Lisbon School of Economics & Management
Universidade de Lisboa

# MASTER

MASTER'S IN MANAGEMENT (MIM)

# MASTER´S FINAL WORK

DISSERTATION

THE IMPACT OF FINANCIAL REGULATION ON US LARGE FIRMS AND THEIR VALUE – A STUDY OF THE 2018 DODD-FRANK ROLLBACK

JOUMÈNE MAMI

JUNE 2025

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JOUMENE MAMI

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JULY 2025

*To my parents, to whom*
*I owe everything, and*
*to the city of Lisbon,*
*which I will never*
*forget.*

## GLOSSARY

| | |
|---|---|
| CRA | Credit Rating Agency |
| CR-CS theory | Credit Rating – Credit Supply theory |
| DE Ratio | Debt-to-Equity Ratio |
| Dood-Frank Act | Dodd-Frank Wall Street Reform and Consumer Protection Act |
| EBITDA | Earnings Before Interest, Taxes, Depreciation, and Amortization |
| FE | Fixed Effects |
| GAAP | Generally Accepted Accounting Principles |
| GDP | Gross Domestic Product |
| IFRS | International Financial Reporting Standards |
| IRR | Internal Rate of Return |
| NPV | Net Present Value |
| (P)OLS | (Pooled) Ordinary Least Squares |
| RE | Random Effects |
| ROC | Return On Capital |
| SDG | Sustainable Development Goal |
| SEC | Security and Exchange Commission |
| US(A) | United States (of America) |
| WACC | Weighted Average Cost of Capital |

## ABSTRACT, KEYWORDS, AND JEL CODES

ABSTRACT: This paper studies the effects of financial regulation and deregulation on firms. Specifically, it analyses the effect of the Dodd-Frank Act rollback bill of 2018 on firms' leverage, capital productivity, revenues, and firm values. Taking advantage of the unique opportunity provided by this bill to empirically assess the impact of deregulation, it combines a difference-in-difference approach with a multiperiod, single-group, before-after study applied to panel data. Findings suggest the Dodd-Frank rollback had a significant and positive effect on firms' debt-to-equity ratio, return-on-capital, revenues, and market capitalization.

KEYWORDS: Financial Deregulation; Dodd-Frank Act; Corporate Finance; Firm Value; Panel Data; Difference-in-Difference.

JEL CODES: L25; G32; C23; G18; D25.

## RESUMO, PALAVRAS-CHAVE E CÓDIGOS JEL

RESUMO[1]: Esta dissertação estuda os efeitos da regulação e da desregulação financeiras sobre as empresas. Especificamente, analisa o efeito da reversão da Lei Dodd-Frank de 2018 na alavancagem, na produtividade do capital, nas receitas e no valor das empresas. Aproveitando a oportunidade única proporcionada por esta reversão legislativa para avaliar empiricamente o impacto da desregulação, combina uma abordagem de diferença-em-diferenças com um estudo multiperíodo de grupo único do tipo antes-e-depois, aplicado a dados em painel. Os resultados sugerem que a reversão da Lei Dodd-Frank teve um efeito significativamente positivo sobre o rácio dívida/capital próprio, o retorno do capital, as receitas e a capitalização bolsista das empresas.

PALAVRAS-CHAVE: Desregulação Financeira; Lei Dodd-Frank; Finanças Empresariais; Valor da Empresa; Dados em Painel; Diferença-em-Diferença.

CÓDIGOS JEL**:** L25; G32; C23; G18; D25.

[1] This paragraph was translated from the English in the previous page below using Google Translate, and was improved using generative AI (ChatGPT).

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There are many people I wish to thank, without whom this project would have been much more difficult than it was.

First, I wish to thank Professor Eric Golson for his mentorship during the early days of this project. His assistance during thesis formulation and literature review made this dissertation and my early submission possible.

I also wish to thank professor Luís Filipe Ávila da Silveira Dos Santos, whose guidance in the data analysis section of this thesis was invaluable.

It would also be unfair not to acknowledge my colleagues and professors (both at ISEG and EM Normandie), who have inspired me in writing this thesis. A special thank you to the faculty members at ISEG, who have also contributed with their cooperation and flexibility.

Finally, and perhaps most importantly, I wish to thank my friends, family, and my parents, for their unconditional and steadfast support which has allowed me to be where I am today.

# 1. INTRODUCTION

Although some authors argue in favor of free banking and deregulation of financial systems, the majority of policy makers agree that regulation plays a crucial role in ensuring the stability of banking and finance, two crucial pillars in modern economies. Financial regulations and their consequences are particularly relevant when discussing sustainable development goal (SDG) 8, which aims to "promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (United Nations, 2024). While this goal is clearly defined, the path to achieving it remains uncertain. When it comes to banking and financial regulation, the extent to which these sectors should be regulated continues to pose a debate amongst scholars and policy makers. However, there has been a shifting trend towards overall tighter regulation following the financial crisis of 2007-2008. Donald Trump has disrupted this trend and positioned himself as a self-proclaimed deregulator during his presidential campaigns (Belton & Graham, 2020).

While there is some debate on whether the American president was in fact a deregulator during his time in office (Belton & Graham, 2020; Coglianese et al., 2021), Trump still achieved significant reforms in various fields (Henderson, 2019; Belton & Graham, 2019). These include – but are not limited to – regulatory rollbacks of the Dodd-Frank Wall Street Reform and Consumer Protection Act (further referenced as Dodd-Frank Act, or Dodd-Frank), a federal law aiming to prevent a repeat of the 2008 financial crisis (Moll et al., 2019). Passed by the Obama administration in 2010, the Dodd-Frank Act imposed stricter rules on banks and financial bodies such as Credit Rating Agencies (CRAs). It was established with the goal of increasing oversight, promoting transparency, reducing

risky behaviors (such as risky bank investments or securitization of toxic assets), and stabilizing the system.

As many authors have pointed out (Sharma et al., 2022; Dimitrov et al., 2015), regulation – including the Dodd-Frank act – can have unintended consequences and spillover effects, which are often difficult to isolate and understand. This further highlights the importance of studying the impact of regulation on various economic agents to achieve the goals of SDG 8. In this context, this dissertation aims to better understand the effects of financial regulation on firms' capital structure and profitability by answering the following question: What was the impact of Trump's relaxation of the Dodd-Frank act on firms and their value in the US since 2018?

To answer this question, this paper is structured as follows: Section two studies the expected effect of the Dodd-Frank rollback on firms based on existing literature. Section three covers the methodology and data used to empirically assess the effect of the Dodd-Frank rollback on firm capital structures, values, and performance since 2018. Section four discusses the results of the data analysis, and finally, section five concludes.

## 2. LITERATURE REVIEW

The first sub-section of this literature review will assess the role of debt in theories of capital structure. The second sub-section will discuss the effect of financial regulation on lending, corporate assets, value, and growth. The third sub-section will cover the Dodd-Frank act and its effect on firm leverage. Finally, sub-section four will conclude with the expected impact of the Dodd-Frank rollbacks on firms.

## 2.1. THE ROLE OF DEBT – THEORIES OF CAPITAL STRUCTURE

To better understand the effects of financial regulation and how it can impact companies, the first step is to go back to the role of debt in theories of capital structure. Harris and Raviv (1991) distinguish between models based on agency costs[2] and models based on information asymmetry.

Under agency cost models, the first benefit of debt financing is that it creates incentives for managers that reduce costs resulting from conflicts of interest. For the same absolute amount invested by the manager in the firm, a higher proportion of debt entails a higher percentage ownership of equity. This better aligns their interests with those of other equity holders and creates stronger incentives to increase firm value, which effectively mitigates losses that might otherwise result from managers pursuing self-serving goals and using free cash for personal benefits (Harris & Raviv, 1991). Additionally, debt interest payments reduce the amount of free cash available for such expenses, while simultaneously providing interest tax shields. Harris and Raviv (1991) also mention the benefits of leverage as a takeover defense tactic.

Under information asymmetry models, managers are assumed to possess information not available to the public, leading to the firm's equity being potentially over or undervalued (Harris & Raviv, 1991; Mostafa & Boregowda, 2014). In this case, a firm's choice of capital structure and financing acts as a signal to outsiders (Antwi et al., 2012); if the firm's equity is undervalued, financing through equity would result in a loss of shareholder value. Firms in this situation are therefore more likely to finance new projects using debt rather than equity. Consequently, a firm that finances a new project by raising

[2] Jensen and Meckling (1976).

equity capital will be perceived by the market as signaling that its equity is currently overvalued, leading to a fall in its share price. This translates to the "pecking order theory of financing"[3]: when financing a new investment, a firm will prefer to resort first to available free cash (internal capital), then debt, and finally, equity (Harris & Raviv, 1991; Myers, 1984; Mostafa & Boregowda, 2014). Capital structure decisions therefore act as a signaling tool, where debt is associated with new investment opportunities and growth, leading to an increase in the firm's share price when it is issued (Harris & Raviv, 1991).

In addition to these two models, debt capital is often more cost-effective than equity; since the cost of debt is lower than the cost of equity, it lowers a firm's overall weighted average cost of capital (WACC). This enables the firm to pursue projects with lower internal rates of returns (IRRs) while still generating value[4]. However, increased reliance on debt increases the risk of financial distress; this can jeopardize the firm's liquidity and solvency and restrict its ability to pursue future growth opportunities. Harris and Raviv (1991) mention that leverage is positively correlated with both firm value and bankruptcy probability, highlighting that capital structure decisions must carefully balance the advantages of debt financing with the potential risks associated with higher leverage. If well managed[5], debt allows firms to raise financing without sending the wrong signals to the markets, access more cost-effective capital, increase investment and take on additional projects, reduce costs related to conflicts of interest, and benefit from an interest tax shield, leading to increased capital productivity, revenues, and firm value.

[3] This theory has been empirically confirmed by various authors, including Sadiq et al. (2023).
[4] Derived from Damodaran (2007).
[5] Piper and Weinhold (1982)

## 2.2. FINANCIAL REGULATION – EFFECT ON LENDING AND FIRMS

Now that the role of debt in corporate capital structure has been established, the next step to understanding the effect of financial regulation on firms is to assess its effect on lending and firms. This is easier done by breaking this mechanism into two parts: the effect on lending, and the effect on corporate assets, value, and growth.

### 2.2.1. EFFECT ON LENDING

According to Avezum et al. (2022), financial regulation affects firm leverage through credit supply. Given the higher costs of raising funds through equity capital, banks facing higher compliance costs or increased capital requirements are likely to reduce their credit supply rather than increase their reserves. Avezum et al. (2022) find a negative relationship between tighter regulation and firm leverage. This effect is likely due to various factors, mainly affecting credit supply and cost of debt, as detailed by Thamae and Odhiambo (2022). Increased minimum reserve requirements decrease the amount of capital available to banks for lending (therefore the amount of capital generating interests), affecting banks' overall profitability and credit supply (Thamae & Odhiambo, 2022; Tirupattur, 2023). Regulations that impose entry barriers to banking and lending are likely to affect financial leverage by decreasing competition within the banking and credit supply industry, leading to higher costs of debt for companies (Thamae & Odhiambo, 2022; Guiso et al., 2006). As for restrictions on banking activities, they prevent banks from taking advantage of information they may gain from diversified activities and segments (economies of scale and scope), contributing to higher costs for banks passed onto their customers (Thamae & Odhiambo, 2022). Finally, tighter regulations and increased regulatory compliance costs can drive banks to move to less regulated markets and countries; this decreases credit supply and drives lending demand

towards other financial intermediaries or shadow banks. These institutions, in addition to being non-regulated, may charge higher interest rates and provide less favorable lending terms (Thamae & Odhiambo, 2022).

