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Katharine Drake
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will discuss

"Does Firm Life Cycle Explain the Relation Between Book-Tax Differences and Earnings Persistence?"

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Does Firm Life Cycle Explain the Relation Between Book-Tax Differences and Earnings Persistence?

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Does Firm Life Cycle Explain the Relation Between Book-Tax Differences and Earnings Persistence?

Abstract

Existing literature consistently documents a relationship between book-tax differences and future financial performance. Specifically, large book-tax differences are associated with lower earnings persistence. I contend that one reason the tax information contained in financial statements is informative about future earnings is that the relationship between book and taxable income captures information about a firm's life cycle stage.

I use fundamental analysis to group firm-year observations into life cycle stages using two measures of life cycle from the literature. I document a link between book-tax differences and firm life cycle and I build on prior studies which find a relation between earnings persistence and book-tax differences, and earnings persistence and firm life cycle. I find that after controlling for firm life cycle stage, the association between large positive and large negative book-tax differences and lower earnings persistence does not hold. My results offer an economically based explanation for the relation between book-tax differences and earnings persistence as an alternative explanation to prior research.

To ensure that my findings are not merely proxying for earnings management, I document that firm life cycle explains variation in book-tax differences and the observed relationship between book-tax differences and future earnings above and beyond earnings management.

Keywords: Book-tax differences, earnings persistence, firm life cycle

Does Firm Life Cycle Explain the Relation Between Book-Tax Differences and Earnings Persistence?

I. Introduction

Extant literature consistently finds an association between book-tax differences (BTD)[1] and both the persistence of accruals and earnings (Hanlon 2005) and future earnings growth (Lev and Nissim 2004). These findings are appealing to researchers and investors alike in that understanding the information in BTD enhances the informativeness of reported financial statement information. While researchers consistently document a relation between this tax fundamental and financial performance, the explanation for this association remains unclear. Specifically, what is it about BTD that relate to earnings persistence or future earnings growth? The consensus among researchers is that BTD can arise from a number of different sources including inherent differences between the tax and financial reporting systems, upwards earnings management, and tax planning strategies (Hanlon 2005; Lev and Nissim 2004; Blaylock et al. 2012). These prior studies do not provide an economic framework as to why the information contained in BTD is associated with future earnings. I offer life cycle theory as an explanation for why BTD are associated with future earnings.

Fundamental to this explanation is the hypothesis that BTD will vary predictably over the life of the firm. Life cycle research uses fundamental analysis to identify stages across firm-year

[1] Throughout the paper, I use the term book-tax differences to represent the differences between a firm's "book" income as reported following GAAP for financial statement reporting and its taxable income. Taxable income is an estimate of a firm's taxable income from information in the financial statements. Actual income reported to taxing authorities is not observable, and thus must be estimated by researchers and investors from information contained in the financial statements.

observations (i.e. introduction, growth, maturity and decline).[2] I document expected variation in firm performance, including sales, ROA, cash flows and earnings persistence across life cycle stages. Because firms engage in fundamentally different transactions depending on their life cycle stage, and because these transactions map into financial reporting and tax reporting differently, I expect BTD will vary across firm life cycle. I contend that BTD are a function of the natural course of business, capturing growth and decline, and are thus associated with earnings persistence. Specifically, in an introduction growth phase, firms tend to increase operations and acquire assets and investments. Increases in estimates and depreciation and amortization increase the level of book-tax differences without necessarily increasing tax aggressiveness or indicating earnings management. Mature firms are often thought of as "steady state," not growing nor declining. Firms in a decline phase tend to reduce operations and sell assets. These actions reduce the level of book-tax differences incurred, again, without necessarily affecting the level of tax aggressiveness. Inherently, life cycle captures growth or decline in firm performance. Thus, I expect, and find, that temporary book-tax differences will vary predictably across life cycle stages.[3]

I test whether the relation between BTD and firm life cycle explains the negative relation between large BTD and earnings persistence. I document a link between BTD and firm life cycle. I then build on prior studies that find a relation between earnings persistence and BTD, and between earnings persistence and firm life cycle. I find that, controlling for firm life cycle stage, the association between large positive and large negative BTD and lower earnings persistence does

[2] Life cycle studies refer to the phases by varying names, and measures.

[3] Permanent differences between GAAP and tax are those in which items of income or expense are included in one measure but never in the other. Temporary differences, however, differ only in the *timing* of recognition of the income or expense between the two reporting systems. Permanent differences between book and tax are not necessarily associated with firm growth or decline, and therefore I do not expect permanent differences to vary predictably across life cycle stages. Lev and Nissim (2004), Weber (2009) and other studies consider the ratio of book to (estimated) taxable income, capturing both temporary and permanent differences. While their results are consistent with a life cycle theory of the firm, there is no intuition regarding permanent differences across life cycle stages of the firm, and thus I focus on temporary differences.

not hold. My results offer an alternative, economically based, explanation for the relation between BTD and earnings persistence as an alternative explanation to prior research.

To ensure that my findings are not merely proxying for a prior explanation of the relation between BTD and earnings (e.g. earnings management), I test whether the association between the earnings management measure in Blaylock et al. (2012) and positive BTD is at least partially explained by life cycle stage. I find that firm life cycle explains variation in BTD and the observed relation between BTD and future earnings above and beyond earnings management.

This study makes three contributions. I contribute to the literature on book-tax differences by providing an economic framework (firm life cycle) for the results in prior research regarding the well-documented link between BTD and future earnings. Graham et al. (2010) comment that "we find it puzzling that the tax information in the financial statements can simultaneously communicate so little about a firm's actual taxes (as asserted by practitioners) and still influence analysts, explain future earnings and predict share prices, among other things..." (page 82). These authors call for researchers to identify *how* and *why* tax information informs investors about future earnings. Similarly, Hanlon and Heitzman (2010) call for future research to examine the source of the information contained in BTD about future earnings. I contend that one reason the tax information contained in financial statements is informative is that it captures information about a firm's life cycle stage.

My study also adds to the life cycle literature by documenting another facet of firm performance (the relation between book and taxable income) that varies with firm life cycle. By expanding our understanding of BTD this study also complements prior literature that examines

tax behavior in value and glamour firms by examining tax behavior across firm life cycle. (e.g. Paprocki and Schnee 2004)

Finally, my study adds to the tax literature by providing an explanation as to why some firms appear to avoid more taxes than others. BTD measure temporary book-tax differences and thus high levels of BTD are associated with low cash effective tax rates (ETR), a measure of tax avoidance, resulting from the deferral of tax expense. Dyreng et al. (2008) observe variation in the level of tax avoidance among firms, proxied by cash ETR, even within the same industry. I document that both BTD and cash ETR vary systematically across life cycle stages. While different firms have different objectives and opportunities for tax planning and tax avoidance, I also suggest that BTD (and, thus, the observed level of tax avoidance) varies across firm life cycle. Historically, researchers use BTD as a measure of tax avoidance and tax aggressiveness. BTD are associated with predicting tax sheltering (Wilson 2009), are a determinant of uncertain tax positions (Cazier et al. 2009), and are subject to scrutiny by regulators (Badertscher et al. 2009; Cloyd 1995; Mills 1998). This prior literature suggests that BTD indicate aggressive, illegitimate or uncertain tax positions. I offer evidence that cross-sectional variation in cash ETR and BTD results from fundamental differences in economic transactions at different stages of a firm's life cycle and not merely by aggressive behavior alone.

II. Literature Review and Hypothesis Development

Sources of book-tax differences

Firms report earnings to investors in accordance with GAAP and to the taxing authorities by the rules and regulations set forth under law. Atwood et al. (2010) identify reasons for differences in book and tax reporting, including, "financial accounting rules are generally based on

the conservatism and matching principles whereas tax accounting rules are based on the ability-to-pay principle, with incentives for taxpayers to engage in specific economic activities" (page 114). There are numerous differences between GAAP and tax reporting, including temporary differences (depreciation, estimates and reserves) and permanent differences (tax exempt income, non-deductible expenses). Permanent differences between GAAP and tax are those in which items of income or expense are included in one measure but never in the other. Temporary differences, however, differ only in the *timing* of recognition of the income or expense between the two reporting systems. One of the characteristics of GAAP accounting principles is conservatism, that is, recognizing losses when probable and measurable, and using forward-looking estimates to establish reserves. The tax code, however, does not allow for deductions until economic performance occurs or losses are realized, giving rise to temporary differences between book income and tax income.

Appendix A provides a summary of a number of common temporary differences between book and tax reporting and their anticipated effect on earnings persistence. By their nature, temporary differences have increasing and decreasing effects on the level of BTD. Appendix A outlines, in general, sources of BTD and whether the underlying transactions give rise to positive BTD (book income greater than taxable income) or negative BTD (taxable income greater than book income).

Beyond the different reporting requirements for each system, BTD are affected by earnings management activities creating non-conforming[4] BTD (Badertscher et al. 2009; Blaylock et al. 2012; Ayers et al. 2009) and tax planning strategies (Blaylock et al. 2012; Ayers et al. 2009). It is

[4] Badertcher et al. (2009) distinguish between conforming earnings management, that affects reported book and taxable income equally, and non-conforming earnings management that creates a book-tax difference.

precisely the subjectivity involved in GAAP reporting that leads researchers to consider earnings management as a source of BTD. Of course, most firms' BTD in any given year will be a combination of firm specific effects, inherent differences between book and tax reporting, any non-conforming earnings management activities and tax planning strategies.

Given the number of different channels through which BTD can arise, researchers have struggled to interpret the economic meaning of firms' BTD and the means through which it relates to future earnings.

Informativeness of book-tax differences

Beginning with Lev and Nissim (2004) and Hanlon (2005), a stream of literature examines whether BTD provide information regarding future financial performance.[5] Hanlon (2005) documents a negative association between earnings persistence and large positive and large negative BTD, which she measures using only temporary BTD. She finds that pre-tax earnings are less persistent for firm-years with large negative and large positive BTD and suggests her findings may be driven by firm characteristics, tax planning, or earnings management. To further examine whether her results are driven by earnings management, she also tests and finds that accrual earnings are less persistent for firm-years with large positive and large negative BTD.

Similarly, Lev and Nissim (2004) identify a positive relation between the ratio of taxable income to book income and future earnings growth. They find that deferred tax expense is positively related to subsequent earnings growth.[6] Lev and Nissim's (2004) measure incorporates

[5] For a summary of the existing literature, see Hanlon and Heitzman (2010).

