Does leverage create or destroy value in the long run? A re-examination of Nissim and Penman (2001)

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Abstract

Purpose: This paper explores the crucial role of financial statement analysis for equity valuation, reaffirming and extending Nissim and Penman's seminal findings (2001).
Design and methodology: We use a worldwide dataset comprising 82,481 observations across 33 countries from 2005 to 2022 to provide updated benchmarks to Nissim and Penman's (2001) findings and facilitate forecasting and valuation. Our methodology involves both cross-sectional and time-series analyses. The cross-sectional analysis aggregates financial ratios over all firms and years, while the time-series analysis tracks the median values of portfolios over successive five-year periods.
Findings: Our analyses reveal that value creation and growth dynamics are intricately linked, with performance metrics significantly influenced by operating and Financial Leverage. The median Return On Common Equity (ROCE) and Return on Net Operating Assets (RNOA), spread, and net borrowing costs collectively indicate a generally positive leverage effect on firm returns. Additionally, our findings demonstrate the importance of differentiating between operating and financing assets and liabilities when assessing Financial Leverage.
Contribution: Overall, the findings contribute valuable insights for managers and academics. They offer a deeper understanding of how leverage affects firm performance, which can inform strategic decision-making to enhance value creation. This paper extends the empirical foundation for equity valuation and financial forecasting, providing relevant benchmarks for financial analysis.

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Doi: 10.3280/FR2024-002003

Keywords: financial statement analysis, ratio analysis, equity valuation, operating leverage, financial leverage

JEL: G32, H25, H26, M41

First submission: 10 June 2024. Accepted: 4 November 2024.

1. Introduction

Ever since the seminal work of Modigliani and Miller (1958, 1963), the strategic use of leverage has been a subject of scholarly and practical interest in accounting and finance. This paper investigates whether leverage contributes to value creation or disruption in the long run. To this end, we replicated the seminal work of Nissim and Penman (2001), "*Ratio Analysis and Equity Valuation*", to examine the actual impact of leverage on firm performance over long time series and across countries.

Before embarking on this exploration, it is important to recognize that leverage can be analyzed in different ways. Dammon and Senbet (1988) synthetized empirical studies investigating the cross-sectional relationship between investment-related tax shields and Financial Leverage, finding that valuation models may be misspecified if they fail to adequately control for variations in production technologies across firms. Put differently, the concept of leverage–as the authors posit–goes beyond the traditional Debt/Equity ratio to adhere to the well-known DuPont scheme. This scheme, in turn, offers a framework for researchers to construct forecasting and accounting-based valuation models (Nissim & Penman, 2001). In this framework, researchers can distinguish between Financial Leverage (FLEV), which is the ratio of the difference between financial obligations and financial assets divided by the difference between net operating assets and net financial obligations (Nissim & Penman, 2001), and operating leverage, which is defined as the fixed and quasi-fixed costs scaled by total assets (Chen et al., 2019). This empirical refinement not only leads to a more transparent measure of operational profitability, but also clarifies balance-sheet leverage by differentiating between the leverage generated by financing and operational activities. Additionally, the approach identifies growth as a feature of operational, not financial, activities and develops growth metrics based on operational analysis. Among these metrics, the Return On Common Equity (ROCE) is likely the most widely used, whose construction aims to highlight the return on operations and the additional contribution from Financial Leverage (Nissim & Penman, 2001). In our subsequent analyses, we thus focus on this metric as a proxy for firm growth.

Empirically, we use data from Compustat Global, which covers public firms during 2005-2022, with 82,481 observations from 13,529 unique firms across 33 countries. This dataset encompasses about 90% of the world's market capitalization over the sample period and aligns with prior law and finance studies (e.g., La Porta et al., 2000). Our analysis employed a two-part methodology: a cross-sectional analysis, focusing on descriptive statistics of ratios across all firms and years, and a time-series analysis that created ten portfolios in the base year (2005) based on specific measures and tracking median values over subsequent five-year periods until 2022.

We uncovered a positive impact of leverage on returns, with key metrics like ROCE and FLEV emphasizing the importance of distinguishing between operating and financing aspects. Adjusted Net Borrowing Costs (NBC) aligned with typical borrowing rates, while positive trends in change in Common Shareholders' Equity (ΔCSE), change in Net Operating Assets (ΔNOA), and change in Sales (ΔSALE) suggest growth. These results provide a clearer understanding of financial metrics' interdependencies and evolution over time.

This study makes several contributions to the existing literature. First, it explores the evolution of financial ratios and their impact on firm performance over time, while considering various industry sectors and periods. Previous research has examined different economic aspects of leverage, such as its potential tax advantages (Dhaliwal et al., 2006; Stickney & McGee, 1982) and the effects of investment-related tax shields on leverage (Dhaliwal et al., 1992; Dammon & Senbet, 1988; Pittman, 2002). This study extends those analyses by focusing on the impact of leverage over a long-time horizon from 2005 to 2022 – a period that has not been extensively covered. It also introduces a cross-country perspective, analyzing data from 33 countries to understand how diverse competitive forces and market maturities influence the role of leverage. The findings illuminate how leverage affects long-term value creation, particularly in times of economic uncertainty and geopolitical tension. Thus, the paper offers critical information to managers and stakeholders looking to make informed strategic decisions and enhance corporate value creation.

The remainder of this paper is organized as follows: Section 2 provides the theoretical background for the topic. Section 3 introduces the empirical strategy employed. Section 4 presents the results, and Section 5 discusses additional analyses. Finally, Section 6 concludes the paper.

2. Theoretical background

Firms consistently experience periods of prosperity, uncertainty, and volatility throughout their lifespan. As firms strive to optimize their financial

structures to create long-term value, a pivotal question emerges: Does leverage create or destroy value in the long run? This question is particularly relevant given the current state of the economy, characterized by inflationary pressures and revived geopolitical tensions, which may significantly impair firms' long-term value creation plans (e.g., Bafundi & Imperatore, 2023). The relationship between these economic conditions and corporate financial strategies is intricate and multifaceted. In this paper, we re-examine Nissim and Penman's (2001) seminal findings on whether and how leverage impacts firm performance by focusing on the ROCE components and growth.

Our investigation aims to shed light on the connection between leverage and firm performance across a large cross-section of countries over an extended period. Additionally, we provide novel evidence for managers concerned with creating value for corporate stakeholders. By focusing on a diverse set of economic environments and countries, our study highlights the varying effects that leverage can have on firm performance based on varying macroeconomic and institutional conditions. Through our comprehensive approach, we present a clear understanding of how leverage can either support or hinder a firm's long-term objectives. Ultimately, our findings offer practical implications for corporate financial management in today's complex and dynamic economic environment.

2.1. How leverage contributes to value creation and growth

At the core of our research question is a fundamental exploration into the relationship between leverage and corporate value creation and growth, whose underlying dynamic is far from obvious. For example, Lang et al. (1996) found that leverage negatively impacts future growth for firms with a low Tobin's q ratio, but not for those with a high q ratio. This effect is apparent in firms with less recognized or less valuable growth opportunities, where debt overhang outweighs its potential benefits. These findings contradict with Modigliani and Miller's (1958) results, which suggested that operating activities generate value while financing activities hold zero net present value, except for potential tax effects. The value-irrelevance of debt, as Modigliani and Miller posit, is further supported by the recognition that financial assets and liabilities, by Financial Accounting Standards Board (FASB) Statement No. 115, titled "Accounting for Certain Investments in Debt and Equity Securities" closely align with market values, which should already be embedded in market prices. As Feltham and Ohlson (1995) further outlined, the ensuing accounting-based valuation model introduces a clear understand-

ing of the leverage effect, presenting two distinct measures, one originating from financing activities and the other from operating activities. Notably, this model attributes growth to *mostly* operating activities.

When we consider growth stocks, these dynamics become even more significant. Growth stocks, often characterized by expectations of high long-term earnings and volatility, are sensitive to leverage in distinct ways. For these stocks, especially those in early stages or high-growth sectors, the negative impact of leverage on growth can be pronounced. The covariance between equity growth and future Return on Equity (ROE) can account for a substantial portion of equity value, particularly in firms with high volatility and growth potential (Nissim, 2024). Relatedly, Dickinson's (2001) findings also underscored that a firm's life cycle also plays a role in understanding the relationship between Financial Leverage and corporate outcomes. The author maintains that a firm's approach to leverage evolves across distinct stages – introduction, growth, maturity, shake-out, and decline. These stages may necessitate using financial and operating leverage differently *and* strategically for growth. Recognizing that a firm's financial strategies are intertwined with operating phases, our empirical analysis will provide insights into why Financial Leverage is crucial in early stages, how it adapts during growth, and why it needs to be carefully considered during maturity and potential decline. Our analysis will also shed light on how financial leveraging strategies contribute to or mitigate financial distress at various points in a firm's life cycle.

2.2. How leverage is connected to value creation with ROCE

To explore how leverage contributes to value creation and growth, we focus on the fundamental relationship between leverage and corporate value in relation to operating and financing activities. Building on this foundation, we now concentrate on a pivotal metric in assessing corporate profitability and performance: ROCE.

