Chapter 3
Ownership Structure, Tax Regime, and Dividend Smoothing

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3.1 Introduction

Since the novel study of Lintner (1956), it has become a widespread idea that US firms only gradually adjust dividend levels toward long-term targets (Fama and Babiak 1968; Mueller 1967; Brav et al. 2005; Leary and Michaely 2011). Dividend smoothing helps firms mitigate problems that arise from information asymmetry (e.g., signaling and reduction of agency costs). Gugler (2003) and Michaely and Roberts (2012) show evidence supporting this idea by using data from the UK and Austria, respectively. However, single country analyses do not provide conclusive answers to the question of why firms smooth dividends. There are significant variations in agency relationships across countries which generate substantial differences in dividend smoothing behaviors. Shleifer and Vishny (1997) point out that in continental Europe and East Asian countries, corporate ownership structures are highly concentrated and there are less severe conflicts between controlling shareholders and management. This fact naturally leads to the idea that international data provides us with an appropriate research setting in which to address the question.

This chapter investigates dividend smoothing behaviors for approximately 6,000 companies from 28 countries. We predict that dividend smoothing is evident in firms with dispersed ownership structures, while dividend smoothing is less evident in firms with concentrated ownership structures. Since controlling shareholders have access to various informal channels to intervene in management, managers

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with strong controlling shareholders have less need to adopt dividend smoothing to mitigate problems attributable to information asymmetry. Using a rich dataset, we compute speed of adjustment (SOA) at the firm level and relate them to corporate ownership structure.

We present robust evidence that the percentage ownership held by the largest shareholder is positively (negatively) associated with SOA (dividend smoothing). This tendency is evident when the target dividend level is lower than dividends of previous years. Managers of companies with concentrated ownership structures can quickly decrease dividends because severe agency conflicts do not exist. This result also suggests that controlling shareholders care about their firms' survival and will allow managers to cut dividends during years in which the firms perform poorly.

Previous studies suggest that tax treatments on dividends significantly affect corporate payout policy (Lasfer 1996; Lee et al. 2006; Brown et al. 2007; Chetty and Saez 2005; Pattenden and Twite 2008; Henry 2011; Alzahrani and Lasfer 2012). Pattenden and Twite (2008) show evidence that the volatility of gross dividend payments in Australian firms became more volatile after the introduction of the imputation system in 1987. In our research, firms located in countries with classical tax regimes smooth dividends the most, followed by those under a partial imputation tax system, and then by those under a full imputation regime. Overall, we argue that corporate ownership structure and tax regime have a significant impact on dividend smoothing behaviors.

The research presented contributes significantly to the literature. Our results support the notion that dividend smoothing is associated with corporate ownership structures. Recent studies have suggested that non-US companies smooth dividends less than US ones do by comparisons between a few countries (e.g., Khan 2006; Andres et al. 2009; Chemmanur et al. 2010). We confirm this result by using a larger set of international data and providing a convincing explanation of why US firms smooth dividends; it is attributable to the ownership structure (less concentrated and high institutional ownership) and the classical tax system. Recent papers intensively use international data to examine corporate dividend policy (La Porta et al. 2000; Denis and Osobov 2008; Brockman and Unlu 2009; Ferris et al. 2009; Alzahrani and Lasfer 2012; Fatemi and Bildik 2012; Kuo et al. 2013; Breuer et al. 2014). We extend this research trend to dividend smoothing as proposed by Lintner (1956).

The rest of the chapter is organized as follows. Section 3.2 presents a literature review and then describes our hypotheses and dividend smoothing measures. Section 3.3 presents the sample selection procedure and data. Section 3.4 shows the empirical results. Finally, Sect. 3.5 presents a brief summary of this research.

3.2 Literature Review, Hypothesis, and Dividend Smoothing Measures

3.2.1 Previous Studies and Hypothesis

Many US corporations pay dividends that are relatively stable over time. Accordingly, Lintner (1956) finds that SOA of dividend payments in US firms is only 30 percent. Early US studies (e.g., Mueller 1967; Fama and Babiak 1968) confirm the dividend smoothing policy, and a recent survey by Brav et al. (2005) suggests that US managers view stable dividend payments as an important financial policy. Leary and Michaely (2011) show evidence that US firm SOA declines over time and that the median SOA reached 0.09 during the period 1998–2007.

Previous studies focus on information asymmetry between shareholders and managers as the main explanation for dividend smoothing. Easterbrook (1984) and Jensen (1986) suggest that high and stable dividend payments demonstrate a firm's commitment to not undertake value-destroying projects, and to mitigate agency conflicts between shareholders and managers.[1] Bhattacharya (1979), John and Williams (1985), and Miller and Rock (1985) formally demonstrated that dividends serve as a signal of a firm's future cash flow. For instance, firms whose stocks are undervalued have an incentive to send a signal of their profitability through dividend increases. Some previous studies suggest that firms whose future cash flow become volatile are more likely to smooth a dividend under information asymmetry (Kumar 1988; Kumar and Lee 2001; Guttman et al. 2010). Information asymmetry in the capital markets increases the cost of external capital and thereby provides firms with incentives for accumulating large cash holdings. Cash requirements cause firms to hesitate about increasing dividends for years in which the firms perform well.