[6] Lev and Nissim (2004) create a deferred tax fundamental, R_DEF, defined as a multinomial variable of industry-year quintile rankings of the negative of the ratio of deferred tax expense to total assets. They find this fundamental is negatively associated with earnings growth in the post-SFAS 109 period. Thus, higher levels of deferred tax expense are associated with higher levels of earnings growth.

both temporary BTD (captured in their deferred tax fundamental) and permanent BTD (captured by their tax fundamental). Their tests indicate that both measures capture information relevant for future earnings growth. Lev and Nissim (2004) attribute their findings to inherent differences between the two reporting systems, earnings management, or smoothing of taxable income.

Other studies examine the informativeness of BTD to firm stakeholders. Ayers et al. (2010) find that both positive and negative changes in BTD are associated with decreases in firm credit ratings. They infer the change in BTD is associated with decreased earnings quality and thus informative to debt holders. Similarly, Comprix et al. (2011) show that large BTD are associated with market participants' uncertainty as measured by share turnover, analyst forecast dispersion, and stock return variance.

Subsequent studies further consider the source of the BTD-persistence relation. Seidman (2010) finds that GAAP changes and changes to general macroeconomic business conditions affect the relation between BTD and earnings persistence. Jackson (2011) finds that temporary BTD are related to changes in future pre-tax income. The subjectivity involved in GAAP reporting leads researchers to consider earnings management as a source of BTD. For example, Blaylock et al. (2012) suggest that the relation between large positive BTD and lower earnings persistence found in Hanlon (2005) is explained by earnings management. They test and find that firm-years with large positive BTD likely arising from upwards earnings management exhibit lower earnings persistence than other firms with large positive BTD.

Guenther (2011) also investigates the causes of the BTD-earnings persistence relation in Hanlon (2005). He identifies certain influential observations that drive her results. He uses "data snooping" in order to identify observations with data coding errors and observations that impact

Hanlon's findings. Guenther finds that young firms, small firms, firms with high levels of ROA, and firms with larger transitory items (gains/losses) drive the relation between large BTD and less persistent earnings. Although his findings result from "data snooping,"[7] they support the notion that firm performance, age and disposition of assets impact the relation between BTD and earnings persistence.

What is it about BTD that relate to earnings persistence or future earnings growth? And how is the market able to appropriately assess this relation? Hanlon and Heitzman (2010) comment "the evidence to date suggests that book–tax differences provide information about current and future earnings (e.g., earnings persistence and future earnings growth) and potentially indicate pre-tax earnings management" (Hanlon and Heitzman 2010, pg. 128). I posit that BTD will vary predictably over the life of a firm and that life cycle explains the earnings persistence variation across BTD groups.

Life Cycle

The life cycle theory of the firm (Mueller 1972) is concerned with how a firm grows, matures, and declines. A different construct than "product" or "industry" life cycle, "firm" life cycle considers the firm as a combination of "many overlapping, but distinct, product life cycle stages" (Dickinson 2011, page 1970). The goal of life cycle analysis is to use fundamental analysis to group firm-years into similar categories and then use these categories as a framework for analyzing how varying incentives, constraints and strategies over a firm's life cycle are related to firm decisions and performance outcomes. Black (1998) notes, "firm-years in a given life cycle stage are relatively more homogenous across multiple financial characteristics than a pooling of all

[7] While Guenther's results suggest that Hanlon's findings arise from a small sample of outliers, Blaylock et al. (2012) find that Hanlon's results hold in their sample, which covers a different time period. Similarly, in my tests, Hanlon's results hold outside her original sample period.

firm-years" (page 40). In sum, life cycle provides an alternative economic framework in which to study firms.

Life cycle studies cross many disciplines. A number of studies examine strategy (Miller and Friesen 1984; Jawahar and McLaughlin 2001), governance (Ramaswamy et al. 2007; Chiang et al. 2011), incentives (Liao 2008), discretionary accruals (Liu 2008), employee stock options (Bens et al. 2002), research and development and capital expenditures (Ahmed and Jinan 2011), and firm payout policy (Coulton and Ruddock 2011) across life cycle stages. My study is the first to examine how tax outcomes, specifically BTD, vary across firm life cycle stages.

Life Cycle and Book-Tax Differences

Appendix B summarizes firm characteristics of the life cycle phases as documented in prior literature.[8] Firms in introductory and growth phases of a life cycle are characterized by investment in capital expenditures, acquisition of subsidiaries, and a focus on sales growth (Spence 1979; Jenkins et al. 2004). Mature firms often focus on efficiencies and are characterized by steady state earnings (Black 1998). In shakeout and decline phases, firms dispose of assets (Dickinson 2011) and focus on cost minimization (Jenkins et al. 2004). Because firms in difference phases of life cycle engage in fundamentally different economic transactions with different book and tax treatments, I build on these differences and examine BTD across life cycle stages.

In considering anticipated firm behavior across life cycle stages, I focus on temporary book-tax differences. Poterba et al. (2010) examine firm tax footnotes in detail and tabulate sources of deferred tax assets and liabilities. They find that temporary differences related to

[8] See discussion in section IV regarding the measures of life cycle.

property and equipment are the largest source of deferred tax liabilities. Appendix A summarizes common sources of temporary differences between GAAP and tax reporting and the anticipated impact on BTD (e.g., giving rise to a negative or positive BTD). For example, the addition of property and equipment will result in positive BTD from the use of accelerated depreciation for tax purposes but not for book purposes (thus book income is greater than taxable income so the BTD is positive). However, the disposition of property and equipment with tax accumulated depreciation in excess of book accumulated depreciation results in a negative BTD. Thus, growth firms are expected to have increasing BTD, and shakeout/decline firms are expected to have decreasing or negative BTD.

Growth firms are characterized by increasing operations, increases in accounts receivable and inventory, large positive accruals (Liu 2008), sales growth (Black 1998), high capital expenditures (Black 1998), high overall levels of investment (Spence 1979), and incentive/stock based compensation plans (Liao 2008; Bens et al. 2002). All of these transactions are associated with deferral of income for tax purposes. Increases in accounts receivable and inventory lead to estimates of allowances, creating differences between book and taxable income. Capital expenditures create deferred tax liabilities associated with accelerated depreciation for tax reporting but not for book reporting (so book income is greater than taxable income). Deferrals of income for tax purposes generate positive BTD. I anticipate that as firms grow they will generate positive BTD. Because book-tax differences are related to firm behaviors across the growth phase of life cycle, I hypothesize:

H1a: During the growth phase of a firm's life cycle, pre-tax book income will be higher than estimated taxable income (positive BTD).

As firms mature, they are characterized by a lower level of investment and innovation (Aharony et al. 2006, Chiang et al. 2011), lower levels of sales growth, and more persistent net income (Black 1998). Where firms in a growth stage have significant increases in investment and firms in a decline stage dispose of assets, mature firms replace assets as needed, generating smaller differences between book and taxable income. The tax effects of the firms' anticipated strategy and income in mature firms are expected to be relatively constant. Likewise, mature firms are more stable, and likely invest in tax planning. Given the anticipated increasing positive BTD in the growth period, I expect firms will also have positive BTD in the maturity phase.

H1b: During the maturity phase of a firm's life cycle, pre-tax book income will be higher than estimated taxable income (positive BTD).

Shakeout or decline firms are characterized by changes in strategy designed to revitalize the firm. These firms reduce investment, and in some cases, dispose of assets to generate cash flows (Dickinson 2011). Decline firms have large negative accruals as the volume of transactions decreases and reserves are reduced (Liu 2008). Low profitability, combined with reversal of previously deferred taxable income will result in taxable income increasing and book income decreasing. Thus, I hypothesize:

H1c: During the decline phase of a firm's life cycle, pre-tax book income will be lower than estimated taxable income (negative BTD).

Together, H1a, H1b and H1c posit that firm life cycle is associated with cross-sectional variation in BTD.

Life Cycle and Earnings Persistence

Jenkins et al. (2004) create a link between a firm's focus and strategy and the value relevance placed by investors on earnings components. They highlight that firms focus on different strategic actions in growth, maturity, and decline phases. In a growth phase firms are focused on changes in sales, and the authors document that the value relevance of a change in sales is relatively greater than other stages. Similarly, mature firms change focus from growth in sales to growth in profitability, and value relevance of changes in profitability increase relative to sales growth. Lastly, for firms in decline, firm strategy focuses on increases in profitability, which is reflected in the value relevance of changes in profitability.

Thus, in considering the earnings persistence expectation for growth firms, I rely on the link created by Jenkins et al. (2004) between firm strategy and market valuation. Market participant evaluate firms based on reliable predictors of future earnings. Growth firms are increasing in complexity (Liao 2008) and focused on innovation (Chiang et al. 2011). Value relevance studies identify sales (Black 1998) and cash flows (Aharony et al. 2006) as more value relevant than bottom line profitability in the growth stage. Thus, if growth firms are focused on factors other than profitability, and if market participants place less value on current earnings as a predictor of future earnings, I expect variation in future earnings for growth firms. Some growth firms will grow both sales and earnings, while others will grow sales only.

In contrast, mature firms are focused on cost minimization (Jenkins et al. 2004) and profitability (Black 1998). Dickinson (2011) finds that mature firms have the highest levels of after-tax earnings persistence. Further, during the mature phase, investors value earnings more

than in the growth phase (Black 1998). Given this relation between firm strategy and market valuation, I verify that the results of Dickinson's tests hold for pre-tax earnings and hypothesize:

H2a: During the growth phase of a firm's life cycle, pre-tax book income will be less persistent than during the maturity phase.

Unlike mature and growth firms, firms in a shakeout or decline phase are focused on recovery or survival. They often look for efficiencies and cost minimization strategies (Jenkins et al. 2004). Declining firms face low profit margins, low earnings (Miller and Friesen 1984; Black 1998), and investors again focus on cash flows as a signal of profitability (Black 1998). Given the nature of these firms' focus and investor valuation, I hypothesize:

H2b: During the shakeout/decline phase of a firm's life cycle, pre-tax book income will be less persistent than during the maturity phase.

