Tax planning and financial default: role of corporate life cycle

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Received 23 August 2022
Revised 8 March 2023
7 June 2023
4 September 2023
Accepted 18 September 2023

Abstract

Purpose – Drawing on the resource-based view (RBV), this study investigates how tax planning affects the likelihood of financial default in different stages of the corporate life cycle.

Design/methodology/approach – Collecting a large sample of US firms between 1989 and 2016, hypotheses are tested using a hazard model. Several robustness and endogeneity checks corroborate the main findings.

Findings – The results show that tax-planning firms are less likely to default in the introduction and decline stages, while they are more likely to default in the growth and maturity stages. The findings suggest that introductory and declining firms use cash resources obtained from tax planning efficiently to meet their needs and acquire other useful resources. In growing and mature firms, tax aggressiveness generates unnecessary slack resources, weakens managerial discipline and increases reputational risks.

Practical implications – The results shed light on the benefits and costs associated with tax planning throughout firms' life cycle, holding great significance for managers, investors, lenders and other stakeholders.

Originality/value – This study contributes to the literature that examines resource management at different life cycle stages by showing that cash resources from tax planning are managed in distinctive ways in each life cycle stage, having a varied impact on the likelihood of default. The authors shed light on underexplored cash resources. Furthermore, this study shows the potential linkages between the agency theory and RBV.

Keywords Tax planning, Corporate life cycle, Financial default, Resource management

Paper type Research paper

1. Introduction

Tax planning [1] is a key managerial activity with relevant implications for firms' growth, internationalization, corporate value and capital structure (Cooper and Nguyen, 2020; Wang *et al.*, 2020). The resource-based view (RBV) posits that tax planning is an important cash-generating activity (Hasan *et al.*, 2017; Medioli *et al.*, 2020; Magerakis, 2022). Studies suggest that, although not inimitable, cash is one of the most desirable resources for value creation because it is flexible, readily convertible and can be used to acquire strategic resources (Lee and Wu, 2016; Warnier *et al.*, 2013). Its scarcity hinders firms from not only acquiring other resources but also managing existing resources, increasing the risk of default (Trahms *et al.*, 2013). Other researchers assert that tax planning is a value-destroying activity because it generates slack cash resources, diminishing the managerial discipline over efficient investing

This research was partially carried out when Alessandro Gabrielli was a Visiting Ph.D. Student at the WHU– Otto Beishem School of Management in Vallendar, Germany. The authors are grateful to the members of the WHU– Otto Beishem School of Management Brown Bag and Tax Readings Group and to the participants of the SIDREA–EAA Workshop jointly held by the Italian Society of Accounting and Business Economics Educators and the European Accounting Association, as well as to the participants of EAA 2022 Annual Congress and the Ninth International Conference of JIAR. The authors are also thankful to Martin Jacob, Lisa Hillmann, Petra Andries, and Marco Maria Mattei for providing helpful comments. Alessandro Gabrielli gratefully acknowledges financial support from the Department of Economics and Management at the University of Pisa.

Management Decision
Vol. 61 No. 13, 2023
pp. 321-355
Emerald Publishing Limited
0025-1747
DOI 10.1108/MD-07-2022-0928

and usage of resources and increasing reputational risks (Daniel *et al.*, 2004; Lee and Wu, 2016; Nohria and Gulati, 1996).

RBV scholars suggest exploring how a firm obtains and manages resources throughout its life cycle (Sirmon *et al.*, 2011; Trahms *et al.*, 2013; Zahra, 2021). Tax planning is likely heterogeneous across a firm's life cycle. Notably, the life cycle affects firms' *ex ante* (pretax planning) resources, their propensity to engage in tax planning (Hasan *et al.*, 2017) and how they allocate and use resources generated from tax planning (Cooper and Nguyen, 2020; Dickinson, 2011). Hence, whether tax planning increases or decreases the likelihood of financial default likely depends on the tax-planning firm's life cycle stage. Therefore, this study investigates how tax planning influences the likelihood of financial default when moderated by the firm's life cycle stage.

This research is important for two reasons. First, it answers recent calls for research on resource management at different life cycle stages (Zahra, 2021), as well as on firm characteristics and outcomes of tax planning (Wang *et al.*, 2020). Second, academics and practitioners are interested in understanding how tax planning affects the likelihood of financial default in those life cycle stages where access to resources is constrained, such as the introduction and decline stages (Zahra, 2021).

Using a large sample of US public firms in the period 1989–2016, the research regresses tax planning, measured by effective tax rates (ETRs) and ETRs volatility, on a financial default-dependent variable. Following prior studies (Altman, 1968; Beaver *et al.*, 2010), we define financial default as the firms filing under either Chapter 11 or Chapter 7 procedures. Our moderator variable is the corporate life cycle. Following prior management literature, we operationalize life cycle using the Dickinson cash flow patterns model (Cuypers *et al.*, 2016; Sánchez *et al.*, 2017; Hasan and Cheung, 2018; Hsu, 2018). The research adds a set of control variables—identified in prior literature on financial default—and year and industry fixed effects. Our study also performs a battery of tests to address potential endogeneity concerns related to reverse causality and omitted variable bias (Wooldridge, 2010).

The findings show that the association between tax planning and financial default varies at different life cycle stages. We find that aggressive tax planner firms (i.e. firms with lower ETRs) are less likely to default in the introductory and decline life cycle stages. The results are economically significant. Using hazard ratios, we find that a 1% reduction of ETRs lowers—*ceteris paribus*—the probability of a default of 6.65% and 3.51% for firms in the decline and introductory stages of the corporate life cycle, respectively. These findings suggest that firms in the introductory and decline stages efficiently use cash resources from tax planning to meet their financial needs and acquire resources useful for their survival. Aggressive tax planning, however, leads to a higher default likelihood among firms in the growth and mature stages—a 1% increase in the ETRs volatility increases the default likelihood by 1.92% in growth firms and by 2.36% in mature firms. Volatile tax rates, which are visible to external stakeholders through financial reports, may signal generation of unnecessary slack resources, lack of managerial discipline and increased reputational risks (Duong *et al.*, 2022).

This study contributes to literature in several ways. First, as stated earlier, it answers the call for research on resource management at specific life cycle stages (Zahra, 2021). Our findings show that cash resources from tax planning are managed and allocated in distinctive ways across life cycle stages, thereby having a varied impact on the default likelihood. Moreover, while most prior studies focus on valuable, rare, inimitable and organizationally embedded (VRIO) resources, we contribute to the literature on less explored cash resources (Warnier *et al.*, 2013; Magerakis, 2022).

Second, this study contributes to prior RBV literature with insights on potential linkages between agency theory and RBV, at a conceptual and empirical level (Biscotti *et al.*, 2018; Zona *et al.*, 2018; Purkayastha *et al.*, 2021; Luu, 2023). This study shows that cash slack from

aggressive tax planning increases agency costs and weakens the optimal management of the firm's resources at certain life cycle stages. In this sense, RBV and agency theory may be complementary in explaining why tax planning increases the default risk in growth and mature firms, thus offering a more refined explanation of the phenomenon.

Third, this study extends the literature on tax planning. It shows that firms' life cycle stages explain not only the heterogeneity of approaches to tax planning (Hasan *et al.*, 2017; Wang *et al.*, 2020; Cooper and Nguyen, 2020) but also the outcome of such activities. Compared to Hasan *et al.*'s (2017) findings, our findings indicate that a firm's life cycle stage must be considered to not only understand why certain firms are more tax aggressive than others, but also gain insight into why only certain firms seem to benefit from tax planning.

Fourth, this study contributes to the literature on how life cycle-specific management decisions affect the likelihood of default. Previous studies have shown that a firm's life cycle stage moderates the relationship between the likelihood of default and several management decisions—such as investment, R&D and CSR (Al-Hadi *et al.*, 2019; Anandarajan *et al.*, 2010; Koh *et al.*, 2015). This study extends our current understanding of this aspect by exploring the moderating role of firms' life cycle stages in the relationship between default likelihood and tax planning. In this sense, it has the potential to complement the recent literature on firm's failure and survival under specific conditions (Islam and Fatema, 2023; Paeleman *et al.*, 2023) and in specific life cycle stages (Mota *et al.*, 2022; Ehsani and Osiyevskyy, 2023).

The findings present several managerial implications. The research informs managers and stakeholders on the costs and benefits of tax planning across a firm's life cycle stages as well as the stakeholders' assessment of tax planning. At certain life cycle stages, tax planning acts as a signal to outsiders for increased managerial discretion and reputational risks (Duong *et al.*, 2022), thus affecting the default likelihood. In this respect, we provide a quantitative estimate of the magnitude of the tax planning effect on financial default likelihood, which is of interest to managers and stakeholders.

The remainder of the paper is structured as follows. Section 2 reviews the relevant literature and develops hypotheses. Section 3 describes the research methodology. Section 4 presents the results. Section 5 critically discusses the research results, highlighting their implications to theory and management practice. Section 6 concludes the paper.

2. Literature review and hypotheses development

2.1 Literature review

The RBV suggests that firms are "a collection of productive resources, where the choice of different uses of these resources over time is determined by administrative decision" (Penrose, 1959, p. 21). Numerous RBV-based empirical studies have examined how firms' resource management [2] impacts their survival and performance (Andersén, 2011; Barney, 1991; Newbert, 2007; Warnier *et al.*, 2013; Wernerfelt, 1984) [3]. Drawing on the RBV, researchers have integrated the concept of the corporate life cycle into the analysis of firms' resources (Sirmon *et al.*, 2011). The management literature identifies five distinct phases in the corporate life cycle: introduction, growth, maturity, shake-out and decline (Miller and Friesen, 1984). These stages are characterized by differences in the business environment, resource availability, strategy and decision-making (Miller and Friesen, 1984).

