Modelling Japanese firms' dividend payout policies using new data*

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27th December 2024

EXTENDED ABSTRACT

Abstract

Despite voluminous empirical research and numerous theoretical contributions, the "dividend puzzle" persists. An impediment to understanding why firms pay dividends and how much to pay is the lack of data on firms' widely hypothesised dividend payout targets. Researchers have relied on limited survey data collected at a point in time, over a short period, or by using realised dividend payout ratios. This research builds a novel database of voluntary numerical medium-term forward-looking dividend payout target disclosures made by Japanese firms in their Annual Securities Reports. Text analysis methods are employed to extract a panel of data on firms' targets. This data is unique as medium-term targets are not disclosed systematically elsewhere to my knowledge. I examine the characteristics of the target disclosures in the time series and cross section, the financial characteristics of the firms that voluntarily disclose targets, and use the targets to examine dividend smoothing and the speed of dividend adjustment. ***Further work to be included in the final version of this conference paper includes the relationship between voluntary dividend target disclosure and corporate governance of disclosing and non-disclosing firms.***

Keywords: Corporate governance, Dividend policy, Dividend smoothing, Japanese corporations, Lintner model, Payout targets, Speed of adjustment, Voluntary disclosure.

JEL Codes: G32, G34, G35

*The author is indebted to Jason Bennett for discussions on ideation and development of the dividend payout target database, and thanks Anna Liu for helpful comments and discussions. Watkins gratefully acknowledges the financial support of the Japan Society for the Promotion of Science (JSPS) (KAKENHI Grant No. 22K01576).

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1 Introduction

Theory says payout policy should not affect firm valuation (Modigliani and Miller, 1958; Miller and Modigliani, 1961), but empirical evidence suggests payout policy matters. Managers believe payout policy has an important influence on valuation. Scholars have long assumed that management maintain long-term corporate payout targets which guide dividend policy. However, with the exception of a small number of surveys, there is little hard evidence on the numerical payout targets that company management use and the evolution of these targets over time. Despite this vast literature on dividend payout policy, understanding of firms' dividend targets is limited because researchers have relied on limited point-in-time survey data. Much of the voluminous extant empirical research on corporate payout policy analyses ex-post dividend and repurchase payouts.

While a rich literature analysing firms' payout policy exists, a relatively small number of important studies have surveyed firms on their dividend policy and dividend payout targets. Table 1 summarizes selected important studies of payout policy using survey data for the U.S. and Japan. Two influential studies have investigated the long-term corporate payout targets of U.S. firms. Lintner (1956) seminal contribution, based on a survey of 28 firms, argues that dividends can be modelled as a function of lagged dividends and earnings, and that dividends adjust slowly toward a hypothesized target ratio of earnings. Lintner's paper and his partial adjustment model lay the foundation for the modern understanding of dividend policy, and subsequently a large literature has sought to explain dividend smoothing. Fama and Babiak (1968) evaluate Lintner's model and a number of alternative specifications using individual firm and simulated data. They find that Lintner's model performs relatively well. However, omitting the intercept and including lagged earnings improves the model's predictive power. Fifty years after Lintner, Brav et al. (2005) survey 256 public and 128 private firms about payout policy. They identify several motivations behind management decisions on payout policy in addition to targeting a ratio of earnings, and show that share repurchases have become a favoured component of payout policy. Brav et al. (2005) argue that target payout ratios have declined in importance for dividend policy and are no longer used by US firms to set dividends.

Table 1: Selected studies of dividend targets.

Paper	Market	Firms surveyed	Key conclusion
Lintner (1956)	U.S.	28 public	Management target a long-term payout ratio relative to earnings, toward which dividends adjust gradually.
Brav et al. (2005)	U.S.	256 public/128 private	Management have several motivations for payout policy in addition to a long-term target ratio of earnings. Stock repurchases have become important.
Hanaeda and Serita (2008)	Japan	629 public	Dividends are sticky and increases are related to managements' long-term earnings growth expectations.
Suzuki et al. (2018)	Japan	320 public	Stock repurchases have grown in importance as part of payment policy but are not a substitute for dividends.

Note: Market refers to the country of listing for firms surveyed.

Hanaeda and Serita (2008) study 629 Japanese public firms and find dividends are sticky, increases are related to managements' long-term earnings growth expectations, dividend decisions are independent of investment decisions and share repurchases are used flexibly. They suggest that dividend target ratios are important for Japanese managers' decisions on dividend policy, contrary to the findings of Brav et al. (2005) for the US. Suzuki et al. (2018) compare a 2017 survey of 320 Japanese public firms with that conducted by Hanaeda and Serita and find management have become more willing to use share repurchases in the payout policy mix to improve return on equity, and to attract foreign and institutional investors. However, Japanese management do not consider dividends and repurchases as substitutes. Sasaki and Hanaeda (2010) suggests the Lintner model performs well in describing the dividend decisions of Japanese firms in contrast to the results of Brav et al. (2005) suggesting the model has become less applicable in the US.

A growing number of Japanese listed firms voluntarily disclosure numerical medium-term dividend payout targets in mandatory annual filings. Such disclosures signal managements' transparent pre-commitment to payout policy and alignment with shareholders' interests. To the best of my knowledge, systematic reporting of payout policy is only available for listed Japanese companies. However, this information has not been used to answer questions about corporate payout policy. Furthermore, the voluntary disclosures appear to not be well known among financial market participants, investment bank analysts or academic researchers. The payout target data is not available from financial data vendors.

This research aims to contribute to the literature by answering the following questions. What payout targets to Japanese listed firms voluntarily disclose? How do these targets evolve over time and vary in the cross section of firms? Are existing models of dividend adjustment adequate in light of this new data? What are the implications of this panel of payout targets for the understanding of dividend policy, dividend smoothing and the speed of adjustment (SOA)?

The research builds a novel database of voluntary medium-term payout target disclosures by listed Japanese firms, spanning the period 2006 to 2024 using natural language processing text analysis methods. The time series and cross-sectional characteristics of the target data are described. Estimates of the speed of adjustment using the voluntary target disclosures are compared with those from estimated with the Lintner model, and those of firms that do not disclose numerical targets. While much of the existing research on the SOA is conducted by estimating the firm level SOA parameter, this research takes a different approach estimating panel models, and in particular within-firm effects over the time series and between-firm effects in the cross-section.

