

## **DO FIRMS ENGAGE IN AGGRESSIVE TAX REPORTING PRIOR TO BANKRUPTCY?**

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### **ABSTRACT**

*Our study examines the tax reporting behaviors of firms just before they file for bankruptcy (“pre-bankruptcy firms”). Specifically, we investigate whether pre-bankruptcy firms engage in more aggressive tax reporting, in comparison to non-bankruptcy firms. We also investigate whether the relationship between aggressive financial reporting and aggressive tax reporting is different across pre-bankruptcy and non-bankruptcy firms. Our findings suggest that pre-bankruptcy firms engage in more aggressive tax reporting, vis-à-vis non-bankruptcy firms. Additionally, we find that the positive relation between aggressive book reporting and aggressive tax reporting is stronger among pre-bankruptcy firms, vis-à-vis firms that are not approaching bankruptcy. Thus, our findings not only further our understanding of the motivations behind these significant reporting decisions, but also help us understand how a growing proportion of corporate managers respond to increasing pressures to perform in a depressed economy.*

**JEL:** M400, M410, M480

**KEYWORDS:** Tax Reporting, Bankruptcy, Aggressive Reporting

### **INTRODUCTION**

**T**his study examines the aggressive financial reporting and aggressive tax reporting of firms just before they file for bankruptcy (“pre-bankruptcy firms”). We conduct this study for two reasons. First, we have seen significant corporate bankruptcy filings over the past ten years. The number of business filings during this time period ranges from 19,695 filings in 2006 to 60,837 filings in 2009 as reported by the American Bankruptcy Institute ([www.abi.org](http://www.abi.org)). Interestingly, some of the firms that filed for corporate bankruptcy during this time once held assets with significant values. The business world witnessed the largest bankruptcy filing in 2008 from Lehman Brothers Holding Inc., which had \$691 billion pre-petition assets ([BankruptcyData.com](http://BankruptcyData.com)). As such, it is important to better understand how managers of such firms make economic decisions; such decisions impact firm valuation and therefore have implications for investors and law enforcers. As discussed wherein, academic studies have largely focused on the financial reporting behavior of pre-bankruptcy firms (i.e. Rosner 2003 and Jaggi and Lee 2002); to the best of our knowledge, this is the first study to examine tax reporting behaviors of this growing sector of our economy.

Second, previous research finds a positive relationship between financial reporting aggressiveness and tax reporting aggressiveness (e.g. Frank *et al.* 2009). In other words, past research shows that firms which engage in aggressive financial reporting, characterized by the legal and illegal upwards reporting of Generally Accepted Accounting Principles (GAAP) income, simultaneously engage in aggressive tax reporting, characterized by the downward reporting of taxable income. This finding has garnered much attention from academics, policy-makers and practitioners, as it contracts the notion that aggressive reporting of one form of income must be done at the expense of the other form of income (e.g., in a

conforming manner). While managers generally have incentives to report higher book income (to generate higher returns) and, at the same time, report lower taxable income (to save cash), large divergences between book income and taxable income can be a “red flag” to both the Securities and Exchange Commission (SEC) and the Internal Revenue Service (IRS). In some instances, we observe firms increasing book income and overpaying on their taxes. Erickson *et al.* (2004) finds this situation with firms that fraudulently overstate their earnings. As discussed within, the unique incentives of firms approaching bankruptcy allow us to gain a deeper understanding into this intersection of aggressive financial and tax reporting.

Our findings suggest that pre-bankruptcy firms engage in more aggressive tax reporting, vis-à-vis firms that are not approaching bankruptcy. Additionally, we find a more pronounced positive relation between aggressive book reporting and aggressive tax reporting among pre-bankruptcy firms, vis-à-vis firms that are not approaching bankruptcy. Thus, our findings not only further our understanding of the motivations behind these significant economic trade-offs, but also help us understand how a growing proportion of corporate managers respond to increasing pressures to perform in a depressed economy.

The remainder of the paper is organized as follows. The next section provides a literature review on pre-bankruptcy firms and the financial and tax reporting aggressiveness research. Then, we discuss our research questions and research design. The following section provides details on the sample selection process and the summary statistics. We provide a discussion of the multivariate results in the subsequent section. The sensitivity results are included after the multivariate discussion. The final section of the paper provides our conclusion.

## LITERATURE REVIEW

### Pre-Bankruptcy Firms

Due to the large number of corporate bankruptcies over the past decade, several papers look at the relationship between earnings quality and bankruptcy. Garcia Lara *et al.* (2009) look at a sample of UK bankruptcy firms and find that the bankruptcy firms performed upward earnings management in the four years before the bankruptcy. Rosner (2003) investigates bankruptcy firms and finds that they are the most likely to have succeeded in reporting overstated earnings in their audited financial statements. In Saleh and Ahmed (2005), their analysis finds significantly negative discretionary accruals during debt renegotiation periods for firms that violated debt covenants as compared to a control set. The decision to use income-increasing or income-decreasing discretionary accruals are analyzed in Jaggi and Lee (2002) by investigating financially distressed firms with debt covenant violations and/or debt restructurings. This analysis finds that financially distressed companies who can obtain a waiver for their debt covenant violations use income-increasing accruals, whereas financially distressed companies who restructure the debt or renegotiate the debt use income-decreasing accruals. Taken together, these papers identify positive relationships between aggressive financial reporting and pre-bankruptcy related decisions.

This study extends the current literature on pre-bankruptcy firms and their reporting behaviors by examining whether aggressive tax reporting exists in pre-bankruptcy firms. Noga and Schnader (2013) analyze the ability of using tax reporting behaviors in the prediction of bankruptcies. Our study extends this analysis by looking at the bankruptcy firms’ tax reporting aggressiveness in comparison to non-bankruptcy firms in the period before the bankruptcy date. In addition, our investigation determines whether or not the aggressive tax reporting decisions exist at the expense of aggressive financial reporting. As outlined below, our findings suggest that pre-bankruptcy firms do engage in aggressive tax reporting, and that they are able to do so while also engaging in aggressive financial reporting.

