Does changing the timing of a yearly individual tax refund change the amount spent vs. saved?

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A B S T R A C T

The empirical evidence surrounding whether federal income tax refunds predominantly stimulate consumer spending or saving remains contradictory. This study is an attempt to combine income tax research findings with research on mental accounting and with the effects of estimated tax payments timing. The authors developed and administered an experiment, using college students as subjects, to test whether tax refunds administered as one lump-sum will be saved (vs. spent) more than tax refunds of the same amount refunded monthly through revised income tax withholding tables. The study also explores the types of saving and spending that result from refunds under both timing patterns. A within-subjects experiment of student spending was used, and ANOVA results confirm that a refund delivered in monthly amounts (for example, by changing the federal income tax withholding tables) stimulated current spending more than if the same yearly total tax reduction was delivered in one lump-sum. The findings also suggest that the lump-sum distribution conversely will stimulate private saving more than a monthly distribution will. The study also explores other specific savings and spending tendencies, including the payment of credit cards vs. investments in securities, and the amount spent on durable goods vs. monthly expenditures across several monthly and yearly distributions. It is important to know if and how the timing of refunds affects savings and spending tendencies because tax cuts are often debated on the political stage as a means to stimulate spending, and the timing of the refund might change how effectively a tax cut meets that goal.
1. Introduction

Do tax refunds predominantly stimulate consumer spending or investment? Multiple presidential administrations have cut taxes to stimulate spending; it is important to know how the timing of refunds affects these goals. Per Slemrod and Bakija (2004), the evidence is contradictory. Combining Slemrod’s findings with Thaler’s (1999) mental accounting research, an experiment is administered to: (a) validate the findings of Shapiro and Slemrod (2003a), (b) test whether lump-sum tax refunds will be invested (vs. spent) more than monthly tax refunds of the same annual amount (e.g. through revised income tax withholding tables) and (c) explore the types of investment and spending that result from refunds under both timing patterns.

2. Literature review

Recent research suggests that spending follows cash flow (Johnson, Parker, & Souleles, 2005; Parker, 1999; Souleles, 1999, 2002). Shapiro and Slemrod (1995) found that almost half the respondents surveyed regarding the 1992 decrease in tax withholding tables expected to spend most of the extra money immediately. That rebate changed the timing of taxes due, not the total tax due; the extra money taken home was due back or reduced a refund with the year-end tax filing. However, the 2001 tax cut took the form of a lump-sum of either $300 or $600; only about one-fourth of those surveyed expected to spend the refund (Shapiro & Slemrod, 2003a, 2003b).

Thaler (1999) asserts that individuals use “mental accounting,” possibly explaining seemingly inconsistent behavior. According to this literature, people have different marginal propensities to consume from accounts that are thought of differently (Heath & Soll, 1996; O’Curry, 1997; Read, Loewenstein, & Rabin, 1999; Rizzo & Zeckhauser, 2003). Camerer, Babcock, Loewenstein, and Thaler (1997) find that New York taxi cab drivers target their earnings level per day, and only work until that target is met rather than working a full day on lucrative days, and saving the extra money to use on low revenue days. Epley, Mak, and Idson (2006) concluded that people spent more of a change in income if they perceived that income as a “bonus” rather than as a “rebate”. However, their experiments did not vary the timing of the gain, and our experiments do not alter the framing of the source of the gain.

Transaction cost economics suggest that in a free market each transaction may bear a cost, either directly and monetarily or in terms of effort, safeguard or opportunity cost (Williamson, 1979). Buyers and sellers of a common and undifferentiated product (like a savings account) face few market hazards because of the availability of other investment opportunities and safeguards such as a regulated banking industry. However, it may be less effort to make a single lump-sum deposit than a series of 12 deposits, which could create additional costs for the depositor. Where frequent allocations are a material market friction, one could accumulate the incremental portion of the 12 larger deposits and physically move it yearly, keeping the costs to a minimum. That is, while transactions costs may be higher when a refund is received monthly, the costs can be easily mitigated if one is determined to save. Because the lump-sum refund is a small amount, the rate of return among lump-sums is assumed constant, ceteris paribus.

