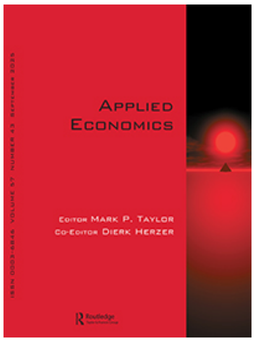

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Payouts smoothing and income growth

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ABSTRACT
We quantify the extent and drivers of payout smoothing by employing 34,966 US firms' data from 1975 to 2022. We report that payout growth is almost insensitive to year-by-year net income growth, in line with preceding literature suggesting payout smoothing. Novel to the literature, we incorporate the dynamics of payout smoothing, permanent, and aggregate net income growth into the depiction. Though payout growth is mostly immune to annual income growth shocks, it is significantly affected by net income growth of 5- or 10-year periods. Firms also consider the aggregate-sectoral and/or country-level-income growth in payout decisions. Since both permanent and aggregate income growths take over the role of year-by-year income growth, we further investigate if firms' financial positions impact the magnitude of the smoothing. Annual payout growth depends more on permanent income growth for firms with higher profits and lower leverage positions. Notably, more financially vulnerable firms with higher leverage adjust payouts more in line with aggregate economic conditions.

KEYWORDS
Payout smoothing; income growth; risk-sharing; dividend polices; financial ratios

JEL CLASSIFICATION
G32; G35

I. Introduction

For decades, corporate payout policy has been a contentious subject of economic interest, encompassing both dividends and stock repurchases. Both payout types play important roles in how firms distribute cash, with their relative use varying across countries and over time. While developed and emerging markets rely more heavily on dividends, the U.S. has experienced strong growth in repurchases alongside dividends, making the two complementary (Braun, Rubio, and Tigero 2023). The payout smoothing policy, originally introduced by Lintner (1956), refers to firms' deliberate efforts to remain payout stability regardless of instability and shocks to net income. The prevalence of payout smoothing has been revealed by recent theoretical developments and empirical investigations (Brav et al. 2005; Fama and Babiak 1968; Leary and Michaely 2011; Lintner 1956)

Studying the corporate dividend policy, Lintner (1956) found that managers opt to keep dividends reasonably stable over a long period regardless of changes in external conditions in the economy. While there were only 28 companies and a seven-year period (1947–1953) included in the sample, the study's findings remain relevant today (Balli et al. 2020; Brav et al. 2005; Fama and Babiak 1968; Hoang and Hoxha 2016; Leary and Michaely 2011). Brav et al. (2005), conducting surveys and interviews with 384 financial executives, confirm that sustaining the dividend level is a priority on par with investment decisions. The stickiness of dividend policy in which dividends are smoothed from year to year is also indicated by a later study by Leary and Michaely (2011), who report the steady and dramatic increase in the degree of dividend smoothing over the past century. Similar conclusions of payout smoothing are further validated by Balli et al. (2020); Hoang and Hoxha (2016).

A significant number of studies have discussed the underlying motivations for payout smoothing. It is typically employed to signal a firm's current or future performance to investors. According to Guttman, Kadan, and Kandel (2010) and Kumar (1988), an increase in payouts can signal positive performance, whereas a reduction may imply negative performance, potentially damaging investor expectations. In years of extreme economic events, a decline in payouts may further exacerbate negative market sentiment as a consequence.

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Notably, asymmetric information can arise between owners and managers, between firms and investors, and between institutional and individual investors. Dividend smoothing policies serve as tools to mitigate these asymmetries, contributing to a reduction in agency costs. According to Fudenberg and Tirole (1995), dividend smoothing may be initiated as a mechanism to address principal-agent information asymmetries. A recent study by Brockman et al. (2022) highlights that dividend smoothing isn't just tradition or habit as managers use it as a bonding tool between managers and shareholders, reducing agency problems. Therefore, firms that smooth their dividends are valued more highly by investors, especially in countries with weaker shareholder protections. Furthermore, in the study by Brennan and Thakor (1990), the objective of payout smoothing is to offset the informational disadvantage faced by uninformed investors (i.e. individual investors) when trading against more informed investors (i. e. institutional investors). In other words, payout smoothing reflects investor clientele effects, as less-informed investors reduce their informational disadvantage through the reception of stable and predictable payouts.

In addition to informational motives, firms smooth payouts for various strategic and financial reasons. In the traditional view, dividend smoothing tends to be more pronounced during periods when personal tax rates on dividends are higher and among firms with a large base of individual investors. Individual (retail) investors often prefer smooth and predictable dividend payments, as these support better personal financial planning and help mitigate tax liabilities, particularly when long-term tax strategies are difficult to implement (Miller and Scholes 1978). At the same time, dividend smoothing is also relevant for institutional investors. As noted by Allen, Bernardo, and Welch (2000) Allen, Bernardo, and Welch (2000), while institutional investors may be less sensitive to personal taxation due to their tax-exempt status, they often view stable and consistent dividend payments as a signal of financial discipline and long-term value creation. Consequently, they may impose reputational or market penalties on firms that unexpectedly reduce dividends. Financial constraints also play a critical role in shaping payout policies. When external finance is costly, firms are more likely to maintain lower and smoother dividend levels, particularly when they face high precautionary savings motives (Almeida, Campello, and Weisbach 2004; Bates, Kahle, and Stulz 2009).

Building on the established understanding of payout smoothing motives, a significant strand of the literature has focused on identifying the financial channels through which firms smooth payouts. As explored by Balli et al. (2021); Balli et al. (2020); Hoang and Hoxha (2016); Lambrecht and Myers (2012), these financial channels are typically associated with debt and investment decisions, as adjusting these elements allows firms to absorb net income shocks and maintain relatively stable payout levels over time. Brav et al. (2005), based on surveys and in-depth interviews with financial executives, report that executives often prioritize maintaining dividend levels over making new investment decisions. Lambrecht and Myers (2012) note that payout policies should be modelled jointly with debt and investment policies due to firms' budget constraints, and they provide evidence that payout variability can be mitigated through borrowing. Similarly, Hoang and Hoxha (2016) find that firms use debt and investment adjustments to absorb a substantial proportion of income shocks in order to preserve payout stability. Specifically, debt and investment absorb 56.90% and 40.70% of net income shocks, respectively, while the resulting change in payouts is limited to only 2.40%. Similarly, a more recent study by Balli et al. (2020) demonstrates that fluctuations in net income can be buffered and payout smoothing achieved through adjustments in borrowing and investment policies.

