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The Zero-Leverage Policy and Family Firms

Pedram Fardnia

Maher Kooli

Sonal Kumar

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Pedram Fardnia
Department of Finance, John Molson School of Business, Montreal, Canada
Maher Kooli
Department of Finance, School of Management, Universite du Quebec a Montreal, Montreal, Canada, and
Sonal Kumar
Department of Finance, Bryant University, Smithfield, Rhode Island, USA

Abstract

Purpose – The purpose of the study is to examine the zero-leverage (ZL) phenomenon in family and non-family firms.

Design/methodology/approach – The authors consider three hypotheses and empirically test them using a sample of the largest US firms over the 2001–2016 period.

Findings – The authors find that, on average, 19.20% of family firms have zero debt vs 10.42% for non-family firms. The authors also find that family firms strategically choose to be ZL to maintain financial flexibility for future investments and exercise control over the decision-making process, consistent with the hypotheses of financial flexibility and control considerations. However, non-family firms are more likely to have zero debt if they have financial constraints and the credit market does not lend them money at affordable credit rates, consistent with the financial constraint hypothesis.

Originality/value – This paper contributes to different strands of literature. First, the authors contribute to the literature examining family firms' financial decisions. Second, the authors complement previous studies by exploring the reasons for the ZL behavior of family firms compared to non-family firms. The authors also examine the previously unexplored impact of ownership concentration on the ZL question.

Keywords Family firms, Zero-leverage, Debt, Capital structure

Paper type Research paper

1. Introduction

The prevalence of zero-debt (ZD) firms is not a recent observation (see Graham (2000) and Strebulaev and Yang (2013), among others). Prior research has also documented that zero leverage (ZL) is a persistent phenomenon around the globe. For example, Dang (2013) shows that for the sample of UK firms, there are two distinct groups of unlevered firms. Dividend-paying firms deliberately eschew debt to mitigate investment distortions, while non-dividend-paying firms are ZL due to financial constraints. El Ghoul et al. (2018) consider a large sample of firms from developed and developing countries over the 1990–2010 period and show evidence of ZL firms worldwide. Devos et al. (2012) show that even during the financial crisis of 2008, 11.3% of US firms in their sample do not resort to debt over the preceding three consecutive years.

With such a significant number and proportion of firms being debt-free, the ZL policy is one of the most enduring puzzles in capital structure literature, especially because it is inconsistent with the predicted benefit of borrowing. A few recent studies have examined different reasons for firms to adopt a conservative debt policy and its impact on various financial outcomes. For example, Huang et al. (2017) and Ghose and Kabra (2016) find that firms without external financing needs are more likely to become ZL in China and India. Devos et al. (2012) find that the ZL phenomenon is not driven by entrenched managers

attempting to avoid the disciplinary pressures of debt but rather due to financial constraints. Takami (2016) finds that Japanese firms are ZL to maintain bank relationships through the main bank system. Lee and Moon (2011) find that a persistent lack of debt in capital structure is an important determinant of stock returns, as ZD firms perform better in the long run. Moon *et al.* (2015) also show that regardless of the level of debt capacity, ZD firms generate positive abnormal returns in the long run.

Even though there is consensus on the existence of ZL phenomena, studies provide different rationales and mixed empirical evidence for the persistent ZD policy adopted by firms (De Jong *et al.*, 2012; Devos *et al.*, 2012; Iona *et al.*, 2004). In this paper, we investigate if there are any differences in motivations between family and non-family firms to eschew debt. We further examine whether insider ownership and family ownership affect firms' ZL decisions. Our empirical analysis provides two main findings based on a sample of the top 2,000 largest public US firms for the 2001–2016 period. First, we show that family firms strategically choose to eschew debt to preserve their borrowing capability. However, non-family firms have extremely low debt levels because they are financially constrained. Second, family ownership has a positive and significant effect on the likelihood of being ZL. Control considerations are essential for family firms as their reputation is often tied to their economic success. Therefore, family firms are concerned about not losing control over the investment process and are more likely to eschew debt. However, we do not find that ownership concentration in non-family firms affects the ZL phenomenon. Further, we find a negative relationship between insider ownership and leverage, but we do not find any significant relationship between insider ownership and the likelihood of being ZL.

Our paper contributes to different strands of literature. First, we contribute to the literature examining family firms' financial decisions. Family firms have a primary goal to transfer the company to future generations, and the families actively participate in the management and governance activities (Basu *et al.*, 2009). Unlike non-family firms, the participation of family firms is imperative for financing decisions. Bertrand and Schoar (2006) and Villalonga and Amit (2006) study how family involvement affects management, ownership and capital structure. However, limited research examines why some family firms have a ZD policy. Wiwattanakantang (1999) suggests that family ownership lowers the agency cost and cost of debt. Anderson *et al.* (2003) find that US family firms have lower debt because of family management concerns over reputation. Also, the extent of conflicts between shareholders and managers is less pronounced in family firms. Schmid (2013) finds that, unlike their non-family counterparts, family firms have lower conflicts between shareholders and managers. In this paper, we extend this strand of literature by investigating the ZD phenomenon of family firms vs non-family firms.

Second, our paper adds to the literature on the ZL puzzle (Ang and Smedema, 2011; De Jong *et al.*, 2012; Denis and McKeon, 2012, among others) and extends the work of Strebulaev and Yang (2013), who find that family firms are more likely to be zero-levered, but without further explanation. We complement these studies by exploring the reasons for the ZL behavior of family firms compared to non-family firms. Our evidence shows that family firms strategically choose to have ZD to maintain financial flexibility, while non-family firms with ZD are financially constrained, and creditors do not choose to lend them money. Our study also contributes to the literature by examining the previously unexplored impact of ownership concentration on the ZL question. Ben-Nasr *et al.* (2015) and Datta *et al.* (2005) find that a firm's leverage policy is affected by ownership concentration. In this paper, we explore the impact of family ownership and insider ownership on the likelihood of firms having extremely low levels of debt in their capital structure.

The rest of the paper is organized as follows: Section 2 outlines the background and hypotheses development. Section 3 details data and methods. Section 4 analyses the empirical results. Section 5 presents the results of the additional analysis. Section 6 concludes.

