$. In Table 3, the coefficients on *MIXG*, *MIXL*, and *MULL* are 0.05, 0.28, and 0.03, respectively, and the related *t*-statistics are 12.62 ($p < 0.0001$), 21.44 ($p < 0.0001$), and 6.90 ($p < 0.0001$), respectively. Similarly, in Table 4, the coefficients on *MIXG*, *MIXL*, and *MULL* are 0.06, 0.32, and 0.20, respectively, and the related *t*-statistics are 13.90 ($p < 0.0001$), 52.13 ($p < 0.0001$), and 26.85 ($p < 0.0001$), respectively. These results provide strong support for Hypothesis 2.

Hypothesis 3 predicts that the relationship between taxpayers' prepayment positions and tax return preparation fees is stronger (more positive) for taxpayers in the mixed loss position than for taxpayers in the mixed gain position. In terms related to (1), Hypothesis 3 predicts that $\alpha_{14} > \alpha_{13}$. In Table 3, the coefficient on *MIXL* is 0.28, while the coefficient on *MIXG* is 0.05. The χ^2 statistic for the difference in coefficients is 278.20 ($p < 0.0001$). In Table 4, the coefficient on *MIXL* is 0.32, while the coefficient on *MIXG* is 0.06. The χ^2 statistic for the difference in coefficients is 3,572.55 ($p < 0.0001$). These results provide strong support for Hypothesis 3.

Hypothesis 4 predicts the relationship between taxpayers' prepayment positions and tax return preparation fees is stronger (more positive) for taxpayers who owe additional taxes than for taxpayers who receive tax refunds. To test this hypothesis, we estimate a modified version of (1) in which the three prepayment positions shown in that equation (*MIXG*, *MIXL*, and *MULL*) are collapsed into

TABLE 3
Estimation of (1) using data transformed by the natural logarithm

$$FEE_i = \alpha_0 + \alpha_1 TPI_i + \alpha_2 MTR_i + \alpha_3 PTPI_i + \alpha_4 NUMF_i + \alpha_5 NUMS_i + \alpha_6 STAX_i + \alpha_7 PMTS_i + \alpha_8 SEMP_i + \alpha_9 MARS_i + \alpha_{10} DEPS_i + \alpha_{11} AGE_i + \alpha_{12} POS_i + \alpha_{13} MIXG_i + \alpha_{14} MIXL_i + \alpha_{15} MULL_i + \varepsilon_{it}^*$$

Variable	Predicted sign	Coefficient estimates (t-statistics in parentheses)†				
		1988	1989	1990	1991	Pooled
Intercept	None	−0.45	−0.47	−0.55	−0.61	−0.41
		(−4.90)	(−5.29)	(−6.33)	(−8.20)	(−9.09)
TPI	+	0.47	0.51	0.51	0.53	0.50
		(59.17)	(59.35)	(46.04)	(72.03)	(120.83)
MTR	+	0.01	0.00	−0.00	−0.01	−0.00
		(4.31)	(2.19)	(−0.00)	(−9.53)	(−5.36)
PTPI	−	−0.14	−0.43	−0.36	−0.27	−0.30
		(−3.16)	(−8.83)	(−7.61)	(−7.55)	(−13.84)
NUMF	+	0.42	0.50	0.44	0.43	0.45
		(23.72)	(25.68)	(24.89)	(29.66)	(53.53)
NUMS	+	0.40	0.34	0.36	0.48	0.40
		(18.24)	(12.67)	(17.71)	(23.85)	(40.15)
STAX	+	−0.04	−0.04	−0.07	0.02	−0.03
		(−1.27)	(−1.36)	(−2.82)	(0.72)	(−2.38)
PMTS	+	0.14	−0.03	0.01	0.14	0.07
		(3.59)	(−0.61)	(0.33)	(4.52)	(4.04)
SEMP	+	0.07	0.02	0.02	−0.02	0.02
		(3.68)	(0.91)	(1.13)	(−1.02)	(2.60)
MARS	−	−0.11	−0.11	−0.14	−0.15	−0.13
		(−4.82)	(−4.60)	(−6.11)	(−7.67)	(−11.46)
DEPS	−	−0.03	−0.07	−0.04	−0.06	−0.05
		(−2.05)	(−4.23)	(−2.38)	(−4.06)	(−6.88)
AGE	+	0.25	0.29	0.28	0.28	0.28
		(9.34)	(10.43)	(10.38)	(12.86)	(21.54)
POS	+	0.12	0.16	0.17	0.16	0.15
		(6.79)	(9.05)	(10.20)	(10.10)	(17.98)
MIXG	+	0.07	0.06	0.06	0.03	0.05
		(6.38)	(7.63)	(5.32)	(3.85)	(12.62)
MIXL	+	0.37	0.29	0.29	0.22	0.28
		(8.61)	(8.30)	(6.35)	(14.14)	(21.44)
MULL	+	0.06	0.05	0.04	−0.01	0.03
		(6.12)	(5.39)	(3.25)	(−1.40)	(6.90)
Adjusted R^2		0.55	0.61	0.60	0.55	0.58
F-statistic		1,406.71	1,625.53	1,640.72	1,662.19	6,315.91
Observations		17,202	15,443	16,199	19,892	68,736

(The table is continued on the next page.)

TABLE 3 (Continued)

Notes:

* Equation (1) is estimated using ordinary least squares. Variables are as defined in the text.

† The null hypothesis of homoscedasticity is rejected in each regression using White's test. As a result, all test statistics are computed using the heteroscedasticity-consistent covariance matrix (White 1980).

positive (*PPOS*) and negative (*PNEG*) prepayment positions. We then test whether the coefficient on *PNEG* is greater than the coefficient on *PPOS* using decile ranks as discussed in the last paragraph of the prior section. The coefficient on both *PPOS* and *PNEG* are significantly positive ($p < 0.0001$) as shown in panels B and D of Table 5, and the coefficient on *PNEG* is significantly greater than the coefficient on *PPOS* ($p < 0.001$) in each year analyzed. This result provides strong support for Hypothesis 4.

Additional analyses

In this section, we discuss additional analyses related to (1) an alternative specification of (1), (2) the use of the Statistics of Income Panel of Individual Returns (SOI Panel File) in place of the SOI Model File, (3) the economic significance of the effect of taxpayers' prepayment positions on tax return preparation fees, (4) the effect of the tax deductibility of fees, and (5) the sensitivity of the results to certain data exclusions. Recall that (1) partitions taxpayers' prepayment positions into *MIXG*, *MIXL*, and *MULL* on the basis of the relative magnitudes of tax return preparation fees and taxpayers' prepayment positions. This partitioning scheme could induce a spurious correlation between fees and taxpayers' prepayment positions — or at least inflate the significance of that relation.[30] As a result, we partition taxpayers' prepayment positions in an alternative manner that avoids this potential problem. Specifically, we partition taxpayers' prepayment positions into those positions that are positive (*PPOS*) and those positions that are negative (*PNEG*).