The paper proceeds as follows. I describe the data and methodology in Section 2. This includes the development of the DPT database, the characteristics of the targets, the characteristics of disclosing firms, the models to be estimated using the target data and the econometric methodology. Section 3 explains and interprets the results, and Section 4 concludes.

2 Data and Methodology

This section outlines how the novel database of Japanese firms' dividend payout targets is built, including the source of the target information and extraction of numerical targets. I then analyse the properties of the targets and the properties of the firms that voluntarily disclose targets. I briefly explain the models to be estimated. I try to provide a fresh approach to the analysis of dividend smoothing by taking panel estimation approach, using the random effects within-between model to simultaneously estimate within-firm and between-firm effects.

2.1 Building the dividend target database

Japanese listed firms must submit an Annual Securities Report (ASR), known as the Yukashouken Houkokusho or Yuho (有価証券報告書 in Japanese), to the Financial Services Agency (FSA). Section IV Status of the Reporting Company (第４ 提出会社の状況), part 3 Dividend Policy (３ 配当政策), is mandatory but the content to be disclosed is left largely to the discretion of the reporting firm.[1] A growing number of firms voluntarily report a numerical medium-term dividend policy target. The majority of firms express their medium-term target in the form of dividends per share divided by earnings per share, or total dividends divided by net income, to which I refer to as the dividend payout target (DPT).[2]

Figure 1 shows the dividend policy section of the ASR submitted by Nippon Steel Corporation for the firm's 2023 fiscal year (FY2023), in which the firm disclosed a medium-term dividend target. Panel (a) shows the original Japanese and Panel (b) provides the section from the firm's official English translation of its ASR. In English, the relevant sentence is 'The Company has adopted a consolidated annual payout ratio target of around 30% as the benchmark for the "payment of dividends from distributable funds in consideration of the consolidated operating results"' (Nippon Steel Corporation, 2024).

Publicly listed firms' ASRs downloadable via the Electronic Disclosure for Investors NETwork (EDINET) system, operated by the FSA. Reports are available for the previous ten years. The system was introduced in 2008. Natural language processing techniques are used to identify and extract the relevant data from the ASR filings on EDINET. The procedure used to build the database of dividend targets consists of the following steps. The EDINET application programming interface (API) is queried for the relevant ASR documents submitted by firms to the FSA over a given data range. The ASR documents are then downloaded through the API in comma separated value (CSV) format. The ASR files are expanded and the dividend policy section is extracted as text along with the firm's identifying information, the reporting period or fiscal year, and submission date. The dividend policy text blocks are then machine read using text analysis methods to determine whether the firm disclosed a medium-term DPT, and if so,

[1] The FSA provides guidelines on the information that should be included.

[2] A small number of firms express their targets as the dividend to equity ratio (DOE), calculated as total dividends divided by shareholder's equity, or the total payout ratio (TPR) defined as total dividends plus repurchases divided by net income. I do not include these targets in the dataset.

３ 【配当政策】

当社は、業績に応じた利益の配分を基本として、企業価値向上に向けた投資等に必要な資金所要、先行きの業績見通し、連結及び単独の財務体質等を勘案しつつ、第２四半期末及び期末の剰余金の配当を実施する方針としています。

「業績に応じた利益の配分」の指標としては、連結配当性向年間30%程度を目安とします。

なお、第２四半期末の剰余金の配当は、中間期業績及び年度業績見通し等を踏まえて判断することとしています。

期末の剰余金の配当については、従前どおり定時株主総会の決議によることとし、これ以外の剰余金の配当・処分等（第２四半期末の剰余金の配当を含む。）については、機動性を確保する観点等から、定款第33条の規定に基づき取締役会の決議によることとします。

当第２四半期末の配当については、１株につき75円を実施しました。当期末の配当については、2024年６月21日開催の第100回定時株主総会において、１株につき85円（年間配当金としては、１株につき160円。）とすることを決議しました。

決議年月日	配当金の総額（百万円）	１株当たり配当額（円）
2023年11月１日 取締役会決議	69,143	75
2024年６月21日 第100回定時株主総会決議	78,381	85

(a) Nippon Steel Corporation dividend policy disclosure (日本製鉄株式会社, 2024)

3. Dividend Policy

The Company's basic profit distribution policy is to pay dividends from distributable funds at the end of the first half (interim) and second half (year-end) of the fiscal year, in consideration of the consolidated operating results and such factors as capital requirements for investment and other activities aimed at raising corporate value and performance prospects while also considering the financial structure of the Company on both consolidated and non-consolidated basis.

The Company has adopted a consolidated annual payout ratio target of around 30% as the benchmark for the "payment of dividends from distributable funds in consideration of the consolidated operating results."

The level of the first-half dividend is determined based on consideration of interim performance figures and forecasts for the full fiscal year performance.

As in the past, the year-end dividend payment will be made according to the resolution of the General Meeting of Shareholders, and any other form of distribution and appropriation of surplus (including the interim dividend) will be made according to the resolution of the Meeting of the Board of Directors as provided in Article 33 of the Articles of Incorporation and with the aim of securing flexibility in financial operations.

, The Company paid a dividend of 75 yen per share at the end of the first half. Regarding the year-end dividend, the Company resolved at the 100th General Meeting of Shareholders held on June 21, 2024 to pay a year-end dividend of 85 yen per share (the annual dividend is 160 yen per share).

Date of resolution	Total amount of dividends (Millions of Yen)	Dividends per share (Yen)
The Meeting of the Board of Directors held on November 1, 2023	69,143	75
The 100th General Meeting of Shareholders held on June 21, 2024	78,381	85

(b) Nippon Steel Corporation dividend policy disclosure in English (Nippon Steel Corporation, 2024)

Figure 1: The dividend policy disclosure in Nippon Steel Corporation's annual securities report for the fiscal year 2023.

the numerical target is extracted.[3] The DPT data were verified by comparing the results of different text analysis methods and manual checks. Dividend targets for the period between 2006 and 2008, before EDINET was introduced, were collected by the analysis of text from ASRs in PDF file format.

Table 2: Dividend target disclosure and dividend payment.