Life Cycle, Book-Tax-Differences and Earnings Persistence

Hanlon and Heitzman (2010) review existing literature and comment that

> "The evidence to date suggests that book-tax differences provide information about current and future earnings (e.g. earnings persistence and future earnings growth)… Recent research partitions the book-tax differences to hone in on the underlying causes of these relations" (Hanlon and Heitzman 2010, pg. 128).

If, as suggested in the hypotheses above, earnings persistence varies across both life cycle stage and BTD, and BTD are associated with life cycle, I contend that the observed relation between BTD and earnings persistence are driven, at least in part, by life cycle stage. Stated otherwise, the reason BTD are informative about future earnings is that BTD capture, to some extent, firm life cycle.

Blaylock et al. (2012) suggest that the relation between large positive BTD and lower earnings persistence found in Hanlon (2005) is explained by earnings management. However, upwards earnings management cannot be sustained over long periods of time (Fedyk et al. 2011; Allen et al. 2009), and earnings management measures are often subject to measurement error and bias, especially in phases of extreme growth (Kothari et al. 2005). I contend that life cycle offers an alternate explanation for Hanlon's findings. I expect BTD are a function of the natural course of business, capturing growth and decline, and are thus informative about future earnings.

Hanlon (2005) finds that firm years with large positive and large negative BTD are associated with less persistent earnings. If the relation between book and taxable income is predictable across life cycle stages, the earnings persistence information contained in book-tax differences will also vary across life cycle stage. If BTD vary predictably across life cycle stage, and both BTD and life cycle stage are associated with earnings persistence, I hypothesize:

H3: Controlling for firm life cycle stage, firm-years with large positive or large negative book-tax differences will not be associated with lower earnings persistence.

III. Sample selection

I begin with a sample of firm-years from 1994-2010 in the intersection of CRSP and COMPUSTAT that are incorporated in the U.S., excluding financial institutions and utilities.[9] Consistent with other BTD studies, my study begins after the implementation of SFAS 109 *Accounting for Income Taxes* in 1993 to ensure consistent accounting for temporary book-tax differences across my sample time period. I require firms to have all regression variables, and, consistent with Hanlon (2005) and Blaylock et al. (2012), I exclude firms-year observations with

[9] Similar to other tax studies, I exclude financial institutions and utilities (SIC codes 4900-4999 and 6000-6999) because firms in regulated industries face a fundamentally different set of tax/non-tax trade-offs.

negative pre-tax income, reported net operating loss, or negative current tax expense, as the measure of BTD for these firms has different meaning for these observations. As discussed in Hanlon (2005), tax losses result in deferred tax assets, that "obscure the effects of 'true' book-tax differences in the deferred tax expense account" (page 144). Because I am interested in examining true book-tax differences arising from the firm's transactions, I incorporate the same screens as Hanlon(2005). After incorporating the required screens to construct the life cycle measures described below, my final sample consists of 21,453 firm-year observations consisting of 4,358 unique firms.

IV. Research Design and Methodology

Life cycle measures

To capture firm life cycle I draw on two distinctly different life cycle measures from the literature. See Appendix C for details of the construction of both measures. Anthony and Ramesh (1992), hereafter A&R, construct a measure of life cycle that incorporates a firm's five year history of four characteristics age, sales growth, dividend growth, and capital expenditures.[10] Under A&R's methodology, each year firms are assigned scores based on their relative ranking of these four characteristics. The scores for each of the four characteristics are then combined into a composite score so that each firm-year observation can be categorized into one of the following life cycle stages: growth, growth/maturity, maturity, maturity/stagnant, and stagnant phases of life cycle.[11]

In a recent study, Dickinson (2011) forms an alternative measure of a firm's life cycle

[10] By construction, requiring a five year history of these variables removes true "introduction stage" firms from the sample. However, due to the uncertainty involved in this stage, most studies do not focus on the introduction stage (Black 1992).

[11] See robustness checks in Section V for additional life cycle measures and modifications to the Anthony and Ramesh (1992) measure.

using cash flow patterns from operations, investing and financing activities. The cash flow model builds on the combination of the sign of each of the three components of the cash flow statement to categorize firms into one of five life cycle stages: introduction, growth, maturity, shakeout, and decline stages. For example, growth firms are associated with *positive* cash flows from operations, *negative* cash flows from investing activities, and *positive* cash flows from financing activities. Similarly, decline firms are associated with *negative* cash flows from operations and *positive* cash flows from investing activities. Several advantages of the cash flow measure of life cycle over the A&R measure are that it includes information readily available to investors, does not involve any comparisons across multiple periods, involves less subjectivity or relativity to other firms and offers a simple proxy for life cycle.

While each of the measures above captures different facets of a firm's life cycle, I choose to use both. Either measure of life cycle is adequate for my study because I am looking for patterns over the life of a firm. The two measures are somewhat correlated ($\rho = 0.21$, $p < 0.0001$), but do not overlap perfectly, and thus I interpret them as capturing different constructs of a firm's life cycle. In my analysis, I find that a number of firms achieve and maintain "maturity" status. Others grow and mature and decline. Still others mature then re-enter the growth stage. Both the Dickinson and the A&R models allow forward or backward progression across life cycle stages.

Models:

To test my first hypothesis, whether BTD vary across firm life cycle stages, I construct a measure of temporary BTD consistent with Hanlon (2005) as follows:

$$BTD_t = \frac{Federal\ Deferred\ Tax\ Expense_t + Foreign\ Deferred\ Tax\ Expense_t}{Statutory\ Tax\ Rate_t} \quad (1)$$

I scale *BTD* by average assets to enable comparability across firms. I use t-tests to examine

whether the means vary across life cycle groups.

In order to test my hypothesis that earnings persistence varies across firm life cycle stages, I follow Hanlon (2005) and construct a model of the persistence of pre-tax earnings using the following equation:

$$PTBI_{t+1} = \beta_0 + \beta_1 PTBI_t + \varepsilon_{t+1} \quad (2)$$

where *PTBI* is pre-tax book income. I use pre-tax earnings to test persistence because my variables of interest involve tax expense and thus affect after-tax earnings. I then estimate an equation interacting indicator variables for life cycle stages with pre-tax earnings, allowing the coefficient on current earnings to vary by life cycle stage. I compare coefficients across the groups in order to determine if persistence varies by life cycle stage:

$$PTBI_{t+1} = \sum_{k=1}^{5} \beta_k LC_t + \sum_{j=6}^{10} \beta_j LC_t * PTBI_t + \varepsilon_{t+1} \quad (3)$$

Where LC_t is a series of indicator variables set to 1 if a firm-year observation is in a particular life cycle category, 0 otherwise. I measure life cycle stage by both the cash flow components methodology in Dickinson (2011) and the A&R (1992) measure. Other variables are as defined above. Equation (3) omits an intercept term because of the five life cycle variables.

The finding in Hanlon (2005) that large BTD are associated with less persistent earnings are essential to my third hypothesis that links BTD, life cycle and earnings persistence. Thus, I replicate the model in Hanlon (2005) as follows.

$$PTBI_{t+1} = \gamma_0 + \gamma_1 LNBTD_t + \gamma_2 LPBTD_t + \gamma_3 PTBI_t + \gamma_4 LNBTD_t * PTBI_t + \gamma_5 LPBTD_t * PTBI_t + \varepsilon_{t+1} \quad (4)$$

where *LNBTD* is an indicator set equal to 1 if a firm-year observation is in the lowest quintile of scaled *BTD*, and *LPBTD* is an indicator set equal to 1 if a firm-year is in the highest quintile of scaled *BTD*, and zero otherwise. Consistent with Hanlon's findings, I expect γ_4 and γ_5 to be

negative.

In order to test my main hypothesis, whether the relation between BTD and future earnings identified in previous studies is explained by firm life cycle stage, I construct the following model:

$$PTBI_{t+1} = \beta_1 LNBTD_t + \beta_2 LPBTD_t + \sum_{k=3}^{7} \beta_k LC_t +$$

$$\beta_8 LNBTD_t * PTBI_t + \beta_9 LPBTD_t * PTBI_t + \sum_{j=10}^{14} \beta_j LC_t * PTBI_t + \varepsilon_{t+1} \qquad (5)$$

where variables are as defined above. Again, I omit an intercept term because of the five life cycle variables. If *LNBTD* and *LPBTD* capture life cycle, I anticipate the coefficients on β_8 and β_9 to be insignificant. Alternatively, if some portion of BTD is explained by life cycle, I anticipate that the coefficients β_8 and β_9 will be smaller than γ_4 and $\gamma_5$in model (4) above.

V. Results

Descriptive Analysis of Sample

Panel A of Table 1 presents descriptive statistics for the full sample of observations. Panel B presents the means of the variables partitioned into life cycle stages by the cash flow method (see Appendix C). Bold numbers indicate significance across groups at the 5% level. The means by life cycle stage indicate that pre-tax earnings (*PTBI*) are increasing from the introduction to the growth and maturity phases, then decreasing in the shakeout and decline phases. A similar trend is apparent for earnings persistence ($PTBI_{t+1}/PTBI_t$), size, pre-tax cash flows (*PTCF*), and sales, confirming that Dickinson's cash flow measure captures some features of firm life cycle. Of relevance to this study

are the measures of BTD and scaled BTD (*BTD_AVGAT*). The means document positive BTD in

the growth and maturity phases, and negative in the shakeout. The BTD average in the decline sample may be an indication of some survival bias; firms that reach a decline phase yet continue at least one year have increasing BTD as they recover. The trend in cash ETR and five year cash ETR also follows expectations; that mature firms have the highest cash ETR. Additionally, I find that mature firms are generally older than growth firms. Lastly, I include the % of large positive and large negative BTD observations in each life cycle stage.

Panel C presents the same variables partitioned on life cycle stage as measured by A&R (1992).[12] Again, most variables demonstrate the anticipated trend across life cycle groups.[13] The two methodologies capture different facets of firm life cycle and thus, I anticipate different results from the analysis. Overall, the descriptive statistics grouped by both measures appear to consistently show mature firms have the highest levels of earnings, persistence, sales, etc.

Lastly, Panel D examines the same sample partitioned across BTD groups, where *LNBTD* (*LPBTD*) represents the group of firm-years with scaled BTD in the bottom (top) quintile of firm-years. The remainder of firms are classified as Small BTD, consistent with Hanlon (2005). Again, the trends across groups are predictable, and appear to support the notion that there is a relation between firm life cycle and BTD. Overall, Table 1 provides preliminary evidence in support of my hypotheses that BTD are associated with firm life cycle. Consistent with expectations, firm-years classified as maturity and growth/ (shakeout/decline/stagnant) are associated with higher (lower) levels of BTD, in support of H1.

