

**ESTIMATING THE IMPACT
OF LIENS ON TAXPAYER
COMPLIANCE BEHAVIOR:
AN ONGOING RESEARCH INITIATIVE**

Estimating the Impact of Liens on Taxpayer Compliance Behavior: An Ongoing Research Initiative¹

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INTRODUCTION

The National Taxpayer Advocate has requested that Taxpayer Advocate Service (TAS) Research & Analysis investigate the impact of Notices of Federal Tax Lien (NFTL) on the compliance behavior of delinquent taxpayers. The results of this analysis will help the National Taxpayer Advocate and the Internal Revenue Service (IRS) better understand the effectiveness of NFTLs. The purpose of this report is to provide an overview of this ongoing research initiative.

Previous IRS research studies indicate that NFTLs exhibit a positive impact on the collection of tax liabilities from delinquent taxpayers.² However, these studies also raise additional questions. For example, one study actually showed an inverse relationship between the filing of an NFTL and the dollars collected on delinquent liabilities, until instrumental variables were added in an attempt to explain why liens were filed in certain circumstances, but not in others.³ Also, the studies do not thoroughly explore the impact of lien filing on taxpayer compliance in subsequent periods. A study by TAS in last year's Annual Report to Congress found that relatively few subsequent payments were attributable to the NFTL. Therefore, the National Taxpayer Advocate commissioned this study to better understand the relationship between lien filings and subsequent taxpayer payment behavior. This research project will also explore the impact of lien filings on taxpayers' future payment compliance, their future filing compliance, and their ability to earn income.

To accomplish these objectives, TAS Research will analyze a cohort of delinquent individual tax return filers who had new unpaid tax liabilities in tax year (TY) 2002. The study will focus on the payment activities and subsequent compliance behavior of these taxpayers. Particularly, this analysis will compare payment activity and compliance behavior for taxpayers with and without an NFTL. TAS Research will examine payment compliance and the overall compliance behavior of these taxpayers from 2002 through 2009.

TAS Research will employ a two-stage regression analysis. The first stage will determine the likelihood that the IRS will file a lien by examining various case factors and applying the lien filing criteria specified by the Internal Revenue Manual (IRM). This first stage will result in the selection of "matched" pairs of cases with relatively equal chances of having an NFTL filed. Each pair will consist of one case where a lien was filed and another case where a lien was not filed. The matched cases will be very similar, however, with respect to the characteristics the IRS uses to make a lien filing determination.

² IRS Small Business/Self-Employed division (SB/SE) Research – St. Paul, Project 13.14, *Estimating the Impact of Federal Tax Lien Filing on Accounts Receivable Resolution* (Dec. 2002); IRS SB/SE Research – St. Paul, Project STP0001, *Impact of the Federal Tax Lien on Cases Shelved by the Currently Not Collectible Filter* (June 2006); IRS SB/SE Research – St. Paul, Project STP0007, *Optimizing the Revenue Collection Impact of Lien Refiling* (Mar. 2007).

³ An instrumental variable can be used in lieu of an independent variable in a regression model to address bias that arises when the dependent variable (*i.e.*, the variable the model is attempting to estimate) causally influences the independent variable (*i.e.*, this causal relationship means that the independent variable is not truly independent). The instrumental variable must be correlated with the dependent variable in the same way that the independent variable is, but must not be causally influenced by the dependent variable.

We will use the matched pairs in the second stage of the analysis. This will allow us to fairly compare the lien and non-lien groups. During the second stage, we will use regression analysis to determine what factors, including the NFTL itself, significantly impact the outcomes we are investigating (*e.g.*, dollars collected or future filing compliance), and the extent to which they influence these outcomes.