2. Background and hypotheses development

Previous studies have focused on the characteristics of firms with ZL policy (Strebulaev and Yang, 2013; Bessler et al., 2013; El Ghoul et al., 2018). These studies find that firms with zero debt in their capital structure are smaller in size and have a higher book-to-market ratio, large cash balances and higher payout ratios. However, the literature is still debating the reasons that can explain ZL behavior for firms (Byoun and Xu, 2013; Dang, 2013). For example, Byoun and Xu (2013) find that financial constraints could explain firms' ZL policy. Similarly, Huang et al. (2017) find financial constraints and financial flexibility as the main reasons firms go debt-free. Devos et al. (2012) reject the hypothesis that entrenched managers drive ZL policies and find that financial constraints drive ZD behavior in firms. Bessler et al. (2013) and El Ghoul et al. (2018) examine the ZL phenomenon in an international context and find that country-specific factors like tax systems and credit protection laws dictate financial conservatism in firms. They also find that countries with a high degree of credit protection and a high level of government trust are more likely to have firms with a ZD policy. Dang (2013) finds that dividend-paying firms choose to have zero debt, while non-dividend-paying firms have low debt because of financial constraints.

Further, Wielsma and Brunninge (2019) and Zellweger et al. (2013) assert that family members in family firms have a higher degree of involvement and influence over major decisions. Romano et al. (2001) point out that despite various financial theories on capital structure, researchers cannot explicitly explain how family businesses choose between different sources of finance. Traditional capital structure theories based on agency theory (Jensen and Meckling, 1976) and information asymmetry theory (Myers, 1984) do not consider family owners' objectives relevant to the set of family firms. Barton and Matthews (1989) find that financing decisions are strongly influenced by managerial choices, which are based on the values and goals of management. Similarly, Matthews et al. (1994) and Hansen and Block (2021) find that capital structure decision in an owner-based firm is influenced by factors related to owners' need to be in control, risk propensity, experience, social norms and personal net wealth. Mishra and McConaughy (1999) also find that founding family-controlled firms use less debt as the founders are more averse to controlling risk. Schmid (2013) finds that family firms in Germany rely less heavily on debt as founders and their families use capital structure to optimize their control over the firm. Anderson et al. (2003) do not find significant differences in debt levels between family and non-family firms. Setia-Atmaja et al. (2009) and King and Santor (2008) find Australian and Canadian family firms to have more debt in their capital structure.

As aforementioned, different objectives dictate the strategic choices undertaken by family and non-family firms, and their decision to eschew debt might also be attributed to various reasons. Based on prior literature, firms can eschew debt for three main reasons. First, financial constraints cause a gap between the cost of external debt and internal financing. Almeida et al. (2004) find that financially constrained firms conserve cash and are more likely to use lease financing than rely on external debt. Hahn and Lee (2009) find that small and young firms lack assets that could be used as collateral which increases their likelihood of being less leveraged. Prior research on family firms suggests that the heterogeneous and unique characteristics of family firms are responsible for generating differences in innovativeness (Campopiano et al., 2020), governance structures (Randolph et al., 2023) and debt levels (Comino-Jurado et al., 2021). For example, Feito-Ruiz and Menendez-Requejo (2022) find that privately held family firms are more likely to exhibit longer debt maturities when family management has close relationships with lenders allowing them to monitor families' commitment to the business. Swanpitak et al. (2020) find that Thai family firms benefit from strong and trustworthy relationships with creditors, which lowers their cost of debt. Similarly, Karaivanov et al. (2019) find that family firms, especially with networks, are associated with a more flexible market and are less likely to be financially constrained than

non-family firms. As family firms are characterized by long-term relationships with lenders, creditors and banks, we expect that family firms are less likely to have ZD because of financial constraints. Hence, our first hypothesis is:

> *H1.* Higher financial constraints positively affect the likelihood of non-family firms having a ZL policy.

Second, firms might choose to maintain low debt levels for financial flexibility and excessive risk avoidance rather than default. Prior literature confirms financial flexibility as an important factor in deciding the firm's capital structure in the US and Europe (Bancel and Mittoo, 2004; Graham and Harvey, 2001). According to the financial flexibility hypothesis, firms strategically avoid debt to mitigate future underinvestment incentives due to the presence of debt. Further, firms do not lose value, as they hold an option to lever up future opportunities. For several reasons, excessive risk avoidance and financial flexibility are important for family firms. First, Lumpkin and Brigham (2011) find that families have long-term commitments and survival in mind. Family firms are motivated to pass on the legacy to future generations. Second, their reputations are often tied to the economic success of their firms. Tong (2007) shows that the financial reporting practices of family firms are of better quality than those of non-family firms, consistent with the long-run investment horizon and reputation concerns of family firms. Therefore, family firms are concerned about not losing control over the investment process. In this context, we expect that family firms who desire to maintain financial flexibility and avoid risk have a higher likelihood of a ZL policy than non-family firms. Hence, we consider the following hypothesis:

> *H2.* Financial flexibility and risk avoidance positively affect the likelihood of ZL for family firms.

Third, managerial entrenchment and extracting private benefits are other important factors affecting the demand for debt. Walsh and Seward (1990) suggest that managerial entrenchment occurs when firms restrict the transfer of control to protect managers from removal, even if those managers perform below expectations. Entrenched managers choose lower debt levels to protect their human capital and avoid the disciplinary power of debt (Fama, 1980; Jensen, 1986). Hence, managers may choose an extremely conservative approach toward debt to obtain private benefits under agency problems. Gomez-Mejia *et al.* (2007) find that family firms behave differently than non-family firms, even when they operate in similar competitive environments. Managerial entrenchment becomes more complex in family firms as family management may favor family executives, lowering the effectiveness of monitoring and executive performance. However, studies find that family firms do not suffer from the consequences of entrenchment as strongly as non-family firms (Oswald *et al.*, 2009). The long-term survival and legacy motivations dictate governance motivations that lower managerial entrenchment in family firms. Randolph *et al.* (2023) find that family firms are less likely to utilize E-index provisions than non-family firms. Thus, though family ownership can lead to concentration of power, that might act as a seed for entrenchment. However, the economic and emotional value associated with family firms leads these firms to meet the family's needs to maintain control, identity and perpetuity dynasty (Haider *et al.*, 2021). Hence, to maintain control, identity and legacy, family firms are less likely to be ZD with a managerial entrenchment motive in mind. Expropriating benefits for their private benefits impact their family legacy and long-term reputation. Hence, we develop the following hypothesis:

> *H3.* The managerial entrenchment negatively affects the likelihood of having a ZL policy for family firms.

