
Session Three:

Drivers of Noncompliance



2010 IRS Research Conference

A Balance Due Before Remittance The Effect on Reporting Compliance

**Small Business/Self Employed Research
Seattle/San Jose
SEA0064**



A Balance Due Before Remittance - The Effect on Reporting Compliance

Roadmap

Introduction & Background

- Hypothesis: prepayment position and reporting compliance
- IRS Benefits
- Utility vs Prospect Theory

Data

- NRP and TCMP datasets

Method 1

- Weighted Least Squares Estimation
- Supports Prospect Theory

Method 2

- Checks - Instrumental Variables Estimation, Subset Estimation
- Mixed Results

Conclusions

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Research Problem - There is evidence that balance due taxpayers have been found to understate their taxes more often than refund due taxpayers.

Hypothesis - prepayment position causes a portion of reporting non-compliance.

This research:

- Provides the Internal Revenue Service (IRS) insight to the behavior of the taxpayer population.
- Contributes to debate between expected utility theory versus behavioral economics reference dependent theories.

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IRS Insight

There have been policy changes that temporarily change taxpayer's withholding to stimulate the economy.

- President Bush enacted a stimulus nicknamed, “play in '92 and pay in '93.”
(8.9 million taxpayers in unexpected balance due)
- President Obama's “Making Work Pay” stimulus plan.
(15.4 million taxpayers in unexpected balance due)

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Expected Utility vs Loss Aversion

Prepayment position does not change the tax liability but the timing of the tax payments within the year.

Expected Utility: taxpayers should realize that lifetime resources remain unchanged

Prospect theory (loss aversion): taxpayers exhibit behavior change

Loss domain – individuals are risk seeking

Gain domain – individuals are risk averse

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Tax Compliance Literature

Allingham and Sandmo (1972)

- A taxpayer makes compliance decisions based on expectations of an audit, their risk aversion and the total amount of their assets (expected utility theory)

Third party income - Kleven et. al (2009)

Marginal tax rates and evasion - Clotfelter (1983), Slemrod

Tax Surveys - Tanzi and Shome (1993), Andreoni, Erard, Feinstein (1998)

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Prospect Theory - Behavioral Economics Literature

Kahneman and Tversky (1979) - Prospect theory

- Value to gains and losses rather than final monetary assets

Tax Experiments - White et. al (1993), Schepanski and Shearer (1995)

Other Applications

Memorabilia trading - List (2003)

Newcomers exhibit loss aversion

Experienced traders exhibit neoclassical behavior

PGA Golf - Pope and Schweitzer (2009)

Putts for par vs putts for birdies

More experienced golfers exhibits loss aversion behavior

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If Prospect Theory Holds:

A taxpayer with a balance due would be more risk seeking and would be willing to underreport to reduce their liability

A taxpayer with a refund due would be more risk averse and act cautious to preserve their gain.

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Data

The 1988 Taxpayer Compliance Measurement Program (TCMP) and the 2001 National Research Program (NRP).

NRP dataset excluded 3,000 cases due to no information on the taxpayer from the previous two years as determined by the primary TIN.

Assumed: Audit reveals true line item values

All predictor variables used—including prepayment position—are the audited 'As corrected' values rather than the taxpayer reported values

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NRP Descriptive Statistics by Prepayment Position

	Refund Due/Exact Withheld	Balance Due - Small*	Balance Due - Large
Variable	Mean / %	Mean / %	Mean / %
change in tax	\$184.45	\$293.43	\$2,468.17
prepayment position	(\$2,225.90)	\$179.52	\$6,135.30
Primary Age	42.30	46.50	50.92
% w/ Sch A	36.07%	29.78%	52.26%
% w/ Sch C	10.78%	15.91%	37.07%
% w/ Sch D	19.78%	23.73%	33.93%
% w/ Sch E	11.20%	11.27%	27.15%
% w/ Sch F	1.29%	1.90%	3.94%
% w/ Interest Income	58.81%	67.04%	75.68%
% w/ Dividend Income	26.67%	31.66%	40.28%
N	21,600	2,027	18,252

source: 2001 NRP

*10th percentile of balance due

** negative values denote overreporting / refund due

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Net Misreporting Percentage* by Income and Prepayment Position