	Prime	**Standard**	**Growth**
Observations			
DPT Disclosed	8020	1323	374
Dividend Payer	30809	10157	1683
Total Observations	35435	12500	5085
Firms			
DPT Disclosed	1208	439	118
Dividend Payer	2471	1912	431
Total Firms	2731	2163	990

Note: In the top panel labelled Observations, the table indicates the number of firm-year observations in which a DPT is disclosed, a cash dividend was paid by the firm and the total number of firm-year observations, by listing section of the Tokyo Stock Exchange. In the bottom panel labelled Firms, the table indicates the number of firms disclosing a DPT at least once, the number of firms paying a cash dividend at least once, and the total number of firms in the dataset, by listing section of the Tokyo Stock Exchange.

The DPT observations are dated as of the end of the fiscal year reporting period for each firm. While most firms report for the standard Japanese fiscal year, April to March, an increasing number of firms have adopted alternative periods for various reasons, such as aligning with the fiscal reporting periods of important foreign subsidiaries. The DPT sample covers the calendar period from January 2006 to June 2024.[4]

The dividend target data was augmented with firm-level annual financial data for all listed firms obtained from the Nikkei NEEDS database through the Nikkei Financial Quest software. The firm-level financial data is winsorized at the 1st and 99th percentiles to ameliorate the effects of outliers and extreme observations on the analysis.

I consider only firms listed on the Tokyo Stock Exchange (TSE), which means firms listed only on the relatively small regional exchanges in Fukuoka, Nagoya and Sapporo are excluded. Listed

[3]Several methods in the programming languages Python and R were used to analyse the dividend policy text and extract the numerical targets. These include employing regular expression pattern matching (regex), the Jigg framework (Noji and Miyao, 2016), and various keyword identification methods. The text analysis was done both in Japanese from the original disclosures and after conversion to English using the polyglotr package in R. The results were broadly the same. Keywords identified include "配当性向", "dividend payout ratio". Guiding keywords in English (and their Japanese equivalents) included "target", "goal", "objective", "guideline", "medium term", and those to avoid included "total payout ratio", "was". More sophisticated methods are possible and will be investigated to improve the quality and completeness of the DPT data extraction. Further work may include enlarging the data harvested to include other characteristics of payout disclosure, such as repetitiveness, transparency, sentiment, and repurchase intentions.

[4]Note that a reporting period ending January 2006 would be labelled as a fiscal year 2005 (FY2005) report while June 2024 is labelled as FY2024.

investment funds and other firms in the TSE industry category "Unclassifiable" (code 9999) are excluded from the sample.

Table 2 shows the the number of firm-year observations for which a DPT is disclosed, for which firms pay dividends and the total firm-year observations, by section on the TSE. I also show the number of firms disclosing a target in at least one year, the number of firms paying a cash dividend at least once, and the total number of firms that have been listed during the sample period, by TSE section. Most disclosures and dividend payments are by Prime section firms and accordingly, the analysis that follows focusses on the data for the Prime listed firms.[5]

This leaves an unbalanced panel of Prime section firms, including firms for which a DPT has been extracted and those for which no target was detected, consisting of 35,435 firm-year observations for 2,731 firms over the period January 2006 to June 2024. Of this sample, there are 8,020 firm-year observations in which a DPT was disclosed, and 1208 firms disclosed a DPT at least once. Cash dividends were paid in 30,809 firm-year observations and 2,471 firms paid a dividend at least once.

2.2 *Characteristics of firms' dividend payout targets*

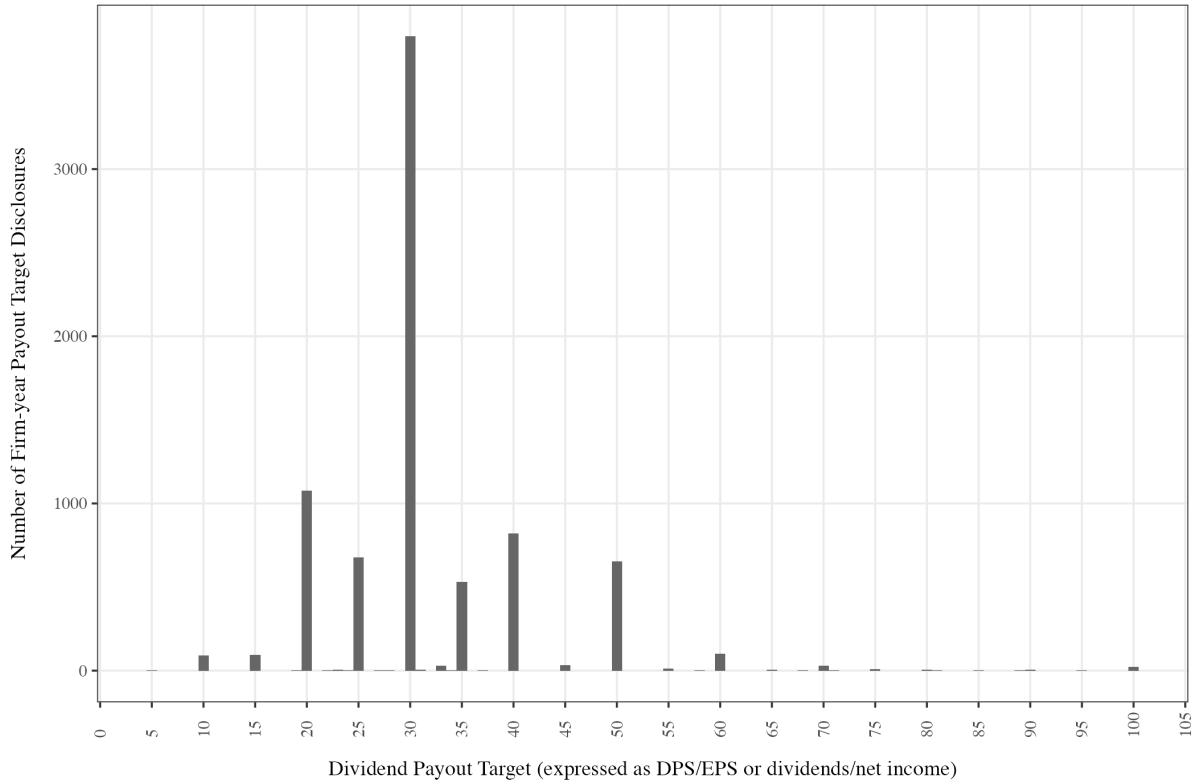

Figure 2: Histogram of dividend payout targets disclosed in Annual Securities Reports.