Agency conflicts and signaling needs are likely to differ considerably depending on the firm's ownership structure. Controlling shareholders who have substantial equity stakes can closely monitor management in various ways, including informal channels, and managers of those firms are less likely to rely on dividend payments to mitigate agency problems (Dewenter and Warther 1998; Chemmanur et al. 2010). Put differently, dividend smoothing behaviors for signaling or agency cost prevention should be pronounced for firms that are owned mainly by arms-length shareholders.[2] Controlling shareholders also care less about short-term undervaluation of their stocks due to long-term equity holdings and therefore reduce the importance of dividend signaling. Controlling shareholders are also likely to care about their firms' survival and allow managers to cut dividends for years in which the firms perform poorly. Gugler (2003) provides evidence that in Austria, family-

[1] Using data from Norwegian savings banks and commercial banks, Bohren et al. (2012) document evidence that dividend payments mitigate conflicts between owners and non-owner stakeholders.

[2] Low et al. (2001) document evidence that the negative stock price reaction to dividend omissions weakens when the firm has bank debt. This result suggests that the effect of dividend signaling declines when the firm has alternative monitoring device.

controlled firms which are not subject to information asymmetry and conflicts of interest engage less in dividend smoothing than state-controlled firms which are viewed as manager-controlled firms. Michaely and Roberts (2012) find that in the UK, public firms smooth dividends more than private companies, suggesting that diffused ownership structures are an important cause of dividend smoothing. These discussions lead to the following hypothesis.

Hypothesis 1 *Ownership concentration is negatively related to dividend smoothing.*

Previous studies have suggested that tax treatments on dividend income affect corporate dividend policy (Lasfer 1996; Chetty and Saez 2005; Lee et al. 2006; Brown et al. 2007; Pattenden and Twite 2008; Henry 2011; Alzahrani and Lasfer 2012). These findings naturally raise the question of whether or not tax treatments affect dividend smoothing (Chemmanur et al. 2010). Among the issues surrounding tax treatments (e.g., tax clientele effects and impacts of tax rate change), we place emphasis on the degree of double taxation on dividend income. Pattenden and Twite (2008) show evidence that gross dividend payments in Australian firms became more volatile after the introduction of the imputation system, in which shareholders could receive tax credits for taxes the corporation paid on distributed income. US firm dividend smoothing behaviors are potentially attributable to the fact that the US adopts a classical tax system, in which shareholders are subject to double taxation. We raise the following hypothesis to examine these ideas.

Hypothesis 2 *Firms located in countries with a classical tax system smooth dividends more than firms in countries that provide tax benefits on dividend income.*

International data show wide variations in ownership structures and tax regimes and therefore serve as good research material to examine our hypotheses. La Porta et al. (1999) suggest that the degree of ownership concentration differs considerably across countries. We adopt percentage ownership by the largest shareholder as a measure of ownership concentration. As mentioned, the classical tax system is adopted in the USA, while several countries (e.g., France and Spain) adopt a partial imputation system in which shareholders receive tax credits for part of the taxes the company pays, and other countries (e.g., Australia) provide tax credits for all the tax the company pays (full imputation system). Following previous studies, we adopt two dummy variables indicating the country tax regime: D_PI (one for countries with partial imputation systems and zero for others) and D_FI (one for countries with full imputation systems and zero for others) (La Porta et al. 2000; von Eije and Megginson 2008; Alzahrani and Lasfer 2012). See Table 3.1 for the definition of variables. Countries' tax regime information is available from the OECD tax database (www.oecd.org/ctp/taxdatabase) as well as from Endres et al. (2010).

There are several non-US studies on dividend smoothing behaviors. Andres et al. (2009) find German firms have a SOA for target dividends ranging from 0.21 to 0.49. Chemmanur et al. (2010) investigate Hong Kong companies that operate under no tax disadvantage and have more concentrated ownership structures. They show

