

# Aggregate Deferred Tax Asset Valuation Allowance and GDP Growth

by

Shiran Vaknin Froymovich

Business Administration  
Duke University

Date: \_\_\_\_\_

Approved:

\_\_\_\_\_  
Scott Dyreng, Co-Supervisor

\_\_\_\_\_  
William Mayew, Co-Supervisor

\_\_\_\_\_  
Suresh Nallareddy

\_\_\_\_\_  
John Graham

Dissertation submitted in partial fulfillment of the requirements for the degree of  
Doctor of Philosophy in Business Administration  
in the Graduate School of Duke University

2022

ABSTRACT

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## **Abstract**

This paper examines whether deferred tax asset valuation allowance growth, as a measure of expected future performance aggregated at the macroeconomy level, conveys information about future GDP growth. Using hand-collected tax footnote data from publicly traded firms over the 1993 to 2019 period, I find that quarterly aggregate valuation allowance growth is negatively associated with future GDP growth up to four quarters ahead. This relationship is incremental to existing accounting and macroeconomic GDP growth indicators, especially for forecast horizons longer than one quarter when other indicators are uninformative. Additionally, the findings suggest that aggregate valuation allowance growth provides unique information that cannot be obtained from other sources of management information, such as management forecasts, the allowance for doubtful accounts, banks' loan loss provision, and goodwill impairment loss. The findings further indicate that the documented association of GDP growth and aggregate valuation allowance growth is driven by the corporate profit growth component of GDP growth. Collectively, the evidence indicates that aggregate valuation allowance growth provides incremental forward-looking information about GDP growth.

## **Dedication**

I dedicate this work to my family, especially my parents and my husband.

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Special thanks to Jana Ready, Jeri Seidman, and Douglas Shackelford for sharing the valuation allowance data that I used to pilot test my study.

# 1. Introduction

Gross Domestic Product (GDP) is one of the most comprehensive and closely watched economic statistics. GDP is used by investors on Wall Street as an indicator of economic activity, by the business community to make production, investment, and employment decisions, by the Federal Reserve to formulate monetary policy, and by the White House and Congress to prepare the federal budget (Bureau of Economic Analysis, 2015). Recent research suggests that earnings information provides incremental information about future GDP growth (e.g., Konchitchki and Patatoukas, 2014a, 2014b; Nallareddy and Ogneva, 2017), potentially helping to produce more accurate GDP estimates, improve the effectiveness of policy and economic decisions, and enhance social welfare. This paper investigates whether deferred tax asset valuation allowance growth, aggregated at the macro-level, conveys information about future GDP growth.<sup>1</sup>

Deferred tax asset valuation allowance potentially provides a unique opportunity to identify a required disclosure of managers' forward-looking information about firms' long-term future performance through audited financial statements. The valuation allowance indicates the amount of deferred tax asset that is more likely than not (i.e., 50% probability or greater) to remain unrealized due to insufficient taxable income in the future. The estimation process of the valuation allowance requires

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<sup>1</sup> Deferred tax asset valuation allowance growth is defined as the change in deferred tax asset valuation allowance.

managers to evaluate the firm's current financial position and to use their private information to project future taxable income. Under Accounting Standards Codification (ASC) Topic 740 (formerly SFAS No. 109), a firm is required to consider future taxable income when estimating the realizability of the firm's deferred tax assets (FASB, 2009), thus, potentially providing information about the firm's expectations of long-term future taxable income.<sup>2</sup>

Despite the potential of the valuation allowance to indicate firms' future performance, whether the valuation allowance provides useful incremental information about GDP growth is unclear for two reasons. First, prior literature finds mixed evidence on the information content of the valuation allowance at the firm level. While several studies suggest that the valuation allowance signals expectations about the firm's future performance (e.g., Dhaliwal et al., 2013; Finley and Ribal, 2019), other studies suggest that the valuation allowance does not signal expectations about future performance, due to earnings management considerations (e.g., Schrand and Wong, 2003; Frank and Rego, 2006) or auditors' litigation risk considerations (DeFond and Zhang, 2014; Drake, Goldman, and Lusch, 2016; Axelton, Gramlich, and Harris, 2019). If the valuation allowance does not provide credible information about future performance at the firm-level, it may not convey information about future performance at the macro-level.

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<sup>2</sup> Other factors could also affect the realizability of the firm's deferred tax assets. For example, if a firm has undergone an ownership change, Section 382 limitation requires a firm to limit the amount of its income in future years that can be offset by historic losses and thus affect the firm's valuation allowance.

Second, aggregate valuation allowance may not convey incremental information because other leading GDP growth indicators might subsume the information embedded in the valuation allowance. For example, prior accounting research suggests that aggregate earnings growth, aggregate special items growth, and earnings dispersion, convey important information about future economic growth (e.g., Konchitchki and Patatoukas, 2014a, 2014b; Nallareddy and Ogneva, 2017, Hann, Li, and Ogneva, 2021; Abdalla and Carabias, 2021). Additionally, prior literature in macroeconomics has identified several indicators of future economic growth, such as the Chicago Fed National Index (CFNAI), which is a weighted average of 85 indicators of economic activity, and inflation (e.g., Stock and Watson, 1999). Furthermore, the Survey of Professional Forecasters (SPF) provides quarterly GDP growth forecasts that predict future GDP growth.

To examine the informativeness of the valuation allowance at the macro-level, I compute quarterly aggregate valuation allowance growth, based on hand-collected tax footnote data from large publicly traded firms in the U.S. over the 1993 to 2019 period. I investigate whether aggregate valuation allowance growth is incrementally associated with future GDP growth by regressing future GDP growth on aggregate valuation allowance growth and other leading accounting and macroeconomic-based GDP growth indicators.

The results provide evidence that the valuation allowance contains incremental forward-looking information about future GDP growth, especially for forecast horizons longer than one quarter when other indicators are uninformative. First, aggregate valuation allowance growth is negatively associated with GDP growth up to four quarters ahead, suggesting that as the valuation allowance decreases, future economic activity increases. Second, for two to four quarters ahead, aggregate valuation allowance provides information incremental to other established accounting and macroeconomic growth indicators, such as aggregate earnings growth and CFNAI. However, for the one quarter ahead forecast horizon, CFNAI subsumes the information embedded in the valuation allowance and other accounting growth indicators. Third, aggregate valuation allowance growth is the only significant predictor of GDP growth for the four quarters ahead forecast horizon.

In terms of economic significance, a one standard deviation change in aggregate valuation allowance growth is associated with a 14 percent change in GDP growth, for the four quarters ahead forecast horizon. For comparison, a one standard deviation change in CFNAI is associated with a 40, 25, and 17 percent change in GDP growth, for the one, two, and three quarters ahead forecast horizon, respectively. Also, the incremental R-squared of aggregate valuation allowance growth for the four quarters ahead forecast horizon is four percent, accounting for almost one-third of the total R-

squared for this forecast horizon. Overall, these findings suggest that aggregate valuation allowance growth provides important information about future GDP growth.

To better understand these findings, I conduct four additional analyses. First, I examine whether the valuation allowance provides unique information that cannot be obtained from other sources of management's private information both inside and outside the accounting system. First, management forecasts provide information about firms' future performance that might capture the information embedded in the valuation allowance (e.g., Bonsall, Bozanic, and Fischer, 2013; Nagar, Schoenfeld, and Wellman, 2019). Second, to the extent that an expanding (declining) economy increases (decreases) customers' ability to pay (e.g., Khan and Ozel, 2016), the allowance for doubtful accounts might provide forward-looking information about the macroeconomy. Third, banks' credit loss estimates convey information about the ability of borrowers to pay their loans (e.g., Beatty and Liao, 2011; Harris, Khan, and Nissim, 2018) and might provide information about the macroeconomy (e.g., Khan and Ozel, 2016). Fourth, prior literature suggests that goodwill impairment might reflect adverse private information about the firm's future (e.g., Li, Shroff, and Venkataraman, 2011). Therefore, I investigate whether aggregate valuation allowance growth provides incremental information beyond management forecast growth, the allowance for doubtful accounts growth, banks' loan loss provision growth, and goodwill impairment growth. My findings indicate that the valuation allowance provides forward-looking

information about future GDP growth that is not embedded in other sources of management's private information that contain forward-looking information.

Second, I examine whether professional macro forecasters incorporate the valuation allowance information into their GDP growth forecasts. Prior literature finds that professional macro forecasters do not integrate earnings information into their GDP growth forecasts (e.g., Konchitchki and Patatoukas, 2014a, 2014b). While professional macro forecasters might not explicitly include the valuation allowance information in their GDP growth forecasts, they might indirectly include similar underlying information by using other private information, such as the Bureau of Economic Analysis (BEA) survey of financial services. Therefore, I investigate whether aggregate valuation allowance growth is an incremental predictor beyond professional macroeconomic forecasters' predictions of future GDP growth. My findings indicate that professional forecasters do not fully incorporate the valuation allowance information into their long-term GDP growth forecasts.

Third, I examine whether there is a difference between the information content of the valuation allowance increases and decreases (e.g., Kumar and Visvanathan, 2003). Auditors' litigation risk considerations can lead to a backward-looking perspective in valuation allowance increases relative to decreases (e.g., Drake, Goldman, and Lusch, 2016), and earnings management considerations can lead to a bias in either the valuation allowance decreases or increases (e.g., Frank and Rego, 2006). Separating aggregate



valuation allowance into increases and decreases does not yield meaningful insights. Increases and decreases are not statistically different from one another and are rarely statistically different from zero individually, likely as a result of low statistical power.<sup>3</sup>

Finally, I examine whether the valuation allowance provides information about the portion of GDP growth that pertains to corporate profits. Conceptually, the valuation allowance reflects management expectations of future taxable income, and thus, should provide information about the corporate profit growth component of GDP growth. I decompose GDP growth to its corporate profit growth component and non-corporate profit growth component and investigate the association of aggregate valuation allowance growth with both GDP components. I also present the descriptive statistics for corporate profit growth and non-corporate profit growth, as this study is the first to decompose GDP growth to its corporate and non-corporate profit growth components, to my knowledge. I find that aggregate valuation allowance growth is consistently negatively associated with corporate profit growth, up to four quarters ahead. However, aggregate valuation allowance growth is only weakly and inconsistently associated with non-corporate profit growth. Overall, these findings are consistent with the documented association between GDP growth and aggregate

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<sup>3</sup> The sample consists of 56 decreases, 48 increases, and 2 no-change, out of 106 total valuation allowance observations for the one quarter ahead forecast horizon. With only slightly over 100 total observations, further decomposition of the sample is not possible nor am I able to reliably estimate out-of-sample tests.

valuation allowance growth being driven by the corporate profit growth component of GDP growth.

This paper makes three contributions to the literature. First, this paper contributes to the growing macro-accounting literature. Macro-level analysis is very important for policymakers and various users of financial statements, yet the link between accounting data and the macroeconomy remains relatively unexplored. Prior accounting literature provides substantial evidence on the informational role of accounting data at the firm-level (e.g., Kothari, 2001), but this evidence might not be applicable at the aggregate-level (e.g., Kothari et al., 2006). Moreover, while previous studies in this literature (e.g., Shivakumar, 2007; Konchitchki and Patatoukas, 2014a, 2014b; Gallo et al., 2016; Shivakumar and Urcan, 2017; Nallareddy and Ogneva, 2017) primarily focus on the macroeconomic information in accounting earnings, this study examines the macroeconomic information in the valuation allowance, which represents a special tax expense account, and documents that the valuation allowance also contains incremental information about future macroeconomic performance.

Second, this paper contributes to the financial accounting literature that examines the information content of the income tax footnote. Prior studies find mixed evidence on the information content of the valuation allowance at the firm-level (e.g., Amir et al., 1997; Ayers, 1998; Amir and Sougiannis, 1999; Schrand and Wong, 2003; Frank and Rego, 2006; Christensen et al., 2008; Finley and Ribal, 2019). This study

examines the information content of the valuation allowance from a different angle, and documents that the valuation allowance contains information at the macro-level.

Finally, this paper contributes to the debate over whether financial statement users benefit from managerial judgment. ASC 740 requires management to use its judgment when determining whether to record a valuation allowance on a deferred tax asset. While previous studies suggest that management takes advantage of this considerable judgment and uses the valuation allowance to manage earnings (e.g., Burgstahler et al., 2002; Schrand and Wong, 2003; Frank and Rego, 2006), this study suggests that managements' disclosures might also convey valuable information, in aggregate.

The remainder of the paper is organized as follows. Section 2 provides the institutional background, reviews the related literature, and presents the main empirical prediction. Section 3 discusses the sample construction, provides the timeline of the research design, and presents descriptive statistics. Section 4 presents the empirical research design and results, and Section 5 concludes.

## ***2. Background, Related Literature, and Hypothesis Development***

### ***2.1 Background***

Given that my empirical analysis focuses on the association between GDP growth and valuation allowance growth, I first describe how each of these constructs is derived.

#### **2.1.1 Deferred Tax Asset Valuation Allowance**

The differences between the reporting objectives of US GAAP and the Internal Revenue Code (IRC) lead to differences between the amount of income reported on financial statements and the amount reported on tax returns. While permanent book-tax differences do not generate deferred tax assets or liabilities, and their effect on accounting earnings is fully reflected when initially recognized, temporary book-tax differences generate deferred tax assets or liabilities, and their effect on accounting earnings is reflected when the difference reverses.

ASC 740 (formerly SFAS No. 109) requires recognition of deferred tax assets and liabilities to reflect the temporary differences between book income and taxable income (FASB, 2009). Deferred tax assets represent the amount of taxes refundable in future years and tend to be generated by book-tax timing differences on net operating losses (NOLs), employment and post-employment benefits, tax credits, and other

carryforwards. For example, when a firm incurs a loss, the loss can be carried forward and offset profits of subsequent years, thus, reducing future tax liability.

Firms are required to establish and maintain a valuation allowance to the extent that it is more likely than not (i.e., more than 50%) that some or all the expected future tax benefits recognized as deferred tax assets will not be realized. Managerial estimations of the valuation allowance are supposed to be based on historical information supplemented by currently available information about future years. ASC 740-10-30-18 explicitly lists four sources that should be considered when evaluating the probability of future realization of deferred tax assets: (1) future reversals of existing taxable temporary differences, (2) future taxable income, (3) taxable income in prior carryback years, and (4) tax-planning strategies.

To release a previously established valuation allowance, there must be new evidence that changes the firm's expectations about the future realizability of deferred tax assets. ASC 740-10-25-14 and ASC 740-10-35-2 state that subsequent recognition and measurement of a tax position should "be based on management's best judgment given the facts, circumstances, and information available at the reporting date" and that subsequent changes in management's judgment should "result from the evaluation of new information and not from a new evaluation or new interpretation by management of information that was available in a previous financial reporting period".