BACKGROUND

A federal tax lien (FTL) arises when the IRS assesses a tax liability and sends the taxpayer notice and demand for payment, and the taxpayer does not fully pay the debt within ten days.⁴ An FTL is effective as of the date of assessment and attaches to all of the taxpayer’s property and rights to property, whether real or personal, including rights or property acquired after that date.⁵ This lien remains in effect against the taxpayer’s property until the liability has been fully paid or becomes legally unenforceable.⁶ To put third parties on notice and establish the priority of the government’s interest in a taxpayer’s property against subsequent purchasers, secured creditors, and junior lien holders, the IRS must file an NFTL in the appropriate location, such as a county register of deeds.⁷

After NFTL filings dropped to an all-time low following the passage of the Restructuring and Reform Act of 1998, the IRS has been increasing the number of filings, with the volume rising precipitously since 2005. In fact, the 2010 volume of lien filings is about six times as large as in 1999. The following chart depicts the trends in lien filings and dollars collected since 1999:

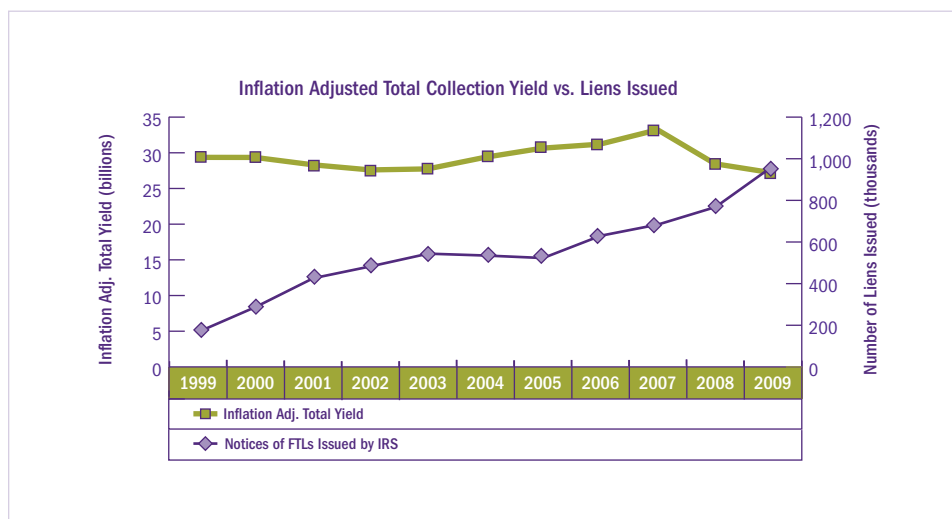
⁴ Internal Revenue Code (IRC) §§ 6321 and 6322. IRC § 6201 authorizes the IRS to assess all taxes owed. IRC § 6303 provides that within 60 days of the assessment the IRS must provide notice and demand for payment to any taxpayer liable for an unpaid tax.

⁵ See IRC § 6321; Internal Revenue Manual (IRM) 5.12.2.2 (May 20, 2005).

⁶ IRC § 6322.

⁷ IRC § 6323(f); Treas. Reg. § 301.6323(f)-1; IRM 5.12.2.8 (Oct. 30, 2009).

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FIGURE 2.5.1, Inflation Adjusted Total Collection Yield vs. Liens Issued⁸

Interestingly, inflation-adjusted collection yield has begun to decline even despite the increase in lien filings. While other economic conditions surely play a part in the total collection yield, the fact that increased lien filings do not necessarily lead to increased collections makes the practice of filing an NFTL questionable in various situations.

A lien filing determination is required for all unpaid assessed delinquencies.⁹ The IRM specifies various criteria for lien filings depending on the nature of the delinquency. The IRS is supposed to file an NFTL even for most cases reported as currently not collectible (CNC), if the unpaid balance is at least \$5,000.¹⁰ Streamlined installment agreements (IAs) do not usually require the filing of an NFTL.

Unfortunately, the IRS systemically files many NFTLs without the benefit of a trained collection employee's personal judgment regarding the facts and circumstances of a particular case. The Automated Collection System (ACS) files over half of NFTLs, and over two-thirds of these liens are filed systemically without any significant IRS employee review of the case.¹¹ The National Taxpayer Advocate does not believe the IRS should be precluded from filing NFTLs, but rather that this powerful collection tool should be used judiciously.

⁸ The total collection yield is any revenue collected attributable to IRS collection activities, such as levies, liens, and seizures. Total collection yield in a fiscal year includes tax, interest, and penalties from multiple tax years.

⁹ IRM 5.12.2.4 (June 11, 2010).

¹⁰ IRM 5.12.4.1 (June 11, 2010).