INSERT TABLE 1 HERE

In order to test H2a and H2b, whether earnings persistence varies predictably across life

[12] The measure requires annual rankings of firms relative to all other firms based on sales growth, dividends, age and capital expenditures (See Appendix C for specific details of the calculation). Hence, the data screens required for my regression analysis alter the groupings from the anticipated 20% in each category.

[13] Recall that the cash flow stages begin with an introductory phase; however, the A&R categories begin with a growth phase.

cycle stages, I estimate Equation (3) and compare the coefficients on the interaction between *PTBI* and life cycle stage across groups. Table 2 shows the results of estimating Equation (3) using both the cash flow model of life cycle stages and the A&R model of firm life cycle. Only the coefficients in the cash flow model regression vary significantly ($p < 0.0001$ for all stages) between life cycle stages. The coefficients on the A&R life cycle measures interacted with *PTBI* do not vary significantly between groups. This indicates that the cash flow model of life cycle captures a different construct of life cycle than A&R. To test H2a that the growth phase will exhibit lower earnings persistence than the maturity phase, I compare the coefficients on *PTBI*Stage2* and *PTBI*Stage3* and find the difference is significant ($p < 0.0001$). Similarly, to test H2b that firms-years in the shakeout phase of life cycle will exhibit lower earnings persistence than the mature phase, I compare coefficients on *PTBI*Stage3* and *PTBI*Stage4* and find the difference is significant ($p < 0.0001$). The cash flow model results support H2 that earnings persistence varies by life cycle stage.

INSERT TABLE 2 HERE

In order to test my main prediction hypothesis that the documented relation between earnings persistence and BTD is explained in part by life cycle, I first replicate the findings in Hanlon (2005) within my sample period. Table 3 presents the main test from Hanlon (2005) as modeled in Equation (4), confirming that large positive and large negative BTD are associated with lower earnings persistence. Interestingly, Guenther (2011) identifies that Hanlon's results are driven by 113 "influential" observations, suggesting that the findings will not hold outside her sample.[14] However, both my study and Blaylock et al. (2012) find that Hanlon's results hold for periods beyond her original sample, suggesting that while Guenther's findings indicate an

[14] In untabulated results, I eliminate Guenther's "influential" observations from my sample and find that Hanlon's results still hold; firm years with large positive and large negative BTD are associated with less persistent earnings.

alternate explanation, overall large positive and large negative BTD are associated with lower earnings persistence.

INSERT TABLE 3 HERE

Hypothesis 3 builds on the results documented above, suggesting that the association between firm-years with large positive and large negative BTD and lower levels of earnings persistence will not hold when controlling for firm life cycle. In Table 4 I examine the results from estimating Equation (5) using both the cash flow and A&R models of firm life cycle. The coefficients on *LPBTD*PTBI* and *LNBTD*PTBI* are of interest for H3. Recall from Hanlon (2005) and the results documented on Table 3, that the coefficients on those interaction terms are significant and negative, indicating an association between large positive and large negative BTD and lower earnings persistence. However, with the addition of life cycle and the relation between life cycle and earnings persistence, the relation between *LPBTD* and *LNBTD* and earnings persistence changes.

Using the cash flow model of life cycle, I find that the relation between *LPBTD* and earnings persistence is no longer significant. In testing the coefficient on *LNBTD*, I find that the difference between the coefficient on *LNBTD *PTBI* in the Hanlon model (Table 3) and in the life cycle test on Table 4 are different (the difference is significant p = 0.0230), suggesting that large negative BTD are still associated with earnings persistence after controlling for life cycle, but that life cycle explains some of the negative relation. In the case of large positive BTD, the inclusion of life cycle in the model subsumes the relation.

Using the A&R life cycle model, I find that the observed relation between *LNBTD* and earning persistence is no longer significant in the presence of life cycle. The relation between *LPBTD* and earnings persistence is also affected; the coefficient on *LPBTD*PTBI* is smaller than

in Equation (4) on Table 3 (the difference is significant p= 0.0111). While the coefficient on *LPBTD*PTBI* is significantly smaller in Table 4, it is negative and significant, indicating that life cycle only explains a portion of the existing relation. Overall, the results using the cash flow and A&R models of life cycle partially support H3. Controlling for life cycle alters the negative association between firm-years with large positive and large negative BTD and earnings persistence.

INSERT TABLE 4 HERE

To further test the relation between life cycle stages, large book-tax differences, and earnings persistence, in Table 5 I present Hanlon's original BTD-persistence model [Equation (4)] regressed on the sample partitioned by life cycle stage. If life cycle explains the less persistent earnings associated with large BTD found in Hanlon (2005), I expect that partitioning the sample by life cycle will result in insignificant coefficients across life cycle stages. Panel A presents the results using the A&R model of life cycle, and Panel B presents the results using the cash flow model. For both models of life cycle, I note that the coefficients on the interaction terms vary across life cycle stage. I interpret the results on Table 5 panels A and B as supporting H3 and documenting that the relation between *LNBTD* and *LPBTD* is related to firm life cycle. Similar to the results on Table 4, I find that life cycle impacts the relation between BTD and earnings persistence.

INSERT TABLE 5 HERE

Taken together, the results suggest that the reason book-tax differences are informative about earnings persistence is that BTD captures life cycle phase.

Robustness

In my tests, I use two measures of life cycle, the cash flow model and the A&R measure

that relies on a five year ranking of sales growth, dividends, capital expenditures, and age. One concern is that since these are researchers-constructed measures of life cycle, my results may be driven by one particular component of the aggregate measure rather than by true life cycle. Thus, I also consider the disaggregated components of the A&R measure. I test a ranking of firm-year based on sales growth, or capital expenditures, or firm age. None of these measures alone captures the same effect as the A&R model. My findings suggest that the aggregate measure employed by A&R is more powerful than its individual components in capturing the life cycle stage of the firm. Likewise, I also construct a measure based on cash flows from operations (the "earnings" component of the cash flow life cycle measure) to examine whether the results from the cash flow measure are dependent only on the cash flows from operations. Again, I find this abbreviated measure does not yield informative results. Because the descriptive statistics in Table 1 indicate size varies significantly and predictably across life cycle stage, I also test whether ranking firms based on size impacts my results. I find that size significantly impacts earnings persistence, but does not significantly impact the BTD-persistence tested in Equation (5). Lastly, to verify my results are not a factor of dividing my sample, I also assign firms to life cycle stages randomly and find the results do not support my hypotheses.

Earnings management and Tax Avoidance

Blaylock et al. (2012) conduct a similar analysis to investigate the results of Hanlon (2005) within the large positive BTD group (LPBTD). Their analysis suggests that the lower earning persistence identified within the LPBTD group is driven by firm-years with high levels of discretionary accruals, an indication of possible earnings management. Both Kothari et al. (2005) and Liu (2008) provide evidence that growth affects the interpretation of discretionary accrual measures. Blaylock et al. (2012) construct a model of earnings persistence and interact current

earnings with *EM* and *TAXAVOID*, measures designed to capture whether the large BTD is likely a result of earnings management or tax planning. In Table 6 I consider the findings documented in Blaylock et al. (2012) controlling for the effect of life cycle on earnings persistence. Similar to my other tests, I find that within the LPBTD group, controlling for life cycle affects the coefficient on *EM*PTBI* (the persistence of earnings for firm-years associated with earnings management). Thus, including life cycle in the model affects the interpretation of the results in Blaylock et al. (2012). Further analysis using the measures in Blaylock et al. and life cycle together may help highlight firms for which earnings management creates large positive BTD.

INSERT TABLE 6 HERE

Lastly, as noted above, Guenther (2011) examines the results in Hanlon (2005), by examining "influential observations." Using "data snooping" Guenther identifies 113 observations driving the lower persistence in Hanlon's study and identifies the characteristics of those observations. He documents that Hanlon's results do not hold once controls are added for those factors such as high levels of special items, gains and losses, etc. In Table 7 I examine the relation among the Guenther's variables and identify where his measures vary significantly vary across life cycle stages. The results in Table 7 indicate that Guenther's findings capture some measure of life cycle. Further analysis is needed to determine what other factors impact the BTD-persistence relation.

INSERT TABLE 7 HERE

VI. Conclusions, limitations and future research

The purpose of my study is to examine whether life cycle explains the relation between book-tax differences and earnings persistence. A number of prior studies find that the relation between book and taxable income is informative about a firm's future earnings. I rely on an

economic theory (firm life cycle) to explain these results. My hypothesis is that because a number of factors explaining growth and decline are associated with transactions such as depreciation, increasing (decreasing) accruals, and gains and losses, that the stage of a firm's life cycle will be associated with its BTD, and thus its future earnings.

My results indicate that the relation between BTD and earnings persistence varies by life cycle, suggesting that life cycle at least partially explains the relation between BTD and earnings persistence. In the case of large positive BTD, which is often identified as a signal of low earnings quality or earnings management, life cycle captures some of the relation between BTD and earnings persistence, suggesting that the relation between BTD and earnings management is more complex and requires additional examination.

For firm-years with large negative BTD, I find that the decline phases of a firm's life cycle explain, to some extent, the lower earnings persistence found in this group. Other studies that further examine the results in Hanlon (2005) (e.g. Blaylock et al. 2012) consider the large positive BTD group only; I contribute to the literature by providing an explanation for the observed relation between both large positive and large negative BTD and earnings persistence.

Finally, my results expand the findings in Blaylock et al. (2012) and Guenther (2011). Both studies, similar to this one, seek to examine the results in Hanlon (2005) more closely. My study further supports the findings in Guenther (2011) by offering a life cycle explanation for why the influential observations he identifies impact the BTD-persistence relation. I also offer an alternative explanation for the results in Blaylock et al. (2012) (who document that the lower earnings persistence associated with LPBTD are driven by earnings management.)

I combine findings from the life cycle and tax literature to provide evidence that temporary BTD vary across firm life cycle stage. Further examination may reveal that firm-years with BTD

contrary to magnitude and sign predicted by life cycle are early predictors of changes to future earnings.