3. Data and method

3.1 Data

We examine a sample of the top 2,000 largest US firms (based on total assets) collected from the Compustat database for the period 2001–2016. Following Anderson *et al.* (2003), we divide the firms into two categories based on family firm status [1]. Firms are classified as a family when the family member owns a 5% or larger stake or voting power. We retrieve data on accounting variables from Compustat, board-related variables from the ISS database and insider ownership variables using the FactSet database. We impose standard data restrictions. We exclude financial and utility firms following prior capital structure literature. Next, we remove the variables where the data is missing for the main variables of interest. The final sample comprises 11,668 firm-year observations. We define a firm as ZL if, in a given year t, the firm i has the outstanding amount of both short-term debt and long-term debt equal to 0. To ensure that ZD is not temporary, we follow Devos *et al.* (2012) and define a firm-year as ZD if the firm does not have any short-term or long-term debt for three consecutive years. We define book leverage as the total debt ratio (long-term debt with a maturity exceeding one year and debt in current liabilities) to total assets following prior literature. Our primary variable of interest is zero debt (ZD), a dummy variable that takes one if the firm-year is categorized as zero debt (no short-term and long-term debt in three consecutive years) and 0 otherwise. We also test our hypothesis for robustness using ZL as the primary dependent variable and find our results remain qualitatively unchanged. The results are not documented but can be available upon request.

To test our first hypothesis, we consider four different proxies for financial constraints. Specifically, we consider the KZ index (Kaplan and Zingales, 1997), the WW index (Whited and Wu, 2006), the HP index (Hadlock and Pierce, 2010) and the bond credit ratings as measures of financial constraints. The KZ index is a relative measure of a company's dependence on external financing and is calculated using the following:

$$\text{KZ index} = -1.001909\frac{\text{Cash flows}}{\text{K}} + 0.2826389\,(Q) + 3.139193\frac{\text{Debt}}{\text{Total Capital}}$$
$$- 39.3678\frac{\text{Dividends}}{K} - 1.314759\frac{\text{Cash}}{\text{K}} \quad (1)$$

where K = (Property, plant and equipment) $_{t-1}$

Q = (Market Cap + total Assets – book value of common equity – deferred tax assets)/
Total assets.

WW index is based on a firm's operating cash flow, Tobin's *Q*, debt to equity ratio and cash held.

$$\text{WW index} = -0.091\frac{\text{Cash flows}}{\text{Total Assets}} - 0.062\,\text{Dividend paying dummy}$$
$$+ 0.021\frac{\text{Long term Debt}}{\text{Total Assets}} - 0.044\,\text{Ln (Total Assets)}$$
$$+ 0.102\,\text{Industry Avg Sales growth} - 0.035\,\text{Sales Growth} \quad (2)$$

HP index is based on firm size and age. It is calculated using the following equation:

$$\text{HP Index} = -0.737\,\text{Size} + 0.043\,\text{Size}^2 - 0.040\,\text{Age} \quad (3)$$

Prior literature in capital structure describes core firm-related factors that influence leverage: firm size, firm age, profitability, market-to-book ratio, tangibility, sales growth, payout

dummy and payout ratio. We also control for board size and the percentage of independent directors. The definition and description of these variables are explained in Table A1. We winsorize all variables at 1% to remove extreme outliers.

To examine our second and third hypotheses, we investigate the impact of ownership concentration on the capital structure choices of firms and control for family ownership and insider ownership. Based on a minimum of 5% ownership, family ownership is the percentage of shares or voting control with individuals or groups identified as family members of the firm. An insider is identified as an individual owning more than 10% of a firm's voting shares. Insider ownership is the percentage of voting shares held by insiders in any given year.

3.2 Methods
First, we conduct a logistic regression to examine the difference in factors determining ZD policy in family and non-family firms. The main model takes the following form:

$$\Pr\ (ZL = 1|X)\ = \frac{1}{1 + e^{-(\alpha + X\beta)}} \tag{4}$$

where ZD is a binary variable that takes the value of 1 if the firm has ZD in a given year and 0 otherwise, X is the vector of control variables that possibly impact the firms' decision to have zero debt in their capital structure, and β are coefficients of independent variables.

Second, we also perform a similar logistic regression to study the impact of ownership concentration on the ZL phenomenon. Additionally, we include family ownership and insider ownership to examine if control considerations and managerial entrenchment are plausible explanations for firms to eschew debt and if they are the distinguishing factors differentiating ZL policy in family and non-family firms. For all regression, we include year and industry dummies. Industry dummies are based on the Fama and French 17 industry classifications.

4. Empirical results
4.1 Univariate results
Table 1 reports the empirical distribution of ZL firms and ZD firms by time and according to their family firm status. The results in Panel A show that over the sample period 2001–2016, 12.43% of the firm-year observations have zero outstanding debt in a given year, neither short-term nor long-term. 27.81% of the firm-year observations are classified as family firms. Among the subsample of family firms, 19.20% of the firm-year observations have zero debt [2]. Panel B shows the frequency distribution of ZD firms. 834 out of 11,668 firm-year observations (7.14%) are characterized as ZD. Amongst family firms, around 11% of firm-year observations are ZD. These observations confirm that extremely conservative debt policy has prevailed more in family firms over the sample period relative to non-family firms.

Table 2 presents descriptive statistics of all relevant variables and the univariate analysis of firms categorized by family status and financial constraints. Family firms are significantly smaller and have significantly higher capital expenditure and payout ratios than non-family firms. We also find that family firms have a smaller board and a smaller fraction of independent directors.

