TAX 620: Causal Data Science for Business Decision Making

Report on the Empirical Project

Replication of *Payout Taxes and the Allocation of Investment (B. Becker et al., 2013)*

Frontini Elena & Wen Long Chen

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1. Introduction

Corporate payout taxes on dividends and share repurchases are a key feature of most tax systems and may affect not only the level of investment but also how investment is allocated across firms. Distortions in capital allocation can reduce efficiency, particularly for firms that rely on external equity financing.

This report examines whether payout taxes influence investment allocation by increasing the cost of external equity relative to internal funds. Higher payout taxes may cause investment to become concentrated in cash-rich firms that can rely on retained earnings, while firms dependent on new equity reduce investment despite profitable opportunities.

The analysis is grounded in the tax wedge theory, which predicts that payout taxes widen the gap between internal and external equity financing. Firms with sufficient internal funds should be largely insensitive to payout taxes, while externally financed firms should respond more strongly. The central hypothesis is that investment differences between these firms increase with payout taxes and narrow following tax reductions.

Using firm-level panel data from 25 countries from 1990 to 2008 and cross-country data on dividend and capital gains taxation, the study exploits major payout tax reforms. Investment behavior of high and low cash flow firms is compared before and after tax changes using difference-in-differences and fixed-effects regressions.

The results show that payout taxes significantly affect investment allocation. Higher payout taxes widen the investment gap between cash-rich and cash-poor firms, while tax cuts reduce this gap, supporting the tax wedge theory and highlighting the efficiency implications of payout tax policy.

2. Theoretical Framework and Hypotheses

2.1 Tax Wedge Theory

The study is grounded in the tax wedge theory, which explains how taxes on dividends and share repurchases distort firms' financing and investment decisions. Payout taxes create a wedge between internal equity financed through retained earnings and external equity raised through new share issuance, since external equity ultimately entails taxable payouts, while retained earnings postpone taxation.

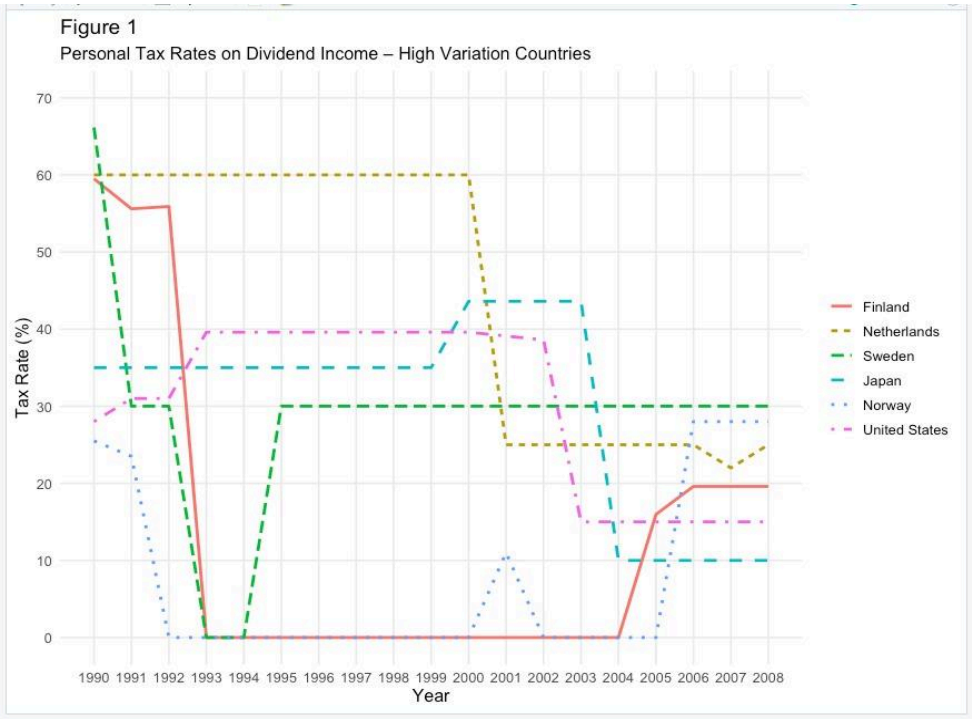
When payout taxes are high, external equity becomes relatively expensive, causing investment to concentrate in cash-rich firms. When payout taxes fall, the wedge narrows, making external financing more attractive and allowing investment to shift toward firms reliant on external capital. The theory therefore predicts that payout taxes distort not only aggregate investment but also its allocation across firms with different financing constraints.

