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# The Financial Impact of ESG: Analysing APP and ACP Dynamics During Economic Crises

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## Abstract

This research investigates whether companies with higher Environmental, Social, and Governance (ESG) ratings adopt more socially responsible financial practices during periods of economic crisis, focusing specifically on the management of the Average Payment Period (APP) and Average Collection Period (ACP). Using the COVID-19 pandemic as an exogenous shock, the study examines how ESG performance influences firms' decisions to either support suppliers through faster payments or assist customers by offering extended credit terms. The analysis is based on a panel of Euro Stoxx 600 firms and applies a Differences-in-Differences methodology, complemented by interaction terms and robustness checks. Results reveal that firms with high ESG scores are significantly more likely to extend collection periods, indicating customer-oriented flexibility in line with social responsibility principles. However, no consistent relationship was found between ESG performance and supplier payment behavior, suggesting that liquidity concerns or strategic trade-offs may override ESG considerations in that dimension. The findings contribute to the literature by showing that ESG-driven operational behavior is not uniform across financial practices, highlighting a more nuanced and asymmetric application of stakeholder-oriented commitments in times of crisis.

**Key words:** ESG; Corporate Social Responsibility; APP; ACP; Covid-19; Differences-in-Differences.

## Resumo

Este estudo investiga se empresas com classificações mais elevadas de Environmental, Social and Governance (ESG) adotam práticas financeiras mais socialmente responsáveis durante períodos de crise económica, analisando em particular a gestão do Prazo Médio de Pagamento (APP) e do Prazo Médio de Recebimento (ACP). Utilizando a pandemia da COVID-19 como choque exógeno, a investigação examina de que forma o desempenho em ESG influencia as decisões das empresas em apoiar fornecedores através de pagamentos mais rápidos ou em ajudar clientes oferecendo prazos de crédito mais alargados. A análise baseia-se num painel de empresas do índice Euro Stoxx 600, recorrendo a uma metodologia de Diferenças-em-Diferenças, complementada por termos de interação e testes de robustez. Os resultados revelam que empresas com pontuações elevadas em ESG são significativamente mais propensas a alongar os prazos de recebimento, evidenciando uma flexibilidade orientada para os clientes em linha com princípios de responsabilidade social. Contudo, não foi encontrada uma relação consistente entre o desempenho ESG e o comportamento de pagamentos a fornecedores, sugerindo que preocupações de liquidez ou trade-offs estratégicos podem sobrepor-se a considerações de sustentabilidade nessa dimensão. O estudo contribui para a literatura ao demonstrar que o impacto operacional do ESG não é uniforme em todas as práticas financeiras, destacando uma aplicação assimétrica dos compromissos com stakeholders em períodos de crise.



**Palavras-chave:** ESG; Responsabilidade Social Corporativa; APP; ACP; Covid-19; Diferenças-em-Diferenças.

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## 1. Introduction

The integration of Environmental, Social, and Governance (ESG) factors in corporate strategies has become a critical issue for investors, regulators, and managers worldwide. In recent years, the influence of ESG factors on corporate behavior has been under increasing scrutiny. The COVID-19 pandemic turned the spotlight on companies' working practices and revealed the extent to which ESG promises are translated into concrete, responsible corporate behavior under crisis conditions. A key focus lies in the average payment period (APP) and average collection period (ACP), whose evolution during financial crises reflects a firm's financial ethics and how it manages stakeholder relationships, mainly with suppliers and customers. The determination of APP and ACP and their changes before and after the pandemic may indicate operational flexibility and social responsibility related to firms with different ESG ratings.

Recent literature has investigated ESG practices on overall corporate resilience and financial stability. This research has found that firms with higher ESG ratings tend to exhibit greater resilience during crises in the sense of being flexible in managing stakeholder relations through actions such as adjusted payment terms or extended credit to vulnerable customers. Flynn and Li (2023) demonstrate that some firms, with the COVID-19 pandemic as a backdrop, have speeded up the payment to suppliers, seen as a socially responsible action aiming at supply chain stability, while others have lengthened the terms as a strategic use of Supply Chain Finance (SCF) tools. This duality of behavior may mean that ESG-driven policies could certainly have a bearing on the APP and ACP of the firms in times of economic instability.

More broadly, beyond the payment practices, the literature on ESG focuses on corporate actions taken in employee welfare, environmental responsibility, and transparent governance. For instance, Flammer and Luo (2017) demonstrate that ESG-conscious firms invest more in employee welfare as part of their governance strategy, particularly relevant during times of crisis when workforce stability is at risk.

Similarly, Garel and Petit-Romec (2021) and Dyck et al. (2019) illustrate that companies portraying environmental responsibility and being true to their social engagements attract positive investor attention, specifically when the market is turbulent.

The literature thus hints toward a growing awareness of ESG as more than just a reporting mechanism but as an operational philosophy with tangible impacts on financial behavior and stakeholder relationships. There remain gaps in the literature concerning the exact determinants of APP and ACP pre- and post-pandemic and how ESG ratings act upon these timelines across different industries. This literature review addresses these dimensions to explore both the direct and indirect impacts of ESG on APP and ACP and the broader spectrum of ESG-driven corporate behavior beyond payment practices. Through this review, the research explains how ESG ratings relate to ethical financial behavior and adaptive resilience, thereby contributing to the current debate about responsible corporate governance in times of crisis.

This research proposes that firms with higher ESG ratings are more likely to adopt financially responsible operational practices in managing stakeholder relationships. Specifically, such firms are expected to maintain shorter Average Payment Periods (APP), reflecting timely payments to suppliers, and exhibit longer Average Collection Periods (ACP), indicating more lenient credit terms for customers. These behaviors suggest a commitment to social equity and stakeholder well-being, both fundamental to ESG principles.

Building on this proposition, the study hypothesises that the relationship between ESG ratings and payment practices becomes more pronounced during economic crises such as the COVID-19 pandemic. Crises provide a real-world test of corporate social responsibility, where firms must decide whether to prioritise liquidity or uphold stakeholder commitments. Therefore, firms with higher ESG ratings are expected to respond more ethically under pressure, shortening APP to support supply chains and extending ACP to assist customers in financial difficulty.

Additionally, the study explores several moderating factors that may influence the strength and direction of this relationship. It is hypothesised that firm size acts as a moderator, with larger firms more likely to align their APP and ACP practices with ESG principles. Financial health is also considered a key factor, as well-capitalised firms may be better positioned to implement ESG-consistent payment behaviors.

In light of this, the research addresses four key questions.

First, do companies with higher ESG scores tend to pay suppliers more promptly and offer more lenient credit terms to customers? Second, are these stakeholder-oriented behaviors more evident during times of crisis, when firms face heightened financial pressures? Third, does company size influence the extent to which ESG performance translates into responsible operational behavior? And finally, to what extent does a firm's financial health determine its ability to align payment and collection practices with ESG values?

The remainder of this dissertation is organized as follows. Chapter 2 reviews the existing literature on trade credit, ESG performance, and their interaction with financial practices, highlighting both theoretical and empirical contributions. Chapter 3 introduces the moderating effects considered in this study, namely firm size and financial health, and explains their expected influence. Chapter 4 describes the dataset, the sample construction, and the methodology employed, including the Differences-in-Differences approach and robustness strategies. Chapter 5 presents the empirical results and discusses their implications in light of the stated hypotheses. Chapter 6 provides additional robustness checks, such as analyses with ESG sub-pillars, continuous ESG scores, and fixed effects. Chapter 7 concludes the study by summarizing the main findings and their relevance for the academic and professional debate on ESG and corporate financial behavior. Finally, Chapter 8 outlines the key limitations of the research and suggests promising directions for future work.