However, other factors could also affect the realizability of the firm's deferred tax assets. For example, if a firm has undergone an ownership change, Section 382 limitations require a firm to limit the amount of its income in future years that can be offset by historic losses and therefore affect the firm's valuation allowance. Also, if there is a change in the corporate tax rate, such as the Tax Cut and Job Act (TCJA), a firm's deferred tax assets and liabilities mechanically change and in turn impact the valuation allowance estimate.

There is anecdotal evidence that supports a link between the valuation allowance and a firm's future performance. General Motors (GM) announced on November 6, 2007, after the closing of the stock market, that it had established a \$39 billion valuation allowance against its deferred tax assets in the United States, Canada, and Germany.<sup>1</sup> As a result of this announcement, GM shares dropped 3% in after-hours trading. Approximately a year and a half later GM filed for Chapter 11 bankruptcy protection. Appendix B provides additional information on this change and illustrates the different possible sources of information that GM considered, as disclosed on the tax footnotes of the firm's financial statements.

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<sup>1</sup> Refer to Forbes for additional information: [http://www.forbes.com/2007/11/06/gm-gmac-charge-markets-equity-cx\\_ra\\_1106markets43.html](http://www.forbes.com/2007/11/06/gm-gmac-charge-markets-equity-cx_ra_1106markets43.html)

### **2.1.2 GDP Measurement**

GDP is a comprehensive measure of the goods and services produced in the U.S. economy and its growth. To estimate GDP, the BEA uses various sources of information, such as the Census Bureau, the Bureau of Labor Statistics, and the Treasury (Bureau of Economic Analysis, 2015). Although the BEA has access to government and private data, there is still a substantial amount of information that is missing in real-time. The unavailable information about several GDP components is imputed using Census Bureau surveys and trend estimates that extrapolate information from prior years (e.g., Landefeld, Seskin, and Fraumeni, 2008). For instance, the BEA estimates corporate profits, which is a leading driver of economic growth and historically explains about 40 percent of the time-series variation in contemporaneous GDP growth (e.g., BEA, 2004), based on extrapolations from corporate income tax return data by the IRS, tabulated with a two-year lag.

As initial GDP estimates are based on imprecise and incomplete information, they are routinely restated in subsequent years after more information becomes available. The BEA usually adjusts the previous GDP estimates after receiving information from additional sources or obtaining more precise information, such as annual tax filings or annual Census Bureau surveys. Also, every five years, the BEA

releases a comprehensive revision based on information from the latest economic census that covers virtually all businesses in the United States.

## ***2.2 Related Literature and Hypothesis Development***

The macro-accounting literature suggests that using accounting information can improve the accuracy of macroeconomic forecasts and the efficiency of macroeconomic policy changes (e.g., Konchitchki and Patatoukas, 2014a, 2014b; Nallareddy and Ogneva, 2017) because accounting information provides a timely and credible signal of firm-level performance every quarter. Previous findings suggest that accounting information can predict key aspects of economic activity. For example, Konchitchki and Patatoukas (2014a) document that aggregate earnings growth is an incrementally significant leading indicator of GDP growth, and Nallareddy & Ogneva (2017) document that aggregate earnings dispersion conveys incremental information for unemployment and GDP growth forecasts.

While the existing macro-accounting literature primarily focuses on the macroeconomic information in accounting earnings, firm-specific taxable income information reflected through the valuation allowance might also provide information about future macroeconomic performance, for at least three reasons. First, although prior literature uses accounting earnings as a proxy for corporate profits (e.g., Konchitchki and Patatoukas, 2014a, 2014b), the BEA's measure of corporate profits is



conceptually closer to taxable income rather than accounting earnings. Second, prior literature at the firm-level finds that tax accounts provide incremental information about future earnings and firm value (e.g., Lev and Nissim, 2004; Hanlon, 2005; Hanlon and Heitzman, 2010; Thomas and Zhang, 2011) and recently, Shevlin, Shivakumar, and Urcan (2019) find that aggregate country-level effective tax rates (ETRs) provide information about future macroeconomic growth. Third, the valuation allowance should reflect management's private information about the firm's expected future taxable income under ASC 740.

Despite the potential of the valuation allowance to indicate firms' future performance, whether the valuation allowance provides useful incremental information for GDP growth is unclear for two reasons. First, prior literature finds mixed evidence on the information content of the valuation allowance at the firm-level. Several studies find that the valuation allowance is negatively associated with the firm's value and the firm's future performance (e.g., Ayers, 1998; Miller and Skinner, 1998; Dhaliwal et al., 2013; Finley and Ribal, 2019). Ayers (1998) finds that distinct recognition of deferred tax assets and the existence of valuation allowance are negatively associated with firm value, and Dhaliwal et al. (2013) find that the establishment of a valuation allowance predicts loss persistence. Also, Finley and Ribal (2019) find that profitable firms

releasing at least a portion of a full valuation allowance have higher subsequent earnings relative to firms that maintain a full valuation allowance.

However, other studies find that firms' decisions to maintain or release the valuation allowance may relate to earnings management considerations (e.g., Burgstahler et al., 2002; Schrand and Wong, 2003; Frank and Rego, 2006). By maintaining a larger valuation allowance in the current period, managers can increase earnings upward through the release of the valuation allowance in subsequent periods. For example, Frank and Rego (2006) find that firms use the valuation allowance to manage earnings toward the mean analyst forecast.<sup>1</sup>

Additional studies find that auditors might influence firms' decisions to maintain or release the valuation allowance due to litigation risk considerations (e.g., DeFond and Zhang, 2014; Drake, Goldman, and Lusch, 2016). ASC 740 states that "forming a conclusion that a valuation allowance is not needed is difficult when there is negative evidence such as cumulative losses in recent years" (FASB 2009). Although the phrase "cumulative losses in recent years" is not clearly defined, the Big 4 audit firms have used cumulative pretax book income for the current and preceding two years as evidence regarding the need for a valuation allowance (PwC 2013; KPMG 2007; Ernst

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<sup>1</sup> Beaver (2002) suggests that any form of earnings management can either improve or impair the quality of financial statements. Relatedly, Graham et al. (2005) provide survey evidence that CFOs believe that earnings management can enhance investor perception of firm value.

&Young 2009; Deloitte 2015). For example, Drake, Goldman, and Lusch (2016) document that Deloitte clients increased their valuation allowance in response to increased auditor scrutiny stemming from a PCAOB inspection report, and Goldman, Lewellen, and Schmidt (2022) find that cumulative losses is the most critical determinant of the valuation allowance. If the valuation allowance is sufficiently based on backward-looking information, its ability to predict future economic activity may be limited.

Second, aggregate valuation allowance growth may not convey incremental information because other leading GDP growth indicators might subsume the information embedded in the valuation allowance. For example, prior accounting research suggests that aggregate earnings growth, aggregate special items growth, and earnings dispersion, convey important information about future economic growth (e.g., Konchitchki and Patatoukas, 2014a, 2014b; Nallareddy and Ogneva, 2017, Hann, Li, and Ogneva, 2021; Abdalla and Carabias, 2021). Prior literature in macroeconomics has identified several additional indicators of future economic growth, such as the Chicago Fed National Index (CFNAI), which is a weighted average of 85 indicators of economic activity, and inflation (e.g., Stock and Watson, 1999). Additionally, the Survey of Professional Forecasters (SPF) provides quarterly GDP growth forecasts that predict future GDP growth. This discussion leads to the following null hypothesis:

**H1:** Aggregate valuation allowance growth is not associated with future GDP growth.

### 3. Sample, Timeline, and Descriptive Statistics

#### 3.1 Sample

Valuation allowance information is disclosed in the tax footnotes of the financial statements and is publicly available. However, this information is not readily available in traditional machine-readable databases before 2010. Therefore, the valuation allowance must be hand-collected for the pre-2010 period. Due to this data constraint, I use a cost-effective approach and limit the sample to the largest 100 U.S. publicly traded firms. I base my choice of 100 firms on Gabaix (2011) and Konchitchki and Patatoukas (2014b) findings which suggest that the behavior of the 100 largest firms can shed light on the behavior of the macroeconomy. The information in the largest firms derives from the notion that these firms are often the bellwether firms that lead and indicate trends in the macroeconomy.

To construct my aggregate valuation allowance growth measure (*VA Growth*), I follow prior literature's methodology for constructing aggregate earnings growth measure (e.g., Konchitchki and Patatoukas, 2014a, 2014b). Specifically, for firm  $i$  in calendar quarter  $t$ , I measure valuation allowance growth as the year-over-year change in valuation allowance scaled by total assets for quarter  $t$ , using value-weighted cross-sectional averages with weights based on the market capitalization of each quarter, as follows:

$$VA\ Growth_t = \sum_{i=1}^n \left( \frac{VA_{i,t}}{ATQ_{i,t}} - \frac{VA_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSOQ_{i,t}} \right),$$

where *VA Growth* is the valuation allowance disclosed in the financial statement footnote, *ATQ* is total assets from Compustat, and *PRCCQ\*CHSOQ* is market capitalization derived from Compustat using price (*PRCCQ*) and the number of shares outstanding (*CHSOQ*). As the valuation allowance information is disclosed annually, for any given calendar quarter *t*, I use the most recently disclosed valuation allowance information. The variation in *VA Growth* partly comes from the variation in fiscal-year ends.<sup>6</sup>

The sample begins in 1993, the first year for which the valuation allowance data exists, and ends in 2019, the last year data were available when I began the study. This results in 107 quarterly observations. I use the largest 100 firms based on Standard and Poor's annual ranking (i.e., S&P 100). I manually collect the valuation allowance data for the years 1993-2010, and I obtain the valuation allowance data for the years 2010-2019 from the Calcbench database.<sup>7</sup> I also use data from Compustat, CRSP, and IBES to obtain firm level accounting data, security prices and analyst forecasts, respectively.<sup>8</sup>

I obtain the BEA initial and final estimates of realized GDP growth in nominal terms from the Real-Time Data Set for Macroeconomists of the Federal Reserve Bank of Philadelphia in its National Income and Product Accounts (NIPA). The BEA reports the

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<sup>6</sup> I use the available valuation allowance information for firms in each quarter, based on the firms' earnings announcement date. To be more specific, if a firm reports its valuation allowance information during quarter *t*, I use this information, but if a firm did not report its valuation allowance information during quarter *t*, I use its last reported valuation allowance information.

<sup>7</sup> I would like to thank Jana Ready, Jeri Seidman, and Douglas Shackelford for sharing their valuation allowance data that was used in a pilot test of my study.

<sup>8</sup> I provide more detailed information in the Appendix.

initial estimate of GDP growth at the end of the first month after the quarter ends and is based on incomplete data.<sup>9</sup> The final estimate is the third revision of the initial estimate and is based on the most accurate data (e.g., Romer and Romer, 2000; Faust and Wrights, 2007; Landfeld et al., 2008).

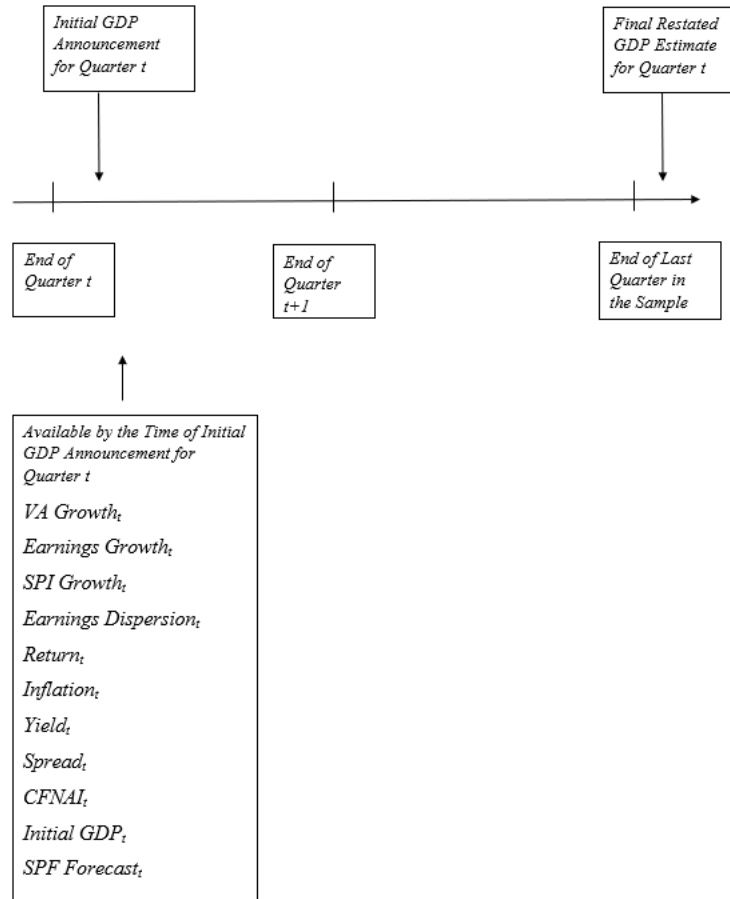
I use the mean consensus SPF forecasts of GDP growth from the Federal Reserve Bank of Philadelphia. The SPF is the best and longest publicly available survey of macroeconomic forecasts and has been used in prior research (e.g., Konchitchki and Patatoukas, 2014a, 2014b; Nallareddy & Ogneva, 2017). Consensus SPF forecasts consistently outperform the forecasts of individuals and therefore is the most appropriate measure for this analysis (e.g., Croushore, 2011). Additionally, prior studies find that professional macroeconomic forecasters outperform time-series models (e.g., Zarnowitz and Braun, 1993; Stark, 2010).

### **3.2 Timeline**

The sample includes firm observations with financial statements that were available to SPF panelists in real-time, at the time of forecasting future GDP growth. The timeline of the research design follows prior literature (e.g., Konchitchki and Patatoukas, 2014a, 2014b) and is presented in Figure 1.

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<sup>9</sup> The initial estimate of GDP growth is unavailable from the Real-Time Data Set for Macroeconomists for Q4:1995 due to a government shutdown.



**Figure 1: Timeline**

Figure 1 presents the timeline of the variable measurement.

### **3.3 Descriptive Statistics**

Table 1 presents the descriptive statistics for the key variables. The mean aggregate valuation allowance growth is -0.015 percent with a standard deviation of 0.117 percent. The mean aggregate quarterly earnings growth is 0.012 percent with a standard deviation of 0.42 percent and is consistent with prior literature (e.g., Konchitchki and Patatoukas, 2014a, 2014b). The mean Chicago Fed National Activity Index (CFNAI), which is a composite index reflecting the nowcast of economic activity, is -10.692 percent with a standard deviation of 70.63 percent and is similar to previous literature (e.g., Nallareddy and Ogneva, 2017). The mean realized nominal GDP growth is 4.496 percent with a standard deviation of 2.585 percent, and the mean GDP growth one quarter ahead is 4.508 percent with a standard deviation of 2.592 percent.

Table 2 presents the correlation coefficients of the key variables. Aggregate valuation allowance growth is negatively associated with GDP growth up to four quarters ahead, suggesting that as the valuation allowance decreases, future economic activity increases. Specifically, the Pearson (Spearman) correlation between aggregate DTA growth and contemporaneous GDP growth is -21.3 (-20.6) percent and is statistically significant (p-value=0.001). Also, the Pearson (Spearman) correlation is statistically significant for the four subsequent quarters and ranges from -40.2 to -27.3 (-37.1 to 26.2) percent.