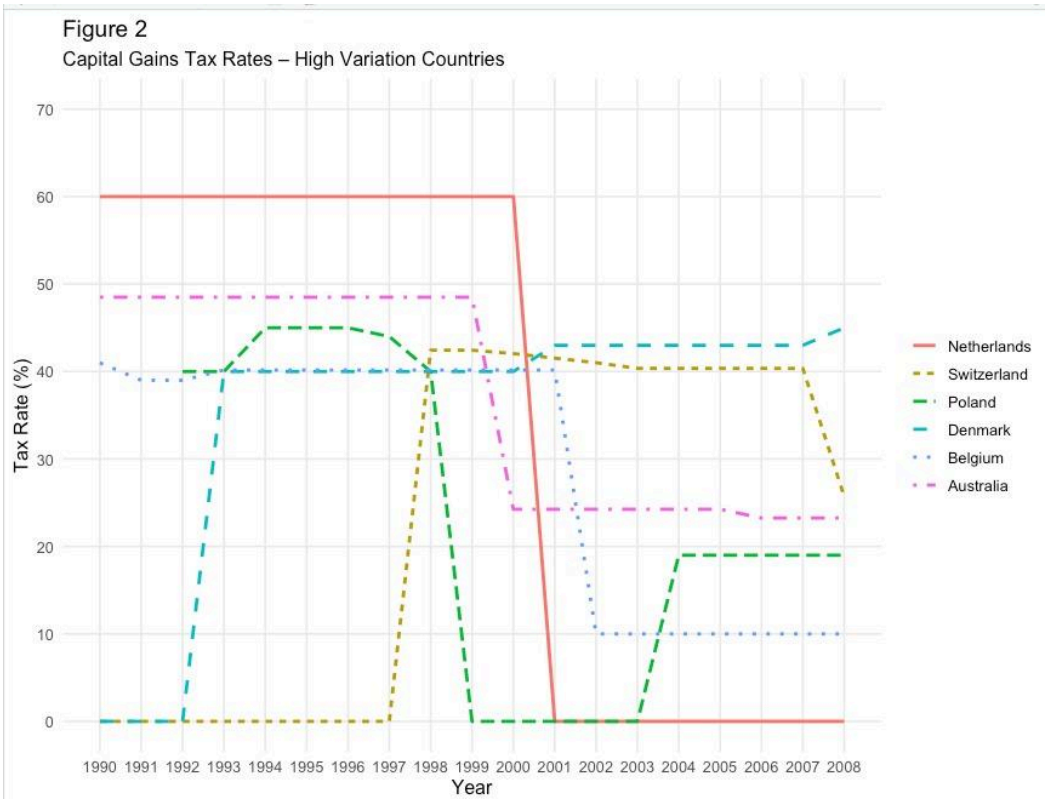
Cross-country evidence supports the relevance of this mechanism. Substantial variation in dividend and capital gains taxation across countries and over time, including sharp tax reforms, generates

meaningful changes in the relative cost of internal and external equity. This variation provides the main source of identification in the analysis.

At the same time, tax reforms may coincide with broader economic or policy changes, raising endogeneity concerns. To address this, the empirical strategy focuses on within-country, within-year differences in investment across firms, isolating relative investment responses while controlling for aggregate conditions.

The framework has several limitations. It does not account for tax avoidance that could reduce the effective wedge, the impact of payout taxes on the location of savings, agency problems that may lead to overinvestment when payout pressure declines, or debt financing as a substitute for equity.





3. Data and Variable Construction

3.1 Data Sources and Data Collection

The empirical analysis combines firm-level financial data from the Worldscope database with cross-country information on corporate payout taxation. Worldscope provides standardized accounting and market-based data for publicly listed firms, including investment, cash flow, leverage, and firm size. The sample covers firms from 25 countries over the period 1990 to 2008.

Data collection from Worldscope involved several challenges related to download limits, variable coverage, and data consistency. Because downloads are capped at 5,000 observations per query, firm-level data were collected separately by country and merged into a single panel dataset. For countries with many listed firms, particularly the United States, data were downloaded in multiple batches using industry filters. Capital expenditure data for Japanese firms exhibited substantial missingness, which required the use of an alternative capital expenditure measure and may affect cross-country comparability.

Additional issues arose from inconsistencies in fiscal year alignment across variables, notably for EBITDA. Fiscal years were reconstructed using the indicator year variable, and EBITDA data were processed separately before merging. Historical changes in Worldscope's platform and variable definitions also resulted in uneven data coverage across countries and time periods, especially in earlier years. Firm-level observations were aligned to calendar years using fiscal year-end information before merging country-level datasets.

