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Determinants of Dividend Initiations by Technology Firms

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by

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Abstract

This thesis presents evidence that tech firms are more likely to initiate dividends to signal undervaluation than non-tech firms. I present evidence that tech firms with lower market to book ratios experience both more positive abnormal returns surrounding dividend initiations and greater increases in earnings following dividend initiations when compared to otherwise similar non- tech firms. I also present some evidence consistent with the tech firms being more likely to use dividends to stem agency costs. Tech firms with few investment opportunities and high cash flows, have higher stock returns surrounding dividend initiations than otherwise similar non tech firms. I find no evidence that dividend initiations of tech firms signal a reduction in risk.

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Chapter 1

Introduction

This thesis examines whether tech firms initiate dividends for the same reasons as non-tech firms. Theoretical models by Bhattacharya (1979) [1], John and Williams (1985) [2], and Miller and Rock (1985) [3] suggest that dividend initiations are a signal of current earnings and future earnings to market participants. Among other things, signaling theory requires that managers know more about the firm's prospects than shareholders. Tech firms are notoriously secretive of upcoming new products and research and development. Additionally, tech firms usually create products and participate in new markets which are more difficult for shareholders to understand. To resolve the higher level of information asymmetry between managers and shareholders in tech firms compared to non-tech firms, the managers of tech firms may be more likely to initiate dividends to signal firm value to shareholders than non-tech firms. I present evidence that tech firms with low market to book ratios experience greater increases in earnings growth in the two years following dividend initiations than non-tech firms. Additionally, tech firms with lower market to book ratios experience higher stock returns surrounding dividend initiations than that of non-tech firms with lower market to book ratios. This evidence is consistent with tech firms being more likely to use dividend initiations to signal undervaluation than non-tech firms.

The second theory I examine is Grullon et al.'s (2002) [4] maturity hypothesis that is based on the life cycle of the firm (Damodaram 2016) [5],and (Copeland, Koller, and Murrin 1994) [6]. This hypothesis suggests that, as firms mature, their investment opportunities and risk decrease. This results in excess cash, which is then distributed to shareholders in the form of dividends (Benartzi, Michaely, and Thaler 1997) [7], and (Lintner's 1956) [8]. At the outset, tech firms are less likely to operate in mature industries than non-tech firms. Thus, on average, the maturity hypothesis is less likely to motivate the dividend initiations of tech firms. I present evidence that is consistent with this conjecture. Dividend initiating tech firms have sales growth that is similar to non-tech firms, which suggest that they are equally mature. Additionally, tech firm's stock returns do not experience a decrease in sensitivity to market risk factors following dividend initiations, whereas non-tech firms do. Both pieces of evidence indicate that the maturity hypothesis is not a major reason for dividend initiations in tech firms relative to those of non-tech firms.

The final theory I examine is the agency cost hypothesis (Jensen 1986) [9] and (Stulz 1990) [10]. The agency theory suggests that firms pay dividends to remove excess cash flow from the firm that would otherwise be appropriated to managers' self-interests (DeAngelo and Stulz 2004) [11]. The agency theory is also dependent on information asymmetry between managers and shareholders because without this assumption, shareholders would be able to easily monitor and punish managers for appropriation of cash flows. Due to the greater opacity of tech firms compared to non-tech firms, dividend initiations of tech firms are more likely to be motivated by agency problems. I present evidence that is consistent with this hypothesis. Specifically, I find that the stock returns surrounding dividend initiations of tech firms with low market to book ratios (fewer investment opportunities) and high cash flows are more positive than those of non-tech firms with same characteristics. This indicates that the market is more likely to reward tech firms for distributing cash when they do not have profitable investment opportunities than to reward non-tech firms with similar characteristics.