The Interaction of Financial and Tax Reporting Aggressiveness

The reporting systems in the U.S. require public companies to prepare two distinct income measures, one for financial reporting (book) purposes to be submitted to the SEC following the rules and regulations outlined in U.S. GAAP and the other for tax reporting to be submitted to the IRS following rules and regulation outlined in the Internal Revenue Code. Under certain circumstances, public Companies may file financial statements with the SEC following the rules and regulations outlined in the International Financial Accounting Standards. While the objective of financial reporting is to provide relevant and reliable information for investors to assess a public company's financial performance, the purpose of tax accounting serves the government's objective of revenue collection and incentivizing firm's behaviors. Managers generally have incentives to report high book income and, at the same time, low taxable income. The literature has documented a positive gap between financial and taxable income reaching to the level of \$436 billion (e.g. Boynton *et al.* 2005).

Following Frank *et al.* (2009), we define the theoretical construct of financial reporting aggressiveness as upward earnings management that may or may not be within the confines of GAAP, and tax reporting aggressiveness as downward manipulation of taxable income through tax planning. Researchers have suggested that book-tax differences can indicate the managerial discretions allowed under GAAP to manage book earnings upward (i.e. Phillips *et al.* 2003), reflecting financial reporting aggressiveness. One assumption under this stream of literature is that, as Hanlon (2005) argued, the discretions allowed under financial reporting provide opportunities for earnings management while taxable income must "clearly reflect income" (Internal Revenue Code Section 446b).

An emerging stream of literature suggests book tax differences do not solely reflect aggressive financial reporting, but alternatively or additionally that firms also use aggressive tax planning (Heltzer 2009 and Wilson 2009). Alternatively, some studies find that firms using aggressive financial reporting are not using aggressive tax reporting. For instance, a few studies find firms who committed fraud or had restatements revising their earnings downwards were less likely to take an aggressive tax strategy (Lennox *et al.* 2013 and Badertscher 2009, respectively). Numerous studies also look at aggressive tax reporting in relation to other firm characteristics such as family firms and equity incentives. Chen *et al.* (2010) finds that family firms are less likely to exhibit tax aggressive reporting than non-family firms and Rego and Wilson (2012) find that equity incentives are a factor of aggressive tax strategies. Overall, these studies have furthered our understanding of the likelihood of tax reporting aggressiveness.

When considering tax and financial reporting aggressiveness together, one methodological challenge of separating the effect of tax planning from earnings management is that prior research focuses on the role of deferred tax expenses, or "temporary" book-tax differences to measure aggressive financial reporting and earnings management. The limit of using temporary book-tax differences, as Hanlon (2005) notes, is that it is difficult to "separate the (temporary book-tax) differences caused by aggressive tax planning from those motivated by aggressive earnings recognition".

To enable empirical researchers to separately measure aggressive tax and financial reporting, Frank *et al.* (2009) developed their tax aggressiveness measure (*DTAX*), which is based on "permanent" book-tax differences. We define the empirical proxies in the research design section of the paper. Using their *DTAX* measure, Frank *et al.* find that firms' tax aggressiveness is increasing with financial reporting aggressiveness and vice versa. In this study, we use their *DTAX* measure as the main variable of interest to investigate pre-bankruptcy firms' tax aggressiveness.

## RESEARCH QUESTIONS AND RESEARCH DESIGN

### Aggressive Tax Reporting

We begin our research by examining whether firms approaching bankruptcy engage in aggressive tax reporting. On one hand, managers of pre-bankruptcy firms face heightened pressure to generate cash flow, and thereby reduce taxable income, in order to stay afloat. Additionally, it may be the aggressive nature of managers' which put them in a pre-bankruptcy position. However, pre-bankruptcy firms have a greater occurrence of net operating losses (NOLs), vis-à-vis non-bankruptcy firms. Therefore, the reduced benefit of aggressive tax reporting among pre-bankruptcy firms may eliminate the need to engage in aggressive tax reporting. As such, our first research question is:

RQ1: Do pre-bankruptcy firms engage in more aggressive tax reporting, vis-à-vis non-bankruptcy firms?

In order to test RQ1, we use the empirical measure of tax aggressiveness (*DTAX*) in Frank *et al.* (2009). This measure is based on calculating the company's permanent book-tax difference from the following model:

$$PERMDIFF_{it} = \alpha_0 + \alpha_1 INTANG_{it} + \alpha_2 UNCON_{it} + \alpha_3 MI_{it} + \alpha_4 CSTE_{it} + \alpha_5 \Delta NOL_{it} + \alpha_6 LAGPERM_{it} + \varepsilon_{it} \quad (1)$$

In the equation, *PERMDIFF* represents total book-tax differences (less temporary book-tax differences), *INTANG* represents goodwill and other intangibles, *UNCON* represents income (loss) reported under the equity method, *MI* is the income (loss) attributable to minority interest, *CSTE* is the current state income tax expense,  $\Delta NOL$  is the change in net operating loss carryforwards, and *LAGPERM* is the one year lagged *PERMDIFF*. The *DTAX* measure is calculated as the residual from model (1), thereby capturing the "abnormal" permanent difference across the relevant industry/year. Following Frank *et al.*, a firm observation will remain in the analysis if there are more than 15 observations per firm year and industry.

After calculating *DTAX*, we use the following multivariate regression to analyze the tax reporting aggressiveness of pre-bankruptcy firms:

$$DTAX_{it} = \alpha_0 + \alpha_1 BANKRUPTCY\_D_{it} + \alpha_2 PTROA_{it} + \alpha_3 NOL\_D_{it} + \alpha_4 FOR\_D_{it} + \alpha_5 LEV_{it} + \alpha_6 MTB_{it} + \alpha_7 AF\_D_{it} + \alpha_8 NUM\_ANALYST_{it} + \alpha_9 EMI_{it} + \alpha_{10} EM2_{it} + \alpha_{11} EM3_{it} + \alpha_{12} APTCFO_{it} + \alpha_{13} SIZE_{it} + \varepsilon_{it} \quad (2)$$

As stated previously, *DTAX* is the residual calculated from model (1). *BANKRUPTCY\_D* is an indicator variable taking the value of one (zero) if it is an ex post bankrupt (non-bankrupt) firm. The remaining variables in model (2) are control variables established by prior literature. Table 2 provides definitions of these independent variables. In evaluating aggressive tax reporting, our analysis focuses on  $\alpha_1$  to determine if the pre-bankruptcy firms are more aggressive with their tax reporting. A positive (negative)  $\alpha_1$  coefficient suggest that pre-bankruptcy firms are more (less) aggressive in their tax reporting, relative to non-bankruptcy firms.