These theoretical implications have been confirmed by many empirical studies, revealing a negative effect of regulation on lending and on non-financial firm leverage (Avezum et al., 2022; Thamae & Odhiambo, 2022). However, Avezum et al. (2022) highlight studies that found a positive correlation between some restrictions on bank activities and firm leverage through the reduction of investment alternatives available to banks.

### 2.2.2. EFFECT ON INVESTMENT, VALUE, AND GROWTH

Faced with these higher costs of debt financing, firms have three alternatives when considering a new project; if internal capital is not available and the cost of debt is too high, the firm can either disinvest funds from other projects to free up cash, finance the project using equity, or reject the project. While disinvestment does not affect the firm's capital structure, it is likely to affect its ability to grow. As highlighted by Harris and Raviv (1991), between equity financing and rejecting the new project, firms are much more likely to choose the second alternative. In addition to being consistent with the pecking order theory, this behavior is also reasonable considering that equity is generally more expensive than debt; if the higher cost of debt reduces the attractiveness of the project, equity will not be a viable financing alternative (Sharma et al., 2022). As such, by restricting firms' access to debt financing through reduced supply and a higher cost of debt, tighter regulations will restrict investment opportunities and decisions by forcing firms to forego projects with an otherwise positive net present value (NPV). This directly affects their profit, growth, and ability to generate value.

Avezum et al. (2022) establish a link between more stringent capital requirements for financial institutions and firm value by assessing the effects of the European Banking Authority capital exercise, which led to an increase in capital requirements for some banks in 2011. This tightening regulation resulted in a decline of firm assets, investment, and sales growth (Avezum et al., 2022). They (Avezum et al., 2022) also report that other papers have established a link between increased capital requirements and lower firm investment, employment, sales, and survival rates.

To summarize, tighter financial regulation increases banks' cost of lending, which translates into reduced credit supply and increased cost of debt for firms. This influences their decisions with respect to capital structure, financing, and investment, and affects their revenues, value, performance, and growth prospects.

### 2.3. DODD-FRANK – EFFECTS ON FIRM LEVERAGE

Following the financial crisis of 2008, the Obama administration passed the Dodd-Frank Act with the goal of improving transparency and stability in the financial system. It increased regulation on banks, nonbank financial companies, and credit rating agencies (CRAs) (Sharma et al., 2022). Later, the Dodd-Frank Act was subject to regulatory rollbacks under the Trump presidency in 2018. Like most regulations, the introduction of the Dodd-Frank act had unintended consequences, such as on firm leverage. First, the new regulation imposed heavy regulatory compliance costs on credit suppliers. Moll et al. (2019) find that the Dodd-Frank Act led to large losses for U.S. commercial banks, due to increased costs which affected their profitability. As established in the previous sections, lenders are likely to transfer at least a part of these higher costs to borrowers, leading to an increased cost of debt for firms.

In addition to higher compliance costs, the Dodd-Frank Act imposed new regulations on CRAs which mainly increased their liability for issuing erroneous credit ratings. The Dodd-Frank Act made it easier for private lawsuits against CRAs to proceed to trial, while simultaneously facilitating the Securities and Exchange Commission's (SEC) ability to impose sanctions for misstatements and fraud (Dimitrov et al., 2015). As discussed by Dimitrov et al. (2015), these tighter regulations can lead to two possible outcomes. First, they can have disciplining effects, incentivizing CRAs to improve their processes and issue more accurate credit ratings. However, if these regulations and penalties are asymmetric (i.e., if CRAs are disproportionately punished for issuing optimistic ratings compared to pessimistic ratings), the Dodd-Frank Act will have a negative effect on ratings accuracy; CRAs will issue lower ratings for firms regardless of their credit worth. Dimitrov et al. (2015) and Sharma et al. (2022) find supporting evidence for this second alternative. Since there are little to no consequences to issuing pessimistic ratings, and since issuing more accurate ratings implies higher information costs, CRAs will simply lower ratings. The period following the passage of Dodd-Frank is characterized by lower average bond ratings, higher levels of false warnings, and lower responses of bond and stock markets to rating downgrades, indicating CRA ratings are less informative (Dimitrov et al., 2015). When controlling for additional variables, the authors (Dimitrov et al., 2015) find a close relationship between the Dodd-Frank act and the lower credit ratings, with no link to a deterioration of issuer quality. Given that information on a firm's financial health reduces credit supply frictions (Avezum et al., 2022), this loss of information is likely to lead to increased costs for both lenders and borrowers.

In addition to leading to higher costs of debt, this increased downgrade risk caused by the change in CRA incentives is likely to affect firms' financing decisions directly, as many

financial market agents and firm stakeholders take credit ratings into account when making decisions. According to Sharma et al. (2022), credit rating plays an important role in debt financing decisions, and firms actively work on protecting it. According to the Credit Rating – Credit Supply theory (CR-CS), two firms with identical credit quality will have significantly different optimal debt levels, with lower debt levels for low-rated firms than what traditional trade-off theory would suggest (Sharma et al. 2022). Given that the consequences of being downgraded are greater for firms with already low credit ratings, this effect will be more pronounced for these companies, making them more likely to significantly reduce their leverage ratios (Sharma et al., 2022). It is important to note, however, that while the consequences of downgrades are higher for low-rated firms, they were not subjected to disproportionally more downgrades in the post-Dodd-Frank period. If this were the case, it would suggest that the credit rating downgrade trend is a result of better information or more accurate ratings, rather than asymmetric incentives. Sharma et al. (2022) and Dimitrov et al. (2015) find the opposite; the increased probability of credit rating downgrades is independent from firms' underlying credit quality.

In addition to these findings, Sharma et al. (2022) highlight a negative feedback loop where lower ratings lead to a higher cost of debt, making it more difficult for the firm to meet its financial obligation and increasing the risk of financial distress, further lowering its credit rating. Another consequence of these downgrades resulting from incentive asymmetry stems from the fact that, according to CR-CS theory, credit ratings are expected to contain additional information not available in other publicly accessible sources such as financial statements. As such, credit ratings are not only informative for debt issuers but are also used by other stakeholders (Sharma et al., 2022). Suppliers are likely to refer to credit ratings to evaluate a firm's default probability. This leads to higher

costs for low-rated companies to compensate for the perceived increase in default risk, less favorable payment terms, or a struggle to find suppliers all together. Customers in certain industries are also likely to rely on information from credit ratings, avoiding firms they perceive as likely to default. For instance, when purchasing new machinery for a manufacturing plant with a five-year warranty, the probability of default within these five years perceived by the firms' customer is likely to affect their purchase decision. Firms with low credit ratings are also likely to struggle in securing partnerships, even if their underlying financial health is not as bad as the ratings suggest. Sharma et al. (2022) find that the post-Dodd-Frank period is characterized by a reduction in these firms' net investment by twenty-four percent (24%). Combined with the previously mentioned effects, this suggests the passage of the Dodd-Frank Act is likely to have had a negative effect on firm values, profitability, and growth.

### 2.4. EXPECTED EFFECTS OF THE DODD-FRANK ROLLBACK

As established in the previous sections, the introduction of new financial regulation is likely to have unintended consequences on firms' capital structure and financing decisions, and the passage of the Dodd-Frank Act is no exception.

Trump's first election and prospects of less regulation resulted in large capitalization gains for commercial banks (Moll et al., 2019). During his first presidency, Donald Trump rolled back part of the restrictions Dodd-Frank imposed on financial institutions. The bill, passed in May of 2018, includes – but is not limited to – an increase from $50 billion to $250 billion of the asset threshold above which banks are subject to heightened regulation and oversight; this reduced the number of banks that fell in this category from thirty-eight to thirteen (Heinrich, 2018). The rollback also included a relaxation of the Volcker Rule of the Dodd-Frank Act, which limited banks' ability to engage in speculative and

proprietary trading, exemptions from certain disclosure requirements for small lenders (Home Mortgage Disclosure Act), and increased leniency for small banks (Cominsky, 2018).

As previously discussed, this decrease in compliance costs for many banks following relaxation of the Dodd-Frank act is likely to increase bank profits, opening the possibility of a lower cost of debt. Based on the consequences of the passage of Dodd-Frank, expectations for the impact of Trump's rollbacks on firms include the following: reduced compliance costs for banks resulting in an increase in credit supply and easier access to debt for firms, increased firm leverage, increased capital productivity, higher revenues, and finally, higher firm values.

## 3. METHODS AND DATA

This section presents the data and methodology used to empirically test the effect of the Dodd-Frank rollback on leverage, capital productivity, revenues, and firm values of the one hundred largest U.S. companies.

### 3.1. CONTEXT

While many authors (Avezum et al., 2022; Thamae & Odhiambo, 2022) have studied the effects of financial regulation on firms and various aspects of the economy, there is a gap in the literature when it comes to the impact of deregulation. This is likely because while there are many instances of large regulations being introduced at once – especially following significant financial crises, deregulation often takes place in a slower, more incremental way, which makes it more difficult to observe. In this regard, the Dodd-Frank rollback bill offers a unique opportunity to empirically study the effect of deregulation. First, the rollbacks were all introduced in the same year, providing a clear timing for the

event. Second, the reforms were relatively diverse and large enough to impact several banks, increasing the likelihood of a significant effect being observed in various aspects of the US economy. Finally, as discussed in the previous sections, the rollback is expected to directly affect easily observable metrics, such as firms' debt-to-equity ratios, revenues, productivity and profitability ratios, and firm values.

One issue, however, is that the Dodd-Frank rollback came amidst a larger wave of deregulation. During his first mandate, Trump positioned himself as a self-proclaimed deregulator (Belton & Graham, 2020). While some question whether he was successful in fulfilling this agenda (Belton & Graham, 2020; Coglianese et al., 2021), the president still completed several deregulatory actions (Belton & Graham, 2020). In addition to the Dodd-Frank rollback, these include deregulation in labor laws relating to health, safety, and pay (McNicholas et al., 2018), as well as climate and environment (Wallach & Kennedy, 2022). Additionally, the period following the Dodd-Frank rollback was marked by a significant and major global event that heavily disrupted supply chains and economic activity around the world: the Covid-19 pandemic.