In panel B of Table 2, we conduct a univariate analysis to examine ZL and zero debt differences between family and non-family firms. We find a statistically higher percentage of family firms with ZL and zero debt (ZD) in their capital structure. We further divide the sample into quartiles based on the KZ index. The top quartile firms have high financial constraints, while the bottom quartile has low financial constraints. We find that for firms with low financial constraints, 25.13% of family firms eschew debt, while only 11.11% of

Panel A: Frequency distribution of zero-leverage (ZL) firms

Year	Full sample			Family firms			Non-family firms		
	All	ZL	% ZL	All	ZL	%ZL	All	ZL	%ZL
2001	1,058	132	12.47	382	65	17.01	676	67	9.91
2002	880	124	14.09	281	57	20.28	599	67	11.18
2003	879	128	14.56	275	59	21.45	604	69	11.42
2004	861	123	14.28	263	53	20.15	598	70	11.70
2005	813	132	16.22	242	59	24.38	571	73	12.78
2006	768	109	14.19	220	44	20.00	548	65	11.86
2007	605	86	14.21	180	39	21.66	425	47	11.05
2008	707	92	13.01	196	37	18.87	511	55	10.76
2009	740	103	13.91	197	40	20.30	543	63	11.60
2010	721	110	15.25	181	44	24.30	540	66	12.22
2011	691	94	13.60	171	37	21.63	520	57	10.96
2012	696	81	11.63	168	29	17.26	528	52	9.84
2013	675	81	12.00	159	27	16.98	516	54	10.46
2014	666	69	10.36	156	27	17.30	510	42	8.23
2015	657	54	8.21	144	17	11.80	513	37	7.21
2016	627	49	7.81	135	21	15.55	492	28	5.69
Total	12,044	1,567		3,350	655		8,694	912	
Average			12.43%			19.20%			10.42%

Panel B: Frequency distribution of ZD firms

Year	No of obs	No of family firm obs	Zero debt firms		Zero debt family firms	
			N	%	N	%
2001	932	312	77	8.26	36	11.53
2002	878	281	77	8.76	36	12.81
2003	879	275	79	8.98	35	12.72
2004	861	263	69	8.01	30	11.40
2005	812	242	70	8.62	31	12.80
2006	768	220	62	8.07	25	11.63
2007	605	180	54	8.92	25	13.88
2008	707	196	65	9.19	25	12.75
2009	740	197	61	8.24	24	12.18
2010	721	181	65	9.01	26	14.36
2011	691	171	65	9.40	24	14.03
2012	696	168	52	7.47	24	14.28
2013	675	159	38	5.62	15	9.43
2014	666	156	NA	NA	NA	NA
2015	657	144	NA	NA	NA	NA
2016	380	57	NA	NA	NA	NA
Total	11,668	3,202	834		356	

Source(s): Authors work

non-family firms have zero debt. The difference is significant at 1%. However, for firms with high financial constraints, we find a significantly higher percentage of non-family firms to have ZD than family firms. The univariate analysis shows that financial constraints are important factors dictating ZL policy for only non-family firms.

4.2 Multivariate analysis
4.2.1 Logistic regression analysis on determinants of zero leverage policy. In the first step, we analyze the firm's propensity to have zero debt for the whole sample and the non-family and

Panel A: Zero-leverage family firms vs zero-leverage non-family firms

Variable	Family firms (1)		Non-family firms (2)		Differences (1)–(2)	t-statistic
	Obs	Mean	Obs	Mean		
Market Leverage	2,575	0.175	7,013	0.192	−0.161***	4.703
Ln (Size)	2,586	7.404	7,023	8.024	−0.619***	26.94
Profitability	2,576	0.139	7,016	0.140	−0.0008	0.382
Market to book ratio	2,585	1.929	7,015	1.960	−0.031	1.347
Capital Expenditure	2,565	0.049	7,003	0.048	0.0009**	1.841
Tangibility	2,586	0.261	7,020	0.267	−0.005	0.242
Sales Growth	2,130	0.076	5,981	0.078	−0.001	0.784
Firm Age (Years)	2,586	6.056	7,023	6.213	−0.156	1.808
Payout Ratio	2,585	0.016	7,014	0.014	0.001***	2.879
Total Directors	2,586	9.053	7,023	9.419	−0.365***	7.354
Frac of Ind Dir	2,586	0.665	7,023	0.771	−0.106***	3.195

Panel B: Zero-leverage and zero debt behavior in family and non-family firms

	Zero leverage (ZL)	Zero debt (ZD)	High financial constraints and zero debt	Low financial constraints and zero debt
Family firms (%)	19.4%	13.7%	20.46%	25.13%
Non-Family firms (%)	10.38%	6.8%	34.24%	11.11%
Difference	0.0904***	0.069***	−0.137***	0.140***
T-statistic	13.11	10.783	4.076	9.303

Note(s): ***, **, and * indicates significant at 1%, 5%, and 10%, respectively
Source(s): Authors work

Table 2.
Univariate Analysis

family subsamples. Table 3 reports the results of the multivariate logistic regression analysis. Models (1), (2) and (3) cover the whole sample, while Model (4) covers family firms and Model (5) covers non-family firms. In Model (1), we find that the coefficient of the KZ index is positive (0.083) and significant at 1%, suggesting that financial constraints positively impact the likelihood of ZD. Coefficients of firm size, tangibility, firm age, dividend dummy and payout ratio are negative and significant. Thus, smaller and younger firms are more likely to be low-leveraged. In Model (2), we find that the coefficient of the family firms dummy is positive (1.293) and significant at 5%, suggesting that family firms are more likely to adopt a ZL policy. We also find that the coefficient of the KZ index is positive (0.012) and significant at 10%, indicating that financially constrained firms are more likely to have zero debt in their capital structure. To test whether financially constrained family firms are more likely to eschew debt, we add in Model (3) the interaction effect of the family firms dummy and the KZ index. In this model, we find that the coefficient of the family firms dummy is positive (1.374) and significant at 1%, and the interaction of the family firms dummy and the KZ index (*Family firms*KZ index*) is negative (−0.908) and significant at 10%. To further examine if financial constraints dictate the ZD behavior in family firms, we run regressions for subsamples of family and non-family firms separately. Comparing the results in Models (4) and (5), we find that the coefficient of the KZ index is negative (−0.004) but insignificant in Model (4), while the coefficient of the KZ index is positive (0.069) and significant at 1% in Model (5), suggesting that within the group of non-family firms, financially constrained firms are more likely to be low leveraged because of a lack of access to debt markets. For the sample of family firms, financial constraints are not a significant determinant for the ZL behavior. So far, our results are consistent with our hypothesis (1) that higher financial constraints positively affect the likelihood of non-family firms having a ZL policy.