Information on payout taxation is obtained from the international dividend and capital gains tax dataset by Jacob, Marcus, and Jacob (2012), which provides country-year measures of personal dividend and capital gains taxation adjusted for imputation systems. These tax variables are merged with the firm-level data by country and year and serve as the main explanatory variables.

Overall, while Worldscope offers comprehensive international firm-level data, download constraints and coverage issues, particularly for the United States and Japan, required several adjustments that may introduce measurement error and reduce statistical power.

3.2 Sample Restrictions and Data Cleaning

After assembling the raw Worldscope dataset, a structured data cleaning process was applied to ensure data quality and comparability across firms and countries. Table A summarizes how the sample size is reduced at each stage in terms of firms and firm-year observations.

The initial dataset contains 26,097 firms and more than 2.1 million firm-year observations. The sample is first restricted to the period 1990 to 2008, which substantially reduces the number of observations while keeping the set of firms unchanged. This ensures consistency with the study period and the availability of payout tax data.

Firms in regulated utility and financial industries are then excluded. Specifically, firms in SIC codes 4900 to 4949 and 6000 to 6999, as well as firms without reliable industry classification, are removed. Due to limited SIC coverage, NAICS codes are used for these exclusions. This step reduces the sample to 21,682 firms and 899,118 firm-year observations and removes industries with investment behavior heavily influenced by regulation or financial intermediation.

To ensure sufficient time-series variation, firms are required to have at least four consecutive years of non-missing data on key accounting variables, including dividends, net income, sales, and total assets. This restriction reduces the sample to 8,536 firms and 208,658 firm-year observations and is necessary for reliable within-firm estimation.

Additional filters remove implausible or inconsistent observations. Firm-years with missing or negative values for stock prices, dividends, or share repurchases are excluded, as are observations where dividends exceed sales or average weekly capital gains exceed 1,000 percent. This step reduces the sample to 7,175 firms and 166,288 observations.

Continuous variables are trimmed at the first and ninety-ninth percentiles to limit outliers, and firms with total assets below USD 10 million are excluded. The final sample consists of 7,169 firms and 133,581 firm-year observations.

The resulting dataset is a large unbalanced panel across 25 countries and closely matches the final sample reported in the original study. Remaining differences likely reflect variations in data coverage and variable availability.

Table A: Overview of Sample Reduction Through Cleaning Pipeline

Cleaning Step	Firms	Observations
0: Raw company-year	26,097	2,101,470
1: After `filter_year_range()` (1990–2008)	26,097	1,140,798
2: After `drop_financials, utilities()`	21,682	899,118
3: After `require_min_consecutive_years()`	8,536	208,658
4: After `drop_inconsistent_firms()`	7,175	166,288
5: After `drop_small_firms()` (Final Clean)	7,169	133,581

Panel A reports the country-level composition of firms and firm-year observations in the replication sample. Overall, the replication closely matches the geographic coverage of the original study, including the same set of countries and maintaining broad cross-country representation. However, notable differences remain in the number of firms and observations across countries.

The original study reports a final sample of 7,661 firms and 81,222 firm-year observations, while the replication includes 7,169 firms and 133,581 firm-year observations. Although the number of firms is slightly lower in the replication, the number of observations is substantially higher. This reflects longer or more complete firm-level time series in the replication dataset, likely driven by differences in Worldscope extraction methods and fiscal year alignment.

At the country level, several large economies show meaningful deviations from the original sample. Japan and South Korea account for a much larger share of firm-year observations in the replication, consistent with improved data availability through alternative capital expenditure measures, country-level data extraction, and reconstructed fiscal year information for variables such as EBITDA.

In contrast, the United States has fewer firms and firm-year observations in the replication sample. This reflects stricter data cleaning requirements and the need to extract U.S. firms in multiple batches due to Worldscope download limits, which may have reduced firm coverage despite industry-based filtering.

Overall, differences between the original and replication samples stem from changes in Worldscope coverage over time, download constraints requiring country-level extraction, and variable-specific data issues. Despite these differences, the replication sample remains comparable in terms of country coverage and firm characteristics and is suitable for re-examining the relationship between payout taxation and investment allocation, though sample differences should be considered when interpreting the results.