This study aims to empirically quantify the prevalence of payout smoothing policies within the context of U.S. firms. Consistent with prior research, we examine the short-term relationship between payout growth and net income growth by employing firm-level data from Compustat, covering U.S. companies that distributed dividends and repurchased shares from 1975 to 2022. While earlier studies provide valuable insights, our research offers several vital contributions by on how and what factors instigate dividend smoothing, yielding methodological extensions.

First, we examine the payout smoothing under net income shocks with the benchmark modelling (Hoang and Hoxha 2016; Lambrecht and Myers 2012). The examination is to assess whether the prevalence of payout smoothing policies holds consistently across different time periods and within the U.S. context. We then incorporate the permanent income growth, within the context of the permanent income hypothesis, and aggregate income growth, within the context of aggregate risk-sharing, to the depiction, which is novel to the pertinent literature on dividend smoothing. Though the empirical evidence suggests the existence of almost complete payout smoothing, there are unsolved questions of whether the payout trend can be changed due to long-term shocks. The permanent income hypothesis suggests that managers' choice to smooth dividends may be associated with the type of income shocks (Darling 1957; Lintner 1956). According to Friedman (2018), temporary income shocks have limited impact on economic agents' consumption, whereas evidence of a significant relationship is provided when working with permanent income. As a result, our article tests the hypothesis that a firm's payout distributing decision is driven by long-term income even though dividend growth is resilient to short-term net income shocks.

In addition, when distributing dividends, firms are concerned about net income growth of other firms because they do not want to send negative market signals. DeAngelo and DeAngelo (1990) cite financial distress as a significant factor influencing payout policies, noting that most firms adjust dividends when dealing with multiple shocks. Other studies (Carceles-Poveda 2005; Huang-Meier, Freeman, and Mazouz 2015) suggest that firms are less likely to retain earnings in good economic times, thus offering dividends to shareholders and vice versa. Therefore, the inclusion of aggregate income growth in our model represents another key contribution, given the importance of broader economic conditions in shaping corporate payout decisions. To the best of our knowledge, this is the first study that empirically considers the importance of both long-term and aggregate net income shocks in shaping payout decisions.

Finally, we extend the analysis to examine the determinants of payout smoothing in the context of permanent income shocks and aggregate income shocks. While prior studies have investigated factors influencing smoothing behaviour, such as short selling (Francis, Samuel, and Wu 2023) and product market competition (Shu and Peng 2024), no existing research has explored how firms adjust their payout smoothing behaviour in response to variations in profitability and leverage. From a broader perspective, the impact of aggregate and long-term net income growth on payout decisions is likely to differ across firms depending on their financial conditions. We specifically investigate whether financially stronger firms, characterized by lower leverage and higher profitability, exhibit greater or lesser degrees of payout smoothing.

Our benchmark analyses show that annual payout growth is almost uncorrelated to annual net income growth, implying complete payout smoothing in the listed US firms. Though payout growth is immune to annual net income shocks, it is primarily shaped by long-term net income growth and aggregate net income growth. Since both the permanent income and aggregate income growth take over the year-by-year net income growth's role, we further find that payout growth depends more on permanent income growth (less payout smoothing) for firms with higher profits and lower leverage positions. Also, more financially vulnerable firms with higher leverage adjust payouts more in line with aggregate economic conditions. The extent of the risk sharing via aggregate income shocks, therefore, turns larger for firms with higher leverage in the market.

The remainder of this study is organized as follows. Section II describes data and provides initial statistics. The research methodologies and the empirical findings with analyses are presented in Section III Lastly, concluding remarks are given in Section IV with implications and avenues for future studies.

II. Data and descriptive statistics

To analyse the extent and drivers of payout smoothing, we obtained the longest available annual data, which targeted all the listed US firms from 1975 to 2022 via Compustat North America. The initial number of firms collected is 34,966 in total (including both active and inactive publicly held firms), and we have more than 1.5 million longitude data (number of firms times number of the years).

Our critical variables of interest include net income (NI), cash dividends (D), and stock repurchases (PRSTKC). Following Brown, Liang, and Weisbenner (2007); Crane, Michenaud, and Weston (2016); Fenn and Liang (2001), the cash dividends are estimated by the sum of common, i.e. ordinary (DVC) and preferred, i.e. preference (DVP). The total payouts, computed in Lambrecht and Myers (2012) model and later by Crane, Michenaud, and Weston (2016), comprise cash dividends and stock repurchases. Skinner (2008) stated that repurchases are the dominant form of payout over time. It has been increasingly used to substitute for dividends, not only for firms that pay dividends but also for firms that only offer repurchases. Thus, a measure of payouts consisting of both dividends and repurchases performs relatively better in following the Lintner theory of payout policy (Skinner 2008). Also, a broader measure of payouts beyond dividends makes Lintner's model more relevant to contemporary payout policy.

After examining the payout ratio's response to annual net income shocks, long-term net income, i.e. permanent and aggregate net income, are further included in the dataset. As stated, while the literature stipulates evidence that payout growth is immune to annual net income shocks, there is a possibility that it may be affected by net income growth over the 5- or 10-year period. In this respect, permanent net income is estimated as the time average of net income ($\underline{\Delta \log NI_i}$). In addition, firms may consider sharing net income shocks with others when deciding payout policy, the reaction of payout ratios to the aggregate net income is measured. To proxy for the aggregate net income, which represents the overall net income in the economy ($\Delta \log NI_t$), we utilize the real GDP growth rate and sector output growth rate as proxy. Data on real GDP growth rate (GDP) is collected from the Bureau of Economics (BEA).

We further collect the leverage ratio (debt to asset) and profit margins to characterize firms' leverage and profitability positions regarding firms' financial characteristics. These firm-level financial ratios are extracted from Wharton Research Data Service (WRDS). More details regarding the financial ratios can be found in Table 1. The data have been log-differenced to purge away the stochastic trend of $I(1)$ variables, as identified in Augmented Dickey-Fuller unit root tests. In general, the results of various panel cointegration tests, considered in Pedroni (1999), are not against the different specifications in our empirical equations.[1]

Descriptive statistics are presented in Table 2. The average yearly change in payouts is recorded at 0.01 and positively skewed, whereas the change in net income is noticeably larger at 0.11 and negatively skewed. In terms of independent variables representing firms' financial characteristics, we selected debt/asset to assess a firm's leverage position or ability to meet long-term obligations, and Net Profit Margin (Pmargin) to measure a firm's potential to create profit (profitability). The average debt-to-asset ratio is 0.23, implying that debt makes up 23% of total assets. The net profit margin

Table 1. Definition of the variables.