## 2. Literature Review

The existing literature highlights that Environmental, Social, and Governance (ESG) performance has become increasingly significant, reflecting the sustainability principles in investor decision-making. ESG scores and ratings provide valuable insights into companies' engagement with sustainable practices and have become integral components in the strategies of large corporations (Jámbor & Zanócz, 2023).

Suppliers often view companies with strong ESG practices as financially robust and trustworthy, expecting them to honor payment obligations due to their better access to financing and sufficient cash flow. The commitment to social responsibility demonstrated by strong ESG performance helps bridge trust gaps with suppliers, foster long-term relationships, and enable extended payment terms. In this context, enterprises with high ESG performance are more likely to secure favorable trade credit terms, which supports their market competitiveness and growth (Wang, 2023).

Furthermore, corporate social responsibility (CSR) investments enhance the likelihood of obtaining trade credit, as they signal reduced financial and operational risks to suppliers. Previous studies have shown that CSR engagement is critical in trade credit decisions, in addition to firm-specific factors like financial reporting quality. Despite the costs of CSR activities, the potential benefits include improved access to trade credit, providing an additional funding source for firms (Xu et al., 2019)

Trade credit, a key component of working capital management, is characterised by delayed payment for goods or services. For sellers, this is an investment in accounts receivable, while for buyers, it is a source of short-term financing recorded as current liabilities. Theories explaining the use of trade credit often highlight operational, financial, and commercial advantages. Trade credit allows firms to separate the delivery of goods from payment, thus improving cash flow and offering flexibility to handle demand fluctuations (Ferris, 1981; Emery, 1984, 1987).

Despite differences in the levels of trade credit across various European countries, the key determinants of trade credit remain consistent. Firms would need to maintain

higher cash reserves to handle immediate payments without trade credit. The separation of goods delivery from payment through trade credit offers operational efficiencies, reducing cash flow uncertainties and providing greater flexibility to respond to fluctuations in demand (Ferris, 1981; Emery, 1987). Firms with cyclical or fluctuating sales can use trade credit strategically to incentivise purchases during low-demand periods, thereby maintaining stable production levels.

## 2.1. Determinants of APP and ACP

The determinants of accounts receivable (AR) and accounts payable (AP) are central to understanding firms' trade credit decisions. Trade credit, which involves delayed payment for goods or services, is a financing tool and a strategic instrument for businesses (García-Teruel & Martínez-Solano, 2010).

For **accounts receivable**, the primary factor influencing a firm's decision to extend credit to customers is its size and financial strength. Larger firms, due to their better access to capital markets and lower borrowing costs, tend to offer more credit to their customers. These firms are often seen as more reliable and can afford to act as financial intermediaries, extending credit to customers who may face difficulties obtaining external financing. In addition to size, a firm's internal financing capacity plays a significant role. Companies that generate strong internal cash flows can offer extended payment terms without jeopardising their liquidity. However, this relationship can vary by region; in countries like Finland and France, strong internal cash flow correlates with more credit granted, whereas in Spain and the UK, this effect is less pronounced (García-Teruel & Martínez-Solano, 2010).

Firms holding substantial cash reserves might allow extended collection periods due to lower urgency for cash inflows, while firms with liquidity constraints enforce stricter collection policies. Cheung and Pok (2019) discuss this in the context of CSR firms with high cash holdings, which, depending on their strategy, may impact the firm's ACP (Flynn & Li, 2023).

Market conditions also influence accounts receivable. Firms facing declining sales may extend more credit to stimulate demand, using trade credit to encourage purchases and maintain customer relationships. By offering longer payment terms during tough times, companies can support sales without immediately receiving payment, which can be an effective strategy to retain clients and increase revenue. On the other hand, firms experiencing strong sales growth often limit credit extensions to preserve liquidity, as their need for cash increases to support expanding operations (García-Teruel & Martínez-Solano, 2010).

Macroeconomic conditions, such as recessions, also impact ACP, as customers may delay payments due to liquidity constraints. During the pandemic, some firms experienced longer collection times as customers sought extended credit terms due to disrupted cash flows (Flynn & Li, 2023).

The authors also find that firms with liberal credit policies may experience extended ACPs, particularly in competitive sectors. By extending favorable credit terms, firms can attract and retain customers, though at the risk of delayed collections. This dynamic is seen in industries prioritising client retention over stringent credit enforcement.

Furthermore, CSR-oriented firms tend to build customer trust, which may facilitate quicker collections. Cheung and Pok (2019)'s study highlights that firms with high CSR engagement benefit from stronger customer relationships, potentially leading to reduced collection periods.

The cost of external financing is another key determinant. When external borrowing costs are high, firms may be less willing to offer generous credit terms, preferring to conserve their cash. Conversely, businesses with access to low-cost financing can afford to grant more trade credit to gain a competitive edge and build stronger customer relationships.

Lastly, the idea that trade credit serves as a signal of product quality has been explored in the literature, suggesting that firms use generous payment terms to allow customers to assess product quality before making payment. However, empirical evidence for this theory is mixed. In many cases, firms with lower sales turnover—often associated with higher-quality products—extend less credit, implying that well-established businesses do not need to rely on credit terms to prove the quality of their offerings.

In contrast, the **determinants of accounts payable** focus more on a firm's financing needs and its relationship with suppliers. Larger firms often report higher levels of accounts payable despite having access to diverse sources of financing. This is likely due to their strong bargaining power, enabling them to negotiate favorable credit terms with suppliers. Suppliers may also be more willing to extend credit to these firms, viewing them as less risky due to their size and financial stability (García-Teruel & Martínez-Solano, 2010).

The availability of alternative financing options significantly impacts accounts payable levels. Firms with access to short-term bank loans or other credit facilities typically rely less on supplier trade credit. This substitution effect reflects the implicit cost of trade credit, often higher than traditional financial products. When external financing is costly or difficult to obtain, firms are more inclined to use trade credit as an alternative funding source (García-Teruel & Martínez-Solano, 2010).

According to García-Teruel and Martínez-Solano (2010), internal cash flow is another critical factor. Companies with strong cash flow tend to have lower levels of accounts payable, as they are less dependent on supplier credit. Conversely, firms experiencing liquidity constraints or generating negative cash flow are more likely to rely on accounts payable to finance their operations. Sales growth and investment in working capital also play a role. As companies expand and invest more in inventories and accounts receivable, they often increase their use of supplier credit to support their working capital needs. This trend is consistent across different regions, suggesting that trade credit serves as a buffer during periods of high demand for liquidity.

Lastly, industry practices and regional differences influence accounts payable. Industries with longer payment cycles, such as manufacturing and wholesale, tend to have higher levels of accounts payable due to their significant inventory needs.
Regional variations, such as longer payment terms in Mediterranean countries than Nordic regions, also reflect local business customs and supplier relationships (García-Teruel & Martínez-Solano, 2010).

Firms in regions or sectors under regulatory pressures, such as payment codes or government-led initiatives to ensure timely supplier payments, show shorter payment periods. The study by Flynn and Li (2023) highlights how institutional pressures—like the UK's Prompt Payment Code—help enforce timely payment by imposing norms that influence corporate behavior towards faster payments.