Table 3.1 Definition of variables

Variable	Definition
$SOA_{Lintner}$	The firm's speed of adjustment for the target dividend level, which is obtained by OLS estimation of Eq. (3.2). At maximum, 11-year data during the period 2001–2011 are used for the estimation
SOA_{LM}	The firm's speed of adjustment for the target dividend level, which is obtained by OLS estimation of Eq. (3.3). At maximum, 11-year data during the period 2001–2011 are used for the estimation
LOWN	Percentage ownership by the largest shareholder. We use the total percentage ownership when it is available, which includes indirect ownership as well as direct ownership. When the total percentage ownership is unavailable, direct ownership is used
D_PI	Dummy variable that takes a value of one for companies located in a country with the partial imputation system. We treat the partial inclusion system as a partial imputation system. We classified Italy that adopts both classical and partial imputation systems as a classical system country
D_FI	Dummy variable that takes a value of one for companies located in a country with the full imputation system. We classify Greece (no shareholder taxation) as a full imputation country
Revised-ADRI	Revised anti-director right index proposed by Djankov et al. (2008)
LnAsset	Natural logarithm of the firm's average total assets during 2001–2011
LEVER	The firm's average leverage during the period 2001–2011. Leverage is computed by total liabilities over total assets
CASH	The firm's average cash holdings during the period 2001–2011. Cash holdings are computed as cash and marketable securities divided by total assets
AvROA	The firm's average ROA during the period 2001–2011. We compute ROA as EBIT divided by total assets
SALESGROW	The firm's average annual sales growth rate during the period 2001–2011
ROARISK	The firm's standard deviation of ROA during the period 2001–2011
TANGIBLE	The firm's average of net PPE (plants, property, and equipment) divided by total assets during the period 2001–2011

evidence that Hong Kong companies have a higher SOA than US firms. However, applying statistical analyses to investigate the relation between agency conflicts, tax treatments, and dividend smoothing in a single country or across a few countries is difficult as the variations in ownership structure and tax system are limited.

3.2.2 Dividend Smoothing Measures

Lintner (1956) originally presented the following partial adjustment model of dividend payments:

$$D_{it} - D_{it-1} = \alpha + \beta(D_{it}^{*} - D_{it-1}) + u_{it},$$

where D is the actual dividend payment and D^* is the target dividend level computed by the net income times the target payout ratio. β represents the SOA. Since the target payout ratio is unknown to researchers, many previous studies including Lintner (1956) estimate β by using the following equations:

$$\Delta D_{it} = a + bE_{it} + cD_{it-1} + v_{it} \tag{3.1}$$

$$D_{it} = d + eE_{it} + fD_{it-1} + w_{it} \tag{3.2}$$

where E is net income. Under the Eq. (3.1), the SOA is estimated as $-\hat{c}$, while it is $1 - \hat{f}$ under Eq. (3.2). Under the Eq. (3.1), the target payout ratio is calculated as $-\mathrm{b}/\hat{c}$, while it is $-\mathrm{b}/(1-\hat{f})$ under Eq. (3.2). Although models (1) and (2) have been commonly used in previous studies, Leary and Michaely (2011) point out that these models suffer from the small sample bias in AR(1) models. Alternatively, they propose the following model to estimate the SOA:

$$\Delta D_{it} = g + h(\hat{D}^*_{it} - D_{it-1}) + x_{it}, \tag{3.3}$$

where $\hat{D}^*_{it}$ is computed as the median payout ratio of the during the period multiplied by net income. Although estimations of Eq. (3.3) successfully avoid the bias associated with AR(1) models, it depends highly on the assumption that the median payout ratio represents the firm's target payout ratio. However, Lintner (1956) suggests that firms only gradually adjust dividend payments toward the target ratio. This means that the median payout ratio can be far from the true target payout ratio. This fact suggests that Eq. (3.3) is also subject to estimation biases. To present robust evidence, we estimate SOA by using model (2) as well as model (3). The estimated SOAs are denoted by $\mathrm{SOA}_{\mathrm{Lintner}}$ and $\mathrm{SOA}_{\mathrm{LM}}$, respectively.

3.3 Sample Selection and Data

We construct our initial sample from the Osiris database provided by Bureau van Dijk Electronic Publishing. This database includes financial data of listed companies around the world as well as ownership structure data. We limit our attention to nonfinancial companies in countries for which the dividend tax regime is available from the OECD database and Endres et al. (2010). We also delete countries from our analyses for which a revised anti-director right index (ADRI) is unavailable from Djankov et al. (2008). Financial data for those companies during the period 2000–2011 are obtained from the Osiris database. Our initial sample companies are also required to satisfy the following conditions: (a) data on dividends (both during current and previous years) and net income are available for at least 5 years during the period 2001–2011; (b) pay dividends for at least 3 years during the sample period; and (c) report positive net income for at least 3 years during the period.

Besides, we delete companies located in countries in which less than ten companies meet the aforementioned criteria. We estimate $SOA_{Lintner}$ and SOA_{LM} for each of the initial sample companies by OLS estimations of models (2) and (3) (a maximum 11-year data for the period 2001–2011 are used for the estimation). These procedures leave 8,062 companies from 28 countries as our initial sample.