While ROE measures the profits generated on shareholders' equity, ROCE provides a more comprehensive view by evaluating how efficiently a company uses all available capital to generate profits (Rutherford, 2002). A higher ROCE signifies efficient use of capital, indicating stronger corporate performance (McClure, 2010), and a higher ROCE suggests higher earnings per unit of capital employed, while a lower value indicates lower profitability (Singh & Sur, 2020). By substituting Earnings Before Interests and Taxes (EBIT) for net income in the ROCE calculation (see Section 3.2 for a more

detailed explanation), we can better understand the relationship between leverage and a firm's ability to generate returns on invested capital, which is also important for stakeholders concerned with identifying firms with strong earning potential. In this regard, Li and Nissim (2014) highlighted that the covariance between equity growth and future ROE accounts for over 10% of equity value on average – with a larger impact for small, low-profitability, high-volatility, or high-growth firms. This effect can exceed 30% for small firms; thus, ignoring it can potentially lead to significant undervaluation.

3. Empirical strategy

3.1. Data

We start with the universe of public firms with data in Compustat Global from 2005 to 2022, amounting to 649,266 firm-year observations (see Table 1). To ensure data quality and relevance, we deleted observations where the fiscal year was less than 12 months and those that had missing (or negative) values for sales, common equity, and total assets. Additionally, we excluded any observations with missing data for location and industry. Further, we removed companies in the financial industry, i.e., those with a Standard Industrial Classification (SIC) code of 6, to avoid the potential influence of banking regulations.

Table 1 - Sample selection

	Sample
The universe of firm-year observations available in COMPUSTAT Global during 2005-2022.	649,266
Reason for dropping	**Obs. dropped**
Length of the fiscal year less than 12 months	6,780
Missing industry code (SIC)	1,551
Keep if final statement and not quarterly report	950
Drop Financial Companies	118,761
Drop if Equity less (or equal) to 0, or missing	23,601
Drop if Sales and Assets (or equal) to 0, or missing	17,122
Drop if Accounting Standards are not IAS/IFRS	237,086
Missing Accounting data	75,045
Interest expense (revenues) higher than FO (FA)	43,031
Negative NOA	299
Missing Rule of Law information	42,559
Final sample	**82,481** [t = 2005, 2022] [firms = 13,529]

Next, we only retained those firms that adhered to International Accounting Standards (i.e., IAS/IFRS). This criterion allowed us to eliminate any potential biases arising from differences in accounting standards across various regions (i.e., Raffournier, 2013; Mechelli & Cimini, 2014). Furthermore, we trimmed continuous financial ratios at the one percent tail to mitigate the effect of outliers. This approach helped to maintain the robustness of our findings. Finally, we sought to enhance the accuracy of our data by excluding observations that exhibited anomalous net financial expenses relative to their net financial obligations. Consequently, our refined sample comprises 82,481 observations, encompassing 13,529 unique firms.

Table 2 presents the distribution of our sample by year and by one-digit SIC industry code (Panel A) and by year and ISO3 country code (Panel B). The most substantial observations can be found in the manufacturing sectors (SIC 2 and SIC 3) and the Transportation, Communications, Electric, Gas, and Sanitary services sector (SIC 4). In contrast, the Agricultural, Forestry, Fishing (SIC 0) and Public Administration (SIC 9) sectors showed the lowest observations. Concerning country distribution, most of the observations derived from the Republic of Korea, the United Kingdom, Hong Kong, Germany, France, and Australia. On the other hand, the lowest number of observations came from Argentina, the United States of America, Austria, and Portugal.

Table 2 – Sample distribution

Panel A: Sample distribution by year-industry

Industry	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
SIC = 0	10	18	13	17	27	44	53	55	55	57	49	43	52	45	52	58	56	49	753
SIC = 1	130	170	203	230	276	353	396	454	454	444	424	425	414	434	480	467	424	414	6,592
SIC = 2	482	573	586	623	717	875	1,098	1,210	1,163	1,211	1,147	1,166	1,183	1,211	1,298	1,288	1,225	1,276	18,332
SIC = 3	657	751	775	836	886	1,040	1,464	1,618	1,583	1,608	1,604	1,579	1,584	1,658	1,829	1,749	1,716	1,798	24,735
SIC = 4	244	275	306	354	428	554	647	673	669	682	687	677	679	684	712	685	633	644	10,233
SIC = 5	221	251	282	283	339	432	501	532	514	542	553	553	538	570	627	602	573	614	8,527
SIC = 7	284	370	421	465	441	444	478	508	509	515	529	548	582	630	769	702	623	726	9,544
SIC = 8	78	99	105	108	109	128	155	162	160	172	179	198	198	217	256	236	217	239	3,016
SIC = 9	20	19	22	23	27	43	45	54	51	54	48	49	50	50	49	49	48	48	749
Total	2,126	2,526	2,713	2,939	3,250	3,913	4,837	5,266	5,158	5,285	5,220	5,238	5,280	5,499	6,072	5,836	5,515	5,808	82,481

Notes. SIC = 0 Agriculture, Forestry and Fishing; SIC = 1 Mining & Construction; SIC = 2 & 3 Manufacturing; SIC = 4 Transportation, Communications, Electric, Gas and Sanitary service; SIC = 5 Wholesale & Retail trade; SIC=7 & 8 Services; SIC = 9 Public Administration.

Panel B: Sample distribution by year-country

Country	2005	2006	2007	2008	2009	2010	2011	2,012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
ARG	0	0	0	0	0	0	1	25	33	40	31	32	30	28	30	18	18	21	307
AUS	16	50	29	23	180	250	240	249	251	244	225	218	219	231	267	273	240	226	3,431
AUT	43	48	46	47	42	41	45	46	35	40	38	39	36	35	38	34	33	31	717
BEL	64	70	68	70	62	57	58	60	58	54	56	49	47	47	46	40	40	40	986
BRA	1	0	0	11	19	163	175	190	189	188	183	181	183	196	198	181	187	196	2,441
CAN	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	3
CHE	93	87	96	105	82	76	76	76	70	67	60	64	57	63	66	63	55	64	1,320
CHL	0	0	1	1	25	95	96	98	103	103	102	100	96	93	102	89	90	92	1,286
CHN	78	100	113	140	162	163	191	230	242	257	273	295	285	314	374	372	381	394	4,364
DEU	257	285	294	325	270	256	272	246	229	219	194	186	188	203	218	198	199	207	4,246
DNK	52	67	62	70	76	66	63	63	53	51	51	50	58	55	58	53	51	61	1,060
ESP	56	79	78	81	79	80	79	77	67	69	73	75	72	65	63	66	61	62	1,282
FIN	82	84	92	95	82	78	75	82	83	74	79	74	73	70	77	71	73	80	1,424
FRA	261	307	284	295	263	234	239	222	221	216	221	208	207	190	187	177	160	159	4,051
GBR	324	413	570	579	470	413	399	409	376	355	376	353	330	327	376	342	282	314	7,008
GRC	122	134	137	151	164	153	150	124	109	100	92	75	81	69	77	83	57	66	1,944
HKG	35	40	56	70	328	329	402	424	450	467	458	487	476	506	621	609	553	573	6,884
ITA	141	176	173	183	183	168	156	154	145	149	144	148	156	152	152	149	146	146	2,821
JPN	0	0	0	0	0	2	4	5	12	39	55	84	101	132	134	116	146	159	989
KOR	0	0	0	0	0	24	524	807	825	852	832	844	900	952	1,071	1,034	1,012	1,126	10,803
MEX	1	3	1	2	5	49	54	71	60	68	65	65	74	72	78	79	70	71	888
MYS	4	5	9	16	25	231	290	335	330	374	367	367	364	394	403	419	406	382	4,721
NLD	69	79	82	71	72	61	69	67	57	47	44	40	41	50	51	43	35	34	1,012
NOR	72	92	98	122	111	108	104	93	89	94	90	84	77	89	106	82	92	108	1,711
PER	15	11	10	8	9	48	56	57	61	59	57	48	53	54	56	52	45	43	742
PHL	20	21	3	7	61	77	67	74	75	78	80	92	89	101	107	96	95	100	1,243
POL	100	119	152	183	198	205	222	228	219	215	219	225	209	197	201	172	138	137	3,339
PRT	28	31	32	30	30	30	30	28	26	25	24	20	22	24	23	23	22	20	468
SGP	10	14	12	25	37	188	252	259	241	249	246	246	248	257	274	243	207	213	3,221
SWE	143	154	185	188	159	150	165	161	173	168	167	169	175	186	218	194	177	222	3,154
THA	2	0	0	0	1	14	124	135	140	175	182	183	188	199	228	290	275	290	2,426
TUR	35	53	24	34	47	99	155	167	130	142	130	131	140	142	168	171	166	165	2,099
USA	2	4	6	6	7	5	4	4	6	7	5	6	5	6	4	4	3	6	90
Total	*2,126*	*2,526*	*2,713*	*2,939*	*3,250*	*3,913*	*4,837*	*5,266*	*5,158*	*5,285*	*5,220*	*5,238*	*5,280*	*5,499*	*6,072*	*5,836*	*5,515*	*5,808*	*82,481*

3.2. Variables of interest

Following Nissim and Penman (2001), we focused on the determinants of ROCE and growth. To gain a comprehensive understanding, we decomposed ROCE as follows:

$$ROCE = RNOA + (FLEV \times SPREAD)$$

where RNOA is Operating Income (OI) divided by NOA, FLEV is Net Financial Obligations (NFO) divided by Common Equity (CSE), and SPREAD represents the difference between RNOA and NBC. As indicated,

ROCE is driven by the return on operations, amplified by the additional return generated from leveraging financial activities (which is represented by the product of FLEV and SPREAD). This decomposition highlights the dual impact of operating efficiency and Financial Leverage on the overall return.