This paper contributes to the extant literature on dividend initiations and payout policy. The prior work examining the motivations for dividend initiations of tech firms is largely consistent with the maturity hypothesis. For example, Yu and Webb (2017) [12] presented evidence that is more consistent with the maturity hypothesis but they purged their sample of non-tech firms, thereby eliminating a necessary condition for the signaling and agency costs theories - information asymmetry between managers and shareholders. Additionally, Lacina and Zhang (2008) [13] presented evidence that tech firms with more liquid assets experience higher stock returns surrounding dividend initiations than non-tech firms with more liquidity. They interpreted this as an evidence of reduced risk, also consistent with the maturity hypothesis. In contrast, my study directly examines changes in risk following dividend initiations and finds no such reduction for tech firms relative to non-tech firms. Finally, there is a long history of studies presenting evidence both for and against the signaling theory like Benartzi, Michaely, and Thaler (1997) [7] and Ham, Kaplan and Leary (2020) [14]. I contribute to this debate by presenting evidence that precisely the firms that need to signal undervaluation due to information asymmetry (i.e., tech firms) are more likely to initiate dividend.

Chapter 2

Hypothesis Development and Related Literature

In this section, I delineate my main hypotheses and discuss the related literature. I examine three of the most prominent theories surrounding payout policy: the signaling theory, the maturity theory, and the agency cost theory. These theories are not mutually exclusive.

2.1 Hypothesis Development

The signaling theory (Bhattacharya 1979) [1], (John and Williams 1985) [2], and (Miller and Rock 1985) [3]) posits that managers of undervalued firms will use dividends to signal their value to market participants. The theory requires that managers of the firm know more about the firm's future prospects than shareholders. Additionally, dividend initiations must allow market participants to distinguish between high quality firms and low quality firms pretending to be high quality firms (i.e. a separating equilibrium). Such a separation requires that high quality firms must incur costs that low quality firms cannot afford. For example, distributing cash increases the likelihood that firms will need external financing. This is especially true for under-performing firms. Thus, high quality firms will incur lower transaction costs than a firm pretending to be high quality. This difference in costs will allow high quality firms to signal their quality to the market by distributing cash. I conjecture that due to the greater information asymmetry between managers and shareholders of tech firms compared to non tech firms, tech firms will be more likely to initiate dividends to signal their value to market participants. This conjecture leads to the following hypotheses,

H1. If tech firms are more likely than non tech firms to use dividends to signal undervaluation, then dividend initiating tech firms will have lower market-to-book ratios than their non tech counterparts.

H2. If tech firms are more likely than non tech firms to use dividends to signal undervaluation, then the relation between CARs and market to book ratios of tech firms should be more negative than that of non tech firms.

H3. If tech firms are more likely than non tech firms to use dividends to signal undervaluation, then dividend initiating tech firms with low market to book ratios will have greater increases in earnings following dividend initiations compared to those of non tech firms with low market to book ratios.

Grullon et al.'s (2002) [4] maturity theory posits that as firms mature, their growth and risk decreases, resulting in excess cash that is then distributed to shareholders in the form of dividends. Because tech firms are less likely to operate in mature industries than non-tech firms, I do not expect that. On average, tech firms are more likely to initiate dividends than non-tech due to declining growth. This leads to the following hypotheses, *H4. If tech firms are more likely than non tech firms to initiate dividends due to firm maturity, then dividend initiating tech firms will have lower sales growth than their non-tech counterparts.*

H5. If tech firms are more likely than non tech firms to initiate dividends due to firm maturity, then dividend initiating tech firms will have greater decreases in market risk premiums following dividend initiations than their non tech counterparts.

The agency-costs theory of Jensen (1986) [9] and Stulz (1990) [10] posits that firms use dividends to reduce the amount of cash that managers have to appropriate to self interests. Like the signaling theory, the agency costs theory also requires information asymmetry between managers and shareholders. Without this information asymmetry, shareholders would be able to perfectly monitor the actions of managers and punish them for any appropriation of cash flows. Information asymmetry should be greater in tech firms than non tech firms, thus tech firms are more likely to initiate dividends to reduce agency costs, such as over investment, than non-tech firms. This discussion leads to the following hypotheses,

H6. If tech firms are more likely than non tech firms to initiate dividends to mitigate agency costs, then dividend initiating tech firms will have lower market-to-book ratios and greater cash flows than their non-tech counterparts.

H7. If tech firms are more likely than non tech firms to initiate dividends to mitigate agency costs, then the stock market reaction to dividend initiating tech firms with low market to book ratios and high cash flows will be greater than that of otherwise similar dividend initiating non tech firms.