Dependent variable: ZD dummy	All firms (1)	All firms (2)	All firms (3)	Family firms (4)	Non-family firms (5)
Family firms dummy		1.293** (2.25)	1.374*** (2.34)		
KZ index	0.083*** (3.52)	0.012* (1.88)	−0.007 (0.79)	−0.004 (0.28)	0.069*** (2.83)
Family Firms*KZ index			−0.908* (1.79)		
Ln (Size)	−2.191*** (5.80)	−2.309*** (6.09)	−2.306*** (6.02)	−3.150*** (3.72)	−2.229*** (4.41)
Market to book ratio	0.588*** (3.59)	0.597*** (3.64)	0.583*** (3.55)	0.656*** (2.37)	0.502*** (2.13)
Tangibility	−1.108*** (2.40)	−1.602** (2.17)	−1.568** (2.18)	−1.942* (1.76)	−1.667* (1.68)
Profitability	4.410** (2.15)	4.629** (2.24)	1.568*** (2.45)	1.446* (1.77)	1.462* (1.76)
Sales growth	−1.056* (1.93)	−1.135** (2.09)	−1.148** (2.12)	−0.360* (1.88)	−1.442** (2.12)
Capital Expenditure	10.443*** (3.28)	12.584*** (2.23)	−1.203 (1.23)	−6.309*** (2.67)	−2.089* (1.85)
Firm age	−0.170** (2.15)	−0.159** (2.17)	−0.121* (1.89)	−0.203* (1.77)	−0.207* (1.78)
Dividend dummy	−0.370** (2.13)	−0.386** (1.96)	−0.230* (1.88)	−0.275* (1.88)	−0.242** (2.02)
Payout ratio	−10.029*** (2.22)	−9.893*** (2.18)	−11.320*** (2.34)	−12.55** (2.17)	−12.497*** (1.72)
Non-debt tax shield	1.863 (1.24)	2.022 (1.45)	−2.091 (1.43)	−2.675 (1.43)	−1.497 (1.13)
Board Size	0.824 (1.04)	0.725 (1.33)	0.682 (1.41)	1.092 (1.53)	1.148 (1.32)
Frac of ind dir	1.859** (2.12)	1.577* (1.77)	1.544* (1.76)	2.072* (1.77)	1.397 (1.07)
Constant	0.384*** (7.52)	0.401*** (7.69)	0.400*** (7.68)	0.613*** (5.03)	0.330*** (5.91)
Year/Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	3,991	3,991	3,991	1,991	2,324
Log-likelihood	−242.450	−736.895	−239.664	−126.23	−75.396

Note(s): ***, **, and * indicates significant at 1%, 5%, and 10%, respectively

This table reports the coefficients and *t*-statistics (in parentheses) for firm-level logistic regressions. Standard errors are adjusted for heteroskedasticity and clustered at the firm level

Source(s): Authors work

Table 3.
Determinants of
ZD policy

Next, we divide our sample based on financial constraints. Specifically, for every year and industry, we categorize firms into three quartiles, with firms in the top quartile being more financially constrained while the bottom quartile firms are the least financially constrained. We then re-run the regressions for the group of less financially constrained (bottom quartile) and more financially constrained firms (top quartile). Table 4 presents the results of the analysis.

For the less financially constrained firms, the coefficient of the family firms dummy is positive (0.871) and significant at 1%, suggesting that among less financially constrained firms, family firms are more likely to adopt ZL policy than their non-family counterparts. For highly financially constrained firms, the coefficient of the family firms dummy is positive (0.276) but statistically insignificant. Thus, we confirm that financial constraints could dictate the ZL behavior, specifically for non-family firms.

4.2.2 Inside ownership and zero leverage policy. In this section, we test our second and third hypotheses. Specifically, we examine the impact of insider stock ownership and family ownership on the likelihood of having a ZL policy. Table 5 presents the results of the analysis. Model (1) of Table 5 examines the impact of insider ownership on the likelihood of ZL behavior. The coefficient of insider ownership is negative (-0.445) and significant at 1%, suggesting that firms with higher insider ownership are less likely to have low debt. In Models (2) and (3), we add the family firms dummy and the interaction of family firms and insider ownership and find that the coefficient of the family firms dummy is positive and significant at 10%. The coefficient of the interaction variable (*Family Firms*Insider ownership*) in Model (3) is also positive but statistically insignificant. Thus, insider ownership does not impact the likelihood of ZL behavior for the family firms. In Model (4), for the group of family firms, the coefficient of insider ownership is positive (0.208) but insignificant, while in Model (5), we find that the coefficient of insider ownership is negative (-0.606) and significant at 10% for non-family firms. Thus, non-family firms are more likely to be ZL to expropriate wealth from shareholders, while managerial entrenchment could not explain the ZL behavior of family firms. These results are consistent with our third hypothesis.

Dependent variable: ZD dummy	Less financially constrained firms		High financially constrained firms	
Family Firms dummy		0.871*** (2.44)		0.276 (1.13)
Ln (Size)	−1.604*** (2.85)	−1.684*** (2.88)	−0.024*** (4.09)	−0.024*** (4.08)
Market to book ratio	1.599*** (4.15)	1.574*** (4.08)	0.078 (1.20)	0.079 (1.21)
Tangibility	−3.641*** (2.41)	−4.199*** (2.54)	0.023 (1.06)	0.024 (1.08)
Profitability	−1.544** (1.29)	−1.527** (2.22)	0.058* (1.98)	0.057* (1.92)
Sales growth	−3.083** (2.22)	−3.160** (2.27)	0.924 (1.10)	0.921 (1.11)
Capital Expenditure	−6.049** (2.09)	−5.371** (2.27)	0.491 (1.17)	0.491 (1.17)
Firm age	−0.794 (0.71)	−0.822 (0.77)	−0.631 (0.55)	−0.587 (0.32)
Dividend dummy	−0.453* (1.64)	−0.465* (1.62)	−0.459* (1.67)	−0.462* (1.66)
Payout ratio	−8.873* (1.99)	−8.810* (1.97)	−8.059* (1.88)	−8.054* (1.76)
Non-debt tax shield	−4.113 (1.28)	−4.167 (1.30)	−4.059 (1.44)	−4.055 (1.43)
Board size	0.213 (1.32)	0.219 (1.31)	0.245 (1.28)	0.257 (1.33)
Frac of ind dir	1.054* (1.76)	1.928* (1.98)	0.427* (1.78)	0.431* (1.83)
Constant	0.654*** (5.93)	0.691*** (6.07)	0.214*** (3.79)	0.214*** (3.77)
Observations	2,692	757	2,717	722
Log-likelihood	−75.164	−74.936	−78.169	−79.248