Corrected Prepayment Position						
TPI Level	Large Refund	Medium Refund	Small Refund	Small Balance Due	Medium Balance Due	Large Balance Due
1	10.95%	8.19%	11.47%	16.32%	26.17%	34.15%
2	10.95%	8.19%	11.47%	16.32%	26.17%	34.15%
3	0.80%	2.06%	1.41%	1.56%	2.81%	10.17%
Reported Prepayment Position						
TPI Level	Large Refund	Medium Refund	Small Refund	Small Balance Due	Medium Balance Due	Large Balance Due
1	55.12%	14.97%	12.02%	12.19%	10.86%	2.71%
2	12.38%	7.87%	7.16%	6.25%	7.85%	9.27%
3	3.83%	6.13%	22.47%	10.39%	7.10%	3.96%

NMP increases as prepayment shifts from large refund to large balance due

source: Tax Year 2001 NRP reporting compliance study of individual income tax returns

Large, Medium and Small prepayment are designated by 75th, interquartile range, and 25th of BD and RD even prepay comprised of 2% of sample and was included in small refund group. estimates weighted to compensate for stratification

* NMP = The sum of the net amounts of tax misreported expressed as a percentage of the sum of the absolute values of the amounts that should have been reported.

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Data suggests a link between a balance due prepayment position and reporting compliance.

- Large balance due positions associated with higher proportion of complex returns (by the percent of attachments)
- Large balance due positions associated with largest understatement of tax liability (higher NMP)
- Caution should be taken using *reported prepayment position*
 - Those who *claim* a large refund often claim too much.
 - Those who *admit* to a large balance due tend to be honest about that.

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Compliance Decision

Taxpayers face a decision between misreporting with a higher risk of an audit, or comply by fully paying tax liability.

- Enter the filing process with an expectation of no additional liability owed
- Draft a return and realize true prepayment position
- Make reporting compliance decision
(finalize draft or change income/deductions/credits)
- File return

Assumed: Zero additional liability = Reference point

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Weighted Least Squares Regression Equation

Underreport = f (return characteristics, actual prepayment position, interaction terms ...)

$$U = \beta_0 + X_1 \beta_1 + \beta_2 BD + \beta_3 RD + X_1 D \cdot BD \beta_4 + X_1 D \cdot RD \beta_5 + \varepsilon_u$$


The parameters of interest: marginal effects of a balance due or refund due position.

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Weighted Least Squares Regression Equation

If prospect theory holds: $\beta_2 > 0$, $\beta_3 < 0$ and $|\beta_2| > |\beta_3|$

A balance due increases the amount of underreporting

A refund due decreases the amount of underreporting

Steeper for balance due than for refund due (Loss aversion)

Otherwise, these parameters would not be significantly different from zero.

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WLS Parameter Estimates

TCMP Prepayment Parameter Estimates				
Dependent Variable: Tax Change (underreport > 0, over report < 0)				
parameter	Full Sample	TPI Level 1	TPI Level 2	TPI Level 3
β_2 Bal Due	0.364 ** (0.014)	0.343 ** (0.012)	0.289 ** (0.010)	0.344 ** (0.038)
β_3 Refund	-0.107 ** (0.033)	-0.159 ** (0.008)	-0.058 ** (0.016)	-0.109 (0.276)
N	54,088	13,522	27,044	13,522