### 3.2. DATA AND SAMPLE

To test the effects of the Dodd-Frank rollback predicted in section 2.4., secondary data is compiled from various sources into two samples. A first sample consists of US and international company data from the following countries: Australia, Canada, France, Germany, Switzerland, and the United Kingdom. This sample is further referred to as the international sample. A second sample consists of data on US companies only and is further referred to as the US sample. To select the companies to be included in the samples, a list of the one hundred largest publicly traded U.S. companies (S&P100) and twenty largest companies in each of the non-US countries was gathered from

TradingView (2025a – 2025g). Using a custom-built template on the Bloomberg terminal, financial data and ratios between the years of 2015 to 2024 of these companies were compiled in individual sheets of an excel document (Bloomberg, 2025a – 2025g). This period allows the use of three pre-Dodd-Frank rollback years as a reference for six post-Dodd-Frank rollback years in the US sample, and three pre-Dodd-Frank rollback years as a reference for seven post-Dodd-Frank rollback years in the international sample[6]. This financial data includes the following variables, further detailed in Table I: debt-to-equity ratio, pretax margin, market capitalization, return on capital (ROC), revenue, enterprise value, net debt-to-EBITDA (earnings before interest, taxes, depreciation, and amortization), cashflow from operations, and EBITDA margin.

Additionally, as discussed in the previous sub-section, the effect of the Dodd-Frank rollback must be isolated from that of other events that may affect firms' financial performance. Given that the effects of labor and environmental deregulation are difficult to observe directly, proxy variables are used as controls. Hourly wage is used as a proxy for labor law deregulation, under the assumption that this deregulation affects wages, at least partially. This data is obtained from the U.S. Bureau of Labor Statistics (2025). To control for environmental deregulation, the proxy variables used are the air quality index and greenhouse gas emissions, assuming that the deregulation affects environmental quality. This data is obtained from the U.S. Environmental Protection Agency (2024a, 2024b).

The data also includes the GDP per state, obtained from the US Bureau of Economic Analysis (2025), used as a proxy variable to control for variations in firms' financial

[6] The lack of data availability of additional control variables included in the US-only sample (*h_wage, AQI, log_GHG, and GDP)* for the year 2024 limited the panel to nine total periods, instead of ten, leading to the US-only panel being one year shorter than the international panel.

performance due to inflation (and general economic conditions). While the consumer price index (CPI) would have been a more appropriate measure, it was not available at state or county-level; this makes it unsuitable for the panel dataset as it would only vary across years, but not between firms.

Given that the variables above were not available at regional level for non-US countries, the data is broken down into two samples. The international sample includes non-US companies as a control group but does not include the control variables. This sample will be used to identify whether the Dodd-Frank rollback had an effect on US companies that led to different outcomes than those observed in non-US companies. The US sample does not include a control group but instead includes the control variables. This sample will be used to further isolate any Dodd-Frank rollback effects identified using the international sample.

Once all the data above was extracted, it was compiled into a panel data structure using custom excel functions (with Microsoft VBA). Each company-year pair was matched with the corresponding financial data from the firm's sheet, and proxy variable values were attributed to each observation of US companies based on year and location of the firm's headquarters. For the US sample, out of the one hundred companies selected, two were excluded because of corrupted data, and another two because of a lack of financial data availability for enough years (four years or more). Three other companies were automatically excluded from the analysis during US only regressions as their headquarters were located outside of the US. In the international sample, another three were excluded because of data availability. This left a total of ninety-three out of the one hundred initial companies in the final US sample, and a total of two hundred and thirteen

companies in the final international sample, over a time period of nine years. Both datasets are short, unbalanced panels.

Finally, five more variables were generated and attributed to each observation in the dataset: a binary variable *DF_rollback* distinguishing observations before the Dodd-Frank rollback from observations after; a binary variable *USA* distinguishing US firms from non-US firms; the interaction *dodd_frank_relaxed* equal to *DF_rollback* × *USA*, distinguishing observations affected by the policy from observations that are not; a binary variable *post_covid* distinguishing observations before the Covid-19 pandemic from observations after; and a time trend variable *t_trend* used to control for time-specific effects. All variables in the dataset are further detailed in Table I.

Table I - Variables and descriptions

| | Variable Name | Description[7] |
|---|---|---|
| **Dependent Variables** | *DE_ratio* | The debt-to-equity ratio, a measure of the proportion of debt in a firm's capital structure. US and international sample. |
| | *market_cap* | The market capitalization of the firm (in millions of USD), which is equal to its share value multiplied by its number of shares outstanding. US and international sample. |
| | *ROC* | Return on capital, the return that the company's investments generate for capital contributors, in percentage. US and international sample. |
| | *revenue* | The amount of sales generated (in millions of USD) by the company after the deduction of sale returns, allowances, discounts, and sales-based taxes. US and international sample. |
| **Financial Regressors** | *enterprise_value* | The enterprise value (in millions of USD), measure of the total economic value of a firm or theoretical takeover price, used to control for firm size. US and international sample. |
| | *net_D_EBITDA* | Net debt-to-EBITDA, a measure of the company's debt burden relative to its earnings. US and international sample. |

[7] Financial variables descriptions were derived from Bloomberg (2025a – 2025g) data descriptions.

| | | |
|---|---|---|
| | *cashflow_op* | The cashflow from operations (in millions of USD), measure of the cash generated by a company from its core business activities. US and international sample. |
| | *EBITDA_margin* | The EBITDA margin, a measure of a firm's operating profit as a percentage of its revenue. US and international sample. |
| | *pretax_margin* | The pretax margin, percentage of revenue that remains as profit after costs but before taxes are deducted. US and international sample. |
| **Proxy Variables** | *h_wage* | The mean hourly wage by state, used as a proxy for labor law deregulation. US sample only. |
| | *AQI* | The air quality index by county, which indicates the proportion of good air quality days recorded (number of good days divided by total number of days recorded). Used as a proxy variable for environmental deregulation. US sample only. |
| | *log_ghg* | The greenhouse gas emissions by county in metric tons of CO2, log transformed to correct for heavy skewness. Used as a proxy variable for environmental deregulation. US sample only. |
| | *GDP* | The gross domestic product by state, used as a proxy variable for inflation. US sample only. |
| **Binary Variables** | *DF_rollback* | A binary variable equal to zero before 2018, and one after. It distinguishes observations recorded before the Dodd-Frank rollback went into effect from those recorded after. International sample only. |
| | *USA* | A binary variable equal to one for US companies, and zero otherwise. International sample only. |
| | *dodd_frank_relaxed* | An interaction variable *DF_rollback* × *USA*. It distinguishes observations affected by the policy (US companies after 2018) from observations that are not. In the US only sample, this variable is equal to *DF_rollback*. US and international sample. |
| | *post_covid* | A binary variable equal to zero before 2020, and one after. It supposes the effects of the Covid-19 pandemic were only felt in and after 2020, as there were few to no lockdowns at the end of 2019. It is used to isolate external shocks to firms' financial performance that are due to disruptions caused by the pandemic. US and international sample. |

Summary statistics for these variables are reported in tables II to IV below. Table II presents statistics for the binary and time trend variables for the international and the US sample. Table III contains panel summary statistics for the variables in the international

sample, and Table IV describes the variables of the US sample. Finally, Table V contains summary statistics for the international sample, differentiating between US companies and non-US companies.

Table II - Summary statistics for binary variables

| | | | US Sample | | | International Sample | | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Min** | **Max** | **Mode** | **Frequency** | **Obs.** | **Mode** | **Frequency** | **Obs.** |
| *dodd_frank_relaxed* | 0 | 1 | 1 | 576 | 864 | 0 | 1,457 | 2,129 |
| *post_covid* | 0 | 1 | 0 | 480 | 864 | 1 | 1065 | 2,129 |
| *DF_rollback* | 0 | 1 | - | - | - | 1 | 1,491 | 2,129 |

Table III - Summary statistics for variables in the international sample

| **Variable** | **Mean** | **Min** | **Max** | **Std. Dev.** | | | **Observations** | |
|---|---|---|---|---|---|---|---|---|
| | | | | **Overall** | **Between** | **Within** | **N** | **n** |
| *DE_ratio* | 174.81 | 0 | 8,885.93 | 391.78 | 307.57 | 286.43 | 2,066 | 212 |
| *pretax_margin* | 18.84 | -151.11 | 178.70 | 17.49 | 14.46 | 9.887 | 2,129 | 213 |
| *ROC* | 11.62 | -123.9 | 275.85 | 13.37 | 8.332 | 10.48 | 2,101 | 212 |
| *revenue* | 55,767.6 | 205.23 | 648,125.0 | 73,570.66 | 69,888.9 | 23,401.47 | 2,129 | 213 |
| *market_cap* | 131,097.1 | 314.21 | 3,443,452 | 235,355.2 | 196,819.5 | 128,832.9 | 2,116 | 213 |
| *enterprise_value* | 151,092.4 | 544.16 | 3,425,759 | 243,076.4 | 198,996.7 | 139,421.9 | 1,896 | 191 |
| *cashflow_op* | 9,777.5 | -105,339.2 | 181,345.0 | 16,485.4 | 12,029.3 | 11,297.9 | 2,129 | 213 |
| *net_D_EBITDA* | 2.395 | -120.76 | 1,773.5 | 42.08 | 14.91 | 39.62 | 1,790 | 182 |
| *EBITDA_margin* | 27.63 | -92.97 | 98.37 | 17.04 | 15.63 | 6.882 | 1,819 | 182 |

Note: N is the total number of observations for a given variable (it excludes missing observations).

Table IV - Summary statistics for variables in the US sample

| Variable | Mean | Min | Max | Std. Dev. | | | Observations | |
|---|---|---|---|---|---|---|---|---|
| | | | | Overall | Between | Within | N | n |
| *DE_ratio* | 216.02 | 0 | 8,885.9 | 536.13 | 395.25 | 415.28 | 818 | 95 |
| *pretax_margin* | 19.73 | -32.37 | 113.01 | 14.83 | 12.70 | 7.754 | 864 | 96 |
| *ROC* | 13.89 | -44.44 | 80.39 | 12.94 | 9.582 | 8.710 | 851 | 95 |
| *revenue* | 69,919.2 | 1,005.5 | 611,289.0 | 86,638.1 | 82,329.1 | 28,123.1 | 864 | 96 |
| *market_cap* | 195,106.9 | 2,312.6 | 2,662,325 | 276,408.1 | 232,929.6 | 150,493.2 | 864 | 96 |
| *enterprise_value* | 212,825.1 | 3,765.8 | 2,638,568 | 272,594.6 | 222,902.7 | 158,455.4 | 819 | 91 |
| *cashflow_op* | 12,803.3 | -79,910.0 | 122,151.0 | 17,049.2 | 13,816.3 | 10,077.4 | 864 | 96 |
| *net_D_EBITDA* | 3.463 | -120.16 | 1,773.5 | 63.31 | 23.76 | 59.18 | 789 | 89 |
| *EBITDA_margin* | 29.09 | -24.49 | 78.21 | 16.64 | 15.52 | 6.215 | 801 | 89 |
| *GDP* | 1,457,120 | 56,604.0 | 3,870,379 | 1,079,329 | 1,052,493 | 260,403.6 | 837 | 93 |
| *log_GHG* | 6.02 | 4.88 | 7.74 | .5308 | .5226 | .1060 | 837 | 93 |
| *AQI* | .5429 | 1.000 | .0082 | .1777 | .1604 | .0780 | 837 | 93 |
| *h_wage* | 28.55 | 18.53 | 51.07 | 4.601 | 3.493 | 3.015 | 837 | 93 |

Note: n is the number of units for which observations are available for a given variable.