Recent studies indicate that different life cycle stages are associated with different resource management and commitment choices and significant changes in resource endowment (Sirmon *et al.*, 2011; Trahms *et al.*, 2013; Zahra, 2021) [4]. Some studies have demonstrated different resource management in different life cycle stages, focusing on default avoidance. For example, Koh *et al.* (2015) showed that firms in the introduction stage change their CEOs more quickly and reduce dividend payouts to avoid bankruptcy. With lower or less appealing investment opportunities, mature firms engage in corporate social

responsibility to attract resources and reduce their risk of default (Al-Hadi *et al.*, 2019). Declining firms attempt to avoid or delay financial defaults by boosting internal efficiency and gaining support from key stakeholders (Anandarajan *et al.*, 2010; Morrow *et al.*, 2007; Trahms *et al.*, 2013).

This study focuses on a notable managerial decision, tax planning and its effect on the likelihood of default. Efficient tax planning reduces financial "scarce resources" that are transferred outside the firm and increases firm performance (Watson, 2015). In managerial decision-making, tax planning is likely a wider evaluation of a firm's economic fundamentals, cash flow patterns and internal resource assessment (Scholes *et al.*, 2014; Xu and Zheng, 2020). Hasan *et al.* (2017) show that firms' propensity to engage in tax planning varies based on their life cycle stage; introductory and declining firms are, on average, more active than growing and mature firms. However, whether tax planning increases or reduces the likelihood of default based on the life cycle stage remains unexplored.

Prima facie, tax planning is a salient cash-generating activity that limits the transfer of financial resources from the firm to the government and generates high discretion slack [5] (George, 2005). The life cycle stage affects two key conditions underlying firms' tax planning decision: the *ex ante* availability of resources (and the related) financial needs, and the managers' commitment or discretion regarding using corporate resources (Dickinson, 2011; Sirmon *et al.*, 2011).

2.2 Hypotheses development

In the introduction stage, firms generally have negative operating cash flows. Some do not even break-even and need resources for investments (Dickinson, 2011; Maiti *et al.*, 2020; Song *et al.*, 2022; Franczak *et al.*, 2023). Since they are run by owner-entrepreneurs, these firms usually have centralized organizational structures (Miller and Friesen, 1984; Franczak *et al.*, 2023) and limited separation between ownership and control (Badertscher *et al.*, 2013; Fama and Jensen, 1983). Resource constraints and limited access to external financing sources increase their propensity to obtain additional resources through tax planning (Edwards *et al.*, 2016; Higgins *et al.*, 2015; Cerrato *et al.*, 2023). They seek and use legal tax minimization opportunities, including benign deferral tax strategies and tax loss deductions, that are unlikely to be challenged by tax authorities (Hasan *et al.*, 2017).

By using resources shrewdly and having little or no managerial discretion (Miller and Friesen, 1984; Sirmon *et al.*, 2011), cash resources generated through tax planning likely foster firms' competitive advantage and performance, reducing the risk of financial default. Owing to their small size and low exposure to capital markets, reputational costs associated with tax planning are limited for these firms (Al-Hadi *et al.*, 2016; Zimmerman, 1983). Hence, in the introduction stage, tax planning likely provides firms with an additional source of cash resources and is negatively associated with their financial default. Thus, we formulate the following hypothesis.

H1. Tax planning is negatively associated with the financial default of firms in the introductory stage of their life cycle.

In the growth stage, firms have robust operating cash flows, raise cash from equity and/or leverage financing to fund investments. Tax planning is less appealing as a source of generating cash (Hasan *et al.*, 2017). At this stage, there is a greater degree of separation between ownership and control with decentralization and functionalization (Filatotchev *et al.*, 2006; Miller and Friesen, 1984). Furthermore, slack resources generated through tax planning can diminish managerial discipline over efficient investment (Nohria and Gulati, 1996). Managers may exploit their discretion and use slack resources to continue projects having negative present value, make suboptimal investments, or take up excessively costly and

risky R&D activities (George, 2005; Lee and Wu, 2016; Nohria and Gulati, 1996). Shareholders are likely to perceive tax planning activities as risky and a sign of managerial wealth diversion, penalizing firms with a higher cost of capital (Desai *et al.*, 2007; Duong *et al.*, 2022). Lenders also penalize high-tax-planning firms with a high cost of debt (Dhawan *et al.*, 2020). Based on these arguments, we posit the following hypothesis.

H2. Tax planning is positively associated with the financial default of firms in the growth stage of their life cycle.

Once firms exhaust all growth opportunities, they mature. Mature firms are older, larger, known in the market, and investors and lenders perceive them as less risky (Easley and O'Hara, 2004; Miller and Friesen, 1984). These firms have abundant operating cash flow owing to reduced investment needs and negative cash flow from financing activities due to debt repayment and cash dividend payouts (Dickinson, 2011; Faff *et al.*, 2016). Resource slack and complex bureaucratic structures can increase managerial discretion in how funds obtained from tax planning are employed (Quinn and Cameron, 1983; Nohria and Gulati, 1996; Carnes *et al.*, 2017). Considering high resource availability, poor investment opportunities and high managerial discretion, tax planning likely becomes ancillary to managerial wealth extraction and/or limited benefit to shareholders and bondholders. For mature firms, as Flanagan and O'Shaughnessy (2005, p. 445) noted, "reputation is perhaps one of its most important strategic resources," and they focus on reinforcing their relationship with the external environment (Boyd *et al.*, 2010; Jacob *et al.*, 2021; Zimmerman, 1983). Meanwhile, aggressive tax planning can raise doubts from the government and tax authorities (Gallemore *et al.*, 2014). Customers may also be unwilling to support aggressive tax-planning companies (Hardeck and Hertl, 2014). Moreover, investors and lenders do not expect tax avoidance from mature and risk-averse firms and can react adversely to such tax planning activities by increasing the cost of capital and debt (Hasan *et al.*, 2017). Concerns regarding reputational costs and penalties may outweigh the expected economic benefits from tax planning. Thus, we posit the following hypothesis.

H3. Tax planning is positively associated with the financial default of firms in the maturity stage of their life cycle.

The corporate life cycle ends in the decline stage. When firms enter this stage, growth rates, operating cash flows and investment expenditures plummet (Hasan *et al.*, 2017). They divest and engage in asset restructuring activities (e.g. sale of assets) to pay off debt, renegotiate interest rates and continue operating (Dickinson, 2011; Koh *et al.*, 2015). The lack of resources and close monitoring by shareholders and external lenders substantially reduce managerial discretion over resource usage (Dickinson, 2011; Jensen, 1986). Then, tax planning can be a valuable source of cash and business restructuring to avoid bankruptcy. In declining firms, the benefits of survival overcome the risks of tax avoidance for both managers and shareholders (i.e. litigation, penalty and reputational risks) (Hasan *et al.*, 2017; Koh *et al.*, 2015; Morrow *et al.*, 2007; Richardson *et al.*, 2015). Based on these arguments, we formulate the following hypothesis.

H4. Tax planning is negatively associated with the financial default of firms in the decline stage of their life cycle.

3. Method

3.1 Sample

We collected data from the Compustat North America database. We downloaded financial statement data of both active and inactive US firms. Then, we merged it with bankruptcy

information gathered from the CRSP, which provides information about the reasons for a firm's delisting (delisting codes: 400 "Liquidation" and 574 "Bankruptcy"). Initially, our sample comprised 283,633 firm-year observations pertaining to the period between 1989 and 2016. After excluding observations with incomplete data, the final sample had 90,790 firm-year observations. Our sample period starts in 1989 because Compustat provides cash flow data of all firms starting from this year (Dickinson, 2011). The sample period ends in 2016 because former President Donald Trump enacted a major change in the US tax system, and the implementation of the Tax Cuts and Jobs Act began in 2016. Since variation in the statutory tax rate may affect both dependent and independent variables, we limited our analysis to investigating a period that was not substantially affected by tax rate variations at the federal level.

3.2 Research design

We used two estimation approaches to test our hypotheses: a hazard model and a logit model. First, we use a hazard model. Scholars suggest that it is an appropriate estimation strategy for analyzing firms' financial default because it can incorporate time-variant features of model covariates (Bandopadhyaya, 1994; Shumway, 2001). Since financial default is dynamic in nature, the hazard model can provide a robust estimation of the probability that a firm will default at a given point in time (Esteve-Pérez and Mañez-Castillejo, 2008; Shumway, 2001). Next, we use the logit model as a robustness test. The logit model is a standard approach in examining financial defaults (Altman *et al.*, 2019; Campbell *et al.*, 2008). Following Hasan *et al.* (2017), we estimate our model (Equation 1) using two approaches: (a) a pooled regression on the full sample and (b) a separate regression on the subsample of firms in each life cycle stage.

$$\begin{aligned} Default_{it} = {} & \beta_0 + \beta_1(Tax\ Planning)_{i,t-1} + \beta_2(Introduction)_{i,t} + \beta_3(Tax\ Planning)_{i,t-1}x(Introduction)_{i,t} + \\ & \beta_2(Growth)_{i,t} + \beta_3(Tax\ Planning)_{i,t-1}x(Growth)_{i,t} + \beta_4(Mature)_{i,t} + \\ & \beta_5(Tax\ Planning)_{i,t-1}x(Mature)_{i,t} + \beta_6(Decline)_{i,t} + \beta_6(Tax\ Planning)_{i,t-1}x(Decline)_{i,t} + \\ & \beta_7(WC\_TA)_{i,t-1} + \beta_8(RE\_TA)_{i,t-1} + \beta_9(EBIT\_TA)_{i,t-1} + \beta_{10}(MV\_TL)_{i,t-1} + \beta_{11}(S\_TA)_{i,t-1} + \\ & \sum_{t=0}^{n} \text{Year } FixedEffects - \text{Industry } FixedEffects + \varepsilon_{i,t} \end{aligned} \tag{1}$$

$Default_{it}$ is the measure of financial default. It is a binary variable that equals one for each firm-year observation of a firm filed under Chapters 11 or 7. Otherwise, it equals zero. Following previous research, we measured financial default as the firm's decision to start the legal procedure of Chapters 11 or 7 (Kücher *et al.*, 2020; Lussier, 1995) [6]. $Tax\ Planning_{i,t-1}$ is the independent variable. Following previous research, we measure tax planning using ETRs. Specifically, we use *GAAP ETR* as the first proxy, calculated as income tax expense (*txt*) on pretax income (*pi*). In addition to *GAAP ETR*, we use a long-term five-year standard deviation of *ETR*s (*GAAP ETRVol*). The *GAAP ETRVol* captures the risk inherent in corporate tax positions (Drake *et al.*, 2019; Guenther *et al.*, 2017). Blouin (2014) argues that combining these two proxies can provide a true and complete picture of corporate tax planning and the level of its aggressiveness. We also ensure that tax volatility is related to tax planning and not driven by the firm's pretax performance volatility by controlling for the firm's performance in the base models and endogeneity checks.

