Session 1. Interventions: Influencing Taxpayer Compliance

Moderator:	*Brenda Schafer* *IRS, RAAS, Office of Research*
Taxpayer Responses to Third-Party Income Reporting: Evidence from a Natural Experiment in the Taxicab Industry	*Bibek Adhikari* *Illinois State University*
Do Audits Deter Future Noncompliance? Evidence on Self-Employed Taxpayers	*Erich Kirchler* *University of Vienna, Austria*
Impact of Fresh Start Initiative on Lien Filings and Taxpayer Compliance	*Alex Turk* *IRS, SB/SE*
Discussant:	*Alan Plumley* *IRS, RAAS*

Taxpayer Responses to Third-Party Income Reporting: Evidence from a Natural Experiment in the Taxicab Industry

Bibek Adhikari, Illinois State University

James Alm, Tulane University

Brett Collins, Internal Revenue Service

Michael Sebastiani, Internal Revenue Service

Eleanor Wilking, University of Michigan

Research Question

- How do taxpayers respond to the introduction of third-party income reporting?
    - Some examples are W-2 and 1099-MISC
- In this study, we focus on:
    - Form 1099-K implementation
    - Taxi cab industry
    - Total receipts, expenses, and ratio of expenses and receipts

The Context of 1099-K

- Percentage of income properly reported and taxed (IRS, 2012)
  - Wages and Salary = 99%
  - Business income not subject to third-party reporting = 44%

- New third-party reporting law (1099-K): Electronic payment companies such as credit card, debit card, PayPal are required to report revenue that businesses receive through such electronic payment system

- Business income (except for cash receipts) are third-party reported
- However, expenses are still not third-party reported

Identification Problem and its Solution

- There is a lack of a control group
  - The implementation of the Form 1099-K program was not randomized
  - 1099-K is a federal program affecting businesses from all states

- The taxicab industry provides a credible control group
  - Many cities passed laws requiring taxicabs to install credit card readers in their taxis
  - Taxis in those cities receive higher share of revenue through credit cards
  - Thus, a greater share of their revenue will be third-party reported

- These measures are exogenous to Form 1099-K
  - Super Bowl cities (e.g., New Orleans and Indianapolis)
  - Quality of service

Cities with Credit Card Laws

City	Adoption Date	Effective Date
Philadelphia	2005	2006
Seattle	22-Feb-05	15-Jul-05
New York	Mar-04	1-Dec-08
Boston	29-Aug-08	1-Jan-09
Indianapolis		2011
Minneapolis		1-Jun-12
Charlotte	25-Jul-11	1-Jul-12
San Francisco	5-Jun-12	6-Jul-12
New Orleans	19-Apr-12	1-Aug-12
Chicago	1-Jul-12	Jan-13
Washington	9-May-13	1-Sep-13
Columbus	1-Jul-13	1-Jun-14
Fort Worth	19-Aug-14	24-Aug-14
Baltimore		31-Dec-14
Houston	6-Aug-14	2-Feb-15
Miami	29-Jan-14	29-Jan-16
Kansas City	9-Apr-15	
Atlanta	17-Sep-15	

Sample of Cities without Credit Card Laws

Los Angeles	Memphis
Phoenix	Oklahoma City
San Diego	Portland
Dallas	Las Vegas
San Jose	Louisville
Austin	Milwaukee
Jacksonville	Albuquerque
Detroit	Tucson
Nashville	Sacramento
Denver	Kansas City

Empirical Strategy

- Difference-in-Differences research design

- Treatment = Post-1099K and Post-Credit Card Law

- Treated Group = Taxicabs in cities with mandatory credit card reader laws after 2011

- Control Group = Taxicabs in other cities or before 2011

Empirical Strategy

- *Difference-in-Differences:*
  - $Y_{ict} = Credit\ Card\ Law_{ct} + \sum X_{ict} + FE_i + FE_c + FE_t + \varepsilon_{ict}$
    - Credit Card Law = treatment indicator
    - FE_i = taxicab fixed effect
    - FE_c = City fixed effect
    - FE_t = year fixed effect
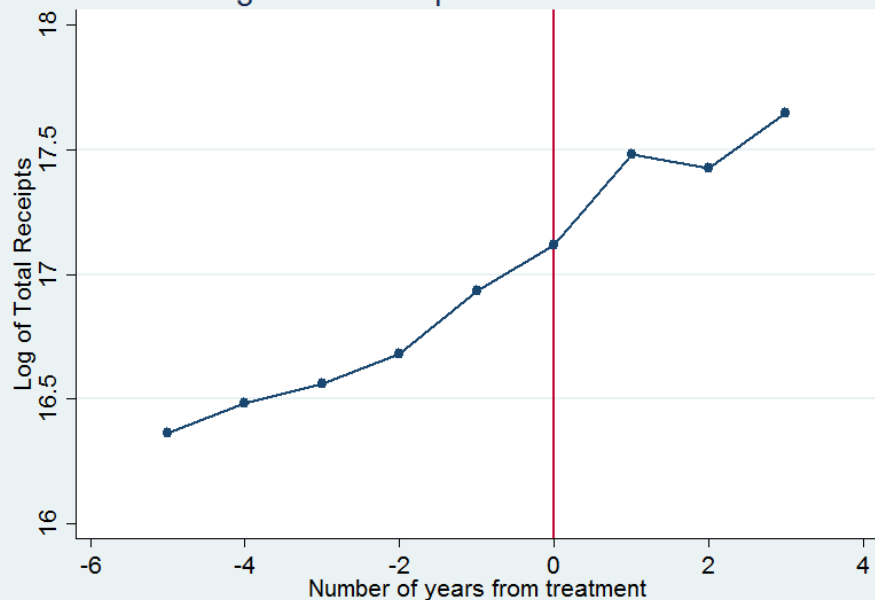   - X_{ict} = controls

- *Event Study:*
  - $Y_{ict} = \sum_{t=-5}^{t=4} Credit\ Card\ Law_c + \sum X_{ict} + FE_i + FE_c + FE_t + \varepsilon_{ict}$
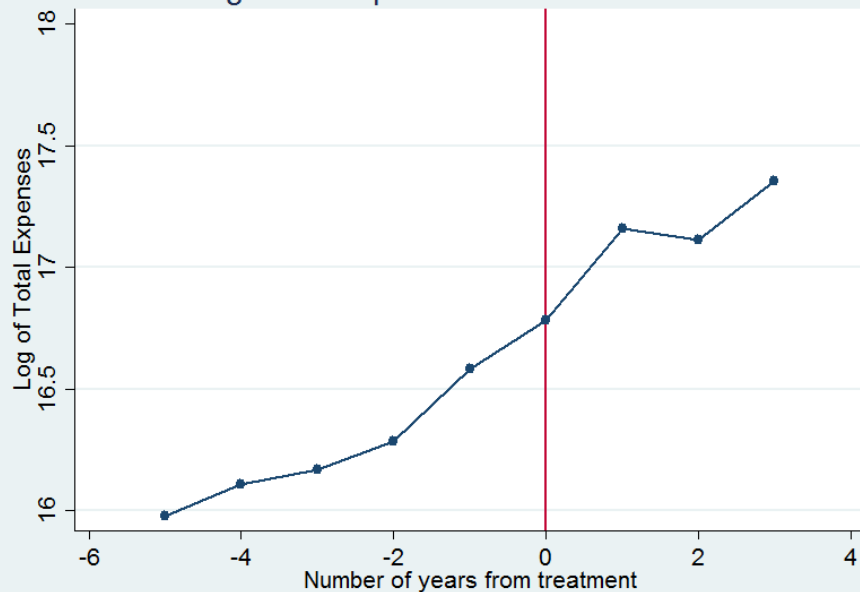   - Credit Card Law = 5 leads and 4 lags around the treatment