Table 5 reports partial regression results related to estimating alternative specifications of (1). Panel A reports partial regression results (*POS*, *PPOS*, and *PNEG*) using data transformed by the natural logarithm, while panel B reports partial regression results (*POS*, *PPOS*, and *PNEG*) using data transformed by decile ranks. Panels C and D will be discussed below. We elect to restrict the information reported in Table 5 to *POS*, *PPOS*, and *PNEG* because the remaining information is virtually identical to that reported in Tables 3 and 4. Also, because the results for the year-by-year regressions are quite similar to the results for the pooled regressions, we focus our discussion on the pooled regressions.

If the partitioning scheme used to create the variables *MIXG, MIXL*, and *MULL* drives the significance of those variables, one would expect *PPOS* and *PNEG* to be insignificant. To the extent that *PPOS* and *PNEG* are significant in Table 5, one can conclude that the significant results reported in Tables 3 and 4 for MIXG, *MIXL*,

TABLE 4
Estimation of (1) using data transformed by decile ranks

$$FEE_i = \alpha_0 + \alpha_1 TPI_i + \alpha_2 MTR_i + \alpha_3 PTPI_i + \alpha_4 NUMF_i + \alpha_5 NUMS_i + \alpha_6 STAX_i + \alpha_7 PMTS_i + \alpha_8 SEMP_i + \alpha_9 MARS_i + \alpha_{10} DEPS_i + \alpha_{11} AGE_i + \alpha_{12} POS_i + \alpha_{13} MIXG_i + \alpha_{14} MIXL_i + \alpha_{15} MULL_i + \varepsilon_{it}^*$$

Variable	Predicted sign	Coefficient estimates (t-statistics in parentheses)†				
		1988	1989	1990	1991	Pooled
Intercept	None	0.38	1.06	1.36	1.08	1.00
		(3.13)	(8.91)	(11.91)	(9.56)	(16.73)
TPI	+	0.54	0.55	0.54	0.58	0.56
		(75.08)	(72.68)	(44.63)	(76.39)	(148.54)
MTR	+	0.02	0.00	0.01	−0.06	−0.00
		(3.60)	(0.10)	(1.03)	(−7.82)	(−0.37)
PTPI	−	−0.06	−0.10	−0.12	−0.11	−0.10
		(−7.26)	(−12.21)	(−13.55)	(−12.53)	(−23.78)
NUMF	+	0.14	0.16	0.13	0.15	0.15
		(21.46)	(23.17)	(20.23)	(24.57)	(46.11)
NUMS	+	0.13	0.10	0.11	0.11	0.11
		(18.04)	(15.14)	(15.82)	(19.86)	(32.09)
STAX	+	−0.07	−0.04	−0.15	0.05	−0.07
		(−1.36)	(−0.81)	(−2.82)	(0.92)	(−2.45)
PMTS	+	0.04	0.02	0.02	0.04	0.02
		(3.67)	(2.05)	(1.93)	(4.54)	(5.40)
SEMP	+	0.04	−0.02	−0.00	−0.08	−0.03
		(1.14)	(−0.81)	(−0.10)	(−2.69)	(−1.84)
MARS	−	−0.17	−0.17	−0.27	−0.19	−0.17
		(−3.61)	(−3.73)	(−5.75)	(−4.41)	(−7.57)
DEPS	−	0.00	−0.02	−0.01	−0.03	−0.01
		(0.22)	(−3.27)	(−1.32)	(−4.27)	(−4.40)
AGE	+	0.37	0.38	0.39	0.42	0.39
		(8.02)	(8.68)	(8.58)	(10.57)	(17.67)
POS	+	0.39	0.20	0.27	0.48	0.33
		(7.45)	(4.01)	(4.85)	(9.01)	(12.46)
MIXG	+	0.07	0.07	0.07	0.03	0.06
		(7.29)	(7.72)	(7.19)	(3.47)	(13.90)
MIXL	+	0.33	0.31	0.30	0.30	0.32
		(26.07)	(25.66)	(23.29)	(26.08)	(52.13)
MULL	+	0.22	0.19	0.18	0.18	0.20
		(15.41)	(12.37)	(11.33)	(12.57)	(26.85)
Adjusted R^2		0.59	0.65	0.64	0.58	0.62
F-statistic		1,656.72	1,940.02	1,932.34	1,844.33	6,211.14
Observations		17,202	15,443	16,199	19,892	68,736

(The table is continued on the next page.)

TABLE 4 (Continued)

Notes:

* Equation (1) is estimated using ordinary least squares. Variables are as defined in the text.

† The null hypothesis of homoscedasticity is rejected in each regression using White's test. As a result, all test statistics are computed using the heteroscedasticity-consistent covariance matrix (White 1980).

and *MULL* are not solely attributable to the partitioning scheme used to create those variables. Also, because taxpayers' prepayment positions are being redefined, it makes sense to explore whether redefining those variables has an effect on the significance of *POS*. Panel A of Table 5 shows that the coefficients on *POS*, *PPOS*, and *PNEG* are 0.14, 0.07, and 0.03, respectively, and the related *t*-statistics are 17.24 ($p < 0.0001$), 15.98 ($p < 0.0001$), and 7.19 ($p < 0.0001$), respectively. Similarly, panel B of Table 5 shows that the coefficients on *POS*, *PPOS*, and *PNEG* are −0.00, 0.09, and 0.15, respectively, and the related *t*-statistics are −0.10 ($p > 0.10$), 19.64 ($p < 0.0001$), and 20.00 ($p < 0.0001$), respectively. With the exception of the coefficient on *POS* in panel B, the results in panels A and B suggest that the partitioning scheme used to create the variables *MIXG*, *MIXL*, and *MULL* does not drive the significant results reported in Tables 3 and 4.

It is somewhat surprising that the coefficient on *POS* is significant in panel A of Table 5, but insignificant in panel B. Perhaps the results are sensitive to the threshold refund amount of $500 used in the definition of *POS*. Thus, in panel C (panel D) of Table 5 we report partial regression results for a regression identical to the regression in panel A (panel B) except that the threshold value for *POS* is $1,500 instead of $500. Once this modification is made, panel C of Table 5 shows that the coefficients on *POS*, *PPOS*, and *PNEG* are 0.21, 0.06, and 0.03, respectively, and the related *t*-statistics are 24.04 ($p < 0.0001$), 14.23 ($p < 0.0001$), and 6.59 ($p < 0.0001$), respectively. Panel D of Table 5 shows that the coefficients on *POS*, *PPOS*, and *PNEG* are 0.21, 0.07, and 0.13, respectively, and the related *t*-statistics are 7.97 ($p < 0.0001$), 13.57 ($p < 0.0001$), and 16.60 ($p < 0.0001$), respectively.[31]

We next consider the effect of using the SOI Panel File in place of the SOI Model File. See Appendix 2 for a complete discussion of the relative merits of using these two taxpayer data bases. The main conclusion in Appendix 2 is that it is appropriate and preferable to use the SOI Model File rather than the SOI Panel File in the present context. Regressions estimated using the SOI Panel File are much weaker (that is, lower adjusted R^2 and less significant or insignificant coefficients on the control variables) than regressions estimated using the SOI Model File in all four years examined. This is not surprising given the dramatic differences in the data bases.