While these findings provide preliminary evidence that aggregate valuation allowance growth conveys information about future GDP growth, other leading GDP



growth indicators might incorporate macroeconomic information that is highly correlated with both aggregate valuation allowance growth and future GDP growth. For example, aggregate valuation allowance growth is negatively associated with aggregate earnings growth, which is a well-established accounting-based GDP growth indicator. The Pearson (Spearman) correlation between aggregate valuation allowance growth and earnings growth is -45.4 (-56.9) percent and is statistically significant (p-value=0.000). Further, consistent with prior literature (e.g., Konchitchki and Patatoukas, 2014a, 2014b), earnings growth is positively associated with current and future GDP growth. The Pearson (Spearman) correlation between aggregate earnings growth and contemporaneous GDP growth is 39.9 (34.4) and is statistically significant (p-value=0.000). Additionally, aggregate valuation allowance growth is negatively associated with aggregate special items growth<sup>10</sup>. Specifically, the Pearson (Spearman) correlation between aggregate valuation allowance growth and aggregate special items growth is -36.7 (-44.6) percent and is statistically significant (p-value=0.00). Furthermore, CFNAI is strongly associated with both current and future GDP growth, as documented in prior literature (e.g., Nallareddy and Ogneva, 2017), and is also strongly associated with aggregate valuation allowance growth. The Pearson (Spearman) correlation

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<sup>10</sup> Aggregate special items growth is expected to be negatively associated with aggregate valuation allowance growth for two reasons. First, changes in special items are likely to mechanically affect firms' future taxable income, and as a consequence affect firms' valuation allowance. Second, changes in special items might lead to changes in firms' investment and hiring decisions (e.g., Abdalla and Carabias, 2021; Hann, Li, and Ogneva, 2021), and these changes might lead to changes in managements' expectations of future taxable income.

between aggregate valuation allowance growth and CFNAI is -46.6 (-36.6) percent and is statistically significant (p-value=0.000).

Overall, these findings from analyzing the correlations provide evidence that aggregate valuation allowance growth conveys information about future GDP growth for one to four quarters ahead. However, several other variables are correlated with both aggregate valuation allowance growth and future GDP growth, highlighting the importance of considering a multiple regression analysis to assess whether aggregate valuation allowance growth provides incremental information for future GDP growth.

**Table 1: Descriptive Statistics**

Table 1 provides descriptive statistics. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995, due to a government shutdown. All variables are defined in Appendix A.

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>P10</i>	<i>P25</i>	<i>P50</i>	<i>P75</i>	<i>P90</i>	<i>Max</i>	<i>N</i>
<i>VA Growth<sub>t</sub></i>	-0.00015	0.00117	-0.00384	-0.00133	-0.00077	-0.00004	0.00061	0.00114	0.00282	107
<i>Earnings Growth<sub>t</sub></i>	0.00012	0.00420	-0.01594	-0.00389	-0.00136	0.00044	0.00264	0.00411	0.01236	107
<i>SPI Growth<sub>t</sub></i>	-0.00003	0.00192	-0.00686	-0.00156	-0.00076	0.00005	0.00074	0.00167	0.00790	107
<i>Earnings Dispersion<sub>t</sub></i>	0.00192	0.02015	-0.05789	-0.02438	-0.00660	0.00219	0.01239	0.02679	0.07286	107
<i>CFNAI<sub>t</sub></i>	-0.10692	0.70630	-3.64000	-0.55000	-0.24000	0.03000	0.26000	0.56000	0.90000	107
<i>Return<sub>t</sub></i>	0.04430	0.11337	-0.31653	-0.07610	-0.01939	0.04609	0.11093	0.16633	0.40526	107
<i>Inflation<sub>t</sub></i>	0.00558	0.00831	-0.03910	-0.00470	0.00153	0.00562	0.01067	0.01552	0.02476	107
<i>Yield<sub>t</sub></i>	0.00740	0.00701	-0.00348	0.00008	0.00140	0.00504	0.01302	0.01663	0.02569	107
<i>Spread<sub>t</sub></i>	0.00644	0.03383	-0.05920	-0.03381	-0.02081	0.00204	0.02928	0.04440	0.11211	107
<i>TA Denominator Growth<sub>t</sub></i>	-0.00003	0.00007	-0.00053	-0.00010	-0.00005	-0.00002	0.00001	0.00003	0.00008	107
<i>Gross DTA Growth<sub>t</sub></i>	-0.01029	0.01424	-0.07384	-0.02825	-0.01792	-0.00932	-0.00009	0.00686	0.01702	107
<i>ADA Growth<sub>t</sub></i>	-0.00004	0.00017	-0.00061	-0.00025	-0.00013	0.00000	0.00000	0.00014	0.00058	107
<i>MFQ Growth<sub>t</sub></i>	0.00000	0.00003	-0.00007	-0.00002	-0.00001	-0.00000	0.00000	0.00002	0.00016	75
<i>SPF Forecast<sub>t</sub> (t+1)</i>	0.04403	0.01482	-0.03802	0.03317	0.03822	0.04402	0.05431	0.05960	0.06760	107
<i>Initial GDP Growth<sub>t</sub></i>	0.04336	0.02129	-0.04050	0.01987	0.03443	0.04414	0.05285	0.06764	0.09017	107
<i>GDP Growth<sub>t</sub></i>	0.04496	0.02585	-0.07229	0.01612	0.03350	0.04729	0.05887	0.07582	0.10154	107

## Table 2: Correlation Matrix

Table 2 presents the Pearson (above diagonal) and Spearman (below diagonal) correlation coefficients for the key variables. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995, due to a government shutdown. Values in bold indicate statistical significance at 10 percent or greater. All variables are defined in Appendix A.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) VA Growth <sub>t</sub>		-0.454	-0.367	0.256	-0.466	-0.352	-0.144	0.188	0.168	-0.447	-0.338	-0.385	-0.402	-0.43	-0.273	-0.271
(2) Earnings Growth <sub>t</sub>	-0.569		0.723	-0.373	0.52	0.158	0.016	-0.094	0.114	0.592	0.446	0.399	0.355	0.243	0.105	0.109
(3) SPI Growth <sub>t</sub>	-0.446	0.671		-0.161	0.413	0.251	0.028	-0.122	0.058	0.453	0.354	0.287	0.284	0.071	0.090	0.060
(4) Earnings Dispersion <sub>t</sub>	0.281	-0.308	-0.120		-0.248	-0.126	-0.188	0.102	-0.029	-0.214	-0.116	-0.164	-0.168	-0.235	-0.043	0.013
(5) CFNAI <sub>t</sub>	-0.366	0.461	0.323	-0.251		0.372	0.128	-0.047	-0.096	0.761	0.669	0.751	0.668	0.503	0.343	0.244
(6) Return <sub>t</sub>	-0.311	0.147	0.155	-0.077	0.234		0.164	-0.166	-0.083	0.439	0.431	0.343	0.236	0.214	0.196	0.17
(7) Inflation <sub>t</sub>	-0.056	0.009	-0.016	-0.151	-0.072	0.102		-0.020	-0.242	0.227	0.373	0.224	0.233	0.054	-0.040	-0.111
(8) Yield <sub>t</sub>	0.181	-0.030	-0.084	0.013	0.061	-0.182	0.052		0.289	0.104	0.053	-0.038	0.035	-0.030	-0.039	-0.028
(9) Spread <sub>t</sub>	0.135	0.096	0.087	-0.093	-0.099	-0.071	-0.17	0.278		-0.018	-0.238	-0.273	-0.062	-0.121	-0.085	-0.083
(10) SPF Forecast <sub>t</sub> (t+1)	-0.451	0.54	0.373	-0.142	0.626	0.284	0.141	0.23	-0.017		0.753	0.694	0.385	0.32	0.211	0.164
(11) Initial GDP Growth <sub>t</sub>	-0.288	0.346	0.222	-0.004	0.557	0.268	0.259	0.124	-0.287	0.615		0.785	0.416	0.304	0.225	0.141
(12) GDP Growth <sub>t</sub>	-0.302	0.322	0.215	-0.174	0.642	0.218	0.045	0.017	-0.293	0.544	0.676		0.43	0.388	0.274	0.218
(13) GDP Growth <sub>t-1</sub>	-0.322	0.344	0.315	-0.144	0.544	0.134	0.082	0.133	-0.004	0.32	0.325	0.292		0.434	0.385	0.282
(14) GDP Growth <sub>t-2</sub>	-0.371	0.333	0.150	-0.232	0.401	0.173	0.013	-0.000	-0.119	0.349	0.274	0.348	0.295		0.433	0.373
(15) GDP Growth <sub>t-3</sub>	-0.262	0.203	0.131	-0.064	0.343	0.252	0.018	0.045	-0.032	0.277	0.261	0.268	0.343	0.297		0.433
(16) GDP Growth <sub>t-4</sub>	-0.295	0.142	0.024	-0.087	0.335	0.206	-0.039	0.085	-0.087	0.189	0.172	0.216	0.276	0.318	0.299	

## 4. Empirical Research Design and Results

### 4.1 Valuation Allowance and Future GDP Growth

To examine the informativeness of the valuation allowance for future GDP growth, I test whether aggregate valuation allowance growth is associated with future GDP growth. I use GDP growth rates because growth rates enhance the comparison of various indicators over different time periods and different sizes. Due to the longer-term nature of the valuation allowance information, I extend prior literature and examine eight quarters ahead of GDP growth. I estimate the following regression model:

$$GDP\ Growth_{t+k} = \alpha_k + \beta_k VA\ Growth_t + \delta_k Controls_t + \varepsilon_{t+k}, \quad (1)$$

where  $k=\{1,2,3,4,5,6,7,8\}$  quarters ahead,  $VA\ Growth_t$  is aggregate valuation allowance growth for calendar quarter  $t$ , and  $Controls_t$  include: (1) aggregate earnings growth ( $Earnings\ Growth_t$ ); (2) aggregate special-items growth ( $SPI\ Growth_t$ ); (3) earnings dispersion ( $Earnings\ Dispersion_t$ ); (4) the Chicago Fed National Activity Index ( $CFNAI_t$ ), which is an aggregate index reflecting the nowcast of economic activity based on 85 various monthly indicators of economic activity, and is a parsimonious alternative to estimating a complex formal statistical nowcasting model (e.g., Giannone, Reichlin, and Small, 2008); (5) the initially released GDP growth estimates ( $Initial\ GDP\ Growth_t$ ); (6) aggregate returns ( $Return_t$ ); (7) inflation ( $Inflation_t$ ); (8) the yield on the one-year constant maturity Treasury bill ( $Yield_t$ ); and (9) the yield on the ten-year constant maturity Treasury bond minus the yield on the one-year constant maturity Treasury bill ( $Spread_t$ ).

Collectively, these control variables are leading indicators of GDP growth (e.g., Fama, 1981; Harvey, 1989; Ang et al., 2005).<sup>11</sup> Additionally, the slope coefficient  $\beta_k$  on *VA Growth<sub>t</sub>* is the coefficient of interest. An estimate of  $\beta_k$  that is statistically significant, for any of the horizons considered, suggests that aggregate valuation allowance growth is informative about GDP growth for that horizon.

I estimate Equation 1 in three steps. First, I test whether aggregate valuation allowance growth contributes to forecasting GDP growth up to eight quarters ahead, without controls. This specification replicates the insights from the Pearson correlation in Table 2 and establishes a point estimate that can be compared across different specifications. Second, I test whether aggregate valuation allowance growth contributes incremental information about future GDP growth, after including accounting-based growth indicators (i.e., Equation 1 with only accounting-based controls). This specification helps to evaluate whether aggregate valuation allowance growth is incremental to accounting-based predictors, which is essential because changes in the valuation allowance mechanically appear as part of overall earnings. Third, I test whether aggregate valuation allowance growth contributes incremental information about future GDP growth after including also macroeconomic-based growth indicators (i.e., Equation 1 with both accounting-based and macroeconomic-based controls). This

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<sup>11</sup> I follow prior literature methodology in calculating the aggregate variables (e.g., Konchitchki and Patatoukas, 2014a, 2014b). All aggregate variables, except aggregate valuation allowance growth, are calculated based on all firms in Compustat and not only the 100 largest firms.

specification helps to assess whether aggregate valuation allowance growth is incremental to other existing accounting and macroeconomic GDP growth indicators and represents a formal test of H1.

The results are reported in Table 3. Panel A presents the results of Equation 1 without controls, while Panel B adds accounting-based controls, and Panel C further adds macroeconomic-based controls. First, Panel A reveals that the estimated slope coefficients are significantly negative, as expected from the correlation matrix, and equal to -8.460 (p-value=0.000), -9.219 (p-value=0.000), -6.177 (p-value=0.004), and -6.039 (p-value=0.005), for forecasts horizons from one to four quarters ahead (i.e., k=1-4), respectively. The estimated slope coefficients decrease in magnitude substantially from five to eight quarters ahead, with each being statistically insignificant.

Second, the findings suggest that aggregate valuation allowance growth conveys incremental information about GDP growth, especially for longer forecast horizons, above and beyond other accounting-based information. The results in Panel B show that the estimated slope coefficients remain significantly negative and equal to -6.390 (p-value=0.004), -8.843 (p-value=0.000), -6.350 (p-value=0.008), and -6.523 (p-value=0.007), for forecasts horizons from one to four quarters ahead, respectively. Compared to Panel A, these estimated slope coefficients attenuate very little, implying that the valuation allowance information is not subsumed by other accounting-based information.

Third, the findings suggest that valuation allowance growth conveys information about GDP growth, especially for forecast horizons longer than one quarter, over both

accounting and macroeconomic-based information. The results in Panel C show that the estimated slope coefficients remain significantly negative and equal to -6.256 (p-value= 0.005), -4.426 (p-value= 0.085), and -5.249 (p-value= 0.047), for forecasts horizons from two to four quarters ahead, respectively. Further, aggregate valuation allowance growth at four quarters ahead is the only statistically significant predictor of GDP growth. However, for the one quarter ahead forecast horizon, CFNAI subsumes the information embedded in the valuation allowance and other accounting growth indicators (i.e., earnings growth, special-items growth, and earnings dispersion). Interestingly, the estimated slope coefficient of CFNAI declines over subsequent quarters and becomes statistically insignificant at four quarters ahead.

The results are not only statistically significant but also economically significant. For instance, based on the results of Panel C for the four quarters ahead forecast horizon, one standard deviation change in aggregate valuation allowance growth is associated with a 14 percent change in GDP growth. For comparison, one standard deviation change in CFNAI is associated with a 40, 25, and 17 percent change in GDP growth, for the one, two, and three quarters ahead forecast horizon, respectively. Further, the incremental R-squared of the valuation allowance for the four quarters ahead forecast horizon is four percent, accounting for almost one-third of the total R-squared for this forecast horizon.