Firms facing difficulty accessing bank financing may extend their APP to conserve cash. This is more common in small firms with limited access to capital markets. Howorth and Reber (2003) and Carvalho (2015) found that financial distress or limited banking options lead firms to extend payment terms as an alternative form of working capital management.

Larger firms, under their market influence, often negotiate longer payment terms with suppliers. Research highlights that larger firms typically delay payments to manage cash flow and may leverage their dominance over smaller suppliers, leading to extended APPs (Flynn & Li, 2023).

During the COVID-19 pandemic, firms adopted varied approaches to payment practices, some speeding up payments to support suppliers while others lengthened payment terms to manage liquidity. Flynn and Li (2023) observed that institutional pressures mitigated the extent of payment delays, as firms under regulatory scrutiny adhered more closely to timely payment practices during the crisis.

## 2.2. ESG Phenomenon

Sustainable development of the global economy and society requires adopting ESG principles. Since its inception in 2004, ESG has evolved over the last two decades into a fundamental component of global sustainable development strategies. The ESG framework attempts to tackle global sustainability challenges while promoting economic growth and societal well-being by allowing a coordinated approach to environmental protection, social equity, and governance practices.

Sustainable and inclusive development has become a key topic in the global agenda. In response to intensifying environmental degradation, growing social inequalities, and vulnerabilities in financial markets, international organisations and governments have developed strategies incorporating Environmental, Social, and Governance (ESG) criteria to establish a robust foundation for human progress. These initiatives indicate an awareness of the interconnectedness of environmental, social, and governance issues and elevate expectations for an integrated approach to sustainable development (Li et al., 2021).

The approach to ESG is based on a broad framework encompassing three main pillars: Environmental (E), Social (S), and Governance (G). The Principles for Responsible Investment (PRI) define ESG as "a strategy and practice to incorporate environmental, social, and governance factors in investment decisions and active ownership." Thus, ESG serves as both a standard and a strategy for evaluating corporate behavior and possible financial performance. ESG combines all three pillars, providing investors and organisations with a framework to analyse and manage risks while promoting sustainable development.

Since its formal introduction, ESG criteria have been actively adopted in developed regions such as Europe and North America. Over time, a series of major events, including the development of standardised evaluation systems, disclosure requirements, and index construction, have strengthened the ESG framework. These have greatly improved the reliability and applicability of ESG practices, allowing investors and stakeholders to make informed decisions. As the ESG concept has

evolved from a niche investment strategy into a mainstream approach, it has become a global key theme for academic research, policy initiatives, and corporate practices (Li et al., 2021).

ESG today means more than an investment. It reflects a vision for sustainable development that integrates economic growth with social and environmental responsibility. Addressing some of the most pressing global challenges provides the foundation for more inclusive, resilient, and sustainable economies. As such, this transformational framework has attracted significant attention from scholars, practitioners, and policymakers, constantly exploring its potential to effect positive societal change amid rising global inclusivity needs.

## 2.3. Determinants of ESG Performance

Understanding the determinants of firms' ESG (Environmental, Social, and Governance) performance is essential for addressing global sustainability challenges and advancing strategic management practices. Research identifies various internal and external factors as key drivers of ESG performance. Internal determinants include financial resources, governance structures, and leadership attributes, such as the CEO's vision and strategic mindset, which significantly shape a firm's commitment to ESG practices (Crace & Gehman, 2022; Garcia-Blandon et al., 2019). Additionally, as the resource-based view describes, unique resource configurations within firms often explain performance variations and highlight the importance of aligning corporate capabilities with ESG objectives (Barney, 1991).

Internal determinants encompass financial and non-financial attributes influencing firms to prioritise and execute ESG strategies. Firm size is crucial, with larger firms typically exhibiting superior ESG performance due to their abundant resources and heightened public scrutiny (Drempetic et al., 2020). Governance characteristics, such as board diversity, also play a pivotal role. Studies show that greater representation of women and minorities on boards correlates with improved ESG outcomes, as diverse boards are more likely to adopt inclusive and innovative strategies (Beji & Loukil, 2021).

Leadership commitment, particularly CEO attributes, significantly affects ESG performance. CEO demographics and strategic decision-making styles influence the integration of ESG principles into corporate policies (Garcia-Blandon et al., 2019). Furthermore, corporate strategies emphasizing stewardship, innovation, and stakeholder engagement are critical. Initiatives such as investments in research and development (R&D), sustainability committees, and robust risk management frameworks enhance a firm's ESG integration (Martiny et al., 2024).

External determinants provide the broader context within which firms operate, including regulatory frameworks, economic conditions, and cultural influences. Regulatory pressures like the European Union's sustainability directives strongly encourage ESG adoption by promoting transparency and accountability (Martiny et al., 2024). Economic factors, including GDP levels and crises, also shape ESG performance. While higher economic development generally correlates with better ESG scores, economic downturns, such as the 2008 financial crisis, often lead firms to deprioritize sustainability in favor of short-term survival (Foo Nin et al., 2012).

Cultural and institutional factors further influence ESG practices. Informal institutions, including societal norms, religion, and legal traditions, significantly impact corporate strategies and stakeholder expectations. Industry-specific pressures, particularly in high-impact sectors, also play a role (Martiny et al., 2024). Firms in industries with high stakeholder visibility and scrutiny often face greater demands to adopt robust ESG practices (Crace & Gehman, 2022). These external determinants set the stage for firms to align their internal strategies with global and regional sustainability priorities.

## 2.4. Divergence and Disagreement in ESG Ratings

ESG ratings, designed to assess firms' sustainability performance, play a pivotal role in investment decisions, corporate strategies, and academic research. However, significant discrepancies among ratings from different agencies have raised questions about their reliability and interpretability. The literature consistently highlights that

correlations between ESG ratings often range from 0.3 to 0.7, a stark contrast to the near-perfect correlations observed in credit ratings (Berg et al., 2022). This variability undermines the utility of ESG ratings as consistent tools for evaluating sustainability and informing decision-making.

The divergence in ESG ratings is rooted in three primary sources: scope, measurement, and weight. Scope divergence arises when rating agencies evaluate different attributes, including lobbying activities or focusing solely on quantifiable metrics like emissions or water use. This difference in what is measured accounts for approximately 38% of the variability in ESG ratings (Berg et al., 2022).

Measurement divergence, the most significant contributor at 56%, stems from variations in the methodology agencies use to assess the same attributes. For example, one provider might evaluate labour practices through workforce turnover data and litigation records by another. Even when similar data is used, differences in interpretation can lead to inconsistent scores. Weight divergence, accounting for 6% of the total discrepancy, reflects the varying levels of importance agencies assign to different ESG factors. Although less impactful than scope and measurement inconsistencies, it still contributes to the overall variability in ratings (Berg et al., 2022).

These divergences have profound implications. For investors, the lack of alignment between ESG ratings complicates the integration of ESG factors into investment strategies, leading to inefficiencies in capital allocation and misaligned incentives (Liu, 2022). Companies, in turn, face uncertainty about which ESG initiatives are most valued by stakeholders and investors, reducing their incentive to invest in meaningful sustainability practices. For researchers, relying on data from a single ESG provider may yield inconsistent or non-generalizable results, particularly when comparing studies using different rating methodologies (Berg et al., 2022).