Table V - Summary statistics for the international sample – US and non-US firm comparison

| | Non-US companies | | | | US Companies | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | Observations | | Std. Dev. | Mean | Observations | | Std. Dev. | Mean |
| | N | n | Overall | | N | n | Overall | |
| *DE_ratio* | 1,159 | 117 | 167.05 | 136.52 | 907 | 95 | 556.69 | 223.75 |
| *pretax_margin* | 1,169 | 117 | 19.36 | 18.05 | 960 | 96 | 14.85 | 19.81 |
| *market_cap* | 1,156 | 117 | 56,407.7 | 64,449.9 | 960 | 96 | 326,387.9 | 211,351.3 |
| *ROC* | 1,157 | 117 | 13.38 | 9.708 | 944 | 95 | 12.99 | 13.97 |
| *revenue* | 1,169 | 117 | 50,856.3 | 41,728.6 | 960 | 96 | 91,256.2 | 72,863.1 |
| *enterprise_value* | 986 | 100 | 73,096.9 | 77,770.3 | 910 | 91 | 324,403.2 | 230,538.01 |
| *cashflow_op* | 1,169 | 117 | 14,399.8 | 7,005.8 | 960 | 96 | 18,158.7 | 13,152.7 |
| *net_D_EBITDA* | 914 | 93 | 2.882 | 1.547 | 876 | 89 | 60.09 | 3.279 |
| *EBITDA_margin* | 929 | 93 | 17.12 | 26.01 | 890 | 89 | 16.80 | 29.31 |

Looking at the statistics of Table V in more detail, US companies appear to keep higher debt levels than non-US firms, with their debt-to-equity and net debt-to-EBITDA ratios being higher. US firms also appear to be more profitable than their international counterparts, with higher average returns on capital, EBITDA margins, and pretax margins. Finally, US companies appear to be relatively larger, with much higher market capitalization and enterprise value means than non-US companies.

## 3.3.METHODOLOGY

Because of the data availability restrictions that affected non-US companies, this paper follows a two-step method to assess the impact of the Dodd-Frank rollback on the dependent variables: *DE_ratio, ROC, revenue, market_cap*. The first set of regressions uses the international sample to assess the effect of the rollback on US companies using international firms as a control group and is detailed in the first subsection. The second set of regressions is run only on US firms, using the control variables discussed in the previous section to further isolate the effect of the rollback from other major regulatory changes during the period, and is introduced in the second subsection. Subsection three will address the use of dynamic models, and subsection four will discuss limitations of the methods used.

### 3.3.1. INTERNATIONAL REGRESSIONS

Taking advantage of the availability of a control group in the international sample, this first set of regressions follows a similar approach to Sharma et al. (2022)[8], who use a difference-in-difference approach to study the effects of the introduction of Dodd-Frank in 2010 on firms' financing and investment policies. The purpose of this set of regressions

[8] This methodology is also inspired by Dimitrov et al. (2015), Lee and Lu (2015), and Lechner (2010).

is to obtain an initial estimation of the effect of the Dodd-Frank rollback on firms, using non-US firms as a control group.

The general regression model used in this section is the following:

(1) $Y_{it} = \beta_0 + \beta_1 DF\_rollback_t + \beta_2 dodd\_frank\_relaxed_{it} + \gamma X_{it} + (u_{it} + \alpha_i)$

where $Y_{it}$ is the dependent variable of interest; $\beta_0$, $\beta_1$, and $\gamma$ are the intercept and the coefficients of the regressors; $i = 1, \dots, 213$ identifies the firm; $t = 2015, \dots, 2024$ identifies the year; $X_{it}$ are the additional control variables included; and $u_{it}$ and $\alpha_i$ the idiosyncratic and individual-specific error terms, respectively.

Based on this general regression model, two subsets of regressions are estimated: a base model and an extended model. In addition to *DF_rollback* and *dodd_frank_relaxed*, the base model of the international set of regressions includes *post_covid* and *t_trend* as explanatory variables. In cases where the base model estimated is not globally significant at the 5% level, it is extended to include additional explanatory variables described in Tables III and IV.

The decision between fixed effect and random effect regressions is based on the approach of Chamberlain (1980) and Mundlak (1978). This method suggests that if the individual-specific portion of the error term ($\alpha_i$) is correlated with the regressors, the time averages of these regressors will be jointly significant when added to the regression. Therefore, to determine whether a fixed or random effect estimator should be used, the dependent variable of interest is regressed on the independent variables and their time averages using a pooled ordinary least squares (POLS) estimator, with (cluster-) robust standard errors. Then, the joint significance of these time averages is tested using an F-test interpreted as follows:

| | | |
|---|---|---|
| $H_0$: the time averages of the regressors are jointly insignificant | vs | $H_1$: at least one of the time averages of the regressors is significant |

If the test leads to a rejection of the null hypothesis, the regression is estimated using fixed effect estimator. If the test fails to reject the null hypothesis, a pooled OLS estimator with cluster robust standard errors is used instead[9]. A standard significance level of 5% is used as a rejection threshold.

Where a pooled OLS estimator is used, the Chamberlain-Mundlak device is included to control for endogeneity. The general regression model therefore becomes:

$$(2)\ Y_{it} = \beta_0 + \beta_1\, DF\_rollback_t + \beta_2\, dodd\_frank\_relaxed_{it} + \gamma X_{it} + \delta \bar{X}_i + (u_{it} + \alpha_i)$$

where $\bar{X}_i$ is the time average of time-varying regressors (except the time trend). By being included, this term controls for the potential correlation between the individual fixed effects, $\alpha_i$, and the regressors, effectively controlling for endogeneity (Chamberlain, 1980; Mundlak, 1978; Woodridge, 2021).

While the time persistence of financial and corporate data is widely accepted in literature, it is not accounted for in the regression. This phenomenon has been discussed and highlighted by various authors, such as Waring (1996), Bennet (2020), Caporale (2024), and many others. In the context of financial regulation and firms, it refers to the observation that a firm's financial performance today will likely affect its performance tomorrow. For example, a firm's current debt-to-equity ratio is likely affected by its debt-to-equity ratio from previous years.

[9] While random effect estimators only account for cluster autocorrelation, POLS estimators with cluster robust standard errors also account for general form heteroskedasticity, promoting efficiency. They are therefore used independently of the outcome of White's test for heteroskedasticity.

Time persistent effects can be accounted for in regressions using dynamic models, such as the Blundel-Bond estimator. However, this estimator is not included in the regressions as it was not relevant in the international sample studied. This is due to the fact that the dependent variables of interest were mostly constant over time, as can be seen on the company line plots in Appendix II. To confirm this, the models of sections 3.2.1. and 3.2.2. were estimated using the Blundell-Bond estimator; the Sargan-Hansen test rejected the validity of the regressions every time (Appendix III). Dynamic models have therefore been excluded from the analysis.

### 3.3.2. US REGRESSIONS

As discussed in section 3.1., the Dodd-Frank rollback took place amidst other regulatory rollbacks. While an ideal methodology would have been to control for these events in the international regressions and benefit from the existence of both a control group and control variables, the proxies used for labor deregulation, environmental deregulation, and inflation were not available at regional, county, or city level for non-US countries. Therefore, this second set of US-only regressions attempts to further isolate the effect of the Dodd-Frank rollback other events using a concept borrowed from the health sector, a multiperiod, single-group, before-after study[10] (Paulus et al., 2013) applied to panel data. However, it is crucial to acknowledge the limitations of this methodology in economics, which will be further detailed in section 3.3.4.

The general regression model used in this section is the following[11]:

(3) $Y_{it} = \beta_0 + \beta_1\, dodd\_frank\_relaxed_{it} + \gamma X_{it} + (u_{it} + \alpha_i)$

[10] This model is also distantly inspired by Avezum et al. (2022) and Dimitrov et al. (2015)
[11] Note: In the US-only sample, the *dodd_frank_relaxed* variable is equal to *DF_rollback*

where $Y_{it}$ is the dependent variable of interest; $\beta_0$, $\beta_1$, and $\gamma$ are the intercept and the coefficients of the regressors; $i = 1, \dots, 93$ identifies the firm; $t = 2015, \dots, 2023$ identifies the year; $X_{it}$ are the additional control variables included; and $u_{it}$ and $\alpha_i$ the idiosyncratic and individual-specific error terms, respectively.

In addition to the *dodd_frank_relaxed* binary variable, the base model of this set of regressions includes *post_covid, AQI, log_GHG, h_wage, GDP,* and *t_trend* as explanatory variables. Similarly to the first set of regressions, if the base model estimated is not globally significant at the 5% level, it is extended to include additional explanatory variables. The choice between a fixed effect or pooled OLS estimator follows the same methodology described in the previous section. In the second case, regressions were estimated using a pooled OLS estimator, extended with the Chamberlain-Mundlak device and using (cluster-) robust standard errors for adequate statistical inference. In this case, the general regression model becomes:

(4) $Y_{it} = \beta_0 + \beta_1\, dodd\_frank\_relaxed_{it} + \gamma X_{it} + \delta \bar{X}_i + (u_{it} + \alpha_i)$

where $\bar{X}_i$ is the time average of time-varying regressors (except the time trend).

Once again, dynamic models are not considered as they were not relevant to the US sample studied, for the same reasons stated in the previous section.

### 3.3.3. LIMITATIONS

Due to data availability constraints, the methods described in subsection 3.3.1. and 3.3.2 present limitations which are important to acknowledge before moving on to result interpretation.

First, as is often the case in economics, the event studied takes place in the real world and not in a controlled environment. It is therefore impossible to rule out that the effects being attributed to one variable are not in reality caused by an unobserved event. This issue is even more pronounced in the international regression set, where the lack of data availability for proxy variables prevented controlling for them in the regression. It is therefore not possible to exclude that effects attributed to the Dodd-Frank rollback variable in the international regressions may be capturing the consequences of other policy rollbacks or unobserved events affecting firms in the same period (Price & Murnan, 2004)[12].