We report partial regression results using the SOI Panel File in Table 6 (that is, regression results for the variables *POS*, *PPOS*, *PNEG*, *MIXG*, *MIXL*, and *MULL*).

TABLE 5
Partial regression results related to estimating alternative specifications of (1)*

Variable	Predicted sign	Coefficient estimates (*t*-statistics in parentheses)† 1988	1989	1990	1991	Pooled
Panel A: Alternative partition of prepayment position (data transformed by the natural logarithm)						
POS	+	0.11	0.16	0.16	0.14	0.14
		(6.32)	(8.80)	(9.93)	(9.38)	(17.24)
PPOS	+	0.09	0.07	0.07	0.04	0.07
		(7.68)	(8.58)	(5.98)	(6.18)	(15.98)
PNEG	+	0.06	0.05	0.04	−0.01	0.03
		(6.45)	(5.53)	(3.36)	(−1.26)	(7.19)
Panel B: Alternative partition of prepayment position (data transformed by decile ranks)						
POS	+	0.04	−0.05	−0.04	0.08	−0.00
		(0.65)	(−0.89)	(−0.66)	(1.28)	(−0.10)
PPOS	+	0.10	0.10	0.09	0.06	0.09
		(10.46)	(10.03)	(9.79)	(6.93)	(19.64)
PNEG	+	0.18	0.15	0.13	0.11	0.15
		(12.25)	(9.53)	(8.34)	(7.90)	(20.00)
Panel C: Alternative partition of prepayment position and alternative specification of *POS* (data transformed by the natural logarithm)						
POS	+	0.18	0.24	0.22	0.19	0.21
		(10.01)	(12.71)	(13.12)	(11.88)	(24.04)
PPOS	+	0.08	0.06	0.06	0.04	0.06
		(7.01)	(7.55)	(5.14)	(5.45)	(14.23)
PNEG	+	0.06	0.05	0.04	−0.01	0.03
		(5.88)	(5.12)	(3.19)	(−1.35)	(6.59)
Panel D: Alternative partition of prepayment position and alternative specification of *POS* (data transformed by decile ranks)						
POS	+	0.21	0.28	0.19	0.27	0.21
		(3.95)	(5.49)	(3.69)	(5.12)	(7.97)
PPOS	+	0.08	0.05	0.06	0.04	0.07
		(7.92)	(5.34)	(6.53)	(4.20)	(13.57)
PNEG	+	0.16	0.12	0.11	0.09	0.13
		(10.48)	(7.23)	(6.78)	(6.31)	(16.60)

(The table is continued on the next page.)

TABLE 5 (Continued)

Notes:

* The partial regression results reported in this table are from estimating alternative specifications of (1). The change to (1) involves removing the variables *MIXG*, *MIXL*, and *MULL* and replacing them with the variables *PPOS* (prepayment position of taxpayers who receive tax refunds) and *PNEG* (prepayment position of taxpayers who owe additional taxes). Variables are as defined in the text.

† The null hypothesis of homoscedasticity is rejected in each regression using White's test. As a result, all test statistics are computed using the heteroscedasticity-consistent covariance matrix (White 1980).

Notice that Table 6 reports 50 regression coefficients in the years 1986 through 1989 for the test variables *POS*, *PPOS*, *PNEG*, *MIXG*, *MIXL*, and *MULL*. Of those 50 regression coefficients, 36 have absolute *t*-statistics below 1.96, indicating that the coefficients on the test variables are, in general, insignificant when the SOI Panel File is used. Of the 14 coefficients with absolute *t*-statistics above 1.96, 1 has a negative coefficient and 13 have positive coefficients.

On one hand, this finding is a concern because it suggests that the results reported in this study may be sensitive to the choice of taxpayer data bases. On the other hand, Appendix 2 clearly articulates our strong reservations about using the SOI Panel File and our justification for using the SOI Model File. What should one conclude about the strong results from using the SOI Model File and the weak or insignificant results from using the SOI Panel File? The conclusions of this study are based on a large, nonrandom sample of high-income taxpayers who have relatively complicated tax returns and who are likely to pay tax return preparation fees on a non–fixed-fee basis. In addition, we are unable to observe tax return preparation fees for a subset of taxpayers, some of whom would be included in our sample, because they do not disclose tax return preparation fees on their tax return. Therefore, it is inappropriate to generalize the results of this study to other segments of the tax-paying population.[32]

In addition to examining the statistical significance of the relationship between taxpayers' prepayment positions and tax return preparation fees, we also examine the economic significance of that relationship. For the purposes of this analysis, we use the pooled regression results in panel A of Table 5.[33] Notice that *FEE*, *PPOS*, and *PNEG* are transformed by the natural logarithm.[34] One attractive feature of using this transformation is that the slope coefficients measure the elasticity of *FEE* with respect to *PPOS* and *PNEG*. In other words, the coefficients on *PPOS* and *PNEG* indicate the percentage change in *FEE* for a given percentage change in *PPOS* or *PNEG*.[35]

Thus, for taxpayers who are in positive prepayment positions, tax return preparation fees increase by 7 percent when taxpayers' prepayment positions increase by 100 percent. Similarly, for taxpayers who are in negative prepayment positions, tax return preparation fees decrease by 3 percent when taxpayers' prepayment positions

decrease by 100 percent.[36] Next, we turn to the coefficient on the dummy variable *POS*. The coefficient on *POS* is 0.14, indicating that there is a fee premium of 14 percent when taxpayers receive a tax refund in excess of $500. Together, these results suggest that the effect of taxpayers' prepayment positions on tax return preparation fees is economically meaningful.