A significant limitation of ESG ratings lies in their reliance on non-standardized metrics. The absence of universal standards for data collection and reporting exacerbates measurement divergence. Metrics such as carbon emissions, gender diversity, or community engagement are often defined or quantified differently across raters, further complicating comparisons (Berg et al., 2022). Additionally, ESG ratings

frequently combine quantitative metrics with qualitative assessments, introducing subjectivity into the evaluation process. This subjectivity is especially problematic in areas like social responsibility, where consensus on what constitutes strong performance remains elusive.

The lack of transparency in rating methodologies further compounds the issue. Many rating agencies do not disclose the algorithms or criteria used to calculate scores, making it challenging for stakeholders to understand the basis of a particular rating (Liu, 2022; Guerrero & Viteri, 2025). This opacity undermines confidence in ESG assessments and limits their comparability.

Efforts to address these divergences have focused mainly on standardizing disclosure practices and enhancing transparency. For instance, the Environmental, Social, and Governance Reporting Guide introduced by the Hong Kong Stock Exchange promotes standardized reporting to reduce variability (Liu, 2022). These initiatives aim to align scope and weight dimensions by encouraging companies to report key performance indicators consistently.

Furthermore, Kimbrough et al. (2024) investigate whether voluntary ESG reporting helps address the persistent disagreement among ESG rating agencies, which stems from variations in methodologies, weighting criteria, and data sources. Their findings indicate that firms that voluntarily disclose ESG reports tend to experience lower levels of rating divergence, particularly when the disclosures provide detailed insights into environmental and social aspects. However, the effectiveness of these reports is contingent upon their quality; longer and more comprehensive reports contribute to greater alignment among rating agencies, whereas reports characterized by excessive positivity or repetitive content can exacerbate discrepancies. The study highlights that external assurance, especially when conducted by reputable accounting firms, enhances the credibility of ESG reports, leading to a more consistent evaluation of firms' ESG performance. Additionally, firms that adhere to advanced levels of the Global Reporting Initiative (GRI) standards are more likely to achieve reduced rating disparities.

## 2.5. Determinants of ESG Ratings

Companies with high ESG ratings are typically more reliable business partners, demonstrating consistent commitment to environmental protection, social responsibility, and sound corporate governance. Such firms are less likely to default or abandon obligations, which lowers the transaction costs and risks for all parties involved. Furthermore, good ESG performance enhances a company's reputation and reduces the likelihood of default, fostering stakeholder trust. High ESG ratings also improve stakeholders' expectations, leading to stronger customer loyalty and better access to trade credit. According to stakeholder theory, while unethical practices might yield short-term gains, they ultimately harm a firm's reputation and disrupt long-term partnerships, undermining sustainable business operations. (Wang, 2023)

With high ESG ratings, significantly reduced operational risks enhance a firm's sustainability and encourage responsible business practices. In the value chain, cost-effective alternative energy solutions that meet carbon emission standards lay the basis for minimizing waste and pollution, improving ESG scores, and reducing operational risks. Developing this focus on sustainability, technology innovation can improve, and products become more competitive. Also, the ESG framework encourages corporate legal responsibility for environmental and social impacts, thereby enhancing governance practices and decreasing the risk of potential legal disputes or regulatory non-compliance (Wang, 2023).

Improved ESG performance, particularly in environmental and governance aspects, has been shown to lower equity capital costs, while social sustainability's impact is less clear. Higher ESG ratings serve as a proxy for reduced default risk, influencing loan rates. Banks prioritising environmental concerns tend to offer better loan terms to firms meeting sustainability standards, thus reducing operational risks. Additionally, higher ESG ratings correlate with better information transparency, leading to lower debt costs and expanded financing opportunities (Wang, 2023).

## Environmental Practices

Environmental performance is critical in determining ESG scores, focusing on resource efficiency, emissions reduction, and climate risk management. According to Porter and van der Linde (1995), environmental pressure can drive innovation and competitive advantage, particularly when firms implement supporting strategies such as closed-loop production systems or renewable energy. Likewise, the Task Force on Climate-related Financial Disclosures (TCFD, 2017) highlighted that transparency in environmental risk disclosure supports investors' confidence and, therefore, upgrades the ratings. In addition, it has been proven that industrywide ecological risks, such as the carbon intensity of energy sectors, are essential indicators of ESG ratings (Clark et al., 2015). Companies that proactively manage these risks align with global sustainability goals and benefit from lower operational costs and higher ESG scores.

ESG companies adopt strategies to minimize their ecological footprint and further encourage sustainability. This involves actively reducing greenhouse gas emissions, shifting to renewable energy sources, and implementing resource-efficient processes. They also frequently monitor and report on their environmental impact, ensuring transparency and accountability. To meet consumer demand and sustainability goals, product innovation in ESG firms involves designing eco-friendly solutions, such as recyclable packaging or energy-efficient products.

## Social Practices

The social dimension assesses the performance of companies concerning human capital, diversity, community involvement, and supply chain ethics. Edmans (2011) has identified that employee satisfaction brings a long-term effect on performance, indicating that companies that invest in the welfare and development of employees receive higher social ratings as a result. Servaes and Tamayo (2013) have further shown that socially responsible practices attract customer awareness, build stakeholder value, and improve overall ratings. The other determinant of social performance is supply chain management, especially on human rights issues like child labor and ethical sourcing. According to the UN Principles for Responsible Investment-UNPRI (2006), companies must inculcate global social sustainability standards into their operations, hence the improved social metrics.

On the social front, ESG companies have focused on the well-being of their employees, customers, and communities by providing competitive benefits, ensuring a safe and inclusive workplace, and investing in employee training and development. Diversity and inclusion policies ensure opportunities and representation equitably, while community engagement programs deal with social challenges such as education, health, or infrastructure. ESG firms also maintain ethical supply chains, with strict standards to avoid human rights violations like forced or child labor.

## Governance Practices

Governance is a core input to ESG ratings, and it stresses the role of board independence, alignment of executive compensation with performance, and shareholder rights protection. Gompers, Ishii, and Metrick (2003) clarify the relationship between strong governance practices and equity performance by noting that firms with independent and diverse boards are considered more transparent and resilient. Ferreira and Matos (2008) highlight the role of institutional investors in advocating strong governance structures, especially in creating ethical practices and risk management policies. Transparency—through the periodic publication of ESG-related metrics—is an important determinant of governance ratings since transparency reflects accountability, resulting in stakeholder trust (Gillan & Starks, 2000). Companies that adopt governance enhancements within strategic frameworks often perform better than their peers in ESG rating assessments.

ESG companies' governance practices aim to improve transparency, accountability, and ethical behavior. A number of these firms ensure independent and diverse boards that provide unbiased oversight and decision-making. They also regularly disclose ESG-related metrics and align their corporate strategies with stakeholder expectations. Strong anti-corruption measures are in place to prevent unethical practices, and strong systems are implemented to interact with shareholders and other stakeholders effectively.

## 2.6. Corporate Adaptation to the COVID-19 Crisis

The COVID-19 pandemic posed an unprecedented challenge to businesses worldwide, forcing them to adapt rapidly to financial, operational, and workforce-related disruptions. Companies exhibited significant variations in their responses, influenced by factors such as firm size, industry sector, and commitment to Environmental, Social, and Governance (ESG) principles.