This is why this paper includes the US set of regressions in an attempt to further isolate the effect of the rollback from other regulatory changes or global events. However, the lack of a control group prevents the use of a Difference-in-Difference approach, relying instead on a single-group, multiperiod, before-after study. As discussed by Paulus et al. (2013), this methodology presents various limitations. First, the lack of a control group makes it impossible to observe how trends evolved in an unaffected group, making the unobserved event problem even more pronounced (Paulus et al., 2013). Additionally, the authors (Paulus et al., 2013) find that this type of study is often "inappropriately analyzed (e.g., autocorrelation was often ignored), underpowered, and poorly reported" (Paulus et al., 2013). In terms of unobserved confounding effects, Paulus et al. (2013) distinguish between time-invariant individual effects and time-varying factors. According to them (Paulus et al., 2013), the former do not affect the validity of result interpretations, because the individuals studied are compared with themselves pre-policy. However, time variant

[12] The authors discuss this issue in the context health education. Their work has been extended to apply to the topic of this dissertation.

unobserved factors compromise the validity of causal inference. In the sample of US firms, it is unlikely that firm-specific effects are time-invariant given the dynamic nature of companies and their environments. Another common limitation relates to sample selection (Paulus et al., 2013; Price & Murnan, 2004). Given that only the largest firms in each country were selected in the samples studied, it is not possible to exclude this potential bias. It is reasonable to expect that the effects of the Dodd-Frank rollback will vary significantly between large and small firms, one of the reasons being the different levels of reliance on bank debt (as opposed to corporate bonds), and access to alternative sources of capital.

Given these limitations to both the international and the US regressions, they should not be interpreted individually to infer the effect of the Dodd-Frank rollback on US firms. Instead, their results will be combined to observe these effects. Ideally, further research will integrate these two models into one regression, where US firms are studied with a control group, and proxy variables control for external shocks and events, providing more robust results and conclusions.

## 4. DATA ANALYSIS AND RESULTS

Now that the specifications and limitations of the regression models used have been discussed, this section analyses the results obtained. Table VI presents the results of the first set of regressions, the international regression base model. Table VII contains the results of the second set of regressions, the US regression base model. As the tables indicate, the base model was not globally significant at the 5% level for the dependent variables *DE_ratio* and *ROC*. Results of the extended models for these dependent

variables are presented in Table VIII. The p-value of each coefficient is reported between parenthesis below it.

Table VI - International regression base model results

| | **Dependent Variable (Y)** | | | |
|---|---|---|---|---|
| **Independent Variables (X)** | *DE_ratio*[13] *(6.1)* | *ROC (6.2)* | *Revenue (6.3)* | *Market_Cap (6.4)* |
| *DF_rollback* | -21.957 | 0.591 | -546.031 | -24,070.460 |
| | (0.277) | (0.380) | (0.737) | (0.007) |
| *dodd_frank_relaxed* | 112.025 | 1.599 | 17,082.860 | 97,564.840 |
| | (0.012) | (0.190) | (0.000) | (0.000) |
| *post_covid* | 6.865 | 0.065 | 10,124.540 | 56,900.250 |
| | (0.721) | (0.922) | (0.000) | (0.000) |
| *t_trend* | 1.549 | -0.027 | -153.890 | -440.801 |
| | (0.652) | (0.718) | (0.238) | (0.438) |
| *_cons* | 144.032 | 10.817 | 46,539.400 | 90,858.650 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| **Observations** | 2,066 | 2,101 | 2,129 | 2,116 |
| **R^2 (Overall)** | 0.0157 | 0.0191 | 0.0465 | 0.1112 |
| **Global Significance** | 0.1683 | 0.1312 | 0.0000 | 0.0000 |
| **Type** | RE | FE | FE | FE |

The analysis of these results will be structured as follows: for each dependent variable, the results of the international regression are analyzed first, followed by the results of the US regression, which will be used to either substantiate or controvert them. Unless indicated otherwise, the significance level considered is 5%.

[13] This regression does not include a Chamberlain-Mundlak device since it does not include any time-varying regressors.

Table VII - USA regression base model results[14]

| | **Dependent Variable (Y)** | | | |
|---|---|---|---|---|
| **Independent Variables (X)** | *DE_ratio (7.1)* | *ROC (7.2)* | *Revenue (7.3)* | *Market_Cap (7.4)* |
| *dodd_frank_relaxed* | 63.855 | 2.401 | 2,155.256 | 14,222.71 |
| | (0.181) | (0.041) | (0.115) | (0.037) |
| *post_covid* | -4.671 | -0.194 | -6,651.258 | 26,542.87 |
| | (0.948) | (0.881) | (0.097) | (0.285) |
| *AQI* | -68.396 | -11.675 | -29,757.060 | -19,652.76 |
| | (0.808) | (0.007) | (0.031) | (0.691) |
| *log_GHG* | -219.315 | -1.862 | -3,301.533 | -193,202.9 |
| | (0.292) | (0.739) | (0.859) | (0.191) |
| *h_wage* | -7.972 | -0.637 | 6,184.271 | 10,375.58 |
| | (0.556) | (0.056) | (0.007) | (0.348) |
| *GDP* | -0.0002 | 0.00001 | -0.012 | 0.032 |
| | (0.357) | (0.007) | (0.512) | (0.698) |
| *t_trend* | -16.462 | -0.020 | 140.679 | -308.156 |
| | (0.052) | (0.885) | (0.618) | (0.787) |
| *_cons* | 817.624 | 43.350 | -51,530.420 | 245,344.1 |
| | (0.275) | (0.005) | (0.678) | (0.437) |
| **Observations** | 792 | 824 | 837 | 837 |
| **R^2 (Overall)** | 0.0241 | 0.0659 | 0.0001 | 0.0680 |
| **Global Significance** | 0.2438 | 0.0023 | 0.0000 | 0.0011 |
| **Type** | RE | RE | FE | RE |

This section will be divided into four subsections, analyzing the impact of the Dodd-Frank rollback on firm leverage, capital productivity, revenues, and firm values.

[14] The Chamberlain-Mundlak device was added to pooled OLS regressions to control for possible correlation between the explanatory variables and the unobserved individual heterogeneity.

Table VIII - Extended model regression results - International and US regressions[15]

| | **International Regressions** | | **US Regressions** | |
|---|---|---|---|---|
| **Independent Variables (X)** | **Dependent Variable (Y)** | | **Dependent Variable (Y)** | |
| | *DE_ratio (8.1)* | *ROC (8.2)* | *DE_ratio (8.3)* | *ROC (8.4)* |
| *DF_rollback* | -2.359 | -0.111 | | |
| | (0.912) | (0.895) | | |
| *dodd_frank_relaxed* | 92.935 | 2.657 | 102.128 | 2.254 |
| | (0.041) | (0.034) | (0.027) | (0.069) |
| *post_covid* | 1.801 | - 0.664 | -3.271 | -0.576 |
| | (0.947) | (0.387) | (0.967) | (0.652) |
| *AQI* | | | -106.755 | -12.065 |
| | | | (0.575) | (0.008) |
| *log_GHG* | | | -38.487 | -0.693 |
| | | | (0.513) | (0.900) |
| *h_wage* | | | -0.654 | -0.786 |
| | | | (0.937) | (0.015) |
| *GDP* | | | -0.00002 | 0.00001 |
| | | | (0.705) | (0.007) |
| *t_trend* | 0.667 | -0.017 | -17.759 | -0.010 |
| | (0.831) | (0.841) | (0.043) | (0.945) |
| *enterprise_value* | 0.00008 | 0.00001 | 0.00007 | 0.00001 |
| | (0.149) | (0.395) | (0.297) | (0.000) |
| *net_D_EBITDA* | 0.156 | | 0.1663 | |
| | (0.000) | | (0.000) | |
| *cashflow_op* | -0.0012 | | -0.0026 | |
| | (0.115) | | (0.049) | |
| *EBITDA_margin* | -1.974 | | 0.2085 | |
| | (0.115) | | (0.898) | |
| *_cons* | 184.256 | 11.136 | 613.426 | 41.88 |
| | (0.000) | (0.000) | (0.281) | (0.010) |
| **Observations** | 1722 | 1871 | 721 | 779 |
| **R^2 (Overall)** | 0.0130 | 0.0357 | 0.0226 | 0.1062 |
| **Global Significance** | 0.0019 | 0.0000 | 0.0009 | 0.0000 |
| **Type** | FE | RE | FE | RE |

[15] The Chamberlain-Mundlak device was added to pooled OLS regressions to control for possible correlation between the explanatory variables and the unobserved individual heterogeneity.

### 4.1. EFFECT ON FIRM LEVERAGE

To analyze the effect of the Dodd-Frank rollback on firm leverage, the regressions of interest are regressions (6.1), (7.1), (8.1), and (8.3), where the dependent variable is *DE_ratio*. However, given the lack of global significance of regressions (6.1) and (7.1), only the extended models (8.1) and (8.3) in Table VIII will be analyzed. In these regressions, the base model is extended to include *enterprise_value, net_D_EBITDA*, *cashflow_op*, and *EBITDA_margin* as explanatory variables. The resulting models are globally significant at the 5% level.

Starting with the international regressions, the insignificance of the coefficient on *DF_rollback* (p-value = 0.912) suggests an effective difference-in-difference setup, where the control group is unaffected by the rollback. All else being equal, the Dodd-Frank rollback seems to have had a significant and positive effect on US firms' debt-to-equity ratios ($\beta_{dodd\_frank\_relaxed}$ = 92.935, p-value = 0.041). When the effects of the rollback are further isolated from inflation and other deregulations in the US regression, the significant and positive effect holds ($\beta_{dodd\_frank\_relaxed}$ = 102.128, p-value = 0.027), supporting the international regression results.

This is compatible with expectations established in the literature review; since tighter regulation negatively impacts firm leverage (Avezum et al., 2022), deregulation has a positive effect on firms' debt-to-equity ratios.

However, it is worth mentioning that the magnitude of the coefficient on *dodd_frank_relaxed* exceeds expectations when compared to the mean of the debt-to-equity ratios in both samples (see Tables III and IV). This is likely due to the presence of significant outliers in the data, as indicated by the abnormally large maximum value for

*de_ratio* in the US and international samples (Tables III and IV). Alternatively, the coefficients could be inflated due to unobserved trends or events being partially captured by the *dodd_frank_relaxed* variable.

### 4.2. EFFECT ON CAPITAL PRODUCTIVITY

To assess the effects of the rollback on capital productivity, regressions (6.2), (7.2), (8.2), and (8.4) are estimated with the dependent variable *ROC*. Given that the base model was not globally significant for the international sample, results of the extended regression (8.2) will be considered instead of the base model (6.2). While the base model was globally significant in the US regression (7.2), the extended model (8.4) will be considered instead for consistency between samples. The models analyzed are reported in Table VIII.

Based on the coefficients estimated in the international regression (8.2), the Dodd-Frank rollback seems to have had a significant and positive effect on firms' capital productivity (p-value = 0.034). The model suggests that, all else being equal, US firms experienced returns on capital 2.66 percentage points higher than their non-US counterparts in the post-rollback period ($\beta_{dodd\_frank\_relaxed}$ = 2.657). The lack of significance of *DF_rollback* (p-value = 0.895) suggests that, once again, non-US firms were an appropriate control group for the difference-in-difference setup. The positive coefficient of *dodd_frank_relaxed* in the US regression further substantiates this result. However, this effect is only significant at the 10% level when effects of the rollback are isolated from inflation and other deregulation (p-value = 0.069). The coefficient on the *dodd_frank_relaxed* variable implies that, all else being equal, US firms experienced in the post-rollback period returns on capital that were 2.25 percentage points higher than pre-rollback levels ($\beta_{dodd\_frank\_relaxed}$ = 2.254).