Notably, RNOA can provide more detailed insights by being further decomposed into the following components that drive returns:

$$ROCE=(PM\times ATO) + (FLEV\times SPREAD)$$

where Profit Margin (PM) is OI divided by Net Revenues, and ATO is Net Revenues divided by NOA (showing the asset turnover ratio). This second decomposition underscores how operational efficiency, through profit margin, asset turnover, and Financial Leverage, contributes to overall ROCE. Appendix A provides detailed descriptions of all the variables utilized in our models, ensuring clarity and precision in our analysis.

Following Nissim and Penman (2001), we calculated balance sheet numbers as averages of beginning and ending amounts for the period under consideration. We excluded negative denominators from the calculations to maintain consistency and accuracy, with the sole exemption for NFO crucial for evaluating Financial Leverage.

This systematic approach to decomposing ROCE and its components enabled a nuanced analysis of how operational performance and financial strategies affect the overall return on common equity.

3.3. Methodology

Our analysis comprises two main parts: (1) a cross-sectional analysis and (2) a time-series analysis. In the first part, we focus on the descriptive statistics of ratios pooled over all firms and years. This involved aggregating data to provide a comprehensive overview of the key financial ratios across the entire dataset. Moreover, by presenting the evolution of the most relevant ratios over time, we could observe trends and patterns that may have emerged throughout the study period. This approach provides a broad picture of firms' financial health and performance across years.

In the second part, we concentrated on the evolution of typical values over time. We created ten portfolios in a base year (2005) based on a given measure, such as a specific financial ratio. We then tracked median values for each portfolio for the following five years. The ranking was performed in 2005 (the base year), 2011, and 2017. Portfolio medians were calculated yearly for the ranking year and the subsequent five years, allowing us to monitor

changes and trends within each portfolio over a substantial period. We conducted the ranking for each five-year period up until 2022. This methodology ensured that our analysis captures both short-term fluctuations and long-term trends, thereby providing a robust understanding of how financial ratios evolve and impact firm performance.

4. Cross-sectional analysis results

This section analyses key financial metrics measured on the pooled sample. Table 3 Panel A provides an overview of the average, median, and various characteristics of the distribution of ratios aggregated across all firms and the entire period. The median ROCE of 7% is proximate to, or even slightly higher than, the conventional assumption of the equity cost of capital. This suggests that firms are generally generating returns that meet or exceed the expected cost of equity. The median RNOA of 6.6% aligns more closely with the average business return, indicating a consistent performance in terms of net operating assets. The median spread stands at a positive value of 2%, highlighting a favorable differential between returns on operating assets and net borrowing costs. Compared to the results of Nissim and Penman (2001), we observed a noticeable decline in overall firm performance. Specifically, Nissim and Penman (2001) reported median values for ROCE and RNOA of 12.2% and 10%, respectively. However, our analysis identified a reduction in the additional value generated above the Net Borrowing Cost (NBC). Nissim and Penman (2001) documented a 3.4% excess return, whereas our sample decreased to 2.1%. This decline suggests that firms have become less efficient in generating returns beyond their borrowing costs.

Table 3 – Descriptive statistics

Panel A: Univariate statistics

Variable	Obs.	Mean	SD	5%	10%	25%	50%	75%	90%	95%
RNOA	82,481	0.058	0.240	-0.254	-0.109	0.011	0.066	0.130	0.229	0.332
NBC	82,481	0.051	0.084	0.002	0.006	0.020	0.039	0.064	0.109	0.164
FLEV	82,481	0.501	0.838	-0.571	-0.378	0.054	0.354	0.792	1.450	2.035
DE	82,481	0.844	0.888	0.014	0.047	0.256	0.608	1.110	1.861	2.550
SPREAD	82,481	0.007	0.257	-0.361	-0.193	-0.050	0.020	0.088	0.197	0.320
PM	82,481	-0.011	0.504	-0.331	-0.114	0.008	0.047	0.100	0.181	0.254
ATO	82,481	1.860	1.970	0.238	0.387	0.761	1.343	2.236	3.649	5.183
ROCE	82,481	0.036	0.266	-0.401	-0.189	-0.005	0.070	0.146	0.240	0.324
ΔCSE	82,481	0.111	0.429	-0.310	-0.172	-0.030	0.051	0.152	0.371	0.677
ΔNOA	82,481	0.154	0.490	-0.257	-0.148	-0.038	0.055	0.201	0.496	0.845
ΔSALE	82,481	0.123	0.428	-0.296	-0.177	-0.041	0.061	0.189	0.408	0.667

Notes. See Appendix A for variable definitions. Variables are trimmed at the 5th and 95th percentiles.

Panel B: Median results by year

Year	RNOA	NBC	FLEV	DE	SPREAD	PM	ATO	ROCE	ΔCSE	ΔNOA	ΔSALE
2005	0.098	0.0397	0.4142	0.6925	0.05	0.0536	1.8721	0.1233	0.1303	0.1276	0.0791
2006	0.1016	0.041	0.4211	0.6537	0.051	0.0554	1.7967	0.1241	0.1045	0.1069	0.1203
2007	0.1024	0.0452	0.4144	0.6349	0.0485	0.0596	1.701	0.1243	0.1103	0.1453	0.1148
2008	0.0687	0.0485	0.4593	0.6757	0.015	0.0413	1.6034	0.0758	0.0264	0.0868	0.0891
2009	0.0549	0.041	0.3902	0.6297	0.0069	0.0368	1.3045	0.0559	0.0429	-0.0083	-0.0423
2010	0.0769	0.0424	0.3595	0.5849	0.0277	0.0534	1.3552	0.0884	0.0849	0.058	0.0999
2011	0.0726	0.0451	0.3587	0.5906	0.0204	0.0488	1.3988	0.0783	0.055	0.0744	0.0931
2012	0.0639	0.0448	0.3471	0.5816	0.0124	0.0439	1.3783	0.0662	0.0432	0.0452	0.0503
2013	0.0623	0.0425	0.3463	0.599	0.013	0.0423	1.3601	0.065	0.0429	0.0371	0.0327
2014	0.0612	0.0408	0.3524	0.5968	0.014	0.0433	1.3432	0.0633	0.0443	0.0437	0.0402
2015	0.0592	0.0374	0.3472	0.5992	0.0148	0.0419	1.2871	0.0608	0.0436	0.0397	0.0357
2016	0.0636	0.0358	0.3497	0.5968	0.0189	0.0472	1.2476	0.0692	0.0498	0.0358	0.0358
2017	0.0676	0.0365	0.3401	0.6012	0.0255	0.0506	1.2673	0.0729	0.052	0.0473	0.0743
2018	0.0635	0.0362	0.3431	0.598	0.0198	0.0468	1.2875	0.0678	0.0408	0.0557	0.0584
2019	0.0562	0.0375	0.3641	0.6256	0.0107	0.043	1.2767	0.055	0.0288	0.0747	0.0363
2020	0.0454	0.0331	0.3291	0.6366	0.0051	0.0376	1.1183	0.0428	0.0257	0.0025	-0.0354
2021	0.0698	0.0303	0.3213	0.6205	0.0332	0.0563	1.2697	0.0746	0.0817	0.076	0.1443
2022	0.0647	0.0327	0.2902	0.5674	0.0261	0.049	1.3196	0.068	0.0524	0.0786	0.1392

Panel C: Correlation coefficients

		1	2	3	4	5	6	7	8	9	10	11
RNOA	**1**	1										
NBC	**2**	-0.033***	1									
FLEV	**3**	-0.110***	0.046***	1								
DE	**4**	-0.069***	0.059***	0.932***	1							
SPREAD	**5**	0.946***	-0.356***	-0.118***	-0.084***	1						
PM	**6**	0.492***	-0.010***	0.028***	0.029***	0.463***	1					
ATO	**7**	0.263***	0.004	-0.192***	-0.074***	0.244***	0.079***	1				
ROCE	**8**	0.729***	-0.081***	-0.121***	-0.106***	0.707***	0.440***	0.141***	1			
ΔCSE	**9**	0.260***	0.028***	-0.029***	0.025***	0.234***	0.127***	0.062***	0.352***	1		
ΔNOA	**10**	0.160***	-0.006*	0.024***	0.042***	0.152***	0.053***	0.094***	0.179***	0.468***	1	
ΔSALE	**11**	0.092***	0.037***	0.012***	0.030***	0.074***	0.023***	0.045***	0.117***	0.273***	0.289***	1

Notes. See Appendix A for variable definitions. *, **, and *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels (two-tailed), respectively.

The differentiation between operating and financing assets and liabilities transforms the Financial Leverage metric, FLEV, deviating from the conventional Debt/Equity ratio. As shown, the median value of FLEV was 0.35, contrasted with the 0.61 observed for the Debt/Equity ratio (DE). This discrepancy arises because FLEV solely acknowledges indebtedness stemming from financing activities and recognizes that debt held as assets effectively offsets debt owed. This refined measurement provides a clearer picture of

Financial Leverage by focusing on financing debt alone, offering a more accurate assessment of financial risk and leverage. It is noteworthy that this result aligns with Nissim and Penman (2001)s' findings, which uncovered a median FLEV value of 0.4.