3. Hypotheses and research questions

3.1. Will a lump-sum refund be saved?

H1A confirms Shapiro and Slemrod’s (2003a, 2003b) finding that a refund received as a lump-sum will likely be saved (all hypotheses shown in alternative form): Respondents receiving a lump-sum hypothetical tax refund of $300 or $600 will save more (spend less) than those receiving the same amount of a yearly refund, monthly. Savings is defined consistent with Shapiro and Slemrod (2003a, 2003b) as increasing assets and/or decreasing liabilities. Here, short-term savings are included as savings because they immediately increase net worth, however, they stimulate the economy (are spent) before year-end. A separate analysis tests the sensitivity of including short-term savings as spending for Hypotheses 1 and 2. The argument that spending choice is tied to economic perceptions is weakened if percentages continue to change with distribution frequency from 2001 to 2005.
3.2. Does the timing of the distribution matter?

H$_2$A tests whether the timing affects the intended consumption or investment of a refund: Taxpayers will intend to (currently) spend more of a refund amount received in equal monthly installments than one of the same amount received as a yearly lump-sum. Most taxpayer bills are paid monthly and wages are generally paid at least monthly. The expected results are that taxpayers’ choice brackets will occur in increments closer to one month than one year. The results for this hypothesis are expected to be positive and significant. Conversely, it is expected that taxpayers will intend to invest more of a refund amount received in a single lump-sum than a refund of the same amount received in equal monthly installments.

3.3. Will consumers use detailed mental accounting?

Shapiro and Slemrod’s (1995) respondents were asked if they intended to “(A) spend, (B) save, [or] (C) repay debt,” although other responses were permitted. Their study considered repaying debt a form of saving, as it increases net worth, but this distinction might elude taxpayers. The choices did not distinguish between short-term and long-term savings; short-term savings for irregular expenses would stimulate the economy, although not immediately. And, taxpayers who save by investing but not by debt repayment potentially affect supply, demand and prices of marketable securities, with no direct effect to the debt market. A durable goods purchase is more of an investment than increased regular monthly purchases which raise the standard of living and provide a regular economic stimulus. Subjects in the current study were asked to respond to research questions designed to learn whether they use these mental accounts.

4. Methodology

A within-subjects experimental questionnaire was distributed to 141 university students. Sheppard, Hartwick, and Warshaw (1988) meta-analysis of 86 theory-of-reasoned-action studies determined that the average correlation between intention and behavior exceeded 0.53. Although not overwhelming, it provides confidence that these subjects’ responses reasonably approximate how they would respond to actual changes. The instrument asked how much of a given lump-sum refund (either $300, $600, $1500 or $3000) would be used for: (1) investing (e.g. in stocks), (2) paying off credit card debt, (3) paying off notes (e.g. mortgage), (4) regular monthly expenses, (5) buying a durable asset (e.g. furniture), and/or (6) saving for an infrequent yearly expense (e.g. vacation). Then each respondent was asked how much of a monthly refund (equal to 1/12 of the lump-sum amount) would be used for each of these purposes. To control for order effects, the $300 and $600 instruments were later distributed to 70 more participants, and no order effect on savings vs. spending was found. Economic theory suggests no difference in how taxpayers would intend to use the money if the total yearly refund amount is unchanged. However, the mental accounting concept suggests significant differences between the amount spent and the amount saved, even when only the timing of the refund is altered, and the distinctions may be finer than only using “saved,” “spent,” and “paid down debt” categories.

All hypotheses and research questions were analyzed with descriptive statistics. Hypotheses 1 and 2 were also analyzed with ANOVA, where choices (1) through (3) and (6) are savings, and choices (4) and (5) are spending. Hypothesis 1 was intended to confirm earlier studies at a $300 or $600 level; only these two refund levels were analyzed for this hypothesis. Research questions for the six refund uses were analyzed by percentage amount of payment at each refund level. The percents invested monthly and yearly were regressed to control for adjusted gross income, gender, size of the yearly refund and perceived business experience.

5. Results

Median income for the 141 respondents was approximately $26,500. The median was $28,281 for the closest year of nationally published statistics (National Taxpayer Advocate, 2005). Allowing for
inflation, respondent income appears comparable to the national average. Respondents had some college, and averaged five years of business experience, with perceived business experience averaging 2.8 on a 5-point Likert scale. Sixty-five percent of the respondents were female, which is somewhat higher than average. Age of respondents was not addressed because for the research upon which we based our study, age was either tested and found to be insignificant (Parker, 1999), or was not included in the discussion of results (Shapiro & Slemrod, 1995, 2003a, 2003b). No control variables were significant.

5.1. Hypothesis of lump-sum refund used for savings

When paid annually, $243 (81%) of the $300 refund and $487 (also 81%) of $600 would be saved, vs. $108 (36%) and $180 (30%) saved, respectively, with monthly refunds. These differences are significant at \( p < .05 \). With 81% saved, the remaining 19% of refunds would be spent, confirming Johnson et al.’s (2005) finding that households spent about 20–40% of their 2001 refund in the quarter it was received.