A major concern for firms during the pandemic was financial stability. According to Fahlenbrach et al. (2021), many companies responded to liquidity shocks by increasing their cash reserves, reducing capital expenditures, and leveraging credit facilities. Firms with strong financial health before the pandemic could navigate the crisis with less reliance on emergency credit, while highly leveraged companies faced significant financial distress (Acharya & Steffen, 2020). Large firms, benefiting from superior capital market access, raised liquidity through bond issuances, whereas small businesses, constrained by limited financing options, suffered severe cash flow shortages (Bartik et al., 2020).

The pandemic also led to significant adjustments in trade credit policies. Some firms delayed supplier payments to conserve cash, extending their Average Payment Period (APP), while others accelerated payments to financially support their supply chain partners (Flynn & Li, 2023). Similarly, companies in customer-focused industries such as retail and hospitality often extended Average Collection Period (ACP), allowing clients more time to pay to sustain long-term relationships (Xu et al., 2019). However, industries with high fixed costs, such as manufacturing and energy, were more likely to tighten credit policies due to their significant operational expenses (García-Teruel & Martínez-Solano, 2010).

The labor market faced immense pressure during the pandemic, with widespread layoffs and furloughs. Cahuc (2020) notes that companies in high-contact industries, such as tourism and retail, faced no alternative but to reduce their workforce due to revenue collapses. In contrast, sectors like technology and pharmaceuticals expanded hiring, benefiting from increased demand for digital and healthcare services. However,

companies varied in their employment strategies, with profit-oriented firms implementing rapid layoffs and wage cuts, whereas ESG-committed firms prioritized job retention, flexible work arrangements, and employee well-being programs (Flammer & Luo, 2017).

The transition to remote work became a defining characteristic of corporate adaptation. Companies in knowledge-based industries, such as finance, consulting, and IT, adapted quickly due to pre-existing digital infrastructure. At the same time, manufacturing and logistics firms faced greater challenges due to the physical nature of their operations (Baert et al., 2020). Bloom et al. (2021) highlight that firms with prior investments in digital transformation exhibited higher resilience and operational flexibility, ensuring business continuity with minimal disruptions.

The COVID-19 pandemic tested the authenticity of corporate ESG commitments, revealing substantial differences between firms prioritizing social responsibility and those focused solely on financial survival. Companies with high ESG ratings demonstrated greater commitment to ethical business practices, ensuring fair supplier relationships, maintaining employee benefits, and upholding sustainability initiatives despite financial pressures (Garel & Petit-Romec, 2021). ESG-oriented firms were more likely to pay suppliers promptly, recognizing the importance of supporting smaller vendors struggling with liquidity constraints (Wang, 2023).

Moreover, companies with strong employee welfare programs, such as extended paid leave, mental health support, and workplace safety measures, experienced higher employee retention and engagement (Flammer & Luo, 2017). In contrast, firms that deprioritized ESG commitments and implemented cost-cutting strategies at the expense of their workforce faced reputational damage and long-term brand erosion (Dyck et al., 2019).

Consumer and investor sentiment also played a crucial role in reinforcing ESG commitments during the crisis. Servaes and Tamayo (2013) found that socially responsible brands experienced higher consumer trust and loyalty, particularly as customers became more conscious of corporate behavior during economic downturns.

Likewise, Dyck et al. (2019) reported that firms with strong governance and ethical leadership attracted greater investor confidence, leading to better financial performance than competitors that neglected social responsibility during the crisis.

Different industries exhibited varying levels of resilience and adaptability during the pandemic. Technology, healthcare, and e-commerce thrived due to increased demand for digital services, pharmaceuticals, and online retail (Baert et al., 2020). In contrast, tourism, aviation, and hospitality faced severe financial strain, requiring government intervention and emergency financing to avoid collapse.

Supply chain disruptions also influenced corporate behavior, with firms with globalized supply networks experiencing severe bottlenecks, while those with regionalized supply chains adapted more efficiently (Flynn & Li, 2023). Research suggests that companies sought to mitigate future risks by diversifying suppliers and increasing local sourcing, ensuring greater resilience against external shocks (García-Teruel & Martínez-Solano, 2010).

## 2.7. ESG and the determinants of ACP and APP

Integrating Environmental, Social, and Governance (ESG) principles into corporate operations reflects an evolving commitment to sustainable and socially responsible practices. Integrating ESG principles into corporate operations reflects a changing commitment to sustainable and socially responsible practices. This commitment directly impacting financial behaviors such as managing the Average Payment Period (APP) and Average Collection Period (ACP). APP and ACP are important metrics that show how firms manage the monetary relationships with stakeholders such as suppliers and customers, especially during an economic crisis. A nuanced understanding of ethical corporate financial behavior comes into being through analysing ESG principles intersecting with these determinants.

The APP reflects a firm's time to settle payments with its suppliers, offering insight into its liquidity management and commitment to supply chain stability. High-ESG-rated companies often prioritize social responsibility and ethical supplier relations,

which are central to the "Social" and "Governance" pillars of ESG. For instance, during the COVID-19 pandemic, companies with strong ESG commitments are expected to accelerate supplier payments to support supply chain continuity and reduce the financial burden on smaller suppliers. These actions fall within the broader ESG goal of promoting sustainable and equitable supply chains, especially during economic instability.

Moreover, ESG-driven firms usually have better access to financing and stronger cash flows, which allow them to keep shorter APPs without sacrificing their liquidity. Suppliers would regard the firms with strong ESG credentials as more credible, which might enable them to get better credit terms and further strengthen their ability to handle APP effectively (Wang, 2023). Still, some companies strategically extend APP to maintain cash flow during crises, thus showing a possible tension between ESG principles and financial survival strategies.

The ACP measures the average time a firm takes to collect customer payments and serves as a proxy for how companies manage their financial interactions with clients. High-ESG-rated firms often emphasize stakeholder trust and long-term relationships, encouraging practices such as extending credit terms or offering flexibility to customers facing financial difficulties. This behavior is particularly evident during crises, where companies with strong ESG commitments are likelier to adopt customer-friendly policies, easing liquidity pressures on vulnerable stakeholders (Cheung & Pok, 2019; Flynn & Li, 2023).

Accordingly, this study tests the following hypotheses:

**H1 (General):** Firms with higher ESG ratings tend to maintain shorter APP and longer ACP, reflecting more stakeholder-friendly financial practices.

**H2 (Crisis-specific):** The relationship between ESG ratings and APP/ACP is stronger during economic crises, such as the COVID-19 pandemic.

## 3. Moderating effects

Moderation analysis examines whether the strength or direction of this relationship changes under specific conditions, offering valuable insights into the interplay between ESG performance and corporate financial decision-making (Alves & Meneses, 2024).

One critical aspect is identifying potential moderators influencing the relationship between ESG ratings and financial practices. Key moderators include industry sector, firm size, financial performance, crisis severity, corporate governance strength, and geographic region. For instance, the influence of ESG ratings on operational practices might be stronger in industries that face higher stakeholder pressure, such as consumer goods, compared to industries with lower social visibility, such as heavy manufacturing. Similarly, larger firms with greater financial resources may exhibit different behaviors than smaller firms, potentially moderating the impact of ESG initiatives on APP and ACP.