The corporate life cycle is the moderator variable. $Lifecycle_{i,t}$ is a dummy variable that identifies the life cycle stage when the firm defaults. Following previous studies (Hasan *et al.*, 2017; Koh *et al.*, 2015), we proxied corporate life cycle stages using firms' cash flow patterns, similar to Dickinson's model (2011). Dickinson (2011) argues that a firm's progression from

one life cycle stage to another is not a function of its age but of its cash flow patterns. Cash flow patterns have a robust relationship with life cycle fundamentals and explain why not all firms progress in the same order despite their age (Dickinson, 2011; Josefy *et al.*, 2017) We adopt the Dickinson model because it provides a less erroneous identification of the corporate life cycle with respect to other classification criteria that are free from distributional assumptions (Hsu, 2018). Although alternative identification strategies exist (e.g. Anthony and Ramesh, 1992), it is a common stand in the literature that they are less effective or more erroneous than the Dickinson model (Habib and Hasan, 2019). According to the recent literature on the corporate life cycle, firms' transition from one stage to another cannot be fully explained by the age or the dynamics of their retained earnings (Dickinson, 2011; Yang *et al.*, 2021). Therefore, a classification based on cash flow patterns can provide a consolidated and theoretically consistent criterion, limiting the researcher's arbitrariness in their identification (i.e. distributional assumption bias) (Dickinson, 2011). Several studies in management, accounting and organization science have used (or built on) Dickinson's model to identify life cycle stages (e.g. Cuypers *et al.*, 2016; Hasan and Cheung, 2018; Hsu, 2018; Sánchez *et al.*, 2017). To ensure the robustness of our results, in all of our models, we also control for the level of retained earnings in total assets (*RE_TA*), a well-established measure in the financial default literature (Altman *et al.*, 2019) and used by DeAngelo *et al.* (2006) as a proxy for the life cycle stage.

Following Dickinson (2011), we define corporate life cycle stages as follows:

Introduction: if $OANCF < 0$, $INVCF < 0$ and $FINCF > 0$,

Growth: if $OANCF > 0$, $IVNCF < 0$ and $FINCF > 0$,

Maturity: if $OANCF > 0$, $INVCF < 0$ and $FINCF < 0$,

Decline: if $OANCF<0$, $INVCF>0$ and $FINCF \leq$ or $= > 0$ and

Shake-out: the remaining firm-years (those that are not classified as introduction, growth, maturity, or decline) [7].

Given its residual nature, previous studies have not considered the shake-out stage in their analyses or included it only as a benchmark (Hasan *et al.*, 2017; Koh *et al.*, 2015). Accordingly, we did not consider this stage in our analyses.

As control variables, we include these financial ratios based on the literature on financial defaults (Altman *et al.*, 2019; Altman, 1968): working capital/total assets ("*WC_TA*"), retained earnings/total assets ("*RE_TA*"), earnings before interest and taxes/total assets ("*EBIT_TA*"), market value of equity/total liabilities ("*MV_TL*") and sales/total assets ("*S_TA*"). *WC_TA* denotes the level of net liquid assets in the total capital invested and is a measure of corporate liquidity. *RE_TA* represents cumulative profitability implicitly related to a firm's age (DeAngelo *et al.*, 2006). On average, the *RE_TA* ratio increases as the firm ages. *EBIT_TA* represents firms' profitability. It specifically reflects the part of corporate profitability that arises from firms' productivity, net of any leverage or tax effect. It is important to control for it because it permits us to parse out the effect of tax avoidance on financial default while limiting the risk that negative corporate performance could affect the interpretation of our results. *MV_TL* is a measure of market performance calculated as the sum of the market value of common and ordinary shares divided by the total liabilities. Finally, the *S_TA* (asset-turnover ratio) measures the total assets that contribute to the firm's sales-generating activities (Altman, 1968). All the models include industry and year fixed effects and standard errors clustered by firms, which control for firm-level fixed effects (Petersen, 2009).

We use lagged independent and control variables. Using lagged dependent variables can help mitigate endogeneity concerns regarding reverse causality (Vergara, 2010), providing a

more conservative examination of the potential endogeneity bias. All the variables were winsorized at 1%.

4. Results

4.1 Descriptive statistics

Table 1 displays the descriptive statistics of all variables with *Default* as the dependent variable. There are 2,121 defaulted observations, 2.3% of the total firm-year observations. The non-defaulted observations amount to 88,669, accounting for 97.6% of the total firm-year observations.

Our explanatory variable is tax planning, proxied by *GAAP ETR* and *GAAP ETRVol*. The mean *GAAP ETR* is 0.332 (33.2%), 0.336 (33.6%) and 0.331 (33.1%) for the total, defaulted and non-defaulted samples, respectively. The mean *GAAP ETRVol* is 0.048 (4.8%), 0.053 (5.3%) and 0.047 (4.7%) for the total, defaulted and non-defaulted samples, respectively. The *t*-statistics show that the mean-in-difference of tax-planning proxies in the defaulted and non-defaulted samples is highly significant.

Descriptive statistics of control variables suggest that, on average, firms filing under Chapters 7 or 11 have a low *RE_TA*, *EBIT_TA* and *MV_TL* and a high *WC_TA* and *S_TA*.

For the total, defaulted and non-defaulted samples, the mean of *WC_TA* is 0.244 (24.4%), 0.273 (27.3%) and 0.240 (24.0%), respectively. The mean of *RE_TA* in the total, defaulted and non-defaulted samples is 0.146 (14.6%), 0.101 (10.1%) and 0.153 (15.3%), respectively. The mean of *EBIT_TA* in the total, defaulted and non-defaulted samples is 0.100 (10.0%), 0.089 (8.9%) and 0.102 (10.2%), respectively. The mean of *MV_TL* is 3.477 (347.7%), 3.530 (353.0%) and 3.091 (309.1%) in the total, non-defaulted and defaulted samples, respectively. Finally, the mean of *S_TA* is 1.113 (111.3%), 1.096 (109.6%) and 1.235 (123.5%) in the whole, non-defaulted and defaulted samples, respectively. The *t*-statistics indicate that the mean-in-difference of all control variables in the defaulted and non-defaulted samples is statistically significant.

4.2 Univariate analysis

Table 2 shows the Spearman's correlation coefficients. Univariate analysis shows that *GAAP ETR* and *GAAP ETRVol* are positively and highly associated with *Default*. Additionally, *Default* is highly correlated with all life cycle stages, except for the growth and shake-out stages, at the <0.01 significance level. More specifically, *Default* is highly and positively correlated with the introduction and decline stages but highly and negatively correlated with the maturity phase. Furthermore, all control variables are significantly associated with *Default* in the expected direction.

4.3 Main results

Table 3 reports the results of employing the hazard model. For the sake of brevity, Table 3 reports only the coefficients of tax planning and the interaction term of tax planning and life cycle. Across all models in Table 3, the control variables are significantly associated with *Default* in the expected direction (not shown).

Column 1 in Table 3 shows that *GAAP ETR* is significantly and negatively associated with *Default*. This finding suggests that tax planning results in more default since lower tax rates imply a greater likelihood of default. Column 2 shows that *GAAP ETRVol* is positively associated with *Default*. These findings support the notion that tax planning is associated with more default when firm's profitability, size, leverage, liquidity and retained earnings are controlled for. They are consistent with the findings of previous studies (e.g. Dhawan *et al.*, 2020; Noga and Schnader, 2013). Columns 3 and 4 add the dummies of life cycle stages (not

Table 1.
Descriptive statistics

Summary statistics

	Non-defaulted firms (n = 88,669)					Defaulted firms (n = 2,121)					Mean-in-Diff		Total (N = 90,790)				
	Mean	Median	p25	p75	SD	Mean	Median	p25	p75	SD	*Diff*	*t-statistics*	Mean	Median	p25	p75	SD
$GAAP\ ETR_{i,t}$	0.331	0.356	0.283	0.393	0.094	0.336	0.367	0.279	0.404	0.102	-0.00423^{***}	(−3.94)	0.332	0.357	0.283	0.395	0.095
$GAAP\ ETRVol_{i,(t,t-4)}$	0.047	0.031	0.013	0.066	0.046	0.053	0.036	0.014	0.079	0.052	-0.00570^{***}	(−12.52)	0.048	0.032	0.013	0.068	0.047
$WC\_TA_{i,t}$	0.240	0.219	0.065	0.398	0.210	0.273	0.265	0.107	0.441	0.214	-0.0102^{***}	(−5.10)	0.244	0.224	0.069	0.404	0.211
$RE\_TA_{i,t}$	0.153	0.222	0.072	0.406	0.392	0.101	0.153	0.036	0.319	0.388	0.115^{***}	(25.18)	0.146	0.212	0.066	0.397	0.392
$EBIT\_TA_{i,t}$	0.102	0.101	0.067	0.149	0.049	0.089	0.087	0.053	0.132	0.056	0.0472^{***}	(57.09)	0.100	0.100	0.065	0.147	0.050
$MV\_TL_{i,t}$	3.530	1.863	0.837	4.632	3.713	3.091	1.609	0.826	3.710	3.499	0.637^{***}	(19.02)	3.477	1.826	0.837	4.531	3.690
$S\_TA_{i,t}$	1.096	1.014	0.636	1.514	0.569	1.235	1.193	0.760	1.763	0.587	-0.138^{***}	(−25.75)	1.113	1.034	0.649	1.547	0.573