The findings suggest that aggregate valuation allowance growth conveys incremental forward-looking information about GDP growth, especially for the long-



term forecast horizons when other leading GDP growth indicators are uninformative. Although the findings indicate that the informational role dominates, on average, the findings do not suggest that earnings management and litigation risk play no role. Overall, the evidence indicates that aggregate valuation allowance growth provides incremental forward-looking information about GDP growth.

The results suggest that aggregate valuation allowance growth is an important predictor of future GDP, but existing accounting-based indicators are less important. To ensure that accounting-based predictors behave in a manner that has been established previously in the literature, I conduct additional analysis and exclude the valuation allowance from this analysis. Table 4 presents the results for earnings growth, SPI growth, earnings dispersion and all three together in Panels A through D, respectively. Earnings growth (Panel A) and earnings dispersion (Panel C) are associated with GDP growth at both one and two quarter horizons, while SPI growth (Panel B) is associated with GDP only at one quarter ahead. When considered concurrently in Panel D, only earnings growth is associated with future GDP among the three accounting-based indicators. Overall, accounting-based predictors are associated with GDP growth consistent with extant literature, but do not systematically predict future GDP at any horizon once valuation allowance growth is considered.

**Table 3: Valuation Allowance and GDP Growth**

Table 3 reports results from regressions of future GDP growth on current quarter aggregate valuation allowance growth. Panel A presents the results of Equation 1 without controls, while Panel B adds accounting-based controls, and Panel C further adds macroeconomic-based controls. \*\*\*, \*, and \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

**Panel A: Valuation Allowance and GDP Growth Without Controls**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-8.460*** (1.997)	-9.219*** (1.947)	-6.177*** (2.102)	-6.039*** (2.120)	-1.757 (2.236)	-2.386 (2.217)	-1.266 (2.250)	0.172 (2.279)
<i>Intercept</i>	0.044*** (0.002)	0.043*** (0.002)	0.044*** (0.003)	0.043*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.15	0.18	0.08	0.07	0.01	0.01	0.00	0.00
<i>N</i>	106	105	104	103	102	101	100	99

**Panel B: Valuation Allowance and GDP Growth Including Accounting-Based Controls**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-6.390*** (2.167)	-8.843*** (2.106)	-6.350*** (2.339)	-6.523*** (2.378)	-1.946 (2.540)	-2.409 (2.484)	-2.263 (2.570)	-0.966 (2.605)
<i>Earnings Growth</i>	1.081 (0.851)	1.183 (0.826)	0.001 (0.921)	0.490 (0.920)	-0.610 (0.976)	-1.373 (0.961)	-0.319 (1.006)	-0.683 (1.011)
<i>SPI Growth</i>	0.565 (1.750)	-3.047* (1.700)	-0.075 (1.896)	-1.171 (1.881)	1.011 (1.972)	1.926 (1.920)	-0.334 (1.984)	0.491 (1.994)
<i>Earnings Dispersion</i>	-0.067 (0.125)	-0.146 (0.121)	0.038 (0.135)	0.130 (0.136)	-0.037 (0.142)	-0.246* (0.138)	0.066 (0.144)	0.071 (0.148)
<i>Intercept</i>	0.044*** (0.002)	0.043*** (0.002)	0.044*** (0.003)	0.043*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.043*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.19	0.23	0.08	0.09	0.01	0.05	0.01	0.01
<i>N</i>	106	105	104	103	102	101	100	99

**Panel C: Valuation Allowance and GDP Growth Including Accounting and  
Macroeconomic-Based Controls**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-2.616 (1.947)	-6.256*** (2.188)	-4.426* (2.541)	-5.249** (2.606)	-0.683 (2.821)	-2.713 (2.726)	-3.258 (2.858)	-0.861 (2.918)
<i>Earnings Growth</i>	0.162 (0.798)	0.356 (0.896)	-0.883 (1.045)	0.100 (1.061)	-0.603 (1.135)	-2.182* (1.101)	-1.221 (1.157)	-0.941 (1.162)
<i>SPI Growth</i>	0.126 (1.453)	-3.310** (1.632)	-0.309 (1.906)	-1.397 (1.926)	0.696 (2.050)	2.328 (1.964)	0.158 (2.053)	0.188 (2.062)
<i>Earnings Dispersion</i>	0.052 (0.108)	-0.132 (0.121)	0.013 (0.141)	0.102 (0.144)	0.034 (0.153)	-0.285* (0.146)	0.005 (0.154)	0.106 (0.157)
<i>CFNAI</i>	0.026*** (0.004)	0.016*** (0.005)	0.011** (0.005)	0.007 (0.005)	0.008 (0.006)	0.007 (0.005)	0.004 (0.006)	0.006 (0.006)
<i>Return</i>	-0.003 (0.020)	0.004 (0.023)	0.008 (0.026)	0.020 (0.027)	0.004 (0.029)	-0.036 (0.027)	-0.027 (0.029)	0.016 (0.029)
<i>Inflation</i>	0.687** (0.264)	-0.181 (0.296)	-0.427 (0.344)	-0.539 (0.349)	0.417 (0.372)	-0.510 (0.354)	-0.497 (0.369)	0.094 (0.371)
<i>Yield</i>	0.374 (0.300)	0.195 (0.337)	0.007 (0.391)	0.130 (0.395)	-0.038 (0.419)	-0.404 (0.399)	0.002 (0.417)	0.039 (0.419)
<i>Spread</i>	-0.003 (0.066)	-0.046 (0.074)	-0.012 (0.086)	-0.053 (0.086)	0.017 (0.092)	0.032 (0.088)	0.078 (0.092)	0.137 (0.092)
<i>Initial GDP Growth</i>	-0.243 (0.150)	-0.061 (0.169)	0.078 (0.195)	-0.011 (0.197)	-0.186 (0.210)	0.030 (0.200)	0.099 (0.209)	-0.125 (0.211)
<i>Intercept</i>	0.051*** (0.006)	0.048*** (0.007)	0.044*** (0.008)	0.046*** (0.008)	0.051*** (0.009)	0.051*** (0.008)	0.043*** (0.009)	0.047*** (0.009)
<i>R-squared</i>	0.50	0.36	0.17	0.14	0.04	0.12	0.06	0.06
<i>VA Growth Incremental R-squared</i>	0.01	0.06	0.03	0.04	0.00	0.01	0.02	0.00
<i>N</i>	106	105	104	103	102	101	100	99

**Table 4: Accounting-Based Growth Indicators and GDP Growth**

Table 4 reports results from regressions of future GDP growth on aggregate accounting-based growth indicators. Panel A,B, and C, presents the results of future GDP growth on current quarter aggregate earnings growth, special-items growth, and earnings dispersion, respectively. Panel D includes all of the three accounting-based growth indicators. \*\*\*, \*, And \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

**Panel A: Earnings Growth and GDP Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>Earnings Growth</i>	2.072*** (0.568)	1.394** (0.583)	0.595 (0.606)	0.635 (0.606)	0.018 (0.615)	-0.023 (0.612)	-0.263 (0.619)	-0.522 (0.620)
<i>Intercept</i>	0.045*** (0.002)	0.045*** (0.002)	0.045*** (0.003)	0.045*** (0.003)	0.045*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.11	0.05	0.01	0.01	0.00	0.00	0.00	0.01
<i>N</i>	106	105	104	103	102	101	100	99

**Panel B: Special-Items Growth and GDP Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>SPI Growth</i>	3.743*** (1.265)	0.950 (1.304)	1.231 (1.328)	0.806 (1.323)	0.540 (1.333)	0.690 (1.319)	-0.439 (1.331)	-0.478 (1.339)
<i>Intercept</i>	0.045*** (0.002)	0.045*** (0.003)	0.045*** (0.003)	0.045*** (0.003)	0.045*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.08	0.01	0.01	0.00	0.00	0.00	0.00	0.00
<i>N</i>	106	105	104	103	102	101	100	99

**Panel C: Earnings Dispersion and GDP Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>Earnings Dispersion</i>	-0.232* (0.124)	-0.293** (0.121)	-0.034 (0.128)	0.022 (0.129)	-0.034 (0.130)	-0.206 (0.127)	0.065 (0.130)	0.103 (0.133)
<i>Intercept</i>	0.046*** (0.003)	0.045*** (0.002)	0.045*** (0.003)	0.045*** (0.003)	0.045*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.03	0.05	0.00	0.00	0.00	0.03	0.00	0.01
<i>N</i>	106	105	104	103	102	101	100	99

**Panel D: Accounting-Based Growth Indicators and GDP Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>Earnings Growth</i>	1.481* (0.871)	1.736* (0.880)	0.407 (0.938)	0.957 (0.934)	-0.452 (0.952)	-1.159 (0.935)	-0.105 (0.974)	-0.595 (0.978)
<i>SPI Growth</i>	1.268 (1.798)	-2.072 (1.818)	0.603 (1.939)	-0.558 (1.928)	1.167 (1.957)	2.096 (1.912)	-0.192 (1.976)	0.552 (1.978)
<i>Earnings Dispersion</i>	-0.103 (0.129)	-0.195 (0.130)	0.005 (0.139)	0.084 (0.139)	-0.050 (0.141)	-0.261* (0.137)	0.054 (0.143)	0.064 (0.146)
<i>Intercept</i>	0.045*** (0.002)	0.045*** (0.002)	0.045*** (0.003)	0.044*** (0.003)	0.045*** (0.003)	0.045*** (0.003)	0.044*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.12	0.09	0.01	0.01	0.00	0.04	0.00	0.01
<i>N</i>	106	105	104	103	102	101	100	99

## **4.2 Robustness and Additional Tests**

### **4.2.1 Robustness Tests**

I perform five tests to address concerns about the sensitivity of the results to several research design choices and concerns. First, I examine the sensitivity of the results to using total assets as a scaler. To address the concern that the results are driven by the scaler, I construct an unscaled valuation allowance growth measure and use it as an alternative measure. Table 5 Panel A presents the results. The estimated slope coefficients on aggregate valuation allowance growth are significantly negative and equal to -0.000055 (p-value=0.005), -0.000063 (p-value=0.005), -0.000055 (p-value=0.017), 0.000047 (p-value=0.053), and -0.000039 (p-value=0.099), for forecasts horizons from two to six quarters ahead, respectively. These findings imply that absent a scalar, aggregate valuation allowance growth may be a stronger proxy for management information about the future, given that unscaled valuation allowance growth predicts out to six instead of four quarters ahead, and CFNAI is subsumed by aggregate valuation allowance growth by the third quarter ahead.

Second, I examine the sensitivity of the results to controlling for the underlying total assets and deferred tax assets growth effects, to alleviate the concern that aggregate valuation allowance growth simply reflects the information embedded in total assets and gross deferred tax assets. I include two additional control variables: (1) TA denominator growth to control for the effect of total assets growth, and (2) Gross DTA growth to control for the effect of deferred tax assets growth. Table 5 Panel B presents

the results. The estimated slope coefficients on aggregate valuation allowance growth are significantly negative and equal to -6.451 (p-value=0.005), -4.285 (p-value=0.084), and -5.819 (p-value=0.029), for forecasts horizons from two to four quarters ahead, respectively. The results not only remain negative and statistically significant but also the magnitude remains relatively similar to the previous results in Table 3, without these two additional control variables.

Third, I examine the sensitivity of the results to the Tax Cut and Job Act (TCJA) which is a major corporate tax change. I exclude post-TCJA observations from the analysis (i.e., observations after the third quarter of 2017). Table 5 Panel C presents the results. The evidence suggests that my results are robust to excluding years impacted by the TCJA.

Fourth, I examine the sensitivity of the results to including U.S. aggregate effective tax rates (ETRs) as an additional control. Shevlin, Shivakumar, and Urcan (2019) find that aggregate country-level ETRs contain information about future macroeconomic growth. Table 5 Panel D presents the results. The findings suggest that my results are robust to controlling for ETRs, although ETRs are positively associated with GDP growth at four, five, six and eight quarters ahead.

Fifth, I examine the sensitivity of the results to the business cycle. ASC 740 states that “cumulative losses in recent years” provide strong evidence to support an increase in the valuation allowance. While the phrase “cumulative losses in recent years” is not clearly defined, the Big 4 audit firms have used cumulative pretax book

income for the current and preceding two years as evidence regarding the need for a valuation allowance (PwC 2013; KPMG 2007; Ernst & Young 2009; Deloitte 2015). Also, recent research suggests that cumulative losses are the most critical determinant of the valuation allowance (e.g., Goldman, Lewellen, and Schmidt, 2022). Additionally, there are more net operating losses during recessions, and thus the valuation allowance is likely to increase. Therefore, the valuation allowance is expected to be positively correlated with recessions.

To alleviate concerns that recession is a correlated omitted correlated variable, I include recession as an additional control variable. Also, I interact recession with aggregate valuation allowance growth to investigate whether the valuation allowance is informative only during recessions due to auditors' litigation risk. Table 5 Panel E presents the results. The findings indicate that after controlling for recession, aggregate valuation allowance growth remains negative and statistically significant for two and four quarters ahead. Furthermore, the results suggest that the valuation allowance is informative for both recession and non-recession periods.

Relatedly, I conduct additional analysis to assess whether the valuation allowance provides information about future recessions. Valuation allowance growth may predict recessions given recessions are defined as a decline in GDP in two consecutive quarters and my previous findings that show that valuation allowance growth is associated with future GDP. Table 5 Panel F presents the results. The estimated slope coefficients are positive and significant and indicate that aggregate



valuation allowance growth predicts recessions up to two quarters ahead. This evidence suggests that the valuation allowance also conveys information about future recessions.

Overall, these findings help to alleviate concerns about the sensitivity of the results. The results are robust to changes in the research design and controlling for additional variables. Furthermore, the use of a scalar, while consistent with the extant literature (e.g., Konchitchki and Patatoukas, 2014a), is arguably a conservative research design choice.