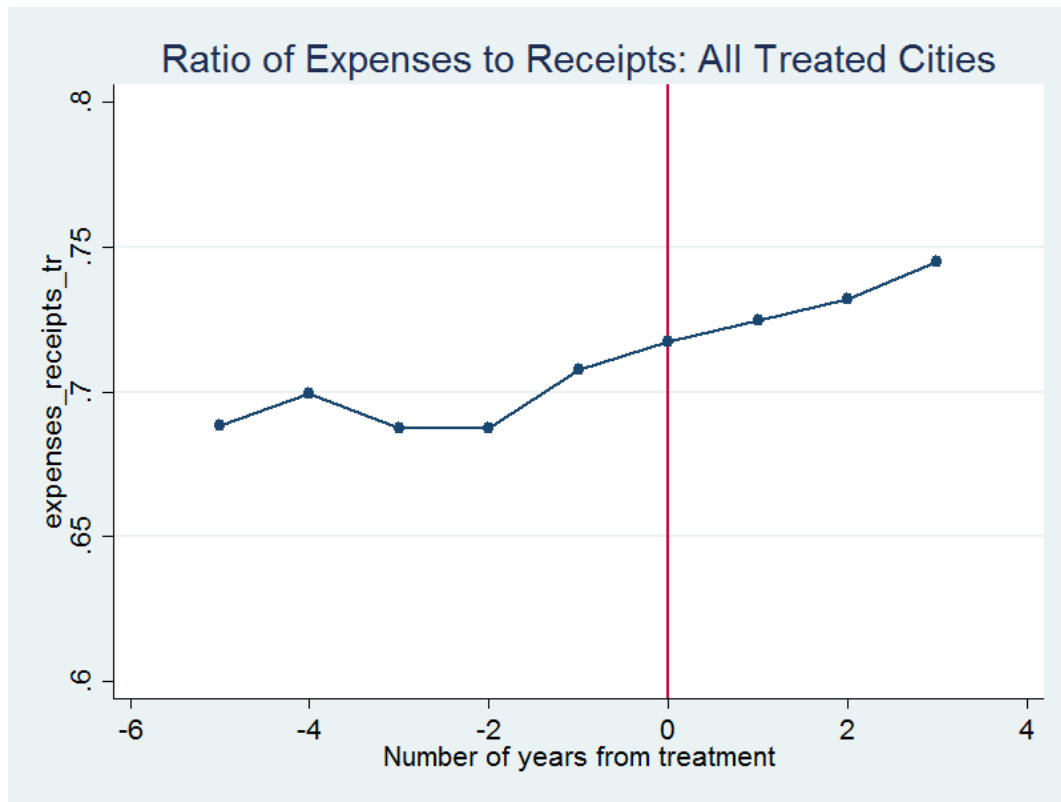- Standard errors are clustered at the city level

Trends Around Treatment

Log Total Receipts: All Treated Cities

Log Total Expenses: All Treated Cities

Trends Around Treatment

Ratio of Expenses to Receipts: All Treated Cities

Difference-in-Differences Results

Outcome Variable	Coefficient	t-Statistics	P-Value
Log Total Receipts	0.22	5.21	0.00
Log Total Expenses	0.25	5.05	0.00
Expenses/Receipts	0.02	2.12	0.04