Table 4.
Determinants of zero leverage policy for different levels of financial constraint

Note(s): ***, **, and * indicates significant at 1%, 5%, and 10%, respectively
This table reports the coefficients and *t*-statistics (in parentheses) for firm-level logistic regressions. Standard errors are adjusted for heteroskedasticity and clustered at the firm level
Source(s): Authors work

Dependent variable: ZD dummy	All firms (1)	All firms (2)	All firms (3)	Family firms (4)	Non-family firms (5)
Family Firms dummy		0.879* (1.73)	0.675* (1.65)		
Insider Ownership	−0.445*** (2.82)	−0.557** (2.21)	−0.654** (2.14)	0.208 (1.13)	−0.606** (2.09)
Family Firms* Inside Ownership			0.207 (1.33)		
KZ index	0.376** (2.12)	0.375** (2.13)	0.372** (2.09)	0.371** (2.13)	0.369** (2.15)
Ln (Size)	−0.394*** (7.25)	−0.398*** (7.17)	−0.397*** (7.21)	−0.390*** (6.98)	−0.378*** (6.54)
Market to book ratio	0.021*** (7.02)	0.018*** (6.78)	0.023*** (7.03)	0.017*** (6.87)	0.025*** (6.99)
Tangibility	−0.056*** (2.23)	−0.055*** (2.22)	−0.056*** (2.23)	−0.056*** (2.21)	−0.053*** (2.19)
Profitability	0.039*** (3.55)	0.047*** (3.65)	0.032*** (2.89)	0.044*** (2.67)	0.034*** (2.45)
Sales growth	−0.012* (1.67)	−0.009* (1.63)	−0.014* (1.72)	−0.008* (1.67)	−0.017* (1.79)
Capital Expenditure	−2.659*** (5.43)	−2.368*** (5.12)	−2.367*** (5.14)	−2.347*** (4.87)	−2.362*** (5.02)
Firm age	−0.034*** (3.01)	−0.034*** (3.02)	−0.033*** (3.02)	−0.033*** (2.99)	−0.034*** (2.99)
Dividend dummy	−0.563* (1.76)	−0.589* (1.67)	−0.565* (1.75)	−0.562* (1.68)	−0.563* (1.76)
Payout ratio	−0.360** (2.12)	−0.362** (2.18)	−0.361** (2.18)	−0.361** (2.17)	−0.362** (2.18)
Non-debt tax shield	0.423 (1.32)	0.423 (1.36)	0.421 (1.34)	0.415 (1.33)	0.415 (1.35)
Board Size	0.356 (1.22)	0.357 (1.25)	0.355 (1.21)	0.245 (1.12)	0.247 (1.31)
Frac of ind dir	0.245* (1.65)	0.244* (1.62)	0.245* (1.67)	0.256* (1.62)	0.257* (1.65)
Constant	0.367*** (7.15)	0.382*** (7.29)	0.380*** (7.13)	0.614*** (5.01)	0.306*** (5.41)
Year/Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	3,978	3,978	3,978	2,122	2,965
Log-likelihood	−230.515	−229.520	−229.516	−73.321	−121.11

Note(s): ***, **, and * indicates significant at 1%, 5%, and 10%, respectively
This table reports the coefficients and t-statistics (in parentheses) for firm-level logistic regressions
Source(s): Authors work

To further examine the factors that dictate ZL phenomenon in family firms, we analyze the impact of family ownership on the likelihood of ZL behavior. Table 6 presents the results of the analysis. In Model (1), the coefficient of family ownership is positive (0.906) and significant at 10%, suggesting that firms with high family ownership are more likely to eschew debt. Our results also show that higher family ownership positively impacts ZL behavior in family firms, which is consistent with the second hypothesis. Family firms are more likely to eschew debt to avoid excessive risk-taking and maintain financial flexibility. When we compare less financially and more financially constrained family firms, we find that the coefficient of the family firms dummy is positive (0.145) and significant at 1% for less financially constrained firms. Increased family ownership dictates low-leverage behavior for family firms. The coefficient of family ownership is negative but insignificant for highly financially constrained firms.

5. Robustness tests

In this section, we perform a battery of tests to ensure the robustness of our findings. First, we consider alternative measures to proxy for financial constraints. Specifically, we use the WW index, the HP index and the firms' credit rating. These measures will deepen the understanding of ZL behavior in family and non-family firms. Table 7 presents the analysis. Panel A of Table 7 shows the Pearson correlations among the four financial constraint measures. We find that the correlation between the KZ index and the WW index is around 30%. Similarly, the correlation between the HP index and the WW index is about 35%, while it is about 5% between the HP and KZ indexes. These low correlations are consistent with Farre-Mensa and Ljungqvist (2016). Panel B of Table 7 presents logit regressions using alternative measures of financial constraints. We find that the coefficient of the WW index is