NRP Prepayment Parameter Estimates				
parameter	Full Sample	TPI Level 1	TPI Level 2	TPI Level 3
β_2 Bal Due	0.404 ** (0.011)	0.378 ** (0.022)	0.501 ** (0.013)	0.383 ** (0.024)
β_3 Refund	-0.052 * (0.030)	-0.074 ** (0.020)	-0.074 ** (0.016)	-0.067 (0.157)
N	41,417	10,503	20,902	10,478

standard errors in parenthesis, ** p < 0.05; * p < 0.10

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Weighted Least Squares Regression Results

Taxpayers' reporting compliance behavior is different depending on prepayment position, holding all else constant.

$$\beta_2 > 0$$

For every dollar balance due increases the amount of underreporting by about \$0.38

$$\beta_3 < 0$$

For every dollar refund due decreases the amount of underreporting by about \$0.09

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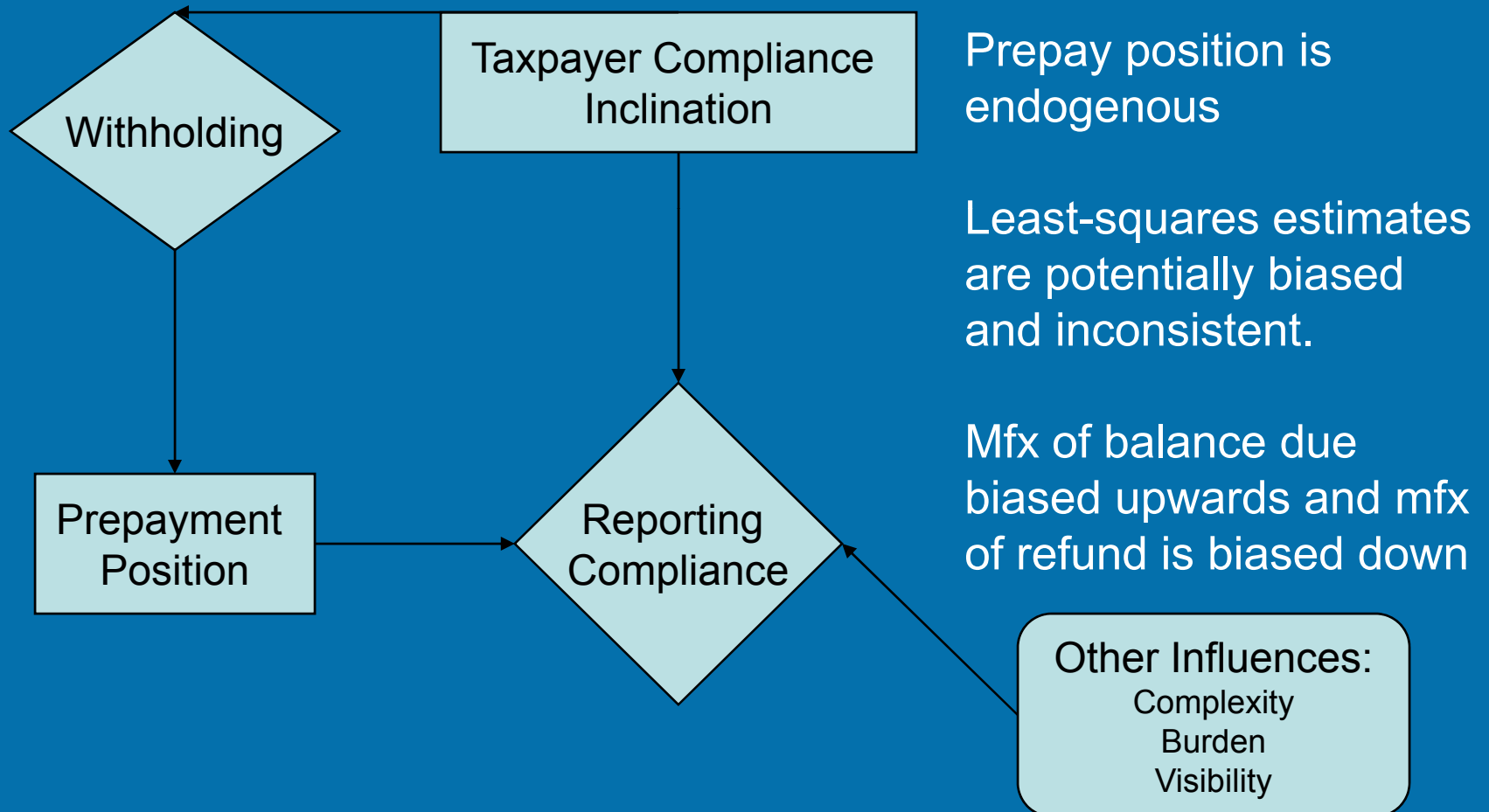
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Endogeneity of Prepayment Position & Reporting Compliance