TABLE 6
Partial regression results related to estimating alternative specifications of equation (1) using alternative taxpayer data base*

Variable	Predicted sign	Coefficient estimates (*t*-statistics in parentheses)†				
		1986‡	1987	1988	1989	Pooled
Panel A: Estimation of (1) using SOI Panel File with data transformed by the natural logarithm						
POS	+	N/A	−0.04	−0.01	−0.02	−0.03
			(−0.88)	(−0.17)	(−0.51)	(−1.04)
MIXG	+	N/A	0.10	0.10	0.08	0.09
			(3.41)	(4.51)	(2.44)	(4.75)
MIXL	+	0.19	0.46	0.29	0.28	0.38
		(1.13)	(4.67)	(5.32)	(3.79)	(6.52)
MULL	+	−0.08	−0.08	−0.01	−0.05	−0.05
		(−1.22)	(−1.61)	(−0.24)	(−1.83)	(−2.47)
Panel B: Estimation of (1) using SOI Panel File with data transformed by ranks						
POS	+	N/A	2.88	48.56	121.59	325.96
			(0.10)	(1.27)	(3.04)	(4.14)
MIXG	+	N/A	0.04	0.01	−0.04	−0.03
			(1.06)	(0.22)	(−1.07)	(−1.29)
MIXL	+	−0.09	0.38	0.35	0.36	0.24
		(−1.41)	(5.29)	(5.67)	(4.96)	(6.87)
MULL	+	0.07	0.10	0.08	0.11	0.10
		(0.00)	(1.08)	(1.09)	(1.35)	(1.84)
Panel C: Estimation of (1) with alternative partition of prepayment position using SOI Panel File with data transformed by the natural logarithm						
POS	+	N/A	−0.08	−0.02	−0.03	−0.05
			(−1.77)	(−0.42)	(−0.64)	(−1.79)
PPOS	+	0.19	0.15	0.12	0.09	0.12
		(1.22)	(4.33)	(5.06)	(2.78)	(6.04)
PNEG	+	−0.07	−0.08	−0.00	−0.05	−0.05
		(−1.64)	(−1.61)	(−0.17)	(−1.80)	(−2.42)

(The table is continued on the next page.)

TABLE 6 (Continued)

Variable	Predicted sign	Coefficient estimates (*t*-statistics in parentheses)† 1986‡	1987	1988	1989	Pooled
Panel D: Estimation of (1) with alternative partition of prepayment position using SOI Panel File with data transformed by the natural logarithm						
POS	+	N/A	−68.82	−14.37	31.95	27.72
			(−1.70)	(−0.37)	(0.80)	(0.36)
PPOS	+	−0.07	0.06	0.04	−0.01	−0.00
		(−1.17)	(1.76)	(1.01)	(−0.22)	(−0.24)
PNEG	+	−0.13	−0.05	−0.02	−0.04	−0.14
		(−1.99)	(−0.53)	(−0.28)	(−0.52)	(−2.72)

Notes:

* The partial regression results reported in panels A and B are from estimating (1) using the SOI Panel File, while the partial regression results reported in panels C and D are from estimating alternative specifications of (1) using the SOI Panel File. The change to (1) involves removing the variables *MIXG*, *MIXL*, and *MULL* and replacing them with the variables *PPOS* (prepayment position of taxpayers who receive tax refunds) and *PNEG* (prepayment position of taxpayers who owe additional taxes). Variables are as defined in the text.

† The null hypothesis of homoscedasticity is rejected in each regression using White's test. As a result, all test statistics are computed using the heteroscedasticity-consistent covariance matrix (White 1980).

‡ In 1986, the number of observations is approximately one-half of what it is in other years and the values for the variables *POS* and *MIXG* are uniformly zero.

The potential tax deductibility of tax return preparation fees as a miscellaneous itemized deduction has implications for interpreting the results of this study. Due to the length of that discussion, we elect to include it in Appendix 3. We simply note here that if taxpayers can deduct tax return preparation fees, their prepayment positions will be higher (or less negative) as a result, which could induce a positive relation between taxpayers' prepayment positions and tax return preparation fees. However, as discussed in Appendix 3, we find that the results of this study are robust to concerns about the deductibility of tax return preparation fees.

Finally, we explore whether the results of testing the hypotheses are sensitive to certain data exclusions. As discussed in Appendix 2, we believe that the SOI Model File generally contains taxpayers who fit a desirable profile for this study (that is, on average, they are high-income taxpayers who have fairly complex tax returns and are unlikely to compensate tax professionals on a fixed-fee basis). Nonetheless, some taxpayers in the SOI Model File probably do not fit that profile. For example, taxpayers who earn all or most of their income from wages may have relatively simple tax returns and pay tax professionals on a fixed-fee basis. Similarly,

taxpayers who make all or most of their interim tax payments via withholdings from wages may also have relatively simple tax returns and pay tax professionals on a fixed-fee basis. As a result, we estimate (1) (results not reported) after excluding taxpayers in the third quartile of *PTPI*, taxpayers in the first quartile of *PMTS*, and taxpayers in both the third quartile of *PTPI* and first quartile of *PMTS*. The regression results are very similar to those reported in the paper and no inferences are affected.

5. Concluding comments

Prompted by the observation that taxpayers often overpay interim income taxes, prior research proposed theories to explain why taxpayers behave in this apparently inefficient manner. However, the scope of prior research may be overly narrow because tax professionals can also influence taxpayers' prepayment positions. Mental accounting theory suggests that by placing taxpayers in positive prepayment positions, tax professionals can induce a favorable mental representation of tax return preparation fees, perhaps allowing tax professionals to collect larger fractions of billable time and costs incurred on taxpayers' behalf.

With the above observation in mind, we adapt the prospect theory value function to the tax domain to understand the general nature of the relationship between taxpayers' prepayment positions and tax return preparation fees. Following Thaler 1980, 1985, and 1999, we use the prospect theory value function to describe how events are perceived and mentally encoded. Empirical tests using almost 70,000 taxpayers for 1988 through 1991 strongly support all hypotheses. The most noteworthy finding is that the relationship between taxpayers' prepayment positions and tax return preparation fees is positive. Our interpretation of this finding is that taxpayers are charged for larger (smaller) fractions of billable time and costs incurred by tax professionals when taxpayers receive tax refunds (owe additional taxes).

The results of this study not only add to our understanding of taxpayers and tax professionals, but also validate theories from cognitive psychology. The laboratory experiments on which the conclusions of mental accounting are based involve simple tasks and often lack realism. Indeed, when individuals are left to their own devices and when they are under the strains and pressures commonly encountered in everyday situations, there is no assurance that they will behave in a manner consistent with behavior observed in the laboratory. Thus, conclusions drawn from laboratory research may not generalize to richer, "real-world" settings. Our results, however, help to validate theories from cognitive psychology using naturally occurring data.

Additional insights into the overpayment phenomenon can be gained by employing complementary methodologies and accessing other data sources. For example, laboratory market studies could examine whether higher equilibrium prices evolve in markets that allow tax professionals to place their clients in positive prepayment positions versus markets that prohibit such behavior. Researchers could also examine the overpayment phenomenon by accessing data sources such as working papers and billing records of accounting firms.

Appendix 1: Discussions with practicing tax professionals

In this appendix, we report the results of informal discussions with six practicing tax professionals (two partners and four managers) from two national accounting firms and one large regional accounting firm. The purpose of these discussions was to highlight certain contextual features of the relationship between high-income taxpayers and tax professionals. Specifically, we discussed (1) the influence of tax professionals on taxpayers' prepayment positions and (2) the fee-setting and client-billing processes.