The Osiris database provides us with shareholder information for individual companies including direct and total ownership levels. Direct ownership simply indicates the level of direct shareholdings of each shareholder, whereas total ownership is the sum of the direct and indirect shareholdings. It is well known that controlling shareholders can keep substantial control rights of a firm (e.g., firm X) through indirect shareholdings in which the shareholder holds substantial shares of another company that directly holds shares of firm X. In this research, we identify each shareholder's percentage ownership by the total ownership, while we use the direct ownership when the total ownership is unavailable. Our access was limited to shareholder information for 2009 and subsequent years. The following analyses use year 2009 data for the firm's ownership structure. We delete 883 companies due to lack of ownership variables; 7,179 firms from 28 countries are left in our sample.

We estimate SOA for each of those companies and construct a SOA database that includes one figure per company. Since the distribution of estimated SOA is highly skewed, we treat SOA variables higher (lower) than the 99th percentile (1st percentile) as missing values. This procedure eliminates 231 companies (6,948 firms remain in the sample). To test Hypothesis 1, we define the maximum value of the firm's shareholders' percentage ownership as largest shareholder ownership (LOWN). We predict LOWN to be positively associated with SOA.

We also include several control variables that potentially affect corporate dividend policy. Firm size is represented by the natural logarithm of the firm's average assets during the period 2001–2011 (LnASSET) (Grullon and Michaely 2002; Fenn and Liang 2001; Cuny et al. 2009; Leary and Michaely 2011). Several previous studies suggest that leverage influences corporate dividend policy and we compute it as the firm's average of total liabilities over assets (LEVER) (Fenn and Liang 2001; Cuny et al. 2009). Cash-rich firms are subject to free cash flow problems and therefore need to pay high, stable dividends. Alternatively, cash-rich firms will be able to increase dividends more frequently than cash-poor companies. To test these ideas, we use cash and marketable securities divided by assets (CASH) (DeAngelo et al. 2006; Brockman and Unlu 2009). Firms' profitability and risk, which are measured by the average ROA (AvROA) and the standard deviation of ROA (ROARISK) during the period (we compute ROA as EBIT divided by assets), also affect dividend policy (Jagannathan et al. 2000; Fenn and Liang 2001; Grullon and Michaely 2002; DeAngelo et al. 2006; Denis and Osobov 2008; Chay and Suh 2009). We also adopt beta as a risk measure instead of ROARISK and obtain qualitatively the same results. To control for firms' growth opportunities, we adopt the firm's mean of annual percentage sales growth during the period (SALESGROW) (La Porta et al. 2000; DeAngelo et al. 2006; Cuny et al. 2009). Our main results are materially unchanged when we replace SALESGROW by the

market-to-book ratio. Finally, asset tangibility (net PPE divided by assets; denoted by TANGIBLE) is included to represent the degree of information asymmetry (Leary and Michaely 2011).

We find that some control variables have highly skewed distributions (LEVER; Av_ROA; ROARISK; SALESGROW). We treat the top and bottom one percent values of these variables as missing values. We also delete companies for which those control variables are not obtained. As a result of these procedures, 6,311 companies from 28 countries are selected as our entire sample.

3.4 Empirical Results

3.4.1 Firm-Level Analyses

To test our hypotheses, we implement firm-level regression analyses of SOA. The key independent variables are LOWN, D_PI, and D_FI. Given that La Porta et al. (1998) suggest ownership concentration is associated with legal investor protection, we include the revised anti-director right index (ADRI) proposed by Djankov et al. (2008). This variable is important because La Porta et al. (2000) and others show evidence that legal investor protection affects payout levels (Brockman and Unlu 2009; Alzahrani and Lasfer 2012; Ferris et al. 2009). We also include variables presented in Sect. 3.3 to control for various firm characteristics.

Table 3.2 presents firm-level descriptive statistics. The mean SOA ranges from 0.39 to 0.53, suggesting that the worldwide average firm engages in dividend smoothing, but the adjustment speed is higher than that of US companies reported in previous studies. Untablulated results show that US companies are the slowest to adjust dividends in the world regardless of the SOA measure. Twenty or more countries have SOA that is double or more of SOA in the US. Those figures suggest that the well-documented dividend smoothing is not a universal phenomenon.

Our regression results are presented in Table 3.3. Since SOA is likely correlated among firms within a single country, we compute standard errors by using country-clustering robust standard errors in OLS estimations. To address potential biases from the correlations within a country, we also employ country-fixed effects model estimations (although the model does not generate coefficients on country-level variables like the tax regime dummies). Regardless of the choice of dependent variable and estimation method, Table 3.3 carries a positive and significant coefficient on LOWN, which supports Hypothesis 1. Controlling shareholders require less to smooth dividends for the purpose of mitigating agency costs and sending signals because they are well informed and have various ways to monitor management. The result is consistent with the information asymmetry-based explanation of dividend smoothing.