2.2 Related Literature

I am only aware of two other papers that examined the potential reasons that technology firms initiate dividends. The most recent of the two Yu and Webb (2017) [12] reported that dividend initiating tech firms have lower long-term debt burdens, lower capital expenditures, but higher cash and short-term investments compared to non dividend initiating tech firms. They failed to find that evidence of significant long-term excess returns in the three year-period following the initiation announcement, nor did they find evidence of increases in return on investment or the growth rate in sales in the following three years. They interpreted these findings as evidence for the maturity theory.

The second paper, Lacina and Zhang (2008) [13], presented evidence that high tech firms experience greater stock returns and volume surrounding dividend initiations than that of non-tech firms. This is especially so for high tech firms with more liquid assets. Lacina and Zhang (2008) [13] interpreted the higher returns as a signal of reduced risk (Grullon et al, 2002) [4], and attributed the greater trading volume to clientele effects (Grinstein and Michaely, 2005) [15].

I extend this research in several ways. Because I examine differences in tech and non-tech firms (as opposed to a matched sample of tech firms), I am better able to test hypotheses that rely on differences in information asymmetry such as the signaling and agency costs theories. Furthermore, I extend Lacina and Zhang's (2008) [13] analysis of stock returns by examining not only differential stock return sensitivities due to liquid assets, but also cash flows and growth opportunities, which are important theoretical determinants of dividend initiations. Finally, I directly examine changes in risk following dividend initiations.

Chapter 3

Data

3.1 Sample Collection

This paper studies the sample of dividend initiating firms from 1966 to 2018 extracted from the The Center for Research in Security Prices (CRSP) database. I define dividend initiation as the first announcement of an ordinary, taxable, cash dividend payable on a quarterly, semi-quarterly, or annual basis by a firm listed in the CRSP database to the common stockholders (share codes 10 and 11). The sample comprised firms listed on the NYSE, Nasdaq, and Amex that operate in the United States. The six industries with four-digit SIC codes categorized as tech firms were: Computer Equipment (3571-3579), Electronic Components and Semiconductors (3612-3699), Precision Measurement Instruments (3812-3873), Telecommunications (4812-4813), Computer Programming, Software, Data Processing (7371-7379), and Technological Research and Development (8732-8734). Any companies that do not fall into the SIC codes above were categorized as non-tech firms companies.

The primary dependent variable I examined in my empirical analysis is the three trading day (i.e., the day prior to the event, the day of the event, and the day following the event) cumulative abnormal returns surrounding dividend initiations. Specifically, these returns were computed using an estimation period of 250 days ending ten days prior to the event window. For each stock, the estimation period was used to determine the parameters of the market model. These parameters were then used to estimate the stock's abnormal return each day in the event window. The sum of these abnormal returns is the cumulative abnormal return (CAR). I denote this variable as $CAR(-1, +1)$.

My primary empirical analysis compared the CARs of tech and non-tech firms. This relation is likely to be affected by several firm level variables in addition to the firm's industry. Therefore, to isolate the differential market response to tech and non-tech dividend initiations, I also controlled for several firm level variables. These variables, which were obtained from the Compustat fundamentals annual file, are described below with the Compustat variables in parentheses.

Larger firms are likely to command more attention and therefore their dividend initiations may be less of a surprise resulting in lower announcement returns. I proxy for firm size using total book value of assets (AT). The market may respond differently to undervalued firms or firms with fewer investment opportunities, therefore I proxy for valuation and investment opportunities using the ratio of a firm's market value of assets to book value of assets ($[AT - CEQ + PRCCF * CSHO]/AT$). This variable is denoted MTB. Firms with greater cash flows are more likely to issue dividends without requiring financing or investment distortions. I proxy for cash flows by earnings before extraordinary items plus depreciation expense scaled by total assets ($[IB + DP]/AT$). This variable is denoted CF. Since firms with higher cash flow can maintain future dividend payment, different levels of liquid assets will also affect announcement returns. I proxy for liquid assets using cash and short term investments scaled by total assets (CHE/AT), denoted $Cash$.