To further evaluate the company's tax reporting aggressiveness, we run additional models to validate the tax reporting aggressiveness of pre-bankruptcy firms. Previous research has identified advantages and disadvantages of tax avoidance measures (Hanlon and Heitzman 2010). The following model uses two of these measures, the "Cash Effective Tax Rate" (*CASH\_ETR<sub>it</sub>*) and the "Book Effective Tax Rate" (*BOOK\_ETR<sub>it</sub>*), as the dependent variables:

$$ETR_{it} = \alpha_0 + \alpha_1 BANKRUPTCY\_D_{it} + \alpha_2 SIZE_{it} + \alpha_3 MVE_{it} + \alpha_4 BM_t + \alpha_5 EP_{it} + \alpha_6 ROA_{it} + \quad (3)$$

$$\alpha_7LEV_{it} + \alpha_8R\&D_{it} + \alpha_9ADV_{it} + \alpha_{10}FOR\_D_{it} + \alpha_{11}CAP_{it} + \alpha_{12}INV_{it} + \varepsilon_{it},$$

In regards to Equation (3), a negative (positive)  $\alpha_l$  will suggest that pre-bankruptcy firms are more (less) aggressive in their tax reporting, vis-à-vis non-bankruptcy firms. We provide definitions for the *ETR* and control variables from Model 3 in Table 2.

### Relationship between Aggressive Tax Reporting and Financial Reporting

Second, we examine the relationship between aggressive financial reporting and tax reporting across pre-bankruptcy firms and firms which are not approaching bankruptcy. Managers have conflicting incentives in the period leading up to a bankruptcy event. On one hand, management of pre-bankruptcy firms strive to increase book income and simultaneously reduce taxable income to create a better financial outlook, as a company's financial strength directly impacts its ability to raise capital. Such aggressive reporting may reflect the aggressive behavior of a management team heading towards bankruptcy. On the other hand, increasing book income and simultaneously lowering tax income could lead to increased regulatory scrutiny due to a large gap between the book and taxable income. The IRS has previously noted the growing gap between book and taxable income and has identified issues with the tax system and the use of abusive tax shelters (Summers 2000). Graham *et al.* (2014) finds that 69% of managers surveyed view reputational concerns as a factor in why their company does not adopt possible tax planning strategies. Further, decreased taxable income and increased NOLs among pre-bankruptcy firms may lead managers of such firms to engage in aggressive financial reporting at the expense of taxable income, as pre-bankruptcy firms will pay, on average, fewer tax dollars. These competing incentives for pre-bankruptcy firms lead to our second research question:

RQ2: Is the relationship between aggressive financial reporting and aggressive tax reporting different among pre-bankruptcy firms, vis-à-vis non-bankruptcy firms?

We test RQ2 by investigating the association between the firm's tax reporting and financial reporting aggressiveness per Frank *et al.* (2009):

$$DTAX_{it} = \alpha_0 + \alpha_1DFIN_{it} + \alpha_2BANKRUPTCY\_D_{it} + \alpha_3DFIN_{it}*BANKRUPTCY\_D_{it} + \alpha_4PTROA_{it} + \alpha_5NOL\_D_{it} + \alpha_6FOR\_D_{it} + \alpha_7LEV_{it} + \alpha_8MTB_{it} + \alpha_9AF\_D_{it} + \alpha_{10}NUM\_ANALYST_{it} + \alpha_{11}EMI_{it} + \alpha_{12}EM2_{it} + \alpha_{13}EM3_{it} + \alpha_{14}APTFCFO_{it} + \alpha_{15}SIZE_{it} + \varepsilon_{it}, \quad (4)$$

$$DFIN_{it} = \alpha_0 + \alpha_1DTAX_{it} + \alpha_2BANKRUPTCY\_D_{it} + \alpha_3DTAX_{it}*BANKRUPTCY\_D_{it} + \alpha_4PTROA_{it} + \alpha_5NOL\_D_{it} + \alpha_6FOR\_D_{it} + \alpha_7LEV_{it} + \alpha_8MTB_{it} + \alpha_9AF\_D_{it} + \alpha_{10}NUM\_ANALYST_{it} + \alpha_{11}EMI_{it} + \alpha_{12}EM2_{it} + \alpha_{13}EM3_{it} + \alpha_{14}APTFCFO_{it} + \alpha_{15}SIZE_{it} + \varepsilon_{it}, \quad (5)$$

The coefficient of interest in the above two models is  $\alpha_3$ . This coefficient captures the additional reporting aggressiveness of bankruptcy firms above the reporting aggressiveness of non-bankruptcy firms. The additional variables in Models 4 and 5 control for tax planning and earnings management incentives as noted in Frank *et al.* (2009). We provide definitions of *DTAX<sub>it</sub>* and the control variables in Table 2. In Table 3, we define the variable *BANKRUPTCY\_D<sub>it</sub>*, and Table 4 defines the *DFIN<sub>it</sub>* and interaction variables.

## SAMPLE SELECTION AND SUMMARY STATISTICS

### Sample Selection

Our sample of pre-bankruptcy firms was obtained through bankruptcydata.com and COMPUSTAT. We first obtained 3,372 pre-bankruptcy firms during the period 1978 to 2012 from bankruptcydata.com, a database which lists companies experiencing bankruptcy proceedings. This database provides company names and bankruptcy dates. We then used the DLRSN code in COMPUSTAT to compare our pre-bankruptcy sample obtained through bankruptcydata.com to firms identified as a bankruptcy in COMPUSTAT. We searched each company manually in Compustat with the code lookup function in this database to improve our ability to keep as many bankruptcy firms in the sample as possible. We further searched COMPUSTAT to identify additional bankruptcy firms with the variable DLRSN (delisting code) of 02. We found 487 additional firms identified as bankruptcy firms on COMPUSTAT that were not on the bankruptcydata.com database.