Therefore, this study proposes the following hypotheses:

**H3:** Firm size moderates the ESG–APP/ACP relationship, with larger high-ESG firms showing stronger alignment.

**H4:** Financial health moderates the ESG–APP/ACP relationship, with more solvent firms better able to act responsibly.

## 4. Data and Methodology

The data for this research will be derived from multiple reliable sources to analyze the impact of ESG ratings on corporate financial behavior during crises, with a specific focus on firms listed in the Euro Stoxx 600 index. This index includes a diverse range of 600 publicly traded companies across 17 European countries, covering various sectors such as healthcare, financial services, industrials, and consumer goods. The Euro Stoxx 600 is an ideal sample frame due to its representativeness of the European market. It captures firms with diverse ESG profiles, financial strategies, and responses to crises such as the COVID-19 pandemic. To ensure the robustness of the analysis, the dataset was cleaned by excluding financial firms and all companies that did not report complete data for the full study period.

The study will source information from several databases to ensure a robust and multidimensional dataset. ESG performance metrics will be obtained from Refinitiv, which provides comprehensive ESG scores, sustainability reports, and granular performance indicators across environmental, social, and governance dimensions. These databases allow for a longitudinal analysis of ESG trends before, during, and after the crisis. Financial data will be sourced from Orbis, including firm-level indicators such as APP, ACP, profitability, and leverage ratios.

Key variables for the research will include dependent variables such as the Average Payment Period (APP) and Average Collection Period (ACP). The APP will be calculated as the ratio of accounts payable to the cost of goods sold (COGS), multiplied by 365 days, while the ACP will be measured as the ratio of accounts receivable to total revenue, also multiplied by 365 days. The independent variable of interest will be ESG ratings, categorized into high and low performers based on ESG scores provided by Refinitiv, using industry-adjusted percentiles. Moderating variables, such as firm size, and financial performance, will be considered to assess how different factors influence the ESG-financial behavior relationship. Control variables include financial indicators such as leverage ratio, profitability, and liquidity.

The timeframe for analysis will span from 2017 to 2023, divided into three distinct periods: pre-COVID-19 (2017-2019), crisis (2020-2022), and post-crisis recovery

(2023). This division allows for evaluating financial behaviors and ESG performance over time, providing a comprehensive view of firms' responses to the pandemic and subsequent recovery efforts.

A Differences-in-Differences (DiD) methodology will be utilized to analyze the impact of ESG ratings on operational financial practices. This approach is particularly suitable for the study as it allows for causal inference by comparing changes in APP and ACP across firms with high and low ESG ratings before and after the COVID-19 crisis. The DiD model helps mitigate endogeneity concerns by assuming that, in the absence of ESG-related commitments, firms in both groups would have exhibited similar financial behaviors (Schiozer et al., 2021). The empirical model will include an interaction term to capture the effect of ESG ratings during the crisis period, controlling for relevant firm-specific and macroeconomic variables.

The regression model to be employed in the study can be represented as follows:

$$Y_{it} = \beta_0 + \beta_1 ESG_i + \beta_2 Crisis_t + \beta_3 (ESG_i \times Crisis_t) + \beta_4 X_{it} + \mu_i + \lambda_i + \varepsilon_{it}$$

In this model, $Y_{it}$ represents the dependent variables (APP and ACP). $ESG_i$ is a dummy variable indicating firms with high ESG ratings. $Crisis_t$ is a dummy variable equal to 1 for the years 2020–2022 (COVID-19 crisis period) and 0 otherwise. The interaction term $ESG_i \times Crisis_t$t captures the differential effect of ESG performance during the crisis (Schiozer et al., 2021). Control variables ($X_{it}$), namely firm size, profitability, leverage, liquidity, and industry classification, are included to account for firm-specific characteristics. Firm fixed effects ($\mu_i$) and year fixed effects ($\lambda_i$) are also incorporated to control for unobserved heterogeneity across firms and time.

Several methodological strategies will be applied to strengthen the validity of the results. In addition to the baseline Difference-in-Differences specification, alternative model setups will be estimated to control for unobserved heterogeneity and to verify the robustness of the findings, including specifications with firm and year fixed effects.

| Variable | Description | Source |
|---|---|---|
| **Average Payment Period (APP)** | Time (in days) a firm takes to pay its suppliers | Orbis |
| **Average Collection Period (ACP)** | Time (in days) a firm takes to collect payments from customers | Orbis |
| **ESG Score** | Environmental, Social, and Governance performance score | Refinitiv |
| **Firm Size** | Measured as the natural logarithm of total assets | Orbis |
| **Profitability (ROA)** | Return on Assets - a measure of a firm's profitability | Orbis |
| **Leverage** | Total debt divided by total assets | Orbis |
| **Liquidity (Current Ratio)** | Short-term liquidity ratio (current assets/current liabilities) | Orbis |
| **Industry Classification** | Categorical variable indicating the firm's sector | - |
| **Crisis Period** | Dummy variable indicating years 2020–2022 (COVID-19 crisis) | - |
| **Financial Health** | Assessed via profitability and leverage ratios | Orbis |

***Table 1*** – Descriptive statistics

| Variable | Expected Effect on APP | Expected Effect on ACP | Source from Literature |
|---|---|---|---|
| **ESG Score (High)** | ↓ APP (faster payments to support suppliers) | ↑ ACP (more lenient credit to help customers) | Flynn & Li (2023); Cheung & Pok (2019) |
| **Firm Size** | ↓ APP (large firms have better liquidity) | ↑ or ↓ ACP (larger firms may offer flexibility or enforce tighter terms) | García-Teruel & Martínez-Solano (2010) |
| **Profitability (ROA)** | ↓ APP (less need to delay payments) | ↓ ACP (strong firms collect faster) | García-Teruel & Martínez-Solano (2010) |
| **Leverage** | ↑ APP (delay payments to preserve cash) | ↑ ACP (allow slower customer payments) | Flynn & Li (2023); García-Teruel & Martínez-Solano (2010) |
| **Liquidity (Current Ratio)** | ↓ APP (can pay suppliers on time) | ↓ ACP (don't need to wait for customer cash) | Cheung & Pok (2019) |
| **ESG × Crisis** | ↓ APP (support suppliers in hard times) | ↑ ACP (support customers under pressure) | Flynn & Li (2023) |
| **ESG × Size** | ↓ APP in larger firms | ↑ ACP in larger firms | Alves & Meneses (2024) |
| **ESG × ROA** | ↓ APP if profitable and ESG-aligned | ↑ ACP if profitable and ESG-aligned | Garcia-Blandon et al. (2019) |
| **ESG × Leverage** | May ↑ APP (use ESG image to delay payments) | May ↑ ACP (maintain relationships despite debt) | Wang (2023) |
| **Social Pillar** | ↓ APP (ethical supplier treatment) | ↑ ACP (supportive customer policies) | Servaes & Tamayo (2013); Edmans (2011) |
| **Governance Pillar** | ↓ APP (better accountability) | ↑ ACP (clear stakeholder commitment) | Gompers et al. (2003); Gillan & Starks (2000) |

***Table 2*** - Summary Statistics

## 5. Results

To test H1, two baseline regressions were estimated using ordinary least squares (OLS): one with APP as the dependent variable and the other with ACP. The key explanatory variable is a binary indicator, ESG_High, which equals one if the firm's ESG score is above the 75th percentile of its industry in a given year. The models also include firm-level control variables, such as return on assets (ROA), leverage (total debt to total assets), current ratio (short-term liquidity), and the logarithm of total assets (firm size). The objective is to assess whether companies with high ESG ratings are generally more financially responsible in their operational decisions. If ESG_High is negatively associated with APP, it would suggest faster payments to suppliers. A positive association with ACP would indicate more flexible credit terms for customers—both outcomes being consistent with socially responsible behavior.