**Table 5: Robustness Tests**

Table 5 reports results from regressions of future GDP growth on current quarter aggregate valuation allowance growth. Panel A presents the results of using unscaled VA growth measure, Panel B presents the results after controlling for total assets and deferred tax assets growth, Panel C presents the results after excluding the TCJA, Panel D presents the results after controlling for ETR, and Panel E presents the results after controlling for recession. Panel F presents the results from regression of future recession on current quarter aggregate valuation allowance growth. \*\*\*, \*, and \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

**Panel A: Unscaled Aggregate Valuation Allowance Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth Unscaled</i>	-0.000016 (0.000)	-0.000055*** (0.000)	-0.000063*** (0.000)	-0.000055** (0.000)	-0.000047* (0.000)	-0.000039* (0.000)	-0.000038 (0.000)	-0.000021 (0.000)
<i>Earnings Growth</i>	0.375866 (0.789)	0.889238 (0.882)	-0.498408 (0.999)	0.540371 (1.030)	-0.554806 (1.086)	-1.959365* (1.058)	-0.943896 (1.113)	-0.867891 (1.123)
<i>SPI Growth</i>	0.322289 (1.461)	-2.749565* (1.634)	0.288906 (1.860)	-0.827795 (1.913)	1.103075 (2.018)	2.711299 (1.957)	0.535876 (2.056)	0.397756 (2.073)
<i>Earnings Dispersion</i>	0.050828 (0.108)	-0.133664 (0.121)	0.008422 (0.138)	0.097352 (0.143)	0.036898 (0.150)	-0.286763* (0.145)	0.002974 (0.153)	0.111849 (0.157)
<i>CFNAI</i>	0.025818*** (0.004)	0.013575*** (0.005)	0.006474 (0.005)	0.003329 (0.006)	0.004032 (0.006)	0.003877 (0.006)	0.001419 (0.006)	0.004183 (0.006)
<i>Return</i>	0.004249 (0.020)	0.021897 (0.022)	0.019650 (0.025)	0.034373 (0.026)	0.007426 (0.027)	-0.028751 (0.026)	-0.017535 (0.028)	0.019293 (0.028)
<i>Inflation</i>	0.712606*** (0.264)	-0.125683 (0.295)	-0.400740 (0.333)	-0.499689 (0.344)	0.405557 (0.363)	-0.494754 (0.350)	-0.476051 (0.366)	0.092866 (0.369)
<i>Yield</i>	0.334946 (0.303)	0.073882 (0.339)	-0.125047 (0.382)	0.010756 (0.393)	-0.125848 (0.413)	-0.484184 (0.398)	-0.079941 (0.416)	0.002412 (0.419)
<i>Spread</i>	-0.020655 (0.065)	-0.091973 (0.073)	-0.050361 (0.082)	-0.094273 (0.085)	0.001184 (0.089)	0.008290 (0.086)	0.051513 (0.090)	0.128791 (0.091)
<i>Initial GDP Growth</i>	-0.257588* (0.150)	-0.083269 (0.168)	0.082148 (0.189)	-0.021688 (0.194)	-0.157776 (0.204)	0.032034 (0.197)	0.095117 (0.207)	-0.117603 (0.209)
<i>Intercept</i>	0.053271*** (0.006)	0.052836*** (0.007)	0.048490*** (0.008)	0.050408*** (0.008)	0.052686*** (0.009)	0.053475*** (0.008)	0.045885*** (0.009)	0.048056*** (0.009)
<i>R-squared</i>	0.49	0.36	0.21	0.16	0.08	0.13	0.07	0.07
<i>N</i>	106	105	104	103	102	101	100	99

**Panel B: Controlling for Total Assets and Gross Deferred Tax Assets Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-2.647 (1.955)	-6.451*** (2.217)	-4.519* (2.586)	-5.786** (2.608)	-1.939 (2.759)	-3.509 (2.700)	-5.094* (2.695)	-2.477 (2.842)
<i>TA Denominator Growth</i>	69.239** (30.345)	65.369* (35.975)	74.603* (42.399)	95.722** (42.055)	68.621 (44.495)	96.075** (43.100)	70.178 (43.049)	32.789 (44.705)
<i>Gross DTA Growth</i>	-0.161 (0.178)	-0.206 (0.202)	-0.155 (0.236)	-0.335 (0.235)	-0.674*** (0.253)	-0.385 (0.245)	-0.904*** (0.246)	-0.778*** (0.255)
<i>Earnings Growth</i>	-0.022 (0.787)	0.149 (0.893)	-1.114 (1.048)	-0.298 (1.046)	-1.098 (1.102)	-2.678** (1.084)	-1.878* (1.087)	-1.415 (1.128)
<i>SPI Growth</i>	0.603 (1.451)	-2.783* (1.646)	0.247 (1.936)	-0.456 (1.920)	2.024 (2.015)	3.421* (1.956)	1.879 (1.950)	1.519 (2.023)
<i>Earnings Dispersion</i>	0.051 (0.105)	-0.134 (0.119)	0.004 (0.140)	0.093 (0.140)	0.029 (0.147)	-0.297** (0.142)	0.003 (0.143)	0.111 (0.150)
<i>CFNAI</i>	0.024*** (0.004)	0.014*** (0.005)	0.009 (0.005)	0.003 (0.005)	0.003 (0.006)	0.003 (0.006)	-0.004 (0.006)	-0.000 (0.006)
<i>Return</i>	0.003 (0.020)	0.011 (0.023)	0.012 (0.027)	0.029 (0.027)	0.019 (0.028)	-0.027 (0.027)	-0.008 (0.027)	0.032 (0.028)
<i>Inflation</i>	0.658** (0.259)	-0.202 (0.294)	-0.466 (0.343)	-0.583* (0.341)	0.406 (0.359)	-0.551 (0.345)	-0.489 (0.344)	0.118 (0.357)
<i>Yield</i>	-0.014 (0.335)	-0.192 (0.382)	-0.392 (0.446)	-0.454 (0.442)	-0.697 (0.464)	-1.016** (0.447)	-0.801* (0.446)	-0.537 (0.462)
<i>Spread</i>	0.030 (0.066)	-0.013 (0.075)	0.018 (0.088)	-0.004 (0.087)	0.088 (0.091)	0.089 (0.089)	0.174* (0.088)	0.213** (0.092)
<i>Initial GDP Growth</i>	-0.274* (0.147)	-0.091 (0.167)	0.050 (0.194)	-0.054 (0.193)	-0.238 (0.202)	-0.011 (0.195)	0.050 (0.195)	-0.159 (0.202)
<i>Intercept</i>	0.056*** (0.007)	0.051*** (0.008)	0.049*** (0.009)	0.050*** (0.009)	0.052*** (0.009)	0.055*** (0.009)	0.042*** (0.009)	0.044*** (0.009)
<i>R-squared</i>	0.53	0.39	0.20	0.20	0.14	0.19	0.21	0.16
<i>N</i>	106	105	104	103	102	101	100	99

**Panel C: Excluding the TCJA**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-2.788 (2.205)	-6.774*** (2.468)	-4.351 (2.866)	-4.834* (2.879)	-0.382 (3.049)	-2.404 (2.884)	-3.140 (2.991)	-0.727 (2.987)
<i>Earnings Growth</i>	0.307 (0.863)	0.431 (0.965)	-0.942 (1.121)	0.145 (1.126)	-0.546 (1.193)	-2.234* (1.128)	-1.226 (1.170)	-0.946 (1.168)
<i>SPI Growth</i>	-0.025 (1.531)	-3.448** (1.714)	-0.293 (1.990)	-1.418 (1.999)	0.640 (2.117)	2.384 (2.002)	0.169 (2.077)	0.200 (2.074)
<i>Earnings Dispersion</i>	0.085 (0.117)	-0.108 (0.131)	0.009 (0.152)	0.099 (0.152)	0.035 (0.161)	-0.307** (0.153)	0.003 (0.158)	0.104 (0.158)
<i>CFNAI</i>	0.026*** (0.004)	0.016*** (0.005)	0.011** (0.005)	0.007 (0.005)	0.009 (0.006)	0.007 (0.005)	0.004 (0.006)	0.006 (0.006)
<i>Return</i>	-0.001 (0.021)	0.006 (0.024)	0.009 (0.028)	0.021 (0.028)	0.005 (0.029)	-0.036 (0.028)	-0.027 (0.029)	0.016 (0.029)
<i>Inflation</i>	0.668** (0.277)	-0.138 (0.309)	-0.434 (0.359)	-0.570 (0.361)	0.409 (0.382)	-0.514 (0.362)	-0.505 (0.375)	0.085 (0.375)
<i>Yield</i>	0.388 (0.314)	0.236 (0.351)	-0.004 (0.408)	0.105 (0.409)	-0.056 (0.434)	-0.416 (0.410)	-0.010 (0.425)	0.026 (0.425)
<i>Spread</i>	-0.003 (0.069)	-0.047 (0.077)	-0.015 (0.089)	-0.055 (0.090)	0.014 (0.095)	0.028 (0.090)	0.078 (0.093)	0.136 (0.093)
<i>Initial GDP Growth</i>	-0.247 (0.156)	-0.062 (0.175)	0.078 (0.203)	-0.013 (0.204)	-0.187 (0.216)	0.021 (0.204)	0.100 (0.212)	-0.124 (0.212)
<i>Intercept</i>	0.051*** (0.007)	0.047*** (0.007)	0.044*** (0.009)	0.047*** (0.009)	0.051*** (0.009)	0.052*** (0.009)	0.043*** (0.009)	0.047*** (0.009)
<i>R-squared</i>	0.50	0.36	0.17	0.14	0.04	0.12	0.06	0.06
<i>N</i>	98	98	98	98	98	98	98	98

**Panel D: Controlling for ETR**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-2.735 (1.960)	-6.138*** (2.204)	-4.130 (2.540)	-4.839* (2.563)	-0.272 (2.755)	-2.465 (2.694)	-3.215 (2.872)	-0.717 (2.841)
<i>ETR</i>	-0.012 (0.017)	0.012 (0.019)	0.029 (0.022)	0.048** (0.022)	0.056** (0.023)	0.042* (0.023)	0.011 (0.024)	0.057** (0.024)
<i>Earnings Growth</i>	0.207 (0.803)	0.311 (0.902)	-0.996 (1.044)	-0.099 (1.044)	-0.855 (1.112)	-2.395** (1.092)	-1.287 (1.171)	-1.285 (1.140)
<i>SPI Growth</i>	0.086 (1.458)	-3.270** (1.639)	-0.208 (1.899)	-1.229 (1.890)	0.911 (2.001)	2.514 (1.941)	0.219 (2.067)	0.509 (2.012)
<i>Earnings Dispersion</i>	0.050 (0.108)	-0.130 (0.121)	0.018 (0.141)	0.113 (0.141)	0.048 (0.149)	-0.276* (0.144)	0.006 (0.154)	0.115 (0.153)
<i>CFNAI</i>	0.027*** (0.004)	0.015*** (0.005)	0.008 (0.006)	0.002 (0.006)	0.003 (0.006)	0.002 (0.006)	0.003 (0.006)	0.000 (0.006)
<i>Return</i>	-0.004 (0.020)	0.006 (0.023)	0.011 (0.026)	0.025 (0.027)	0.010 (0.028)	-0.032 (0.027)	-0.025 (0.029)	0.022 (0.028)
<i>Inflation</i>	0.669** (0.266)	-0.163 (0.299)	-0.380 (0.344)	-0.469 (0.343)	0.503 (0.364)	-0.445 (0.351)	-0.481 (0.372)	0.176 (0.363)
<i>Yield</i>	0.434 (0.313)	0.136 (0.352)	-0.143 (0.405)	-0.111 (0.403)	-0.320 (0.425)	-0.613 (0.410)	-0.051 (0.435)	-0.234 (0.423)
<i>Spread</i>	-0.008 (0.066)	-0.041 (0.074)	0.000 (0.086)	-0.033 (0.085)	0.040 (0.090)	0.050 (0.087)	0.083 (0.093)	0.163* (0.091)
<i>Initial GDP Growth</i>	-0.241 (0.150)	-0.062 (0.169)	0.075 (0.195)	-0.015 (0.194)	-0.191 (0.204)	0.027 (0.198)	0.097 (0.210)	-0.134 (0.205)
<i>Intercept</i>	0.056*** (0.009)	0.043*** (0.010)	0.033*** (0.012)	0.028** (0.012)	0.030** (0.012)	0.035*** (0.012)	0.039*** (0.013)	0.025** (0.013)
<i>R-squared</i>	0.50	0.36	0.18	0.18	0.10	0.15	0.06	0.12
<i>N</i>								

**Panel E: Controlling for Recession**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=1</i>	(6) <i>k=2</i>	(7) <i>k=3</i>	(8) <i>k=4</i>
<i>VA Growth</i>	-2.542 (1.955)	-6.057*** (2.170)	-3.948 (2.421)	-4.611* (2.490)	-1.534 (2.028)	-3.961* (2.166)	-3.627 (2.552)	-5.232** (2.627)
<i>Recession</i>	-0.008 (0.011)	-0.020* (0.012)	-0.044*** (0.013)	-0.044*** (0.014)	0.003 (0.013)	0.002 (0.013)	-0.041** (0.016)	-0.050*** (0.016)
<i>VA Growth*Recession</i>					-11.737* (7.027)	-24.283*** (7.507)	-3.661 (8.826)	6.781 (8.938)
<i>Earnings Growth</i>	0.131 (0.801)	0.276 (0.889)	-1.025 (0.995)	-0.004 (1.011)	0.345 (0.804)	0.719 (0.858)	-0.955 (1.013)	-0.139 (1.029)
<i>SPI Growth</i>	0.079 (1.458)	-3.431** (1.618)	-0.636 (1.816)	-1.737 (1.837)	0.165 (1.445)	-3.252** (1.542)	-0.615 (1.825)	-1.773 (1.842)
<i>Earnings Dispersion</i>	0.050 (0.108)	-0.136 (0.120)	0.008 (0.134)	0.090 (0.137)	0.051 (0.107)	-0.134 (0.114)	0.009 (0.135)	0.090 (0.138)
<i>CFNAI</i>	0.024*** (0.005)	0.010* (0.006)	-0.003 (0.006)	-0.007 (0.007)	0.021*** (0.006)	0.003 (0.006)	-0.004 (0.007)	-0.005 (0.007)
<i>Return</i>	-0.005 (0.020)	-0.000 (0.023)	-0.001 (0.025)	0.010 (0.026)	-0.002 (0.020)	0.005 (0.022)	-0.000 (0.026)	0.009 (0.026)
<i>Inflation</i>	0.694** (0.264)	-0.163 (0.293)	-0.381 (0.327)	-0.482 (0.333)	0.585** (0.270)	-0.390 (0.288)	-0.415 (0.339)	-0.422 (0.343)
<i>Yield</i>	0.446 (0.317)	0.382 (0.352)	0.412 (0.392)	0.533 (0.396)	0.410 (0.315)	0.306 (0.336)	0.401 (0.394)	0.553 (0.398)
<i>Spread</i>	-0.012 (0.067)	-0.070 (0.075)	-0.064 (0.083)	-0.105 (0.084)	-0.002 (0.067)	-0.049 (0.071)	-0.061 (0.084)	-0.111 (0.085)
<i>Initial GDP Growth</i>	-0.240 (0.150)	-0.053 (0.167)	0.093 (0.186)	0.004 (0.188)	-0.191 (0.152)	0.047 (0.162)	0.108 (0.190)	-0.024 (0.192)
<i>Intercept</i>	0.051*** (0.006)	0.048*** (0.007)	0.044*** (0.008)	0.046*** (0.008)	0.050*** (0.006)	0.045*** (0.007)	0.044*** (0.008)	0.047*** (0.008)
<i>R-squared</i>	0.50	0.38	0.26	0.23	0.52	0.44	0.26	0.23
<i>N</i>	106	105	104	103	106	105	104	103

**Panel F: Valuation Allowance and Future Recession**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	114.966*** (22.941)	82.027*** (24.379)	32.194 (25.651)	22.254 (26.193)	-2.954 (26.715)	9.484 (26.918)	8.705 (27.112)	-11.042 (27.389)
<i>Intercept</i>	0.121*** (0.027)	0.118*** (0.029)	0.111*** (0.031)	0.111*** (0.031)	0.107*** (0.031)	0.111*** (0.032)	0.112*** (0.032)	0.109*** (0.033)
<i>R-squared</i>	0.19	0.10	0.02	0.01	0.00	0.00	0.00	0.00
<i>N</i>	106	105	104	103	102	101	100	99

## 4.2.2 Uniqueness of the Valuation Allowance Information

To shed light on the uniqueness of the valuation allowance information, I examine whether the valuation allowance provides unique information that cannot be obtained from other sources of management's private information both inside and outside of the accounting system.