The tax professionals asserted that they influence taxpayers' prepayment positions,[37] and that this influence typically begins when tax professionals inquire about taxpayers' expected income levels (or anticipated year-to-year change in income levels) and the sources and types of income for the upcoming year. Ordinarily, taxpayers cannot precisely determine their future income levels or all sources and types of that income. As a result, taxpayers often provide a range of income values. On the basis of the range of values provided by taxpayers, tax professionals provide advice about withholdings and/or estimated tax payments, although they may advise taxpayers to alter their withholdings and/or estimated tax payments as the year progresses and events materialize. This observation is important because tax professionals provide advice that is based on income levels that tend toward the upper bound of income ranges provided by taxpayers, and may therefore induce overpayments by taxpayers. Although we have no direct evidence that tax professionals behave in this manner, it is nonetheless consistent with their incentives to frame tax-related outcomes in a positive light.

The tax professionals also provided insights into the fee-setting and client-billing processes. They indicated that tax return preparation fees are based primarily on the complexity of the return, the expected number of hours required to complete the return, and the prior year's fee. Hours worked on a particular return are accumulated and multiplied by applicable standard hourly billing rates. A billing report is generated after the tax return has been completed (this is often done more frequently) and a billing decision is made. Write-downs of billable time and costs are made for inefficiencies (for example, excessive time of new staff), learning curve time (for example, new research), competitive pressures, and market conditions. Each of the tax professionals indicated that professional judgement must be exercised in determining the proportion of billable time and costs for which clients will be charged. In most cases, clients are charged for between 60 to 100 percent of billable time and costs. This billing range is somewhat broad, but is consistent with the notion that tax professionals use significant judgement in making billing decisions.

Client billing invoices are typically given to clients concurrent with or in close proximity to completing the return. One tax professional stated, "When clients are due refunds, invoices are given to them as close to the receipt of the prepared tax returns as possible so that clients associate the refund with the fee." Invoices typically provide no details as to the manner in which the fee was determined. Importantly, the tax professionals indicated that adjustments to billable time and costs are quite common. They also used the phrases "the psychology of billing" and "billing is an art", which suggests that they have a general understanding of the way

that taxpayers perceive or frame tax-related outcomes. While none of the professionals stated that fees are influenced by taxpayers' prepayment positions, it seems conceivable that this factor could creep into their billing decisions in subtle, unconscious ways, especially in light of the significant discretion these decisions engender.

Appendix 2: Consideration of tax data bases

The three taxpayer data bases commonly used by researchers are (1) the Statistics of Income Individual Model File (SOI Model File), (2) the Statistics of Income Panel of Individual Returns (SOI Panel File), and (3) the Taxpayer Compliance Measurement Program File (TCMP File). The SOI Model File and SOI Panel File are publicly available data bases that we evaluate in this appendix. Our correspondence with the IRS indicates that the TCMP File is not currently available to researchers. This appendix therefore focuses on why we used the SOI Model File instead of the SOI Panel File.

The SOI Panel File reports information about a simple random sample of individual income tax returns, while the SOI Model File reports information about a stratified sample (based on income, income types, and location) of individual income tax returns. Accordingly, the most obvious taxpayer characteristic that distinguishes the SOI Panel File from the SOI Model File is taxpayer income. The SOI Model File tends to capture taxpayers who are at the higher end of the income spectrum. This observation is consequential for the following reasons. Taxpayers who have relatively high incomes are more likely to have relatively complex tax returns and are more likely to hire tax professionals not only to complete the required tax forms but also to provide advice about interim tax payments and about other tax-related matters. For such taxpayers, the tax services provided are less likely to be of a routine nature and, as a result, less likely to be provided on a fixed-fee basis. On the other hand, taxpayers who have relatively low incomes are likely to have relatively simple tax returns and hire professionals to complete the required tax forms rather than hiring them to provide advice about interim tax payments or other tax-related matters. For such taxpayers, the tax services are likely to be relatively low cost and be provided on a fixed-fee basis.

For taxpayers who disclose fees paid to tax professionals in the two data bases we consider, descriptive information about fees and taxpayer incomes are as follows.

			FEE		*TPI*	
Data base	Year	*n*	Mean ($)	Median ($)	Mean ($)	Median ($)
SOI Panel File	1986	911	187.06	100.00	53,081.35	40,751.00
SOI Panel File	1987	1,792	290.42	110.00	62,813.63	43,278.50
SOI Panel File	1988	1,742	253.25	120.00	68,122.10	45,838.50
SOI Panel File	1989	1,756	275.54	125.00	71,619.33	49,581.50
SOI Model File	1988	17,202	1,843.05	485.00	1,091,572.26	298,105.00
SOI Model File	1989	15,443	2,105.50	450.00	1,013,614.20	248,648.00
SOI Model File	1990	16,199	1,782.79	390.00	903,163.05	169,571.00
SOI Model File	1991	19,892	2,235.68	595.00	842,731.66	255,014.50

Notice that mean (median) *FEE* is at least 7.04 (3.25) times larger in the SOI Model File than in the SOI Panel File. Similarly, notice that mean (median) *TPI* is at least 11.76 (3.70) times larger in the SOI Model File than in the SOI Panel File. Because we want to identify taxpayers who hire tax professionals on a non–fixed-fee basis and who are likely to require substantial assistance from tax professionals, the SOI Model File appears to be the appropriate data base. Recall that the theory invoked in this paper presupposes that tax professionals have some influence over taxpayers' prepayment positions. Absent that influence, the hypothesized relationships are not likely to emerge. Higher fees and incomes suggest that tax professionals may be able to exercise greater influence over taxpayers' prepayment positions, which also points toward the use of the SOI Model File.

The next factor we consider is the alignment of tax return preparation fees with other taxpayer information. Before addressing this issue directly, we make the following observations. High-income taxpayers are relatively likely to obtain the advice of tax professionals periodically during the year. For example, high-income taxpayers may require assistance in structuring or timing transactions and deciding on the amount of interim tax payments. Under such circumstances, tax professionals may progressively bill taxpayers for work performed during the year, rather than waiting until the following year when they complete taxpayers' tax return. Our discussions with practicing tax professionals lead us to believe that periodic billing occurs relatively frequently for high-income clients who require assistance with tax-related matters during the year. On the other hand, when professionals merely complete taxpayers' tax return, billing for the fee is likely to coincide with the completion of the return. Amounts paid to tax preparers are deductible by taxpayers in the year they are paid. The SOI Panel File provides information about the same taxpayers over a period of years. As a result, it is possible to align taxpayer information in year *t* with the fees deducted by taxpayers in that year. The SOI Model File does not provide information about the same taxpayers over a period of years, but instead provides information about a unique sample of high-income taxpayers each year. As noted above, a considerable percentage of the fees associated with a particular year for high-income taxpayers are likely to be paid in year *t* (when tax-related advice is rendered) and the remainder in the subsequent year (when the tax return is completed). As a result, it is not clear whether having multiple years of data for the same high-income taxpayers would solve the alignment problem.