Financial ratio	Description	Formula	WRDS variable name
Debt/asset	Total debt/total assets	Total debt as a fraction of total assets	debt_assets
Pmargin	Net profit margin	Net income as a fraction of sales	Npm
Current ratio	Current ratio	Current assets as a fraction of current liabilities	Curr_ratio
Capital ratio	Capitalization ratio	Total long-term debt as a fraction of the sum of total long-term debt, common/ordinary equity and preferred stock	capital_ratio
Cash/debt ratio	Cash-flow/total debt	Operating cash-flow as a fraction of total debt	cash_debt
Interest coverage ratio	Interest coverage ratio	Multiple of earnings before interest and taxes to interest and related expenses	intcov_ratio

[1]Test statistics for the panel cointegration analysis will be available upon request.

Table 2. Descriptive statistics.

Variables	Mean	Median	Std. Dev.	Skew.	Kurt
Change in payouts	0.01	0.00	0.81	0.09	1.45
Change in net income	0.11	0.13	0.94	−0.31	12.32
Debt/asset	0.23	0.17	0.30	37.36	13.33
Net profit margin	0.01	0.04	0.02	−4.71	22.12
Current ratio	3.18	2.04	14.49	239.63	4.34
Cash/debt ratio	−0.01	0.08	4.62	−326.87	0.34
Interest coverage ratio	11.763	3.17	1175.66	−4.42	19.03
Change in GDP	0.02	0.01	0.01	−0.96	2.13

The table illustrates the descriptive statistics for key variables. The second to sixth column displays the mean, median, standard deviation, skewness, and kurtosis of each variable.

(Net Income as a fraction of Sales) at 0.01 indicates that firms earn $0.01 of net income for every dollar of sales.

In addition, the firm's liquidity and solvency are alternatively captured using the current and interest coverage ratios to validate our empirical findings. Defined as current assets divided by current liabilities, the mean current ratio shows the short-term obligation and the figure is recorded at 3.18. On the other hand, the long-term obligation is 11.763, as evidenced by the interest rate coverage ratio. The rest of the statistics for the alternative variables are intuitive.

III. Empirical analyses

Payout smoothing under net income shocks

The response of payouts to net income shocks has been analysed by the intertemporal budget constraint developed by Lambrecht and Myers (2012). Hoang and Hoxha (2016) put forward two essential arguments in this respect. They argue that debt and investment channels may absorb adverse shocks to net income. We, therefore, continue our analysis from Equation (1) and employ a foundational model for a firm's smoothing behaviour considering its intertemporal budget constraint in line with Lintner (1956)'s model of payout smoothing, further improved by Lambrecht and Myers (2012) as follows:

$$\Delta \mathrm{Debt_i} + \mathrm{Net\,Income_i} = \mathrm{Investment_i} + \mathrm{Payout_i} \tag{1}$$

The model specifies that firms adjust the variability in $NetIncome_i$ by changing net $Debt_i$ through repayment of current debt, increase in borrowing and changes in cash balances. Lambrecht and Myers (2012) put forward this approach (as stipulated in Equation 1) with some reforms that included a comprehensive theory of debt, payout, and investment, following the intertemporal budget limitation and the dynamics of payout smoothing.[2]

Under this payout smoothing hypothesis, we follow the variance decomposition model developed by Asdrubali, Sørensen, and Yosha (1996), Sørensen and Yosha (1998) and Balli, Kalemli-Ozcan, and Sørensen (2012) to examine this relationship. Implementing the approach of Asdrubali, Sørensen, and Yosha (1996) and Sørensen and Yosha (1998), the following expression is proposed to detect the corporate intertemporal budget restriction:

$$Net\,Income_i = \frac{Net\,Income_i}{Net\,Income_i + \Delta \mathrm{Debt_i}} \times \frac{Net\,Income_i + \Delta \mathrm{Debt_i}}{Payout_i} \times Payout_i \tag{2}$$

We conjecture that firms are likely to smooth changes in earnings through borrowings, which should be evident in the variation between $NetIncome_i$ and $NetIncome_i + \Delta \mathrm{Debt_i}$. Another smoothing channel can be through a firm's investment, evident in the difference between $NetIncome_i + \Delta \mathrm{Debt_i}$ and $Payout_i$ (from Equation 1) when volatility in a firm's earnings is not wholly smoothed using debt.

By adopting the approach of Hoang and Hoxha (2016), we can ascertain the magnitude of changes in $NetIncome_i$ absorbed by firms using debt and investment channels. To achieve that, we apply a log transform and first difference to the factors in equation (3) to provide a growth rate expression.

[2]More detailed explanations are provided in Lambrecht and Myers (2012).

We then multiply both sides of the equation with $\Delta \log NetIncome_i$ to generate the cross-sectional variance decomposition equation expressed as:

$$
\begin{aligned}
&NetIncome_i : var\{\Delta \log \text{Net Income}_i\} \\
&= cov\left\{\begin{matrix}\Delta \log \text{NetIncome}_i, \Delta \log \text{Net Income}_i \\ -\Delta \log(\text{NetIncome}_i + \Delta \text{Debt}_i)\end{matrix}\right\} \\
&+ cov\left\{\Delta \log \text{Net Income}_i, \begin{pmatrix}\Delta \log(\text{Net Income}_i + \Delta \text{Debt}_i) \\ -\Delta \log \text{Payout}_i\end{pmatrix}\right\} \\
&+ cov\{\Delta \log \text{Net Income}_i, \Delta \log \text{Payout}_i\}
\end{aligned} \tag{3}
$$

We further scale both sides of equation (3) with the variance of $\Delta \log NetIncome_i$ which results in attaining the slope coefficients from three different panel univariate regressions with a total sum of 1. Thus, it is expressed mathematically as:

$$1 = \beta_D + \beta_I + \beta_P \tag{4}$$

where β_D represents the slope coefficient in the regression of $\Delta \log NetIncome_i - \Delta \log(NetIncome_i + \Delta Debt_i)$ on $\Delta \log NetIncome_i$ and proxy the debt channel; β_I represents the slope coefficient in the regression of $\Delta \log(NetIncome_i + \Delta Debt_i) - \Delta \log Payout_i$ on $\Delta \log NetIncome_i$ and proxy the investment channel. β_P represents the slope coefficient, in the regression of $\Delta \log Payout_i$ on $\Delta \log NetIncome_i$ and proxy the payout channel of smoothing of earnings.