[5]Prime firms have a large market capitalisation, are liquidly trades, investable to many institutional investors, have a high quality of corporate governance, and a commitment to sustainable growth through constructive dialogue with investors. Standard section firms have a level of market capitalisation and liquidity appropriate for a public company, basic corporate governance standards as a listed company, and a commitment to sustainable growth. Growth section firms are small young firms that have a reasonable business plan to realise high growth potential in the future and have a relatively higher level of risk. Prior to April 2022, the TSE sections were known and First, Second and MOTHERS. See Tokyo Stock Exchange, Inc. (2020).

Figure 2 provides a histogram of the DPT extracted for Prime section firms by firm-year observation. The targets are expressed as dividends per share divided by earnings per share, or equivalently, total dividends paid divided by net income. By far the most frequently disclosed medium term payout target is 30% of earnings. The disclosed targets are almost always specified for round numbers, with 20%, 25%, 30%, 35%, 40% and 50% of earnings being popular. A small number of firms disclose targets outside of the six most popular levels, with targets ranging from 5% to 100%.[6]

Table 3: Descriptive statistics for DPT by year of disclosure.

Year	Mean	Med	Min	Max	SD	Firms Up	Mean Up	No Change	Firms Down	Mean Down	No Prev.	Firms
2006	29.56	30	10	100	10.68						205	205
2007	28.98	30	10	100	10.73	5	9	172	5	-8	124	304
2008	28.83	30	10	90	8.96	23	9	244	6	-21	68	341
2009	28.78	30	10	90	8.49	10	10	279	7	-9	30	325
2010	29.30	30	10	90	8.93	13	10	288	1	-10	20	322
2011	29.48	30	10	60	8.14	10	10	293	4	-21	18	325
2012	29.16	30	10	65	7.98	8	7	299	1	-20	30	337
2013	29.21	30	10	90	8.83	15	12	307	3	-8	50	375
2014	29.92	30	10	90	9.09	28	10	343	7	-8	60	430
2015	31.22	30	5	80	9.72	48	11	313	4	-8	67	429
2016	31.93	30	10	100	10.30	50	11	372	7	-15	75	504
2017	32.35	30	10	100	10.45	38	10	446	3	-7	67	551
2018	32.57	30	10	100	10.21	40	11	478	7	-9	73	596
2019	33.08	30	10	100	10.88	50	8	524	9	-9	62	644
2020	32.65	30	10	95	10.38	32	11	390	20	-12	45	487
2021	33.19	30	10	75	9.68	36	10	381	12	-22	31	460
2022	34.30	30	10	100	10.37	39	13	359	6	-18	54	457
2023	36.10	30	10	100	11.90	57	14	361	2	-29	48	468
2024	37.06	35	10	100	11.81	62	11	290	3	-18	81	436

Note: The table shows descriptive statistics for the voluntarily disclosed medium-term firm-level dividend payout targets (DPT) by year. Year represents the date of the end of the fiscal reporting period for which the DPT is disclosed. Mean, Median, Min, Max and SD represent the mean, median, minimum, maximum, and standard deviation of the dividend payout targets. Firms Up provides the number of firms that increased their DPT relative to the previous year. Mean Up provides the average increase in the DPT for firms that increased their target in a given year. No Change provides the number of firms that did not change their target relative to the previous year. Firms Down provides the number of firms that decreases their DPT relative to the previous year. Mean Down provides the average decrease in the DPT for firms that decreased their target in a given year. No Prev. provides the number of firms that did not disclose a target in the previous year. Firms indicates the number of firms that disclosed a DPT in a given year. The data includes fiscal reporting period ends to June 2024, thus the data in the last line of the table for 2024 covers only half of the year.

Descriptive statistics for DPT disclosures by year, from 2006 to 2024, are shown in Table 3. Some caution must be exercised when interpreting the statistics for 2024 as the sample ends in June. While the median target has remained steady at 30% over the entire sample, the mean target has increased from around 30% to 37%. The minimum is generally 10%, but the maximum varies from 65% to 100%. Some firms do no consistently state a target every year, and these omissions likely explain the variation in the maximum. The standard deviation is around 10 percentage points.

As previous target data examined in the literature was collected in one-time surveys. The voluntarily disclosed target data collected in this study over a 19-year period shows how DPTs

[6]It is possible that some of the targets shown outside the 10% to 60% range may be anomalous and further work on the textual analysis will verify and improve the data collection.

evolve over time. Firms Up indicates the number of firms that increased their stated target relative to the previous year. Mean Up provides the median target increase. Similarly, Firms Down shows the number of firms that decreased their target relative to the previous year, and Mean Down gives the mean target decrease. No change shows the number of firms that maintained the same target as in the previous year. No Prev. indicates firms that did not disclose a target in the previous year, which may be because the firm initiated disclosures in the year in question, or the firm skipped a year in disclosure. Some previously disclosing firms omit disclosure when their net income turns negative.