The next question to examine is how market participants incorporate life cycle and book-tax differences into their expectations. Life cycle theory predicts that market participants have different expectations and react differently to firm performance over the phases of the life cycle. Given firm characteristics, both innate and those included in the construction of the life cycle measures, I expect that the differing market expectations across firm life cycle will extend to BTD. The life cycle literature has documented that investors value earnings, sales, cash flows and accruals differently across life cycle stages. Because the existing tax literature supports the theory that investors adjust their expectations of firm performance for years with large BTD, it is possible that investors' reaction is a function of their understanding of firm life cycle.

Lastly, my study addresses the question of why some firms appear to avoid more taxes than others. If BTD vary by life cycle, it may be interesting to consider the findings in other tax studies that examine the characteristics of firms that appear to avoid income taxes. For example, Higgins et al. (2011) find that tax avoidance is related to a firm's strategy of product differentiation or cost minimization. Specifically, they find that firms focused on cost minimization are less likely to be identified as avoiding taxes. Miller and Friesen (1984) identify that price cutting and low levels of innovation are indicative of the decline phase. Based on a life cycle explanation, the cost minimizing firms identified in Higgins et al. will have negative levels of BTD, and thus exhibit low levels of tax avoidance. The results of my study suggest considering the information in BTD in a life cycle framework may enhance our understanding of firm behavior.

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Appendix A - Book-Tax Differences

Book-tax Differences		Source of Positive BTD (PBTD)[15]	Source of Negative BTD (NBTD)
Property, plant & equipment	In general, GAAP requires depreciating assets over the estimated useful life. Tax rules allow for accelerated depreciation over established lives	Tax depreciation expense > book depreciation expense (young assets and/or increasing acquisitions)	Book depreciation expense > tax depreciation expense (aged assets not being replaced) Tax gain > book gain (disposing of assets with excess tax accumulated depreciation over book depreciation)
Revenues	In general, GAAP requires recognizing revenues when earned, tax requires recognition when received.	Installment sale revenue recognized at transaction date, revenues not recognized for tax purposes until received. Subsequent recognition for GAAP of revenues received but not earned, recognized for tax purposes upon receipt.	Subsequent receipt of installment sale revenues recognized for tax purposes, previously recognized for GAAP. Revenues received in advance recognized for tax purposes when received (i.e. subscription revenues), recognized when earned for GAAP.
Inventory	In general, GAAP requires matching of costs of inventory with sales revenue. IRS rules require capitalization of additional indirect costs ("UNICAP"). Firms may use different cost flow methods under both reporting systems.	Current year increase in tax inventory > current year increase in book inventory Inventory growth	Current year change in book inventory < change in tax inventory Inventory decline
Bad debts	GAAP requires estimating a reserve for uncollectable accounts to match revenues and expenses. Tax allows a deduction only once the account is written off.	Write off of bad debts > Allowance Increase (sales decreasing)	Allowance increase >write off of bad debts (sales increasing)
Warranty reserve	GAAP requires recording an estimate of future warranty expenses as a liability at the time of sale (matching). Tax allows a deduction of expenses only once they have been incurred.	Actual warranty expenditures > estimated warranty expense (sales decreasing, estimated warranty reserve decreasing)	Estimated warranty expense > actual warranty expenditures (sales increasing and/or estimated warranty increasing)
Goodwill	Goodwill from asset acquisition is amortized for tax purposes over a 15 year life. Goodwill for GAAP is tested annually for impairment and adjusted downward in the event impairment is identified.	Tax amortization expense>GAAP impairment	GAAP impairment > tax amortization

These BTD were selected from Poterba et al. (2010) and Raedy et al. (2011) who examine the information content of tax footnote disclosures and tabulate the temporary differences reported in the Schedule of Deferred Tax Positions of the Fortune 250 firms from 1993 through 2007.

[15] Spilker et al. (2010) refer to positive BTD as "favorable" and negative BTD as "unfavorable," referring to the impact on earnings reported for income tax purposes.

Appendix B – Characteristics of Life Cycle Phases and Expectations of Book-Tax Differences

Life cycle phase	Characteristics of phase	Book-tax differences Expectation	Persistence expectation

Introduction
(Early Growth)
 	
(most studies ignore this phase as it is considered to be the time before going public)
	• Operations/Strategy
	  ○ Little positive earnings or positive cash flows (Black 1998)
	• Investing
	  ○ Innovation (Miller and Friesen 1984)
	  ○ Few assets in place (Black 1998; Aharony et al. 2006)
	  ○ R&D investment (Black 1998)
	• Financing
	  ○ Stockholders demand returns greater than market for uncertainty (Mueller 1972)
	  ○ ESO granted (Bens et al. 2002)
	  ○ Cash constraint (Black 1998)
	  ○ Low dividends (Black 1998)
	  ○ Contributed capital/total equity high (DeAngelo et al. 2006)
	  ○ Reinvest profits and raise additional capital (Mueller 1972)
	• Valuation
	  ○ Value of the firm based on growth opportunities (Black 1998)
		Loss, NOLs
		
		Possible TI>NI, or NI>TI as move into growth phase.
			Variation in persistence (strong firms survive)
			
			Earnings less likely to persist because of changes in assets in place (Black 1998)

Growth
(Late Growth)
	• Operations/Strategy
	  ○ Firm complexity increases (Liao 2008)
	  ○ Increases in accounts receivable and inventory (Liu 2008)
	  ○ Large positive accruals (Liu 2008)
	  ○ Growth pursued at the expense of stockholder welfare (Mueller 1972)
	  ○ Growing organizational complexity (Mueller 1972)
	  ○ High sales growth (Black 1998)
	  ○ Product differentiation (Jenkins et al. 2004)
	  ○ Rapid growth and technological innovation (Chiang et al. 2011)
	  ○ Rapid and accelerating growth in sales (Spence 1979)
	• Investing
	  ○ Firm has many positive NPV projects available (Grullon and Michaely 2004)
	  ○ Innovation (Miller and Friesen 1984)
	  ○ High capital expenditures (Black 1998)
	  ○ High levels of investment (Spence 1979)
	• Financing
	  ○ Incentive based compensation plans (Liao 2008)
	  ○ ESO issued/granted (Bens et al. 2002)
	  ○ Low dividends (Black 1998)
	• Valuation
	  ○ Cash flows more value relevant (Aharony et al. 2006)
	  ○ Value of firm based on growth and growth opportunities more so than assets in place (Black 1998)
	  ○ Earnings related to changes in assets in place (Black 1998)
	  ○ Earnings less likely to persist (Black 1998)
	  ○ Performance more informative for pricing than risk factors (Xu 2007)
		NI > TI
		(LPBTD)
			Firms focus on sales more than profitability (Aharony et al. 2006; Black 1998)

Maturity	• Operations/Strategy
	  ○ Net income persists because of assets in place (Black 1998)
	  ○ Profitability maximized (Black 1998; Dickinson 2011)
	  ○ Cost minimization strategy (Jenkins et al. 2004)
		NI > TI
		(PBTD) decreasing across phase
		
		As NI >TI decreases, move into
			Earnings persistence expected to be highest in maturity (Dickinson 2011)

	○ Low growth (Black 1998) ○ Sales levels stabilize (Chiang et al. 2011) • Investing ○ Fewer investment opportunities leads to excess cash (Aharony et al. 2006; Yu and Jiang 2010) ○ Less new innovations (Chiang et al. 2011) ○ Depreciation may suffice to finance asset replacement and maintenance. (Aharony et al. 2006) • Financing ○ Excess cash leads to repurchases (Grullon and Michaely 2004; Yu and Jiang 2010) ○ Firms service debt and distribute cash to shareholders (Dickinson 2011) ○ High levels of retained earnings lead to increased dividends and share repurchases (Coulton and Ruddock 2011) • Valuation ○ Related diversification increases firm value, unrelated diversification erodes firm value (Shyu and Chen 2009) ○ Beta and leverage risk factors priced (Xu 2007) ○ Decrease in risk results from a decrease in cost of capital and a decrease in growth options (Grullon and Michaely 2004) ○ Value of firm based more on assets in place (Black 1998) ○ High levels of market value of equity and book value of equity (Black 1998)	shakeout/decline.	
Shake-out/ revival (Early Decline)	• Operations/Strategy ○ Large firms with organizational complexity and inefficient information flow, leading to increased uncertainty and decreased profitability. (Mueller 1972) ○ Cost minimization and focus on operational efficiencies (Jenkins et al. 2004) ○ New management may be brought in and new markets and products explored (Ramaswamy et al. 2007) • Investing ○ Declining innovations (Mueller 1972) ○ Firms divest to remove less profitable operations, resulting in increased profitability and decreased debt levels (Pashley and Philippatos 1990) ○ Firms can regenerate by investing in new technology (Black 1998) • Financing ○ Increasing share of profits distributed to shareholders (Mueller 1972) ○ Increased repurchases and dividends. (Coulton and Ruddock 2011) • Valuation ○ Risk factors priced (Xu 2007)	Tax planning may be more important in this phase due to cash constraints Likely move from NI>TI to TI>NI As the relation between TI and NI changes, the information content of book-tax differences will change If TI>NI not true, decline may not persist.	Earnings expected to be less persistent for firms in decline. Anticipate variation in persistence (strong firms revert to growth/maturity, weak decline further)
Decline (Late Decline)	• Operations/Strategy ○ Inflexible firms recommit to prior strategy (Liao 2008) ○ Inventory write down and write off of uncollectible receivables (Liu 2008) ○ Large negative accruals (Liu 2008) ○ Price cutting (Miller and Friesen 1984) ○ Low earnings, low profit margins (Black 1998) • Investing ○ Low levels of innovation (Miller and Friesen 1984) • Financing ○ Low dividend payout (Black 1998) • Valuation ○ Probability of liquidation high (Black 1998)	TI > NI (LNBTD) Should indicate lack of persistence of earnings. If TI>NI not true, decline may not persist. Tax planning may be more important in this phase due to cash constraints	Lowest level of persistence.