Accordingly, using the following panel regressions, we get the estimation coefficients for Equation (5) as:

$$
\begin{aligned}
&\Delta \log NetIncome_{it} - \Delta \log(NetIncome_{it} + \Delta Debt_{it}) \\
&\quad = \beta_D \Delta \log NetIncome_{it} + \varepsilon_{it}
\end{aligned} \tag{5a}
$$

$$
\begin{aligned}
&\Delta \log(\text{Net Income}_{it} + \Delta Debt_{it}) - \Delta \log \text{Payout}_{it} \\
&\quad = \beta_I \Delta \log \text{Net Income}_{it} + \varepsilon_{it}
\end{aligned} \tag{5b}
$$

$$\Delta \log \text{Payout}_{it} = \beta_P \Delta \log \text{NetIncome}_{it} + \varepsilon_{it} \tag{5c}$$

where i identified the firm (cross section) at time t, while t is the year of observation for the three-panel regressions given above. We can reasonably interpret a hypothetical 100% increase in the growth rate of $NetIncome_{it}$ as the above variables in the equations.[3]

From Equation (5c), the coefficient β_P represents the percentage of change in earnings that are not compensated for by adjusting debt and investment channels. From a theoretical perspective, payouts should remain smooth as changes in net income are compensated with adjustments to debt and investments. Thus, payouts are regarded as smoothed when β_P is either zero or approaches zero. A case of perfect payout smoothing would imply that β_P is zero. We can represent β_P as the unsmoothed part (missing from complete payout smoothing).

Prior studies, for instance, Hoang and Hoxha (2016) and Balli et al. (2021), found that the β_P (payout smoothing coefficient) is zero or closer to zero. We run the Equation(5c) to quantify the extent of payout smoothing across the US firms collectively and present the results in the table below:

Table 3 contains the estimations of equation (5c).[4] Econometrically, to consider autocorrelation in the residuals, we assume that the error terms in each equation/country follow an AR(1) process. We restrict the autocorrelation parameter to be identical across firms/equations. We allow for country-specific variances of the error terms. Following Sørensen and Yosha (1998), the estimation is carried out using a two-step generalized least squares (GLS) procedure: (i) the entire panel is estimated using ordinary least squares and (ii) residuals from the first step are used to estimate variance for each firm and corrected for heteroscedasticity. Unless stated otherwise (just like Table 4), we use differenced data at a yearly frequency.

[3]Equation (5a) argues that if firm's smooth variations by paying back debt, the growth rate of $\Delta Debt_{it}$ is 100%, which further shows the term $NetIncome_{it} + \Delta Debt_{it}$grows at a rate of zero. A coefficient, β_D, equal 1 is generated from the regression of $\Delta \log NetIncome_{it} - \Delta \log(NetIncome_{it} + \Delta Debt_{it})$ on $\Delta \log NetIncome_{it}$ if changes in net income are entirely compensated for by debt repayment. If a 100% increase in $NetIncome_{it}$ increases by 100% result in no smoothing in borrowing, $NetIncome_{it} + \Delta Debt_{it}$ is adjusted to grow at a rate same as that of $NetIncome_{it}$. Thus, regressing $\Delta \log NetIncome_{it} - \Delta \log(NetIncome_{it} + \Delta Debt_{it})$on $\Delta \log NetIncome_{it}$ results in β_D being equal to zero. On the other hand, if changes in net income are not entirely compensated for with debt, we expect that these changes are compensated for by adjusting investments. These adjustments to investments are justified by the same reasons given for alterations in debt/borrowing. From Equation (5b), the dependent variable, $\Delta \log(NetIncome_{it} + \Delta Debt_{it}) - \Delta \log Payout_{it}$, represent investments with a coefficient, β_I, proxying the magnitude of changes to earnings that are absorbed by adjusting investments.

[4]We only estimate equation (5c) in this article. The other equations (5a) and (5b) are derived to explain the variance decomposition model better.

Table 3. Payout smoothing under net income shocks.

	1975–1984	1985–1994	1995–2004	2005–2019	1975–2019
β_P	−0.01	0.00	0.03	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

The estimation results for the entire sample and subsamples corresponding to the Equation (5c), $\Delta \log \text{Payout}_{it} = \beta_P \Delta \log \text{NetIncome}_{it} + \varepsilon_{itP}$, are shown in the table. The coefficient β_P quantifies the effect of the net income shocks on the payouts. The numbers in parentheses represent standard deviations. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Table 4. Payout smoothing under net income shocks, k-year frequency.

	k=2	k=3	k=4	k=5
β_P	0.03***	0.08***	0.04**	0.02**
	(0.01)	(0.01)	(0.02)	(0.01)

The estimation results for the entire sample and subsamples corresponding to the Equation (5c), $\Delta \log \text{Payout}_{it} = \beta_P \Delta \log \text{NetIncome}_{it} + \varepsilon_{itP}$, are shown in the table for the entire period. The coefficient β_P quantifies the effect of the net income shocks on the payouts. The frequency of data (k) increases from 2 years to 10 years. The numbers in parentheses represent standard deviations. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Table 3 shows β_P estimations for the entire sample and subsamples, either statistically insignificant or the extent is in low level (1–3%).[5] As stated earlier, the payout growth is not correlated with the short-term net income shocks. The empirical framework above suggests that debt and investment channels can smooth the net income shocks so that firms can pay out without being affected by net income shocks.[6]

Next, we investigate the persistency of the income shocks and how they affect the payout growths. We rerun the Equation (5c) by increasing the frequency from 1 year to k = 2, k = 3, k = 4, k = 5, and k = 10 years. To make it clear, say for k = 2 we run the following equation

$\Delta \log \text{Payout}_{it} = \beta_P \Delta \log \text{NetIncome}_{it} + \varepsilon_{it}$;where $\Delta \log \text{Payout}_{it} = \log \text{Payout}_{it} - \log \text{Payout}_{it-2}$ and $\Delta \log \text{Net, Income}_{it} = \log \text{Net, Income}_{it} - \log \text{Net}$ $Income_{it-2}$. The relationship between the long-term net income growth and payout growth is exposed, as shown in Table 4. For the different levels of 'k', we have mixed results. When k = 2 or k = 3, the net income growth explains the payout growth, suggesting that firms consider net income growth 2–3-year terms in deciding (or setting) 2–3-year payout growths. When the differencing years increase (k = 4, k = 5), we find that the magnitude of the payout smoothing fluctuates but remains statistically significant.