Panel A: Summary of Firms and Observations by Country

Country	Unique Firms	Observations
Australia	442	6,742
Austria	38	720
Belgium	64	1,180
Canada	553	8,067
Denmark	56	1,024
Finland	72	1,317
France	278	5,111
Germany	291	5,265
Greece	92	1,720
Hungary	11	187
Ireland	31	571
Italy	82	1,556
Japan	1,961	37,216
Mexico	65	1,234
Netherlands	50	936
New Zealand	52	926
Norway	57	1,050
Poland	135	2,372
Portugal	20	370
South Korea	1,104	20,204
Spain	67	1,268
Sweden	184	3,144
Switzerland	110	2,080
United Kingdom	353	6,297
United States	1,001	22,994
TOTAL	**7,169**	**133,581**

3.3 Variable Construction

All variables are constructed to closely follow the definitions used in the original paper to ensure comparability, with any deviations explicitly noted.

Investment is measured using three alternative variables. The main measure is capital expenditures scaled by lagged total assets. Two alternative measures are used for robustness: growth in property, plant, and equipment and total asset growth, both scaled by lagged total assets. These measures capture investment from different accounting perspectives.

Tax variables are based on country-year data on dividend and capital gains taxation. Dividend taxes reflect personal income tax rates adjusted for imputation systems and exemptions. The main tax measure is the effective payout tax, defined as a weighted average of dividend and capital gains taxes using payout-based weights. An alternative average payout tax is constructed using statutory rates and the same weighting scheme.

Internal financial resources are proxied using operating cash flow, cash holdings, and EBITDA, each scaled by total assets. These measures capture different aspects of firms' internal funding capacity and are used in robustness analyses.

Standard control variables include leverage, Tobin's q, and sales growth to account for differences in investment opportunities. Firm size is included as an additional control and is measured as the percentile rank of total assets within each country-year, capturing relative firm size while accounting for cross-country scale differences.

3.4 Comparison of Summary Statistics with the Original Paper

Panel B and Panel C report summary statistics for the main investment and financial variables. Overall, the distributions are broadly comparable to those in the original study, though some differences in levels and dispersion are evident and consistent with earlier differences in sample composition and data coverage.

For the main investment measure, the replication shows slightly higher mean and median investment rates, along with substantially greater dispersion. Similar patterns appear for PPE growth and asset growth, where central tendencies are comparable but variability is higher. These differences likely reflect expanded firm-year coverage in large countries and differences in fiscal year alignment and capital expenditure data availability.

Tax variables are highly comparable across samples. Mean dividend and effective payout tax rates and their distributions closely match those in the original paper, as these variables are constructed from the same country-level sources. Minor differences likely arise from changes in firm-year weighting.

Measures of internal financial resources, including cash flow, cash holdings, and EBITDA, show similar central tendencies but higher dispersion in the replication, particularly for cash flow and EBITDA. Control variables display comparable patterns, with similar leverage statistics and a wider dispersion of Tobin's q in the replication. Firm size, measured as a country-year percentile rank, has a median close to 0.5 by construction, with slight differences due to operationalization.

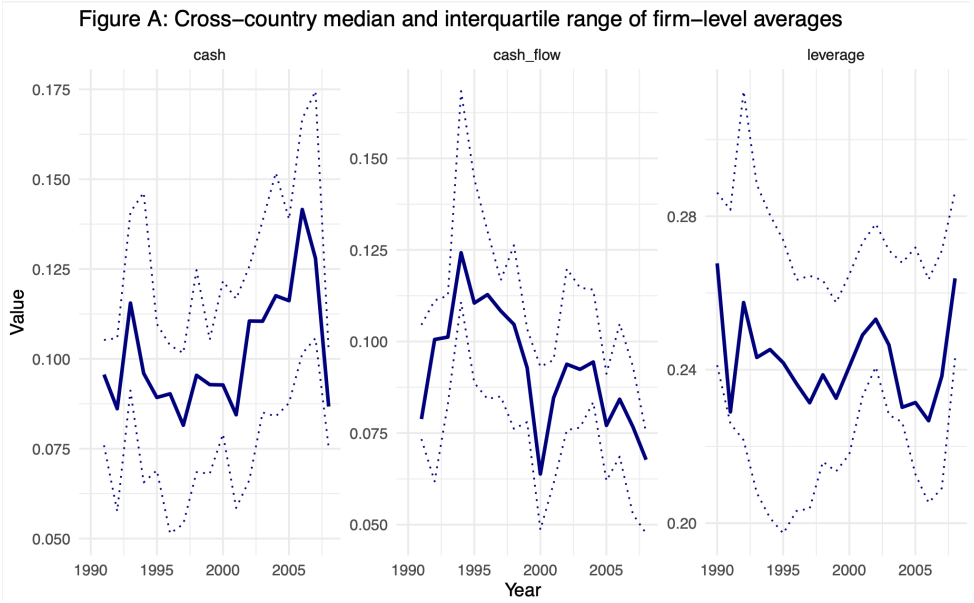
In sum, despite higher variability and a larger number of observations, the replication sample remains comparable to the original. Greater dispersion may reduce statistical significance in some regressions but does not undermine the validity of the empirical approach. Figures A and B further illustrate the distributions of key financial and tax variables.