The market is likely to respond less favorably to dividend initiations of firms with greater investment requirements. I used two variables to proxy for investment, research and development expense scaled by total assets (XRD/AT) denoted $R\&D$, and capital expenditures scaled by the prior year's total assets ($CAPX/AT_{t-1}$) denoted $CAPX$. Firms may substitute dividends for stock repurchases ($PRSTKC/AT$). Thus, market participants may respond differently to dividend initiations of firms that repurchase shares compared to those that do not. Finally, the market is likely to respond differently to the dividend initiations of mature firms compared to growth firms. I proxy for firm maturity using the ratio of retained earning to market value of equity ($RE/[PRCCF * CSHO]$) denoted RE/MVE and year over year sales growth ($SALE/SALE_{t-1} - 1$). All firm level variables were measured at the fiscal year end prior to the fiscal year including the dividend initiation.

After excluding all observations that were missing firm level data or stock return data, the final sample consisted of 1516 dividend initiating firms; 270 were classified as tech firms and 1246 were classified as non-tech firms. Table 3.1 reports the number of dividend initiations in the sample by fiscal year. As reported, dividend initiations of tech firms were more prevalent in the latter half of the sample, with 68 percent of tech dividend initiations occurring after 1990, whereas 58 percent of non-tech dividend initiations occurring after 1990.

Table 3.1: Number of Dividend Initiations

Year	Combined	Tech	Non-tech
1966	2	0	2
1967	1	0	1
1968	1	0	1
1969	0	0	0
1970	1	1	0

Continued on next page.

Table 3.1 – Continued

Year	Combined	Tech	Non-tech
1971	1	0	1
1972	3	0	3
1973	34	3	31
1974	43	2	41
1975	51	6	45
1976	65	12	53
1977	78	15	63
1978	39	1	38
1979	25	4	21
1980	22	6	16
1981	16	1	15
1982	10	1	9
1983	12	3	9
1984	22	2	20
1985	31	4	27
1986	11	2	9
1987	32	5	27
1988	50	10	40
1989	37	4	33
1990	25	4	21
1991	22	4	18
1992	43	9	34
1993	39	8	31
1994	32	7	25
1995	26	10	16
1996	15	2	13
1997	20	4	16
1998	16	4	12
1999	14	2	12
2000	10	2	8
2001	15	0	15
2002	16	2	14
2003	66	15	51
2004	51	11	40
2005	54	8	46
2006	37	6	31
2007	39	7	32
2008	27	5	22
2009	23	6	17
2010	44	8	36

Continued on next page.

Table 3.1 – Continued

Year	Combined	Tech	Non-tech
2011	54	13	41
2012	53	18	35
2013	53	10	43
2014	41	8	33
2015	28	7	21
2016	31	4	27
2017	23	3	20
2018	12	1	11
No. of Obs.	1516	270	1246

Table 3.2 reports the average firm characteristics and CARs in the sample. As shown, there are several statistically significant differences, which illustrates the need to control for these variables in my regression analysis. Of note, the univariate results in this table indicate that tech firms have higher market to book ratios than non-tech firms, which is inconsistent with H1. Additionally, tech firms and non-tech firms appeared to have similar three day CARs. However, these unconditional means do not control for differences in firm characteristics of tech and non-tech firms. In order to control for these differences, I conduct multivariate regressions in the next chapter. [1]

Table 3.2: Summary Statistics

	Tech	Non-tech	t-statistic	p-value
Total Assets (in million $)	1905	1583	0.65	0.52
MTB	1.99	1.63	4.25	0.00
CF	0.18	0.13	3.63	0.00
R&D	0.06	0.01	14.37	0.00
CAPX	0.06	0.08	-2.55	0.01
Repurchases	0.02	0.02	2.60	0.01
RE/MVE	0.19	0.35	-3.81	0.00
Cash	0.28	0.15	9.80	0.00

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[1] All of my results are similar if employ a five day event window (i.e., $CAR(-2,+2)$)

Table 3.2 – Continued

	Tech	non-tech	t-statistic	p-value
Sales Growth	0.24	0.25	-0.20	0.85
CAR(-1, +1)(%)	1.46	1.59	-0.30	0.77
No. of Obs.	270	1246		