This analysis has been set up to provide a robustness check to observe whether the results differ if we have biannual growths (k = 2) or 5-year growths (k = 5). We could not observe a solid causality (higher magnitude of the β_P coefficient) between payout growth and income growth.

Are payouts affected by long-term net income shocks?

Decomposition of payout smoothing

Intertemporal choice has been a critical characteristic of income smoothing (Acharya and Lambrecht 2015). One of the main issues implementing the variance decomposition as represented in equation 2 is that it cannot reconcile temporary, i.e. risk-sharing, and permanent, i.e. intertemporal payout smoothing over time. For that reason, a joint examination of risk-sharing and intertemporal smoothing yields a complete analysis of payout smoothing. Relying on panel data analysis, Asdrubali and Kim (2008) and Mundlak (1978) suggest a measure to distinguish temporary and permanent shocks clearly. Asdrubali and Kim (2008) neatly separate temporary and permanent output shocks. We, therefore, take the same route to explore the intertemporal aspect of payout smoothing stemming from the same model Eq. (5c) with a specific interest in the time dimension. Moving forward, the error term can be decomposed as:

$$\varepsilon_{itP} = \varepsilon_{it} + \mu_i + \vartheta_t \qquad (6)$$

So that Equation 5c is transformed into:

$$\Delta \text{logPayout}_{it} = \beta_P \Delta \text{logNetIncome}_{it} + \varepsilon_{it} + \mu_i + \vartheta_t (6a)$$

Again employing Mundlak (1978) strategy, we could model individual heterogeneity by

[5]Hoang and Hoxha (2016) also find that the β_P coefficient is either zero or close to zero in their analysis.

[6]Due to space limitation, we do not provide tables contain the extent of the smoothing via debt and investment channels. The estimations are similar to Hoang and Hoxha (2016) and Balli et al. (2020).

considering the correlation between μ_i and the time average of net income growth as:

$$\varepsilon_{itP} = \varepsilon_{it} + \alpha_P \underline{\Delta \mathrm{logNI_i}} + \vartheta_t \quad (7)$$

At this point, the time fixed effect ϑ_t corresponds to the (aggregate) risk-sharing effect.

Asdrubali, Sørensen, and Yosha (1996) and Sørensen and Yosha (1998) identify the measure of the risk-sharing by decomposing the consumption growth from aggregate (worldwide) consumption growth fetching idiosyncratic consumption growth and its relationship to idiosyncratic output growth (i.e. country-level output growth minus worldwide output growth). Econometrically, panel estimations imposing a time-fixed effect would yield idiosyncratic consumption and output growth. Thereforeϑ_t represents the 'extent' of the risk-sharing in Equation (7). Following Asdrubali and Kim (2008), we measure the time fixed-effect component with $\underline{\Delta \mathrm{logNI_t}}$. Accordingly, we extend the Equation (5c) as follows:

$$\Delta \mathrm{logPayout_{it}} = \beta_P \Delta \mathrm{logNI_{it}} + \delta_P \underline{\Delta \mathrm{logNI_i}} + \delta_A \underline{\Delta \mathrm{logNI_t}} + \varepsilon_{it} \quad (8)$$

Here β_P attached to the time net income growth yet again measures the effect of the net income (hereafter *NI*) shocks on the payouts (temporary growth). We now have two new factors utilized in this extended model. The coefficient δ_P, attached to the time average of Net Income ($\underline{\Delta \mathrm{logNI_i}}$), can be explained as the extent of the correlation of permanent earnings growth with payouts. Similarly, $\underline{\Delta \mathrm{logNI_t}}$ measures the degree of the 'risk-sharing' according to the literature. This variable in the equation is justifiable when firms share net income shocks. In other words, it shows how payout growth reacts to the overall net income in the economy. The coefficient $\delta_A$simply reflects the reaction of the payout ratio to overall net income growth among firms (overall output growth as a proxy). Adopting Mundlak (1978)'s methodology, both the cross-sectional ($\Delta \mathrm{logNI_i}$) and intertemporal decomposition ($\Delta \mathrm{logNI_t}$) help to solve the problem of choosing between a fixed and random effect. Estimating δ_A allows us to estimate the risk-sharing coefficient directly, rather than indirectly through the β_P.

Table 5 provides the estimation results of Equation (8) for the entire sample and subsamples. Results indicate that contemporary net income shocks ($\Delta \mathrm{logNI_{it}}$) do not have significant coefficients for the whole period and the most recent period 2005–2019. The coefficient β_p is either insignificant or 2–3%, similar to Table 3, showing that payout growth is barely correlated with contemporary net income growth. This might result from a firm's decision on payouts based on long-term indicators (Aivazian, Booth, and Cleary 2006; Darling 1957; DeAngelo, DeAngelo, and Stulz 2006; Lintner 1956). More interestingly, and different from the literature, we find that payout growth is explained by the average income growth ($\underline{\Delta \mathrm{logNI_i}}$) between the entire (1975–2019) or 10-year periods. The coefficient δ_P indicates that permanent net income growth significantly explains the payout growth. Preceding literature and the dividend smoothing model, developed by Lintner (1956) and variance decomposition models, investigate the impact of short-term income shocks on payouts and find no strong relationship. Indeed, in Table 3, the effect of short-term net income fluctuations is limited on annual payout growth (i.e. 2–3% maximum). In contrast, we show a strong impact of permanent income growth on payout growth. Coefficient δ_p is also statistically significant for different subsamples, indicating that a firm's payout strategies (payout growth) may be linked to long-term net income growth. The relationship between payouts and long-term income growth might be one of the reasons why the growth of the payout is not affected by annual net income growths or β_p coefficients are either insignificant or in terms of insufficient magnitude.

Next, we investigate the impact of the aggregate net income growth ($\Delta \mathrm{logNI_t}$) to detail the procyclical nature of aggregate risk-sharing in the literature. The positive (δ_A) significant coefficients refer that payouts are positively correlated with all firms' aggregate net income growth and spot the procyclicality of aggregate payout policy. Consistent with Carceles-Poveda (2005, 2009) and Huang-Meier, Freeman, and Mazouz (2015), earlier studies state that firms are less willing to retain earnings in good times, thus offering dividends to shareholders and vice versa. This is because firms do not want to send a negative signal to the market, investors in particular,

Table 5. Payout smoothing under permanent income and aggregate income shocks.