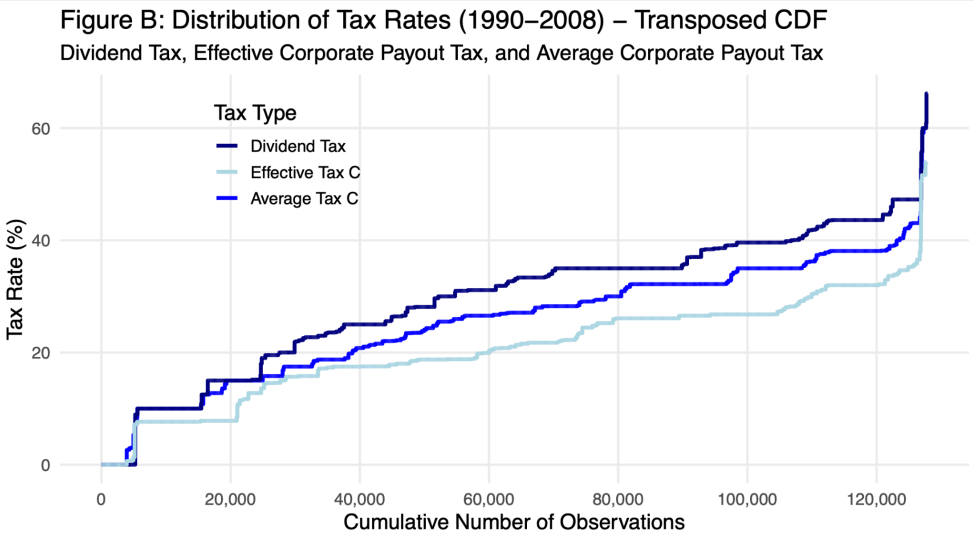
Panel B: Summary Statistics for Investment Variables

Variable	N	Mean	SD	P10	Median	P90
Investment	42,140	0.0897	0.3612	0.0115	0.0523	0.1812
PPE_Growth	65,200	0.0598	8.3447	−0.0582	0.0062	0.1312
Asset_Growth	68,616	0.1521	4.9011	−0.1602	0.0516	0.3643

Panel C: Summary Statistics for Financial Variables

Variable	N	Mean	SD	P10	Median	P90
div_tax	127,907	29.4496	12.1619	10.0000	32.8571	43.6000
eff_tax_c	127,815	20.6741	8.9669	7.6536	21.0443	31.9932
avg_tax_c	127,815	25.5372	10.5116	10.0000	27.0890	38.0938
cash_flow	42,732	0.0780	1.0233	−0.0386	0.0829	0.2148
cash	67,842	0.1192	0.2606	0.0110	0.0740	0.2625
q	63,923	1.5690	32.0287	0.4154	0.8553	2.0144
leverage	70,663	0.2723	0.9571	0.0220	0.2378	0.5363
size	75,960	0.5000	0.2903	0.0979	0.5000	0.9021





4. Tests and Results

4.1 Difference in investment between high and low cash flow firms around payout tax changes

Following the original study, our goal is to compare the evolution of investment among firms with high internal resources versus low internal resources around exogenous changes in the effective payout tax rate. To construct the Difference-in-Difference framework, we identify major payout-tax reforms across 25 countries from 1990–2008 using the country-weighted average payout tax rate. An event qualifies as a tax reform when the payout tax changes by at least 3 percentage points, and the corresponding country-year contains at least 30 firms to ensure adequate statistical power.
To preserve clean identification, we exclude (i) overlapping opposite-direction tax changes within two years, (ii) events that overlap with large corporate-tax reforms, and (iii) short-lived or easily anticipated changes, such as temporary reforms. After applying these filters, we identify 29 tax

change events, consistent with the findings in the original paper. These events, described in Table B, form the basis for our Difference-in-Difference analysis.