Once again, these results support the mechanisms studied in the literature review; if tighter regulation affects firms' ability to take on additional profitable projects (Harris & Raviv, 1991, Sharma et al., 2022), deregulation has the opposite effect. It allows firms more freedom in their investments, which enables them to achieve more efficient capital utilization and better capital productivity.

### 4.3. EFFECT ON REVENUES

The effects of the Dodd-Frank rollback on firm revenues are estimated in regressions (6.3) and (7.3) where the dependent variable is *revenue* (Tables VI and VII). The coefficients and p-value of the international regression (6.3) support the hypothesis that the Dodd-Frank rollback had a significant and positive effect on US firm revenues relative to non-US firms (p-value = 0.000). All else being equal, US firms in the post-rollback period saw revenues that were $17,082.86 million higher than their international counterparts ($\beta_{dodd_frank_relaxed}$ =17,082.860). The lack of significance of *DE_rollback* suggests, once again, that the difference-in-difference setup was successful, with the control group being unaffected by the rollback. However, the US regression (7.3) fails to confirm this result. Despite a still positive coefficient, the *dodd_frank_relaxed* variable is not significant, even at the 10% level. Therefore, it cannot be excluded that the coefficient in the international regression could be capturing the effect of other deregulation and events that occurred in the same period and may not be fully attributable to the Dodd-Frank rollback.

Looking back to the literature, Avezum et al. (2022) find that tightening regulation negatively affects firm assets and investments, which can be reasonably expected to negatively affect revenues. Therefore, the empirical finding that deregulation leads to increased revenues aligns with the literature.

## 4.4. EFFECT ON FIRM VALUES

When assessing the effect of the Dodd-Frank rollback on firm values, market capitalization offers distinct advantages compared to other accounting-based measures. First, it is less subjective and firm-specific than book value, making it more appropriate for comparison between firms. Additionally, given that the international sample includes US and non-US firms, using market capitalization to assess value reduces any discrepancies that may be due to the use of different accounting standards (U.S. GAAP versus IFRS). Finally, market capitalization is also more reactive, reflecting the impact of policy changes faster than more change-resistant accounting measures. This last trait can also be considered a limitation as the volatility of financial markets may interfere with the results obtained.

The dependent variable of interest in assessing firm value is *market_cap*. The estimates in the international sample regression (6.4) (Table VI) indicate that the Dodd-Frank rollback had a significant and positive effect on firm values, with US firms experiencing market capitalizations $97,564.84 million higher than their non-US counterparts post-rollback, *ceteris paribus* ($\beta_{dodd_frank_relaxed}$ = 97,564.840, p-value = 0.000). This effect is further confirmed by the significantly positive coefficient of *dodd_frank_relaxed* in the US regression (7.4) (Table VII), which suggests that all else being equal, US firms' market capitalizations were on average $14,222.71 million higher in the post-rollback period than they were before ($\beta_{dodd_frank_relaxed}$ = 14,222.71, p-value = 0.037).

These results are in line with the results of section 4.2. and Damodaran (2007), who argues that an improved return on capital can be expected to lead to higher firm values. If more stringent regulation has a negative impact on firm values (Avezum et al., 2022), it is plausible that deregulation has the opposite effect.

It is also worth mentioning that the *DF_rollback* coefficient in the international regression is negative and significant, implying that across all firms in the sample, there was a general decline in market capitalization in the post-2018 period ($\beta_{DF\_rollback}$ = -24,070.460, p-value = 0.007). There are various possible explanations for this trend, mostly related to the volatility of financial markets. First, *DF_rollback* may be capturing global events or trends that are unaccounted for in the regression, such as the US – China trade war in 2018, the Russia – Ukraine war started in 2020, or the Silicon Valley Bank and Credit Suisse collapses in 2023. Alternatively, the decline in international firms' market capitalization may be due to a change in relatively perceived value and expectations from shareholders, with investors favoring U.S. firms. Finally, the rollback may have contributed to a broader pessimistic sentiment in international financial markets as investors anticipated potential instability following the Trump administration's deregulatory agenda.

## 5. CONCLUSION

Theories of capital structure highlight the important role of debt in firms' financing decisions. If well managed, debt allows firms to raise financing, achieve lower weighted average costs of capital, increase investments, take on additional projects, reduce costs related to conflict of interest, and benefit from an interest tax shield. This in turn leads to increased capital productivity, revenues, and firm value. Available literature suggests that the introduction of new financial regulation can have unintended consequences on the economy, including effects on firms' capital structure. Tighter regulations are likely to increase lender compliance costs, which are often transferred to borrowers, at least to some extent. This increased cost of debt, combined with a tighter credit supply, can be expected to restrict firms' ability to raise financing through debt, reducing their potential

for growth and affecting their revenues, value, and performance. The introduction of the Dodd-Frank Act by the Obama administration in 2010 is no exception. Various authors (Dimitrov et al., 2015; Moll et al., 2019; Sharma et al., 2022) find that the new regulation had unintended consequences, leading to an increase in compliance costs for U.S. commercial banks and a loss of information through asymmetric incentives on CRAs, likely affecting firms.

While the effects of financial regulation on various sectors are well investigated, the impact of deregulation remains less explored. The Dodd-Frank rollback bill offers a unique opportunity to empirically study these effects. Based on the established consequences following the introduction of the Dodd-Frank Act, the rollback is expected to have had positive effects on firm leverage, performance, and value in the US since 2018.

This dissertation combined a difference-in-difference method including US and non-US firms and a single-group before-after-study of US firms to empirically assess the impact of the rollback on firm leverage, capital productivity, revenues, and firm values. All else being equal, the results obtained point to the following conclusions:

First, the Dodd-Frank rollback had a significant and positive effect on US firms' debt-to-equity ratios, suggesting that US firms affected by the rollback increased the proportion of debt in their capital structures. This observed effect aligns with expectations established by the literature review.

Second, the Dodd-Frank rollback had a significant and positive effect on US firms' return on capital in the post-rollback period. Given that the return on capital is a measure of a firm's ability to generate returns on its invested capital, an increase in ROC suggests a

more efficient capital utilization which translated to better capital productivity. Additionally, an improved return on capital is expected to translate into higher firm value (Damodaran, 2007), a consequence which is verified by the empirical analysis.

Third, the Dodd-Frank rollback had a significant and positive effect on firm revenues, which increased for US firms after the rollback. However, this effect was only significant in the international regression.

Fourth, the Dodd-Frank rollback had a significant and positive effect on the values of US firms after 2018. These results align with expectations from the literature review; the value of US firms was higher following the rollback when compared to pre-rollback levels and non-US firms.

In the context of SDG 8, these findings provide insight into how financial policy makers can influence an economy's performance towards achieving this goal. Financial deregulation, by having a positive effect on firms' capital productivity, revenues, and values, can stimulate economic growth. This is consistent with evidence that financial development and private credit allocation play a central role in promoting growth (King & Levine, 1993). Firms that perform better are likely to invest more, hire more employees, and contribute to economic growth[16]. However, it is important not to forget the sustainable aspect of SDG 8. While this empirical analysis suggests positive effects of deregulation on the dependent variables studied, regulation still plays an important role in ensuring stability in the financial system. As demonstrated by various financial crises through the years, such as the subprime crisis of 2008, financial instability can have significantly negative impacts on firms and economies, with effects being felt for many

[16] See endogenous growth theory (Aghion & Howitt, 1997)

years after the event. Many, such as US Senator Martin Heinrich (2023), blame the Dodd-Frank rollback for paving the way to the collapse of Silicon Valley Bank in 2023 and the crisis that followed, highlighting the complexity of assessing the far-reaching consequences of financial regulation and deregulation. To simplify, while there might not be an obvious answer when it comes to choosing between regulation and deregulation to achieve the goals of SDG 8, literature and the findings of this paper highlight the importance of considering both direct and indirect consequences when making financial policy decisions.

Finally, it is important to remember that the results of this empirical analysis must be interpreted with the limitations of the methodologies used in mind: the lack of control variables in the international regression set, and the lack of a control group in the US regressions set may affect the conclusions drawn. Further research should combine these two models into one, where US firms are studied with a control group, and control variables isolate the effects of the Dodd-Frank rollback from external shocks and events. Additionally, the sample of firms studied could benefit from more diversity in terms of firm size, given the likelihood that impacts of the rollback on smaller firms were different than those observed in larger firms. Different levels of access to alternative sources of capital and a heavier reliance on bank debt instead of corporate bonds by smaller companies could lead to different behaviors being observed in the post-rollback period.

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# APPENDICES

## APPENDIX I - Detailed summary statistics for variables *ghg* and *log_ghg*

**Variable: *GHG***

| | Percentiles | Smallest | | |
|---|---|---|---|---|
| ***1%*** | 113106 | 75875 | | |
| ***5%*** | 183424 | 80499 | | |
| ***10%*** | 319155 | 94253 | | |
| ***25%*** | 464254 | 94253 | **Observations** | 837 |
| ***50%*** | 906973 | | **Mean** | 3302399 |
| | | **Largest** | **Std. Dev.** | 9224287 |
| ***75%*** | 2188758 | 5.44e+07 | | |
| ***90%*** | 2541724 | 5.44e+07 | **Variance** | 8.51e+13 |
| ***95%*** | 1.35e+07 | 5.44e+07 | **Skewness** | 4.656063 |
| ***99%*** | 5.43e+07 | 5.44e+07 | **Kurtosis** | 24.35118 |