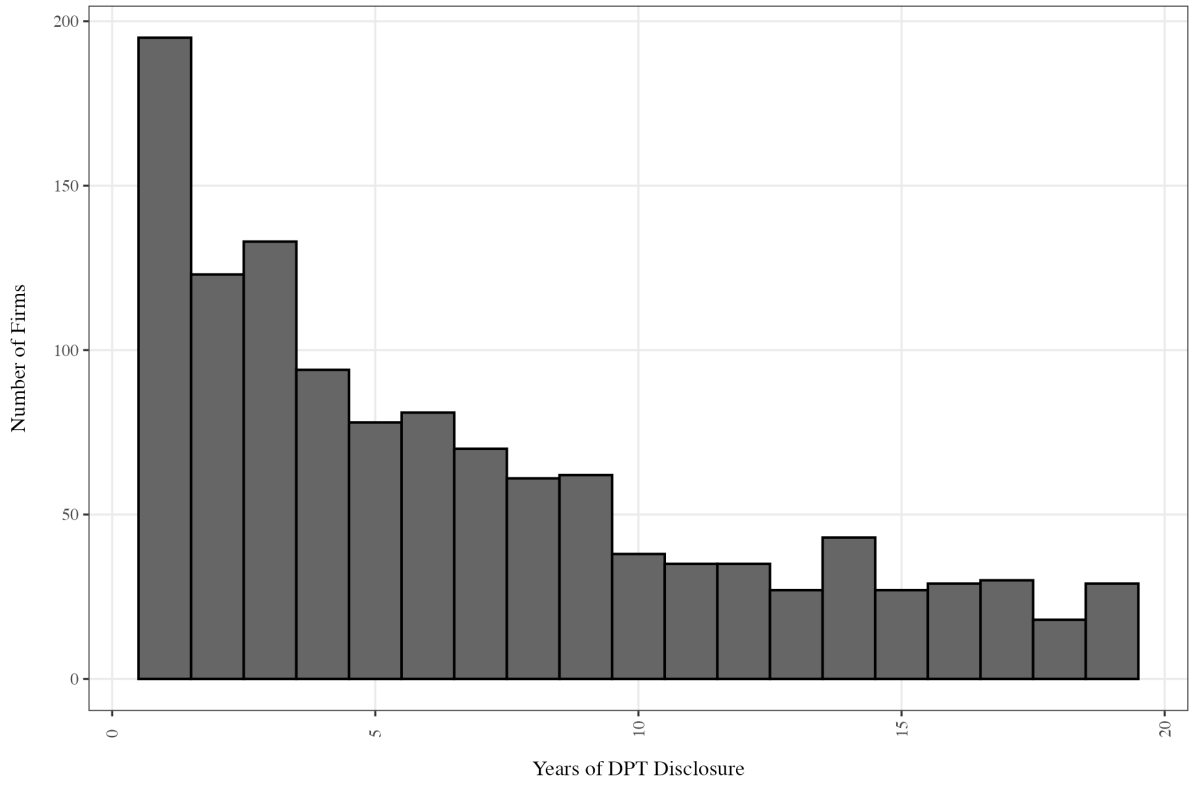

Figure 3: Number of disclosing firms by cumulative years of voluntary disclosure.

The great majority of firms do not change their DPT from year to year. More firms increase than decrease their targets. Generally only a handful o firms decrease their target in a given year, with the exception being in 2020 and 2021 at height of the COVID19 pandemic. The average increase in target is around 10 percentage points. However, DPT decreases are more volatile from year to year, and larger during macroeconomic downturns associated with the Lehman shock, the euro area sovereign debt crisis, the 2016 slowdown of the Chinese economy, and the period during and following COVID19.

The number of disclosing firms broadly increased year by year from 2006 to 2014. Coinciding with the release of Japan's Corporate Governance Code in 2015, the numer of firms voluntarily disclosing a DPT increased more substantially. The general principles of the code include (1) Securing the Rights and Equal Treatment of Shareholders and (3) Ensuring Appropriate Information Disclosure and Transparency (The Council of Experts Concerning the Corporate Governance Code, 2015). Voluntary disclosure of a quantified DPT on an annual basis in the

ASR would appear to be in line with the general principles of the code.[7] However, the number of firms disclosing a DPT in 2020 and has remains approximately unchanged since then, likely due to firms concerns over the sustainability and predictability of their future net income.

Figure 3 provides the number of disclosing firms by cumulative years of voluntary disclosure. Almost 200 Prime section firms have disclosed only once int he last 19 years. Around 100 firms have disclosed four times. Just over 50 firms have disclosed for 9 years. Only around 25 firms have disclosed for the 19 years covered in the sample.

A breakdown of targets by industry is shown in Table 4. The table is ordered by the number of firm-year DPT observations per industry. All 33 industries within the TSE classification system are represented. The number of firms in each industry that have disclosed targets and the number of firm-year observations attributable to each industry vary substantially, from 137 to 1 firms, and 919 to 1 firm-year observations, respectively.The industries most active in disclosure are wholesale Trade, Information & Communications, Services, Electrical Appliances, Machinery, Retail Trade and Chemicals. The least active include Rubber Products, Insurance, Mining, Pulp & Paper, Air Transportation, Oil & Coal Products, and Fishery, Agriculture and Forestry.

The median target in most industries is 30%. Those industries with a higher median DPTs include Securities & Commodity Futures and Insurance, both at 40%. Industries with lower median targets include Non-Ferrous Metals and Marine Transportation. The industries with greater disclosure also show the most movement in targets, with the number of changes heavily skewed to DPT upgrades.

[7] Another strand of this research aims to examine whether voluntary target disclosure signals a higher standard of corporate governance.

Table 4: Descriptive statistics for DPT by industry.

Industry	Mean	Med	Min	Max	SD	Up	Mean Up	Down	Mean Down	Firms	Obs.
Wholesale Trade	31.15	30	10	100	10.65	76	11	11	-13	116	919
Information & Communication	31.81	30	5	100	10.41	54	10	4	-20	131	835
Services	34.33	30	10	100	13.67	66	13	16	-14	137	755
Electric Appliances	31.33	30	10	100	9.39	42	11	10	-12	86	710
Machinery	31.09	30	15	95	7.64	37	9	9	-18	78	628
Retail Trade	30.80	30	10	70	8.62	40	10	4	-15	86	607
Chemicals	32.23	30	15	100	9.04	33	9	7	-11	87	548
Construction	34.28	30	10	100	11.26	30	13	6	-16	58	350
Foods	32.36	30	20	75	8.75	31	11	6	-8	48	347
Real Estate	27.59	30	15	50	7.19	15	8	1	-5	52	255
Other Products	29.93	30	20	50	9.32	10	11	2	-10	31	214
Banks	32.24	30	10	81	9.93	16	14	5	-20	40	205
Securities & Commodity Fut.	40.16	40	20	60	10.83	14	18	3	-15	17	185
Glass & Ceramics Products	30.69	30	20	55	8.17	15	9	3	-8	20	153
Pharmaceutical	34.63	30	10	50	7.98	6	11	3	-12	20	147
Iron & Steel	29.41	30	15	50	7.60	18	7	6	-8	23	142
Textile & Apparels	32.29	30	20	70	10.29	5	18	0		21	140
Transport Equipment	26.70	30	10	100	10.49	5	12	2	-5	23	125
Precision Instruments	30.87	30	10	60	12.53	8	8	1	-5	21	120
Metal Products	34.06	30	15	100	13.93	10	15	0		19	117
Land Transportation	30.00	30	15	40	3.41	4	10	0		18	100
Other Financing Business	31.90	30	10	60	13.30	10	9	0		21	88
Non-ferrous Metals	27.82	25	20	50	8.44	6	8	2	-18	11	71
Marine Transportation	23.85	20	20	50	6.11	5	5	2	-12	7	65
Electric Power & Gas	32.86	30	10	60	9.86	0		1	-10	11	56
Warehousing & Harbour Trans.	36.15	30	25	60	9.35	0		1	-5	12	48
Rubber Products	30.54	30	20	40	4.38	3	10	1	-10	7	28
Insurance	37.92	40	20	50	9.66	3	12	0		6	24
Mining	30.71	30	30	40	2.67	0		0		4	14
Pulp & Paper	22.73	20	20	30	4.67	0		0		2	11
Air Transportation	31.11	35	20	35	6.51	2	8	0		1	9
Oil & Coal Products	83.33	100	50	100	28.87	0		1	-50	1	3
Fishery, Agriculture & Forestry	30.00	30	30	30		0		0		1	1