¹¹ For a detailed discussion of the National Taxpayer Advocate's concerns about IRS lien filing policies, see National Taxpayer Advocate 2009 Annual Report to Congress 4-40 (Most Serious Problem: *One-Size-Fits-All Lien Filing Policies Circumvent the Spirit of the Law, Fail to Promote Future Tax Compliance, and Unnecessarily Harm Taxpayers*); National Taxpayer Advocate 2009 Annual Report to Congress 357-364 (Legislative Recommendation: *Strengthen Taxpayer Protections in the Filing and Reporting of Federal Tax Liens*); National Taxpayer Advocate FY 2011 Objectives Report to Congress 13-17 (Area of Emphasis: *The National Taxpayer Advocate Remains Concerned About IRS Collection Practices that Do Not Promote Future Voluntary Compliance and Can Unnecessarily Harm Taxpayers*); Status Update: *The IRS Has Been Slow to Address the Adverse Impact of Its Lien Filing Policies on Taxpayers and Future Tax Compliance, supra*.

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Moreover, she believes more research is needed to determine the best criteria for filing an NFTL.

OBJECTIVES

We intend to explore the effect of the NFTL on:

- Current payment behavior;
- Future payment behavior;
- Future filing behavior; and
- Future income potential.

We also intend to conduct a sensitivity analysis to better understand when NFTLs are likely to be an effective collection tool. TAS does not envision that NFTLs would never be effective, but they may not work for certain taxpayers or in certain situations, such as when taxpayers have low incomes or their liabilities have been reported as CNC.

METHODOLOGY

TAS Research intends to use a two-stage regression method for our analysis. The first stage, which estimates the probability of a tax lien filing for taxpayers, is also described as generating propensity scores for the taxpayers. We intend to use a logistic regression equation to estimate a propensity score for each taxpayer. The score estimates the likelihood of a tax lien being filed on the taxpayer's liability. This estimation method addresses the selection bias inherent in the tax lien filing process. Selection bias exists because case criteria generally determine which cases will receive an NFTL. We will use propensity scores and a matching algorithm to generate matched pairs of lien taxpayers and non-lien taxpayers, who are very similar with respect to the characteristics the IRS uses to make a lien filing determination. The result will be a sample of taxpayers that approximates a random sample of equivalent pairs of taxpayers for use in the second stage. The two-stage regression model is described in more detail hereafter.

The tax lien model investigates the likelihood that a taxpayer will have a tax lien filed against his or her delinquent tax modules. As mentioned previously, IRS lien filings are not random events. IRM 5.12.2.4 establishes the criteria that determine when they should occur. These criteria introduce selection bias that must be addressed, or the estimation of the tax lien impact in the second stage (using a tax lien indicator) will produce biased results. To overcome this selection bias, we will use a class of probability equations to estimate the dependent variable, *i.e.*, tax lien filing. We intend to use a logistic equation for this purpose.

To overcome the problem of non-randomization in our observational data, we will conduct a matching of taxpayers based on the set of observed covariates (*i.e.*, the taxpayer characteristics used by the IRS in the lien filing determination). When the propensity scores

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(conditionally assigned based on the covariates) are equivalent for lien and non-lien taxpayers, the difference in the lien and non-lien outcome measures is an unbiased estimator of the lien effect.

Stage One of the Regression Analysis

Our first step estimates the propensity score for each taxpayer, *i.e.*, the conditional probability of the taxpayer having a tax lien filed. We use a logistic regression where the dependent variable is a binary variable (one indicates a tax lien has been filed and zero indicates that a lien has not been filed).

The independent variables are the covariates that capture the underlying conditions for tax lien filing. These conditions are identified in the provisions of the IRM section or the systemic behavior of the IRS collection personnel.