Event Study Graphs

Event Study Graph

Difference between Treated and Control Group
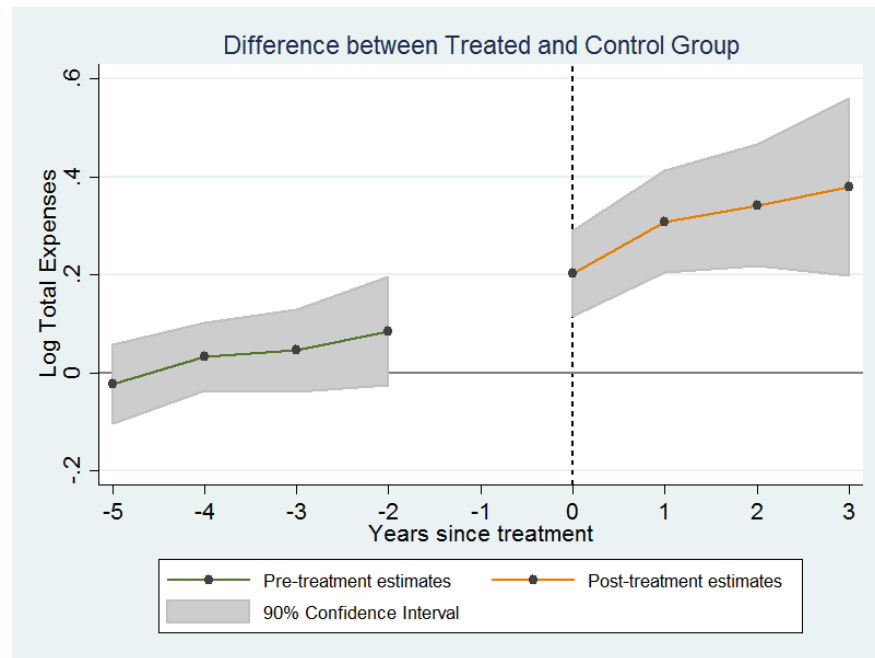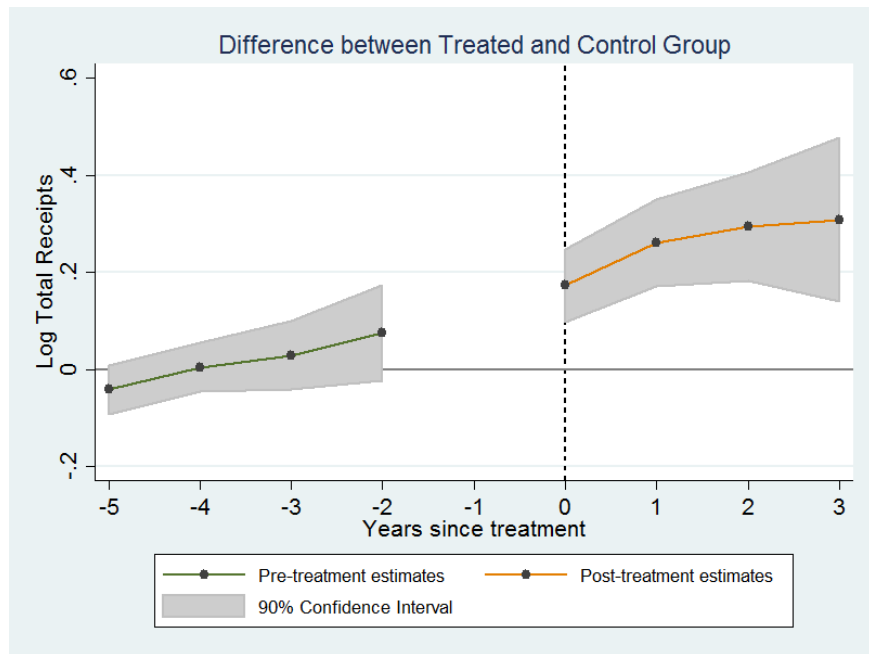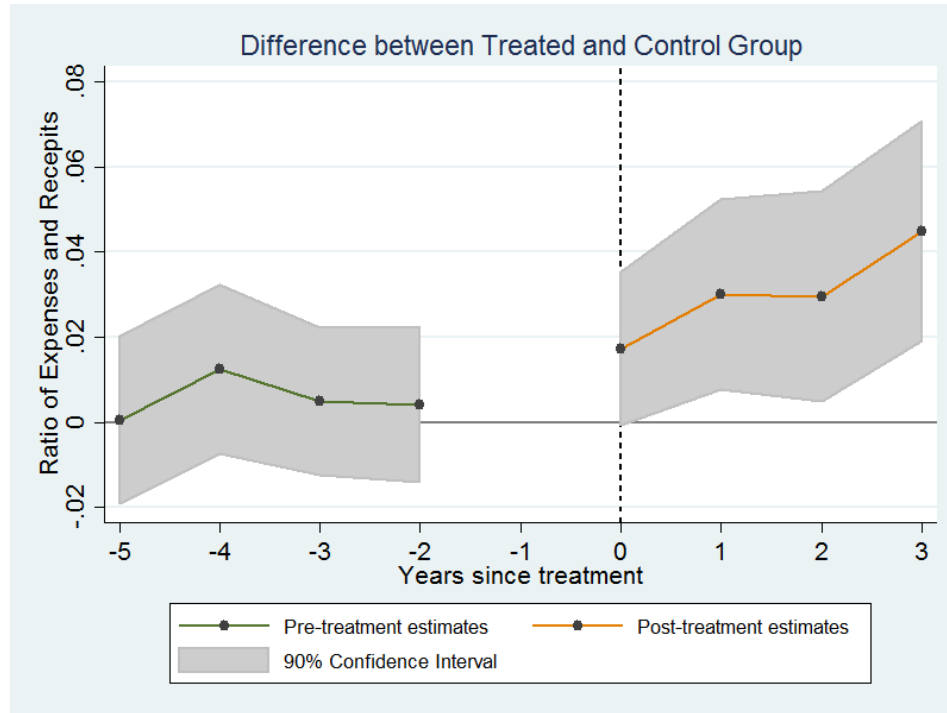
Conclusions

- Results are still preliminary

- Firms report more revenue after the introduction of Form 1099-K

- The increase in reported revenue was accompanied by offsetting increases in expenses

- So: taxpayers respond to information reporting but in offsetting ways

Do Audits Deter Future Non-compliance? Evidence on Self-Employed Taxpayers

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Washington, 2016

Tax behavior:
Research in economics and psychology

Law & Economics approach:

Decision under risk

(audit probability, fines, income effects, tax rate)

Command and control approach

Power of authorities

Enforced compliance

Psychological approach:

Attitudes, mentality and morale, knowledge and understanding of law, personal and social norms, distributive, procedural, retributive fairness)

Trust in authorities

Voluntary compliance

Introduction

- IRS audits 1.5% of self-employed taxpayers annually (IRS, 2015)

- Direct/mechanical revenue effect: > $3bn additional assessments

- Little knowledge about indirect effects: audit experience might impact on subsequent reporting behavior

Consequences of audits

- Economic theory and psychological insights:
  - Updating of prior beliefs on audit probability (subjectiv p of audits)
  - Income effect: tax debt might increase risk-aversion
  - Alter fairness and trust perceptions (interaction climate)
  - Trigger loss repair tendencies (in future filing years)
- Reactions to audits are likely not uniform across taxpayers, for instance:
  - Income effect: depending on audit result
  - Fairness perceptions: depending on audit experience

Audit Impact Study

- Examine impact of audits on subsequent reporting behavior empirically and allow for heterogenous responses (for those audited with positive vs negative audit result)

- Data: 2,204 Schedule C filers (sole proprietors with revenue <200,000 $/yr) between 2005-2011;

  + matched control sample
  - Administrative information on income and risk indicator (DIF score)
 - Audit information (starting/closing date, audit type, audit result)

Empirical strategy

Difference in differences

- Compare change in reported income between taxpayers who were audited with those who were not audited
- Treatment definition: audited for tax year 2007 before filing 2008 return, both groups not audited between 2005 and 2007

Allow responses to vary between *compliant* and *non-compliant* taxpayers

- Classification based on audit result
- Drawback: classification only possible for audited taxpayers, audit result does not always reflect compliance
- Control for selection bias and influence of time-varying factors (propensity score matching, Heckman estimator,...)