Some firms from our bankruptcydata.com data set had other delisting codes identified in COMPUSTAT. For instance, 173 of our pre-bankruptcy firms were listed with delisting code of 01 (Acquisition or Merger) in COMPUSTAT. Bankruptcydata.com identified these firms as a bankruptcy, so we keep all of these firms with various delisting codes in our pre-bankruptcy data set. The bankruptcydata.com database identified all of these firms as a specific type of bankruptcy (i.e. chapter 7, 11, etc.) 272 of our observations from the bankruptcydata.com database did not have a delisting code from COMPUSTAT. This shows that using both the COMPUSTAT and bankruptcydata.com resources aids in obtaining a larger sample of pre-bankruptcy firms.

We lost 1,415 pre-bankruptcy observations due to data limitations in calculating necessary variables and through eliminating firms in the finance and utilities industries. Due to using discretionary accruals in our aggressive financial reporting measure, we eliminate firms in the finance, insurance and real estate industries (SIC 6000-6999) and in the electric gas and sanitary services industries (SIC 4900-4999). This left us with 1,957 pre-bankruptcy observations in the *ETR* Sample Set. We lost an additional 1,636 observations with missing *DTAX* variable data leaving us with 321 observations in our pre-bankruptcy *DTAX* Sample Set. We outline pre-bankruptcy sample selection process in Table 1, Panel A.

To perform our analysis, we compare our pre-bankruptcy sample set on an annual basis to all other COMPUSTAT observations during our time period which are not included in our pre-bankruptcy dataset. In Table 1, Panel B and C, we provide more details on the non-bankruptcy sample selection process. The total sample size for our analysis is 169,545 yearly observations. The sample observations have an equal representation across the sample years included in our analysis. We find that our sample contains about 2-4% of the sample each year. In the non-bankruptcy sample, the lowest number of observations occurs in 1978 (0.4%) and the highest percentage occurs in 2000 (3.9%). In the pre-bankruptcy sample, the lowest number of observations occurs in 1978 (0.1%) and the highest percentage occurs in 2000 (9.2%). We obtained each observation's data in relation to the last year they filed prior to the bankruptcy. We obtained the pre-bankruptcy data from Compustat. In order to preserve the size of the pre-bankruptcy sample observations, we pull the most recent data prior to the bankruptcy filing date. About 24% of our sample has data in Compustat immediately preceding the bankruptcy year. About 37% of the sample has data from the previous year. We eliminated any observations that have the last filing data older than 7 years from our analysis. In our robustness tests, we also drop a firm if it does not have any financial data in the three years preceding the bankruptcy filing. The results are highly similar.

Summary Statistics

We provide descriptive statistics on the dependent and independent variables used in our analysis in Table 2. Table 2 Panel A provides details on the dependent variables. As expected, DTAX is close to zero across both samples, as it is the residual from Equation (1). It is worth noting that both *CASH\_ETR* and *BOOK\_ETR* are significantly lower in the Pre-Bankruptcy samples (relative to the Non-Bankruptcy samples). This suggests that Pre-Bankruptcy firms may engage in more aggressive tax reporting, vis-à-vis Non-Bankruptcy firms. Due to potential correlated omitted variables, all of these proxies are analyzed further using multivariate analysis. In Panel B and C of Table 2, we analyze the explanatory and control variables across pre-bankruptcy and non-bankruptcy firms. This provides information on the type of firms that fall into each category.

Table 1: Sample Details

<b>Panel A: Pre-Bankruptcy Sample Selection</b>	
<b>Description</b>	<b>Number of Observations</b>
BankruptcyData.com listed firm bankruptcies	3,372
Firms that are not listed in Compustat	(1,042)
Subtotal	2,330
Firms that do not have Compustat data within five years prior to	(171)
Firms in Compustat with DLRSN of 02 and not in bankruptcydata.com list	487
Eliminate firms in finance and utilities industries	(279)
Subtotal	2,367
Eliminate observations missing ETR variables	(410)
Pre-bankruptcy ETR Sample Set	1,957
Eliminate observations missing DTAX variables	(1,636)
Pre-bankruptcy DTAX Sample Set	321
<b>Panel B: Non-Bankruptcy Sample 1 (Dependent Variable = DTAX)</b>	
<b>Description</b>	<b>Number of Observations</b>
COMPUSTAT observations from 1978-2012	358,354
Eliminate observations missing total asset data	(46,819)
Eliminate observations with total assets less than zero	(787)
Eliminate firms in finance and utilities industries	(65,215)
Subtotal	221,373
Eliminate observations missing DTAX regression and control variables	(153,494)
Subtotal	67,879
Eliminate observations missing lag asset data	(10,580)
Eliminate observations missing common equity data	(7)
Eliminate observations with common equity data less than zero	(511)
Subtotal	53,803
Eliminate observations with less than 15 observations in Industry	(4,565)
Subtotal	49,238
Pre-bankruptcy Observations	(321)
Non-bankruptcy Observations	48,917
<b>Panel C: Non-Bankruptcy Sample 2 (Dependent Variable = ETR)</b>	
<b>Description</b>	<b>Number of Observations</b>
COMPUSTAT observations from 1978-2012	358,354
Eliminate observations missing total asset data	(46,819)
Eliminate observations with total assets less than zero	(787)
Eliminate firms in finance and utilities industries	(65,215)
Subtotal	221,373
Eliminate observations missing ETR control variables	(49,871)
Subtotal	171,502
Pre-bankruptcy Observations	(1,957)
Non-bankruptcy Observations	169,545