Note(s): This table reports descriptive statistics for all the main variables included in our analyses during the period 1989–2016. The table also includes mean-in-differences and *t*-statistics of the independent and control variables used

Source(s): Created by authors

Table 2.
Correlation coefficients

Spearman correlation matrix

Covariates	*Default*$_{i,t}$	*Introduction*	*Growth*	*Mature*	*Shake-out*	*Decline*	*GAAP ETR*$_{i,t}$	*GAAP ETRVol*$_{i,(t,t-4)}$	*WC_TA*$_{i,t}$	*RE_TA*$_{i,t}$	*EBIT_TA*$_{i,t}$	*MV_TL*$_{i,t}$	*S_TA*$_{i,t}$
		Life cycle					Tax avoidance		Control variables				
Default$_{i,t}$	*1*												
Life cycle													
Introduction	0.142***	*1*											
Growth	−0.00158	−0.174***	*1*										
Mature	−0.0733***	−0.233***	−0.705***	*1*									
Shake-out	−0.00367	−0.00236	−0.00714	−0.00953*	*1*								
Decline	0.0397***	−0.0287***	−0.0868***	−0.116***	−0.00117	*1*							
Tax avoidance													
GAAP ETR$_{i,t}$	0.0146***	0.0185***	0.0182***	−0.00804*	−0.000761	−0.0174***	*1*						
GAAP ETRVol$_{i,(t,t-4)}$	0.0456***	0.0380***	0.00940*	−0.0641***	0.00817*	0.0474***	−0.114***	*1*					
Control variables													
WC_TA$_{i,t}$	0.0516***	0.133***	−0.0290***	−0.0910***	0.00182	0.0584***	−0.0440***	0.0123***	*1*				
RE_TA$_{i,t}$	−0.0433***	−0.0475***	−0.0189***	0.0895***	−0.0271***	−0.0701***	0.122***	−0.186***	0.0799***	*1*			
EBIT_TA$_{i,t}$	−0.0869***	−0.0819***	−0.0378***	0.163***	−0.00822*	−0.164***	0.0637***	−0.190***	0.128***	0.172***	*1*		
MV_TL$_{i,t}$	−0.0391***	−0.00435	0.0815***	−0.0938***	0.00474	0.00299	−0.0464***	−0.0195***	0.531***	0.0463***	0.272***	*1*	
S_TA$_{i,t}$	0.0799***	0.0974***	−0.132***	0.108***	−0.0157***	−0.0112**	0.173***	−0.0783***	0.215***	0.00947*	0.249***	−0.0333***	*1*

Note(s): This table reports the Spearman correlations between the main variables included in the analyses, namely: *Default; GAAP ETR*$_{i,t}$, *GAAP ETRVol*$_{i,(t,t-4)}$, Introduction, Growth, Mature, Shake-out, Decline, Working capital on total assets, Retained earnings on total assets, Earnings before interest and taxes on total assets, Market value of equity on total liabilities, Sales on total assets. ***, **, * represent statistical significance at the 1%, 5 and 10% level, respectively

Source(s): Created by authors

Table 3. Main pooled analysis: hazard model

	Pred. Sign	*Default* (1)	(2)	(3)	(4)	(5)	(6)
Tax avoidance as GAAP ETR							
$GAAP\ ETR_{i,t-1}$	(−)	−0.679***		−0.605***		−0.551*	
		(0.187)		(0.186)		(0.330)	
Tax avoidance as GAAP ETR volatility							
$GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)		2.685***		2.347***		1.340**
			(0.311)		(0.310)		(0.593)
Life cycle × Tax avoidance							
Introduction × $GAAP\ ETR_{i,t-1}$	(+)					*0.705**	
						(0.408)	
Growth × $GAAP\ ETR_{i,t-1}$	(−)					−0.425	
						(0.380)	
Mature × $GAAP\ ETR_{i,t-1}$	(−)					−0.487	
						(0.389)	
Decline × $GAAP\ ETR_{i,t-1}$	(+)					*1.344**	
						(0.548)	
Life cycle × Tax avoidance							
Introduction × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(−)						−0.5111
							(0.720)
Growth × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)						*1.996***
							(0.686)
Mature × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)						*2.200***
							(0.662)
Decline × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(−)						−0.613
							(0.851)
Observations		90,790	90,790	90,790	90,790	90,790	90,790
Life cycle dummies		NO	NO	YES	YES	YES	YES
Model controls		YES	YES	YES	YES	YES	YES
Year fixed effects		YES	YES	YES	YES	YES	YES
Industry fixed effects		YES	YES	YES	YES	YES	YES
Standard errors clustered by		FIRM	FIRM	FIRM	FIRM	FIRM	FIRM

Note(s): This table reports the estimated coefficients obtained by regressing the hazard model with a dependent binary variable ("*Default*") identifying firms entering Chapter 11 (restructuring) or Chapter 7 (liquidation) at time t. Columns 1, 3 and 5 report the results obtained by including a 1-year lagged *GAAP ETR* variable, calculated by taking the total income tax expense at time t-1 on the pre-tax accounting income at time t-1 (Hanlon and Heitzman, 2010). The higher the *GAAP ETR* is, the lower the level of tax avoidance is. Columns 2, 4 and 6 report the results obtained by using a 1-year lagged *GAAP ETRVol* variable, calculated as the standard deviation of *GAAP ETR* from time t-1 to time t-5. The higher the *GAAP ETRVol* is, the higher the level of risk associated to the firm's tax position is. Columns 1 and 2 report the results obtained by running the hazard model and including a proxy for tax avoidance. Column 3 and Column 4 show the results obtained by running hazard model and including life cycle dummies in addition to a variable of tax avoidance. Column 5 and Column 6 report the results obtained by running the hazard model and including: (1) corporate life cycle; (2) tax avoidance and (3) the interaction between corporate life cycle and tax avoidance, respectively. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. All the models are estimated using standard errors clustered by firms, industry and year fixed effects. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): Created by authors

reported) and replicate the analysis. The results remain consistent with those in Columns 1 and 2. That is, our tax planning proxies are statistically significant in the expected direction after including life cycle stages.

Columns 5 and 6 show the models with the interaction term of tax planning and life cycle. The interaction variable measures the difference between the effect of tax planning on a group of firms in the same life cycle and the main effect (Wooldridge, 2010). Column 5 shows that the main effect of *GAAP ETR* does not differ in growing and mature firms, but it differs in the introductory and declining firms. In the case of the latter firms, the coefficient of the interaction terms is positive and significant, signaling that introductory and declining firms with higher *GAAP ETR* (low tax avoidance) are more likely to default. Column 6 shows consistent and complementary findings. When *GAAP ETRVol* interacts with the life cycle, the results show that, in growing and mature firms, the effect of tax volatility on financial default is significantly higher than the average effect in the full sample, which is measured by the coefficient of *GAAP ETRVol* (1.340) (Wooldridge, 2010). In contrast, the interaction of tax volatility and financial default has a negative and non-significant effect in introductory and declining firms, indicating that tax volatility does not contribute to a higher financial default in these firms. In this case, the interaction indicates that introductory and declining firms do not contribute to the average tax volatility effect on financial default in the full sample, which is measured by the coefficient of *GAAP ETRVol* (1.340) (Wooldridge, 2010).

These results are economically significant. Using hazard ratios, we show that, *ceteris paribus,* a 1% reduction in ETRs lowers the probability of default by 3.51 and 6.65% in introductory ($e^{(0.705-(-0.551))} = 3.51$) and declining firms ($e^{(1.344-(-0.551))} = 6.65$) [8], respectively. A 1% increase in the tax rate volatility increases the default likelihood by 1.92 and 2.36% in growing ($e^{(1.996-1.340)} = 1.92$) and mature firms ($e^{(2.200-1.340)} = 2.36$), respectively.

These findings support our hypotheses. Introductory and declining firms benefit from tax planning with a lower likelihood of default, confirming HP1 and HP4. Meanwhile, tax-planning growing and mature firms are more likely to default, confirming HP2 and HP3. We replicated the analysis using the logit model and obtained consistent results (available in a supplementary file upon request).

To ensure robust findings, we follow Hasan *et al.* (2017) and run a life cycle-wise analysis. Instead of including life cycle dummy variables together, we included each one by one. We then interacted each life cycle stage with the tax planning proxies. Table 4 shows the results for the hazard model and reports only the coefficients of tax planning and the interaction terms of tax planning and life cycle stages. Across all models in Table 4, the control variables are significantly associated with *Default* in the expected direction (not shown). Columns 1 and 2 in Table 4 report the results for the introduction stage. In Column 1, the *GAAP ETR* is significantly and negatively associated with *Default*, signifying that tax-avoiding firms are more likely to default. The coefficient of the interaction term of tax planning and the introduction stage is positive and highly significant, showing that introductory firms with higher ETRs are more likely to default. Hence, unlike other firms, tax-avoiding introductory firms benefit from tax planning with a lower likelihood of defaulting. Column 2 shows a consistent and complementary result; *GAAP ETRVol* is positively and significantly associated with *Default*, while the interaction of *GAAP ETRVol* and the introduction stage is significantly and negatively associated. This finding indicates that introductory firms with higher tax volatility are much less likely to default than other firms in the sample. These findings provide empirical support for HP1, showing that tax-avoiding introductory firms are less likely to default. Columns 3 and 4 show that growing firms do not display a behavior different from the average behavior of the full sample, as indicated by the coefficients of the tax planning measures. The coefficients of the interaction of *GAAP ETR* and *GAAP ETRVol* with the life cycle stage are insignificant and have the same direction as that of the