Matched Sample
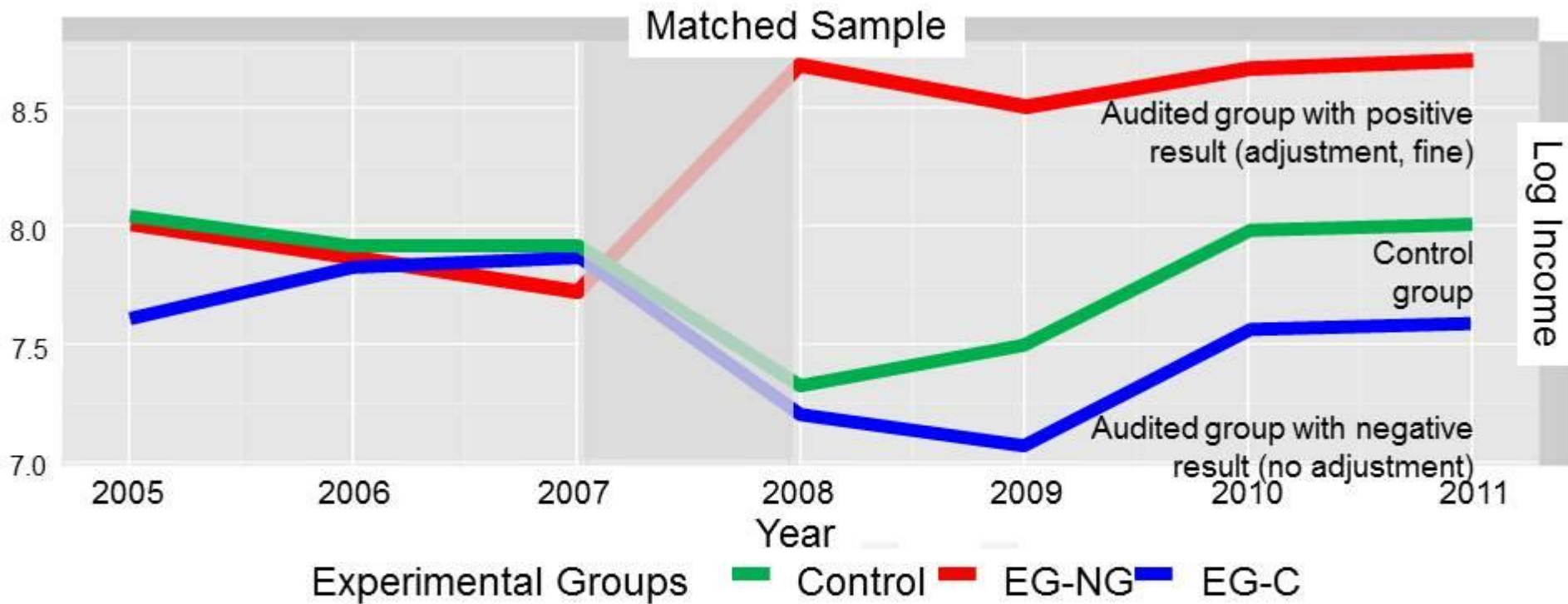
Findings

Change in reported income	1 year after audit	3 years after audit
Compliant	- 14%	- 35%**
Non-compliant	+ 250%***	+ 130%***

- Considerable indirect effect of audits
- Important to differentiate responses between taxpayers
- Average treatment effect conceals part of response (and is likely biased; it is necessary to distinguish between different audit results)
- Negative impact potentially driven by:
  - *Bomb-crater effect*
  - Loss-repair tendencies
  - Limited enforcement capacity (non-detection of true evaders) might encourage more aggressive reporting
  - Interaction climate might be affected by harsh auditing procedures vs audits as instruction

Scope for future research

- Analyze components of income: schedule C income, dividend income, expenses,… (investigate substitution effects)

- Employ more sophisticated matching algorithms

- Assess effects of different audit types and their impact on perceived power of authorities and trust in authorities as defined in the Slippery Slope Framework

Command and control …
Audits and fines …
are a simple answer to a complex phenomenon!

For every complex problem there is an answer that is clear, simple, and wrong.

Henry Louis Mencken (12 September 1880-29 January 1956), was a twentieth-century journalist, satirist, social critic, cynic, and freethinker, known as the "Sage of Baltimore" and the "American Nietzsche".

SAM: Strategic Analysis and Modeling

CIDS: Collection Inventory Selection and Delivery

Small Business Self Employed

Internal Revenue Service

Resolving Unpaid Taxes and the Notice of Federal Tax Lien: Evidence from the Fresh Start Initiative

June 23, 2016
IRS Research Conference

Alex Turk, Supervisory Economist
Stacy Orlett, Operations Research Analyst
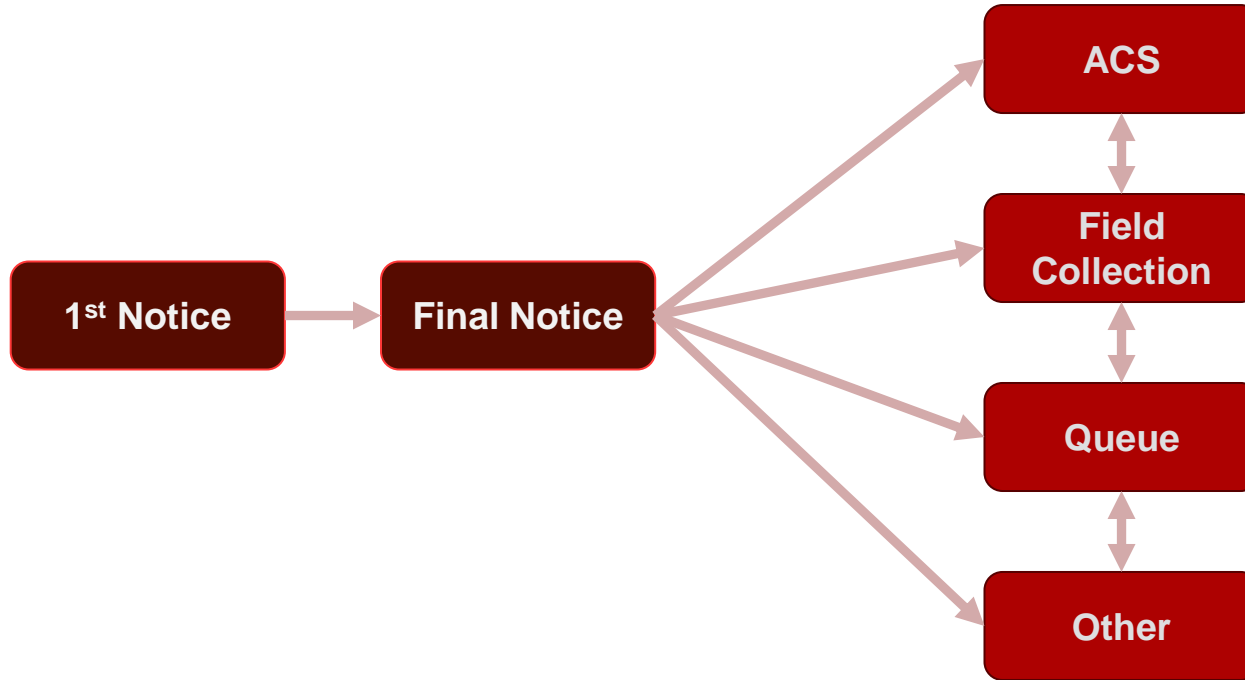John Iuranich, Operations Research Analyst
Saurabh Datta, Operations Research Analyst