Note: The table shows descriptive statistics for the voluntarily disclosed firm-level dividend payout targets (DPT), by industry, based on the TSE 33 industry classifications. Unclassifiable firms (code 9999) have been excluded from the analysis. Mean, Median, Min, Max and SD represent the mean, median, minimum, maximum, and standard deviation of the dividend payout targets. Up provides the number of firm-year observations in each industry for which a firm disclosed an upward revision of their DPT. Mean Up provides the average increase in the DPT for upward revision disclosures. Down provides the number of firm-year observations in each industry for which a firm disclosed a downward revision of their DPT. Mean Down provides the average of these decreases in disclosed target by industry. Firms indicates the number of firms within the industry that disclosed a DPT. Obs. indicates the number of firm-year observations in which firms in the industry disclosed a medium-term DPT.

2.3 *Firm financial characteristics by dividend payout target*

Table 5: Median firm-level characteristics by medium-term dividend payout target.

	Target					
	20%	**25%**	**30%**	**35%**	**40%**	**50%**
SIZE	11.430	11.497	11.611	11.670	11.537	11.249
MTB	1.198	1.042	1.090	1.295	1.267	1.423
ROA	0.064	0.059	0.063	0.071	0.071	0.077
ROE	0.088	0.075	0.076	0.076	0.077	0.080
AG	0.048	0.035	0.040	0.049	0.042	0.039
LEV	0.160	0.117	0.107	0.067	0.048	0.026
NIVTA	0.021	0.016	0.017	0.017	0.016	0.018
CFVTA	0.032	0.025	0.027	0.025	0.026	0.032
PE	15.481	15.326	16.715	17.918	19.313	20.583
PS	0.624	0.522	0.694	0.913	0.976	1.292
AGE	52.375	62.792	61.500	56.500	62.583	58.708
DPR	0.221	0.251	0.306	0.360	0.410	0.495

Note: The table shows median firm characteristics by dividend payout target for those targets for which the data set contains more than 200 firm year observations. The table shows the median of firm-level characteristics for firms disclosing each payout target. SIZE is the natural logarithm of total assets. MTB is the market to book ratio. ROA is return on assets and ROE is return on equity. AG represents asset growth (growth in total assets). LEV represents the short-term plus long-term debt to total assets ratio. NIVTA is net income volatility scaled by total assets, while CFVTA is the volatility of operational cash flow divided by total assets. PE is the price earnings ratio and PS is the price to sales ratio. AGE represents firm age from date of founding. DPR is the realised dividend payout ratio.

Given the distribution of DPTs as shown in Figure 2, I consider median firm characteristics by the most commonly disclosed target levels. Table 5 shows shows median firm-level financial characteristics by dividend payout target for those targets for which the data set contains more than 200 firm-year observations.

The median values for SIZE (natural log of total assets) appears to show an inverted "U" pattern over the targets, with the highest value for the 30% DPT. The market to book ratio (MTB) is consistently high for firms with targets of 35, 40 and 50%, while the median leverage ratios (short-term plus long-term debt scaled by total assets) are relatively low. The price to earnings (PE) and price to sales (PS) valuation ratios broadly increase with DPT. The characteristics, return on assets (ROA), return on equity (ROE), net income volatility divided by total assets (NIVTA), cash flow volatility to total assets (CFVTA), and firm age do not show clear unconditional relationships with the disclosed target levels. Interestingly, the median realised dividend payout ratio, DPR, is close to target for all six target levels. However, note that the firms' DPRs are widely dispersed for each target.

2.4 *Models*

I estimate panel models of dividend smoothing based on both the seminal model of Lintner (1956) given in Equation (1) and the specification proposed in Leary and Michaely (2011), shown in equation 2. Lintner's model of partial adjustment related the change in dividend at time t, $DCDPS_{i.t}$, to last period's dividend, $CDPS_{i,t-1}$, and current earnings, $EPS_{i,t}$, expressed on a per share basis. The speed of adjustment parameter is $-1 \times \beta_{1,i}$ and the dividend payout target is $-1 \times \beta_{2,i}/\beta_{1,i}$.

$$DCDPS_{i.t} = \alpha + \beta_{1,i} CDPS_{i,t-1} + \beta_{2,i} EPS_{i,t} + \epsilon_{i,t} \tag{1}$$

The specification of Leary and Michaely allows a dividend payout target to be incorporated directly. Leary and Michaely assume a target of the full sample mean dividend payout ratio, which involves a look-ahead bias.

$$DCDPS_{i.t} = \alpha + \beta DEV_{i,t} + \epsilon_{i,t} \tag{2}$$

$DEV_{i,t}$ is the deviation of last year's dividend from this year's dividend target, as shown in equation 3.

$$DEV_{i.t} = DPT_{i,t} \times EPS_{i,t} - CDPS_{i,t-1} \tag{3}$$

2.5 Econometric methodology

The models are estimated using pooled ordinary least squares (POLS) and the multilevel modelling method, the random effects within-between model (REWB). Interaction terms are included in the REWB specifications to examine the effects of other factors on the speed of adjustment. REWB is employed to distinguish the within-firm (time series) and between-firm (cross section) relationships between the change in firms' dividends and deviation from firms' medium-term dividend targets.