Net borrowing costs (NBC) presented in the data are post-tax. Adjusting the median of 3.9% for tax rates, the pre-tax rate aligns with the typical borrowing rates observed in corporate settings. The variability in borrowing costs can likely be attributed to fluctuations in borrowing rates and the acknowledgment of (transitory) realized and unrealized gains and losses on financial items. The spread over the NBC exhibited a positive value at the median. The median ROCE (7%) surpassed the median RNOA (6.6%), suggesting that the generally positive leverage, combined with a positive spread, effectively enhances ROCE. The standard DuPont Profit Margin and Asset Turnover, influential in steering RNOA, are delineated in the sixth and seventh rows of Panel A in Table 3.

ΔCSE displayed a median of 5.1%. At the median, there is a positive ΔCSE that suggests potential growth or positive financial performance. The table also displays the NOA. The median ΔNOA of 5.5% signifies a positive change in net operating assets, which implies potential business expansion or improved operational efficiency. Meanwhile, there was a positive ΔSALE, as indicated by the median value of 6.1%. At the median, sales growth over the observed period reflected potential business expansion or increased market demand.

Table 3 Panel B offers a temporal perspective, showcasing median values from 2005 to 2022. We uncover trends in financial dynamics by tracking shifts in the median values of variables like RNOA, NBC, FLEV, and others. This longitudinal approach allows us to observe the evolution of, and significant patterns demonstrated by, these financial metrics over time. One of the most important observations is the general decline in RNOA, particularly following the 2008 financial crisis. Before the crisis, RNOA was relatively stable, peaking at 10.2% in 2007. However, it dropped sharply to 6.9% in 2008 and decreased, reaching its lowest point in 2020 at 4.5%. This suggests that firms experienced considerable challenges in maintaining operational efficiency during and after the crisis, with recovery not occurring until 2021 and 2022. NBC generally declined over time, from 3.9% in 2005 to a low of 3% in 2021, which likely reflects a period of lower interest rates and favorable borrowing conditions. However, it slightly increased to 3.3% in 2022. This downward trend in NBC is noteworthy as it contributed to a relatively

consistent spread between RNOA and NBC, despite fluctuations in firm performance. Finally, FLEV also exhibited some variability, increasing during the financial crisis (reaching 0.46 in 2008) before gradually declining to 0.29 in 2022. This reduction in leverage indicates that firms adopted a more conservative financial strategy in the post-crisis period, seeking to mitigate risk by relying less on debt financing. Notably, ROCE (which combines operational performance and leverage) mirrored the movements of RNOA, with a steep drop in 2008 (from 12.4% in 2007 to 7.6%) and a slow recovery in the following years (reaching 7.5% by 2021).

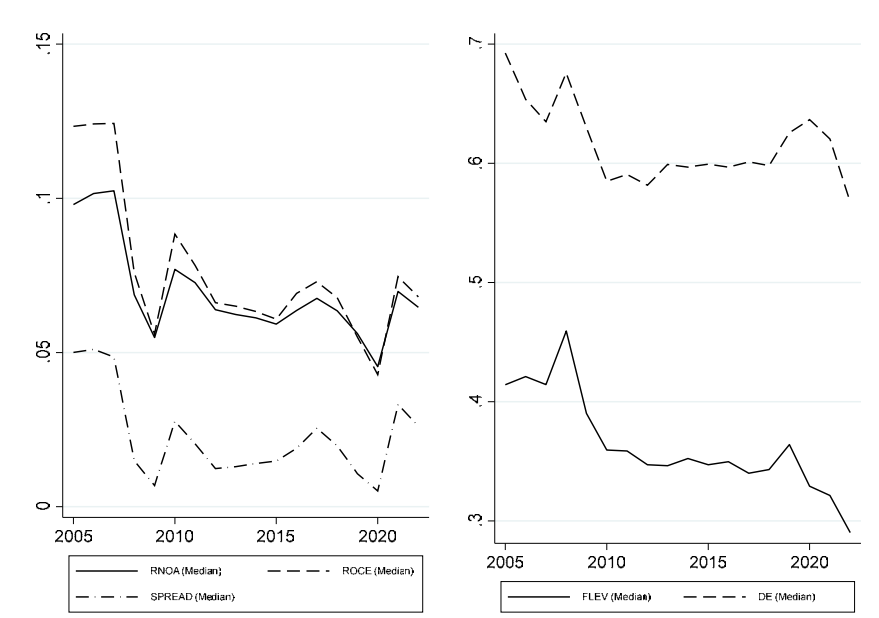
Concerning the determinant of RNOA, it can be noticed that the PM showed modest fluctuations, indicating that firms' profitability was relatively stable over time despite a decline during the crisis period and a recovery in the later years, particularly in 2021 and 2022. Likewise, ATO remained relatively stable throughout the period, though it exhibited a slight downward trend post-2008, suggesting a marginal decline in firms' ability to generate revenue from their assets. The crisis' impact was further reflected in the lower growth rates of ΔSALE and ΔNOA, particularly in 2009 and 2020, as well as reduced growth in ΔCSE during the same periods.

Panel C, instead, presents a matrix illustrating Spearman correlations among the ratios outlined in Panel A, explaining the relationships between variables and shedding light on interdependencies within the dataset. Strong positive correlations – such as between RNOA and ROCE (0.729) and SPREAD and NBC (0.946) – signal significant relationships. Noteworthy correlations, including DE and FLEV (0.932) and ΔNOA and ΔSALE (0.467), provide insights into key financial associations. The significance levels (*, **, and ***) offer context on the statistical reliability of these observed correlations.

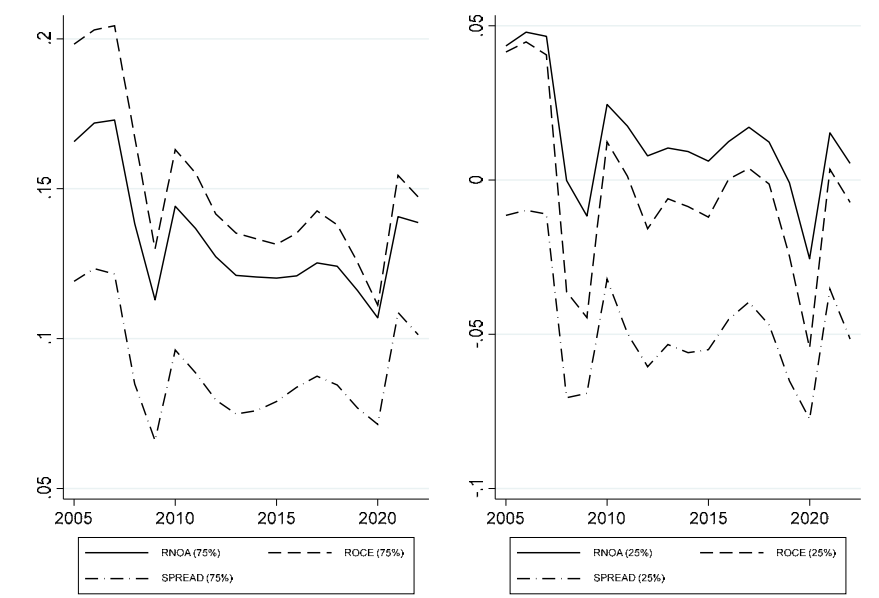
In Figure 1, Panel A offers an overview of the median values for key financial ratios across 20 years. The panel consists of two figures: the first one traces the median values of RNOA, ROCE, and SPREAD, while the second plots the median values of FLEV and DE. This representation captures central tendencies and variations across different periods, explaining the financial performance and leverage dynamics over time. Persistent trends observed in these medians may inform future expectations, with a cautionary note to interpret recent figures considering historical tendencies.

Figure 1 - Typical ratios over time

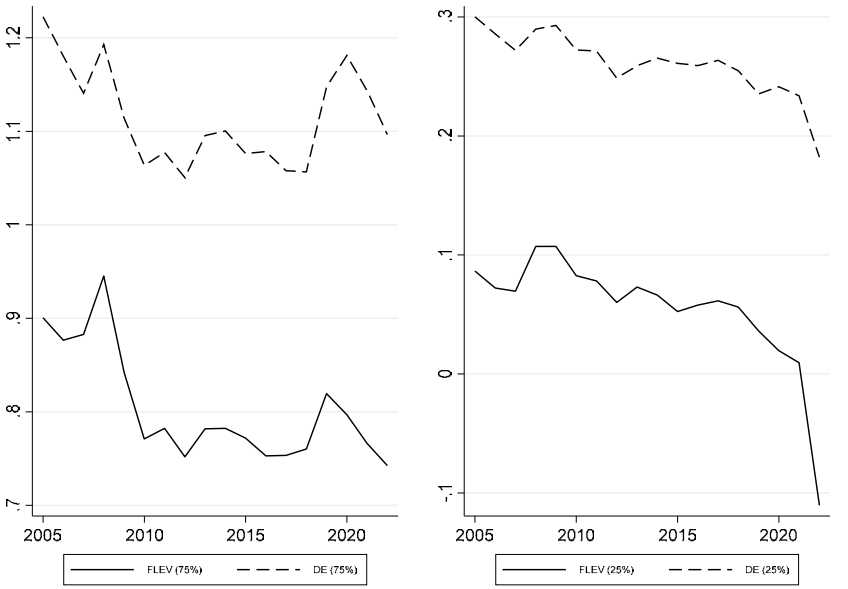
Panel A: Median results of RNOA, ROCE, SPREAD, FLEV and DE