This discussion suggests that using either the SOI Panel File or the SOI Model File involves trade-offs. If we use the SOI Panel File, we test our hypotheses using a relatively small sample, which is not likely to reveal much about the phenomenon we seek to investigate because tax professionals may have little influence over taxpayers' prepayment positions and are likely provide services on a fixed-fee basis. On the other hand, if we use the SOI Model File, we test our hypotheses using a relatively large sample, which may be somewhat noisy in the sense that it captures fees for parts of two separate years. All things considered, we feel that it is appropriate to use the SOI Model File as the primary data base to test our hypotheses. However, we discuss the results of testing our hypotheses using the SOI Panel File in the additional analyses part of section 4.

We now consider two final issues. First, the SOI Model File provides data for a number of years, and we purchased the years 1988 through 1991. We wanted to use data from the SOI Panel File for the same years, but the final year in the SOI Panel File is 1990. Because we need year $t + 1$ data, the most recent year that we could use is 1989. We therefore selected the four-year period 1986 through 1989. There is no obvious reason why having partially overlapping rather than fully overlapping time periods introduces any problems.

Second, we recognize that the amounts paid to tax professionals in both the SOI Panel File and SOI Model File include amounts paid for tax return preparation, tax-planning, and other tax-related services. Unfortunately, this amount cannot be decomposed into its components. However, the use of an aggregate amount seems to introduce noise rather than bias into the relationship between taxpayers' prepayment positions and tax return preparation fees. This problem seems to be most pronounced for high-income taxpayers who tend to be represented in the SOI Model File. As a result, we may not find the hypothesized relationships even though they exist.

Appendix 3: Consideration of the tax deductibility of fees

Tax return preparation fees are observable for two groups of taxpayers who hire tax professionals. The first group is taxpayers who have miscellaneous itemized deductions in excess of 2 percent of their adjusted gross income (AGI). These taxpayers report tax return preparation fees as part of miscellaneous itemized deductions on schedule A. The second group is taxpayers who do not have miscellaneous itemized deductions in excess of 2 percent of AGI but who nonetheless report tax return preparation fees on schedule A. This occurs because in many cases tax professionals do not initially know whether miscellaneous itemized deductions will exceed the 2 percent threshold, so they include all tax-related information on schedule A and make that determination later. Even if taxpayers ultimately fall below the 2 percent threshold, tax professionals typically do not remove miscellaneous itemized deductions from schedule A. The proportions of taxpayers reporting fees on schedule A who do and do not have miscellaneous itemized deductions in excess of 2 percent of AGI are presented below.

	1988		1989		1990		1991	
	n	%	*n*	%	*n*	%	*n*	%
Returns with misc. itemized deductions > 2% of AGI	5,005	29.10	5,307	34.37	5,601	34.58	7,259	36.49
Returns with misc. itemized deductions < 2% of AGI	12,197	70.90	10,136	65.63	10,598	65.42	12,633	63.51
Total tax returns in sample	17,202	100.00	15,443	100.00	16,199	100.00	19,892	100.00

In (1) in the text, notice that the dependent variable is tax return preparation fees and the independent variables of interest are the three partitions of taxpayers'

prepayment positions. Also notice that the deductibility of fees means that larger tax return preparation fees result in lower tax liabilities and larger prepayment positions, regardless of other forces. This observation suggests that the positive relation between taxpayers' prepayment positions and tax return preparation fees may be partly attributable to the tax deductibility of fees. However, as noted above, most of our sample taxpayers capture no tax benefits from tax return preparation fees (70.90 percent in 1988, 65.63 percent in 1989, 65.42 percent in 1990, and 63.51 percent in 1991). Mean values for several variables related to the tax deductibility of fees are presented below.

	1988 (n = 5,005)	1989 (n = 5,307)	1990 (n = 5,601)	1991 (n = 7,259)
Tax liability (*a*)	85,161.98	86,687.88	76,229.50	95,540.87
Effect of fees on tax liability	744.70	876.21	665.00	1,093.97
Tax liability excluding tax benefit of fees (*b*)	85,906.68	87,564.09	76,894.50	96,634.84
Ratio of (*a*) to (*b*)	0.99	0.99	0.99	0.99

The item labeled "effect of fees on tax liability" is the product of multiplying mean fees by mean marginal tax rate. As can be seen from the table, the effect of deducting tax return preparation fees on taxpayers' tax liability is quite small, especially when one considers the ratio of tax liability (*a*) to tax liability excluding tax benefit of fees (*b*). Thus, while the positive relation between taxpayers' prepayment positions and tax return preparation fees may be partly attributable to the tax deductibility of fees, that effect is likely to be somewhat small.

To formally evaluate the effect of the tax deductibility of fees on the regression results reported in Tables 3 and 4, we perform the following analyses. For all taxpayers who have miscellaneous itemized deductions in excess of 2 percent of AGI, we use taxpayers' prepayment positions after removing the effect of fees on their tax liability. For example, the average taxpayer in 1988 had his or her prepayment position determined using a tax liability of $85,906.68 instead of a tax liability of $85,161.98. For taxpayers who do not report miscellaneous itemized deductions in excess of 2 percent of AGI, no adjustment to their prepayment position is made. Inferences are unaffected by making this modification, although the coefficient on *MULL* in 1991 in Table 3 becomes significantly negative when this modification is made. Thus, while we recognize the fact that fees influence taxpayers' prepayment positions for taxpayers who have miscellaneous itemized deductions in excess of 2 percent of AGI, the tax deductibility of fees does not appear to be driving our results.

Endnotes

1. See http://www.irs.gov/taxstats/indtaxstats/article/0,,id=129376,00.html for statistics on the percentage of tax returns that are professionally prepared. During the period covered by this study (1988 through 1991), approximately 50 percent of tax returns were professionally prepared. With respect to the size of tax refunds, see Christian, Gupta, Weber, and Willis 1994; Jackson 2004a; and Pechman 1987.