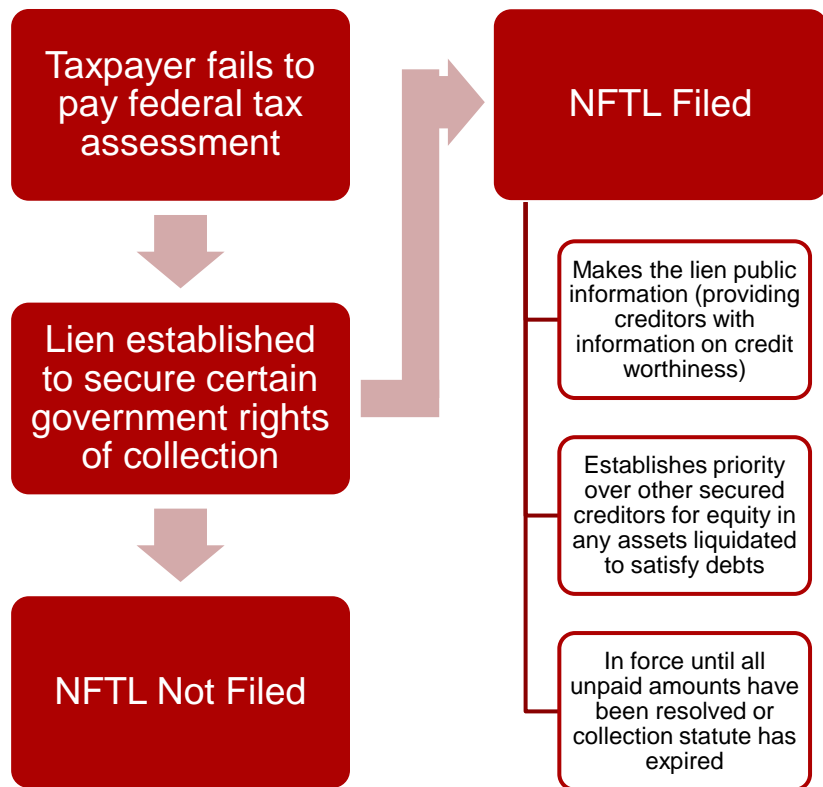# Presentation Outline

▶ Background
  ▸ NFTLs & Unpaid Assessments
  ▸ Previous Research

▶ Methodology
  ▸ Data Construction
  ▸ Model Specifications

▶ Results
  ▸ Estimates of NFTL Marginal Effects
  ▸ Illustration of impact of not filing the NFTL
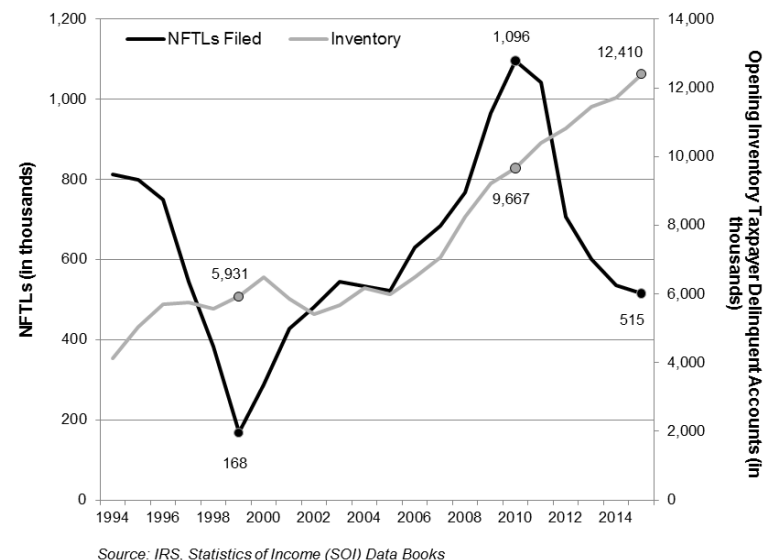
▶ Conclusions and Direction for Future Research

Overview of the Collection Process for Unpaid Assessment

Notice of Federal Tax Liens (NFTL)

Taxpayer fails to pay federal tax assessment

Lien established to secure certain government rights of collection

NFTL Not Filed

NFTL Filed

Makes the lien public information (providing creditors with information on credit worthiness)

Establishes priority over other secured creditors for equity in any assets liquidated to satisfy debts

In force until all unpaid amounts have been resolved or collection statute has expired

Number of Notice of Federal Tax Liens and Taxpayer Delinquent Accounts per Year

*Source: IRS, Statistics of Income (SOI) Data Books*

Taxpayers with Unpaid Assessments and the Percentage with a Notice of Federal Tax Lien

The IRS Restructuring and Reform Act of 1998 resulted in a decrease in the percentage of taxpayers with an NFTL
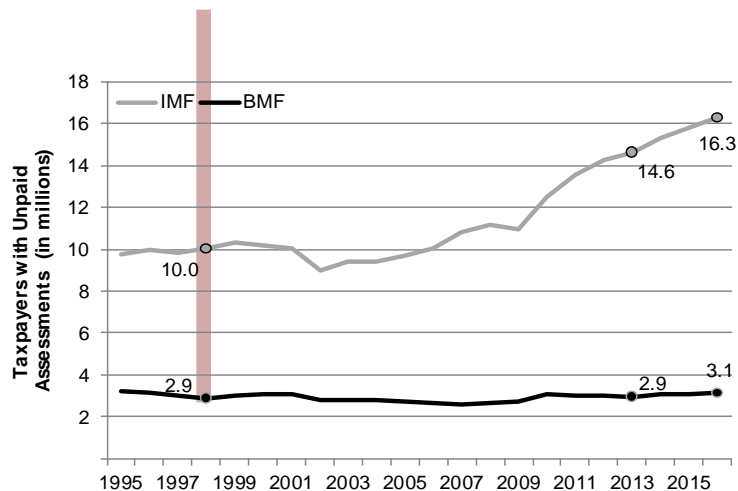
Source: Compliance Data Warehouse, Accounts Receivable Dolar Inventory IMF and BMF Module Tables. Data Extracted May 2016.
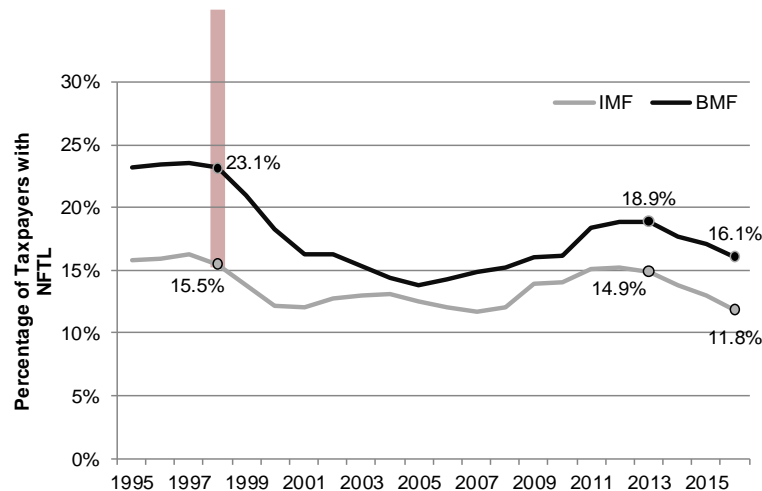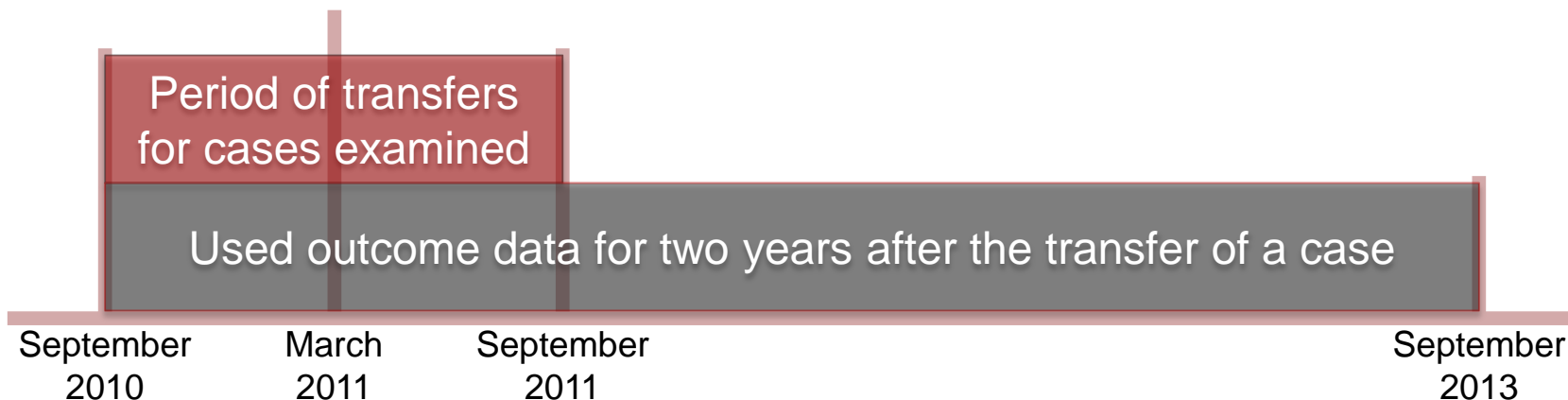
Issues when Evaluating the NFTL