Table 4. Main life cycle-wise analysis: hazard model

Hazard Model (life cycle-wise analysis)		*Introduction*		*Growth*		*Mature*		*Decline*	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax avoidance as GAAP ETR									
$GAAP\ ETR_{i,t-1}$	(−)	−0.831***		−0.571***		−0.491***		−0.769***	
		(0.205)		(0.200)		(0.187)		(0.192)	
Tax avoidance as GAAP ETR volatility									
$GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)		2.647***		2.397***		1.973***		2.683***
			(0.450)		(0.456)		(0.448)		(0.432)
Life cycle × Tax avoidance									
Introduction × $GAAP\ ETR_{i,t-1}$	(+)	*1.066****							
		(0.309)							
Growth × $GAAP\ ETR_{i,t-1}$	(−)			−0.363					
				(0.247)					
Mature × $GAAP\ ETR_{i,t-1}$	(−)					*−0.555***			
						(0.270)			
Decline × $GAAP\ ETR_{i,t-1}$	(+)							*1.737****	
								(0.503)	
Life cycle × Tax avoidance									
Introduction × $GAAP\ ETRVol_{i,\ (t-1,t-5)}$	(−)		*−2.012****						
			(0.724)						
Growth × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)				0.249				
					(0.590)				
Mature × $GAAP\ ETRVol_{i,(t-1\ t-5)}$	(+)						*1.166**		
							(0.608)		
Decline × $GAAP\ ETRVol_{i,(t-1,\ t-5)}$	(−)								*−2.684****
									(1.028)
Observations		90,790	90,790	90,790	90,790	90,790	90,790	90,790	90,790
Stage-specific life cycle dummy		YES	YES	YES	YES	YES	YES	YES	YES
Model controls		YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects		YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effects		YES	YES	YES	YES	YES	YES	YES	YES
Standard error clustered by		FIRM	FIRM	FIRM	FIRM	FIRM	FIRM	FIRM	FIRM

Note(s): This table represents the estimated coefficients obtained by regressing the hazard model with a dependent binary variable ("*Default*") identifying firms entering Chapter 11 (restructuring) or Chapter 7 (liquidation) at time t, for each stage of the corporate life cycle. Columns 1 and 2 report the results for the introduction stage. Columns 3 and 4 report the results for the growth stage. Columns 5 and 6 report the results for the mature stage. Columns 7 and 8 report the results for the decline stage. All control variables included in the model are lagged at 1 year. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. All the models are estimated using standard errors clustered by firms, industry and year fixed effects. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): Created by authors

coefficients of the tax planning measures. This indicates that tax-planning growing firms are more likely to default. These findings support HP2. Similarly, Columns 5 and 6 show that the coefficients of the interaction of *GAAP ETR* and *GAAP ETRVol* with the maturity stage are in the same direction as that of the coefficients of tax planning measures. This indicates that mature firms with lower effective rates and higher tax volatility are more likely to default. These findings support HP3. Finally, Column 7 shows that the effect of tax planning is reversed in declining firms. The coefficient of the interaction of *GAAP ETR* and the decline stage is positive and highly significant (1.737 and significant at the 1% level), while the coefficient of *GAAP ETR* is negative and significant. This result suggests that declining firms with lower ETRs (tax avoiders) are less likely to default. Column 8 shows that the prevailing effect of tax volatility on default is positive in the sample, but declining firms show a different behavior, as shown by the interaction term. Declining firms with higher tax volatility are also less likely to default, confirming that tax planning negatively affects financial default in these firms. These findings support HP4.

4.4 Robustness and endogeneity checks

To ensure robust findings, we ran our analyses using a different estimation model (the logit model) and a different measure of the dependent variable. In the main analyses, following previous studies (Altman, 1968; Beaver *et al.*, 2010), we measured financial default as a dummy variable that equaled one for each firm-year observation of a firm if the firm filed under Chapter 11 or Chapter 7. Otherwise, it equaled zero. To test our results' robustness, we measured financial default as a dummy variable that equals one for the firm-year observation in which a firm enters Chapters 11 or 7 and zero otherwise. We obtained results consistent with those reported above. These findings will be made available in a supplementary file upon request. We use another measure of the dependent variable and replicate the analysis. We use the Altman Z-score (Altman, 1968; Ali *et al.*, 2023) [9] as an alternative to financial default. The results remained consistent with our main findings (untabulated).

To address potential endogeneity bias from reverse causality, we employ an instrumental variable two-stage least squares (2SLS) approach that uses the fitted median value of tax planning as an instrumental variable for tax planning (Dhawan *et al.*, 2020; Hasan *et al.*, 2014). In the first stage, we regress the median value of tax planning on the life cycle and the interaction term of tax planning (*GAAP ETR*) and life cycle plus controls. We then used the first-stage regression to predict the median value of tax planning. This value (fitted median tax planning) is the instrumental variable (IV). We use this instrumental variable as an additional explanatory variable in our second-stage regression, which we performed by running the main pooled regression and replacing tax planning (*GAAP ETR*) with the fitted value of median tax planning. Table 5 reports the results of the 2SLS analysis with the two alternative measures of the dependent variable. Overall, the results suggest that endogeneity from reverse causality does not bias the results.

We also address potential endogeneity bias from omitted variables related to past negative performance. We re-ran our analyses and added controls for performance in the last three years (Table 6).

Table 6 reports the results obtained when we included a control for three-years lagged performance in the main model, as opposed to the one-year lagged performance used in the main analyses. Panels A and B in Table 6 report the results of using *GAAP ETR* and *GAAP ETRVol* as a proxy for tax avoidance, respectively. In both the cases, we analyze data life cycle-wise. Collectively, the results confirm that past negative performance does not confound our results. Additional analyses on past performance, available in a supplementary file upon request, confirm that our findings are robust to endogeneity concerns.

		Default	
		(1)	(2)
IV	(–)	−1.088*	−1.064
		(0.635)	(1.263)
Introduction × IV	(+)	*1.378**	*2.983**
		(0.823)	*(1.601)*
Growth × IV	(–)	−0.717	−0.776
		(0.690)	(1.619)
Mature × IV	(–)	−0.818	−0.924
		(0.701)	(1.571)
Decline × IV	(+)	*2.595***	*4.136**
		(1.165)	*(2.158)*
Observations		90,790	90,790
Life cycle dummies		YES	YES
Model controls		YES	YES
Year fixed effects		YES	YES
Industry fixed effects		YES	YES
Std. error clustered by		FIRM	FIRM

Note(s): This table reports the coefficients obtained by running the logit model and using the fitted median tax avoidance as an instrumental variable for tax avoidance (IV). Column 1 reports the result obtained by defining the default dependent dummy variable equal to 1 for each firm-year observations of a firm filing under either a Chapter 11 or Chapter 7 bankruptcy procedure, and 0 otherwise. Column 2 reports the results obtained by defining the default dependent dummy variable equal to 1 for the firm-year observations in which the firm enters a bankruptcy procedure, and 0 otherwise. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): Created by authors

Table 5. Addressing endogeneity from potential reverse causality: instrumental variable (IV) approach

5. Discussion and contribution

5.1 Theoretical implications

Many studies on RBV have focused on firms' resource management across their life cycle and how managers obtain and use resources to improve performance and avoid financial defaults (Trahms *et al.*, 2013; Zahra, 2021; Islam and Fatema, 2023). Warnier *et al.* (2013) suggested that resource management research should not be limited to investigating strategic resources; it should be extended to a broader set of resources, such as cash resources, which are usually underexplored. Tax planning is a resource-generating activity for most businesses (Edwards *et al.*, 2016; Hanlon and Heitzman, 2010). However, RBV scholars have only recently acknowledged it as a resource-generating strategy (Hasan *et al.*, 2017), overlooked when investigating the firm's survival likelihood in distress conditions (Islam and Fatema, 2023).

A firm's life cycle stage influences two key conditions underlying the use of tax planning: a) *ex ante* availability of resources and b) resource management (Sirmon *et al.*, 2011; Trahms *et al.*, 2013; Zahra, 2021). Below, we discuss our results for each life cycle stage, referring to these two conditions and comparing our findings with that of prior literature.

Our results show that, in introductory firms, resource scarcity increases the propensity to obtain requisite cash resources from tax planning (Edwards *et al.*, 2016; Higgins *et al.*, 2015; Cerrato *et al.*, 2023). Simultaneously, owing to their small size and poor performance, tax planning by introductory firms has limited reputational risks and is unlikely to be strictly scrutinized by tax authorities (Sirmon *et al.*, 2011; Al-Hadi *et al.*, 2016). Additional resources obtained with limited risks reduce their default likelihood. Our findings suggest that tax planning complements other strategies identified by prior literature, which enhance the introductory firms' survival likelihood—such as reducing dividend payouts or changing top managers (Koh *et al.*, 2015; Trahms *et al.*, 2013).