2. The optimal prepayment position from a time value of money perspective is to owe the Internal Revenue Service (IRS) as much taxes as possible upon filing without incurring interest or penalties. Virtually every U.S. tax textbook implores taxpayers to follow this tax-paying strategy (e.g., Pope, Anderson, and Kramer 2004, 14–30; Jones 2003, 482). Although prior research suggests that the overpayment of taxes may occur because of uncertainty (e.g., Feltham and Macnaughton 2000; Highfill, Thorson, and Weber 1998) and tax law complexity (e.g., Moore, Steece, and Swenson 1985), the sample of taxpayers used in our study consists exclusively of taxpayers who hire tax professionals, which should alleviate overpayment tendencies associated with these factors. This is because taxpayers in the United States can take advantage of the annualized income method exception when making estimated tax payments. Using this method allows taxpayers to base their payments on income earned prior to the payment, which reduces uncertainty about the appropriate amount of interim tax payments (Christian et al. 1994). Moreover, using tax professionals relieves taxpayers' of the burden of understanding the somewhat complex estimated tax payment rules — including the annualized income method exception. Through the combination of professional tax advice and the use of the annualized income method, U.S. taxpayers can generally avoid overpaying significant amounts of interim income taxes. However, it is important to recognize that taxpayers are likely to balance the potential costs of underpaying interim income taxes (that is, interest, penalties, and feelings of dread associated with the prospect of owing additional taxes) with the costs of overpaying interim income taxes (that is, forgone interest income). Some taxpayers who face considerable uncertainty about their actual tax liabilities may balance the costs of underpaying interim income taxes with the costs of overpaying interim income taxes and rationally choose to overpay interim income taxes (Feltham and Paquette 2002), even though a tax professional may advise them to do otherwise. Importantly, while we acknowledge the existence of this taxpayer preference, it does not detract from the central issue of this study, which is that taxpayers' prepayment positions and tax return preparation fees are likely to be positively related to one another.
3. The IRC (§6654) generally allows taxpayers to avoid underpayment penalties by withholding or paying on a quarterly basis the lesser of (1) 90 percent of the tax due on current income, and (2) 100 percent of the previous year's tax liability unless the taxpayer's adjusted gross income exceeds $150,000, whereby the minimum is based on 110 percent of the previous year's tax liability.
4. Prepayment position is computed as the sum of all estimated federal income taxes paid prior to filing minus the tax liability. If taxes paid exceed the tax liability, the IRS owes the taxpayer a refund and the taxpayer is in a positive prepayment position. On the other hand, if the tax liability exceeds taxes paid, the taxpayer owes the IRS additional taxes and the taxpayer is in a negative prepayment position.
5. The phrases "tax return preparation fee" and "fee" are used interchangeably throughout this paper.
6. Basing billing decisions on taxpayers' prepayment positions is tantamount to a contingent fee arrangement. IRS Circular 230 (2002) and Rule 302 of the AICPA Code of Professional Conduct (2005) prohibit such arrangements.

7. Gourville and Soman (1998) find that consumers mentally depreciate upstream payments (that is, payments for assets that have long lives) with the passage of time. This means that the cognitive impact of interim tax payments to the IRS and progress payments to tax professionals will decline as time passes. However, both types of payments generally occur in reasonably close time proximity to the completion of the tax return and any refund from or payment to the IRS, which suggests that the effect of mental depreciation is not likely to have a material influence on the relationships investigated in this study. Furthermore, because this study uses archival tax data, not experimental tax data, it is not possible to evaluate directly the effect of mental depreciation on the results.
8. A related matter concerns the manner in which the refund is received. Taxpayers may apply their refunds to their subsequent tax liabilities or receive refunds from the IRS. On the basis of our review of the research, there is no obvious reason why refunds used to offset future tax liabilities would be captured in a different mental account than refunds actually received by taxpayers. In either case, tax refunds are known to taxpayers and are likely to be perceived as benefits of hiring tax professionals.
9. This claim was made during a national advertising campaign in 2001. However, the Jackson Hewitt website made no such claim.
10. This claim was made in a Val-Pak coupon in February 2001.
11. In this study, we define positive prepayment positions as tax positions that result in refunds of $500 or more. The reason for defining positive prepayment positions in this manner is discussed under the heading "Cross-sectional Regressions" in section 3. Hypothesis 1 is an intercept shift hypothesis. Accordingly, the variable used to test this hypothesis is a dummy variable. In subsequent sections of the paper, the hypotheses focus on the slopes associated with prepayment positions.
12. For example, consider an athlete who averages 25 points in the first 30 contests and who scores 15 points in the next contest. According to prospect theory, the athlete's performance in the most recent contest will be mentally encoded as a decline of 10 points (a negative outcome relative to the status quo) rather than as scoring 15 points (a positive outcome in absolute terms).
13. This means that the difference in value between a gain of $10 and a gain of $20 seems greater than the difference in value between a gain of $110 and a gain of $120. Likewise, the difference in value between a loss of $10 and a loss of $20 seems greater than the difference in value between a loss of $110 and a loss of $120.
14. Research strongly supports the general assumption concerning the shape of the value function (Kahneman and Tversky 1979, 1984; Tversky and Kahneman 1981).
15. Examples of studies that use prospect theory to formulate hypotheses and archival data to test those hypotheses include Shefrin and Statman 1984 and 1985 and Odean 1998. Authors of several experimental tax studies use prospect theory as the theoretical underpinning for their research questions. Examples of such studies include Dusenbury 1994, Schepanski and Kelsey 1990, Schadewald 1989, and Schisler 1994. The theory and results reported in Dusenbury 1994 are consistent with the general proposition in this study that taxpayers' prepayment positions influence the manner in which they frame tax-related matters.

16. The results of Dhami and al-Nowaihi 2003, among others, suggest that prospect theory (and its variants) provide a useful framework for understanding taxpayer behavior. They observe that tax evasion should be an extremely attractive gamble to an expected utility maximizer, given actual audit probabilities and penalty rates. Contrary to the predictions of expected utility theory, actual tax evasion rates are, however, quite low. Dhami and al-Nowaihi draw on cumulative prospect theory (Tversky and Kahneman 1992) to understand taxpayer compliance behavior. The predictions of their analytical model regarding tax evasion correspond well with observed rates of tax evasion. This finding highlights the notion that prospect theory and related behavioral theories are appropriate hypotheses to help explain actual taxpayer behavior.
17. Exploring what taxpayers view as a neutral reference point is beyond the scope of this study. However, the assumption that taxpayers' reference points are neither owing additional taxes nor being owed tax refunds is reasonable in the present context.
18. In other words, we examine the relation between taxpayers' prepayment positions and tax return preparation fees, holding other factors constant. The covariates of fees are discussed in section 3.
19. Thaler (1985) and Linville and Fischer (1991) identify four possible compound outcomes (multiple gains, multiple losses, mixed gains, and mixed losses). In the tax domain, multiple gains cannot arise because fees always result in an outflow of resources. Hence, we are concerned only with mixed gains, mixed losses, and multiple losses, all of which involve at least one outflow and may involve one inflow. To be consistent with prior research, we use the same terminology to describe compound outcomes.
20. It is possible that taxpayers in the *MIXL* position frame the fee as a loss because the refund does not fully offset the fee. If this is the case, taxpayers in the *MIXL* position should be positioned in the lower left quadrant of the stylized value function. However, we believe that it is most appropriate to place taxpayers in the *MIXL* position in the top right quadrant of the stylized value function because of the manner in which the stylized value function is constructed. Notice that all taxpayers with positive prepayment positions (*MIXL* and *MIXG*) must fall to the right of the vertical axis. Positioning taxpayers in the *MIXL* position to the left of the vertical axis incorrectly implies that they are in negative prepayment positions.
21. This perspective indirectly supported by the economic concept of price discrimination, which involves selling identical goods or services to consumers at prices equal to their maximum willingness to pay for those goods or services. For price discrimination to be a viable pricing strategy, firms must have the ability to sort consumers on the basis of their willingness to pay (Varian 1992). Because tax professionals have access to a wide variety of financial information about their tax clients, sorting taxpayers is not likely to be a problem. We believe that price discrimination points to the possibility that taxpayers' willingness to pay increases with the size of their tax refund. Further, Mauldin, Brown, Stocks, and Braun (2002) find that tax professionals' billing decisions are influenced by taxpayers' income sources and income types, which supports our contention that tax professionals' billing decisions are influenced by factors beyond billable time and costs.