Appendix C Life Cycle Measures

1. Following Anthony and Ramesh (1992)

Anthony and Ramesh use four classification variables

1. Dividend as a percentage of net income

$$DP_t = (DVC_t/IB_t) * 100$$

2. Percentage sales growth

$$SG_t = \left(\frac{SALES_t - SALES_{t-1}}{SALES_{t-1}}\right) * 100$$

3. Capital expenditure as a percentage of the total value of the firm[16]

$$CEV_t = \left(\frac{CE_t}{VALUE_t}\right) * 100$$

4. Age_t from founding dates from Jay Ritter website.[17]

$IBED_t$ = income before extraordinary items and discontinued operations in year t
$Sales_t$ = net sales in year t
CE_t = capital expenditures in year t (CAPX)

[16] Anthony and Ramesh (1992) exclude CEV from their measure because for their time frame that variable is poorly populated. I include it in my calculations, however, excluding CEV does not impact the inferences of my results.
[17] bear.warrington.ufl.edu/ritter/foundingdates.htm

$VALUE_t$ = market value of equity plus book value of long-term debt at the end of year t (DLTT)
For each of the firm-year, the median value of the prior five years is calculated for each of the financial variables.

For each variable, the median measure is ranked into low, medium and high based on the following table:

Life Cycle Stage (score)	DP	SG	CEV	AGE
Growth (1)	Low	High	High	Young
Mature (2)	Medium	Medium	Medium	Adult
Stagnant (3)	High	Low	Low	Old

Each firm-year is then assigned a score based on each variable (low DP = 1, Old age = 3). Using a composite score, firm-year observations are assigned to five groups – Growth, Growth/Mature, Mature, Mature/Stagnant, and Stagnant.

2. Following Dickinson (2011)

Dickinson (2011) models life cycle stage based on the sign of the three components of the cash flow statement.

	Introduction	Growth	Mature	Shakeout	Shakeout	Shakeout	Decline	Decline
Cash flows from operating activities	-	+	+	-	+	+	-	-
Cash flows from investing activities	-	-	-	-	+	+	+	+
Cash flows from financing activities	+	+	-	-	+	-	+	-

TABLE 1
Descriptive Statistics for the Full Sample, by Life Cycle Stages, and by BTD Classifications

Panel A Full Sample

n = 21,453

Variable	mean	median	std. dev.
PTBI	273.95	27.219	1616.65
PTBI_AVGAT (t)	0.129	0.107	0.117
PTBI_AVGAT (t+1)	0.095	0.093	0.144
PERSISTENCE (PTBIt+1/PTBI)	0.670	0.924	12.585
SIZE	5.755	5.656	1.937
PTCF_AVGAT	0.153	0.142	0.117
PTACC_AVGAT	-0.024	-0.034	0.112
CASH ETR	0.304	0.286	1.317
GAAP ETR	0.364	0.370	1.353
SALES	2667.56	339.98	12315.43
SALES GROWTH	26.119	11.792	660.863
LEVERAGE	0.158	0.116	0.177
BTD	18.018	0.234	358.085
BTD_AVGAT †	3.075	2.599	89.054
ROA	0.129	0.108	0.117
DISCRETIONARY ACCRUALS	0.0230	0.0093	0.339
5 YR CASH ETR	0.289	0.308	0.208
AGE	18.988	14.000	14.202
BTM	0.814	0.480	34.573
DEBT/EQUITY	0.369	0.199	9.408

Panel B

Partitioned by Cash Flow Life Cycle Stage

Variable	Introduction	Growth	Maturity	Shakeout	Decline
n	1339	7646	10527	1622	319
% total n	6.2%	35.6%	49.1%	7.6%	1.5%
PTBI	**67.21**	**244.437**	**455.790**	**248.095**	**106.092**
PTBI_AVGAT (t)	**0.095**	**0.123**	**0.134**	**0.122**	**0.168**
PTBI_AVGAT (t+1)	**0.034**	**0.086**	**0.113**	**0.088**	**0.011**
PERSISTENCE (PTBIt+1/PTBI)	**-0.643**	**0.791**	**0.829**	**0.317**	**-0.487**
SIZE	**5.068**	**5.958**	**6.042**	**5.601**	**4.967**
PTCF_AVGAT	**-0.032**	**0.153**	**0.185**	**0.131**	**-0.036**
PTACC_AVGAT	**0.128**	**-0.031**	**-0.051**	**-0.009**	**0.204**
CASH ETR	**0.321**	**0.270**	**0.290**	**0.344**	**0.583**
GAAP ETR	0.364	0.365	0.346	0.333	0.232
SALES	**1014.82**	**2371.63**	**3958.85**	**2128.05**	**1452.90**
SALES GROWTH	143.45	27.029	15.038	15.262	21.388
LEVERAGE	**0.173**	**0.170**	**0.145**	**0.125**	**0.126**
BTD	2.62	14.830	28.494	-8.040	43.395
***BTD_AVGAT*†**	**-5.874**	**3.576**	**3.512**	**-1.080**	**38.109**
ROA	**0.095**	**0.123**	**0.135**	**0.122**	**0.168**
DISCRETIONARY ACCRUALS	0.088	0.032	0.012	0.041	0.054
5 YR CASH ETR	**0.251**	**0.264**	**0.309**	**0.295**	**0.274**
AGE	**15.035**	**17.254**	**22.615**	**21.238**	**19.969**
BTM	0.811	0.374	1.034	0.681	0.905
DEBT/EQUITY	0.546	0.483	0.238	0.259	0.629
% LNBTD	11%	10%	23%	30%	26%
% LPBTD	23%	33%	19%	14%	11%

Panel C

Partitioned by Anthony and Ramesh (1992) Life Cycle Stage

Variable	Growth	Growth/ Maturity	Maturity	Maturity/ Stagnant	Stagnant
n	1699	2968	4590	5238	6958
% total n	7.9%	13.8%	21.4%	24.5%	32.4%
PTBI	**97.208**	**118.826**	**338.188**	**307.710**	**495.733**
PTBI_AVGAT (t)	**0.131**	**0.134**	**0.129**	**0.119**	**0.130**
PTBI_AVGAT (t+1)	**0.088**	**0.087**	**0.090**	**0.092**	**0.110**
PERSISTENCE (PTBIt+1/PTBI)	0.276	0.344	0.390	0.942	0.935
SIZE	**5.618**	**5.788**	**5.827**	**5.947**	**6.064**
PTCF_AVGAT	0.167	0.161	0.155	0.150	0.154
PTACC_AVGAT	**-0.036**	**-0.028**	**-0.026**	**-0.031**	**-0.024**
CASH ETR	0.225	0.283	0.277	0.313	0.313
GAAP ETR	0.292	0.368	0.363	0.375	0.341
SALES	**974.489**	**1382.11**	**2949.37**	**3292.33**	**4226.02**
SALES GROWTH	**140.27**	**34.523**	**23.375**	**11.955**	**5.978**
LEVERAGE	**0.155**	**0.151**	**0.159**	**0.164**	**0.144**
BTD	9.548	7.732	22.199	35.098	14.839
BTD_AVGAT †	2.548	1.596	2.723	3.702	3.195
ROA	**0.132**	**0.135**	**0.130**	**0.120**	**0.131**
DISCRETIONARY ACCRUALS	-0.002	0.025	0.021	0.035	0.031
5 YR CASH ETR	**0.196**	**0.246**	**0.260**	**0.294**	**0.338**
AGE	**6.717**	**9.732**	**14.475**	**22.033**	**30.083**
BTM	**0.571**	**0.559**	**0.487**	**0.622**	**1.513**
DEBT/EQUITY	0.434	0.207	0.282	0.360	0.422
% LNBTD	17%	18%	21%	21%	23%
% LPBTD	23%	28%	19%	14%	16%

Panel D

Partitioned by Large positive and large negative BTD

Variable	LPBTD	Small BTD	LNBTD
n	4287	12881	4285
% total n	20%	60%	20%
PTBI	**354.031**	**367.709**	**238.386**
PTBI_AVGAT (t)	**0.142**	**0.118**	**0.141**
PTBI_AVGAT (t+1)	**0.094**	**0.094**	**0.106**
PERSISTENCE (PTBIt+1/PTBI)	0.574	0.679	0.842
SIZE	**5.913**	**6.016**	**5.608**
PTCF_AVGAT	**0.165**	**0.146**	**0.173**
PTACC_AVGAT	**-0.023**	**-0.028**	**-0.032**
CASH ETR	**0.183**	**0.314**	**0.335**
GAAP ETR	**0.401**	**0.392**	**0.188**
SALES	**2642.64**	**3593.96**	**2130.35**
SALES GROWTH	23.539	25.894	24.926
LEVERAGE	**0.179**	**0.157**	**0.120**
BTD	**136.612**	**18.351**	**-88.841**
BTD_AVGAT †	**64.101**	**3.282**	**-59.873**
ROA	**0.143**	**0.119**	**0.142**
DISCRETIONARY ACCRUALS	0.244	0.024	0.035
5 YR CASH ETR	**0.008**	**0.307**	**0.281**
AGE	**19.577**	**21.065**	**18.072**
BTM	2.232	0.611	0.293
DEBT/EQUITY	**0.479**	**0.402**	**0.080**

Variable Definitions
Bold font indicates the difference between group is significant at p=0.05 or smaller
† Multiplied by 1,000 for descriptive statistics

ARSTAGE = life cycle stage as defined by Anthony and Ramesh (1992)

CFSTAGE	=	life cycle stage based on cash flow components as defined by Dickinson (2011)
LC	=	life cycle stage
PTBI	=	Pre-tax book income (PI)
PTBI t+1	=	Pre-tax book income (PI) in year t+1, scaled by average assets
PTBI t	=	Pre-tax book income (PI) in year t, scaled by average assets
PTCF	=	Pre-tax cash flows (OANCF+TXPD-XIDOC) in year t, scaled by average assets
PTACC	=	Pre-tax accruals (PTBI-PTCF) in year t, scaled by average assets
EM	=	Indicator variable equal to 1 for firm-year observations with modified Jones Model discretionary accruals in the top quintile of all firm-years in the sample
TAXAVOID	=	Indicator variable equal to 1 for firm -year observations with a five-year cash effective tax rate (see Dyreng et al. 2008) in the lowest quintile of all firm-years in the sample
Persistence	=	PTBI t+1/PTBI t
size	=	natural log of assets
Cash ETR	=	as defined by Dyreng et al. (2008) cash taxes paid divided by pre-tax income less special items TXPD/(PI-SPI)
GAAP ETR	=	as defined by Dyreng et al. (2008) tax expense divided by pre-tax income TXT/PI
sales	=	total sales (SALE)
sales growth	=	change in sales = (sales t - sales t-1)/sales t-1
leverage	=	long-term debt scaled by total assets DLTT/AT
BTD	=	temporary differences between book and tax as defined in Hanlon (2005) as sum of federal and foreign deferred tax expense grossed up by the statutory tax rate (35%) = (TXDFO+TXDFED)/.35
BTD_avgat	=	BTD scaled by average assets
ROA	=	Net income scaled by average assets
Discretionary accruals	=	modified Jones model discretionary accruals
5 YR Cash ETR	=	as defined in Dyreng et al. (2008) = sum 5 years cash taxes paid / sum 5 years pre-tax income less special items
Age	=	firm age calculated as current year less founding year from Jay Ritter web site (bear.warrington.ufl.edu/ritter/foundingdates.htm);
BTM	=	ratio of a firm's book value of equity to its market value of equity at time t (SEQ/(PRCC_F*CSHO)
Debt/Equity	=	Ratio of long-term debt (DLTT) to equity (SEQ)
% LNBTD		% of the sample that is in the lowest quintile of annual scaled BTD
% LPBTD		% of the sample that is in the highest quintile of annual scaled BTD

All continuous variables are winsorized at 1% and 99%.