Table 2: Descriptive Statistics

<b>Panel A: Dependent Variables</b>									
<i>Non-bankruptcy</i>									
<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Med.</i>	<i>T-Stat</i>	<i>P-Value</i>			
<i>DTAX</i>	48,917	0.002	0.140	0.004	2.89	0.004			
<i>CASH_ETR</i>	102,986	0.187	0.228	0.110	263.52	<.0001			
<i>BOOK_ETR</i>	169,424	0.232	0.229	0.244	416.85	<.0001			
<i>DFIN</i>	45,142	0.004	0.119	-0.000	6.60	<.0001			
<i>Pre-bankruptcy</i>									
<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Med.</i>	<i>T-Stat</i>	<i>P-Value</i>			
<i>DTAX</i>	321	-0.015	0.213	0.000	-1.23	0.221			
<i>CASH_ETR</i>	1,264	0.064	0.187	0.000	12.22	<.0001			
<i>BOOK_ETR</i>	1,955	0.093	0.202	0.000	20.29	<.0001			
<i>DFIN</i>	311	0.040	0.197	0.032	3.57	0.0004			
<i>Differences</i>									
<i>Variable</i>	<i>Mean Diff.</i>	<i>T-Stat</i>	<i>P-Value</i>						
<i>DTAX</i>	0.016	2.08	0.04						
<i>CASH_ETR</i>	0.123	19.10	<.0001						
<i>BOOK_ETR</i>	0.139	26.73	<.0001						
<i>DFIN</i>	-0.036	-5.30	<.0001						
<b>Panel B: Explanatory and Control Variables for Sample 1 (DTAX Sample).</b>									
<i>Variable</i>	<i>Non-bankruptcy (N=48,917)</i>			<i>Pre-bankruptcy (N=321)</i>			<i>Differences</i>		
	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>Mean Diff.</i>	<i>T-Stat</i>	<i>P-Value</i>
<i>SIZE</i>	5.36	2.20	5.29	4.57	1.66	4.61	0.79	6.43	<.0001
<i>PTROA</i>	0.05	0.21	0.07	-0.15	0.29	-0.10	0.19	15.96	<.0001
<i>NOL_D</i>	0.52	0.50	1.00	0.73	0.44	1.00	-0.22	-7.76	<.0001
<i>FOR_D</i>	0.35	0.48	0.00	0.19	0.39	0.00	0.16	5.93	<.0001
<i>LEV</i>	0.22	0.22	0.17	0.35	0.28	0.32	-0.13	-10.58	<.0001
<i>MTB</i>	2.88	3.26	1.95	2.12	3.47	1.10	0.76	4.18	<.0001
<i>ΔPTCFO</i>	0.01	0.12	0.01	-0.04	0.17	-0.02	0.05	7.69	<.0001
<i>AF_D</i>	0.43	0.50	0.00	0.38	0.49	0.00	0.05	1.75	0.0807
<i>NUMEST</i>	0.02	0.04	0.00	0.01	0.03	0.00	0.01	2.29	0.0219
<i>EM1</i>	0.03	0.18	0.00	0.02	0.12	0.00	0.02	1.73	0.0830
<i>EM2</i>	0.11	0.31	0.00	0.01	0.11	0.00	0.10	5.57	<.0001
<i>EM3</i>	0.01	0.07	0.00	0.00	0.00	0.00	0.00	1.25	0.2113
<b>Panel C: Explanatory and Control Variables for Sample 2 (ETR Sample)</b>									
<i>Variable</i>	<i>Non-bankruptcy (N=169,545)</i>			<i>Pre-bankruptcy (N=1,957)</i>			<i>Differences</i>		
	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Median</i>	<i>Mean Diff.</i>	<i>T-Stat</i>	<i>P-Value</i>
<i>SIZE</i>	4.51	2.49	4.45	4.01	2.08	3.94	0.51	8.98	<.0001
<i>MVE</i>	1,345	4,702	80	123	1,072	11	1,222	11.49	<.0001
<i>BM</i>	0.59	1.07	0.49	-0.62	3.01	0.17	1.21	47.69	<.0001
<i>EP</i>	-0.10	0.60	0.05	-1.52	1.74	-0.71	1.43	101.21	<.0001
<i>ROA</i>	-0.14	0.88	0.05	-0.39	0.91	-0.15	0.25	12.45	<.0001
<i>LEV</i>	0.32	0.55	0.20	0.51	0.64	0.37	-0.19	-15.30	<.0001
<i>INT</i>	0.11	0.21	0.01	0.12	0.24	0.00	-0.01	-1.77	0.0761
<i>R&amp;D</i>	0.07	0.16	0.00	0.06	0.18	0.00	0.00	1.13	0.2564
<i>ADV</i>	0.01	0.04	0.00	0.02	0.05	0.00	-0.01	-5.08	<.0001
<i>FOR_D</i>	0.22	0.41	0.00	0.14	0.35	0.00	0.08	7.96	<.0001
<i>CAP</i>	0.36	0.36	0.26	0.32	0.34	0.22	0.04	5.46	<.0001
<i>INV</i>	0.16	0.18	0.09	0.16	0.20	0.08	-0.01	-1.13	0.2569



Table 2: Descriptive Statistics (Continued)