▸ Impact of the NFTL lasts many years
  ▸ In force over the entire collection statute period
  ▸ Policy changes may occur within a year and across years

▸ Observation of direct effects is difficult in many cases
  ▸ Some payments can be associated with a lien – most cannot
    ▸ Difficult to tell why a taxpayer makes a payment
  ▸ Indirect effects are also part of the effect of the NFTL

▸ Liens are not filed randomly – filing determination is made in part by the facts and circumstances of the taxpayer's case
  ▸ Randomization for study can be accomplished via field or natural experiment
  ▸ Econometric Techniques (e.g. Instrumental Variables)

"Fresh Start" Provides a "Natural Experiment"

▸ "Fresh Start" changes (February 2011-March 2011)
  ▸ Threshold for NFTL determinations increased from $5,000 to $10,000
  ▸ Threshold for NFTL filing increased for cases systemically transferred from the IRS's Automated Collection System to the Field Collection Queue

Period of transfers for cases examined

Used outcome data for two years after the transfer of a case

September 2010   March 2011   September 2011   September 2013

▸ Cases transferred six months before and after "Fresh Start" change used as "natural experiment"
  ▸ Compare cohorts of cases with unpaid balances within the policy change parameters
  ▸ Model the likelihood the taxpayer will fully or partially resolve their unpaid balances and the expected change in the unpaid balance

Previous Research

- ▸ Numerous studies of direct impacts of NFTL filing on resolving delinquent balances
  - ▸ Majority of evidence suggests NFTL filing increases number of cases resolving and/or dollars collected or resolved
  - ▸ Econometric Studies:
    - ▸ SB/SE Research – St. Paul (2002), Turk and Ashley (2002), SB/SE Research – St. Paul (2007), SB/SE Research – Denver (2011), Ashley, Beers, and Wilson, (2012)
      - □ SB/SE Research – St. Paul (2002) estimated:
        - □ An additional 100 NFTLs would result in about 11 more taxpayers resolving (fully or partially) their balances
        - □ Just under an additional $3,000 dollars resolved per additional filed NFTL
      - □ TAS (2012)/Ashely *et al* (2012) Provide some contradictory evidence for IMF taxpayers
        - □ NFTL filing decreases likelihood of resolving current liabilities, but also reduces propensity to accrue new liabilities
  - ▸ Experimental Studies
    - ▸ SB/SE Research – St. Paul (2006), SB/SE Research – Denver (2014), OPERA (2013)
    - ▸ OPERA (2013)
      - □ Also uses cases ACS transferred to the queue six months before and after the Fresh Start policy changes
      - □ Policy changes for the field resulted in fewer NFTLs being filed
        - □ These NFTLs were filed on (arguably) the more problematic cases, exacerbating the *endogeneity* problem

Previous Research

▶ **Impact on Payment Compliance Behavior**
  ▸ SB/SE Research (2002) (arguably) captures indirect effects
  ▸ Indirect effect hard to identify: area of opportunity for further research

▶ **Impact on the Taxpayer**
  ▸ OPERA (2014) contracted with Experian
    ▸ Experian Advantage score dropped by less than 5 points on average
      ☐ Larger impact on taxpayers in sub-prime range who have very little access to credit
    ▸ 40% of NFTL filings did not appear on credit report within 90 days
  ▸ TAS (2011)
    ▸ NFTL associated with 5.2% to 7.9% decline in income
      ☐ Unclear if annual or aggregate, likely initial negative impact on income
      ☐ Could be coincidental to filing, not a result of filing

Previous Research

▶ Cost of Filing NFTL

  ▸ Costs not fully quantified, but could be in the "ball park" of $100 per NFTL

  ▸ SB/SE Research estimated benefits per NFTL and NFTL refile

    ▸ 2002 Study (St. Paul) estimates $3,000 per NFTL, (30:1 direct benefit to costs)

    ▸ 2006 Study estimates $40.6M in payments from $2.9M in costs for re-filed NFTL refiles (14:1 direct benefit to costs)

▶ Comparison of NFTL to Other Treatments

  ▸ An NFTL remains in place until the underlying balances are resolved or expired

  ▸ SB/SE Research (2014) examined sending an additional letter to taxpayers warning them of a potential NFTL filing

    ▸ Increased cases resolving their balances by one and three percentages points for IMF and BMF cases respectively

Empirical Modeling of Accounts Receivable Resolution

‣ Resolution model is a function of characteristics of the case and the NFTLs

‣ Resolution is measured at the taxpayer (case) level
  ‣ One NFTL can cover a number of outstanding balances for different tax years
  ‣ Modeling the behavior of the entity more accurately reflects call site and field case handling

‣ Unpaid assessments measured in dollar value and number of taxpayers
  ‣ Resolution defined in two ways:
    ‣ As an ordinal variable representing the change in the entity balance
      ☐ Increase in balance
      ☐ Decrease in balance that is not sufficient to fully resolve all modules
      ☐ Decrease in balance that fully resolves all modules
    ‣ The change in a taxpayer's balance due

Specifications

- We specify models for resolution, r_{it}, and the change in the entity balance due, Δb_{it}