This table presents descriptive statistics of the variables. See Table 3.1 for definition of the variables.

Table 3.2 Descriptive statistics

Variable	Mean	Standard deviation	Minimum	Median	Maximum	*N*
$SOA_{Lintner}$	0.536	0.422	−0.549	0.490	1.870	6,311
SOA_{LM}	0.393	0.350	−0.270	0.306	1.492	6,311
Target payout ratio (Eq. 3.2)	0.245	0.520	−3.104	0.172	3.524	6,311
Median payout ratio	0.328	0.230		0.291	1.274	6,311
LOWN	0.207	0.223		0.097	1.000	6,311
Total assets (million US dollars)	3,800	16,600	2.614	439.916	676,000	6,311
LEVER	0.142	0.121		0.116	0.569	6,311
CASH	0.136	0.116	0.000	0.105	0.829	6,311
AvROA	0.073	0.058	−0.079	0.063	0.352	6,311
SALESGROW	0.131	0.150	−0.080	0.093	1.346	6,311
ROARISK	0.056	0.050	0.008	0.041	0.470	6,311
TANGIBLE	0.299	0.200	−0.012	0.267	0.993	6,311

OLS estimations in Table 3.3 engender a positive and significant coefficient on D_PI and D_FI. Consistent with Hypothesis 2, D_FI has larger coefficients than D_PI, which suggests that companies located in the classical tax system smooth dividends the most, followed by those in the partial imputation system, and then by those under the full imputation system. The estimated coefficient suggests that firms located in the full (partial) imputation tax system have 20–28% (8–13%) higher SOA than those with the same characteristics located in the classical tax system; the tax effect on dividend smoothing is economically large. Overall, we argue that ownership concentration and tax regimes are strongly associated with dividend smoothing policy. Previous studies have suggested that US firms smooth dividends but that this payout policy is not necessarily universal. Our evidence suggests that this fact is attributable to low ownership concentration and the classical tax system.

This table indicates regression results of SOA measures ($SOA_{Lintner}$; SOA_{LM}). In the OLS estimation, *t*-statistics are computed by using country-clustering robust standard errors. See Table 3.1 for definition of the variables.

With respect to control variables, Table 3.3 suggests that well-performing (high AvROA) companies have high SOA_{LM}. It is likely that profitable companies tend to pay high dividends and therefore need less to provide stable dividends. Large companies tend to smooth dividends, a result that is consistent with Leary and Michaely's (2011) US findings but inconsistent with the idea that firms suffering information asymmetry tend to smooth dividends. A plausible interpretation is that large companies tend to view a certain amount of dividend payments as a strong commitment to shareholders. SALESGROW has a positive and significant coefficient, suggesting that growing companies adjust dividends quickly to the long-term target.

Table 3.3 Regression results

Dependent variable	$SOA_{Lintner}$				SOA_{LM}			
	(1)		(2)		(3)		(13.1)	
	OLS		Country-fixed effects		OLS		Country-fixed effects	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
LOWN	0.215[a]	2.94	0.079[b]	2.23	0.176[a]	3.27	0.081[c]	2.73
D_PI	0.131[b]	2.58			0.083[b]	2.18		
D_FI	0.278[a]	3.58			0.201[a]	3.42		
Revised-ADRI	−0.035	−0.87			−0.028	−0.98		
LnASSET	−0.039[a]	−6.05	−0.025[a]	−8.9	−0.025[a]	−3.78	−0.014[a]	−3.93
LEVER	0.077	0.62	0.060	0.68	0.035	0.33	0.023	0.24
CASH	0.111	1.00	0.150[b]	2.11	0.021	0.22	0.059	0.95
SALESGROW	0.110[b]	2.25	0.030	0.67	0.179[a]	3.95	0.105[a]	3.24
AvROA	0.343	1.36	0.268	1.44	1.253[a]	4.66	1.159[a]	6.07
ROARISK	−0.610[b]	−2.47	−0.271	−1.45	−0.578[a]	−2.90	−0.356[c]	−1.74
TANGIBLE	0.067	1.28	0.049	1.67	0.052	1.21	0.033	1.01
Constant	1.108[a]	4.78	0.920[a]	18.93	0.668[a]	4.01	0.512[a]	6.75
Industry dummy	Yes		Yes		Yes		Yes	
Adj.R2	0.15		0.03		0.182		0.06	
N	6,311		6,311		6,311		6,311	

[a]Significant at the 1% level [b]Significant at the 5% level [c]Significant at the 10% level