Table 2
OLS Regression of Next Year's Pre-Tax Earnings on Current Pre-Tax Earnings, with Coefficients Varied by Life Cycle Stage

$$PTBI_{t+1} = \sum_{k=1}^{5} \beta_k \, LC_t + \sum_{j=6}^{10} \beta_j \, LC_t * PTBI_t + \varepsilon_{t+1} \quad (3)$$

	Cash Flow Model of Life Cycles Stages		Anthony & Ramesh Model of Life Cycle Stages	
Parameter	coeff (t-stat)	P-value	coeff (t-stat)	P-value
Stage 1	0.025	0.0337 **	0.037	0.0019 ***
	(2.12)		(3.11)	
Stage 2	0.046	<0.0001 ***	0.066	0.0003 ***
	(4.46)		(3.64)	
Stage 3	0.073	<0.0001 ***	0.044	0.0040 ***
	(4.17)		(2.88)	
Stage 4	0.036	0.2334	0.054	<0.0001 ***
	(1.19)		(4.49)	
Stage 5	0.052	0.0003 ***	0.092	<0.0001 ***
	(3.62)		(4.60)	
PTBI * Stage 1	0.320	0.0010 ***	0.594	<0.0001 ***
	(3.29)		(7.66)	
PTBI * Stage 2	0.550	<0.0001 ***	-0.363	0.0076 ***
	(8.90)		(2.67)	
PTBI * Stage 3	0.641	<0.0001 ***	0.590	<0.0001 ***
	(2.40)		(5.23)	
PTBI * Stage 4	0.509	0.0165 **	0.575	<0.0001 ***
	(4.22)		(6.89)	
PTBI * Stage 5	-0.147	0.0177 **	0.377	0.0052 ***
	(-2.37)		(2.79)	
Industry Effects	Yes		Yes	
Year Effects	Yes		Yes	
n	21,453		21,453	
R^2	45.73%		43.28%	

Variables are defined in Table 1.
Robust standard errors are reported, clustered by firm.
*, **, *** indicates significance at the 0.10, 0.05 and 0.01 levels, respectively, using a two-tailed test.

Life Cycle Stages:

	Cash Flow Model	Anthony & Ramesh Model
Stage 1	Introduction	Growth
Stage 2	Growth	Growth/Maturity
Stage 3	Maturity	Maturity
Stage 4	Shakeout	Maturity/Stagnant
Stage 5	Decline	Stagnant

Table 3
Replication of Hanlon (2005) OLS Regression of Next Year's Pre-Tax Earnings on Current Pre-Tax Earnings, with Coefficients Varied by Large Positive and Large Negative BTD

$$PTBI_{t+1} = \gamma_0 + \gamma_1 LNBTD_t + \gamma_2 LPBTD_t + \gamma_3 PTBI_t + \gamma_4 LNBTD_t * PTBI_t + \gamma_5 LPBTD_t * PTBI_t + \varepsilon_{t+1} \quad (4)$$

Parameter	coeff (t-stat)	P-value
Intercept	0.012 (1.64)	0.1008 **
LNBTD	0.041 (2.18)	0.0296 **
LPBTD	0.028 (1.45)	0.1464
PTBI	0.671 (10.28)	<0.0001 ***
PTBI*LNBTD	-0.307 (-2.22)	0.0267 **
PTBI*LPBTD	-0.321 (-2.18)	0.0296 **
Industry Effects	Yes	
Year Effects	Yes	
n	21,453	
R^2	17.05%	

Variables are defined in Table 1.
Robust standard errors are reported, clustered by firm.
*, **, *** indicates significance at the 0.10, 0.05 and 0.01 levels, respectively, using a two-tailed test.
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Table 4
OLS Regression of Next Year's Pre-Tax Earnings on Current Pre-Tax Earnings, with Coefficients Varied by Life Cycle Stage and Large Positive and Large Negative BTD

$$PTBI_{t+1} = \beta_1 LNBTD_t + \beta_2 LPBTD_t + \sum_{k=3}^{7} \beta_k LC_t + \beta_8 LNBTD_t * PTBI_t + \beta_9 LPBTD_t * PTBI_t + \sum_{j=10}^{14} \beta_j LC_t * PTBI_t + \varepsilon_{t+1} \quad (5)$$

	Cash Flow Model of Life Cycles Stages		Anthony & Ramesh Model of Life Cycle Stages	
Parameter	coeff (t-stat)	P-value	coeff (t-stat)	P-value
LNBTD	0.040	0.0245 **	0.040	0.0066 ***
	(2.25)		(2.72)	
LPBTD	0.004	0.8385	0.028	0.0984 *
	(0.20)		(1.65)	
Stage 1	0.015	0.2557	0.019	0.1352
	(1.14)		(1.49)	
Stage 2	0.036	0.0089 ***	0.045	0.0034 ***
	(2.62)		(2.93)	
Stage 3	0.058	<0.0001 ***	0.023	0.0952 *
	(4.61)		(1.67)	
Stage 4	0.020	0.4759	0.042	0.0042 ***
	(0.71)		(2.86)	
Stage 5	0.039	0.0283 **	0.070	<0.0001 ***
	(2.19)		(4.54)	
LNBTD * PTBI	-0.280	0.0373 **	-0.289	0.1050
	(-0.07)		(-2.56)	
LPBTD * PTBI	-0.118	0.4397	-0.297	0.0227 **
	(-0.41)		(-2.28)	
PTBI * Stage 1	0.429	0.0001 ***	0.777	<0.0001 ***
	(3.88)		(8.93)	
PTBI * Stage 2	0.662	<0.0001 ***	0.555	<0.0001 ***
	(6.55)		(4.75)	
PTBI * Stage 3	0.792	0.0013 ***	0.786	<0.0001 ***
	(3.21)		(7.69)	
PTBI * Stage 4	0.649	<0.0001 ***	0.691	<0.0001 ***
	(7.78)		(5.98)	
PTBI * Stage 5	-0.010	0.9316	0.567	<0.0001 ***
	(-0.09)		(5.47)	
Industry Effects	Yes		Yes	
Year Effects	Yes		Yes	
n	21,453		21,453	
R^2	46.46%		44.23%	

Variables are defined in Table 1.
Robust standard errors are reported, clustered by firm.
*, **, *** indicates significance at the 0.10, 0.05 and 0.01 levels, respectively, using a two-tailed test.

Life Cycle Stages:

	Cash Flow Model	Anthony & Ramesh Model
Stage 1	Introduction	Growth
Stage 2	Growth	Growth/Maturity
Stage 3	Maturity	Maturity
Stage 4	Shakeout	Maturity/Stagnant
Stage 5	Decline	Stagnant

Table 5
OLS Regression of Next Year's Pre-Tax Earnings on Current Pre-Tax Earnings with Coefficients varied by Large Positive and Large Negative BTD Partitioned on Life Cycle Stage

$$PTBI_{t+1} = \gamma_0 + \gamma_1 LNBTD_t + \gamma_2 LPBTD_t + \gamma_3 PTBI_t + \gamma_4 LNBTD_t * PTBI_t + \gamma_5 LPBTD_t * PTBI_t + \varepsilon_{t+1}$$

Panel A – Anthony and Ramesh Life Cycle Stages

	Full Sample n = 21, 453		Stage 1 Growth n = 1,699		Stage 2 Growth/Maturity n = 2,968		Stage 3 Maturity n = 4,590		Stage 4 Maturity/Stagnant n = 5.238		Stage 5 Stagnant n = 6,958	
	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon
Intercept	0.062 ***	0.012 **	0.003	-0.018 *	0.035	0.002	0.010	-0.008	0.022 *	0.025	0.058 ***	0.023
	(5.56)	(1.64)	(0.29)	(2.05)	(1.62)	(0.09)	(0.82)	(1.10)	(2.09)	(1.60)	(3.36)	(1.36)
PTBI	0.475 ***	0.671 ***	0.614 ***	0.852 ***	0.364 **	0.644 ***	0.596 ***	0.765 ***	0.568 ***	0.567 ***	0.384 **	0.679 ***
	(6.68)	(10.28)	(8.06)	(16.79)	(2.26)	(4.57)	(5.93)	(15.43)	(6.42)	(4.15)	(2.86)	(4.27)
LNBTD		0.041 **		0.040 **		0.040		0.056 **		-0.017		0.062 *
		(2.18)		(2.34)		(1.08)		(2.68)		(1.07)		(2.09)
LPBTD		0.028		0.035		0.064 ***		-0.007		-0.009		0.050 *
		(1.45)		(1.47)		(5.20)		(0.29)		(0.32)		(1.90)
PTBI* LNBTD		-0.307 **		-0.342 **		-0.288		-0.362 **		0.098		-0.467 *
		(-2.22)		(2.68)		(0.98)		(2.50)		(0.66)		(2.00)
PTBI* LPBTD		-0.321 **		-0.430 **		-0.548 ***		-0.070		-0.156		-0.447 **
		(-2.18)		(2.91)		(5.72)		(0.36)		(0.66)		(2.13)
R^2	17.79	17.05	11.25	21.35	5.95	8.40	20.71	22.47	20.65	21.14	15.07	20.16

Variables are defined in Table 1.
Regressions include industry and year fixed effects. Robust standard errors are reported, clustered by firm.
*, **, *** indicates significance at the 0.10, 0.05 and 0.01 levels, respectively, using a two-tailed test.