Estimated on a firm-year panel, the REWB model allows for different effects within firms over time and between firms in the cross section, and provides separate estimates for these effects (Bell and Jones, 2015; Bell et al., 2019; Fairbrother, 2013; Schmidt-Catran and Fairbrother, 2016; Mundlak, 1978). REWB is a more general specification, encompassing the frequently used FE and random effects (RE) models. FE models estimate only within effects, while POLS and RE models combine the within and between effects (Jordan and Philips, 2022). Although used frequently in corporate finance panel applications, pooled OLS ignores the panel structure of the data. RE models assume the within and between effects are equal and estimate a weighted average of the effects making interpretation difficult where the within and between effects are expected to be different. Jordan and Philips (2022, p.212) note the advantages of REWB: "REWB helps avoid the RE versus FE false dichotomy often discussed by scholars. Practitioners should consider estimating an REWB model to determine whether there are separate within and between effects to uncover." Between effects for meaningful entities, such as firms, should not be ignored and are often enlightening (Bell and Jones, 2015).

The REWB model takes the form shown in equation 4, where $y_{i.t}$ and $x_{i,t}$ are variables in a panel data set, with i representing firm and t representing time. The β_W estimate provides the within effect, identical to the FE estimate, and the β_B estimate gives the between effect (Bell et al., 2019). The μ_i represent the firm random effects, assumed to be normally distributed, and the $\epsilon_{i,t}$ are the residuals which are assumed to be homoscedastic and normally distributed. The model includes the mean of the explanatory variable for each firm, $\bar{x}_i$, and the demeaned value of

the explanatory variable, $x_{i,t} - \bar{x}_i$. Time-invariant variables may be included, for example z_i, associated with the between coefficient, δ_B.

$$y_{i,t} = \alpha + \beta_W \left(x_{i,t} - \bar{x}_i\right) + \beta_B \bar{x}_i + \delta_B z_i + \mu_i + \epsilon_{i,t} \tag{4}$$

Although the REWB model has infrequently been applied to panel estimation in corporate finance applications, it would appear to have substantial advantages where both within and between firm effects are important and these effects differ substantially in magnitude. As both within firm and between firm effects are relevant to the hypotheses I examine and are expected to differ in magnitude, I estimate the general specification given in Equation (2) using REWB. For each coefficient, the REWB model produces within and between estimates.

3 Dividend Smoothing and the Speed Of Adjustment

Table 6: Pooled OLS estimates.

	Dependent Variable: DCDPS				
Model:	(1)	(2)	(3)	(4)	(5)
DEV	0.767***				
	(0.053)				
LAGCDPS		−0.722***	−0.574***	−0.613***	−0.598***
		(0.052)	(0.064)	(0.060)	(0.065)
EPS		0.197***	0.125***	0.142***	0.134***
		(0.016)	(0.014)	(0.015)	(0.015)
Intercept	14.10***	15.90***	8.73***	10.5 ***	10.40***
	(3.93)	(3.34)	(1.82)	(1.58)	(1.69)
Firms	1131	1131	2314	2458	2562
Obs.	7317	7317	22954	30271	32926
R^2	0.81784	0.76021	0.63097	0.66377	0.64544
Adj. R^2	0.81781	0.76014	0.63094	0.66375	0.64542

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. The standard errors shown in parentheses are clustered on firm and year. The dependent variable, $DCDPS_{i,t}$, is the annual difference in the cash dividend per share for firm i in year t. DEV is the deviation between the target payout and the previous year's cash dividend per share, $DPT_{i,t} \times EPS_{i,t} - CDPS_{i,t-1}$. $LAGCDPS$ is the lagged cash dividend per share, $CDPS_{i,t-1}$. EPS is the current year earnings per share. Firms represents the number of unique firms in the sample. Obs. represents the number of firm-year observations included in the sample. Firm-year observations are excluded if data for any variables are missing. The sample covers the period 2006 to 2024.

To investigate the dividend smoothing of firms disclosing DPTs, I first estimate POLS models for Equations (1) and (2) with different data sets including firms disclosing and non disclosing targets. I then estimate REWB models for Equation (2) for firms that disclose targets and examine three interactions that influence the speed of adjustment.

Table 6 provides the results of the POLS estimations. Model (1) is specified according to Equation (2) of Leary and Michaely, and Models (2) to (5) are based on Lintner's model in Equation 1. Models (1) and (2) are estimated on firm-year observations where the firm discloses a DPT and pays a dividend ($CDPS_{i,t} > 0$), consisting of 7,313 observations for 1,131 firms. The speed of adjustment estimates in Models (1) and (2) are of similar magnitude at 0.767 and 0.722, respectively.

Table 7: Random effects within-between estimates.

Model:	Dependent variable: DCDPS							
	(6)		(7)		(8)		(9)	
	Within	Between	Within	Between	Within	Between	Within	Between
DEV	0.683^{***}	0.794^{***}	0.575^{***}	0.478^{***}	0.713^{***}	0.811^{***}	0.783^{***}	0.750^{***}
	(0.012)	(0.004)	(0.024)	(0.013)	(0.012)	(0.004)	(0.015)	(0.007)
DEV:DEVSIGN			0.143^{***}	0.382^{***}				
			(0.026)	(0.014)				
DEV:EPSSIGN					-0.720^{***}	-0.420^{***}		
					(0.052)	(0.036)		
DEV:PRTD							-0.206^{***}	0.077^{***}
							(0.020)	(0.010)
Intercept		11.588		11.726		11.284		9.479
		(8.636)		(9.071)		(8.358)		(7.911)
Industry		Y		Y		Y		Y
Firms		962		962		962		939
Obs.		7321		7321		7321		6793
AIC		97849		97148		97296		91001
BIC		98083		97396		97545		91247
Marg. R^2		0.824		0.838		0.837		0.829
Cond. R^2		0.837		0.856		0.850		0.835