Dependent variable: ZD dummy	Family firms (1)	Less financially constrained family firms (2)	High financially constrained family firms (3)
Family ownership	0.906* (1.95)	0.145*** (3.05)	−0.106 (1.23)
Insider Ownership	0.016 (0.59)	0.481 (1.49)	0.061 (1.16)
KZ index	0.297 (1.13)		
Ln (Size)	−0.056*** (3.69)	−0.365*** (2.57)	−0.053*** (3.40)
Market to book ratio	0.023*** (3.39)	0.400*** (2.77)	0.065*** (3.56)
Tangibility	−0.251*** (2.49)	−1.873* (1.81)	−0.247*** (2.34)
Profitability	0.034 (1.52)	0.614 (1.48)	0.043 (1.55)
Sales growth	0.639 (1.28)	0.123 (1.13)	0.754 (1.45)
Capital Expenditure	−0.304* (1.90)	−0.793* (1.99)	−0.429** (2.99)
Firm age	0.018 (1.33)	0.148 (1.11)	0.038 (1.20)
Dividend dummy	−0.025* (1.66)	−0.034 (1.07)	−0.022 (1.16)
Payout ratio	−0.251** (2.09)	−0.298** (2.11)	−0.236** (2.09)
Non-debt tax shield	−0.987 (1.36)	−0.932 (1.45)	−0.954 (1.34)
Board Size	0.356 (1.10)	0.378 (1.21)	0.366 (1.13)
Frac of ind dir	0.372* (1.98)	0.483 (1.56)	0.345* (1.78)
Constant	0.660*** (5.05)	0.731*** (2.55)	0.591*** (4.65)
Year/Industry fixed effects	Yes	Yes	Yes
Observations	2,122	757	722
Log-likelihood	−72.475	−15.437	−71.547

Note(s): ***, **, and * indicates significant at 1%, 5%, and 10%, respectively
This table reports the coefficients and *t*-statistics (in parentheses) for firm-level logistic regressions. Standard errors are adjusted for heteroskedasticity and clustered at the firm level
Source(s): Authors work

Table 6.
Family ownership and leverage

Panel A: This table presents the correlation matrix for alternate measures of financial constraints

Variables	KZ index	WW index	HP index	Credit rating
KZ Index	1.000			
WW Index	0.301	1.000		
HP Index	0.049	0.349	1.000	
Credit Rating	0.0094	0.3022	−0.133	1.000

Panel B: This table reports the coefficients and t-statistics (in parentheses) for firm-level logistic regressions

Dependent variable: ZD dummy	Family firms (1)	Family firms (2)	Family firms (3)	Non-family firms (4)	Non-family firms (5)	Non-family firms (6)
WW Index	−0.651*** (2.55)			1.021** (2.20)		
HP Index		−0.467 (1.26)			0.821*** (2.36)	
Credit rating			−0.157* (1.83)			0.547* (1.89)
Ln (Size)	−0.079*** (2.66)	−0.043*** (2.82)	−0.065*** (2.67)	−0.079*** (6.62)	−0.082*** (5.67)	−0.065*** (4.98)
Market to book ratio	0.023*** (3.32)	0.026*** (3.69)	0.028*** (3.45)	0.019*** (5.96)	0.022*** (4.67)	0.032*** (3.45)
Tangibility	−0.271*** (2.71)	−0.291*** (2.91)	−0.287*** (2.88)	0.018 (1.40)	0.025 (1.55)	0.056 (1.65)
Profitability	0.021 (1.25)	0.040 (1.50)	0.032 (1.46)	0.524*** (2.31)	0.632*** (2.34)	0.765*** (2.55)
Sales growth	0.030 (1.47)	0.083 (1.32)	0.054 (1.33)	−0.051 (1.54)	−0.065 (1.55)	−0.54 (1.32)
Capital Expenditure	−0.295* (1.85)	−0.305* (1.88)	−0.321* (1.92)	−0.115 (1.43)	−0.165 (1.55)	−0.155 (1.33)
Firm age	0.684 (1.23)	0.089 (1.54)	0.0531 (1.44)	0.029 (1.33)	0.034 (1.45)	0.042 (1.34)
Dividend dummy	−0.060* (1.60)	−0.054* (1.66)	−0.40* (1.62)	−0.434* (1.76)	−0.456* (1.77)	−0.476* (1.82)
Payout ratio	−0.218* (1.82)	−0.227* (1.90)	−0.218* (1.82)	−0.223* (1.77)	−0.341* (1.88)	−0.453* (1.95)
Non-debt tax shield	0.952 (1.27)	0.943 (1.14)	0.954 (1.22)	1.076 (1.32)	1.165 (1.55)	1.075 (1.33)
Board Size	0.683 (1.18)	0.691 (1.32)	0.688 (1.45)	0.234 (1.34)	0.256 (1.45)	0.213 (1.33)
Frac of ind dir	−0.406* (1.88)	−0.541* (1.92)	−0.456* (1.76)	−0.127* (1.77)	−0.154* (1.79)	−0.165* (1.83)
Constant	0.629*** (5.13)	0.602*** (4.26)	0.654*** (3.96)	0.348*** (6.23)	0.529*** (5.26)	0.569*** (3.45)
Year/Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,121	2,122	1,000	2,728	2,727	2,102

Note(s): ***, **, and * indicates significant at 1%, 5%, and 10%, respectively
Source(s): Authors work

Table 7.
Alternative measures
of financial constraints

negative (−0.651) and significant at 1% for the subsample of family firms (Model 1), suggesting that family firms with lesser financial constraints are more likely to be ZD. For the subsample of non-family firms, we find that the coefficient of the WW index is positive (1.021) and significant at 10% in Model 4, confirming that financial constraints dictate ZD behavior, for non-family firms. We find similar results using the HP index, even though they are not significant for family firms. The coefficient for the HP index is positive (0.821) and significant for non-family firms at 1% (Model 5), suggesting that non-family firms adopt ZL behavior due to the lack of debt markets. Using credit rating as a proxy for financial constraints, we confirm our previous findings that financially constrained non-family firms are more likely to have zero debt in their capital structure, but financial constraints do not fully explain the ZL behavior for family firms.