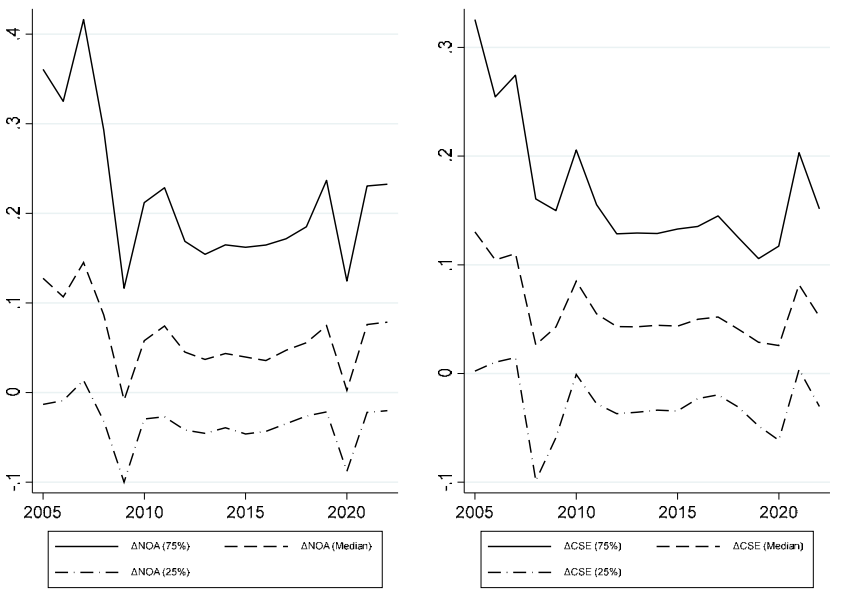
Panel B: Percentile results of RNOA, ROCE and SPREAD



Panel C: Percentile results of FLEV and DE



Panel D: Change in NOA and CSE over time



Moving to Panel B, the two figures delve into percentiles, showcasing the 75th and 25th percentiles for RNOA, ROCE, and SPREAD. The first (vs. second) figure explores the upper (vs. lower) quartile, analyzing firms with higher returns and broader spreads (vs. comparatively lower returns and narrower spreads). This examination underlines the distribution of financial metrics, revealing variability across dataset segments.

In Panel C, two distinct figures present the FLEV and Debt-to-Equity Ratio (DE) at the 75th and 25th percentiles. The first (vs. second) figure elucidates the financial structures of companies in the upper (vs. lower) quartile, emphasizing firms with higher (vs. lower) Financial Leverage. These percentile-specific insights contribute to a comprehensive understanding of financial metric variations. Finally, Panel D features two figures depicting changes in NOA and CSE over time, focusing on the 75th and 25th percentiles and the median.

In conclusion, Figure 2 presents a time-series analysis of various financial metrics, underlining their evolution over the years relative to the portfolio formation year and tracing portfolio medians of annual growth rates in RNOA, ROCE, FLEV, ATO, PM, ΔCSE, ΔNOA, and ΔSALE. Each panel displays a different variable, providing a multifaceted view of the financial performance of portfolio entities over time. Collectively, these panels illuminate the temporal dynamics of key financial metrics, enabling a thorough analysis of the portfolio entities' financial performance and stability over the specified period. It takes up to three years for firms in higher portfolios to return RNOA and ROCE to average values. This result aligns with Nissim and Penman (2001). Besides the change in equity, sales, and net operating assets, as in NP, the mean reversion was more pronounced, as it took place mostly in 1 year ahead.

5. Additional analysis: The role of institutions

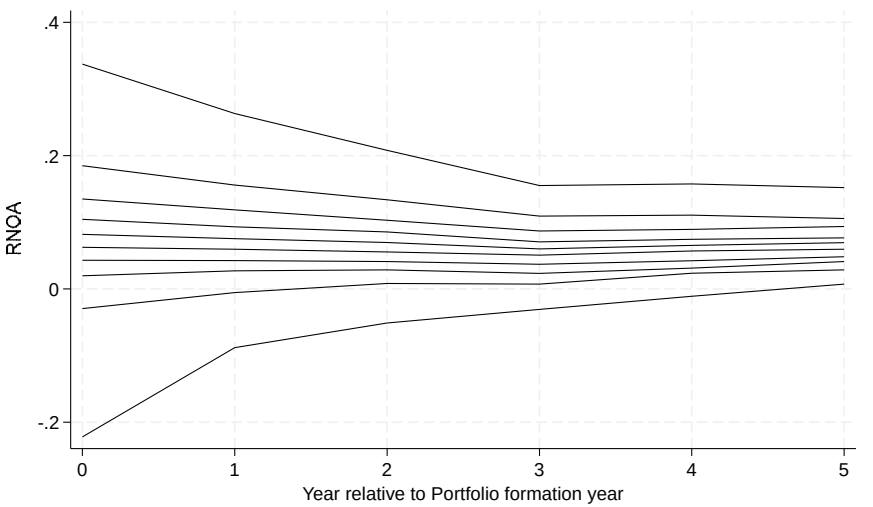
In this section, we conduct a cross-country analysis to examine the cross-sectional variation of key financial statement ratios over time, while accounting for different institutional features. Specifically, we divided the entire sample into two groups based on the strength of formal institutions. We proxied formal institutions using the *Rule of Law* indicator from the World Bank, which captures the degree to which legal frameworks and regulations are effectively enforced in a given country *k*. Panel A of Table 4 summarizes the sample countries and the average Rule of Law indicator for

each country from 2005-2022. The Rule of Law indicator ranges from an average of 1.90 (or higher) in Scandinavian countries to less than 0.50 in developing and emerging countries, with an overall average of 1.02 across all countries. The variation in the Rule of Law is substantial across and within countries, with a cross-country standard deviation of 0.86. Within countries, the maximum (minimum) standard deviation is 0.24 (0.03), observed in Thailand (Finland).

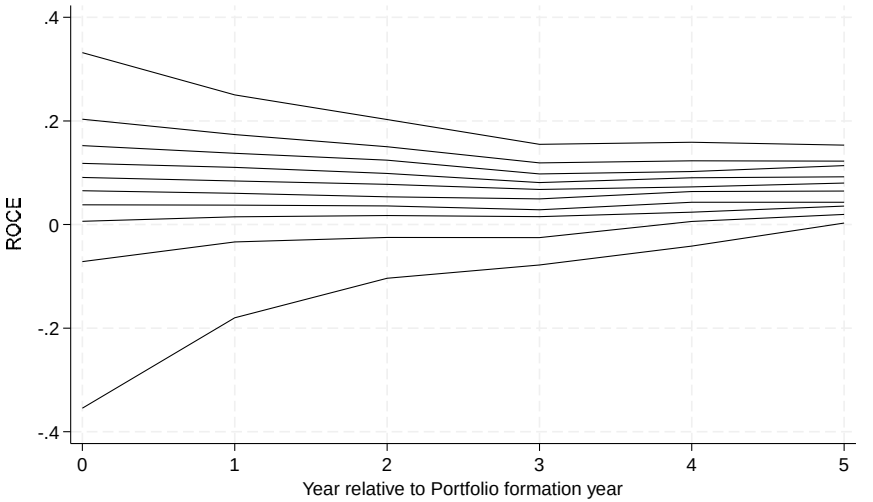
One concern with our cross-country analysis is that the Rule of Law may not fully capture the role of institutions in influencing corporate decision-making. The law and finance literature suggests that regulations protecting capital providers are key drivers of managerial decisions (La Porta et al., 1998). To support the argument that the Rule of Law precedes and shapes corporate laws – and thus our analytical use of it over shareholder or creditor protection laws is justified – Panel B of Table 4 examines the determinants of investor protection laws through panel regression models. Specifically, in columns (1) to (3), we analyze whether country-level economic and institutional variables correlate with changes in investor protection laws.