Panel D: Explanation of Variables Used in Analysis	
Variable	Definition
<i>DTAX</i>	Residuals from the following model, estimated by industry and year: $PERMDIFF_{it} = \alpha_0 + \alpha_1 INTANG_{it} + \alpha_2 UNCON_{it} + \alpha_3 MI_{it} + \alpha_4 CSTE_{it} + \alpha_5 \Delta NOL_{it} + \alpha_6 LAGPERM_{it} + \varepsilon_{it}$ INTANG represents goodwill and other intangibles, UNCON represents income (loss) reported under the equity method, MI is the income (loss) attributable to minority interest, CSTE is the current state income tax expense, $\Delta NOL$ is the change in net operating loss carryforwards, and LAGPERM is the one year lagged PERMDIFF.
<i>CASH_ETR</i>	Measures the amount of cash taxes paid per dollar of pre-tax earnings, calculated as total income taxes paid (TXPD) divided by (book income (BI) minus special items (SPI)).
<i>BOOK_ETR</i>	Measures the amount of tax expense per dollar of pre-tax earnings, calculated as total income taxes (TX) divided by (book income (BI) minus special items (SPI)).
<i>SIZE</i>	Natural logarithm of total assets (AT) at year <i>t</i> .
<i>PTROA</i>	Pretax book income (BI) at year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>NOL_D</i>	Dummy variable set to 1 if the firm has net operating loss carryforwards (NOL) in year <i>t</i> , and 0 otherwise.
<i>FOR_D</i>	Dummy variable set to 1 if the absolute value of foreign pretax income (PIFO) is greater than 0 at year <i>t</i> , and 0 otherwise.
<i>LEV</i>	Total of long-term debt (DLTT) and debt in current liabilities (DLC) in year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>MTB</i>	Market value (MVE defined below) at year <i>t-1</i> , divided by book value of common equity (CEQ) at year <i>t-1</i> .
<i>ΔPTCFO</i>	Change in pre-tax cash flow (PTCFO) from operations from year <i>t-1</i> to <i>t</i> , scaled by total assets at year <i>t-1</i> .
<i>AF_D</i>	Dummy variable set to 1 if at least one financial analyst is covering the firm on IBES in year <i>t</i> , and 0 otherwise.
<i>NUMEST</i>	Number of analysts covering the firm as reported by IBES in year <i>t</i> , scaled by total assets at year <i>t-1</i> .
<i>EMI</i>	Dummy variable set to 1 if net income (NI) in year <i>t</i> divided by market value of common equity (MVE defined below) at year <i>t-1</i> is greater than 0 and less than or equal to 0.01, and 0 otherwise.
<i>EM2</i>	Dummy variable set to 1 if the change in net income from year <i>t-1</i> to year <i>t</i> , divided by the market value of common equity at year <i>t-2</i> is greater than 0 and less than or equal to 0.01, and 0 otherwise.
<i>EM3</i>	Dummy variable set to 1 if firm's actual earnings per share (basic excluding extraordinary items) less the median analyst forecast for fiscal year <i>t</i> is greater than 0 and less than or equal to 0.01, and 0 otherwise.
<i>MVE</i>	Market value of equity, calculated as annual fiscal closing price (PRCC_F) times the common shares outstanding (CSHO) at year <i>t</i> .
<i>BM</i>	Book to market ratio, calculated as common ordinary equity total (CEQ) divided by MVE at year <i>t</i> .
<i>EP</i>	Earnings-to-price ratio, calculated as (book income (BI) minus special items (SPI)) divided by MVE at year <i>t</i> .
<i>ROA</i>	Return on assets, calculated as (book income (BI) minus special items (SPI)) at year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>INT</i>	Intangible assets (INTANG) at year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>R&amp;D</i>	Research and development expenses (XRD) at year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>ADV</i>	Advertising expense (XAD) at year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>CAP</i>	Capital intensity (PPENT) at year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>INV</i>	Inventory intensity (INV) at year <i>t</i> , scaled by total assets (AT) at year <i>t-1</i> .
<i>BANKRUPTCY_D</i>	Dummy variable set to 1 if the firm experienced a bankruptcy; otherwise, the value is set to 0.
<i>DFIN</i>	Calculated as the residuals from the model: $TACC_{it} = \alpha_0 + \alpha_1 (\Delta REV_{it} - \Delta AR_{it}) + \alpha_2 PPE_{it} + \varepsilon_{it}$
<i>DTAX*</i>	Interaction term of the DTAX and bankruptcy dummy variables.
<i>BANKRUPTCY_D</i>	
<i>DFIN*</i>	Interaction term of the DFIN and bankruptcy dummy variables.
<i>BANKRUPTCY_D</i>	

We see from Panel B that the pre-bankruptcy firms are significantly smaller (*SIZE*), are significantly more leveraged (*LEV*), and have a significantly lower pretax book income (*PTROA*) than the non-bankruptcy firms. We also observe that NOLs are more prevalent in pre-bankruptcy firms: 52% of non-bankruptcy firms have NOLs while 73% of pre-bankruptcy firms have NOLs. It is possible that the increase presence of NOLs will take away the incentive of pre-bankruptcy firms to engage in aggressive tax reporting. In Panel C of Table 2, we see again that the pre-bankruptcy firms are smaller (*SIZE*) and more leveraged (*LEV*) than the non-bankruptcy firms. The pre-bankruptcy firms also have a significantly lower return on asset (ROA) and earnings-to-price (EP) ratio than the non-bankruptcy firms. Panel D of Table 2 provides a detailed explanation of the variables used in the analysis.

RESULTS

Tax Reporting Aggressiveness

We begin our multivariate analysis by examining RQ1 to determine the tax reporting aggressiveness of the pre-bankruptcy firms, vis-à-vis non-bankruptcy firms. We first test RQ1 by using *DTAX* as the dependent variable. Results may be found in Panel A of Table 3. Consistent with Frank *et al.* (2009), we

Table 3: Multivariate Analysis of the Tax Reporting Aggressiveness Variables

Panel A: <i>DTAX</i>		
Independent Variable	Estimate	t Value
<i>INTERCEPT</i>	-0.0076219	-3.97***
<i>BANKRUPTCY_D</i>	0.0128885	1.69*
<i>PTROA</i>	0.1916509	56.38***
<i>NOL_D</i>	0.0236407	17.28***
<i>FOR_D</i>	-0.0034833	-2.43**
<i>LEV</i>	0.0142202	5.00***
<i>MTB</i>	0.0004098	2.15**
<i>AF_D</i>	-0.0037227	-2.51**
<i>NUM_ANALYST</i>	-0.0762192	-4.71***
<i>EM1</i>	0.0151577	4.41***
<i>EM2</i>	-0.0075685	-3.78***
<i>EM3</i>	0.0132198	1.49
<i>ΔPTCFO</i>	0.0542173	10.52***
<i>SIZE</i>	-0.0022382	-6.57***
R <sup>2</sup>	0.077	
N	49,238	

  