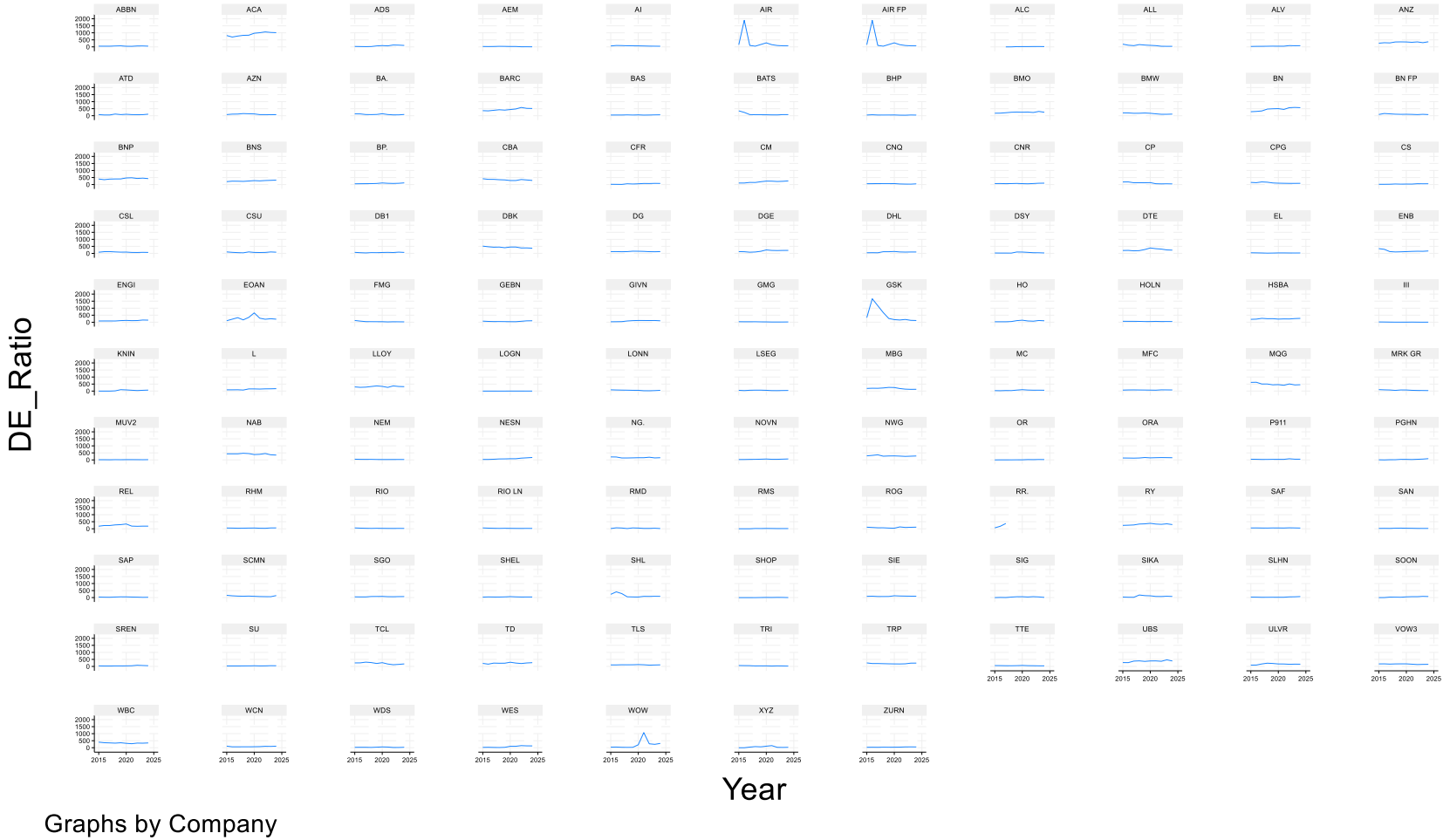
**Variable: *log_GHG***

| | Percentiles | Smallest | | |
|---|---|---|---|---|
| ***1%*** | 5.053486 | 4.880099 | | |
| ***5%*** | 5.263456 | 4.90579 | | |
| ***10%*** | 5.504002 | 4.974295 | | |
| ***25%*** | 5.666756 | 4.974295 | **Observations** | 837 |
| ***50%*** | 5.957594 | | **Mean** | 6.020976 |
| | | **Largest** | **Std. Dev.** | .5307605 |
| ***75%*** | 6.340198 | 7.73535 | | |
| ***90%*** | 6.405128 | 7.743867 | **Variance** | .2817067 |
| ***95%*** | 7.12997 | 7.743867 | **Skewness** | 1.101823 |
| ***99%*** | 7.73495 | 7.743867 | **Kurtosis** | 4.912153 |

## APPENDIX II – Data line plots by dependent variable

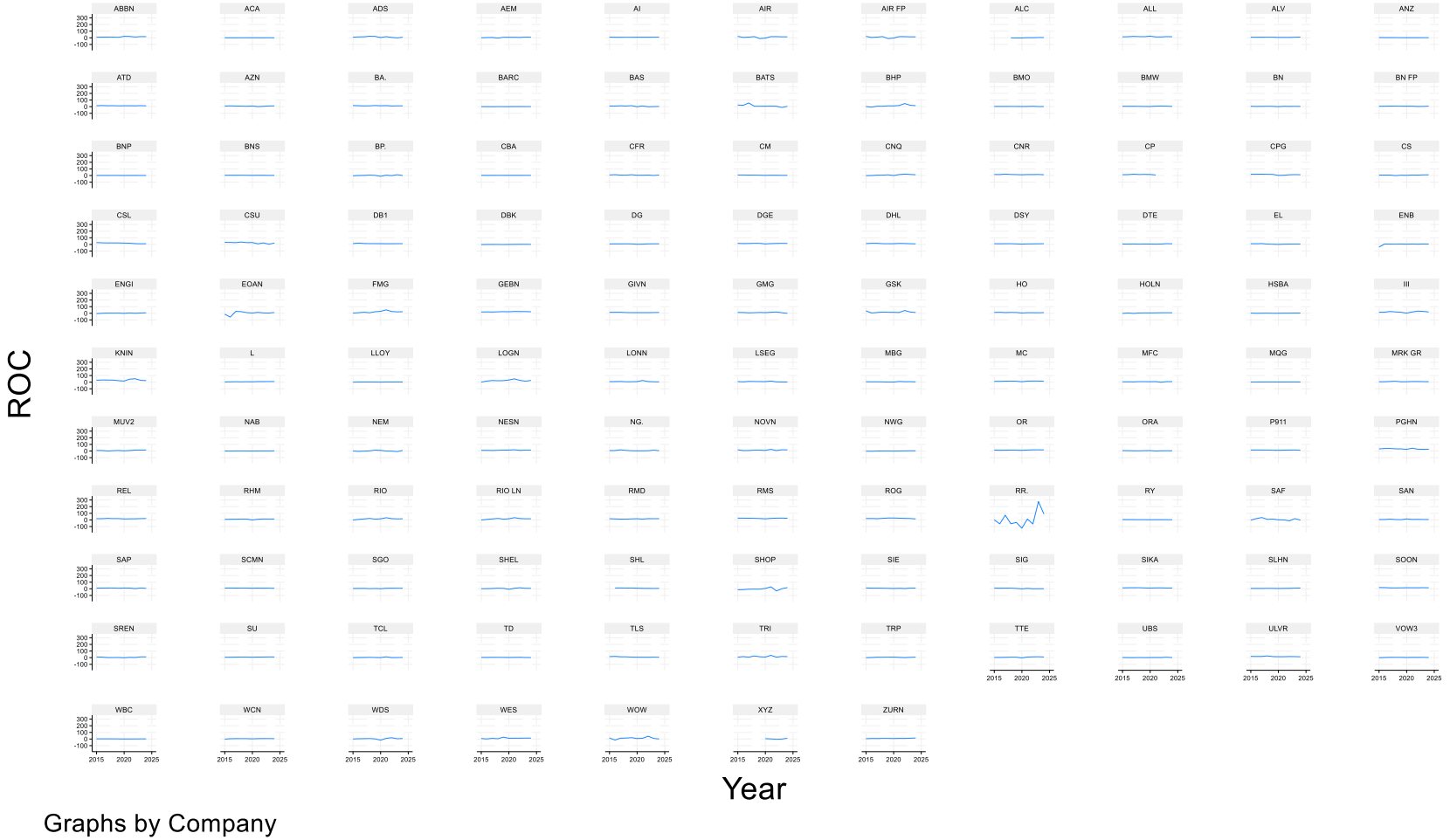
STATA command: `xtline DE_ratio if Country == "USA"`

STATA command: `xtline DE_ratio if Country != "USA"`



STATA command: `xtline ROC if Country == "USA"`

STATA command: `xtline ROC if Country != "USA"`



STATA command: `xtline Revenue if Country == "USA"`

STATA command: `xtline Revenue if Country != "USA"`

STATA command: `xtline Market_Cap if Country == "USA"`

STATA command: `xtline Market_Cap if Country != "USA"`

# APPENDIX III – STATA outputs for Blundell-Bond estimator, Sargan-Hansen test, and autocorrelation test

## *DE_Ratio*

### International regression

```
. xtdpdsys DE_Ratio DF_rollback dodd_frank_relaxed post_covid, maxldep(2) twostep vce(robust)

System dynamic panel-data estimation      Number of obs   =   1,847
Group variable: firm_id             Number of groups =    211
Time variable: Year
                        Obs per group:
                              min =     2
                              avg =  8.753555
                              max =     9

Number of instruments =   27         Wald chi2(4)   =    2.70
                        Prob > chi2    =   0.6094
Two-step results
------------------------------------------------------------------------------
             |       WC-robust
    DE_Ratio | Coefficient std. err.   z  P>|z|   [95% conf. interval]
-------------+----------------------------------------------------------------
    DE_Ratio |
       L1. |  .1285956  .1176215   1.09  0.274  -.1019384  .3591296
           |
  DF_rollback |  .7603976  6.121262   0.12  0.901  -11.23706  12.75785
dodd_frank_relaxed |  32.27494  32.88714   0.98  0.326  -32.18268  96.73256
    post_covid |  16.61137  11.53109   1.44  0.150  -5.989145  39.21189
         _cons |  100.1724  20.72439   4.83  0.000   59.55333  140.7914
------------------------------------------------------------------------------
Instruments for differenced equation
    GMM-type: L(2/3).DE_Ratio
    Standard: D.DF_rollback D.dodd_frank_relaxed D.post_covid
Instruments for level equation
    GMM-type: LD.DE_Ratio
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(22)   =  53.6005
    Prob > chi2 =  0.0002
```

```
. estat abond

Arellano-Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
------------------------------
  1  -1.5001   0.1336
  2  -.78337   0.4334
------------------------------
```

### US regression

```
. xtdpdsys DE_Ratio dodd_frank_relaxed post_covid AQI log_ghg h_wage GDP, maxldep(2) twostep
vce(robust)

System dynamic panel-data estimation      Number of obs   =    695
Group variable: firm_id             Number of groups =     91
Time variable: Year
                        Obs per group:
                              min =     3
                              avg =  7.637363
                              max =     8

Number of instruments =   27         Wald chi2(7)   =   18.80
                        Prob > chi2    =   0.0088
Two-step results
------------------------------------------------------------------------------
             |       WC-robust
    DE_Ratio | Coefficient std. err.   z  P>|z|   [95% conf. interval]
-------------+----------------------------------------------------------------
    DE_Ratio |
       L1. |  .1443742  .0897969   1.61  0.108  -.0316245  .3203729
           |
dodd_frank_relaxed |  46.1448  41.71319   1.11  0.269  -35.61155  127.9011
    post_covid | -30.83095  29.29152  -1.05  0.293  -88.24127  26.57936
         AQI |  20.29509  72.85803   0.28  0.781   -122.504  163.0942
      log_ghg | -243.3211  267.7605  -0.91  0.363   -768.122  281.4799
      h_wage |  30.84362  14.95702   2.06  0.039   1.528396  60.15885
         GDP |  -.000331  .0001578  -2.10  0.036  -.0006404  -.0000217
       _cons |  1203.107  1796.692   0.67  0.503  -2318.345  4724.559
------------------------------------------------------------------------------
Instruments for differenced equation
    GMM-type: L(2/3).DE_Ratio
    Standard: D.dodd_frank_relaxed D.post_covid D.AQI D.log_ghg D.h_wage D.GDP
Instruments for level equation
    GMM-type: LD.DE_Ratio
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(19)   = 47.82547
    Prob > chi2 =  0.0003
```

```
. estat abond

Arellano-Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
------------------------------
  1  -1.2627   0.2067
  2  -1.0849   0.2779
------------------------------
```