First, management forecasts have been shown to provide information about firms' future performance and might also convey information about the macroeconomy (e.g., Bonsall, Bozanic, and Fischer, 2013; Nagar, Schoenfeld, and Wellman, 2019). However, the valuation allowance might provide incremental information over management forecasts due to the unique nature of the information embedded in the valuation allowance. The valuation allowance provides information on a relatively long-time horizon, while management forecast provides information on a relatively short-time horizon and tends to focus on one quarter ahead. Furthermore, the valuation allowance is an audited disclosure, and this third-party verification may possibly increase the reliability of the information. Moreover, the valuation allowance is a mandatory disclosure and firms cannot withhold bad news. However, it is unclear whether a voluntary disclosure is less informative than mandatory disclosure, due to the unraveling process (e.g., Grossman, 1981; Milgrom, 1981).

Second, the allowance for doubtful accounts represents management's estimate of the amount of accounts receivable that will not be paid by customers. To the extent that an expanding (declining) economy increases (decreases) customers' ability to pay



(e.g., Khan and Ozel, 2016), the allowance for doubtful accounts might also provide forward-looking information about the macroeconomy.

Third, banks collect detailed and proprietary information about the financial prospects of their customers to extend and monitor loans. Prior research suggests that credit loss estimates convey information about the ability of borrowers to pay their loans (e.g., Beatty and Liao, 2011; Harris, Khan, and Nissim, 2018). Also, recent research finds that banks' loan portfolio information is predictive of state-level economic growth, and the information embedded in the provision for loan and lease losses is incremental to the information contained in other leading state-level economic indicators (e.g., Khan and Ozel, 2016). Therefore, banks' loan portfolios might convey useful information about future macroeconomic performance.

Fourth, goodwill is recorded when a firm acquires assets and pay a price in excess of identifiable net value. Goodwill impairment arises when there is a deterioration in the ability of acquired assets to generate cash flows such that the fair value of goodwill declines below its book value. Prior literature finds that the announcement of goodwill impairment reveals negative information about the firm and indicates a decline in future profitability (e.g., Li, Shroff, and Venkataraman, 2011). Therefore, goodwill impairment might reflect manager's private information about the firm's adverse future.

I investigate whether aggregate valuation allowance growth provides incremental information beyond management forecasts growth, the allowance for

doubtful accounts growth, banks' loan loss provision growth, and goodwill impairment growth, separately.<sup>12</sup>

The results are reported in Table 6. Panel A presents the results of using aggregate quarterly management forecasts growth and valuation allowance growth.<sup>13</sup> The results in Panel A indicate that the estimated slope coefficients of aggregate valuation allowance growth are negative and significant up to four quarters ahead, while the estimated slope coefficients of aggregate quarterly management forecasts growth are positive for all quarters and statistically significant only at the one quarter ahead forecast horizon. The evidence indicates that management forecasts also convey information about future GDP growth, but this information does not subsume the valuation allowance information.

Panel B presents the results of using aggregate allowance for doubtful accounts growth and valuation allowance growth. The results in Panel B indicate that the estimated slope coefficients of aggregate valuation allowance growth are negative and significant up to four quarters ahead, as previously observed, while the estimated slope coefficients of aggregate allowance for doubtful accounts growth are always statistically insignificant. The evidence suggests that the allowance for doubtful accounts does not convey incremental information about future GDP growth.

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<sup>12</sup> I use the same methodology as aggregate valuation allowance growth to construct aggregate management forecast growth, aggregate allowance for doubtful accounts growth, aggregate loan loss provision growth, and aggregate goodwill impairment growth. See Appendix A for more information.

<sup>13</sup> Management forecasts data is available through IBES. I have access to IBES data only until 2012, therefore, this analysis is based on a smaller sample (75 observations).

One possible reason for the lack of any association between the allowance for doubtful accounts growth and future GDP growth may be the accounting standards effective during the 1993-2019 period. Pre-2019, firms use the incurred loss model to account for their allowance for doubtful accounts, which requires firms to recognize losses only when it is probable a loss has been incurred. Post-2019, firms use the Current Expected Credit Losses (CECL) model, which requires firms to consider a broader range of reasonable and supportable information to inform credit loss estimates, such as future economic conditions.<sup>14</sup> The results suggest that pre-CECL the allowance for doubtful accounts does not incorporate forward-looking information about future macroeconomic performance. Perhaps going forward, the allowance for doubtful account growth will contain meaningful information about future GDP growth, but currently there is not enough data to assess this possibility.

Panel C presents the results of using aggregate banks' loan loss provision growth (*LLP Growth*) and aggregate valuation allowance growth<sup>15</sup>. The results in Panel C indicate that the estimated slope coefficients of aggregate valuation allowance growth are negative and significant up to four quarters ahead, while the estimated slope coefficients of aggregate banks' loan loss provision growth are negative and statistically significant up to three quarters ahead. The evidence indicates that loan loss provision

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<sup>14</sup> In June 2016, FASB issued Accounting Standards Update (ASU) 2016-13, Financial Instruments - Credit Losses (Topic 326). This ASU sets forth the Current Expected Credit Losses (CECL) model, effective on December 15, 2019.

<sup>15</sup> I use all the banks' information in Compustat to construct *LLP Growth*. Appendix A provides more detailed information.

also conveys information about future GDP growth, but this information does not subsume the valuation allowance information.

Panel D presents the results of using aggregate goodwill impairment growth and aggregate valuation allowance growth. The results in Panel D indicate that the estimated slope coefficients of aggregate valuation allowance growth are negative and significant up to four quarters ahead, while the estimated slope coefficients of aggregate goodwill impairment growth are only positive and statistically significant at the one quarter ahead forecast horizon and statistically insignificant at all other horizons. The evidence indicates that goodwill impairment also conveys information about future GDP growth, but this information does not subsume the valuation allowance information.

Collectively, the findings suggest that aggregate valuation allowance growth provides unique forward-looking information about future GDP growth. The information embedded in the valuation allowance cannot be fully obtained from management forecasts, the allowance for doubtful accounts, banks' loan loss provisions, and goodwill impairment. Also, these findings further help to alleviate concerns about the sensitivity of the results to specific research design choices, such as aggregation and weighting, because my other aggregate variables are constructed using the same methodology as aggregate valuation allowance growth.

**Table 6: Uniqueness of the Valuation Allowance Information**

Table 6 reports results from regressions of future GDP growth on current aggregate valuation allowance and other potential sources of managements' private information. Panel A presents the results of using aggregate management forecast growth, Panel B presents the results of using aggregate allowance for doubtful accounts growth, Panel C presents the results of using aggregate banks' loan loss provision growth, and Panel D presents the results of using aggregate goodwill impairment loss growth. \*\*\*, \*, and \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

**Panel A: Comparing to Management Forecasts**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-9.912*** (2.280)	-10.789*** (2.225)	-6.693*** (2.480)	-6.208** (2.478)	-1.237 (2.585)	-2.368 (2.564)	-1.786 (2.575)	-0.466 (2.589)
<i>MFQ Growth</i>	161.741* (86.270)	94.836 (84.185)	101.320 (93.857)	94.223 (93.791)	87.920 (97.841)	27.492 (97.017)	58.597 (97.464)	41.819 (97.981)
<i>Intercept</i>	0.044*** (0.003)	0.043*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.045*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.045*** (0.003)
<i>R-squared</i>	0.24	0.25	0.10	0.09	0.01	0.01	0.01	0.00
<i>N</i>	75	75	75	75	75	75	75	75

**Panel B: Comparing to the Allowance for Doubtful Accounts**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-8.028*** (2.022)	-9.285*** (1.985)	-6.027*** (2.140)	-5.933*** (2.153)	-1.415 (2.260)	-2.150 (2.244)	-1.189 (2.284)	-0.276 (2.287)
<i>ADA Growth</i>	17.114 (13.775)	-2.680 (13.560)	6.188 (14.634)	4.880 (14.681)	15.828 (15.231)	11.273 (15.107)	3.720 (15.335)	-22.135 (15.287)
<i>Intercept</i>	0.045*** (0.002)	0.043*** (0.002)	0.044*** (0.003)	0.044*** (0.003)	0.045*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.043*** (0.003)
<i>R-squared</i>	0.16	0.18	0.08	0.08	0.02	0.02	0.00	0.02
<i>N</i>	106	105	104	103	102	101	100	99

**Panel C: Comparing to Banks' Loan Loss Provision**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-5.895*** (2.156)	-6.503*** (2.086)	-3.947* (2.292)	-5.047** (2.362)	-0.542 (2.497)	-2.747 (2.492)	-1.689 (2.532)	-0.127 (2.567)
<i>LLP Growth</i>	-11.007*** (4.047)	-11.656*** (3.915)	-9.567** (4.295)	-4.167 (4.371)	-4.975 (4.567)	1.468 (4.540)	1.705 (4.600)	1.194 (4.638)
<i>Intercept</i>	0.044*** (0.002)	0.043*** (0.002)	0.044*** (0.002)	0.043*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.20	0.24	0.12	0.08	0.02	0.01	0.00	0.00
<i>N</i>	106	105	104	103	102	101	100	99

**Panel D: Comparing to Goodwill Impairment Loss**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-7.670*** (2.010)	-9.060*** (1.995)	-6.740*** (2.138)	-6.014*** (2.165)	-1.950 (2.274)	-2.662 (2.250)	-1.505 (2.287)	0.487 (2.313)
<i>GW Growth</i>	13.810* (6.998)	2.760 (6.941)	-9.721 (7.427)	0.490 (7.562)	-4.191 (7.915)	-6.028 (7.805)	-5.167 (7.912)	6.706 (7.954)
<i>Intercept</i>	0.044*** (0.002)	0.043*** (0.002)	0.044*** (0.003)	0.044*** (0.003)	0.044*** (0.003)	0.043*** (0.003)	0.044*** (0.003)	0.044*** (0.003)
<i>R-squared</i>	0.18	0.18	0.09	0.07	0.01	0.02	0.01	0.01
<i>N</i>	106	105	104	103	102	101	100	99

### 4.2.3 Valuation Allowance and SPF Forecasts

Next, I examine whether professional macroeconomic forecasters incorporate the valuation allowance information into their GDP growth forecasts. Prior literature finds that professional macroeconomic forecasters do not integrate earnings information into their GDP growth forecasts (e.g., Konchitchki and Patatoukas, 2014a,2014b). For example, Konchitchki and Patatoukas (2014a) find that future GDP growth forecast errors are predictable based on accounting earnings data that is available to professional macroeconomic forecasters, and Nallareddy and Ogneva (2017) find that aggregate earnings growth dispersion predicts future restatements in GDP growth. While professional macroeconomic forecasters might not explicitly include the valuation allowance information in their GDP growth forecasts, they might indirectly include similar underlying information by using other private information, such as the Bureau of Economic Analysis (BEA) survey of financial services. This possibility is observable empirically as Table 2 reveals strong positive associations between SPF forecasts and CFNAI.

To examine whether professional macroeconomic forecasters include the valuation allowance information into their GDP growth forecasts, I use the mean SPF consensus forecast of GDP growth. The SPF is the best and longest publicly available survey of macroeconomic forecasts and has been used in prior research (e.g., Konchitchki and Patatoukas, 2014a, 2014b; Nallareddy & Ogneva, 2017). The consensus SPF forecasts consistently outperform the forecasts of individuals and therefore is the

most appropriate measure for this analysis (e.g., Croushore, 2011). Therefore, I investigate whether aggregate valuation allowance growth is an incremental predictor beyond professional macroeconomic forecasters' predictions of future GDP growth.

The results are reported in Table 7. Panel A suggests that SPF forecasts are informative for one and two quarters ahead, consistent with previous findings (e.g., Konchitchki and Patatoukas, 2014a). Panel B suggests that aggregate valuation allowance growth is superior to SPF forecasts for long-term forecast horizons, as the estimated slope coefficients of aggregate valuation allowance growth are significantly negative up to four quarters ahead, while the estimated slope coefficients of SPF forecasts are significantly positive only for one quarter ahead forecast horizon. Also, the incremental R-squared of aggregate valuation allowance growth for the four quarters ahead forecast horizon is seven percent, accounting for almost one-third of the total R-squared for this forecast horizon. However, the Vuong (1989) test results indicate that the difference in R-squared between the SPF forecasts and aggregate valuation allowance growth is not statistically significant. Panel C suggests that aggregate valuation allowance growth remains significantly negative up to four quarters ahead, after also including accounting and macroeconomic-based controls.<sup>16,17</sup> Overall, the

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<sup>16</sup> Before adding CFNAI as a control variable, the coefficient of SPF forecast is significantly positive, as documented in prior literature (e.g., Konchitchki and Patatoukas, 2014a). However, after including CFNAI, the coefficient of SPF forecast becomes significantly negative. Since CFNAI is based on proprietary data, it is very difficult to know which component of CFNAI leads to these results.

<sup>17</sup> In this analysis, the results indicate that aggregate valuation allowance growth is statistically significant for the first quarter ahead forecast horizon, but only marginally.



findings suggest that professional macroeconomic forecasters do not fully incorporate the valuation allowance information into their long-term GDP growth forecasts.

To be consistent with prior literature (e.g., Konchitchki and Patatoukas, 2014a), I also investigate whether future GDP growth forecast errors are predictable based on aggregate valuation allowance growth. Table 8 presents the results. The findings suggest that aggregate valuation allowance growth is negatively associated with future GDP growth forecast errors for two, three, and four quarters ahead. The cumulative evidence indicates that using different tests leads to a similar conclusion that macro forecasters can benefit from including the valuation allowance information in their GDP growth forecasts.