			Default		
	(1)	(2)	(3)	(4)	(5)
PANEL A: *Results after the inclusion of 3-year long run performance using GAAP ETR*					
Omitted variable – Past negative performance					
1.laggedEBIT_TA	−3.189***	−1.938***	−2.176***	−2.029***	−1.962***
	(0.373)	(0.282)	(0.282)	(0.281)	(0.284)
2.laggedEBIT_TA	*−0.460****	*−0.771****	*−0.812****	*−0.797****	*−0.798****
	(0.172)	*(0.139)*	*(0.142)*	*(0.141)*	*(0.141)*
3.lagged EBIT_TA	*−0.883****	*−0.824****	*−0.923****	*−0.863****	*−0.898****
	(0.136)	*(0.114)*	*(0.115)*	*(0.114)*	*(0.115)*
Life cycle × Tax avoidance as GAAP ETR					
GAAP ETR$_{i,t-1}$	−0.627***	−0.708***	−0.421**	−0.347*	−0.619***
	(0.224)	(0.210)	(0.205)	(0.193)	(0.198)
Life cycle × Tax avoidance					
Introduction × GAAP ETR$_{i,t-1}$		*1.147****			
		(0.318)			
Growth × GAAP ETR$_{i,t-1}$			−0.360		
			(0.251)		
Mature × GAAP ETR$_{i,t-1}$				*−0.558***	
				(0.272)	
Decline × GAAP ETR$_{i,t-1}$					*1.617****
					(0.499)
Observations	90,790	90,790	90,790	90,790	90,790
Stage-specific life cycle dummy	NO	YES	YES	YES	YES
Model controls	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES
Std. error clustered by	FIRM	FIRM	FIRM	FIRM	FIRM
PANEL B: *Results after the inclusion of three-year long run performance using GAAP ETRVol*					
Omitted variable – Past negative performance					
1.laggedEBIT_TA	−2.815***	−2.511***	−2.784***	−2.666***	−2.626***
	(0.143)	(0.143)	(0.142)	(0.142)	(0.143)
2.laggedEBIT_TA	*−0.554****	*−0.502****	*−0.553****	*−0.524****	*−0.556****
	(0.131)	*(0.131)*	*(0.131)*	*(0.131)*	*(0.133)*
3.lagged EBIT_TA	*−1.091****	*−1.017****	*−1.096****	*−1.015****	*−1.088****
	(0.139)	*(0.136)*	*(0.138)*	*(0.138)*	*(0.137)*
Life cycle × Tax avoidance as GAAP ETR volatility					
GAAP ETRVol$_{i,(t-1,t-5)}$	*2.427****	*2.593****	*2.328****	*1.844****	*2.633****
	(0.342)	*(0.366)*	*(0.368)*	*(0.365)*	*(0.347)*
Life cycle × Tax avoidance					
Introduction × GAAP ETRVol$_{i,(t-1,t-5)}$		*−1.823****			
		(0.579)			
Growth × GAAP ETRVol$_{i,(t-1,t-5)}$			0.354		
			(0.489)		
Mature × GAAP ETRVol$_{i,(t-1,t-5)}$				*1.465****	
				(0.484)	
Decline × GAAP ETRVol$_{i,(t-1,t-5)}$					*−2.935****
					(0.930)
Observations	90,790	90,790	90,790	90,790	90,790

Table 6.
Addressing endogeneity from omitted variable bias: past negative performance

(*continued*)

	Default				
	(1)	(2)	(3)	(4)	(5)
Stage-specific life cycle dummy	NO	YES	YES	YES	YES
Model controls	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES
Std. error clustered by	FIRM	FIRM	FIRM	FIRM	FIRM

Note(s): Table 6 Panel A displays the coefficients obtained by running the life cycle-wise hazard regressions with *GAAP ETR* as independent variable and including a control for past performances. Table 6 Panel B displays the coefficients obtained by running the life cycle-wise hazard regression with *GAAP ETRVol* as independent variable and including a control for past performances. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): Created by authors

Table 6.

Similar to introductory firms, declining firms must cope with resource scarcity (Koh *et al.*, 2015). Prior literature emphasizes how declining firms try to boost internal efficiency and gain support from key stakeholders (Koh *et al.*, 2015). We find that cash resources from tax planning are likely to be used for restructuring and fulfilling financial obligations as opposed to being utilized for lenders, suppliers and employees (Dickinson, 2011). Considering this, our findings suggest that tax planning can supplement divesting and restructuring activities that help avoid financial default (Zahra, 2021; Hasan *et al.*, 2017; Morrow *et al.*, 2007).

Our research demonstrates that growth firms engaging in aggressive tax planning are more likely to default. Since growing firms have strong operating cash flows and can raise cash resources through shareholders and lenders (Dickinson, 2011), tax planning generates slack resources, which weakens managerial discipline and induces inefficient usage of resources (Lee and Wu, 2016; George, 2005; Nohria and Gulati, 1996). In other words, unnecessary tax planning harms efficient resource management and may damage existing strategic resources (e.g. reputation) (Carnes *et al.*, 2017; Nohria and Gulati, 1996). Indeed, stakeholders perceive tax planning as a risky activity for growth firms; for instance, they penalize firms with a higher cost of debt or by limiting their supplies (Cerrato *et al.*, 2023; Hasan *et al.*, 2017; Flanagan and O'Shaughnessy, 2005).

Tax planning also increases the default risk for mature firms. Prior literature findings suggest that mature firms have abundant operating cash flows and poor investment opportunities (Faff *et al.*, 2016; Carnes *et al.*, 2017). Tax planning generates slack resources, which are likely used for managerial wealth extraction and/or to maintain ongoing negative net present value projects (Desai *et al.*, 2007). As in the case of growth firms, in a crucial stage for the firm's survival, unnecessary aggressive tax planning hinders efficient resource management and significantly damages the firm's reputation (Carnes *et al.*, 2017; Nohria and Gulati, 1996). Damages to reputation from tax planning result in an increased cost of debt and equity and a higher default risk (Hasan *et al.*, 2017; Duong *et al.*, 2022).

Collectively, our findings enhance the understanding of resource management in different life cycle stages of firms (Trahms *et al.*, 2013; Carnes *et al.*, 2017; Zahra, 2021). They contribute to prior literature with evidence that cash savings from tax planning—an overlooked non-VRIO resource—are managed and allocated in different ways in different life cycle stages, having a varied impact of default likelihood.

Our research can complement prior studies on slack resources, with evidence on cash resources. Existing research suggests that the influence of slack resources on performance or innovation depends on several factors, including the industry (Daniel *et al.*, 2004), type of firm (public or private; George, 2005), type of slack (absorbed or unabsorbed; Lee and Wu, 2016)

and the degree of managerial discretion (Magerakis, 2022). Nohria and Gulati (1996) demonstrated that both excessive or insufficient slack resources can hinder innovation. George (2005) demonstrated that high levels of slack resources hamper the performance of private firms but not of public firms. Lee and Wu (2016) found that slack resources have a curvilinear effect on the positive association between R&D expenses and firm performance. This study complements this literature by showing that the effect of slack resources on the likelihood of financial default depends on the nature of the slack and the life cycle stage. Excess unabsorbed slack cash resources resulting from tax planning can either increase or decrease the likelihood of default, depending on the life cycle stage.

The finding that tax planning and financial default are positively associated in growing and mature firms has another theoretical interpretation based on agency theory (Jensen and Meckling, 1976; Jensen, 1986). High levels of slack cash resources exacerbate agency conflicts between shareholders and managers (Jensen, 1986). Thus, firms that use tax planning to generate cash slack suffer from agency conflicts, causing non-optimal investment decisions, managerial wealth extraction and reputational risks (Balakrishnan *et al.*, 2019; Desai *et al.*, 2007; Dhawan *et al.*, 2020; Noga and Schnader, 2013; Shevlin *et al.*, 2020). Overall, our findings suggest that, regarding tax planning, cash slack has implications for both agency costs and the optimal management of firm resources at certain life cycle stages. Thus, RBV and agency theory may be complementary in explaining why tax-aggressive growing and mature firms are more likely to default. Our study supports the notion that studying the conceptual and empirical linkage between the agency theory and RBV can help overcome the problems related to "the unambiguous identification of appropriate resources, specification of testable hypotheses, and construction of suitable samples" (Lockett and Thompson, 2001, p. 743). It identifies cash as a key resource and provides testable hypotheses.

Finally, our results have relevant implications for research on corporate tax planning. Prior literature suggests that tax-planning activities are heterogeneous across a firm's life cycle (Cooper and Nguyen, 2020; Hasan *et al.*, 2017). Compared to Hasan *et al.*'s (2017) findings, we find that a firm's life cycle stage needs to be considered to not only understand why certain firms avoid more taxes than others but also gain insight into why only certain firms appear to benefit from tax planning.

5.2 Practical implications

Our findings inform entrepreneurs, managers and other practitioners interested in corporate tax planning. They underline the importance for managers to consider the costs and benefits associated with using tax planning as a resource-generating strategy in different life cycle stages. Scholes *et al.* (2014) posited that effective tax planning strategies should be the result of considering "all the parties," "all the costs," and "all the taxes" involved in decision-making. The tax benefits and non-tax costs (e.g. reputational and litigation risks) associated with tax planning likely change throughout a firm's life cycle (Hasan *et al.*, 2017). Therefore, managers should consider the firm's life cycle stage in determining tax planning strategies and balance the opportunity to create new resources with the need to preserve existing ones, with the firm's reputation being the most important.

This study is also of interest to managers assessing the costs and benefits of internal versus external financing (Cerrato *et al.*, 2023). Tax planning is a useful internal financing source with costs and benefits varying across life cycle stages and affecting the selection of internal versus external sources.

Our results also inform managers of the stakeholders' perceptions of tax planning. Tax planning is a powerful resource-generating strategy but also poses costs and risks for firms, such as tax audits, reputational risks and managerial opportunism (Jacob *et al.*, 2021). Investors, lenders, public authorities, employees and other stakeholders may not expect

aggressive tax planning from healthy and risk-adverse growing and mature firms. They could penalize such firms with a higher cost of debt, a higher cost of capital or reputational costs (Dhawan *et al.*, 2020; Hasan *et al.*, 2017). Thus, our results recommend managers to carefully consider the reactions of these stakeholders in deciding to plan taxes in different life cycle stages.

Finally, our study suggests to managers that tax planning may complement other strategies aimed at ensuring firm's survival. It also provides a quantitative estimate of the magnitude of the tax-planning effect on the firm's survival, holding great significance for managers and stakeholders (Mota *et al.*, 2022; Islam and Fatema, 2023).

5.3 Limitations and future research directions

This study has some limitations. First, it does not investigate firm-specific ownership structures and internal governance mechanisms, which may affect tax planning. In our research, we control for firm-level fixed effects and consider the firm's life cycle stage, which is related to the degree of development of internal governance structures (i.e. less developed in the introductory stage and more developed in later stages). However, some heterogeneity among firms within the same life cycle stage may prevail. Second, although this study uses robust measures like the GAAP ETR and cash ETR, there are other measures for tax planning (e.g. income shifting or cross-country transfer pricing) that may have varied effects across life cycle stages.