1. *Asymmetry of SOA*

Leary and Michaely (2011) show that US firms adjust dividends more quickly when they should increase dividends than when they can decrease. We estimate SOA separately for firm-years in which the previous year's dividends are higher than the target dividend level and those in the opposite situation to further examine the effects of ownership concentration and tax regime on dividend smoothing. Specifically, we estimate the following model for all sample companies (Leary and Michaely 2011):

$$\Delta D_{\mathrm{it}} = g + h_{\mathrm{Inc}}(\hat{D}^{*}_{\mathrm{it}} - D_{\mathrm{it}-1}) \times I_{\mathrm{Inc}} + h_{\mathrm{Dec}}(\hat{D}^{*}_{\mathrm{it}} - D_{\mathrm{it}-1}) \times I_{\mathrm{Dec}} + x_{\mathrm{it}}, \qquad (3.4)$$

where I_{Inc} is a binary variable that takes a value of one when the firm should increase dividends ($\hat{D}^{*}_{it} > D_{it-1}$) and zero otherwise ($\hat{D}^{*}_{\mathrm{it}} < D_{\mathrm{it}-1}$). I_{Dec} is a similar indicator variable that takes a value of one when the firm can decrease dividends ($\hat{D}^{*}_{\mathrm{it}} > D_{\mathrm{it}-1}$). As with the Eq. (3.3) estimation, we employ the firm's median payout ratio to compute $\hat{D}^{*}_{\mathrm{it}}$. Firms whose median payout ratio is zero are excluded from the estimation of Eq. (13.1). We also delete firm-years in which $\hat{D}^{*}_{\mathrm{it}}$ equals $D_{\mathrm{it}-1}$.

Panel A of Table 3.4 presents summary statistics of $\mathrm{SOA}_{\mathrm{Inc}}$ ($\hat{h}_{\mathrm{Inc}}$) and $\mathrm{SOA}_{\mathrm{Dec}}$($\hat{h}_{\mathrm{Dec}}$). As with Leary and Michaely (2011), we find that the SOA is higher when the firm should increase dividends (the mean is 0.42) than for firm-years when it can decrease them (the mean is 0.36).

Panel B of Table 3.4 presents regression results of $\mathrm{SOA}_{\mathrm{Inc}}$ and $\mathrm{SOA}_{\mathrm{Dec}}$. It shows that LOWN has a positive and significant coefficient in the regression of $\mathrm{SOA}_{\mathrm{Dec}}$ (models (3) and (4)), while it has an insignificant coefficient in the regression of $\mathrm{SOA}_{\mathrm{Inc}}$ (models (1) and (2)). Although firms with controlling shareholders do not quickly increase dividends for years in which they perform well, those firms decrease dividends quickly when the target dividends are lower than the previous year's dividends. This result suggests that controlling shareholders care less about dividend cuts, because they have mechanisms in place to monitor management, and managers do not need to pay dividends to mitigate agency problems (there is no strong commitment regarding dividend payments). Another explanation is that controlling shareholders care about the firm's survival and thus allow management to decrease dividends.

With respect to other variables, AvROA has a significantly positive impact on SOA only when the firm can decrease dividends, suggesting that poorly performing companies tend to cut dividends quickly. Growing companies tend to rapidly increase dividends, especially when the target dividends are higher than the previous year. We do not find clear evidence that firm size affects dividend smoothing in an asymmetric manner.

Panel A indicates summary statistics for $\mathrm{SOA}_{\mathrm{Inc}}$ and $\mathrm{SOA}_{\mathrm{Dec}}$. $\mathrm{SOA}_{\mathrm{Inc}}$ ($\mathrm{SOA}_{\mathrm{Dec}}$) is the speed of dividend adjustment when the target dividend level is higher (lower) than previous year dividends. Panel B indicates regression results of $\mathrm{SOA}_{\mathrm{Inc}}$ and $\mathrm{SOA}_{\mathrm{Dec}}$, respectively. t-statistics are computed by using country-clustering robust standard errors. See Table 3.1 for definition of the variables.

Table 3.4 Asymmetric SOA

Panel A: summary statistics

	Mean	Standard deviation	Minimum	Median	Maximum	N
SOA_{Inc}	0.422	0.884	−5.012	0.321	5.288	5,844
SOA_{Dec}	0.358	0.580	−1.990	0.231	2.900	5,844