Figure 2 - Time-series analysis

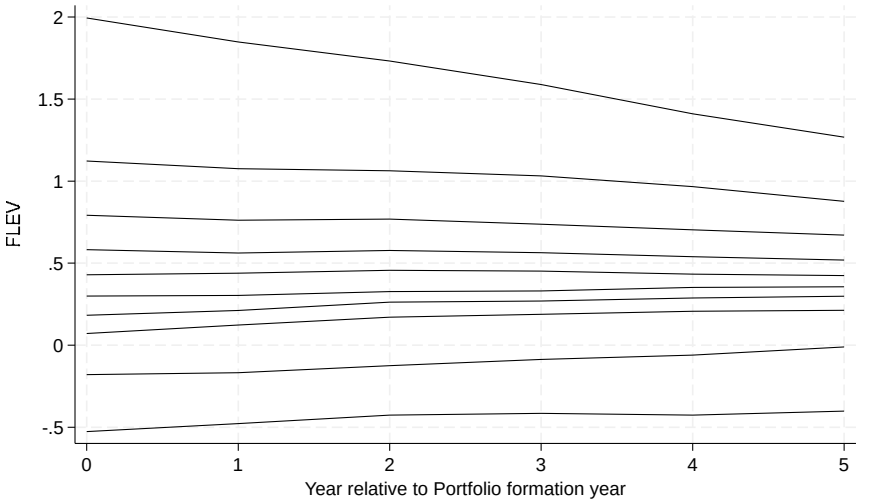
Panel A: Return on Net Operating Assets



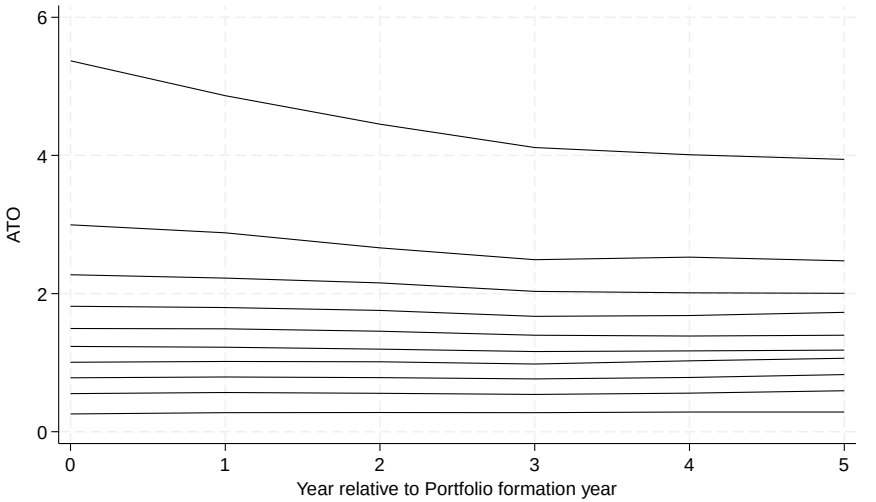
Panel B: Return on Common Equity



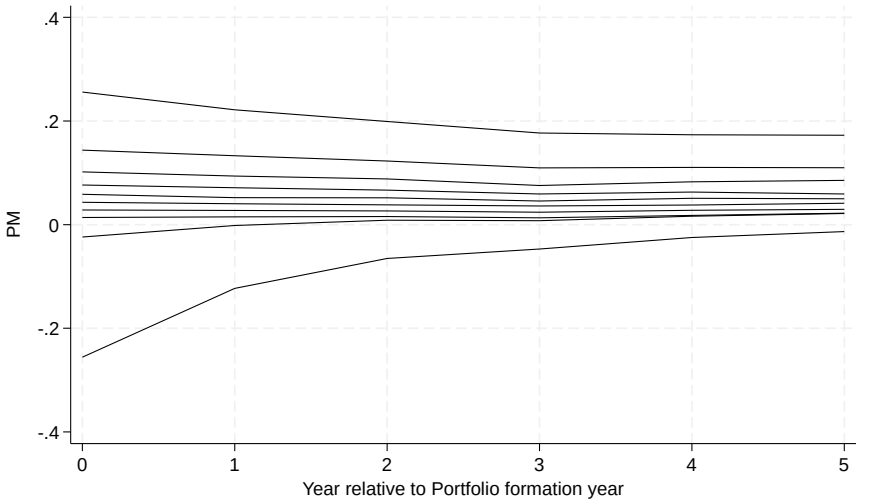
Panel C: Financial Leverage



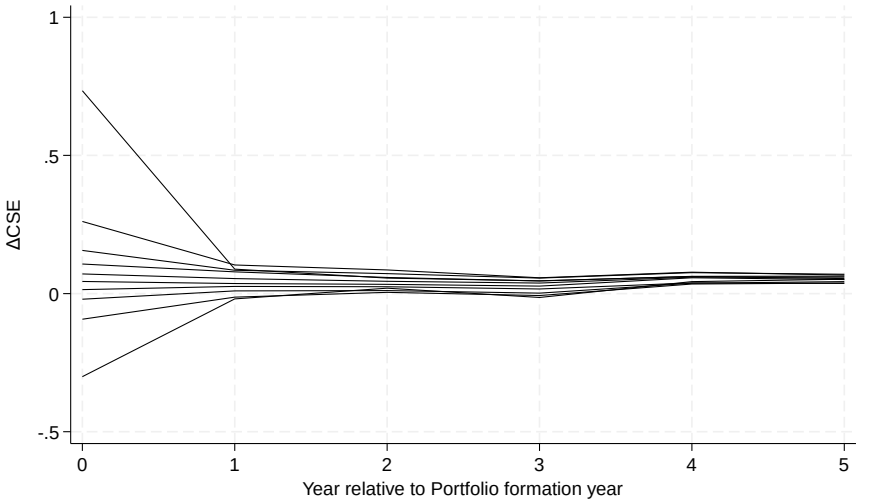
Panel D: Asset Turnover



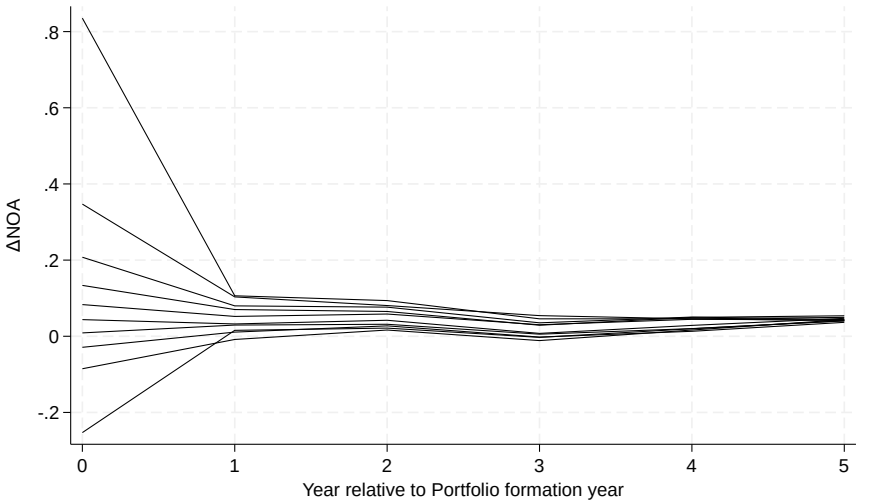
Panel E: Profit Margin



Panel F: Change in Common Equity



Panel G: Change in Net Operating Assets



Panel H: Change in Sales

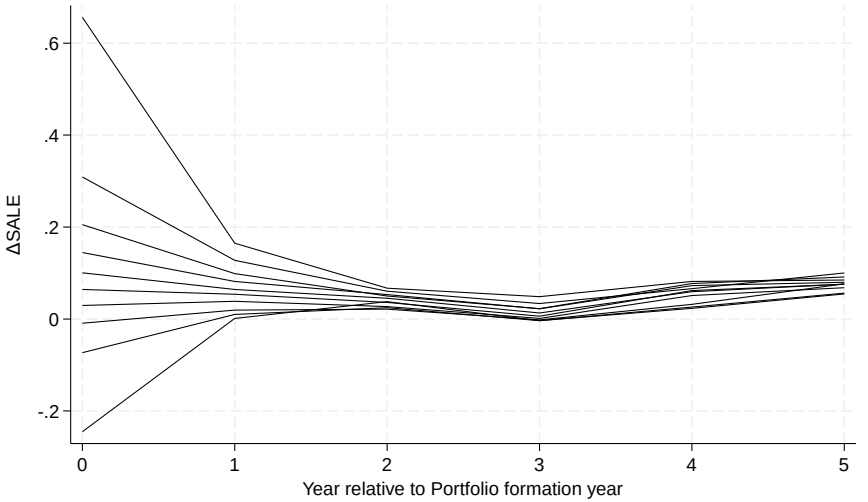


Table 4 – Descriptive statistics

Panel A: Mean value of Rule of Law across countries

Country	Rule of Law (Mean)	Cluster	Country	Rule of Law (Mean)	Cluster
ARG	-0.66	LOW	HKG	1.45	HIGH
AUS	1.75	HIGH	ITA	0.48	LOW
AUT	1.85	HIGH	JPN	1.31	LOW
BEL	1.34	HIGH	KOR	0.92	LOW
BRA	-0.25	LOW	MEX	-0.51	LOW
CAN	1.74	HIGH	MYS	0.49	LOW
CHE	1.83	HIGH	NLD	1.77	HIGH
CHL	1.30	LOW	NOR	1.92	HIGH
CHN	-0.44	LOW	PER	-0.64	LOW
DEU	1.64	HIGH	PHL	-0.48	LOW
DNK	1.90	HIGH	POL	0.61	LOW
ESP	1.14	LOW	PRT	1.10	LOW
FIN	1.94	HIGH	SGP	1.64	HIGH
FRA	1.40	HIGH	SWE	1.90	HIGH
GBR	1.67	HIGH	THA	0.01	LOW
GRC	0.66	LOW	TUR	0.06	LOW
			USA	1.55	HIGH