	1975–1984	1985–1994	1995–2004	2005–2022	1975–2022
β_P	0.01	0.03***	0.02***	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
δ_P	0.23***	0.18***	0.19***	0.12***	0.20***
	(0.09)	(0.03)	(0.01)	(0.03)	(0.03)
δ_A	0.02**	0.03***	0.02	0.07***	0.06***
	0.01	0.01	0.02	0.01	0.01
N	4630	4447	4536	7427	21040
R^2	0.51	0.49	0.40	0.38	0.33

The table provides the estimation results for the Equation (8), $\Delta \text{logPayout}_{it} = a_{ip} + \beta_P \Delta \text{logNI}_{it} + \delta_P \underline{\Delta \text{logNI}_i} + \delta_A \underline{\Delta \text{logNI}_t} + \varepsilon_{it,}$ for the entire sample and subsamples. The coefficient β_P quantifies the effect of the net income shocks on the payouts. The coefficient δ_P measures the extent of the correlation between permanent earnings growth and payouts. The coefficient $\delta_A$reflects the reaction of the payout to the aggregate net income growth among firms. The numbers in parentheses represent standard deviations. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

attributable to market competition. Conversely, in bad times, we expect shrinkage in retained earnings. In all sub-periods except 1995–2004, we observe a statistically significant coefficient for $\underline{\Delta \text{logNI}_t}$, signifying strong evidence that firms consider the nature of the economy when they pay out. Specifically, in the last 15-year period, the significance of the aggregate net income growth on the payout smoothing has been positive, and the magnitude of the coefficient increases over time. This also subdues the impact of the net income growth of each firm in the sample.

Determinants of payout smoothing

Analyses above reveal that firms consider long term, i.e. permanent growth, and aggregate either firmwide or nationwide growth in payouts. Accordingly, the low correlation between payout growth and net income growth is explained with these important two dynamics. We now investigate these channels profoundly and observe how they affect firms' leverage and profitability positions.

We sustain the dynamics of the model and examine if the coefficients of the δ_P are sensitive to the firm-level characteristics. Econometrically, we follow Balli and Rana (2015), Balli, Pierucci, and Fu (2019) and proceed as:

$$\Delta \text{logPayout}_{it} = \beta_P \Delta \log \text{NI}_{it} + \delta_{P0} \underline{\Delta \log \text{NI}_i} + \delta_A \underline{\Delta \log \text{NI}_t} + \delta_{P1} \underline{\Delta \log \text{NI}_i} * \frac{\text{DEBT}}{\text{ASSET}} + \delta_{P2} \underline{\Delta \text{logNI}_i} * \text{Pmargin} + \delta_{P3} \underline{\Delta \text{logNI}_i} * \text{TREND} + \varepsilon_{it} \tag{9}$$

Accordingly, the coefficient of δ_p is expressed as:

$$\delta_P = \delta_{P0} + \delta_{P1} * \frac{DEBT}{ASSET} + \delta_{P2} * PMARGIN + \delta_{P3} * TREND \tag{9a}$$

We restricted the Equation (5c) where the change of logarithm payouts for firm 'i' at time 't' regressed the logarithm change in the net income. Now, we have added the interaction terms which are employed to capture the determinants of the extent of payout smoothing. δ_P will be a function of average permanent income smoothing coefficient δ_{P0}, δ_{P1}, δ_{P2}, and δ_{P3}. δ_{P1} measures the relationship between a firm's debt position and permanent income smoothing coefficient, and similarly, δ_{P2} quantifies the impact of the firm's profit margin on the permanent income smoothing coefficient.

As shown above in the previous analysis, permanent income is significant in explaining payout smoothing. Thus, the extent of payout smoothing via permanent income growth (δ_P) is highly significant and is an imperative item for payout smoothing. We decompose that coefficient (as in Equation 9a.) in Table 6 and find that firms with higher leverage ratios have less correlation of their permanent income growth with payout growth. In other words, the impact of permanent growth on payout smoothing decreases when firms have higher leverage positions. Thus, for firms in a strong solvency position (i.e. less debt-to-asset ratio; δ_{P1}), permanent income growth is highly effective in explaining the year-by-year payout smoothing. Firms will not be vulnerable and use long-term projections to govern payout growth.[7] We also tested interest coverage ratio or current ratio as

[7] We have tested different threshold levels for the leverage (debt to asset ratio) if the results differ. However, the results are not deviating much from original estimations.

Table 6. Determinants of payout smoothing under permanent income shocks.

	1975–1984	1985–1994	1995–2004	2005–2022	1975–2022
β_p	0.01	0.03**	0.02**	0.01	0.01
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
δ_A	0.02**	0.03***	0.02	0.07***	0.06***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
δ_{P0}	0.28***	0.22***	0.25***	0.17***	0.23***
	(0.04)	(0.04)	(0.04)	(0.05)	(0.03)
δ_{P1}	−0.12**	−0.14**	−0.20***	−0.16***	−0.27***
	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)
δ_{P2}	0.01	0.02**	0.01	0.04***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
δ_{P3}	0.02**	0.02	0.02	0.01	0.01
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)
N	4205	3915	4060	6964	19144
R^2	0.25	0.22	0.17	0.28	0.28

Notes: The table provides the estimation results for the Equation (9), $\Delta \text{logPayout}_{it} = a_{iP} + \beta_P \Delta \text{logNI}_{it} + \delta_{P0} \underline{\Delta \text{logNI}_i} + \delta_A \underline{\Delta \text{logNI}_t} + \delta_{P1} \underline{\Delta \text{logNI}_i} * \frac{DEBT}{ASSET_{it}} + \delta_{P2} \underline{\Delta \text{logNI}_i} * Pmargin + \delta_{P3} \underline{\Delta \text{logNI}_i} * TREND + \varepsilon_{it},$, for the entire sample and subsamples. The coefficient β_P quantifies the effect of the net income shocks on the payouts. The coefficient $\delta_A$reflects the reaction of the payout to the aggregate net income growth among firms. The coefficient of δ_p is expressed as $\delta_P = \delta_{P0} + \delta_{P1} * \frac{DEBT}{ASSET} + \delta_{P2} * PMARGIN + \delta_{P3} * TREND$. δ_{P1} measures the relationship between a firm's debt position and permanent income smoothing coefficient and δ_{P2} quantifies the impact of the firms' profit margin on the permanent income smoothing coefficient. The numbers in parentheses represent standard deviations. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

different proxies for solvency ratios. The results are not much different. Profit margin is also important in explaining payout growth. The positively significant coefficient (δ_{P2}) suggests that firms consider the long-term net income growth shocks in smoothing the year-by-year payout growth.