Table B: Payout tax changes events

country_code	event_year	event_type	delta_tax_pp	avg_tax_c	n_companies
AUS	1993	increase	6.210	28.242	442
BEL	2002	decrease	−8.473	13.596	63
CAN	1993	increase	3.135	42.132	550
CAN	1996	decrease	−5.516	37.557	511
CAN	2001	decrease	−3.397	29.400	339
CAN	2006	decrease	−5.334	24.065	316
CHE	1998	increase	18.997	42.440	109
DEU	1994	increase	5.256	27.434	290
DEU	1995	increase	4.741	32.175	290
DEU	2001	decrease	−7.027	21.361	273
DNK	1993	increase	10.525	40.000	56
DNK	2001	increase	3.000	43.000	52
ESP	1996	decrease	−3.785	34.382	67
ESP	1999	decrease	−8.754	25.628	67
ESP	2003	decrease	−3.283	21.908	66
FIN	2005	increase	14.185	17.220	70
FIN	2006	increase	3.259	20.479	70
FRA	1997	increase	3.655	39.211	276
FRA	2002	decrease	−3.702	33.877	262
ITA	1998	decrease	−9.960	12.500	81
JPN	2000	increase	5.909	38.094	1,958
JPN	2004	decrease	−28.094	10.000	1,957
NLD	2001	decrease	−39.655	20.345	49
NOR	2006	increase	28.000	28.000	54
POL	2001	decrease	−3.597	10.790	121
POL	2004	increase	8.210	19.000	104
USA	1993	increase	3.110	32.196	955
USA	1997	decrease	−5.107	27.089	945
USA	2003	decrease	−11.727	15.000	928

Subsequently, we replicated the Difference-in-Difference results shown in Table 4. The results for tax increase events are displayed in Panel A, while the ones related with tax decrease events are shown in Panel B.

Using the same approach, we compared average investment rates of high-cash-flow (internally financed) firms and low-cash-flow (externally financed) firms before and after major payout-tax changes of at least 3 percentage points across 25 countries from 1990–2008.

The results follow the expected pattern. When payout taxes increase, the investment gap between high- and low-cash-flow firms widens, indicating that firms relying on external equity reduce investment relative to those with abundant internal funds. Overall, the findings are consistent with the Tax-Wedge Theory: higher payout taxes raise the cost of external equity and “lock in” investment within firms rich in internal resources.

Table 4

	Low CF	High CF	Difference (High–Low)
Panel A: Tax increase events			
Pre-reform (t−4; t−1)	−0.0165	0.0195	0.0361
Post-reform (t; t+2)	−0.0220	0.0221	0.0441
Difference between periods	−0.0055	0.0026	0.0080
Panel B: Tax decrease events			
Pre-reform (t−4; t−1)	−0.0208**	0.0212	0.042**
Post-reform (t; t+2)	−0.0290***	0.0314	0.0604
Difference between periods	−0.0082	0.0102	0.0184

Although the Difference in Difference results follow the predicted relative pattern, high cash flow firms also respond to tax changes, which deviates from the strict theoretical prediction. Several mechanisms may explain this. Tax reforms often coincide with business cycle conditions, which the original study addresses by using demeaned investment to isolate relative firm level responses. Agency problems may also play a role, as higher payout taxes reduce payout pressure and can lead to overinvestment. In addition, investment opportunities may shift toward cash rich firms if cash poor firms reduce investment. Short lived or anticipated reforms may induce intertemporal tax arbitrage, and general equilibrium effects may affect all firms following tax changes, even those not directly exposed to payout taxes.

4.2 Linear Regressions Results

We extend the analysis by replicating the linear regressions from Table 5 of the original paper, regressing investment on the interaction between payout taxes and internal funds, firm controls, firm fixed effects, and country-year fixed effects. Controls include cash flow, size, Tobin's q, and leverage, while the fixed effects account for macroeconomic conditions.

The replication confirms the main prediction. The interaction between payout taxes and cash flow is positive, indicating that higher payout taxes strengthen the dependence of investment on internal funds, consistent with the tax wedge mechanism. The estimates are statistically weaker than in the original study due to fewer observations, but the qualitative results are unchanged.

Table 6 provides a robustness check using EBITDA as an alternative measure of internal funds and yields consistent results. Table 7 also includes the interactions of cash flow with both country and year indicator variables.