On average, $225 of $300 and $405 of $600 of the once-yearly refund would be saved after excluding short-term savings for irregular items, vs. $97 and $334, saved at the $300 and $600 levels with the monthly refund. Three of the 34 respondents (9%) who would receive a $300 lump-sum would spend it all, and seven (21%) would spend some of it. The remaining 70% would save the refund. Three of the 38 respondents (8%) who received a $600 lump-sum would spend it all, and 11 (29%) would spend some; with the remaining 63% saving the refund. These findings demonstrate the persistence of Shapiro and Slemrod’s (2003a, 2003b) finding that about one-in-four would spend the refund, supporting H1A (see Table 1). Results are similar and remain highly significant when the short-term saving is counted as spending and when liquidity-constrained households are excluded.

5.2. Testing respondents’ sensitivity to the amount refunded

Refunds of $1500 and $3000, which are five and 10 times the $300 used in the Shapiro and Slemrod (2003a) study, were used to test the sensitivity of these findings. Refunds of larger amounts could soundly affect respondents’ standard of living, as they approximate average of 5% and 10% of respondents’ respective after-tax income. Their planned saving and spending percentages began to converge, eliminating the timing effect, with much larger hypothetical refunds (see Fig. 1). When short-term saving is viewed as spending, they did converge at a 65% saving rate. However, because abrupt, after-tax increases of this size are rare among households, it may be appropriate to examine windfall studies in greater depth, which is beyond the scope of this paper.

5.3. Monthly refunds stimulate spending

ANOVA results for H2A confirm that monthly refunds stimulate current spending significantly more (\( p < .01 \)) than yearly refunds. Strong significant results persisted with the liquidity-constrained excluded and with short-term saving classified as spending. Separate ANOVA results confirm that a yearly refund stimulates private investment in savings, debt and/or equity securities significantly more (\( p < .01 \)) than a monthly refund. ANOVA tests were run for the $300 level and the $600 level

<table>
<thead>
<tr>
<th>Table 1</th>
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<tbody>
<tr>
<td>ANOVA of savings when a $300 or $600 refund is received yearly vs. monthly</td>
</tr>
<tr>
<td>Groups</td>
</tr>
<tr>
<td>Yearly % saved</td>
</tr>
<tr>
<td>Monthly % saved</td>
</tr>
<tr>
<td>Source of variation</td>
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<tr>
<td>ANOVA</td>
</tr>
<tr>
<td>Between groups</td>
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<tr>
<td>Within groups</td>
</tr>
</tbody>
</table>

independently to test the sensitivity of aggregating these amounts, resulting in similar significant findings only at the $600 level \((p \leq .01)\). The results for each of the research questions are presented in Table 2.

6. Discussion

6.1. Mental accounting matters

Traditional policy discussions have not examined potential effects of changing refund frequencies on taxpayer actions. Given tax rebate history, taxpayers may consider refunds as windfalls, not as permanent income. The amount of the refund, the type of tax change, and the timing should be considered to achieve the desired public policy. The timing of a refund affects its use: taxpayers would save most of a modest tax refund paid in a lump-sum and would spend most of an identical tax refund paid in the form of reduced monthly withholding, an effect that appears to diminish as the refund size becomes a material amount of income.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Yearly</th>
<th>Monthly</th>
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<th>Monthly</th>
<th>Yearly</th>
<th>Monthly</th>
<th>Yearly</th>
<th>Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refunded as Lump-sum vs. refunded monthly</td>
<td>$300</td>
<td>$25</td>
<td>$600</td>
<td>$50</td>
<td>$1500</td>
<td>$125</td>
<td>$3000</td>
<td>$250</td>
</tr>
<tr>
<td>N</td>
<td>34</td>
<td>34</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Investments in debt/equity (%)</td>
<td>26</td>
<td>19</td>
<td>32</td>
<td>20</td>
<td>28</td>
<td>22</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>Short-term savings (%)</td>
<td>6</td>
<td>2</td>
<td>14***</td>
<td>4**</td>
<td>18</td>
<td>10</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Pay long-term notes (%)</td>
<td>20**</td>
<td>1***</td>
<td>13</td>
<td>22</td>
<td>13</td>
<td>11</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Pay credit cards (%)</td>
<td>29***</td>
<td>13***</td>
<td>23</td>
<td>14</td>
<td>25</td>
<td>25</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Spend on monthly expenditures</td>
<td>8***</td>
<td>57***</td>
<td>10***</td>
<td>38***</td>
<td>9**</td>
<td>28***</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>Spend on durable goods (%)</td>
<td>11</td>
<td>8</td>
<td>9*</td>
<td>2*</td>
<td>8</td>
<td>3</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Percent to be saved/pay off debt (%)</td>
<td>81</td>
<td>34</td>
<td>81</td>
<td>60</td>
<td>83</td>
<td>68</td>
<td>76</td>
<td>72</td>
</tr>
<tr>
<td>Percent to be spent (%)</td>
<td>19</td>
<td>66</td>
<td>19</td>
<td>40</td>
<td>17</td>
<td>32</td>
<td>24</td>
<td>28</td>
</tr>
</tbody>
</table>