Panel B: regression of SOA

	SOA_{Inc}				SOA_{Dec}			
	(1)		(2)		(3)		(13.1)	
	OLS		Country-fixed effects		OLS		Country-fixed effects	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
LOWN	0.141	1.58	−0.010	−0.14	0.227[a]	3.82	0.131[a]	3.74
D_PI	0.051	0.83			0.111[b]	2.21		
D_FI	0.263[b]	2.38			0.243[a]	3.60		
Revised-ADRI	−0.064	−1.17			−0.001	−0.03		
LnASSET	−0.028[b]	−2.30	−0.014	−1.55	−0.027[a]	−3.73	−0.015[a]	−3.23
LEVER	−0.077	−0.52	0.003	0.02	0.049	0.41	0.004	0.04
CASH	−0.106	−0.56	−0.171	−1.12	−0.007	−0.05	0.053	0.48
SALESGROW	0.427[a]	3.36	0.307[b]	2.35	−0.003	−0.04	−0.084	−1.48
AvROA	0.011	0.03	0.073	0.25	1.542[a]	4.78	1.422[a]	6.51
ROARISK	0.121	0.39	0.664[b]	2.58	−0.502	−1.49	−0.312	−0.9
TANGIBLE	0.033	0.40	−0.020	−0.24	0.070	1.03	0.042	0.73
Constant	1.086[a]	2.91	0.810[a]	4.86	0.351[c]	1.75	0.294[a]	2.91
Industry dummy	Yes		Yes		Yes		Yes	
Adj.R2	0.04		0.01		0.08		0.17	
N	5,844		5,844		5,844		5,844	

[a]Significant at the 1% level
[b]Significant at the 5% level
[c]Significant at the 10% level

3.5 Conclusion

Previous studies have argued that US firms slowly adjust dividend levels to the long-term target. However, it is still unclear whether dividend smoothing is a universal phenomenon and what factors are associated with this behavior. To address this issue, we investigate the relationship between SOA, corporate ownership structure, and tax regime by using approximately 6,000 companies from 28 countries.

Our data present evidence that the percentage ownership held by the largest shareholder is positively (negatively) associated with SOA (dividend smoothing). Especially, firms with controlling shareholders adjust dividends quickly when the target dividend level is below the previous year's dividend. The results support the agency theory of dividend smoothing as well as the idea that controlling shareholders care about the survival of their companies. We also find that companies located in a classical tax system smooth dividends more than companies in a partial or full imputation system. Overall, we argue that ownership structure and tax regime have a significant impact on dividend smoothing behaviors.

Previous studies have suggested that non-US companies smooth dividends less than US companies (e.g., Andres et al. 2009; Chemmanur et al. 2010), and we confirm this result by using broader international data and presenting a convincing argument for why US firms smooth dividends; it is attributable to less concentrated ownership structures and the classical tax system. Recent papers intensively use international data to examine corporate dividend policy (La Porta et al. 2000; Brockman and Unlu 2009; Ferris et al. 2009; Alzahrani and Lasfer 2012; Fatemi and Bildik 2012; Kuo et al. 2013; Breuer et al. 2014), and we extend this trend to research on dividend smoothing as proposed by Lintner (1956).

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References

Alzahrani, M., and M. Lasfer. 2012. Investor protection, taxation, and dividends. *Journal of Corporate Finance* 18:745–762.

Andres, C., A. Betzer, M. Goergen, and L. Renneboog. 2009. Dividend policy of German firms: A panel data analysis of partial adjustment models. *Journal of Empirical Finance* 16:175–187.

Bhattacharya, S. 1979. "The bird in the hand" fallacy. *Bell Journal of Economics* 10:259–270.

Bohren, O., Josefsen, M.G., and P.E. Steen. 2012. Stakeholder conflicts and dividend policy. *Journal of Banking and Finance* 36:2852–2864.

Brav, A., J.R. Graham, C.R. Harvey, and R. Michaely. 2005. Payout policy in the 21st century. *Journal of Financial Economics* 77:483–527.

Breuer, W., M.O. Rieger, and K.C. Soypak. 2014. The behavioral foundations of corporate dividend policy a cross-country analysis. *Journal of Banking and Finance* 42:247–265.

Brockman, P., and E. Unlu. 2009. Dividend policy, creditor rights, and the agency costs of debt. *Journal of Financial Economics* 92:276–299.

Brown, J.R., N. Liang, and S. Weisbenner. 2007. Executive financial incentives and payout policy: Firms responses to the 2003 dividend tax cut. *Journal of Finance* 62:1935–1965.

Chay, J.B., and J. Suh. 2009. Payout policy and cash-flow uncertainty. *Journal of Financial Economics* 93:88–107.

Chemmanur, T.J., J. He, G. Hu, and H. Liu. 2010. Is dividend universal? New insights from a comparative study of dividend policies in Hong Kong and the US. *Journal of Corporate Finance* 16:413–430.

Chetty, R., and E. Saez. 2005. Dividend taxes and corporate behavior: Evidence from the 2003 dividend tax cut. *Quarterly Journal of Economics* 120:791–833.

Cuny, C.J., G.S. Martin, and J.J. Puthenpurackal. 2009. Stock options and total payout. *Journal of Financial and Quantitative Analysis* 44:391–410.

DeAngelo, H., L. DeAngelo, and R. Stulz. 2006. Dividend policy and the earned/contributed capital mix: A test of the life-cycle theory. *Journal of Financial Economics* 81:227–254.

Denis, D.J., and I. Osobov. 2008. Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics* 89:62–82.