Table 5: Firm investment and internal resources under various tax regimes

	Dividend tax rate	Country-weighted effective tax rate	Country-weighted average tax rate
Cash flow × Tax	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Cash flow	0.061**	0.074***	0.066**
	(0.021)	(0.021)	(0.022)
Sales growth	0.013***	0.013***	0.013***
	(0.002)	(0.002)	(0.002)
Leverage	0.087***	0.087***	0.087***
	(0.006)	(0.006)	(0.006)
Size	−0.028**	−0.028**	−0.028**
	(0.009)	(0.010)	(0.009)
Q	0.012***	0.012***	0.012***
	(0.001)	(0.001)	(0.001)
Num. Obs.	31,226	31,226	31,226
R^2	0.588	0.588	0.588

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Firm investment and internal resources under various tax regimes—alternative measures

	Cash × Dividend tax	EBITDA × Dividend tax	Cash × Effective tax C	EBITDA × Effective tax C	Cash × Average tax C	EBITDA × Average tax C
Cash × Tax	0.002*		0.005*		0.004**	
	(0.001)		(0.002)		(0.001)	
EBITDA × Tax		0.000		0.000		−0.000
		(0.000)		(0.000)		(0.000)
Cash	0.011		−0.004		−0.028	
	(0.021)		(0.024)		(0.028)	
EBITDA		0.003		0.003		0.005
		(0.003)		(0.003)		(0.004)
Sales growth	0.016**	0.016*	0.016**	0.016*	0.016**	0.016*
	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)
Leverage	0.063***	0.053***	0.063***	0.053***	0.063***	0.053***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Size	−0.032**	0.004	−0.031**	0.004	−0.031**	0.004
	(0.010)	(0.013)	(0.010)	(0.013)	(0.010)	(0.013)
Q	0.012***	0.013***	0.012***	0.013***	0.012***	0.013***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Num. Obs.	9,477	9,477	9,477	9,477	9,477	9,477
R^2	0.619	0.617	0.619	0.617	0.620	0.617

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Firm investment and internal resources under various tax regimes—controlling for country-year and year-country cash flow effects

	Dividend tax rate	Country-weighted effective tax rate	Country-weighted average tax rate
Cash flow × Tax	0.001	0.002	0.002
	(0.001)	(0.002)	(0.001)
Sales growth	0.012***	0.012***	0.012***
	(0.002)	(0.002)	(0.002)
Leverage	0.086***	0.086***	0.086***
	(0.005)	(0.005)	(0.005)
Size	−0.026**	−0.026**	−0.026**
	(0.009)	(0.009)	(0.009)
Q	0.012***	0.012***	0.012***
	(0.001)	(0.001)	(0.001)
Num. Obs.	31,226	31,226	31,226
R^2	0.591	0.591	0.591

$+ p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

An auxiliary prediction of Tax Wedge Theory is that high taxes should reduce the amount of equity issues. We replicated this analysis in Table 8, representing the regression results for external financing behavior, estimated over the 1990–2008 period. The dependent variable is the value of new equity issues to start-of-year total assets, and we included the variable stock price appreciation to control for market timing. The results are consistent with the original paper. In particular, as predicted, we found a negative relationship between payout tax and amount of equity issues.

Table 8: External equity financing and tax regimes

	Dividend tax rate	Country-weighted effective tax rate	Country-weighted average tax rate
Tax	−0.000+	−0.001+	−0.001
	(0.000)	(0.001)	(0.000)
Cash flow	0.151***	0.151***	0.151***
	(0.010)	(0.010)	(0.010)
Stock price appreciation	0.009***	0.009***	0.009***
	(0.002)	(0.002)	(0.002)
Sales growth	0.021**	0.021**	0.021**
	(0.006)	(0.006)	(0.006)
Leverage	−0.012+	−0.012+	−0.012+
	(0.006)	(0.006)	(0.006)
Size	0.057**	0.056**	0.055**
	(0.019)	(0.019)	(0.019)
Q	0.017***	0.017***	0.017***
	(0.001)	(0.001)	(0.001)
Num. Obs.	10,879	10,879	10,879
R^2	0.541	0.541	0.541

$+ p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5. Robustness Tests

5.1 Measurement Robustness: different measures of internal funds and alternative scaling for investment

To test the robustness of our model, we performed several tests. In particular, in Table 6 we showed how we checked for measurement robustness by using EBITDA as different measure of internal funds.

Additionally, in Table A.VII we used alternative scaling for investment. Panel A shows the results for PPE growth and Assets growth, while Panel B considers scaling by PPE or fixed assets instead of total assets. The overall results are consistent with our previous analysis.