**H1 (General) – a):** Firms with higher ESG ratings tend to maintain shorter APP, reflecting more stakeholder-friendly financial practices overall.

The coefficient on ESG_High is 861.75, indicating that, on average, firms with high ESG scores have a longer APP than their lower-ESG counterparts. However, the result is not statistically significant (p-value = 0.2305), which means there is no evidence to reject the hypothesis that ESG performance does not affect APP. Contrary to expectations, the positive coefficient suggests a possible delay in supplier payments, although the lack of significance prevents any reliable conclusion. The R-squared of the model is 0.0024, indicating that the model explains only a tiny portion of the variation in APP.

In conclusion, based on this model, there is no evidence to support Hypothesis 1 in relation to APP. The ESG_High variable is not statistically significant, and the model's explanatory power is weak.

**H1 (General) – b):** Firms with higher ESG ratings tend to maintain longer ACP, reflecting more stakeholder-friendly financial practices overall.

To test whether ESG-oriented firms adopt more customer-friendly collection practices, a linear regression was estimated with the Average Collection Period (ACP) as the dependent variable. The model includes the binary variable ESG_High as the key explanatory variable and controls for profitability (ROA), leverage, liquidity (current ratio), and firm size (log of total assets).

The results show that ESG_High is positive and statistically significant at the 1% level (coefficient = 4.32, p = 0.0057). This indicates that, on average, firms with ESG scores above the 75th percentile allow their customers approximately 4.3 additional days to settle outstanding payments, compared to firms with lower ESG performance.This finding supports Hypothesis 1 in the context of ACP, suggesting that high-ESG firms may extend more lenient payment terms to clients, consistent with socially responsible business conduct.

In conclusion, the results provide statistical evidence in favor of H1 in the context of ACP. High ESG-rated firms appear to adopt more flexible collection practices, consistent with the idea that ESG performance reflects a broader commitment to stakeholder support.

| Variable | APP Coefficient | APP Std. Error | APP p-Value | ACP Coefficient | ACP Std. Error | ACP p-Value |
|---|---|---|---|---|---|---|
| C | -9.025087 | 5780.981 | 0.9988 | 77.95764 | 12.55636 | 0.0 |
| ESG_HIGH | 861.7529 | 718.4185 | 0.2305 | 4.320592 | 1.55988 | 0.0057 |
| ROA | -3839.139 | 3732.871 | 0.3038 | -9.993306 | 8.1027 | 0.2176 |
| LEVERAGE | 3542.042 | 2582.121 | 0.1703 | 21.77071 | 5.610054 | 0.0001 |
| CURRENT_RATIO | 23.17027 | 356.9607 | 0.9483 | 0.105673 | 0.775078 | 0.8916 |
| LOG_TOTAL_ASSETS | -10.04852 | 240.422 | 0.9667 | -1.284208 | 0.522271 | 0.014 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.002445 | 0.000295 | 1.137198 | 0.338327 | 2.004131 |
| **ACP** | 0.012887 | 0.010761 | 6.062691 | 1.4e-05 | 2.112593 |

***Table 3 -*** Results for H1 – Baseline OLS Models (APP and ACP)

To test H2, a Differences-in-Differences (DiD) methodology is used to evaluate whether the relationship between ESG ratings and financial practices becomes more pronounced during economic crises. A dummy variable, Crisis, is defined as 1 for the years 2020-2022, and 0 otherwise. The interaction term ESG_Crisis, defined as ESG_High × Crisis, captures the differential effect of high ESG ratings during the crisis period. The coefficient on this interaction term identifies whether high-ESG firms behaved differently from others in terms of APP and ACP during the pandemic. A negative and significant coefficient in the APP model would suggest that ESG firms reduced their payment periods more than others, possibly to support their suppliers. Conversely, a positive and significant coefficient in the ACP model would indicate that ESG firms offered more generous payment terms to customers during the crisis.

**H2 (Crisis-specific) – a):** The relationship between ESG ratings and APP is stronger during economic crises, such as the COVID-19 pandemic.

The coefficient on the interaction term ESG_Crisis is negative (–1747.39), which aligns with the hypothesis that ESG-oriented firms would reduce their APP during the crisis to support their suppliers. However, the effect is not statistically significant ($p = 0.2230$), meaning that the result does not provide sufficient evidence to confirm that high-ESG firms behaved differently from others in this respect.

The ESG_High variable is marginally significant at the 10% level ($p = 0.0744$), suggesting a possible trend where firms with higher ESG ratings generally maintain longer payment periods, though not necessarily during the crisis. The Crisis variable is not significant ($p = 0.6946$), indicating that, on average, firms did not significantly change their APP during the crisis, regardless of ESG status. The R-squared value is extremely low (0.0037), which indicates that the model explains only a tiny portion of the variation in APP.

While the sign of the ESG_Crisis coefficient is consistent with Hypothesis 2, the lack of statistical significance prevents any firm conclusions. Thus, the model does not provide evidence that ESG-oriented firms adopted more supportive payment behavior toward suppliers during the COVID-19 crisis. The findings suggest that APP may be

less sensitive to ESG concerns than initially expected, or that the ESG scores used do not sufficiently capture firms' supplier engagement in crisis conditions.

**H2 (Crisis-specific) – b):** The relationship between ESG ratings and ACP is stronger during economic crises, such as the COVID-19 pandemic.

The coefficient on ESG_Crisis is positive (4.29), suggesting that firms with higher ESG ratings extended longer collection periods to clients during the crisis. This finding is in line with Hypothesis 2, which anticipates more stakeholder-supportive behavior in ESG-oriented firms under pressure. However, the result is not statistically significant($p = 0.1686$), meaning we cannot confidently assert that ESG firms behaved differently during the crisis with respect to ACP.

The main variable ESG_High is also positive (2.13) but not significant ($p = 0.3326$), indicating that outside of crisis periods, ESG performance does not have a measurable effect on ACP.

Among control variables, leverage is again significant and positive ($p < 0.001$), reinforcing the idea that firms with higher debt levels tend to allow longer collection periods. Firm size (log of total assets) is negatively associated with ACP ($p = 0.0159$), meaning larger firms enforce tighter credit terms, likely due to stronger bargaining power. Other controls (ROA and current ratio) show no statistically significant effect.

The R-squared of the model is 0.0138, indicating limited explanatory power, which is typical for firm-level panel data where many behavioral drivers are unobservable or qualitative.