Dewenter, K.L., and V.A. Warther. 1998. Dividends, asymmetric information, and agency conflicts: Evidence from a comparison of the dividend policies of Japanese and U.S. firms. *Journal of Finance* 53:879–904.

Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer. 2008. The law and economics of self-dealing. *Journal of Financial Economics* 88:430–465.

Easterbrook, F.H. 1984. Two agency-cost explanations of dividends. *American Economic Review* 74:650–659.

Endres, D., C. Fuest, and C. Spengel. 2010. *Company taxation in the Asia-Pacific region, India, and Russia*. Berlin/Heidelberg: Springer.

Fama, E.F., and H. Babiak. 1968. Dividend policy: An empirical analysis. *Journal of the American Statistical Association* 63:1132–1161.

Fatemi, A., and R. Bildik. 2012. Yes, dividends are disappearing: Worldwide evidence. *Journal of Banking and Finance* 36:662–677.

Fenn, G.W., and N. Liang. 2001. Corporate payout policy and managerial stock incentives. *Journal of Financial Economics* 60:45–72.

Ferris, S.P., N. Jayaraman, and S. Sabherwal. 2009. Catering effects in corporate dividend policy: The international evidence. *Journal of Banking and Finance* 33:1730–1738.

Grullon, G., and R. Michaely. 2002. Dividends, share repurchases, and the substitution hypothesis. *Journal of Finance* 57:1649–1684.

Gugler, T. 2003. Corporate governance, dividend payout policy, and the interrelation between dividends, R&D, and capital investment. *Journal of Banking and Finance* 27:1297–1321.

Guttman, I., O. Kadan, and E. Kandel. 2010. Dividend stickiness and strategic pooling. *Review of Financial Studies* 23:4455–4495.

Henry, D. 2011. Ownership structure and tax-friendly dividends. *Journal of Banking and Finance* 35:2747–2760.

Jagannathan, M., C.P. Stephens, and M.S. Weisbach. 2000. Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics* 57:355–384.

Jensen, M.C. 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review* 76:323–329.

John, K., and J. Williams. 1985. Dividends, dilution, and taxes: A signaling Equilibrium. *Journal of Finance* 40:1053–1070.

Khan, T. 2006. Company dividends and ownership structure: Evidence from UK panel data. *Economic Journal* 116: C172–C189.

Kumar, P. 1988. Shareholder-manager conflict and the information content of dividends. *Review of Financial Studies* 1:111–136.

Kumar, P., and B. Lee. 2001. Discrete dividend policy with permanent earnings. *Financial Management* 30:55–76.

Kuo, J.-M., D. Philip, and Q. Zhang. 2013. What drives disappearing dividend phenomenon? *Journal of Banking and Finance* 37:3499–3514.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny. 1998. Law and finance. *Journal of Political Economy* 106:1113–1155.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer. 1999. Corporate ownership around the world. *Journal of Finance* 54:471–518.

La Porta, R., F. Lopez-De-Silanes, A. Shleifer, and R.W. Vishny. 2000. Agency problems and dividend policies around the World. *Journal of Finance* 55:1–33.

Lasfer, M.A. 1996. Taxes and dividends: The UK evidence. *Journal of Banking and Finance* 20:455–472.

Leary, M.T., and R. Michaely. 2011. Determinants of dividend smoothing: Empirical evidence. *Review of Financial Studies* 24:3198–3249.

Lee, Y.T., Y.J. Liu, R. Roll, and A. Subrahmanyam. 2006. Taxes and dividend clientele: Evidence from trading and ownership structure. *Journal of Banking and Finance* 30:229–246.

Lintner, J. 1956. Distribution of incomes of corporations among dividends, retained earnings, and taxes. *American Economic Review* 46:97–113.

Low, S.-W., L. Glorfeld, D. Hearth, and J.N. Rimbey. 2001. The link between bank monitoring and corporate dividend policy: The case of dividend omissions. *Journal of Banking and Finance* 25:2069–2087.

Michaely, R., and M.R. Roberts. 2012. Corporate dividend policies: Lessons from private firms. *Review of Financial Studies* 25:712–746.

Miller, M.H., and K. Rock. 1985. Dividend policy under asymmetric information. *Journal of Finance* 40:1031–1051.

Mueller, D.C. 1967. The firm decision process: An econometric investigation. *Quarterly Journal of Economics* 81:58–87.

Pattenden, K., and G. Twite. 2008. Taxes and dividend policy under alternative tax regimes. *Journal of Corporate Finance* 14:1–16.

Shleifer, A., and R.W. Vishny. 1997. A survey of corporate governance. *Journal of Finance* 52:737–783.

von Eije, H., and W.L. Megginson. 2008. Dividends and share repurchases in the European union. *Journal of Financial Economics* 89:347–374.