**Table 7: Valuation Allowance and SPF Forecasts**

Table 7 reports results from regressions of future GDP growth on current quarter aggregate valuation allowance growth, after controlling for current quarter SPF forecast. Panel A presents the results of using only the current quarter SPF forecast, while Panel B adds the valuation allowance growth, and Panel C further adds control variables \*\*\*, \*, and \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

**Panel A: SPF Forecasts and GDP Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>
<i>SPF Forecast (t+1)</i>	0.664*** (0.158)			
<i>SPF Forecast (t+2)</i>		0.785*** (0.232)		
<i>SPF Forecast (t+3)</i>			0.550 (0.352)	
<i>SPF Forecast (t+4)</i>				0.480 (0.440)
<i>Intercept</i>	0.016** (0.007)	0.008 (0.011)	0.019 (0.017)	0.021 (0.022)
<i>R-squared</i>	0.15	0.10	0.02	0.01
<i>N</i>	106	105	104	103

**Panel B: SPF Forecasts versus Aggregate Valuation Allowance Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>
<i>VA Growth</i>	-5.963*** (2.142)	-7.669*** (2.159)	-5.775** (2.325)	-5.847** (2.232)
<i>SPF Forecast (t+1)</i>	0.463*** (0.169)			
<i>SPF Forecast (t+2)</i>		0.396 (0.246)		
<i>SPF Forecast (t+3)</i>			0.156 (0.379)	
<i>SPF Forecast (t+4)</i>				0.129 (0.449)
<i>Intercept</i>	0.024*** (0.008)	0.025** (0.012)	0.037** (0.018)	0.037* (0.022)
<i>R-squared</i>	0.20	0.20	0.08	0.08
<i>VA Growth Incremental R-squared</i>	0.05	0.10	0.06	0.07
<i>Vuong Z</i>	0.87	1.17	1.14	1.2
<i>N</i>	106	105	104	103

Panel C: SPF Forecasts versus Aggregate Valuation Allowance Growth and

Controls

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>
<i>VA Growth</i>	-3.348* (1.825)	-6.876*** (2.208)	-4.870* (2.629)	-5.355** (2.657)
<i>SPF Forecast (t+1)</i>	-0.931*** (0.238)			
<i>SPF Forecast (t+2)</i>		-0.567 (0.364)		
<i>SPF Forecast (t+3)</i>			-0.332 (0.486)	
<i>SPF Forecast (t+4)</i>				-0.125 (0.529)
<i>Earnings Growth</i>	0.930 (0.769)	0.738 (0.923)	-0.724 (1.073)	0.157 (1.093)
<i>SPI Growth</i>	-0.025 (1.355)	-3.583** (1.629)	-0.583 (1.953)	-1.496 (1.980)
<i>Earnings Dispersion</i>	0.068 (0.100)	-0.125 (0.120)	0.023 (0.142)	0.106 (0.146)
<i>CFNAI</i>	0.033*** (0.004)	0.020*** (0.005)	0.012** (0.006)	0.007 (0.005)
<i>Return</i>	0.014 (0.019)	0.010 (0.023)	0.010 (0.027)	0.021 (0.027)
<i>Inflation</i>	0.761*** (0.246)	-0.093 (0.299)	-0.373 (0.354)	-0.531 (0.352)
<i>Yield</i>	0.647** (0.288)	0.354 (0.350)	0.086 (0.408)	0.158 (0.414)
<i>Spread</i>	0.019 (0.061)	-0.033 (0.074)	-0.005 (0.086)	-0.052 (0.087)
<i>Initial GDP Growth</i>	-0.035 (0.150)	-0.028 (0.169)	0.085 (0.196)	-0.007 (0.199)
<i>Intercept</i>	0.081*** (0.010)	0.071*** (0.016)	0.059** (0.023)	0.052** (0.025)
<i>R-squared</i>	0.57	0.37	0.17	0.14
<i>VA Growth Incremental R-squared</i>	0.02	0.06	0.03	0.04
<i>N</i>	106	105	104	103

**Table 8: Valuation Allowance and GDP Growth Forecast Errors**

Table 8 reports results from regressions of future GDP growth forecast error on current quarter aggregate valuation allowance growth. \*\*\*, \*, and \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>
<i>VA Growth</i>	-3.066 (2.020)	-5.300*** (1.978)	-3.601* (2.151)	-4.554** (2.159)
<i>Intercept</i>	0.001 (0.002)	-0.003 (0.002)	-0.004 (0.003)	-0.005** (0.003)
<i>R-squared</i>	0.02	0.07	0.03	0.04
<i>N</i>	106	105	104	103

#### **4.2.4 Valuation Allowance Increases and Decreases**

I next examine whether there is a difference between the information content of the valuation allowance increases and decreases. Kumar and Visvanathan (2003) find evidence that the information content of the valuation allowance decreases is different from the valuation allowance increases. They document that returns responses are stronger for valuation allowance decreases relative to valuation allowance increases and suggest that these results are consistent with prior findings (e.g., Hayn, 1995; Basu, 1997) that earnings decreases (i.e., bad news) are more timely and less persistent than earnings increases (i.e., good news).

Valuation allowance increases and decreases may differ in their information content about future performance due to earnings management and auditors' litigation risk considerations. First, previous studies suggest that managers' decisions to maintain or release the valuation allowance may relate to earnings management considerations (e.g., Burgstahler et al., 2002; Schrand and Wong, 2003; Frank and Rego, 2006). Frank and Rego (2006) find that firms are using the valuation allowance to manage earnings toward the mean analyst forecast. Although most firms might want to overreport earnings, there are occasions when firms might want to underreport earnings (e.g., Jones, 1991). As a result of earnings management, valuation allowance increases or decreases might be biased, and might not reflect managers' private expectations about future taxable income.

Second, prior literature suggests that auditors influence firms' decisions to maintain or release the valuation allowance due to litigation risk considerations (e.g., Drake, Goldman, and Lusch, 2016). DeFond and Zhang (2014) suggest that auditors respond to litigation risk with excessive conservatism. Relatedly, Drake, Goldman, and Lusch (2016) document that Deloitte clients increased their valuation allowance in response to increased auditor scrutiny stemming from a PCAOB inspection report. Further, the Big 4 audit firms have used cumulative pretax book income for the current and preceding two years as evidence regarding the need for a valuation allowance (PwC 2013; KPMG 2007; Ernst & Young 2009; Deloitte 2015). As a result of auditors' litigation risk, valuation allowance increases might be more backward-looking relative to valuation allowance decreases.

The results are reported in Table 9. The findings suggest that separating aggregate valuation allowance into increases and decreases does not yield meaningful insights, probably due to low statistical power.<sup>18</sup> The sample is relatively small and further decomposition of the sample leads to low statistical power tests. For instance, for the one quarter ahead forecast horizon, the sample consists of 56 decreases, 48 increases, and 2 no-changes, out of 106 total valuation allowance observations. The results show that the estimated slope coefficients of aggregate valuation allowance increases and decreases are mostly negative and insignificant. An F-test indicates that the difference

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<sup>18</sup> In this analysis, I decompose aggregate valuation allowance growth to either increases ( $VA\ Growth > 0$ ), decreases ( $VA\ Growth < 0$ ), or no-change ( $VA\ Growth = 0$ ).

between aggregate valuation allowance increases and decreases is not statistically significant. Overall, the current evidence is not sufficient to draw conclusions on the difference between valuation allowance increases and decreases at the macroeconomic-level.



**Table 9: Valuation Allowance Increases and Decreases**

Table 9 reports results from regressions of future GDP growth on current quarter aggregate valuation allowance increases and decreases. The F-statistic results indicate the difference between the valuation allowance decreases and increases coefficients. \*\*\*, \*, and \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth Decreases</i>	-3.030 (2.820)	-2.482 (3.083)	-1.497 (3.695)	-6.260 (3.768)	-1.468 (3.953)	-3.508 (3.749)	-3.391 (3.928)	-3.290 (3.968)
<i>VA Growth Increases</i>	-0.454 (4.095)	-10.461** (4.476)	-8.277 (5.355)	-2.511 (5.671)	3.573 (6.176)	2.497 (5.894)	0.955 (6.150)	7.022 (6.382)
<i>Earnings Growth Decreases</i>	-0.821 (0.988)	-1.207 (1.081)	-1.729 (1.308)	-0.449 (1.334)	-1.985 (1.400)	-3.768*** (1.325)	-2.845** (1.384)	-2.124 (1.399)
<i>Earnings Growth Increases</i>	1.407 (1.133)	2.830** (1.239)	0.532 (1.483)	0.726 (1.531)	1.229 (1.626)	0.064 (1.572)	1.185 (1.658)	0.616 (1.675)
<i>SPI Growth</i>	-0.075 (1.452)	-3.493** (1.584)	-0.356 (1.908)	-1.527 (1.947)	0.376 (2.050)	1.883 (1.950)	-0.301 (2.041)	-0.266 (2.062)
<i>Earnings Dispersion</i>	0.029 (0.108)	-0.169 (0.118)	-0.009 (0.143)	0.082 (0.147)	-0.012 (0.155)	-0.338** (0.146)	-0.045 (0.154)	0.059 (0.158)
<i>CFNAI</i>	0.028*** (0.005)	0.015*** (0.005)	0.009 (0.006)	0.009 (0.006)	0.012* (0.006)	0.011* (0.006)	0.008 (0.006)	0.011* (0.007)
<i>Return</i>	-0.004 (0.020)	0.005 (0.022)	0.008 (0.027)	0.018 (0.027)	0.000 (0.029)	-0.040 (0.027)	-0.030 (0.028)	0.012 (0.029)
<i>Inflation</i>	0.652** (0.264)	-0.280 (0.288)	-0.491 (0.346)	-0.546 (0.354)	0.368 (0.373)	-0.570 (0.352)	-0.564 (0.367)	0.071 (0.371)
<i>Yield</i>	0.417 (0.301)	0.313 (0.328)	0.079 (0.393)	0.146 (0.401)	0.018 (0.420)	-0.338 (0.397)	0.072 (0.414)	0.060 (0.419)
<i>Spread</i>	-0.010 (0.065)	-0.060 (0.072)	-0.020 (0.086)	-0.057 (0.087)	0.005 (0.092)	0.015 (0.087)	0.060 (0.091)	0.122 (0.092)
<i>Initial GDP Growth</i>	-0.227 (0.152)	0.020 (0.166)	0.133 (0.198)	-0.012 (0.202)	-0.167 (0.212)	0.048 (0.201)	0.129 (0.211)	-0.137 (0.213)
<i>Intercept</i>	0.047*** (0.007)	0.042*** (0.008)	0.041*** (0.009)	0.043*** (0.009)	0.044*** (0.010)	0.043*** (0.009)	0.035*** (0.010)	0.041*** (0.010)
<i>R-squared</i>	0.51	0.41	0.19	0.15	0.07	0.16	0.10	0.10
<i>F-TEST</i>	0.21	1.68	0.85	0.24	0.38	0.60	0.29	1.55
<i>N</i>	106	105	104	103	102	101	100	99

#### **4.2.5 Valuation Allowance and Corporate Profits Growth**

As a final analysis, I examine whether the valuation allowance provides information about the portion of GDP growth that pertains to corporate profits. Conceptually, the valuation allowance reflects management expectations of future taxable income, and thus, should provide information about the corporate profit growth component of GDP growth. I decompose GDP growth to its corporate profit growth component and non-corporate profit growth component, by using corporate profit data from the Federal Reserve Bank of Philadelphia, and I investigate the association of aggregate valuation allowance growth with both GDP growth components.

The results are reported in Table 10. Panel A presents the descriptive statistics for corporate profit growth and non-corporate profit growth, as this study is the first, to the best of my knowledge, to decompose GDP growth to its corporate and non-corporate profit growth components. Mean corporate profits growth is 7.94 percent with a standard deviation of 16.90 percent and mean non-corporate profits growth is 4.37 percent with a standard deviation of 2.08 percent. Panel B suggests that aggregate valuation allowance growth is consistently negatively associated with corporate profit growth, up to four quarters ahead. Panel C suggests that aggregate valuation allowance growth is only weakly and inconsistently associated with non-corporate profit growth. Overall, the findings suggest that the documented association of GDP growth and

aggregate valuation allowance growth is driven by the corporate profit growth component of GDP growth.

**Table 10: Valuation Allowance and Corporate Profits Growth**

Table 10 reports results from regressions of future corporate (non-corporate) profits growth on current quarter aggregate valuation allowance. Panel A presents the descriptive statistics of corporate and non-corporate profits growth. Panel B (C) presents the results of using corporate (non-corporate) profits growth as the dependent variable, respectively. \*\*\*, \*, and \* indicate statistical significance at 1, 5, and 10 percent level, respectively, using two-tailed tests. Standard errors are reported in parentheses. The sample includes 107 quarters over the period from 1993 to 2019, excluding Q4:1995 due to a government shutdown. All variables are defined in Appendix A.

**Panel A: Descriptive Statistics**

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>P10</i>	<i>P25</i>	<i>P50</i>	<i>P75</i>	<i>P90</i>	<i>Max</i>	<i>N</i>
<i>Corporate Profits Growth<sub>t</sub></i>	0.0794	0.1690	-0.4727	-0.0825	-0.0171	0.0532	0.1378	0.2898	1.0279	107
<i>Non-Corporate Profits Growth<sub>t</sub></i>	0.0437	0.0208	-0.0486	0.0247	0.0349	0.0469	0.0579	0.0643	0.0825	107

**Panel B: Valuation Allowance and Future Corporate Profits Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	-39.987** (15.576)	-58.976*** (15.915)	-55.441*** (15.483)	-43.085*** (15.316)	-9.770 (16.268)	13.987 (17.360)	2.500 (17.889)	8.399 (18.741)
<i>Earnings Growth</i>	-14.495** (6.381)	-20.656*** (6.518)	-16.799*** (6.366)	-3.792 (6.234)	3.214 (6.549)	2.638 (7.009)	4.817 (7.243)	1.745 (7.463)
<i>SPI Growth</i>	17.000 (11.623)	21.864* (11.871)	5.687 (11.614)	-9.491 (11.317)	-12.881 (11.825)	-3.609 (12.505)	-6.825 (12.854)	4.417 (13.245)
<i>Earnings Dispersion</i>	-0.117 (0.861)	-0.546 (0.879)	-0.064 (0.861)	-0.254 (0.847)	-0.491 (0.883)	-0.396 (0.930)	-0.289 (0.962)	-0.453 (1.008)
<i>CFNAI</i>	0.034 (0.032)	-0.018 (0.033)	-0.075** (0.032)	-0.128*** (0.031)	-0.153*** (0.032)	-0.111*** (0.034)	-0.092*** (0.035)	-0.058 (0.036)
<i>Return</i>	0.101 (0.161)	-0.013 (0.165)	-0.142 (0.161)	0.118 (0.159)	0.161 (0.166)	0.058 (0.175)	-0.048 (0.179)	0.081 (0.184)
<i>Inflation</i>	-0.159 (2.108)	-0.784 (2.153)	-0.715 (2.095)	-6.200*** (2.049)	-2.605 (2.145)	1.536 (2.256)	2.010 (2.310)	1.644 (2.382)
<i>Yield</i>	-5.008** (2.399)	-3.931 (2.452)	-7.113*** (2.380)	-2.893 (2.320)	-2.247 (2.419)	-2.743 (2.543)	1.863 (2.611)	3.311 (2.693)
<i>Spread</i>	1.044** (0.525)	0.755 (0.537)	0.463 (0.522)	0.714 (0.508)	0.172 (0.530)	0.002 (0.561)	0.638 (0.574)	0.726 (0.594)
<i>Initial GDP Growth</i>	1.412 (1.200)	1.388 (1.226)	1.595 (1.190)	1.295 (1.160)	1.671 (1.209)	0.693 (1.274)	0.688 (1.311)	0.117 (1.352)
<i>Intercept</i>	0.045 (0.050)	0.043 (0.052)	0.058 (0.050)	0.051 (0.049)	0.013 (0.051)	0.048 (0.054)	0.010 (0.055)	0.023 (0.057)
<i>R-squared</i>	0.25	0.22	0.28	0.32	0.26	0.19	0.15	0.11
<i>N</i>	106	105	104	103	102	101	100	99