Table A.VII: Alternative measures for investment

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: PPE growth and Assets growth						
Cash Flow × Tax	0.009***	0.015***	0.011***	0.010***	0.016***	0.012***
	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Num. Obs.	27,602	27,602	27,602	27,602	27,602	27,602
R^2	0.282	0.283	0.282	0.588	0.589	0.588
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country–Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year × Cash Flow	Yes	Yes	Yes	Yes	Yes	Yes
Country × Cash Flow	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Capex/PPE and Capex/FA						
Cash Flow × Tax	0.006**	0.012**	0.008**	0.003***	0.004***	0.003***
	(0.003)	(0.005)	(0.003)	(0.000)	(0.000)	(0.000)
Num. Obs.	27,602	27,602	27,602	27,602	27,602	27,602
R^2	0.586	0.586	0.586	0.607	0.607	0.607
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country–Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year × Cash Flow	Yes	Yes	Yes	Yes	Yes	Yes
Country × Cash Flow	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.2 Sample Robustness: checking for US and Japan dominance effects

Since in our analysis we identified the most issues with data points from Japan and the US, we tested our results in a subsample excluding the two countries, to control for dominance effects. Our results are shown in Table A.V.

Table A.V: Checking US and Japan dominance effects

	Dividend tax rate	Country-weighted effective tax rate	Country-weighted average tax rate
Cash flow × Tax	0.000	−0.001	−0.000
	(0.001)	(0.001)	(0.001)
Cash flow	0.088**	0.103***	0.099***
	(0.029)	(0.027)	(0.024)
Sales growth	0.011***	0.011***	0.011***
	(0.002)	(0.002)	(0.002)
Leverage	0.097***	0.097***	0.097***
	(0.007)	(0.007)	(0.007)
Size	−0.017	−0.017	−0.017
	(0.014)	(0.014)	(0.014)
Q	0.012***	0.012***	0.012***
	(0.001)	(0.001)	(0.001)
Num. Obs.	21,265	21,265	21,265
R^2	0.581	0.581	0.581

$+ p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.3 Debt Substitution

As a final robustness test, we checked whether firms might substitute debt for equity if payout taxes rise. To perform this analysis, we examined whether firms' leverage or debt issuance offsets equity-based effects. As shown in Table A.XIII, the results prove little evidence that debt financing replaces equity in response to tax changes.

Table A.XIII: Change in leverage and tax regimes

	Dividend tax rate	Country-weighted effective tax rate	Country-weighted average tax rate
Payout Tax	−0.000	−0.001	−0.000
	(0.000)	(0.001)	(0.001)
Corporate tax	0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)
Cash flow	−0.236***	−0.236***	−0.236***
	(0.040)	(0.040)	(0.040)
Sales growth	0.015	0.015	0.015
	(0.010)	(0.010)	(0.010)
Size	0.237***	0.236***	0.236***
	(0.045)	(0.045)	(0.045)
Q	0.048***	0.048***	0.048***
	(0.005)	(0.005)	(0.005)
Num. Obs.	10,879	10,879	10,879
R^2	0.161	0.161	0.161

$+ p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6. Conclusions and Implications

This replication provides evidence that payout taxes play a significant role in shaping the allocation of investment across firms. Higher payout taxes are associated with a relative concentration of

investment within cash-rich firms that can finance investment internally, while firms that rely on external equity reduce investment. In this sense, payout taxes tend to “lock in” investment within internally financed firms and disadvantage firms that depend on external funding, even when profitable investment opportunities exist.

The results strongly support the tax wedge theory. Payout taxes create a cost-of-capital differential between internal and external equity financing, lowering the effective cost of capital for firms with access to retained earnings. As payout tax rates increase, firms’ investment decisions become more dependent on internal financial resources. Consistent with this mechanism, financially constrained “old view” firms are found to be relatively more sensitive to changes in payout taxes than “new view” firms that finance investment internally.

These findings have important implications for tax policy and capital allocation. Payout tax reforms affect not only the level of investment but also its distribution across firms. High payout taxes may distort capital allocation by favoring mature, cash-generating firms and reducing investment in equity-dependent sectors, potentially limiting growth among younger or more financially constrained firms. Policymakers should therefore consider how payout taxes influence financing channels and firm heterogeneity, rather than focusing solely on aggregate investment outcomes. Reducing payout taxes may help alleviate financing frictions and stimulate investment among constrained firms, thereby improving capital allocation efficiency and supporting broader economic growth.

7. Model Limitations and Future Research Directions

While the replication supports the tax wedge theory, several limitations remain. The framework abstracts from debt financing, dynamic investment adjustments, tax arbitrage behavior, endogeneity of tax reforms, and agency and governance issues. Incorporating these elements in future research could improve causal interpretation and provide a more comprehensive understanding of how payout taxes affect corporate investment and financing decisions.

8. References

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- AI Usage: this report made limited use of AI-assisted tools, which were employed for grammar correction, language refinement and coding assistance; all substantive analyses and interpretations are the authors' own.