  - $r_{it} = \begin{cases} 0 \ if \ b_{it} \geq b_{it-1} \\ 1 \ if \ b_{it} < b_{it-1}, b_{it} \neq 0 \\ 2 \ if \ b_{it} = 0 \end{cases}$

    - b_{it} the natural log of the entity balance for taxpayer i at time t
    - b_{it-1} the natural log of the entity balance for taxpayer i at time $t-1$

- The change in entity balance due
  - $\Delta b_{it} = b_{it} - b_{it-1}$
  - Modeled as:
    - $\Delta b_{it} = x_{it-1}\beta + \varepsilon_{it}$

- Probability of r_{it} is determined by assignment values for r_{it}
  - $P(r_{it} = 2) = F(x_{it-1}\alpha)$
  - $P(r_{it} = 1) = F(x_{it-1} \alpha + c) - F(x_{it-1} \alpha)$
  - $P(r_{it} = 0) = 1 - F(x_{it-1} \alpha + c)$
    - x_{it-1} is a vector of characteristic for taxpayer i
      - Includes NFTL filing indicator
    - α is a vector of associated parameters
    - c is a threshold value
    - F is the logistic cumulative distribution function

- α and c are unknown but can be estimated using the logistic regression model

Specifications – Estimating Tobit Regressions

▸ The balance at time t cannot be less than zero, resulting in left censoring of the change in balance at b_{it-1}

   ▸ OLS estimates are biased and inconsistent

▸ The parameters β_i reflect the marginal impacts of each variable on the latent variable

   ▸ The marginal impact on the change in natural log of the balance is given by:

$$\frac{\partial \Delta b_{it,}}{\partial x_{ijt-1}} = \beta_j \Phi\left(\frac{X_{it-1}\beta}{\sigma_U}\right)$$

      ▸ x_{ijt-1} is a specific element of the X_{ijt}, $\Phi()$ is the normal distribution function

      ▸ σ_U is the scale parameter

   ▸ We use a similar approach to look at the change in the balance over two years

Data Construction

- IRS Unpaid Assessments Data (Accounts Receivable Dollar Inventory)
  - Cases where ACS requested a transfer to the Queue within six months of Fresh Start changes
  - Cases limited to those without an existing NFTL

- Identified 56,116 IMF taxpayers and 4,488 BMF taxpayers
  - 51% of IMF and 62% of BMF cases had a new NFTL filed at the time of transfer

- Annual change in total balance calculated by comparing subsequent years' balance
  - Omitted new assessments after transfer from previously delinquent returns (Tax Periods prior to 200912)
    - These assessments likely came from noncompliance that existed prior to the transfer
   - Actually an indication of bringing the taxpayer more into compliance

Percentage of Taxpayers with New Assessments After Transfer from Previous Tax Years
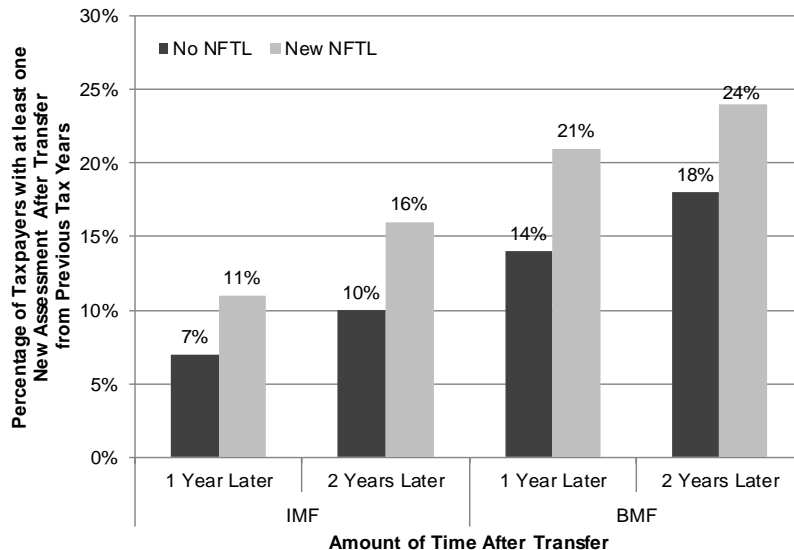
Source: Compliance Data Warehouse, Accounts Receivable Dollar Inventory Individual and Business Module Tables. Data Extracted May 2016.

Payments and Abatements After Transfer

▸ Balance due may be reduced via payments and/or abatements after transfer
  ▸ We treat payments and abatements equally in our analysis as both are important in resolving the outstanding balance

▸ The figures below show the percentage of cases that made a payment or had an abatement within one or two years after transfer
  ▸ Cases receiving a new NFTL had a higher percentage of payments and abatements after transfer
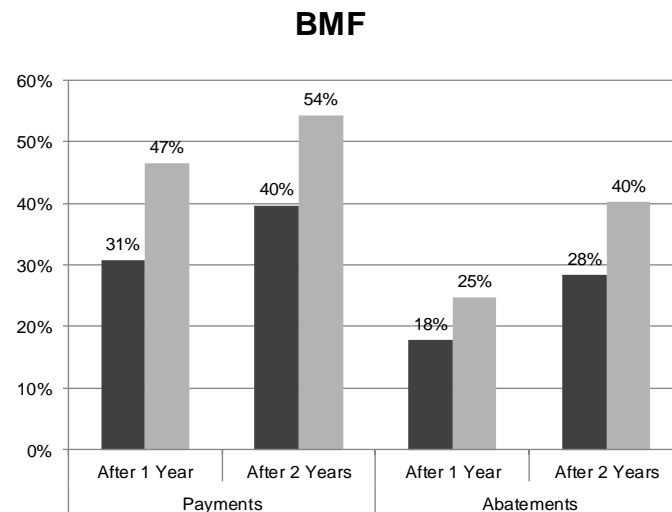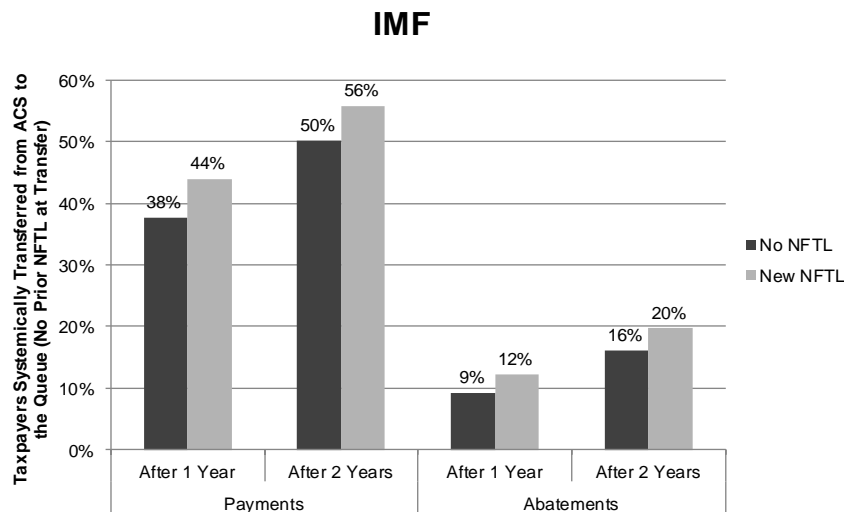
IMF

BMF

Source: Compliance Data Warehouse, Accounts Receivable Dollar Inventory Individual and Business Module Tables. Data Extracted May 2016.