Model #1 specifies the relationship for generating the propensity scores:

$$P(Y_L|Y_{L1}=1) = f(X_{AAT}, X_{CR}, X_{CNC}, X_{IA}, X_{IA-Def}, X_{Bank}, X_{Rpr}),$$

$P(Y_L)$ is probability of a tax lien filing, propensity score;

Y_{L1} is an indicator of a tax lien filing;

X_{AAT} is an indicator of aggregate assessed tax greater than \$5,000;

X_{CR} is an indicator of collection at risk;¹²

X_{CNC} is an indicator of taxpayer having CNC modules;

X_I^A is an indicator of taxpayer having an installment agreement;

X_{IA-Def} is an indicator of taxpayer having a defaulted installment agreement;

X_{Bank} is an indicator of taxpayer having a bankruptcy filing; and

X_{Rpr} is an indicator of taxpayer is repeater.

The second step in the propensity score matching technique involves using the estimated propensity scores to create matched pairs of tax lien taxpayers with non-tax lien taxpayers. Several matching methods are available, but we will likely use the nearest available neighbor method. The matched pairs allow the two groups (tax lien taxpayers and non-tax lien taxpayers) to be relatively identical over set covariates (observable characteristics). This condition in the sample allows the estimate of the event effect (*i.e.*, tax lien filing) to be a more unbiased estimator.

In the nearest available neighbor matching method, both lien and non-lien groups are first randomly sorted. Then the first lien unit is selected to find its closest non-lien unit match based on the absolute value of the difference between the propensity score of the selected lien unit and that of the non-lien unit under consideration. The closest non-lien unit is

¹² Sufficient data are not likely available on the Master File to make this determination.

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selected as a match. This procedure is repeated for all the lien units. A possible hazard in the analysis is that we will not have sufficient numbers of cases in the lien and non-lien groups to create a matched sample. However, preliminary results indicate that this will not be a problem. The second stage of the regression analysis estimates the actual effect of the NFTL.

Stage Two of the Regression Analysis

As discussed above, in stage two we will use the dataset that results from the stage one propensity scoring and matching process. This dataset will allow us to make a better estimate of the impact of lien filing on the outcome variables of interest, because the dataset has been adjusted to address the selection bias inherent in the population of taxpayers against whom liens have been filed. Following is an overview of the regression models we will use to estimate each of the outcome variables we are exploring.

Current Tax Payment Behavior

Model #2 investigates the tax lien's impact on the probability of the taxpayer making payments on the TY 2002 liability. The dependent variable is a binary variable, where one indicates that a reduction has occurred in the balance due for this liability. The reductions in the balance due exclude any offsets or abatements. The lien variable is the critical variable in this model. Other independent variables are taxpayer condition variables and IRS status variables. The taxpayer condition variables characterize information about the taxpayer's past payment activities, family status, income conditions, and personal conditions (*e.g.*, health issues or other personal issues that influence the taxpayers financial status) while IRS status variables characterize information about lien filing behavior and audit activity. The model analyzes several forms of the dependent variable, Y_{CP} for payments. The initial dependent variable is change in payments, $\Delta Y_{CP(1-0)}$. Other forms of the dependent variable are the probability of payment, $P(Y_{CP})$, and amount of the payment, Y_{CPI} .

The model #2 specification is:

$$Y_{CP} = f(X_{PTP}, X_{FS}, X_{IC}, X_{PC}, X_P, X_A, X_{Lien}),$$

Dependent Variables:

$\Delta Y_{CP(1-0)}$ is the change in payments for 0th and 1st periods,

$P(Y_{CP})$ is the probability of the taxpayer making a payment,

where $Y_{CP} = 1$; and

Y_{CPI} is the taxpayer payment.

Independent Variables:

Y_{CPI1} is payments in period 1;

Y_{CPI0} is payments in period 0;

X_{PTP} is a vector of past payment variables;

X_{FS} is a vector of family status variables;

X_{IC} is a vector of income condition variables;

X_{PC} is a vector of personal condition variables;

X_F is a vector of IRS filing activity variables;

X_A is a vector of IRS audit activity variables; and

X_{Lien} is an indicator of NFTL.

Timely Future Filing Behavior

Model #3 in the analysis investigates the impact of a lien on the taxpayer's timely filing behavior for future tax obligations. The dependent variable in this relationship is the timely tax filing indicator for future tax returns. This is a binary variable where one signifies that all tax forms for all relevant future years were filed timely and zero signifies that all forms were not filed timely (*i.e.*, at least one return was not timely). The critical variable in this model is the lien indicator variable. Other independent variables are taxpayer condition variables and IRS status variables. The taxpayer condition variables are the type of primary return filer variable, the number of forms variable (not counting schedules), and the indicator of prior timely tax filing behavior. The IRS status variables are a prior IRS audit variable and an IRS audit outcome variable. [These variables are still to be established.]