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Solutions:

WLS on Subset of data

Stable withholding the prior two years, but large change in tax liability in the NRP year.

If prepayment position is unanticipated then it is not determined by the taxpayer, thus reducing the endogeneity.

Instrumental Variables Estimation

Prior year data assumed to influence 2001 prepayment position but not 2001 reporting compliance decision.

Estimate prepayment position then use these fitted results to estimate the level of reporting non-compliance

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Subset Estimation Results

NRP WLS Regression - Stable Withholding						
Dependent Variable: Change in Tax Liability (underreport > 0, over report < 0)						
parameter	Full Sample estimate		TPI lev 1 estimate		TPI lev 2 estimate	TPI lev 3 estimate
Bal Due	0.730 ** (0.028)		1.465 ** (0.088)		0.594 ** (0.035)	0.709 ** (0.067)
Refund	-0.047 (0.031)		-0.048 (0.049)		-0.055 (0.026)	0.311 (0.426)

source: 2001 NRP, stable withhold <= -+15% change in withholding
standard errors in parenthesis
** p < 0.05; * p < 0.10

Consistent with previous results

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Instrumental Variables Estimation Results

IV Estimation – Second Stage Results

Dependent Variable: Change in Tax Liability
(Underreport > 0, Overreport < 0)

	TPI Level 1	TPI Level 2	TPI Level 3
N	10503	20902	10478
parameter	Estimate	Estimate	Estimate
Bal Due	0.524 (1.96)	2.631 (3199.20)	1.253 (1.23)
Refund	-0.439 (1.27)	-3.335 (3.88)	-6.044 (17.51)

standard errors in parenthesis, ** p < 0.05; * p < 0.10
source: 2001 NRP

Evidence towards Expected utility theory not
Prospect theory

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WLS vs IV – Hausman Test Statistics

Hausman's Specification Test Stats

Comparing WLS to 2SLS

Ho: WLS and IV consistent, WLS efficient

Ha: IV consistent and efficient

	TPI Level 1	TPI Level 2	TPI Level 3
DF	31	31	28
Statistic	417.7	289.8	16.04
Pr > ChiSq	<.0001	<.0001	0.9652
Suggested Model	IV	IV	WLS

source: WLS and IV estimations with 2001 NRP data

Cannot reject the null for the high income group (TPI Level 3).

Appears to be an endogeneity issue with prepayment position

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Summary

WLS and the subset analysis supports the theory of a behavioral shift in taxpayers depending on their prepayment position

IV analysis does not report such a link

Summary of estimation results

	WLS	Subset	IV
Different Signs	X	X	X
Loss Aversion	X	X	
Sig BD	X	X	
Sig RD	X		

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Conclusions and Recommendations

IRS Insight

Suggestive evidence in support of a change in taxpayer behavior due to their prepayment position.

Increased education (withholding calculator) could decrease non-compliance at a low cost

Utility vs Prospect Theory

Further work on the endogeneity problem is needed.

Alt. modeling techniques: probit, tobit analysis

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Thanks!

IRS: Adelsheim, Defiel, DeWald, Hunt, Johns, Miller, Plumley, Parker, Shipley, Turk, Zanetti

UW: Rose, Shi, Wolff