Asterisks indicate that the % lump-sum applied is different than % monthly refund (of same yearly amount) for a specific category, using: *\((p \leq .10)\), **\((p \leq .05)\), ***\((p \leq .01)\).
6.2. Size matters

As refund timing changes, savings and spending patterns change. Taxpayers invest more in securities and other long-term investments with a lump-sum refund, an effect that declines with substantially larger refunds. Perhaps the first part or minimum amount of a lump-sum refund is earmarked for a savings goal, but, the remainder is perceived as a windfall to be spent. Similarly, perhaps small monthly refunds are spent, but when money comes in large monthly amounts the refund is saved.

Given small monthly payments, taxpayers would not save much for irregular expenses but will save a moderate portion for such expenses with a lump-sum refund. Johnson et al. (2005) found significant differences in spending tax rebates for non-durables, but not for sub-categories of non-durables, except that expenditures on food away from home initially rose significantly.

Taxpayers are hesitant to pay down long-term notes with a small monthly refund but will pay down a larger percentage of notes with small lump-sum refunds, an effect that appears to diminish with total refund size. The best after-tax use of the money for most taxpayers may be to pay down credit cards, which normally carry the highest after-tax, risk-adjusted return. Lump-sum recipients plan to apply refunds to paying down credit card debt, but the amount is much less for those receiving monthly refunds. Perhaps a small refund has a very small effect on future required minimum credit cards payments, providing little utility unless taxpayers “make a dent” in total or in the minimum monthly payments. Agarwal, Liu, and Souleles (2004) found that households initially using part of their refunds to pay down credit card debt later increased spending; nine months later, their debt was near pre-refund levels. Liquidity-constrained taxpayers may be especially hesitant to pay down credit cards because they potentially face bankruptcy; their funds are best used to meet secured note payments – thus saving the house or car from repossession.

6.3. Timing matters

Taxpayers will generally not parcel out a lump-sum for regular monthly expenses; they do not perceive these funds as part of a permanent income stream. They will spend most of small monthly payments when they receive them (supporting Parker’s (1999) assertion against yearly income smoothing of year-end social security reductions), an effect that diminishes with increased monthly payments. Per Johnson et al. (2005), spending for non-durables lasted for more than one quarter, but tapered off into the quarter after receipt. The most liquidity-constrained spent significantly more on non-durables; high-income households spent a greater fraction of tax rebates upon receipt, but this difference was not significant.

In this study, spending for durables remained nearly constant at about 10% of the total yearly refund but fluctuated between a low of two percent at the $600 level and a high of eight percent at the $300 level when received monthly. The authors are uncertain about the cause(s) of this pattern. Similarly, Johnson et al. (2005) found no significant evidence that spending on durables increased, which they posited might reflect the small size of the average household refund or the greater volatility of expenditures on durables.

This study focused on behavioral intents; for motivation, Friedman (1957) postulated that household consumption behavior depends upon whether the income is viewed as transitory (i.e. windfall) or permanent. Transitory income does not cause a systematic change in consumption, but permanent changes in income change regular consumption. Beach and Wilson (2001) concluded that tax rate cuts would stimulate economic growth more than a tax rebate of the same magnitude would, because the assumptions of decision-makers are based on income stream, and because evenly distributed “lumps” of rebates are not perceived as a permanent.

7. Conclusion

Several US presidential administrations have used tax cuts to stimulate the economy and/or encourage savings, in the face of conflicting empirical evidence with the timing of refunds varying but not controlled for. This study finds evidence that tax refund timing affects intended use. Refunds
received monthly are likely to be spent, and refunds received yearly are likely to be saved, a difference that diminishes with refund size. This information is useful for achieving administrative goals by timing a refund consistent with the policy objective.

References