Panel B: Determinants of investor protection laws

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	***Investor Protection***	***Shareholder Protection***	***Creditor Protection***	***Private Credit (% of GDP)***	***Private Credit (% of GDP)***	***Private Credit (% of GDP)***
DRule of Law	**0.7365****	**0.1903***	**0.2814****	**0.3132****	**0.3162****	**0.2562***
	(0.2879)	**(0.1030)**	**(0.1286)**	**(0.1236)**	**(0.1251)**	**(0.1505)**
GDP per capita	-0.0776	-0.0660	0.0400	-0.0441	-0.0420	-0.0718
	(0.1891)	(0.0596)	(0.0782)	(0.1648)	(0.1617)	(0.1523)
Inflation	0.3810	1.0359*	-1.2745	-4.5673**	-4.6273**	-3.8587*
	(1.9396)	(0.5437)	(1.4082)	(1.9538)	(1.9040)	(1.9242)
Buddhism	0.1516	0.0448	0.0495	-0.2611	-0.2584	-0.2089
	(0.3146)	(0.1020)	(0.1102)	(0.2101)	(0.2089)	(0.2574)
Catholicism	-0.0895	-0.0621	0.0248	-0.5110***	-0.5096***	-0.5551**
	(0.2697)	(0.0938)	(0.0878)	(0.1840)	(0.1841)	(0.2592)
Islam	0.2512	0.0748	0.0810	-0.4213**	-0.4167**	-0.3286
	(0.2746)	(0.0886)	(0.1570)	(0.1782)	(0.1780)	(0.2320)
Protestantism	0.1371	-0.0600	0.1969*	-0.4473*	-0.4358**	-0.4696*
	(0.2935)	(0.1050)	(0.0980)	(0.2196)	(0.2124)	(0.2575)
Corporate tax rate	0.2628	0.7794**	-0.9773**	1.1705	1.1086	1.7077
	(0.8396)	(0.3145)	(0.4188)	(1.1618)	(1.0716)	(1.1113)
Legal origin	0.5062***	0.0919**	0.2524***	0.2798**	0.2984*	0.3648***
	(0.1157)	(0.0422)	(0.0550)	(0.1328)	(0.1667)	(0.1296)
Constant	0.7028	1.2163*	0.4111	0.3132**	0.3162**	0.2562*
	(1.9632)	(0.6080)	(0.7787)	(0.1236)	(0.1251)	(0.1505)
Observations	384	384	384	371	371	371
Income Group-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.489	0.258	0.582	0.560	0.559	0.603

Notes: This table examines the determinants of changes in investor protection laws. The model specifications presented include income group-year fixed effects. The table reports (in parentheses) heteroskedasticity- robust standard errors clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two tailed), respectively. Appendix A provides the variable definitions.

Panel C: Sample with low Rule of Law

Year	RNOA	NBC	FLEV	DE	SPREAD	PM	ATO	ROCE	ΔCSE	ΔNOA	ΔSALE
2005	0.0866	0.0398	0.4914	0.7492	0.0382	0.0628	1.3132	0.1114	0.1139	0.1506	0.0862
2006	0.0886	0.0423	0.4822	0.7149	0.0384	0.062	1.3753	0.1093	0.0887	0.1236	0.1415
2007	0.0988	0.0437	0.4621	0.6861	0.0472	0.0694	1.4201	0.1223	0.107	0.1393	0.1431
2008	0.0644	0.0504	0.5337	0.7503	0.0082	0.0473	1.3021	0.0711	0.0278	0.1161	0.0998
2009	0.0549	0.0404	0.478	0.6983	0.0085	0.0446	1.0855	0.0568	0.0462	0.0157	-0.0325
2010	0.0725	0.0424	0.4147	0.6495	0.0233	0.0581	1.1435	0.0832	0.0724	0.061	0.1123
2011	0.0658	0.0467	0.4304	0.6715	0.0131	0.0481	1.2604	0.0689	0.0559	0.0852	0.1075
2012	0.0613	0.047	0.3655	0.6192	0.0088	0.0446	1.2962	0.0608	0.0454	0.0517	0.0596
2013	0.0582	0.0437	0.3727	0.6355	0.0085	0.0411	1.2904	0.0576	0.0448	0.0445	0.04
2014	0.0587	0.0408	0.3617	0.6091	0.0101	0.0429	1.2944	0.0595	0.0481	0.046	0.0468
2015	0.057	0.0371	0.357	0.6147	0.0134	0.0434	1.2264	0.0571	0.0478	0.047	0.0375
2016	0.0607	0.0364	0.354	0.6117	0.0159	0.0477	1.2008	0.063	0.0552	0.0396	0.0398
2017	0.0647	0.038	0.3554	0.6206	0.0208	0.0506	1.2173	0.067	0.0508	0.0445	0.077
2018	0.0623	0.0375	0.3492	0.6133	0.0169	0.0475	1.2352	0.0634	0.0417	0.0553	0.0627
2019	0.059	0.0376	0.3333	0.6176	0.0124	0.0459	1.2382	0.0564	0.037	0.0599	0.0365
2020	0.0494	0.0327	0.2985	0.6278	0.0093	0.0411	1.1166	0.0456	0.034	0.0145	-0.0249
2021	0.0751	0.0297	0.2827	0.6043	0.0397	0.0602	1.2843	0.0764	0.0861	0.0876	0.1599
2022	0.0715	0.0339	0.2551	0.5545	0.0301	0.0549	1.325	0.072	0.0608	0.0896	0.1519

Notes. See Appendix A for variable definitions. Variables are trimmed at the 5th and 95th percentiles.

Panel D Sample with high Rule of Law

Year	RNOA	NBC	FLEV	DE	SPREAD	PM	ATO	ROCE	ΔCSE	ΔNOA	ΔSALE
2005	0.1032	0.0397	0.3878	0.6633	0.0538	0.0496	2.0406	0.1264	0.1365	0.1196	0.0773
2006	0.1066	0.0407	0.3853	0.6301	0.0561	0.0531	1.9641	0.1297	0.1092	0.1028	0.1135
2007	0.1038	0.0457	0.3897	0.616	0.0486	0.0556	1.8552	0.125	0.1106	0.1476	0.1063
2008	0.0708	0.0476	0.4374	0.6493	0.0174	0.0392	1.7461	0.0785	0.026	0.076	0.0855
2009	0.0548	0.0412	0.3588	0.5947	0.0059	0.0332	1.4183	0.0556	0.0401	-0.0178	-0.0456
2010	0.081	0.0424	0.3286	0.5568	0.0324	0.0499	1.5199	0.0913	0.0946	0.0566	0.0914
2011	0.079	0.0434	0.3084	0.5373	0.0271	0.0494	1.5554	0.0869	0.0546	0.064	0.0807
2012	0.0675	0.0426	0.3309	0.5532	0.0177	0.0433	1.4963	0.0744	0.0402	0.0394	0.0419
2013	0.0672	0.0408	0.3257	0.5743	0.0187	0.0435	1.4622	0.0733	0.0405	0.0299	0.0255
2014	0.0652	0.0407	0.3378	0.5816	0.0179	0.0434	1.431	0.0707	0.0397	0.0417	0.0324
2015	0.0629	0.0378	0.3391	0.5817	0.0172	0.0398	1.394	0.0673	0.0378	0.0299	0.0337
2016	0.0677	0.0352	0.3447	0.5844	0.0232	0.0466	1.313	0.0758	0.0414	0.032	0.0323
2017	0.0736	0.0349	0.332	0.574	0.0311	0.0504	1.3462	0.0828	0.0544	0.0492	0.0692
2018	0.0653	0.0342	0.3394	0.5745	0.0237	0.0456	1.383	0.0738	0.0382	0.0565	0.0547
2019	0.052	0.0373	0.3969	0.6349	0.0089	0.0389	1.3482	0.0522	0.016	0.0962	0.0361
2020	0.0393	0.0337	0.3673	0.6518	-0.0021	0.0316	1.1292	0.0364	0.0094	-0.016	-0.0503
2021	0.0612	0.0311	0.3705	0.6415	0.0252	0.0494	1.2244	0.072	0.0754	0.0646	0.1264
2022	0.0552	0.0314	0.3448	0.592	0.0198	0.042	1.3042	0.062	0.0337	0.0643	0.1212

Notes: See Appendix A for variable definitions. Variables are trimmed at the 5th and 95th percentiles.

Given the stickiness of most of these variables, we avoided absorbing important variation by using country-fixed effects; instead, we included time-varying income region fixed effects based on the World Bank income classification. Among the wide range of economic and institutional variables examined, only a few exhibited significant correlations with changes in investor protection laws. Crucially, the Rule of Law indicator coefficient was positive and statistically significant across the first three model specifications at conventional levels, suggesting that this institutional factor systematically influences a country's corporate legal framework.

Furthermore, we validated another important assumption underlying our analysis: the role of the Rule of Law indicator in enabling firms' reliance on private credit in a country. Because our discussion revolves around how debt financing enables value creation, this additional analysis aimed to validate and corroborate the factors that can spur growth across countries and over time. Similar to the previous analysis, we correlated country-level economic and institutional variables with changes in private credit (as a percentage of a country's gross domestic product). In columns (4) to (6), table 4 Panel B, we consistently find that the Rule of Law is positively and statistically significant across all model specifications, in line with the prior law and finance literature (La Porta et al., 2000).

Next, we present the evolution of the median values of the selected financial ratios across time and the sample. Panel C (vs. Panel D) shows the results for firms operating in countries with a low (vs. high) Rule of Law level. RNOA followed a similar trend across these two samples, with a sharp decline during the 2008 financial crisis and subsequent recovery. However, companies in high rule-of-law countries consistently reported higher RNOAs throughout the period, reflecting a more stable business environment, stronger legal protections, and higher operational efficiency. NBC was relatively similar between both groups of countries, although it tended to be slightly higher in low rule-of-law countries during periods of financial instability, denoting higher risks and borrowing costs for companies operating in countries with weaker institutional frameworks. The spread was also generally higher in high rule-of-law countries, suggesting that the respective firms are better at generating returns from their assets relative to their cost of debt. This trend persisted across the period, indicating that stronger institutional frameworks support more efficient capital allocation and higher investment returns.

The ROCE was consistently higher in high rule-of-law countries, particularly before the 2008 financial crisis. This metric reflects a firm's ability to generate profits from its capital base; thus, the higher values suggest that firms

in those countries benefit from better governance, regulatory frameworks, and legal protections, which enhance capital efficiency.