**Panel C: Valuation Allowance and Future Non-Corporate Profits Growth**

<i>Variable</i>	(1) <i>k=1</i>	(2) <i>k=2</i>	(3) <i>k=3</i>	(4) <i>k=4</i>	(5) <i>k=5</i>	(6) <i>k=6</i>	(7) <i>k=7</i>	(8) <i>k=8</i>
<i>VA Growth</i>	2.350* (1.413)	2.477** (1.136)	0.686 (1.083)	-0.862 (1.341)	-2.833* (1.696)	-3.574* (1.958)	-3.611* (2.122)	-3.258 (2.271)
<i>Earnings Growth</i>	1.947*** (0.579)	1.886*** (0.465)	1.074** (0.445)	0.369 (0.546)	-0.359 (0.683)	-1.002 (0.791)	-1.467* (0.859)	-1.621* (0.905)
<i>SPI Growth</i>	-1.709 (1.054)	-2.351*** (0.847)	-1.955** (0.812)	-0.948 (0.991)	-0.683 (1.233)	0.433 (1.411)	0.832 (1.525)	0.382 (1.605)
<i>Earnings Dispersion</i>	0.023 (0.078)	0.007 (0.063)	-0.007 (0.060)	0.017 (0.074)	0.062 (0.092)	0.048 (0.105)	-0.009 (0.114)	0.012 (0.122)
<i>CFNAI</i>	0.016*** (0.003)	0.021*** (0.002)	0.024*** (0.002)	0.025*** (0.003)	0.022*** (0.003)	0.018*** (0.004)	0.014*** (0.004)	0.011** (0.004)
<i>Return</i>	-0.017 (0.015)	0.001 (0.012)	0.008 (0.011)	0.003 (0.014)	0.004 (0.017)	-0.004 (0.020)	-0.008 (0.021)	-0.020 (0.022)
<i>Inflation</i>	0.041 (0.191)	0.164 (0.154)	0.104 (0.147)	0.183 (0.179)	-0.074 (0.224)	-0.277 (0.254)	-0.357 (0.274)	-0.218 (0.289)
<i>Yield</i>	0.944*** (0.218)	0.699*** (0.175)	0.626*** (0.166)	0.485** (0.203)	0.307 (0.252)	0.095 (0.287)	-0.101 (0.310)	-0.294 (0.326)
<i>Spread</i>	-0.101** (0.048)	-0.119*** (0.038)	-0.071* (0.036)	-0.087* (0.045)	-0.040 (0.055)	-0.009 (0.063)	-0.026 (0.068)	0.022 (0.072)
<i>Initial GDP Growth</i>	0.065 (0.109)	-0.012 (0.087)	-0.036 (0.083)	-0.187* (0.102)	-0.140 (0.126)	-0.088 (0.144)	-0.079 (0.156)	-0.061 (0.164)
<i>Intercept</i>	0.037*** (0.005)	0.041*** (0.004)	0.042*** (0.003)	0.049*** (0.004)	0.049*** (0.005)	0.049*** (0.006)	0.050*** (0.007)	0.050*** (0.007)
<i>R-squared</i>	0.59	0.74	0.76	0.65	0.47	0.32	0.22	0.14
<i>N</i>	106	105	104	103	102	101	100	99

## 5. Conclusion

This paper examines whether deferred tax asset valuation allowance growth, as a measure of expected future performance, aggregated at the macroeconomy level, conveys information about future GDP growth. Using hand-collected tax footnote data from publicly traded firms over the 1993 to 2019 period, I find that quarterly aggregate valuation allowance growth is negatively associated with future GDP growth, up to four quarters ahead. This relationship is incremental to existing accounting and macroeconomic GDP growth indicators, especially for forecast horizons longer than one quarter when other indicators are uninformative. Additionally, the findings suggest that aggregate valuation allowance growth provides unique information that cannot be obtained from other sources of management information, such as management forecasts, the allowance for doubtful accounts, banks' loan loss provision, and goodwill impairment. The findings further indicate that the documented association of GDP growth and aggregate valuation allowance growth is driven by the corporate profit growth component of GDP growth. Collectively, the evidence indicates that aggregate valuation allowance growth provides incremental forward-looking information about future GDP growth.

## Appendix A: Variable Definitions

Variable	Definition
<i>VA Growth<sub>t</sub></i>	<p>The year-over-year change in valuation allowance scaled by total assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes the biggest 100 firms' information. Source: Compustat, Calcbench, and manually collected data.</p> $\sum_{i=1}^n \left( \frac{VA_{i,t}}{ATQ_{i,t}} - \frac{VA_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>VA Growth Unscaled<sub>t</sub></i>	<p>The year-over-year change in valuation allowance for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes the biggest 100 firms' information. Source: Compustat, Calcbench, and manually collected data.</p> $\sum_{i=1}^n (VA_{i,t} - VA_{i,t-4}) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>Earnings Growth<sub>t</sub></i>	<p>The year-over-year change in earnings scaled by total assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes all Compustat firms' information. Source: Compustat.</p> $\sum_{i=1}^n \left( \frac{NIQ_{i,t}}{ATQ_{i,t}} - \frac{NIQ_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>SPI Growth<sub>t</sub></i>	<p>The year-over-year change in special items scaled by total assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes all Compustat firms' information. Source: Compustat.</p> $\sum_{i=1}^n \left( \frac{SPIQ_{i,t}}{ATQ_{i,t}} - \frac{SPIQ_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$

<i>Earnings Dispersion<sub>t</sub></i>	<p>The residual from an AR(2) model:</p> $AggEarnDisp_t = \rho_0 + \rho_1 AggEarnDisp_{t-1} + \rho_2 AggEarnDisp_{t-2} + \varepsilon_t,$ <p>where <math>AggEarnDisp_t</math>, <math>AggEarnDisp_{t-1}</math>, and <math>AggEarnDisp_{t-2}</math> are aggregate earnings changes dispersion estimates (standard deviation of firm-level income before extraordinary items changes scaled by total assets for quarter t) for quarters <math>t</math>, <math>t-1</math>, and <math>t-2</math>, respectively. Includes all Compustat firms' information.</p> <p>Source: Compustat.</p>
<i>CFNAI<sub>t</sub></i>	<p>The Chicago Fed National Activity Index is a weighted average of 85 monthly indicators of national economic activity. Source: Federal Reserve Bank of Chicago.</p>
<i>Return<sub>t</sub></i>	<p>The market stock returns for quarter <math>t</math>, using equally-weighted cross-sectional averages. Includes all Compustat firms' information. Source: Compustat.</p> $\frac{1}{n} \sum_{i=1}^n \left( \frac{PRCCQ_{i,t} - PRCCQ_{i,t-1}}{PRCCQ_{i,t-1}} \right)$
<i>Inflation<sub>t</sub></i>	<p>Rate of change in Consumer Price Index (CPIRET) for quarter <math>t</math>. Source: CRSP.</p>
<i>Yield<sub>t</sub></i>	<p>The yield on the one-year constant maturity Treasury bill (B1RET) for quarter <math>t</math>. Source: CRSP.</p>
<i>Spread<sub>t</sub></i>	<p>The yield on the ten-year constant maturity Treasury bond (B10RET) minus the yield on the one-year constant maturity Treasury bill (B1RET) for quarter <math>t</math>. Source: CRSP.</p>
<i>TA Denominator Growth<sub>t</sub></i>	<p>The year-over-year change in one scaled by total assets for quarter <math>t</math>, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes the biggest 100 firms' information.</p>



	<p>Source: Compustat.</p> $\sum_{i=1}^n \left( \frac{1}{ATQ_{i,t}} - \frac{1}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>Gross DTA Growth<sub>t</sub></i>	<p>The year-over-year change in deferred tax assets scaled by total assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes the biggest 100 firms' information. Source: Compustat, Calcbench, and manually collected data.</p> $\sum_{i=1}^n \left( \frac{DTA_{i,t}}{ATQ_{i,t}} - \frac{DTA_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>ADA Growth<sub>t</sub></i>	<p>The year-over-year change in doubtful accounts scaled by total assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes the biggest 100 firms' information. Source: Compustat.</p> $\sum_{i=1}^n \left( \frac{RECDQ_{i,t}}{ATQ_{i,t}} - \frac{RECDQ_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>MFQ Growth<sub>t</sub></i>	<p>The year-over-year change in quarterly management forecast scaled by total assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes the biggest 100 firms' information. Source: IBES.</p> $\sum_{i=1}^n \left( \frac{CIG\_EST_{i,t}}{ATQ_{i,t}} - \frac{CIG\_EST_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>LLP Growth<sub>t</sub></i>	<p>The year-over-year change in quarterly banks' loan loss provision scaled by total assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes all Compustat firms' information. Source: Compustat.</p> $\sum_{i=1}^n \left( \frac{PLLQ_{i,t}}{ATQ_{i,t}} - \frac{PLLQ_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>GW Growth<sub>t</sub></i>	<p>The year-over-year change in quarterly goodwill impairment scaled by total</p>

	<p>assets for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes all Compustat firms' information. Source: Compustat.</p> $\sum_{i=1}^n \left( \frac{GDWLIPQ_{-i,t}}{ATQ_{i,t}} - \frac{GDWLIPQ_{i,t-4}}{ATQ_{i,t-4}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>ETR</i>	<p>The quarterly effective tax rate for quarter t, using value-weighted cross-sectional averages with weights based on market capitalization of each quarter. Includes all Compustat firms' information. Source: Compustat.</p> $\sum_{i=1}^n \left( \frac{TXTQ_{-i,t}}{PIQ_{i,t}} \right) \left( \frac{PRCCQ_{i,t} * CSHOQ_{i,t}}{\sum_{i=1}^n PRCCQ_{i,t} * CSHOQ_{i,t}} \right)$
<i>Recession</i>	Indicator for recession. Source: Federal Reserve Bank of Philadelphia.
<i>SPF Forecast<sub>t</sub></i>	Survey of Professional Forecasters median GDP forecast for quarter t. Source: Federal Reserve Bank of Philadelphia.
<i>Initial GDP Growth<sub>t</sub></i>	The initially available nominal GDP growth (NGDP) estimate for quarter t. The initial estimate of GDP growth is unavailable for Q4:1995, due to a government shutdown, Source: Federal Reserve Bank of Philadelphia.
<i>GDP Growth<sub>t</sub></i>	Final vintage value of nominal GDP growth for quarter t. Seasonally adjusted annual growth rate. Source: Federal Reserve Bank of Philadelphia.
<i>Corporate Profit Growth<sub>t</sub></i>	Final vintage value of nominal corporate profits for quarter t. Using billions of dollars seasonally adjusted (NCPROFAT) to calculate corporate profits growth rate. Source: Federal Reserve Bank of Philadelphia.
<i>Non-Corporate Profit Growth<sub>t</sub></i>	Final vintage value of the non-corporate profits portion of GDP growth for quarter t. Using billions of dollars seasonally adjusted GDP and corporate

	profits to calculate the non-corporate profits growth rate. Source: Federal Reserve Bank of Philadelphia.
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## Appendix B: General Motors

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United States, Canada and Germany: — In the third quarter of 2007, we recorded a charge of \$39 billion related to establishing full valuation allowances against our net deferred tax assets in the U.S., Canada and Germany. Concluding that a valuation allowance is not required is difficult when there is significant negative evidence which is objective and verifiable, such as cumulative losses in recent years. We utilize a rolling twelve quarters of results as a measure of our cumulative losses in recent years. We then adjust those historical results to remove certain unusual items and charges. In the U.S., Canada and Germany our analysis indicates that we have cumulative three year historical losses on an adjusted basis. This is considered significant negative evidence which is objective and verifiable and therefore, difficult to overcome. In addition, our near-term financial outlook in the U.S., Canada and Germany deteriorated during the third quarter. While our long-term financial outlook in the U.S., Canada and Germany remains positive, we concluded that our ability to rely on our long-term outlook as to future taxable income was limited due to uncertainty created by the weight of the negative evidence, particularly:

- The possibility for continued or increasing price competition in the highly competitive U.S. market. This was seen in the external market in the third quarter of 2007 when a competitor introduced its new fullsize trucks and offered customer incentives to gain market share. Accordingly, we increased customer incentives on our recently launched fullsize trucks, which were not previously anticipated;
- Continued high fuel prices and the possible effect that may have on consumer preferences related to our most profitable products, fullsize trucks and utility vehicles;
- Uncertainty over the effect on our cost structure from more stringent U.S. fuel economy and global emissions standards which may require us to sell a significant volume of alternative fuel vehicles across our portfolio;
- Uncertainty as to the future operating results of GMAC's Residential Capital, LLC mortgage business, and
- Acceleration of tax deductions for OPEB liabilities as compared to prior expectations due to changes associated with the Settlement Agreement.

Accordingly, based on our current circumstances and uncertainty regarding our future taxable income, we recorded full valuation allowances against these net deferred tax assets during the third quarter of 2007. If and when our operating performance improves on a sustained basis, our conclusion regarding the need for full valuation allowances could change, resulting in the reversal of some or all of the valuation allowances in the future.

Temporary differences and carryforwards that give rise to deferred tax assets and liabilities are comprised of the following:

	December 31,			
	2007		2006	
	Deferred Tax	Deferred Tax	Deferred Tax	Deferred Tax
	Assets	Liabilities	Assets	Liabilities
	(Dollars in millions)			
Postretirement benefits other than pensions	\$ 17,726	\$ —	\$ 18,721	\$ —
Pension and other employee benefit plans	2,582	6,618	5,044	6,137
Warranties, dealer and customer allowances, claims and discounts	4,148	54	4,070	47
Depreciation and amortization	7,108	4,536	6,098	2,008
Tax carryforwards	14,148	—	13,293	—
Lease transactions	—	136	—	199
Miscellaneous U.S.	7,799	1,556	8,240	2,194
Miscellaneous non-U.S.	2,598	37	2,992	40
Subtotal	56,109	12,937	58,458	10,625
Valuation allowances	(42,489)	—	(6,523)	—
Total deferred taxes	13,620	\$ 12,937	51,935	\$ 10,625
Net deferred tax assets	\$ 683	—	\$ 41,310	—

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## **Biography**

Shiran Vaknin Froymovich earned a bachelor's degree in Economics and Management (summa cum laude), during her high school, from the Open University of Israel, and a master's degree in Economics from the Ben-Gurion University of the Negev.