Future research could investigate whether ownership structures affect the relationship between tax planning and default, as moderated by life cycle; for instance, it could focus on family firms or analyze the demographics of key owners. It could also study whether internal governance mechanisms limit aggressive tax planning across the life cycle stages. Finally, future research could investigate the interaction between tax planning and other financing tools, like, e.g. working capital management or fintech (Liu *et al.*, 2023).

6. Conclusion

Drawing on the RBV, this study investigates the effect of tax planning on the likelihood of financial default at different life cycle stages. The results show that firms engaging in more aggressive tax planning are less likely to default in the introduction and decline stages. By contrast, tax-planning firms are more likely to default in the growth and maturity stages. The findings suggest that introductory and declining firms efficiently use cash resources from tax planning to meet their financial needs and acquire further resources that are useful for their survival. However, in growth and mature firms, tax aggressiveness produces unnecessary slack resources, weakens managerial discipline and increases reputational risks.

This study contributes to the RBV literature by answering the call for research on resource management at specific life cycle stages (Trahms *et al.*, 2013; Zahra, 2021). It shows that cash resources from tax planning are managed in distinctive ways in each life cycle stage, thereby having a varied impact on the likelihood of default. Our study sheds light on the underexplored non-VRIO cash resources, and highlights the potential linkages between the agency theory and RBV (Luu, 2023; Ali *et al.*, 2023).

The results of this research can be informative for managers, investors, lenders and other stakeholders, as it offers evidence on the tax planning benefits and costs across firms' life cycle stages.

Notes

1. Tax planning is the reduction of explicit taxes. It can include legal tax-reduction activities and aggressive tax-sheltering activities, which are likely challenged in a tax audit (Hanlon and Heitzman,

2010). The authors clarify that "tax avoidance represents a continuum of tax planning strategies where something like municipal bond investments is at one end (lower explicit tax, perfectly legal) and practices such as 'noncompliance,' 'evasion,' 'aggressiveness' and 'sheltering' closer to the other end" (Hanlon and Heitzman, 2010). In this study, tax planning is considered synonymous with tax avoidance (see also Cooper and Nguyen, 2020).

2. Sirmon *et al.* (2007) defined resource management as "the comprehensive process of structuring, bundling and leveraging a firm's resources to creating value for customers and competitive advantages for the firm."
3. The literature review presented in this section is based on a systematic literature review for identifying and critically appraising relevant research (Snyder, 2019). The algorithmic tool used to search in relevant databases is available in a supplemental file to this paper, to ensure transparency and reproducibility (Davis *et al.*, 2014).
4. For example, Carnes *et al.* (2017) investigated a sample of growing and mature firms and found that firms manage their resource portfolio and capabilities to develop innovation based on the firm's life-cycle stage. Tariq *et al.* (2020) showed that, compared to growing firms, mature firms devote more financial and non-financial internal resources to undertake environmental investments.
5. Slack is a pool of resources over the minimum required for a given level of organizational output (Lee and Wu, 2016; Singh, 1986). Cash is a desirable slack for managers because it represents an unabsorbed available slack and is highly flexible and easily redeployed (Lee and Wu, 2016).
6. Chapter 11 of the US Bankruptcy Code is a court-supervised reorganization procedure aimed at reducing financial distress and allowing firms to continue to operate as a going concern. Chapter 7 of the US Bankruptcy Code is a liquidation procedure aimed at satisfying creditors' claims.
7. *OANCF*, *IVNCF* and *FINCF* is the operating cash flow from operating, investing and financing activities, respectively.
8. See Table 4.
9. The authors generate a Z-score variable by using parameters from Altman (1968). Z-score = 1.2*(WC_TA) + 1.4*(RE_TA) +3.3*(Ebit_TA) +0.6(MV_TL) +0.999*(S_TA).

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(The Appendix follows overleaf)

Supplemental File
"Tax planning and financial default: role of corporate life cycle"

	Non-defaulted firms	Defaulted firms	Total
Introduction	*6,596* (92.37%)	*545* (7.63%)	*7,141* (7.87%)
Growth	*29,430* (98.50%)	*419* (1.5%)	*29,849* (32.87%)
Mature	*40,267* (98.64%)	*554* (1.36%)	*40,821* (44.96%)
Shake-out	*9,970* (96.8%)	*322* (3.12%)	*10,292* (11.35%)
Decline	*2,406* (89.54%)	*281* (10.46%)	*2,687* (2.95%)
Total	*88,669* (97.6%)	*2,121* (2.3%)	*90,790* (100%)

Table S1. Breakdown defaulted and non-defaulted firm-year observation for each life cycle's stages

Note(s): This table shows the defaulted, non-defaulted and the total number of firm-year observations for each stage of the corporate life cycle at time t
Source(s): Created by authors

Table S2.
Main pooled analysis: logit model

		Default					
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)
Tax avoidance as GAAP ETR							
$GAAP\ ETR_{i,t-1}$	(−)	−0.807***		−0.749***		−0.616*	
		(0.210)		(0.211)		(0.373)	
Tax avoidance as GAAP ETR volatility							
$GAAP\ ETRVol_{i,(t-1,\ t-5)}$	(+)		3.159***		2.827***		1.727**
			(0.368)		(0.371)		(0.698)
Life cycle × Tax avoidance							
Introduction × $GAAP\ ETR_{i,\ t-1}$	(+)					0.642	
						(0.473)	
Growth × $GAAP\ ETR_{i,t-1}$	(−)					−0.450	
						(0.426)	
Mature × $GAAP\ ETR_{i,t-1}$	(−)					−0.508	
						(0.437)	
Decline × $GAAP\ ETR_{i,t-1}$	(+)					*1.292***	
						(0.630)	
Life cycle × Tax avoidance							
Introduction × $GAAP\ ETRVol_{i,(t-1,\ t-5)}$	(−)						−0.699
							(0.884)
Growth × $GAAP\ ETRVol_{i,(t-1,\ t-5)}$	(+)						*2.033***
							(0.796)
Mature × $GAAP\ ETRVol_{i,(t-1,\ t-5)}$	(+)						*2.195****
							(0.769)
Decline × $GAAP\ ETRVol_{i,(t-1,\ t-5)}$	(−)						−1.238
							(1.056)

(*continued*)

Table S2.

	Pred. Sign	*Default*					
		(1)	(2)	(3)	(4)	(5)	(6)
Observations		90,790	90,790	90,790	90,790	90,790	90,790
Life cycle dummies		NO	NO	YES	YES	YES	YES
Model controls		YES	YES	YES	YES	YES	YES
Year fixed effects		YES	YES	YES	YES	YES	YES
Industry fixed effects		YES	YES	YES	YES	YES	YES
Standard errors clustered by		FIRM	FIRM	FIRM	FIRM	FIRM	FIRM
Pseudo R2		0.121	0.135	0.133	0.148	0.133	0.149

Note(s): This table reports the estimated coefficients obtained by regressing the logit model with a dependent binary variable ("*Default*") identifying firms entering Chapter 11 (restructuring) or Chapter 7 (liquidation) procedures at time t. Columns 1, 3 and 5 report the results obtained by including a 1-year lagged *GAAP ETR* variable, calculated by taking the total income tax expense at time t-1 on the pre-tax accounting income at time t-1 (Hanlon and Heitzman, 2010). The higher the *GAAP ETR* is, the lower is the level of tax avoidance is. Columns 2, 4 and 6 report the results obtained by using a 1-year lagged *GAAP ETRVol* variable, calculated as the standard deviation of GAAP ETR from time t-1 to time t-5. The higher the *GAAP ETR Vol* is, the higher the level of risk associated with the firm's tax position is. The control variables used in the models are: (1) working capital on total assets (*WC_TA*), (2) retained earnings on total assets (*RE_TA*), (3) *EBIT* on total assets (*EBIT_TA*), (4) market value of equity on total liabilities (*MV_TL*) and (5) sales on total assets (*S_TA*). All control variables included in the model are lagged at 1-year. Columns 1 and 2 report the results obtained by running the logit model and including our proxies for tax avoidance. Column 3 and Column 4 show the results obtained by running the logit model and including the life cycle dummies, in addition to tax avoidance. Column 5 and Column 6 report the results obtained by running the logit model and including: (1) corporate life cycle, (2) tax avoidance and (3) the interaction between corporate life cycle and tax avoidance, respectively. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. All the models are estimated using standard errors clustered by firms, industry and year fixed effects. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): Created by authors

Table S3.
Life cycle-wise analysis: logit model

Logit Model (life cycle-wise analysis)		*Default*							
		Introduction		*Growth*		*Mature*		*Decline*	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax avoidance as GAAP ETR									
GAAP ETR$_{i,t-1}$	(−)	−0.930***		−0.718***		−0.632***		−0.876***	
		(0.228)		(0.225)		(0.211)		(0.215)	
Tax avoidance as GAAP ETR Volatility									
GAAP	(+)		3.334***		2.997***		2.615***		3.331***
ETRVol$_{i,(t-1,t-5)}$			(0.390)		(0.394)		(0.394)		(0.376)
Life cycle × Tax avoidance									
Introduction ×	(+)	*1.004****							
GAAP ETR$_{i,t-1}$		*(0.360)*							
Growth × GAAP	(−)			−0.290					
ETR$_{i,t-1}$				(0.275)					
Mature × GAAP	(−)					*−0.495**			
ETR$_{i,t-1}$						*(0.298)*			
Decline × GAAP	(+)							*1.665****	
ETR$_{i,t-1}$								*(0.566)*	
Life cycle × Tax avoidance									
Introduction ×	(−)		*−2.374****						
GAAP ETRVol$_{i,(t-1,t-5)}$			*(0.654)*						
Growth × GAAP	(+)				0.583				
ETRVol$_{i,(t-1,t-5)}$					(0.510)				
Mature × GAAP	(+)						*1.190***		
ETRVol$_{i,(t-1\ t-5)}$							*(0.515)*		
Decline × GAAP	(−)								*−2.806****
ETRVol$_{i,(t-1,\ t-5)}$									*(0.940)*

(*continued*)

Table S3.