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. Standard errors are included in parentheses. Prob-values are calculated using Satterthwaite degrees of freedom. The estimates in the within columns represent within-firm (or time series) estimates. The estimates in the between columns are the between firm(or cross sectional) estimates. The dependent variable, $DCDPS_{i,t}$, is the annual difference in the cash dividend per share for firm i in year t. The explanatory variables are as follows. DEV is the deviation between the target payout and the previous year's cash dividend per share, $DPT_{i,t} \times EPS_{i,t} - CDPS_{i,t-1}$. $DEV : DEVSIGN$ is the interaction term between DEV and a dummy variable indicating the sign of DEV. The reference category is defined for $DEV > 0$, that is, the target dividend is above the lagged dividend. $DEV : EPSSIGN$ is the interaction term between DEV and a dummy variable indicating the sign of earnings per share. The reference category is set for positive earning per share. $DEV : PRTD$ is the interaction term between DEV and a dummy variable indicating the whether the lagged realised dividend payout ratio is greater than the dividend payout target. The reference category is defined for the dividend payout ratio less than the dividend payout target. Industry indicates whether industry fixed effects are included. Firms represents the number of unique firms in the sample. Obs. represents the number of firm-year observations included in the sample. Firm-year observations are excluded if data for any variables is missing. Firms with less than two years of data are excluded. The sample covers the period 2006 to 2024. AIC and BIC are the Akaike and Schwarz Bayesian information criteria, respectively. The marginal R^2 reflects the fixed effects part of the model. The conditional R^2 represents both the random and fixed effects components of the model.

Model (3) is estimated for all firms that pay dividends but do not disclose a DPT, determined on a firm-year observation basis, providing 22,954 observations for 2,314 firms. Non-disclosing firms smooth their dividends to a substantially greater extent, with the estimated speed of adjustment being 0.574. The data on which Model (4) is estimated includes all firm-year observations in which dividends are paid, irrespective of whether the firm discloses a DPT or not (30,271 observations for 2,458 firms). Model (5) is estimated for all firm-year observations (32,926 observations for 2,562 firms). The speeds of adjustment indicated by Models (4) and (5) are similar to that estimated in Model (3).

Table 7 shows the REWB estimates as Models (6) to (9).[8] Model (6) is specified according to Equation (2) and provides a baseline for interpreting Models (7) to (9) that contain interaction terms. The within estimate is equivalent to a fixed effects model estimate. The between estimate is interpreted as indicating the relationship between change in dividend and the average of firms' dividend deviation (target dividend minus lagged dividend), that is, representing the relationship in the cross section.

[8]Note that the sample for the REWB models is limited to firms with at least two years of DPT disclosures.

Model (7) includes an interaction term DEV:DEVSIGN for the interaction between DEV and a dummy variable indicating negative deviation of dividend from target. That is, the dummy takes a value of 1 when the dividend target in year t, $DPT_{i,t} \times EPS_{i,t}$, is less than the lagged dividend, $CDPS_{i,t-1}$. There are 3,929 firm-year observations in the sample where the lagged dividend exceeds the target dividend, and 880 firms have a negative dividend deviation in at least one year. Both within firm and between firms, dividend smoothing is substantially lower (the speed of adjustment is higher) when their dividend deviation is negative.

Japanese firms are well known to continue paying dividends from retained earnings when net income is negative, even for prolonged periods of time. In the sample of target disclosers, there are 432 firm-year observations where 283 firms pay a dividend when EPS is negative. Model (8) examines how negative net income influences the speed of adjustment by including an interaction term DEV:EPSSIGN between DEV and a dummy variable that takes a value of 1 when EPS is negative. Considering the interaction term, the within effect suggests complete smoothing when net income is negative as the speed of adjustment parameter is about zero. The between effect suggests that firms in years with negative earnings smooth dividends substantially more than those with positive earnings.

As Table 5 in Section 2.3 shows, the median dividend payout ratio for each target level is close to its respective level. How is dividend smoothing influenced when the previous period's realised dividend payout ratio is above the firm's current dividend payout target? In the discloser sample, there are 3,446 firm-year observations, involving 855 firms, where the lagged payout ratio exceeds the current dividend payout target ratio. Model (9) includes an interaction term DEV:PRTD between DEV and a dummy variable that takes a value of 1 when the lagged realised dividend payout ratio is greater than the current dividend payout target. Within-firm, a realised lagged DPR that is greater than the DPT is associated with greater dividend smoothing. However, the between-firm the effect is the opposite. Firms smooth their dividend less when the target ratio is less than the lagged realised payout ratio. This may mean that the between-firm effect is dominated by firms for which the change in the lagged realised DPR is driven by volatility in EPS that firms react to by adjusting dividends.

4 Conclusion

This paper describes a novel database of voluntary medium-term numerical divided payout target disclosures made by Japanese listed firms in their Annual Securities Reports. Most firms state targets in the range of 20% to 50% of net income, or equivalently, earnings per share. By far the most frequently stated target is 30%. The number of firms voluntarily stating targets increased following the the release of Japan's Corporate Governance Code in 2015, disclosures decreased during the COVID19 pandemic. Targets are not changed often, but when they are, increases are more frequent than decreases. Decreases occur more during periods of economic uncertainty, and then are of a relatively large magnitude. There is substantial variation in targets and their disclosure across industries. Firms stating higher targets tend to have higher market valuation multiples and lower leverage. Median firms realised dividend payout ratios are close to their targets.

In comparison with firms that do not disclose targets, disclosers smooth their dividends less. Based on the sample of dividend disclosures, the following conclusions are made regarding dividend smoothing. Firms with a negative dividend deviation (target dividend minus lagged dividend) smooth less, both in the time series and cross section. When earnings are negative, the within firm effect suggests a high level of dividend conservatism (complete smoothing) while the between effect suggests that firms in years with negative earnings smooth dividends substantially more than those with positive earnings. When firms' realised dividend payout ratio is above their target, the within and between firm effects are opposite, greater smoothing within and less smoothing between.

This study has numerous limitations. The sample of dividend disclosers remains small relative to the number of listed firms, and firms omit disclosure in some years. Thus there is a relatively small set of firms who have disclosed consistently over a long period. Omitting disclosure may be a signal in itself, and this is to be explored in future research. Furthermore, the textual analysis likely can be improved to enhance the quality and completeness of the disclosures database. The panel approach to estimating the speed of dividend adjustment is somewhat less transparent than the bottom up approach of estimating the SOA at firm level and then aggregating. However, on the other hand it allows an analysis of the target data that would not be possible bottom up.

Ideas for future work related to the DPT data include examining hypotheses related to corporate governance, such as does voluntary disclosure of dividend payout targets indicate superior corporate governance and correlate with, or predict, measures of corporate governance. Dividend target disclosures may also have information on future corporate performance and stock returns.

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