We extend the Equation (9a.) by adding a square term of the $\frac{DEBT}{ASSET}$ variable to observe if there is a threshold impact of the leverage position on payout smoothing.

Overall, the coefficient of δ_P gets more prominent for firms with lower leverage and higher profitability positions and thus infers that the impact of permanent income shocks on payout growth increases when firms hold less debt and higher profitability.

Next, we examine how the extent of payout smoothing via aggregate income shocks changes with firms' leverage and profitability positions. We consider the dynamics of the model and see if the coefficients of the δ_A are sensitive to the firm-level characteristics. Econometrically, we run the following:

$$\Delta \text{logPayout}_{it} = a_i + \beta_P \Delta \text{logNI}_{it} + \delta_{A0} \underline{\Delta \text{logNI}_t} + \delta_P \underline{\Delta \text{logNI}_i} + \delta_{A1} \underline{\Delta \text{logNI}_t} * \frac{\text{DEBT}}{\text{ASSET}_{it}} + \delta_{A2} \underline{\Delta \text{logNI}_t} * \text{Pmargin} + \delta_{A3} \underline{\Delta \text{logNI}_t} * \text{TREND} + \varepsilon_{it} \quad (10)$$

Accordingly, the coefficient of δ_A is expressed as:

$$\delta_A = \delta_{A0} + \delta_{A1} * \frac{DEBT}{ASSET} + \delta_{A2} * PMARGIN + \delta_{A3} * TREND \quad (10a)$$

Payout smoothing via aggregate income shocks is statistically significant, as shown in Table 5. Firms consider the aggregate net income shocks in smoothing payouts, and to some extent, they share the risk of payouts with the total market. When aggregate income boosts up, firms pay out more, and when the economy goes down, firms intuitively pay out less. Even though the magnitudes are not comparable with the impact of permanent income growth, it is still statistically significant. We decompose the channel and see firms' leverage and profitability positions make any difference. Table 7 contains the estimations of Equation (10). From Equation (10a), we can decompose the aggregate risk-sharing coefficient, quantify the impact of the firm's leverage and profitability positions, and add a trend component (TREND). In the table, we estimate the equation for the overall sample with subsamples. The estimations reveal that the debt/asset factor (δ_A) is highly significant in explaining the aggregate risk-sharing coefficient for the entire and subsample periods. However, profit margin does not yield any impact.

n all subsamples, we spot that more vulnerable firms (i.e. having higher leverage—debt-to-asset ratio) move more with the aggregate economy

Table 7. Determinants of payout smoothing under aggregate income shocks.

	1975–1984	1985–1994	1995–2004	2005–2022	1975–2022
β_p	0.00	0.02	0.01	0.01	−0.01
	(0.01)	(0.02)	(0.02)	(0.03)	(0.01)
δ_P	0.32***	0.04***	0.35***	0.11***	0.21***
	(0.02)	(0.01)	(0.11)	(0.03)	(0.04)
δ_{A0}	−0.04	−0.02	−0.03***	−0.04***	−0.04***
	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)
δ_{A1}	0.12***	0.08***	0.08***	0.14***	0.10***
	(0.03)	(0.03)	(0.02)	(0.03)	(0.01)
δ_{A2}	−0.01	0.00	0.01	0.02	0.01
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)
δ_{A3}	0.02	0.00	0.03	0.02	0.01
	(0.05)	(0.04)	(0.03)	(0.02)	(0.01)
N	4205	4106	4025	6964	19300
R^2	0.14	0.13	0.34	0.23	0.28

The table provides the estimation results for the Equation (10), $\Delta \text{logPayout}_{it} = a_i + \beta_P \Delta \text{logNI}_{it} + \delta_{A0} \underline{\Delta \text{logNI}_t} + \delta_P \underline{\Delta \text{logNI}_i} + \delta_{A1} \underline{\Delta \text{logNI}_t} * \frac{DEBT}{ASSET_{it}} + \delta_{A2} \underline{\Delta \text{logNI}_t} * Pmargin + \delta_{A3} \underline{\Delta \text{logNI}_t} * TREND + \varepsilon_{it,}$, for the entire sample and subsamples. The coefficient β_P quantifies the effect of the net income shocks on the payout growth. The coefficient δ_P measures the extent of the correlation between permanent earnings growth and payouts. The coefficient of δ_A is expressed as $\delta_A = \delta_{A0} + \delta_{A1} * \frac{DEBT}{ASSET} + \delta_{A2} * PMARGIN + \delta_{A3} * TREND$. δ_{A1} measures the relationship between a firm's debt position and aggregate income smoothing coefficient and δ_{A2} quantifies the impact of the firms' profit margin on the aggregate income smoothing coefficient. The numbers in parentheses represent standard deviations. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

when they pay out. In other words, the extent of the risk-sharing via aggregate income shocks (δ_A) turns larger for firms with higher leverage (more vulnerable) in the market. The rest of the coefficients are not statistically significant. We conclude that firms that have higher financial stress do not consider their idiosyncratic income shocks much on deciding their payout growth but pay more attention to aggregate income shocks, i.e. pay out more when the economy is good and pay out less when the economy is in a bad state. These companies likely aim to make the signal to the market in a better way. Those firms want to be seen as stable and provide higher payout in the boom and less in the recession.

Robustness checks

To perform the robustness checks, we have combined Equations (9) and (10) into one equation to collectively explore the determinants of δ_A and δ_p as:

$$\Delta \text{logPayout}_{it} = a_i + \beta_P \Delta \text{logNI}_{it} + \delta_{A0} \underline{\Delta \text{logNI}_t} + \delta_{P0} \underline{\Delta \text{logNI}_i} + \delta_{A1} \underline{\Delta \text{logNI}_t} * \frac{DEBT}{ASSET_{it}} + \delta_{A2} \underline{\Delta \text{logNI}_t} * Pmargin + \delta_{A3} \underline{\Delta \text{logNI}_t} * TREND + \delta_{P1} \underline{\Delta \text{logNI}_i} * \frac{DEBT}{ASSET_{it}} + \delta_{P2} \underline{\Delta \text{logNI}_i} * Pmargin + \delta_{P3} \underline{\Delta \text{logNI}_i} * TREND + \varepsilon_{it} \quad (11)$$

Table 8 exhibits the estimations from equation (11). Most of the coefficients of interest have similar signs and significance compared to Tables 6 and 7. Permanent income shocks remain highly significant in explaining the payout smoothing, as shown in Table 6. The extent of payout smoothing via permanent income shocks increases for firms with higher leverage and profitability positions. Similarly, payout smoothing via aggregate income shocks remains statistically significant with marginal magnitude compared to permanent income shocks, as shown in Table 7. The extent of payout smoothing via aggregate income shocks increases for higher leveraged firms, but profitability remains irrelevant in this regard.