Chapter 4

Regression Analysis

I begin by examining the differences between tech firms and non-tech firms in the year prior to initiating dividends. Table 4.1 presents the results of the following logistic regression,

$$Tech_i = \alpha + \beta_1 log(AT)_i + \beta_2 MTB_i + \beta_3 CF_i + \beta_4 R\&D_i + \beta_5 CAPX_i + \\ \beta_6 Repurchases_i + \beta_7 RE/MVE_i + \beta_8 Cash_i + \beta_9 Sales\ Growth_i \\ + \eta_i \tag{4.1}$$

where the dependent variable is equal to one if the firm is a tech firm and zero otherwise. The other variables in the regression were described in Chapter 3. In all my regression tables, statistical significance at 1%, 5%, and 10% level are indicated with ***,**, and * respectively. Additionally, t-statistics that are robust to heteroskedasticity are reported in parentheses. In logistic regressions, z-statistics are reported. As reported in Table 4.1, tech firms have lower market to book ratios, higher cash flows, higher R&D expenditures, lower retained earnings, and higher cash balances than non-tech firms. The lower market to book ratios of tech firms versus non-tech firms is consistent with H1: tech firms may use dividend initiations to signal that they are undervalued. However, the evidence that tech firms have higher cash flows than non-tech firms may indicate that is consistent with H6: dividend initiations are more likely to be used by tech firms to mitigate agency costs than non-tech firms. The low market to book ratios may also indicate that growth is slowing, however I do not see differences in the sales growth of tech and non-tech firms. Thus, the evidence is not entirely consistent with H4: tech firms do not appear to be more likely to initiated dividends due to declining growth (the maturity theory) compared to non-tech firms. Overall, the evidence in Table 4.1 is consistent with tech firms initiating dividends to signal undervaluation or to stem agency costs.

Table 4.1: Logistic Regression Tech vs. non-tech Dividend Initiators

	Tech =1; Non-tech = 0
Log(Total Assets)	-0.046
	(-0.975)
MTB	-0.181***
	(-2.758)
CF	1.732***
	(3.578)
R&D	34.128***
	(10.017)
CAPX	-0.488
	(-0.862)
Repurchases	-1.140
	(-0.433)
RE/MVE	-0.166**
	(-2.061)
Cash	2.010***
	(4.499)
Sales Growth	0.057
	(0.415)
Intercept(α)	-2.339***
	(-7.978)
No. of Obs.	1516
Pseudo R Squared	0.271

4.1 Cumulative Abnormal Returns

In this section, I compare the cumulative abnormal returns (CARs) of tech firms and non-tech firms surrounding dividend initiations. The examination is conducted using ordinary least squares regressions of the following form,

$$CAR_i(-1,+1) = \alpha + \beta_1 Tech_i + \gamma Controls_i + \eta_i \tag{4.2}$$

where, $CAR_i(-1,+1)$ is the three day cumulative abnormal return surrounding the declaration date, $Tech_i$ is an indicator variable that takes the value of one if firm i is classified as tech firms and zero otherwise. $Controls_i$ is a vector of controls variables, η_i is the usual mean zero error term. The main coefficient of interest is β_1, which indicates whether, on average, tech firms have different CARs than non-tech firms. I report CARs relative to the market model, which was described in more detail in Chapter 3. As shown in Table 4.2, I do not find evidence that the average market response to tech firms' dividend initiations is different from that of non-tech firms.

Table 4.2: Cumulative Abnormal Returns, Tech vs. non-tech

	CAR(−1,+1)	CAR(−1,+1)
Tech	-0.133	-0.490
	(-0.298)	(-0.894)
Log(Total Assets)		-0.372***
		(-3.684)
MTB		-0.479***
		(-3.518)
CF		-0.302
		(-0.277)
R&D		-1.176
		(-0.214)
CAPX		-0.973
		(-1.303)
Repurchases		1.611

Continued on next page.