Panel B – Cash Flow Life Cycle Measure

	Full Sample n = 21, 453		Stage 1 Introduction n = 1,339		Stage 2 Growth n = 7,646		Stage 3 Maturity n = 10,527		Stage 4 Shakeout n = 1,622		Stage 5 Decline n = 319	
	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon	Persistence	Hanlon
Intercept	0.062 ***	0.012 **	-0.002	-0.021 *	0.014	0.015	0.044 **	0.017 *	0.007	0.013	0.027 **	0.015
	(5.56)	(1.64)	(0.18)	(1.95)	(1.31)	(1.00)	(2.74)	(1.55)	(0.23)	(0.69)	(2.56)	(1.11)
PTBI	0.475 ***	0.671 ***	0.318 ***	0.579 ***	0.563 ***	0.582 ***	0.514 ***	0.735 ***	0.643 **	0.628 ***	-0.169 *	0.105
	(6.68)	(10.28)	(3.04)	(5.44)	(6.95)	(4.65)	(4.35)	(7.31)	(2.36)	(4.15)	(1.95)	(0.99)
LNBTD		0.041 **		0.012		0.009		0.058 *		0.032		0.043
		(2.18)		(1.04)		(0.97)		(2.03)		(1.11)		(1.98)
LPBTD		0.028		0.043 **		-0.013		0.035		-0.162		-0.045
		(1.45)		(2.27)		(0.70)		(1.43)		(1.35)		(1.23)
PTBI* LNBTD		-0.307 **		-0.137		-0.047		-0.392 *		-0.342		-0.391 **
		(-2.22)		(0.92)		(0.53)		(1.95)		(1.42)		(2.54)
PTBI* LPBTD		-0.321 **		-0.756 ***		-0.012		-0.316		1.064		-0.249 *
		(-2.18)		(4.19)		(0.07)		(1.69)		(1.19)		(1.84)
R^2	17,79	17.05	2.50	5.64	15.08	15.29	25.32	28.58	18.02	28.56	4.39	6.64

Variables are defined in Table 1.
Regressions include industry and year fixed effects. Robust standard errors are reported, clustered by firm.
*, **, *** indicates significance at the 0.10, 0.05 and 0.01 levels, respectively, using a two-tailed test.

Table 6
OLS Regression of Future Pre-tax Earnings on Current Pre-Tax Earnings with Coefficients Varied by Life Cycle Stage and Earnings Management and Tax Avoider (Blaylock 2012)

$$PTBI_{t+1} = \beta_1 EM_t + \beta_2 TaxAvoid_t + \sum_{k=3}^{7} \beta_k LC_t + \sum_{j=8}^{12} \beta_j LC_t * PTBI_t + \beta_{13} EM_t * PTBI_t + \beta_{14} TaxAvoid_t * PTBI_t + \varepsilon_{t+1}$$

	Cash Flow Model of Life Cycles Stages		Anthony & Ramesh Model of Life Cycle Stages	
Parameter	coeff (t-stat)	p-value	coeff (t-stat)	p-value
EM	0.004	0.8797	0.035	0.0789 *
	(0.15)		(1.94)	
TAXAVOID	-0.052	0.0800 *	-0.002	0.9522
	(-1.93)		(-0.06)	
Stage 1	0.057	0.0118 **	0.035	0.1869
	(3.01)		(1.41)	
Stage 2	0.036	0.2832	0.056	0.1147
	(1.13)		(1.71)	
Stage 3	0.061	0.0476 **	-.004	0.8790
	(2.23)		(-0.16)	
Stage 4	-0.126	0.2854	0.051	0.1822
	(-1.12)		(1.42)	
Stage 5	-0.018	0.6884	0.062	0.0435 **
	(-0.41)		(2.28)	
PTBI * Stage 1	-0.204	0.4284	0.459	0.0178 **
	(-0.82)		(2.78)	
PTBI * Stage 2	0.499	0.0058 ***	0.316	0.0871 *
	(3.41)		(1.88)	
PTBI * Stage 3	1.73	0.0753 *	0.825	0.0005 ***
	(1.96)		(4.84)	
PTBI * Stage 4	0.534	0.0002 ***	0.483	0.0367 **
	(5.61)		(2.38)	
PTBI * Stage 5	-0.021	0.3103	0.492	0.0029 ***
	(-1.06)		(3.80)	
EM * PTBI	-0.069	0.7105	-0.338	0.0104 ***
	(-0.38)		(-3.08)	
TAX AVOID * PTBI	0.278	0.2366	-0.149	0.6110
	(1.25)		(-0.52)	
Industry Effects	Yes		Yes	
Year Effects	Yes		Yes	
n	3,419		3,419	
R^2	44.75%		32.56%	

Variables are defined in Table 1.
Robust standard errors are reported, clustered by firm.
*, **, *** indicates significance at the 0.10, 0.05 and 0.01 levels, respectively, using a two-tailed test.

Life Cycle Stages:

	Cash Flow Model	Anthony & Ramesh Model
Stage 1	Introduction	Growth
Stage 2	Growth	Growth/Maturity
Stage 3	Maturity	Maturity
Stage 4	Shakeout	Maturity/Stagnant
Stage 5	Decline	Stagnant

Table 7
Comparison of Means across Life Cycle Stages of Influential Variables from Guenther (2011)

Anthony and Ramesh Life Cycle Stages

	n = 1,699	n = 2,968	n = 4,590	n = 5,238	n = 6,958			
	Growth	Growth/ Maturity	Maturity	Maturity/ Stagnant	Stagnant			
	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	diff 1-3	diff 3-5	diff 1-5
AGE	6.0250	8.2450	13.3500	20.9749	28.9600	***	***	***
LO_SP	0.0141	0.0220	0.0217	0.0018	0.0110	-	***	***
HI_SP	0.0106	0.0120	0.0132	0.0124	0.0132	-	-	-
LO_NOP	0.0000	0.0000	0.0002	0.0008	0.0043	-	-	-
HI_NOP	0.0065	0.0067	0.0065	0.0055	0.0093	-	-	-
LO_GLIS	0.0041	0.0057	0.0102	0.0097	0.0111	-	-	-
HI_GLIS	0.0377	0.0306	0.0484	0.0538	0.0633	***	-	***
LO_GLCF	0.0071	0.0134	0.0131	0.0120	0.0151	-	-	-
HI_GLCF	0.0006	0.0010	0.0011	0.0057	0.0007	-	-	-
LO_DWC	0.0088	0.0074	0.0072	0.0042	0.0027	-	-	-
HI_DWC	0.0000	0.0007	0.0004	0.0004	0.0101	-	-	-
LO_DFO	0.0082	0.0067	0.0078	0.0074	0.0063	-	-	-
HI_DFO	0.0553	0.0485	0.0468	0.0273	0.0243	-	***	***
LO_DAL	0.2861	0.2675	0.2527	0.2378	0.2396	-	-	***
HI_DAL	0.2684	0.2884	0.2766	0.2484	0.2331	-	***	***
ROA	0.1310	0.1358	0.1328	0.1213	0.1304	***	***	***

CASH FLOW Life Cycle Stages

	n = 1,339	n = 7,646	n = 10,527	n = 1,622	n = 319			
	Introduction	Growth	Maturity	Shakeout	Decline			
	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	diff 2-3	diff 3-4	diff 2-4
AGE	12.4400	15.9264	21.8360	20.5388	17.9680	***	***	***
LO_SP	0.0141	0.0196	0.0119	0.0203	0.0219	***	-	-
HI_SP	0.0097	0.0072	0.0073	0.0474	0.1567	-	***	***
LO_NOP	0.0007	0.0003	0.0004	0.0062	0.0000	-	-	-
HI_NOP	0.0097	0.0036	0.0048	0.0184	0.1034	-	***	***
LO_GLIS	0.0022	0.0054	0.0124	0.0142	0.0031	***	-	***
HI_GLIS	0.0172	0.0349	0.0569	0.1116	0.0940	***	***	***
LO_GLCF	0.0104	0.0060	0.0042	0.0640	0.2257	-	***	***
HI_GLCF	0.0000	0.0039	0.0009	0.0018	0.0031	-	-	-
LO_DWC	0.0583	0.0009	0.0012	0.0012	0.0344	-	-	-
HI_DWC	0.0000	0.0003	0.0007	0.0018	0.0031	-	-	-
LO_DFO	0.0142	0.0069	0.0043	0.0105	0.0596	-	***	-
HI_DFO	0.0328	0.0424	0.0299	0.0432	0.0376	***	-	-
LO_DAL	0.4152	0.2531	0.2154	0.2805	0.4388	***	***	-
HI_DAL	0.2031	0.2579	0.2625	0.2626	0.2225	-	-	-
ROA	0.0980	0.1259	0.1361	0.1243	0.1560	***	***	***

*** indicates significance between groups at p = 0.05 or smaller.
Variable Definitions (from Guenther (2011)):

AGE = firm age calculated as current year less founding year from Jay Ritter web site (bear.warrington.ufl.edu/ritter/foundingdates.htm); *SP*=special items scaled by average assets for year t (data17); *LO_SP*=1 if *SP* is less than -0.07 and 0 otherwise; *HI_SP*=1 if *SP* is greater than 0.07 and 0 otherwise; *NOP*=nonoperating income scaled by average assets for year t; *LO_NOP*=1 if *NOP* is less than -0.1 and 0 otherwise; *HI_NOP*=1 if

NOP is greater than 0.1 and 0 otherwise; *GLIS*=gain or loss from the income statement scaled by average assets for year t; *LO_GLIS*=1 if *GLIS* is less than 0 and 0 otherwise; *HI_GLIS*=1 if *GLIS* is greater than 0 and 0 otherwise; *GLCF*=gain or loss on the cash flow statement scaled by average assets for year t (data213); *LO_GLCF*=1 if *GLCF* is less than -0.07 and 0 otherwise; *HI_GLCF*=1 if *GLCF* is greater than 0.07 and 0 otherwise; *DWC*=change in working capital accounts from the statement of cash flows scaled by average assets for year t; *LO_DWC*=1 if DWC is less than -0.3 and 0 otherwise; *HI_DWC*=1 if DWC is greater than 0.3 and 0 otherwise;