## *ROC*

### International regression

```
. xtdpdsys ROC DF_rollback dodd_frank_relaxed post_covid, maxldep(2) twostep

System dynamic panel-data estimation      Number of obs   =   1,888
Group variable: firm_id             Number of groups =    212
Time variable: Year
                        Obs per group:
                              min =     4
                              avg =  8.90566
                              max =     9

Number of instruments =   27         Wald chi2(4)   =   57.72
                        Prob > chi2    =   0.0000
Two-step results
------------------------------------------------------------------------------
        ROC | Coefficient Std. err.   z  P>|z|   [95% conf. interval]
------------------+-----------------------------------------------------------
        ROC |
        L1. |  .0312121  .0117506   2.66  0.008   .0081813  .0542429
            |
  DF_rollback | -1.472936  .6191328  -2.38  0.017  -2.686414  -.2594578
dodd_frank_relaxed |  3.377294  1.108469   3.05  0.002   1.204734  5.549854
    post_covid | -2.293398  .3657478  -6.27  0.000   -3.01025  -1.576545
       _cons |  11.17321  .5752778  19.42  0.000   10.04568  12.30073
------------------------------------------------------------------------------
Warning: gmm two-step standard errors are biased; robust standard
     errors are recommended.
Instruments for differenced equation
    GMM-type: L(2/3).ROC
    Standard: D.DF_rollback D.dodd_frank_relaxed D.post_covid
Instruments for level equation
    GMM-type: LD.ROC
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(22)   = 41.38858
    Prob > chi2 =  0.0074
```

```
. estat abond

Arellano–Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
---------------------------
  1  -1.2315   0.2181
  2  .83486   0.4038
---------------------------
```

### US regression

```
. xtdpdsys ROC dodd_frank_relaxed post_covid AQI log_ghg h_wage GDP, maxldep(2) vce(robust)

System dynamic panel-data estimation      Number of obs   =    732
Group variable: firm_id             Number of groups =     92
Time variable: Year
                        Obs per group:
                              min =     4
                              avg =  7.956522
                              max =     8

Number of instruments =   27         Wald chi2(7)   =   83.46
                        Prob > chi2    =   0.0000
One-step results
------------------------------------------------------------------------------
             |               Robust
         ROC | Coefficient std. err.   z  P>|z|   [95% conf. interval]
-------------+----------------------------------------------------------------
         ROC |
         L1. |  .4557963  .0812817   5.61  0.000   .2964872  .6151055
             |
dodd_frank_relaxed | -.0272266  1.795037  -0.02  0.988  -3.545435  3.490982
    post_covid | -.7611859  1.492574  -0.51  0.610  -3.686578  2.164206
         AQI |  -11.2907  6.773032  -1.67  0.096   -24.5656   1.9842
      log_ghg |  4.022005  6.695531   0.60  0.548  -9.100994   17.145
      h_wage | -.3414208  .4059959  -0.84  0.400  -1.137158  .4543167
         GDP |  7.26e-06  4.71e-06   1.54  0.124  -1.98e-06  .0000165
       _cons | -10.87073  42.15774  -0.26  0.797  -93.49839  71.75692
------------------------------------------------------------------------------
Instruments for differenced equation
    GMM-type: L(2/3).ROC
    Standard: D.dodd_frank_relaxed D.post_covid D.AQI D.log_ghg D.h_wage D.GDP
Instruments for level equation
    GMM-type: LD.ROC
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(19)   = 62.40099
    Prob > chi2 =  0.0000
```

```
. estat abond

Arellano–Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
---------------------------
  1  -4.2173   0.0000
  2  -.75719   0.4489
---------------------------
```

## *Revenue*

### International regression

```
. xtdpdsys Revenue DF_rollback dodd_frank_relaxed post_covid, maxldep(2) twostep vce(robust)

System dynamic panel-data estimation      Number of obs   =   1,916
Group variable: firm_id             Number of groups =    213
Time variable: Year
                        Obs per group:
                              min =     8
                              avg =  8.995305
                              max =     9

Number of instruments =   27         Wald chi2(4)   =  10834.00
                        Prob > chi2    =   0.0000
Two-step results
------------------------------------------------------------------------------
             |       WC-robust
     Revenue | Coefficient std. err.   z  P>|z|   [95% conf. interval]
-------------+----------------------------------------------------------------
     Revenue |
       L1. |  1.026483  .0101786  100.85  0.000   1.006533  1.046432
           |
  DF_rollback |  519.984  458.5815   1.13  0.257  -378.8191  1418.787
dodd_frank_relaxed |  1066.524  707.6489   1.51  0.132  -320.4421  2453.491
    post_covid | -746.4077  573.981  -1.30  0.193   -1871.39  378.5744
      _cons |  464.5998  513.747   0.90  0.366  -542.3257  1471.525
------------------------------------------------------------------------------
Instruments for differenced equation
    GMM-type: L(2/3).Revenue
    Standard: D.DF_rollback D.dodd_frank_relaxed D.post_covid
Instruments for level equation
    GMM-type: LD.Revenue
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(22)   = 50.84735
    Prob > chi2 =  0.0004
```

```
. estat abond

Arellano–Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
---------------------------
  1  -1.7819   0.0748
  2  -.78674   0.4314
---------------------------
```

### US regression

```
. xtdpdsys Revenue dodd_frank_relaxed post_covid AQI log_ghg h_wage GDP, maxldep(2) vce(robust)

System dynamic panel-data estimation      Number of obs   =    744
Group variable: firm_id             Number of groups =     93
Time variable: Year
                        Obs per group:
                              min =     8
                              avg =     8
                              max =     8

Number of instruments =   27         Wald chi2(7)   =   736.63
                        Prob > chi2    =   0.0000
One-step results
------------------------------------------------------------------------------
             |        Robust
     Revenue | Coefficient std. err.   z  P>|z|   [95% conf. interval]
-------------+----------------------------------------------------------------
     Revenue |
       L1. |   1.0583  .1010628  10.47  0.000   .8602204  1.256379
           |
dodd_frank_relaxed |  6045.643  2566.907   2.36  0.019   1014.597  11076.69
    post_covid |  3164.145  6293.355   0.50  0.615  -9170.604  15498.89
           AQI | -27571.96  13312.23  -2.07  0.038  -53663.45  -1480.46
       log_ghg | -32974.89  11415.15  -2.89  0.004  -55348.18  -10601.61
       h_wage | -1805.069  1991.619  -0.91  0.365  -5708.571  2098.432
           GDP |  .0115283  .012872   0.90  0.370  -.0137003  .0367569
         _cons |  243746.6  82432.77   2.96  0.003   82181.3  405311.8
------------------------------------------------------------------------------
Instruments for differenced equation
    GMM-type: L(2/3).Revenue
    Standard: D.dodd_frank_relaxed D.post_covid D.AQI D.log_ghg D.h_wage D.GDP
Instruments for level equation
    GMM-type: LD.Revenue
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(19)   = 169.2347
    Prob > chi2 =  0.0000
```

```
. estat abond

Arellano–Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
---------------------------
  1  -1.2699   0.2041
  2  -.06154   0.9509
---------------------------
```

## *Revenue*

### International regression

```
. xtdpdsys Market_Cap DF_rollback dodd_frank_relaxed post_covid, maxldep(2) twostep vce(robust)

System dynamic panel-data estimation      Number of obs   =   1,903
Group variable: firm_id             Number of groups =    213
Time variable: Year
                        Obs per group:
                              min =     2
                              avg =  8.934272
                              max =     9

Number of instruments =   27         Wald chi2(4)   =  23165.69
                        Prob > chi2    =   0.0000
Two-step results
------------------------------------------------------------------------------
          |       WC-robust
    Market_Cap | Coefficient std. err.   z  P>|z|   [95% conf. interval]
-----------------+------------------------------------------------------------
    Market_Cap |
        L1. |  1.10332  .0085259  129.41  0.000   1.08661   1.12003
          |
  DF_rollback |  -14273.3  2171.384  -6.57  0.000  -18529.13  -10017.46
dodd_frank_relaxed |  26484.27  4613.27   5.74  0.000   17442.43  35526.12
    post_covid |  4683.285  2107.965   2.22  0.026   551.7494   8814.82
       _cons |  1394.452  1817.089   0.77  0.443  -2166.977  4955.881
------------------------------------------------------------------------------
Instruments for differenced equation
    GMM-type: L(2/3).Market_Cap
    Standard: D.DF_rollback D.dodd_frank_relaxed D.post_covid
Instruments for level equation
    GMM-type: LD.Market_Cap
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(22)   = 95.46566
    Prob > chi2 =  0.0000
```

```
. estat abond

Arellano–Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
---------------------------
  1  -2.5694   0.0102
  2  -1.0584   0.2899
---------------------------
```

### US regression

```
. xtdpdsys Market_Cap dodd_frank_relaxed post_covid AQI log_ghg h_wage GDP, maxldep(2) vce(robust)

System dynamic panel-data estimation      Number of obs   =    744
Group variable: firm_id             Number of groups =     93
Time variable: Year
                        Obs per group:
                              min =     8
                              avg =     8
                              max =     8

Number of instruments =   27         Wald chi2(7)   =   444.20
                        Prob > chi2    =   0.0000
One-step results
------------------------------------------------------------------------------
          |        Robust
    Market_Cap | Coefficient std. err.   z  P>|z|   [95% conf. interval]
-----------------+------------------------------------------------------------
    Market_Cap |
        L1. |  .8732921  .1165117   7.50  0.000   .6449334  1.101651
          |
dodd_frank_relaxed | -2733.615  13206.2  -0.21  0.836  -28617.29  23150.06
    post_covid |  13517.66  18814.17   0.72  0.472  -23357.43  50392.75
         AQI |  118242.9  115736.5   1.02  0.307  -108596.6  345082.4
      log_ghg | -305895.1  177740.9  -1.72  0.085  -654260.8  42470.63
      h_wage | -6253.388  5672.806  -1.10  0.270  -17371.88  4865.107
         GDP |  .0730096  .0706312   1.03  0.301   -.065425  .2114442
       _cons |  1888102  1069297   1.77  0.077  -207682.5   3983886
------------------------------------------------------------------------------
Instruments for differenced equation
    GMM-type: L(2/3).Market_Cap
    Standard: D.dodd_frank_relaxed D.post_covid D.AQI D.log_ghg D.h_wage D.GDP
Instruments for level equation
    GMM-type: LD.Market_Cap
    Standard: _cons
```

```
. estat sargan
Sargan test of overidentifying restrictions
H0: Overidentifying restrictions are valid

    chi2(19)   = 473.8447
    Prob > chi2 =  0.0000
```

```
. estat abond

Arellano–Bond test for zero autocorrelation in first-differenced errors
H0: No autocorrelation

Order     z  Prob > z
---------------------------
  1  -2.6773   0.0074
  2  -.94058   0.3469
---------------------------
```