Table 4.2 – Continued

	CAR(−1,+1)	CAR(−1,+1)
		(0.299)
RE/MVE		-0.338
		(-1.056)
Cash		3.528***
		(3.049)
Sales Growth		-0.208
		(-0.972)
Intercept	1.589***	4.016***
	(8.034)	(5.170)
No. of Obs.	1516	1516
Adj. R-Squared	0.000	0.017

While the overall returns may not be different, examining the differential response of the market to tech firm and non-tech firm initiations with certain firm characteristics may shed light on differences in motivations for the two types of firms. I conducted this comparison using ordinary least squares regressions of the following form,

$$CAR_i(-1,+1) = \alpha + \beta_1 Tech_i + \beta_2 Tech_i \times Characteristic_i + \gamma Controls_i + \eta_i \qquad (4.3)$$

where, in addition to the variables described in equation 4.2, I also include the interaction term $Tech_i \times Characteristic_i$. The variable $Characteristic_i$ represents the various firm characteristics that I examine. The main coefficient of interest in equation (4.3) is β_2, which indicates if on average tech firms with a particular firm characteristic have different CARs than non-tech firms with that same characteristic.

Table 4.3 presents the results of regressions examining the relation between CARs and the interaction of tech and market to book ratio. As reported, I find that the relation between CARs and market to book is much lower for tech firms than for non-tech firms.

Table 4.3: Cumulative Abnormal Returns, Market to Book Value

	CAR(−1,+1)	CAR(−1,+1)
Tech	1.614*	0.566
	(1.954)	(0.623)
Tech × MTB	-0.878***	-0.563*
	(-2.769)	(-1.700)
Log(Total Assets)		-0.361***
		(-3.550)
MTB		-0.393***
		(-2.753)
CF		-0.169
		(-0.157)
R&D		-0.401
		(-0.073)
CAPX		-0.987
		(-1.320)
Repurchases		1.120
		(0.207)
RE/MVE		-0.323
		(-1.005)
Cash		3.513***
		(3.040)
Sales Growth		-0.215
		(-1.014)
Intercpet	1.589***	3.804***
	(8.032)	(4.786)
No. of Obs.	1516	1516
Adj. R-Squared	0.003	0.018

I examine the agency cost hypothesis (H7) in Table 4.4 using the following ordinary least squared regressions,

$$CAR_i(-1,+1) = \alpha + \beta_1 LowMTB_i + \beta_2 HighCF_i + \beta_3 LowMTB_i \times HighCF_i + \gamma Controls_i + \eta_i. \quad (4.4)$$

The regressions are run separately for tech and non-tech firms. The difference between the two β_3 coefficients indicates if tech firms with low market to book ratios and high cash flows have different CARs than non-tech firms with the same characteristics. As reported, the relation between CARs and the interaction of low market book ratios (i.e., lower than the median market to book ratio in the firms two digit SIC industry) and high cash flow (i.e., higher than the median market to book ratio in the firms two digit SIC industry) is positive and greater than that of non-tech firms. This difference is statistically significant at the one percent level, as indicated by "a" in the table. Firms with low market to book and high cash flows are likely to have fewer investment opportunities and ample cash flow for managers to appropriate to self interests. Thus, the evidence presented in Table 4.4 is consistent with tech firms being more likely to initiate dividends to stem agency costs than non-tech firms.

One could also argue that the relation between CARs and low market to book and its interaction with high cash flows is due to the maturity hypothesis, however that would also require that tech firms are more likely to experience earning declines and reductions in risk relative to the non-tech firms. As I show in later sections, this is not the case. Overall, the evidence presented in this section is consistent with tech firms being more likely to use dividend initiations to signal undervaluation and/or to stem agency costs when compared to non-tech firms.

Table 4.4: Cumulative Abnormal Returns, Market to Book Value and Cash Flows

	Tech CAR(−1,+1)	Non-tech CAR(−1,+1)	Tech CAR(−1,+1)	Non-tech CAR(−1,+1)
Low MTB	-4.368	-0.277	-3.853	0.225
	(-1.333)	(-0.440)	(-1.175)	(0.333)
High CF	1.541	-0.578	1.879	-0.419
	(1.345)	(-1.102)	(1.540)	(-0.775)
Low MTB × High CF	2.142^a	-0.352^a	1.635^a	-1.028^a
	(0.620)	(-0.432)	(0.477)	(-1.227)
Log(Total Assets)			-0.345*	-0.299**
			(-1.755)	(-2.484)