Change in Balance Due

▶ Cases that received an NFTL at transfer had a higher percentage of cases reducing their balance due

   ▸ Resolution defined as reducing balance due, which includes partially or fully resolved cases

	IMF		BMF	
	1 Year	2 Years	1 Year	2 Years
No NFTL	24%	31%	23%	30%
New NFTL	29%	36%	35%	42%
Absolute Difference	5%	5%	12%	12%

Change in Balance Due After ACS Systemic Transfer to the Queue

Legend: ■ Resolved ■ Partially Resolved ▢ Increased

Y-axis: Taxpayers Systemically Transferred from ACS to the Queue (No Prior NFTL at Transfer)

IMF Balance Due — 1 year later: No NFTL (76%, 22%, 3%), New NFTL (71%, 25%, 4%); 2 years later: No NFTL (69%, 25%, 6%), New NFTL (64%, 28%, 8%)

BMF Balance Due — 1 year later: No NFTL (77%, 17%, 6%), New NFTL (65%, 24%, 10%); 2 years later: No NFTL (70%, 19%, 11%), New NFTL (58%, 26%, 16%)

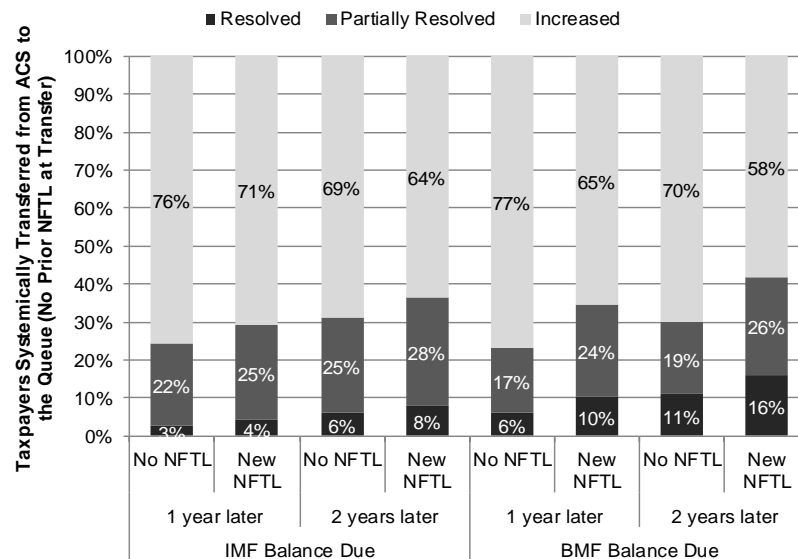Source: Compliance Data Warehouse, Accounts Receivable Dollar Inventory Individual and Business Module Tables. Data Extracted May 2016. Note: Percentages may not add to 100% due to rounding.

NFTL Parameter Estimates & Marginal Effects

- All regression coefficients for the NFTL indicator have a positive and significant impact on reducing balance due
- The likelihood of reducing balance due within one year increases by six and eight percentage points for IMF and BMF respectively
  - Consistent impact across the timeframes

- OLS estimates indicate filing of an NFTL reduces the taxpayer's balance over both time horizons
  - 22% and 33% lower for IMF over one and two years, respectively
  - 38% and 60% lower for BMF over one and two years, respectively

- Tobit regression marginal effects are negative and slightly larger than OLS estimates
  - We estimate the Tobit regressions to allow for the left censoring of the change in balance variable at the initial observed balance

Model	Time Period	Individual Cases (IMF)		Business Cases (BMF)	
		Parameter Estimate	Marginal Effect	Parameter Estimate	Marginal Effect
Logistic Model of Full, Partial, or No Resolution	1 year	0.304	0.056	0.438	0.084
		(0.020)		(0.074)	
	2 Year	0.278	0.059	0.421	0.090
		(0.019)		(0.069)	
OLS Model of the change in the Ln(Balance)	1 year	-0.224		-0.383	
		(0.017)		(0.094)	
	2 Year	-0.331		-0.597	
		(0.023)		(0.113)	
Tobit Model of the change in the Ln(Balance)	1 year	-0.231	-0.231	-0.406	-0.404
		(0.017)		(0.103)	
	2 Year	-0.355	-0.355	-0.672	-0.649
		(0.025)		(0.133)	

Notes: Standard Errors are provided in parentheses. All estimates significant at the 0.01 level.
Marginal effects are calculated as the average marginal effect for the cases in the study

Marginal Impact of an NFTL on Sample Cases

▶ **We calculate the impact if the NFTLs were filed on cases in our sample that were transferred without an NFTL**

▸ Estimates are derived from the Logistic and Tobit model parameters for the models of the resolution outcomes

▸ A two-year period was used to display a more complete picture of the impact of the NFTL on payment compliance behavior

▶ **The calculations reflect the marginal impact of filing an NFTL for each case without an NFTL**

▸ Estimated Impact Compared to SB/SE Research – St. Paul (2002)

▹ Dollar impacts are similar

▹ Increase in the number of taxpayers fully or partially resolving is slightly lower

	Individual Cases (IMF)	Business Cases (BMF)
Increase in Taxpayers Fully Resolving - per 100 NFTL	1.8	4.4
Increase in Taxpayers Partially Resolving - per 100 NFTL	4.1	4.5
Increase in Dollars Resolved per NFTL	$3,379	$4,103

*Source: Logistic and Tobit model estimates for the resolution and the change in the balance two years after the transfer to the Collection Field Queue, applied to the forgone lien cases.

Conclusions

▸ NFTL is an effective tool in resolving unpaid balances

  ▸ Increasing the NFTL filing thresholds has a negative impact on the resolution of unpaid assessments

   ▸ Study is limited to cases that have not been resolved in the IRS call site, and are being transferred to the field queue for potential contact by a Revenue Officer

  ▸ Results are consistent with much of the previous research

▸ NFTL has a persistent effect over time

▸ A reasonable estimate of the NFTL impact can be obtained within a one-year time horizon

Direction for Further Research

▸ Additional research around the impact of the withdrawal provisions is probably warranted

▸ The indirect effect of NFTL filing on Payment Compliance Behavior is an area of opportunity for further research

▸ A larger scale econometric study of all collection treatment options:

  ▸ Allows for exploration of the relative effectiveness of treatment paths
  ▸ Enables estimates of direct and indirect effects of policy

Thank You

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