22. Business executives sometimes receive tax return preparation services as a corporate perquisite, in which case the cost of the service to the corporation is included in the executive's tax return as a taxable fringe benefit and as a miscellaneous itemized deduction. In some cases this amount is a flat fee for all corporate executives. Under such circumstances, the hypothesized positive relation between taxpayers' prepayment positions and tax return preparation fees may not emerge. However, we are not overly concerned about this possibility because the sample is composed of a broad cross-section of high-income taxpayers and only a subset of those individuals are likely to be corporate executives who receive this perquisite.
23. These variables are drawn from prior research on the determinants of tax preparer use and fees. For elaboration, see Christian et al. 1994, Frischmann and Frees 1999, and Long and Caudill 1993, among others.
24. Our conclusions are identical when we use cutoff points of $1,000 and $1,500.
25. Dummy variables are not transformed by the natural logarithm or decile rank, and variables expressed as a percent are not transformed by the natural logarithm. The logarithmic transformation for prepayment position (*MIXG*, *MIXL*, *MULL*) is equal to the logarithm of all taxes paid minus the logarithm of the tax liability. The logarithmic transformation has been used in a large number of published studies in accounting, finance, and economics. This transformation is often justified on the basis that it dramatically dampens the values of extreme observations that potentially exert an undue influence on regression results. We can think of two alternatives to using the logarithmic transformation to deal with extreme observations. First, we could winsorize the data, which involves deleting the most extreme observations in the sample. Second, we could use a statistical approach to identifying influential observations, such as that described in Belsley, Kuh, and Welsch 1980. We use the logarithmic transformations to avoid throwing away data.
26. The use of decile ranks in place of the original data is appealing for several reasons. First, to the extent that the data include extreme or anomalous observations, their influence on regression results is reduced. Second, because some variables are probably measured with error, decile ranks likely reduce the effect of measurement error on regression results. Third, the theoretically correct form of the relation between the variables is unknown. However, if the relation between the dependent variable and independent variables is monotonic, a higher-ranked dependent variable will correspond to a higher-ranked independent variable regardless of the precise functional form of the relation between the variables (Lang and Lundholm 1993). Iman and Conover (1979) show that rank regressions are quite powerful when the relation between variables is nonlinear but monotonic. See Hollander and Wolf 1999 and Iman and Conover 1979 for a discussion of this nonparametric regression technique. Yatchew (1998) indicates that if one has reservations about the validity of the assumptions underlying parametric regressions, it is appropriate to report the results of nonparametric regressions.
27. If the data are not transformed in any way whatsoever, the results are generally consistent with the results reported in this study. However, the test variables (*POS*, *MIXG*, *MIXL*, and *MULL*) are not significant in all years.

28. Our concern about this problem turns out to be warranted. As discussed in the next section, taxpayers in the multiple loss position do indeed have mean and median absolute prepayment positions that far exceed the mean and median absolute prepayment positions of taxpayers in the mixed loss and multiple loss positions.
29. Many of the independent variables are highly correlated, which suggests that multicollinearity might be a problem. We examined the variance inflation factors (VIF) associated with the independent variables to assess the potential effect of multicollinearity. In several cases, the VIFs exceeded the conservative threshold of five suggested by Montgomery and Peck 1982, but none exceeded the threshold of 10 suggested by Neter, Wasserman, and Kutner 1990 and Kennedy 1985. As a result, multicollinearity is not likely to have an undue influence on the regression results.
30. We thank the discussant, Lillian Mills, for drawing our attention to this problem.
31. If taxpayers' prepayment position is not partitioned in any manner whatsoever, the *t*-statistics associated with that variable in the logarithmically transformed regressions are 9.74 (year 1988), 9.71 (year 1989), 6.38 (year 1990), 3.32 (year 1991), and 15.74 (all years combined). Similarly, if taxpayers' prepayment positions are not partitioned in any manner whatsoever, the *t*-statistics associated with that variable in the ranked transformed regressions are 11.60 (year 1988), 10.42 (year 1989), 10.15 (year 1990), 7.89 (year 1991), and 21.39 (all years combined). Again, these results point to the conclusion that the partitioning of taxpayers' prepayment positions does not drive the significant results reported in Tables 3 and 4.
32. The SOI Model File contains a set of sample weights that researchers sometimes use in certain contexts to weight the data so that they are representative of the national return population (Christian 1990; Erard and Ho 2001). However, if one selects a nonrandom sample from the SOI Model File, the use of the sample weights does not make the weighted sample representative of the national return population. As a result, our ability to generalize the results of this study to the national return population is not enhanced by using the sample weights. For completeness and as a robustness check, we have estimated (1) using data in the SOI Model File that has been weighted by the sample weights (results not reported). The regression results based on using the weighted data are remarkably similar to the results reported in this study. When the data are log transformed after weighting, the test variables are all positive and significant ($p < 0.01$), except for *MULL* in 1991, which is insignificant. This is not surprising because *MULL* in 1991 is also insignificant using unweighted data as shown in Table 3. When the data are rank-transformed after weighting, the test variables are all positive and significant ($p < 0.001$) using the pooled sample, except for *MULL*, which is negative and significant. This same pattern of results emerges in the year-by-year regressions. When *MIXG*, *MIXL*, and *MULL* are collapsed into a single variable (that is, prepayment position) and the variable is weighted, the coefficient on prepayment position is positive and significant ($p < 0.001$) in every year for both log- and rank-transformed regressions. This finding reinforces the central conclusion of this study that there is a positive relation between taxpayers' prepayment positions and tax return preparation fees.
33. A parallel analysis using the regression results reported in Table 3 and Table 5 (panel C) can also be performed.

34. Panels B and D of Table 5 cannot be used to evaluate economic significance because ranked data has no economic meaning.
35. For a discussion of this matter see, for example, Gujarati 2003 (176).
36. Notice that the effect of taxpayers' prepayment position on tax return preparation fees is weaker for taxpayers who receive a tax refund than for taxpayers who owe additional taxes. While this may seem to run counter to Hypothesis 4, readers are referred to the last paragraph of section 3, which explains why Hypothesis 4 should be tested using rank-transformed data. The elasticities should be viewed as rough rather than precise estimates.
37. The alternative view is that tax professionals have little or no influence on taxpayers' prepayment positions, which seems untenable because it implies that taxpayers compensate tax professionals for advice that they subsequently ignore.

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