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Table 4.4 – Continued

	Tech CAR(−1,+1)	Non-tech CAR(−1,+1)	Tech CAR(−1,+1)	Non-tech CAR(−1,+1)
R&D			-12.666**	8.493
			(-2.334)	(0.988)
CAPX			0.662	-1.285
			(0.127)	(-1.534)
Repurchases			29.480***	-4.252
			(3.505)	(-0.704)
RE/MVE			0.316	-0.397
			(0.397)	(-1.162)
Cash			0.023	3.885***
			(0.014)	(2.824)
Sales Growth			-0.210	-0.278
			(-1.266)	(-1.048)
Intercept	-2.982	1.804***	-1.038	3.526***
	(-0.928)	(3.369)	(-0.290)	(3.415)
No. of Obs.	270	1246	270	1246
Adj. R-Squared	0.016	0.003	0.041	0.019

4.2 Earnings Surrounding Dividend Initiations

In this section, I examine changes in earnings surrounding dividend initiations. According to the signaling theory, dividends signal an increase in future earnings. Whereas, the maturity hypothesis would suggest that earnings do not increase, due to the lack of profitable investment opportunities. I measure earnings using the change in gross profit (Compustat variables Sales minus COGS) from the year prior to the dividend initiation to one and two years following the dividend initiation. To control for potential changes in underlying assets, I scale gross profit in all years by the firm's total assets in the year prior to the dividend initiation. I focus on gross profit, as opposed to other earnings measures, because it has been shown to have more desirable properties in this context (Ham, Kaplan, and Leary, 2020) [14]). For example, compared to net income, gross profit is less likely to be affected by various accounting treatments.

Table 4.5 compares the changes in gross profit surrounding dividend initiations of tech firms and non-tech firms. The comparison is conducted using the following ordinary least squares regressions,

$$\Delta GP_i(-1,+y) = \alpha + \beta_1 Tech_i + \beta_2 LowMTB_i + \beta_3 Tech_i \times Low_M TB_i + \gamma Controls_i + \eta_i \quad (4.5)$$

where, $\Delta GP_i(-1,+y)$ represents change in gross profit from the fiscal year prior to the dividend initiation to that of the fiscal year y years post dividend initiation. The main coefficient of interest is β_3 that indicates if tech firms with low market to book ratios have different changes in gross profit than non-tech firms with the same characteristics.

As shown, tech firms with low market to book ratios have greater changes in gross profit following dividend initiations than that of non-tech firms with low market to book ratios. This evidence is consistent with H3: tech firms are more likely to initiate dividends to signal undervaluation than non-tech firms.

Table 4.5: Change in Gross Profit Surrounding Dividend Initiations

	$\Delta GP(-1,+1)$	$\Delta GP(-1,+1)$	$\Delta GP(-1,+2)$	$\Delta GP(-1,+2)$
Tech	-0.035		-0.021	
	(-1.606)		(-0.682)	
Low MTB		0.017		0.019
		(0.877)		(0.595)
Tech × Low MTB		0.075***		0.085**
		(3.295)		(2.505)
Log(Total Assets)	-0.029***	-0.032***	-0.048***	-0.051***
	(-7.386)	(-6.601)	(-7.204)	(-6.811)
MTB	0.066***		0.067***	
	(4.418)		(3.909)	
R&D	0.208	0.403*	0.545	0.828**
	(0.869)	(1.690)	(1.643)	(2.507)

Continued on next page.