Second, we perform a logistic regression analysis to study the decision by a ZL firm to raise debt (with an increase in leverage to be at least 1%) in year $t+1$. We consider all the explanatory variables used in previous regressions. Table 8 reports the result. In Model (1) of Table 8, we find that the coefficient of decrease in the KZ index is positive (0.376) and significant at 5%, suggesting a positive relation between the decrease in financial constraints and the likelihood of levering up. However, we do not find a similar result for the subsample of family firms in Model (3). The coefficient of decrease in the KZ index is negative (−0.799) and significant at 10%, suggesting that a decrease in financial constraints lowers the probability of family firms increasing debt in their capital structure. The results confirm our previous findings that financial constraints do not fully dictate family firms' decision to adopt the ZL policy. An increase in insider ownership does not also impact the decision to lever up debt. Still, family ownership impacts the decision to lever up for the sub-sample of family firms. In Model (4), we find that the coefficient of increase in family ownership is negative (−1.497) and significant, suggesting that an increase in family ownership reduces the likelihood of family firms levering up. This finding is consistent with our second hypothesis. Family firms

	All firms (1)	All firms (2)	Family firms (3)	Family firms (4)
Decrease in KZ index	0.376** (2.12)		−0.799* (1.76)	
Increase in *Insider* ownership		0.806 (1.13)		
Increase in family ownership				−1.497* (1.76)
KZ Index		0.232 (1.37)		0.166 (1.45)
Δ Ln (Size)	0.165** (2.21)	0.143* (1.99)	0.662* (1.87)	0.331* (1.76)
Δ Market to book ratio	−0.653* (1.99)	−0.632* (1.87)	0.126 (1.24)	0.147 (1.28)
Δ Tangibility	0.293 (1.10)	0.487 (1.32)	0.473 (1.16)	0.465 (1.23)
Δ Profitability	0.164* (1.88)	0.198* (1.88)	0.960 (1.32)	0.966 (1.33)
Δ Sales growth	−0.129 (1.44)	−0.145 (1.54)	0.652 (1.25)	0.631 (1.33)
Δ Capital Expenditure	−0.256** (2.17)	−0.255* (1.98)	0.873 (0.88)	0.934 (1.09)
Δ Firm age	0.251 (1.17)	0.213 (1.08)	0.496 (1.15)	0.578 (1.23)
Δ Dividend dummy	0.153 (1.49)	0.143 (1.33)	0.470 (0.61)	0.488 (0.88)
Δ Payout ratio	0.165 (1.44)	0.168 (1.36)	0.140 (1.41)	0.187 (1.54)
Δ Board Size	0.104 (1.15)	0.134 (1.09)	0.338 (1.17)	0.984 (1.23)
Δ Frac of ind dir	0.452* (1.93)	0.562* (2.01)	0.671 (1.09)	0.751 (1.19)
Constant	0.708*** (11.86)	0.589*** (6.68)	0.128*** (6.02)	0.152*** (7.81)
Year/Industry fixed effects	Yes	Yes	Yes	Yes
Observations	1,159	984	654	513
Log-likelihood	−345.76	−278.657	−228.657	−212.631

Table 8.
Logistic regression of ZD firms' decision to lever up

Note(s): ***, **, and * indicates significant at 1%, 5%, and 10%, respectively
This table reports the coefficients and *t*-statistics (in parentheses) for logistic regressions. Standard errors are adjusted for heteroskedasticity and clustered at the firm level
Source(s): Authors work

have financial flexibility in mind. To achieve long-term sustainability, family firms avoid taking excessive risks and maintain financial flexibility. Hence, family firms are more likely to adopt a ZL behavior to maintain financial flexibility and avoid excessive risk-taking.

6. Conclusion

The purpose of this study is to examine the ZL phenomenon in family and non-family firms. Family firms represent a unique set of firms with long-term owners, active management and long-term commitment to their stakeholders. Using a sample of the top 2,000 largest US firms over the 2001–2016 period, we find that, on average, 19.40% of family firms have ZD vs 10.42% for non-family firms. Further, we find that family firms strategically choose to be ZL to maintain financial flexibility for future investments and exercise control over the decision-making process, consistent with the financial flexibility and control considerations hypotheses. We also find that, unlike family firms, non-family firms have a higher likelihood of having ZD if they have financial constraints and if the credit market does not lend them money at affordable credit rates. This finding is consistent with the financial constraint hypothesis. Overall, our results suggest that family and non-family firms adopt a ZL policy for different reasons. The conservative debt policy of family firms is explained by the need to be financially flexible and exercise control over the firm's operations. However, for non-family firms, credit availability at affordable rates associated with financial constraints rather than the strategic reason could explain their ZL behavior. Our results show that families wish to retain control over the firm's operations and the decision-making process. Further studies should consider these differences when examining financial conservatism.

Notes

1. The authors thank Dr. Ronald C. Anderson and Dr. David M. Reeb for providing the updated dataset on family firms and family ownership for our sample period0. See Anderson *et al.* (2009) and Anderson *et al.* (2012).

2. Strebulaev and Yang (2013) find that family firms are 6% more likely to pursue zero-leverage policy than non-family firms.

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Appendix

Zero-leverage firm (ZL)	A firm in year t is defined as ZL if the outstanding amount of short-term debt (DLC) and long-term debt (DLTT) are zero
Zero-Debt Firm (ZD)	A dummy variable that takes 1 if the firm-year is categorized as zero debt (no short-term and long-term debt in three consecutive years) and 0 otherwise
Zero Long-Term Debt	A firm in year t is defined as zero long-term debt if the outstanding amount of long-term debt (DLTT) is zero
Firm Size	Natural Log of Book Assets (AT)
Profitability	Ratio of earnings before interest taxes and depreciation to Book Assets (OIBDP/AT)
Market Value of Assets	The current market price times no. of shares outstanding (LT + PSTKL − TXDITC + CSHO*PRCC_F)
Market to book ratio	Ratio of market value of assets to book value of assets (MV/BV)
Firm Age	No of years since the firm's record first appears in COMPUSTAT
Capital Expenditure	Ratio of capital expenditure to book assets (CAPX/AT)
Tangibility	Ratio of fixed assets to book assets (PPENT/AT)
Sales growth	Ratio of difference in sales in year t and $t-1$ to sales in year $t-1$
Payout Dummy	An indicator variable that takes the value of 1 if the company pays dividend in a year and 0 otherwise
Payout Ratio	Ratio of sum of cash dividends and share repurchases to book assets (R.P. + DIV)/AT
Total Directors	Total no of directors on the board for the given year
Independent Directors	Fraction of independent directors (Independent directors/total directors)
Family Ownership	Percentage of shares or voting control with individuals identified as family members
Insider Ownership	Percentage of shares or voting control with individuals identified as insiders. An insider is an individual owning more than 10% of a firm's voting shares

Table A1.
List and definition of variables

Corresponding author
Maher Kooli can be contacted at: kooli.maher@uqam.ca