Logit Model (life cycle-wise analysis)		*Default*							
		Introduction		*Growth*		*Mature*		*Decline*	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Observations		90,790	90,790	90,790	90,790	90,790	90,790	90,790	90,790
Stage-specific life cycle dummy		YES	YES	YES	YES	YES	YES	YES	YES
Model controls		YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects		YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effects		YES	YES	YES	YES	YES	YES	YES	YES
Standard error clustered by		FIRM	FIRM	FIRM	FIRM	FIRM	FIRM	FIRM	FIRM

Note(s): This table reports the estimated coefficients obtained by regressing the logit model with a dependent binary variable ("*Default*") identifying firms entering Chapter 11 (restructuring) or Chapter 7 (liquidation) procedures at time t. Columns 1 and 2 report the results for the introduction stage. Columns 3 and 4 report the results for the growth stage. Columns 5 and 6 report the results for the mature stage. Columns 7 and 8 report the results for the decline stage. All control variables included in the model are lagged at 1-year. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. All the models are estimated using standard errors clustered by firms, industry and year fixed effects. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): Created by authors

	Pred. Sign	*Default* (1)	(2)
Tax avoidance as GAAP ETR			
$GAAP\ ETR_{i,t-1}$	(−)	−0.784	
		(0.768)	
Tax avoidance as GAAP ETR volatility			
$GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)		0.963
			(1.178)
Life cycle × Tax avoidance			
Introduction × $GAAP\ ETR_{i,t-1}$	(+)	*1.628**	
		(0.972)	
Growth × $GAAP\ ETR_{i,t-1}$	(−)	−0.287	
		(1.037)	
Mature × $GAAP\ ETR_{i,t-1}$	(−)	−0.225	
		(1.016)	
Decline × $GAAP\ ETR_{i,t-1}$	(+)	*2.203**	
		(1.236)	
Life cycle × Tax avoidance			
Introduction × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(−)		−1.556
			(1.497)
Growth × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)		1.114
			(1.643)
Mature × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)		*3.926***
			(1.480)
Decline × $GAAP\ ETRVol_{i,(t-1,t-5)}$	(−)		−1.311
			(1.796)
Observations		90,790	90,790
Life cycle dummies		YES	YES
Model controls		YES	YES
Year fixed effects		YES	YES
Industry fixed effects		YES	YES
Standard errors clustered by		FIRM	FIRM

Note(s): This table reports the pooled estimated coefficients obtained by running the logit model and using an alternative definition of the dependent variable. In this table, the *Default* dependent variable is defined as a dummy variable equal to 1 for the firm-year observations in which the firm enters the Chapter 11 or Chapter 7 procedure, and 0 otherwise. Column 1 reports the results obtained by using the 1-year lagged *GAAP ETR* as explanatory variable for tax avoidance. Column 2 reports the results obtained by using the 1-year lagged *GAAP ETRVol* as explanatory variable for tax avoidance. Control variables used in the models are: (1) working capital on total assets (*WC_TA*), (2) retained earnings on total assets (*RE_TA*), (c) EBIT on total assets (*EBIT_TA*), (4) market value of equity on total liabilities (*MV_TL*) and (5) sales on total assets (*S_TA*). All control variables included in the model are lagged at 1-year. Both columns report the results obtained by running the logit model and including: (1) corporate life cycle, (2) tax avoidance and (3) the interaction of each stage of the corporate life cycle for tax avoidance, respectively. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): Created by authors

Table S4. Robustness check: pooled analysis using an alternative definition of the dependent variable

Table S5.
Robustness check: life cycle-wise analysis using an alternative definition of the dependent variable

		Default							
		Introduction		*Growth*		*Mature*		*Decline*	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tax avoidance as GAAP ETR									
$GAAP\ ETR_{i,t-1}$	(−)	−0.822**		−0.213		−0.148		−0.603	
		(0.406)		(0.400)		(0.405)		(0.372)	
Tax avoidance as GAAP ETR volatility									
$GAAP\ ETRVol_{i,(t-1,t-5)}$	(+)		2.803***		2.272***		1.043*		2.518***
			(0.545)		(0.515)		(0.547)		(0.500)
Life cycle × Tax avoidance									
Introduction × GAAP $ETR_{i,t-1}$	(+)	*1.900***							
		(0.733)							
Growth × GAAP $ETR_{i,t-1}$	(−)			−0.817					
				(0.783)					
Mature × GAAP $ETR_{i,t-1}$	(−)					−0.893			
						(0.758)			
Decline × GAAP $ETR_{i,t-1}$	(+)							*2.359***	
								(1.055)	
Life cycle × Tax avoidance									
Introduction × GAAP $ETRVol_{i,(t-1,t-5)}$	(−)		*−3.507****						
			(1.092)						
Growth × GAAP $ETRVol_{i,(t-1,t-5)}$	(+)				−0.424				
					(1.235)				
Mature × GAAP $ETRVol_{i,(t-1\ t-5)}$	(+)						*3.615****		
							(1.041)		
Decline × GAAP $ETRVol_{i,(t-1,\ t-5)}$	(−)								*−2.755**
									(1.493)
Observations		90,790	90,790	90,790	90,790	90,790	90,790	90,790	90,790
Stage-specific life cycle dummy		YES	YES	YES	YES	YES	YES	YES	YES

(*continued*)

Table S5.

		Default							
		Introduction		*Growth*		*Mature*		*Decline*	
	Pred. Sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Model controls		YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects		YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effects		YES	YES	YES	YES	YES	YES	YES	YES
Standard error clustered by		FIRM	FIRM	FIRM	FIRM	FIRM	FIRM	FIRM	FIRM

Note(s): This table reports the coefficients for each stage of the corporate life cycle obtained by running the logit model and using an alternative definition of the dependent variable. Columns 1 and 2 report the results for the introduction stage. Columns 3 and 4 report the results for the growth stage. Columns 5 and 6 report the results for the mature stage. Columns 7 and 8 report the results for the decline stage. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): Created by authors

	Default			
	(1)	(2)	(3)	(4)
PANEL A: Results after the inclusion of 3-year long run performance using GAAP ETR (Logit Model)				
Omitted variable – Past negative performance				
1.laggedEBIT_TA	−2.973***	−3.296***	−3.085***	−3.050***
	(0.355)	(0.355)	(0.353)	(0.356)
2.laggedEBIT_TA	*−0.820****	*−0.868****	*−0.849****	*−0.855****
	(0.159)	*(0.160)*	*(0.160)*	*(0.160)*
3.lagged EBIT_TA	*−0.966****	*−1.067****	*−1.002****	*−1.036****
	(0.130)	*(0.130)*	*(0.130)*	*(0.130)*
Life cycle × Tax avoidance as GAAP ETR				
GAAP ETR$_{i,t-1}$	−0.801***	−0.560**	−0.485**	−0.726***
	(0.235)	(0.232)	(0.220)	(0.223)
Life cycle × Tax avoidance				
Introduction × GAAP ETR$_{i,t-1}$	*1.105****			
	(0.373)			
Growth × GAAP ETR$_{i,t-1}$		−0.292		
		(0.281)		
Mature × GAAP ETR$_{i,t-1}$			−0.491	
			(0.302)	
Decline × GAAP ETR$_{i,t-1}$				*1.680****
				(0.582)
Observations	90,790	90,790	90,790	90,790
Stage-specific life cycle dummy	YES	YES	YES	YES
Model controls	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES
Std. error clustered by	FIRM	FIRM	FIRM	FIRM
PANEL B: Results after the inclusion of 3-year long run performance using GAAP ETRVol (Logit Model)				
Omitted variable – Past negative performance				
1.laggedEBIT_TA	−3.335***	−3.652***	−3.494***	−3.473***
	(0.179)	(0.176)	(0.175)	(0.175)
2.laggedEBIT_TA	*−0.553****	*−0.574****	*−0.538****	*−0.552****
	(0.158)	*(0.157)*	*(0.157)*	*(0.157)*
3.lagged EBIT_TA	*−1.211****	*−1.311****	*−1.211****	*−1.284****
	(0.159)	*(0.158)*	*(0.159)*	*(0.159)*
Life cycle × Tax avoidance as GAAP ETR volatility				
GAAP ETRVol$_{i,(t-1,t-5)}$	2.994***	2.850***	2.322***	3.110***
	(0.423)	(0.432)	(0.430)	(0.408)
Life cycle × Tax avoidance				
Introduction × GAAP ETRVol$_{i,(t-1,t-5)}$	*−1.918****			
	(0.735)			
Growth × GAAP ETRVol$_{i,(t-1,t-5)}$		0.190		
		(0.550)		
Mature × GAAP ETRVol$_{i,(t-1,t-5)}$			*1.322***	
			(0.547)	
Decline × GAAP ETRVol$_{i,(t-1,t-5)}$				*−3.833****
				(1.104)
Observations	90,790	90,790	90,790	90,790
Stage-specific life cycle dummy	YES	YES	YES	YES

Table S6. Addressing endogeneity from omitted variable bias: past negative performance

(*continued*)

	Default			
	(1)	(2)	(3)	(4)
Model controls	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES
Std. error clustered by	FIRM	FIRM	FIRM	FIRM

Note(s): Table S6 Panel A shows the results obtained by running the life cycle-wise logit regression using *GAAP ETR* as independent variable and including a control for past performances. Table S06 Panel B shows the results obtained by running the life cycle-wise logit regression using *GAAP ETRVol* as independent variable and including a control for past performances. In both the cases, Column 1 reports the results at the introduction stage and including a measure of 3-year lagged performance. Column 2 reports the results at the growth stage and including a measure of 3-year lagged performance. Column 3 reports the results obtained at the mature stage and including a measure of 3-year lagged performance. Column 4 reports the results at the decline stage and including a measure of 3-year lagged performance. 3-year lagged firm performance is proxied by using lagged values of *EBIT_TA* other than the 1-year lagged *EBIT_TA* already included in the model as a control variable. All the variables are winsorized at 1 and 99% to avoid the impact of outliers. Robust standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): Created by authors

Table S6.

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