Panel B: <i>BOOK_ETR</i>				
Independent Variable	Dependent Variable: <i>BOOK_ETR</i>		Dependent Variable: <i>CASH_ETR</i>	
	Estimate	t Value	Estimate	t Value
<i>INTERCEPT</i>	0.1026752	93.57***	0.0724850	45.68***
<i>BANKRUPTCY_D</i>	-0.1270567	-25.69***	-0.1116006	-17.85***
<i>SIZE</i>	0.0298916	129.24***	0.0225374	72.15***
<i>MVE</i>	-0.0000012	-25.52***	-0.0000007	-13.46***
<i>BM</i>	-0.0000014	-2.88***	-0.0000008	-1.48
<i>EP</i>	0.0000057	2.91***	0.0000031	1.50
<i>ROA</i>	0.0000302	2.35**	0.0000244	1.34
<i>LEV</i>	-0.0000290	-1.67*	-0.0000235	-0.96
<i>R&amp;D</i>	-0.0000036	-0.13	0.0000105	0.33
<i>ADV</i>	0.0000172	0.08	-0.0000557	-0.12
<i>FOR_D</i>	-0.0173774	-12.81***	0.0127317	8.00***
<i>CAP</i>	-0.0000063	-1.39	-0.0000038	-0.76
<i>INV</i>	0.0001079	1.80*	0.0000837	1.00
R <sup>2</sup>	0.100		0.064	
N	171,259		104,187	

Panel A provides results from estimating the following regression:  $DTAX_{it} = \alpha_0 + \alpha_1 BANKRUPTCY\_D_{it} + \alpha_2 PTROA_{it} + \alpha_3 NOL\_D_{it} + \alpha_4 FOR\_D_{it} + \alpha_5 LEV_{it} + \alpha_6 MTB_{it} + \alpha_7 AF\_D_{it} + \alpha_8 NUM\_ANALYST_{it} + \alpha_9 EM1_{it} + \alpha_{10} EM2_{it} + \alpha_{11} EM3_{it} + \alpha_{12} \Delta PTCFO_{it} + \alpha_{13} SIZE_{it} + \epsilon_{it}$ , (2) The data period is from 1988-2012. \*, \*\*, and \*\*\* denotes significance at the 10%, 5% and 1% levels, respectively.

Panel B provides results from estimating the following regression:  $ETR_{it} = \alpha_0 + \alpha_1 BANKRUPTCY\_D_{it} + \alpha_2 SIZE_{it} + \alpha_3 MVE_{it} + \alpha_4 BM_{it} + \alpha_5 EP_{it} + \alpha_6 ROA_{it} + \alpha_7 LEV_{it} + \alpha_8 R\&D_{it} + \alpha_9 ADV_{it} + \alpha_{10} FOR\_D_{it} + \alpha_{11} CAP_{it} + \alpha_{12} INV_{it} + \epsilon_{it}$ , (3). The data period is from 1988-2012. \*, \*\*, and \*\*\* denotes significance at the 10%, 5% and 1% levels, respectively.

find that *PTROA*, *NOL\_D*, *LEV*, *EM1* and *ΔPTCFO* are positive and significantly associated with the *DTAX* variable. We also find (along with previous research) that analyst following variables (*AF\_D* and

*NUM\_ANALYST*) are significant and negatively associated with *DTAX*. Regarding our research question, we find that *BANKRUPTCY\_D* is positive and significantly associated with the tax aggressiveness measure *DTAX* at the 90% level. This suggests that pre-bankruptcy firms do indeed engage in more aggressive tax reporting, relative to non-bankruptcy firms. We augment our analysis by using alternative aggressive tax reporting measures: *BOOK\_ETR* and *CASH\_ETR*. Results are found in Panel B of Table 3. We find that *BANKRUPTCY\_D* is significantly negative at the 99% level across both ETR measures, supporting our finding that pre-bankruptcy firms do indeed engage in more aggressive tax reporting, relative to non-bankruptcy firms. In sum, across all measures of aggressive tax reporting, we find that pre-bankruptcy firms are more aggressive with their tax reporting than non-bankruptcy firms.

#### Relationship between Tax and Financial Reporting Aggressiveness

We investigate RQ2 by examining whether the relationship between financial and tax reporting aggressiveness is more pronounced in firms approaching bankruptcy, vis-à-vis firms not approaching bankruptcy. Results may be found in Table 4.

Control variables are significant and in the expected direction, based upon previous research. Specifically, as outlined in Panel A, we find that *DFIN*, *PTROA*, *NOL\_D*, *LEV*, *EMI* and *ΔPTCFO* are positive and significantly associated with the *DTAX* variable. Previous research has found analyst following to be significantly and negatively associated with *DTAX*. In our analysis, we find that one of the analyst following variables (*AF\_D*) is significant and negatively associated with *DTAX*. In Panel B, we also find similar results to prior research. *DTAX*, *PTROA*, *NOL\_D*, *LEV* and *MTB* have all been found to be positively and significantly associated with *DFIN* and we find the same results. We also find that *AF\_D*, *NUM\_ANALYST*, *ΔPTCFO* and *SIZE* are significant and negatively associated with *DFIN* as previous research has found.

In regards to RQ2, we find the interaction term of *DFIN* \* *BANKRUPTCY\_D* is positively and significantly associated with *DTAX* the dependent variable at the 99% level in Panel A. This suggests that pre-bankruptcy firms are concurrently performing aggressive tax and financial reporting. Panel B also supports this analysis by showing the alternative multivariate regression using *DFIN* as the dependent variable. In Panel B, we see a significant and positive relationship between the *DTAX* \* *BANKRUPTCY\_D* interaction term and the *DFIN* dependent variable at the 99% level.

#### **SENSITIVITY TEST RESULTS**

We perform several robustness tests (un-tabulated). First, we follow the procedure in Frank *et al.* (2009) by estimating *DTAX* in Equation (1) without lagged permanent differences (*LAGPERM*) and then test whether our results are sensitive to this alteration. Similar to that reported in Frank *et al.*, the revised *DTAX* measure continues to be positively and significantly related with *DFIN*. Further, the coefficients on *DTAX\*BANKRUPTCY\_D* and *DFIN\*BANKRUPTCY\_D* remain positive and significant, suggesting that removing the control for yearly effects does not change the main inference on the relationship between tax and financial reporting aggressiveness.