Table 4.5 – Continued

	$\Delta GP(-1,+1)$	$\Delta GP(-1,+2)$	$\Delta GP(-1,+2)$	$\Delta GP(-1,+2)$
CAPX	0.009	0.049	0.150	0.190
	(0.144)	(0.725)	(1.479)	(1.506)
Repurchases	-0.876***	-0.654***	-1.043***	-0.817***
	(-4.641)	(-4.180)	(-3.966)	(-3.379)
RE/MVE	-0.001	-0.015*	-0.013	-0.029**
	(-0.097)	(-1.944)	(-1.211)	(-1.992)
Cash	-0.072	0.064	-0.114	0.026
	(-1.564)	(0.958)	(-1.530)	(0.331)
Intercept	0.205***	0.313***	0.375***	0.492***
	(7.087)	(8.704)	(8.680)	(7.613)
No. of Obs.	1402	1402	1294	1294
Adj. R-Squared	0.123	0.055	0.095	0.064

4.3 Risk Surrounding Dividend Initiations

In this section, I compare the changes in risk surrounding dividend initiations of tech and non-tech firms. The comparison is conducted using the following regressions,

$$\begin{aligned} Return_{it} = \alpha &+ \beta_1 Post + \beta_2 (r_m - r_f)_t + \beta_3 Post_{it} \times (r_m - r_f)_t \\ &+ \beta_4 SMB_t + \beta_5 Post_{it} \times SMB_t \\ &+ \beta_6 HML_t + \beta_7 Post_{it} \times HML_t + \eta_{it} \end{aligned} \tag{4.6}$$

where, $Return_i$ is the firm i's monthly stock return, $(r_m - r_f)$, SMB, and HML are risk factors described in Fama and French (1993) [16], and $Post$ is an indicator variable equal to one if the return occurs following firm i's dividend initiation and zero otherwise. The regression is on the 36 months prior to and post the dividend initiation, thus the coefficients on the interaction terms (i.e., β_3, β_5, β_7) indicate if, on average, the sensitivity of tech firms' or non-tech firms' stock returns to the particular risk factor changed following dividend initiations.

The maturity hypothesis posits that dividends signal a reduction in risk premiums. Table 4.6 compares the changes in tech firms' sensitiveness to market risk factors to those of non-tech firms surrounding dividend initiations. As shown, I failed to find evidence that tech firms become less sensitive to risk factors following dividend initiations. However, non-tech firms appeared to become less sensitive to the market risk factor ($r_m - r_f$) following dividend initiations. The evidence in this section suggests that tech firms are less likely to initiate dividends in a manner consistent with the maturity hypothesis than non-tech firms.

Table 4.6: Change in Sensitivity to Risk Factors

	Tech	Non-tech
Post	-0.004**	-0.005***
	(-2.393)	(-9.760)
$r_m - r_f$	1.060***	1.009***
	(34.028)	(79.115)
Post $\times (r_m - r_f)$	-0.046	-0.176***
	(-1.069)	(-12.076)
SMB	-0.017	-0.199***
	(-0.255)	(-9.189)
Post × SMB	0.043	-0.006
	(0.474)	(-0.243)
HML	-0.291***	0.205***
	(-4.820)	(9.424)
Post × HML	-0.038	0.016
	(-0.456)	(0.646)
Intercept	0.011***	0.006***
	(7.497)	(13.747)
No. of Obs.	21642	216475
Adj. R-Squared	0.187	0.164

Chapter 5

Conclusion

In conclusion, this thesis presented evidence consistent with the signaling theory, and the agency cost theory of payout policy. Specifically, I presented the evidence that the stock returns surrounding dividend initiations of tech firms with low market to book ratios are more positive than that of non-tech firms with low market to book ratio. Additionally, tech firms with low market to book ratios have a greater increase in earnings following dividend initiations than non-tech firms with low market to book ratio. This evidence indicates that tech firms are more likely to use dividend initiations to signal undervaluation to non-tech firms. I also presented the evidence that tech firms with few investment opportunities and high cash flows experience more positive stock price reactions surrounding dividend initiations than non-tech firms with few investment opportunities and high cash flows. This evidence is consistent with tech firms that are more likely to use dividend initiations to distribute excess cash to stem agency costs than non-tech firms. Finally, I found no evidence that dividend initiations signal reduction of risk in technology firms.

The study of dividend initiations by tech firms presents a promising avenue for future research. The changes in 2003 dividend tax law may have boosted the dividend usage. Thus, a comparison of tech and non-tech firms dividend usage before and after this law could establish if tech firms are more likely than non-tech firms to issue dividends for tax purposes. Further expanding the risk factors I examined may help uncover differences in risks that tech firms may use dividends to mitigate compared to non-tech firms.

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