The model #3 specification is:

$$P(Y_F | Y_{F1}=1) = f(X_T, X_{NF}, X_{PTF}, X_A, X_{AO}, X_{Lien}),$$

Y_F is probability of future timely tax filing;

Y_{F1} is an indicator of timely tax filing for 1st period variable;

X_T is a type of primary tax filer variable;

X_{NF} is a number of tax forms variable, not counting schedules;

X_{PTF} is an indicator of prior period timely tax filing variable;

X_A is an indicator of IRS audit in prior period variable;

X_{AO} is an IRS audit outcome for prior audit variable; and

X_{Lien} is an indicator of NFTL.

Timely Future Payment Behavior

Model #4 in the analysis investigates the impact of the lien on the taxpayer's timely payment behavior for future obligations. The dependent variable in this relationship is the timely tax payment indicator for future returns. This is a binary variable where one signifies that all tax obligations for all relevant future years were paid timely and zero signifies that all obligations were not paid timely (*i.e.*, at least one payment was not timely). The critical variable in this model is the lien indicator variable. Other independent variables are taxpayer condition

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variables and IRS status variables. The taxpayer condition variables are the type of primary return filer variable, the number of forms variable (not counting schedules), and the indicator of prior timely tax paid behavior. The IRS status variables are a prior IRS audit variable and an IRS audit outcome variable. [These variables are still to be established.]

The model #4 specification is:

$$P(Y_p|Y=1) = F(X_T, X_{NF}, X_{PTP}, X_A, X_{AO}, X_{Lien}),$$

Y_p is probability of future timely tax paid;

X_T is a type of primary tax filer variable;

X_{NF} is a number of tax forms variable, not counting schedules;

X_{PTP} is an indicator of prior period timely tax paid variable;

X_A is an indicator of IRS audit in prior period variable;

X_{AO} is an IRS audit outcome for prior audit variable; and

X_{Lien} is an indicator of NFTL.

Future Income Outcome

Model #5 in the analysis investigates the impact of the lien on the taxpayer's future income. The dependent variable in this relationship is the change in future income as measured by a change in gross income. The change in gross income will act as a proxy for a change in economic financial potential, which is a concept that permits economic hardship to be examined indirectly. Economic hardship will impose a negative impact on economic financial potential. Lower economic financial potential implies that less gross income will be generated. The critical variable in this model is the lien indicator variable. Other independent variables are economic condition variables, which are employment condition variables, gross domestic product variables, and the location variable. [These variables are still to be established.]

The model #5 specification is:

$$\Delta Y_{Inc(1-0)} = Y_{Inc 1} - Y_{Inc 0} = f(X_{Emp}, X_{GDP}, X_L, X_{Lien}),$$

$\Delta Y_{Inc(1-0)}$ is the change in income for 0th and 1st periods,

$Y_{Inc 1}$ is income in period 1;

$Y_{Inc 0}$ is income in period 0;

X_{Emp} is a vector of employment type variables;

X_{GDP} is a vector of gross domestic product type variables;

X_L is a vector of location variables; and

X_{Lien} is an indicator of NFTL.

These models will use the cohort data on the delinquent taxpayers. Estimation of these models will also include procedures to account for the time series cross section nature of the data.

CONCLUSION

This research project will attempt to quantify the value of a lien in collecting payment delinquencies. TAS Research will also examine the lien's effect on future filing and payment compliance and its effect on the taxpayer's ability to earn future income. We anticipate completing our research by the end of fiscal year 2011.

The lien's effect will be measured under various circumstances (*e.g.*, is its value different for CNC liabilities or for taxpayers with different levels of income) to determine how the impact of lien filing changes with changing circumstances and to help identify when lien filing is most effective. This information will enable the National Taxpayer Advocate to better advocate for modifications in IRS lien filing policies so the IRS will not unnecessarily harm taxpayers or impact their future compliance with the tax laws.

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