Second, we include the changes in tax cushion (*D\_Cushion*) measure by Blouin and Tuna (2007) in our multivariate analysis. When computing the tax cushion measure, we follow the practice in Frank *et al.* by excluding the tax benefit from stock options to preserve sample size and have a meaningful cross-section and time series multivariate regression analysis. We continue to find positive and significant coefficients on *DTAX\*Bankruptcy\_D* and *DFIN\*Bankruptcy\_D* after including *D\_Cushion* and *D\_Cushion\*Bankruptcy\_D* as additional control variables.

TABLE 4: Multivariate Analysis of the Financial Reporting Aggressiveness Variables

<b>Panel A: DTAX</b>		
<b>Independent Variable</b>	<b>Estimate</b>	<b>t Value</b>
INTERCEPT	-0.0128798	-6.41***
DFIN	0.1523573	26.49***
BANKRUPTCY_D	-0.0018276	-0.24
DFIN * BANKRUPTCY_D	0.1838718	4.74***
PTROA	0.1645000	45.16***
NOL_D	0.0197498	14.00***
FOR_D	-0.0016815	-1.15
LEV	0.0121430	4.13***
MTB	0.0001920	0.99
AF_D	-0.0050209	-3.07***
NUM_ANALYST	0.0000833	0.69
EM1	0.0174713	5.00***
EM2	-0.0064181	-3.13***
EM3	0.0129804	1.46
DPTCFO	0.1127293	19.86***
SIZE	-0.0012331	-3.40***
R <sup>2</sup>	0.096	
N	45,453	
<b>Panel B: DFIN</b>		
<b>Independent Variable</b>	<b>Estimate</b>	<b>t Value</b>
INTERCEPT	0.0144682	8.84***
DTAX	0.1008261	26.42***
BANKRUPTCY_D	0.0397753	6.40***
DTAX * BANKRUPTCY_D	0.1511811	5.32***
PTROA	0.1657976	56.57***
NOL_D	0.0244716	21.36***
FOR_D	-0.0061321	-5.13***
LEV	0.0240928	10.07***
MTB	0.0009094	5.73***
AF_D	-0.0080008	-6.01***
NUM_ANALYST	-0.0003259	-3.32***
EM1	-0.0139714	-4.91***
EM2	-0.0031122	-1.87*
EM3	-0.0055938	-0.77
ΔPTCFO	-0.3748528	-87.21***
SIZE	-0.0048953	-16.63***
R <sup>2</sup>	0.185	
N	45,453	

Panel A, Table 4, provides results from estimating the following regression:  $DTAX_{it} = \alpha_0 + \alpha_1 DFIN_{it} + \alpha_2 BANKRUPTCY\_D_{it} + \alpha_3 DFIN_{it} * BANKRUPTCY\_D_{it} + \alpha_4 PTROA_{it} + \alpha_5 NOL\_D_{it} + \alpha_6 FOR\_D_{it} + \alpha_7 LEV_{it} + \alpha_8 MTB_{it} + \alpha_9 AF\_D_{it} + \alpha_{10} NUM\_ANALYST_{it} + \alpha_{11} EM1_{it} + \alpha_{12} EM2_{it} + \alpha_{13} EM3_{it} + \alpha_{14} \Delta PTCFO_{it} + \alpha_{15} SIZE_{it} + \varepsilon_{it}$ , (4). The data period is from 1988-2012. \*, \*\*, and \*\*\* denotes significance at the 10%, 5% and 1% levels, respectively.

Panel B, Table 4, provides results from estimating the following regression:  $DFIN_{it} = \alpha_0 + \alpha_1 DTAX_{it} + \alpha_2 BANKRUPTCY\_D_{it} + \alpha_3 DTAX_{it} * BANKRUPTCY\_D_{it} + \alpha_4 PTROA_{it} + \alpha_5 NOL\_D_{it} + \alpha_6 FOR\_D_{it} + \alpha_7 LEV_{it} + \alpha_8 MTB_{it} + \alpha_9 AF\_D_{it} + \alpha_{10} NUM\_ANALYST_{it} + \alpha_{11} EM1_{it} + \alpha_{12} EM2_{it} + \alpha_{13} EM3_{it} + \alpha_{14} \Delta PTCFO_{it} + \alpha_{15} SIZE_{it} + \varepsilon_{it}$ , (5). The data period is from 1988-2012. \*, \*\*, and \*\*\* denotes significance at the 10%, 5% and 1% levels, respectively.

## CONCLUSION

Our study adds to two branches of the academic literature: pre-bankruptcy analysis and the intersection between aggressive financial reporting and aggressive tax reporting. Recent studies have investigated the relationship between financial reporting aggressiveness and pre-bankruptcy firms, but to the best of our knowledge, there has not been an examination of the tax reporting aggressiveness of pre-bankruptcy firms. Our findings suggest that pre-bankruptcy firms exhibit greater tax reporting aggressiveness than non-bankruptcy firms. As such, we shed light on the manager's decision-making process of pre-bankruptcy firms, a growing proportion of our economy. This finding may be used to caution analysts and regulators about the precision of taxable income determination in the years preceding bankruptcy filings.

We additionally find that the positive relation between financial reporting aggressiveness and tax reporting aggressiveness, as previously documented in Frank *et al.*, is stronger among pre-bankruptcy firms, vis-à-vis firms which are not approaching bankruptcy. As such, we provide greater motivation behind the economic trade-offs managers face to report high book income, and, at the same time, low book income. While increased book income and taxable income can be a “red flag” to investigators, managers facing increased pressures to survive will exhibit more aggressive reporting of both GAAP and IRC income.

It should be noted that our study is only as strong as the proxies used for aggressive reporting. While past research has vetted the proxies used herein, this does remain an inherent limitation of our findings. Further, future research may advance our study by examining specific causes of our findings. For example, it may be interesting to examine whether the increased aggressive tax reporting among pre-bankruptcy firms is more strongly aligned with the aggressive nature of managers of pre-bankruptcy firms, vis-à-vis non-bankruptcy firms, or the need to increase cash flow. How, if at all, does the proximity to fundraising impact the tax aggressive reporting of pre-bankruptcy firms? We leave it to future research to propel this discussion forward.

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