IV. Concluding remarks

Payout smoothing and its relevance to firm valuation remain in question to date. Nonetheless, little is known about how and what factors influence payout smoothing.

This study quantifies the extent and drivers of payout smoothing by employing 34,966 US firms' data from 1975 to 2022. Empirical analysis reveals that payout growth is almost uncorrelated with net income growth. This is in line with preceding literature, insight into full risk-sharing among firms to smooth payout. However, novel to the payout smoothing literature, we incorporate the dynamics of risk-sharing and add the permanent and aggregate income growth to the depiction. Though payout growth is immune to annual net income shocks, it is mainly affected by net income growth

Table 8. Determinants of payout smoothing under permanent and aggregate income shocks.

	1975–1984	1985–1994	1995–2004	2005–2022	1975–2022
β_p	0.00	0.01	0.02	0.01	−0.01
	(0.01)	(0.03)	(0.02)	(0.03)	(0.02)
δ_{A0}	−0.03	−0.02	−0.03***	−0.05***	−0.04***
	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)
δ_{A1}	0.15**	0.07***	0.07***	0.14***	0.11***
	(0.04)	(0.03)	(0.02)	(0.03)	(0.01)
δ_{A2}	−0.02	0.00	0.02	0.02	0.01
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)
δ_{A3}	0.04	0.00	0.03	0.02	0.01
	(0.04)	(0.03)	(0.03)	(0.03)	(0.01)
δ_{P0}	0.26***	0.03***	0.20***	0.08***	0.15***
	(0.02)	(0.01)	(0.11)	(0.03)	(0.04)
δ_{p_1}	−0.15***	−0.13***	−0.15***	−0.12***	−0.10***
	(0.05)	(0.03)	(0.02)	(0.03)	(0.02)
δ_{p_2}	0.01	0.02***	0.03***	0.02	0.02**
	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)
δ_{p_3}	0.03***	0.01	0.01	0.01	0.01
	(0.01)	(0.04)	(0.02)	(0.02)	(0.01)
N	4205	4106	4025	6964	19300
R^2	0.18	0.19	0.35	0.24	0.30

The table provides the estimation results for the Equation (11) $\Delta \text{logPayout}_{it} = a_i + \beta_P \Delta \text{logNI}_{it} + \delta_{A0} \underline{\Delta \text{logNI}_t} + \delta_{P0} \underline{\Delta \text{logNI}_i} + \delta_{A1} \underline{\Delta \text{logNI}_t} * \frac{\text{DEBT}}{\text{ASSET}_{it}} + \delta_{A2} \underline{\Delta \text{logNI}_t} * \text{Pmargin} + \delta_{A3} \underline{\Delta \text{logNI}_t} * \text{TREND} + \delta_{P1} \underline{\Delta \text{logNI}_i} * \frac{\text{DEBT}}{\text{ASSET}_{it}} + \delta_{P2} \underline{\Delta \text{logNI}_i} * \text{Pmargin} + \delta_{P3} \underline{\Delta \text{logNI}_i} * \text{TREND} + \varepsilon_{it}$ for the entire sample and subsamples. The coefficient β_P quantifies the effect of the net income shocks on the payouts. The coefficient of δ_p is expressed as $\delta_P = \delta_{P0} + \delta_{P1} * \frac{DEBT}{ASSET} + \delta_{P2} * PMARGIN + \delta_{P3} * TREND$. δ_{P1} measures the relationship between a firm's debt position and permanent income smoothing coefficient and δ_{P2} quantifies the impact of the firms' profit margin on the permanent income smoothing coefficient. The coefficient of δ_A is expressed as $\delta_A = \delta_{A0} + \delta_{A1} * \frac{DEBT}{ASSET} + \delta_{A2} * PMARGIN + \delta_{A3} * TREND$. δ_{A1} measures the relationship between a firm's debt position and aggregate income smoothing coefficient and δ_{A2} quantifies the impact of the firms' profit margin on the aggregate income smoothing coefficient. The numbers in parentheses represent standard deviations. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

over the 5- or 10-year period. In other words, firms consider long-term net income growth instead of year-by-year growth in setting short-term payout growth. The Permanent Income Hypothesis also holds in the context. Importantly, firms also consider aggregate net income growth in their sectors when they grow their payouts for the sake of positive signalling to the market. The aggregate risk-sharing impacts payout growth positively, suggesting that firm's payout more when the aggregate economy booms and payout less when the economy performs poorly. This signalling issue would be quite effective in determining the degree of aggregate risk-sharing.

Since both the permanent income and aggregate income growth take over the year-by-year net income growth's role, we further investigate if firms' financial positions might affect the extent of the payout smoothing. We find that firms with lower leverage level exhibit a strong correlation between their permanent income growth and payout growth, indicating less payout smoothing. In contrast, firms with higher leverage ratios tend to smooth their payouts more for the sake of positive signalling to the market. For firms with higher profit margin, findings suggest that payout is more aligned with permanent income growth. Perhaps, these financially strong firms do not need to rely on leverage or investment channels to smooth their payouts, as they do not need to signal their financial stability. In fact, it's easier to accurately predict payout growth for firms that are financially healthy and profitable than for those that are not. Nevertheless, it is found that more financially vulnerable firms characterized by higher leverage are more sensitive to changes in the economy and therefore tend to adjust their payouts more in line with aggregate economic conditions.

These findings offer several key implications. First, they highlight the opportunity to enhance existing payout forecasting models by integrating the permanent and aggregate income growth, to better reflect the forward-looking nature of firms' payout decisions. It is equally palpable that firms' positions are essential in forecasting their payouts over time as financially strong firms are less dependent on payout smoothing strategy and align their payouts more closely with long-term fundamentals.

From a practical perspective, it is essential to consider a firm's long-term earning's performance, industry-wide and economic environment when evaluating payout strategies. Firms that engage in persistent payout smoothing may use payouts as a strategic communication tool. Depending on market conditions and time horizons, a strong reliance on payout smoothing can signal underlying fragility, whereas firms with more transparent, fundamentals-driven payout decisions may convey greater financial strength and stability. Utilizing datasets covering longer time periods would enhance our ability to examine the long-term relationship between payouts and income smoothing. This limitation represents the primary constraint of the present study.

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