Finally, firms in low rule-of-law countries tended to have higher PM but lower asset turnover (ATO) than those in high rule-of-law countries. This suggests that firms in weaker institutional environments rely more on higher profit margins from individual sales, possibly due to pricing strategies or market inefficiencies. In contrast, firms in high rule-of-law countries are better at efficiently utilizing their assets to generate revenue.

Altogether, our comparative analysis of financial ratios between countries with low and high levels of Rule of Law highlights the critical role that institutional frameworks play in shaping firm performance and financial strategies. Firms operating in high rule-of-law countries consistently outperform their counterparts in key metrics such as RNOA, ROCE, and spread, indicating more efficient operations and better capital allocation. Meanwhile, firms in low Rule of Law countries rely more heavily on debt financing and experience higher borrowing costs, reflecting the increased risks and challenges of weaker legal protections and governance structures.

6. Conclusion

This paper studied the relationship between leverage and firm performance, and by extension its impact on value creation and growth, from 2005 to 2022 for firms across the world. Our empirical analysis involved a comprehensive dataset of 82,487 observations across various countries, employing a cross-sectional analysis of ratios across all firms and years, alongside a time-series analysis that created ten portfolios in 2005 and tracked median values annually until 2023 based on specific measures. This dual approach allowed us to form a holistic view of financial performance over an extensive period.

Several significant findings emerged from our robust analysis. The median ROCE, which is proximate to or higher than the conventional equity cost of capital, suggests that leverage positively impacts returns. The decomposition of ROCE highlights the significant role of Financial Leverage FLEV and the spread in enhancing overall returns. This result underscores the importance of understanding how leverage components interact to influence firm performance. Recognizing operating and financing assets and liabilities transforms the conventional Debt/Equity ratio, emphasizing the need to distinguish between the two for more accurate financial analysis. Net borrowing costs, adjusted for tax rates, aligned with typical borrowing rates, showcasing the variability attributed to fluctuations in borrowing rates and financial item gains and

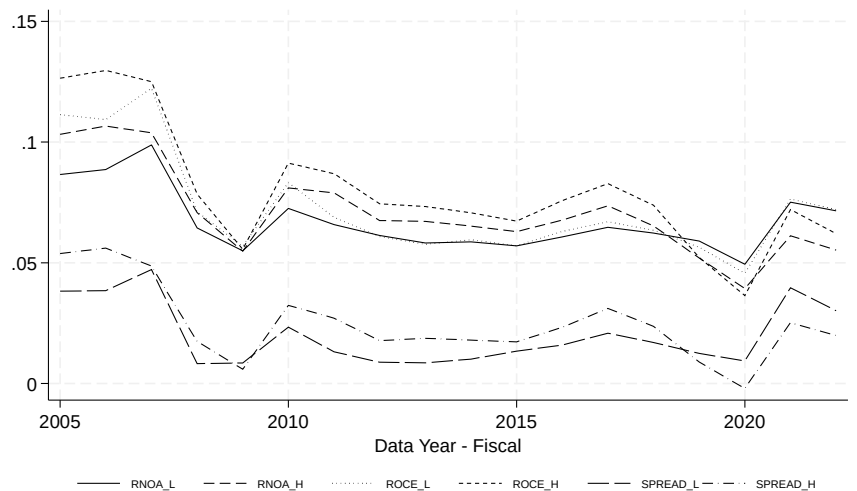
losses over time. The positive spread over net borrowing costs enhances ROCE, indicating a generally positive leverage effect on firm returns.

Furthermore, we enriched our understanding of financial metric variations across different dataset segments by exploring key financial associations through Spearman correlations and percentile-specific insights. This analysis showed how other firms perform in relation to varying leverage levels. The temporal perspective in Figure 2 offers a comprehensive time-series analysis of various financial metrics, tracing portfolio medians of annual growth rates. This approach allowed us to illuminate the temporal dynamics of key financial metrics, enabling a thorough examination of portfolio entities' financial performance and stability over the specified time frame.

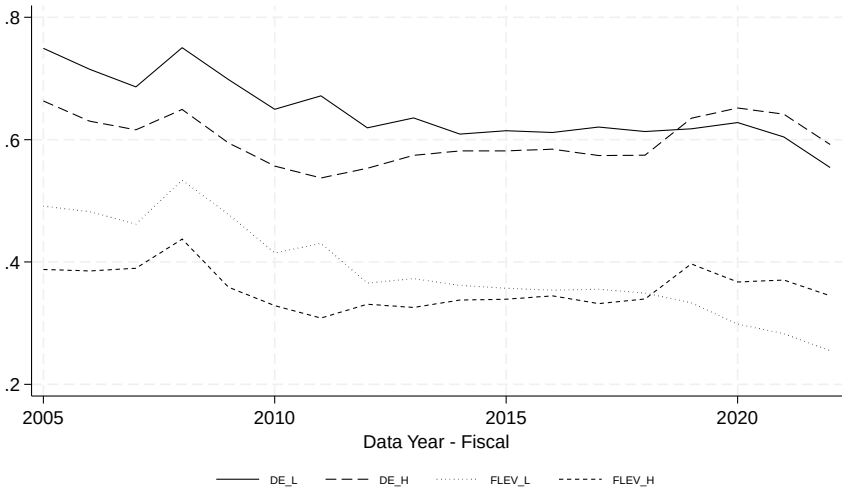
These findings contribute significantly to the ongoing discussion about the role of leverage in creating long-term value and offer relevant insights for managers and stakeholders. In the face of economic uncertainties and geopolitical tensions, these insights can inform strategic decisions, fostering enhanced value creation for all corporate stakeholders. By providing a detailed analysis of the financial implications of leverage, this paper aims to support more informed decision-making processes in the corporate finance landscape.

Figure 3 – Cross-country analysis

Panel A: Return on Net Operating Assets, Return on Common Equity and Spread across samples



Panel B: Financial Leverage and Debt-Equity ratio across samples



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Appendix A. Definition of variables

Name	Description
Financial Assets (FA)	Sum of cash and short-term investments (CHE) and investment and advances (IVAO) at the end of the year.
Financial Obligations (FO)	Sum of debt in current liabilities (DLC), long-term debt (DLTT) and preferred stock (PSTK) at the end of the year.
Net Financial Obligations (NFO)	Financial Obligations (FO) minus Financial Assets (FA) at the end of the year.
Common Equity (CSE)	Sum of common ordinary equity (CEQ) and noncontrolling interests (MIBT) at the end of the year. ΔCSE is the year over year change in CSE (% change).
Net Operating Assets (NOA)	Net Financial Obligations (NFO) plus Common Shareholders' Equity (CSE) at the end of the year. ΔNOA is the year over year change in NOA (% change).
Net Financial Expenses (NFE)	Difference between interest and related expenses (XINT) and interest and related income (IDIT) net of taxes (corporate tax rate is at state-year level, source https://taxfoundation.org/data/all/global/corporate-tax-rates-around-the-world-2020/) at the end of the year.
Operating Income (OI)	Sum of interest before extraordinary items (IB), Net Financial Expenses (NFE) and noncontrolling interest (MII) at the end of the year.
Return on Net Operating Assets (RNOA)	Operating Income divided by average Net Operating Assets at the end of the year.
Net Borrowing Costs (NBC)	Net Financial Expenses divided by average Net Financial Obligations at the end of the year.
Financial Leverage (FLEV)	Net Financial Obligations divided by average Common Shareholders' Equity at the end of the year.

Name	Description
Debt Equity ratio (DE)	Financial Obligations divided by average Common Shareholders' Equity at the end of the year.
Spread (SPREAD)	Return on Net Operating Assets minus Net Borrowing Costs at the end of the year.
Profit Margin (PM)	Operating Income (OI) divided by Revenues at the end of the year.
Asset Turnover (ATO)	Revenues divided by average Net Operating Assets at the end of the year.
Return on Common Equity (ROCE)	ROCE= RNOA + (FLEV x SPREAD)
Δ SALE	Year-over-year change in Revenues (% change)
Investor protection	Principal component of the shareholder and creditor protection indexes.
Shareholder protection	The strength of the shareholder rights index from Guillén and Capron (2015) normalized to 0 and 1.
Creditor protection	The strength of the creditor rights index from the World Bank Doing Business reports normalized to 0 and 1.
Private credit	The amount of private credit as a percentage of a country's GDP from the World Bank.
Rule of law	The strength of the rule of law index from the World Bank Doing Business reports.
GDP per capita	Natural logarithm of the GDP per capita in 2005 U.S. dollars.
Inflation	Rate of price change in country *k* as a whole, as measured by the annual growth rate of the GDP implicit deflator.
Buddhism	Indicator variable that takes the value of one if a country *k* practices that religion and zero otherwise from La Porta et al. (1998).
Catholicism	Indicator variable that takes the value of one if a country *k* practices that religion and zero otherwise from La Porta et al. (1998).
Islam	Indicator variable that takes the value of one if a country *k* practices that religion and zero otherwise from La Porta et al. (1998).
Protestantism	Indicator variable that takes the value of one if a country *k* practices that religion and zero otherwise from La Porta et al. (1998).
Corporate tax rate	Corporate tax rate for a country *k* in year *t* from the E&Y Corporate tax guides.
Legal origin	Indicator variable that takes the value of one if a country *k* has English legal origin and zero otherwise from La Porta et al. (1998).

Notes: In parentheses the COMPUSTAT Global code.