While ESG appears to influence customer-facing policies, the lack of significant results regarding APP suggests an asymmetry in ESG application. Firms may be more willing to support customers than suppliers during times of crisis. These findings highlight a potential misalignment between ESG rhetoric and operational behavior when financial trade-offs are involved.

| Variable | APP Coefficient | APP Std. Error | APP p-Value | ACP Coefficient | ACP Std. Error | ACP p-Value |
|---|---|---|---|---|---|---|
| C | 212.2551 | 5781.55 | 0.9707 | 77.64434 | 12.55985 | 0.0 |
| ESG_HIGH | 1806.45 | 1012.124 | 0.0744 | 2.131572 | 2.199411 | 0.3326 |
| CRISIS | -284.3938 | 724.2518 | 0.6946 | -0.510975 | 1.573199 | 0.7454 |
| ESG_CRISIS | -1747.388 | 1433.414 | 0.223 | 4.286396 | 3.112786 | 0.1686 |
| ROA | -3931.614 | 3734.464 | 0.2925 | -10.00547 | 8.107871 | 0.2173 |
| LEVERAGE | 3703.301 | 2584.746 | 0.1521 | 21.61864 | 5.616628 | 0.0001 |
| CURRENT_RATIO | 32.70878 | 357.5749 | 0.9271 | -0.090895 | 0.776505 | 0.9068 |
| LOG_TOTAL_ASSETS | -16.35158 | 240.574 | 0.9458 | -1.261193 | 0.52268 | 0.0159 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.003669 | 0.000661 | 1.219568 | 0.288145 | 2.004174 |
| **ACP** | 0.013771 | 0.010795 | 4.627821 | 3.7e-05 | 2.110853 |

***Table 4*** **-** Results for H2 – Difference-in-Differences (ESG × Crisis)

To test H3, an interaction term between firm size and ESG ratings is included in the regression models to evaluate whether firm size moderates the relationship between ESG performance and financial practices (APP and ACP). Firm size is measured as the logarithm of total assets, and the interaction term, ESG_Size, is defined as ESG_High × Log_Total_Assets. The coefficient on this interaction term indicates whether the effect of ESG ratings on APP and ACP varies depending on the size of the firm. A significant coefficient would suggest that the influence of ESG on payment and collection periods is stronger or weaker for larger firms compared to smaller ones. Specifically, a positive and significant coefficient in the ACP model would imply that larger firms with high ESG ratings extend longer collection periods to customers, while a negative and significant coefficient in the APP model would indicate that larger ESG firms reduce payment periods to suppliers more than smaller firms.

**H3:** Firm size moderates the relationship between ESG ratings and ACP, with larger firms showing stronger alignment with ESG principles.

For the Average Collection Period (ACP), the interaction term between ESG performance and firm size (ESG_SIZE_INTERACTI_) is positive and statistically significant at the 5% level ($p = 0.0165$). This finding indicates that the impact of ESG on extending the average collection period is more pronounced in larger firms. In other

words, larger firms with higher ESG scores tend to offer longer payment terms to customers, reflecting a greater willingness and capacity to translate their ESG commitments into socially responsible practices that prioritize customer support. Additionally, the negative and significant coefficient for firm size itself further supports the notion that, on average, larger firms maintain tighter collection policies, but when combined with high ESG performance, this effect is moderated toward greater leniency.

The regression analysis, including an interaction term between ESG ratings and firm size, reveals a significant moderating effect of size on the relationship between ESG performance and ACP. The negative and significant coefficient for ESG_High indicates that, among smaller firms, higher ESG ratings are associated with shorter collection periods, suggesting stricter credit policies. However, the positive and significant interaction term between ESG_High and firm size demonstrates that as firm size increases, the effect of ESG on ACP becomes less negative and may even reverse, implying that larger ESG-oriented firms tend to grant more generous credit terms to their customers. This nuanced finding supports Hypothesis 3, highlighting that firm size is critical in shaping how ESG commitments influence financial interactions with clients.

**H3:** Firm size moderates the relationship between ESG ratings and APP, with larger firms showing stronger alignment with ESG principles.

For the Average Payment Period (APP), the interaction term between ESG performance and firm size (ESG_SIZE_INTERACTION) is positive, but it is not statistically significant ($p = 0.3921$). This suggests that, in this model, the moderating effect of firm size on the relationship between ESG performance and payment practices is not significant. While a positive coefficient indicates that larger firms with higher ESG ratings could potentially have longer payment periods, the lack of statistical significance means we cannot draw any firm conclusions regarding the moderation of ESG effects by firm size on APP.

The regression results show that ESG ratings alone (ESG_HIGH) have a negative but insignificant relationship with APP (p = 0.7311), suggesting that, in general, higher ESG ratings do not necessarily lead to faster payments to suppliers. Similarly, firm size (LOG_TOTAL_ASSETS) does not show a significant effect (p = 0.4302).

| Variable | APP Coefficient | APP Std. Error | APP p-Value | ACP Coefficient | ACP Std. Error | ACP p-Value |
|---|---|---|---|---|---|---|
| **C** | 2171.707 | 6319.206 | 0.7311 | 91.23343 | 13.71036 | 0.0 |
| **ESG_HIGH** | -10538.54 | 13356.47 | 0.4302 | -65.10589 | 28.98644 | 0.0248 |
| **LOG_TOTAL_ASSETS** | -102.9741 | 263.8711 | 0.6964 | -1.84998 | 0.572579 | 0.0013 |
| **ESG_SIZE_INTERACTION** | 487.7836 | 570.655 | 0.3928 | 2.970482 | 1.238421 | 0.0165 |
| **ROA** | -3893.923 | 3733.637 | 0.2971 | -10.32358 | 8.09559 | 0.2024 |
| **LEVERAGE** | 3475.627 | 2583.439 | 0.1786 | 21.36669 | 5.606851 | 0.0001 |
| **CURRENT_RATIO** | 10.77 | 357.276 | 0.976 | -0.180483 | 0.774914 | 0.8159 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.002759 | 0.000179 | 1.06933 | 0.378586 | 2.004593 |
| **ACP** | 0.015327 | 0.012782 | 6.021469 | 3.00E-06 | 2.110864 |

***Table 5 -*** Results for H3 – ESG × Firm Size Interaction

To test H4, the regression models include an interaction term between financial health and ESG ratings to evaluate whether financial health moderates the relationship between ESG performance and financial practices, specifically Average Payment Period (APP) and Average Collection Period (ACP). Financial health is proxied by indicators such as profitability (e.g., Return on Assets). The interaction term, defined as ESG_High × Financial_Health, captures whether the effect of ESG ratings on payment and collection behaviors varies depending on the firm's financial condition. A statistically significant positive coefficient in the ACP model would suggest that financially healthier firms with high ESG scores are more capable of offering lenient credit terms to customers. Conversely, a significant negative coefficient in the APP model would indicate that solvent ESG firms tend to reduce payment periods to suppliers, demonstrating a stronger adherence to responsible financial practices.

**H4:** Financial health moderates the relationship between ESG ratings and APP, with more solvent firms better able to act responsibly.

The model includes an interaction term (ESG_ROA_INTERACTION) between ESG performance (ESG_HIGH) and a proxy for financial health (ROA – Return on Assets). The coefficient of this interaction term is -34701.85, with a p-value of 0.2241, which is not statistically significant at conventional levels (0.05 or 0.10). This result implies that there is no sufficient evidence to support a moderating effect of financial health on the relationship between ESG performance and APP. In other words, the data does not show that financially healthier firms with high ESG ratings behave significantly differently in terms of payment practices compared to others.

In conclusion, the data provides partial support for H4. While ESG performance itself is significantly associated with APP, the expected moderation effect through financial health is not supported by the interaction term. This may suggest that ESG-oriented firms, regardless of financial strength, do not consistently align their payment behavior with the principles of financial responsibility.

**H4:** Financial health moderates the relationship between ESG ratings and ACP, with more solvent firms better able to act responsibly.

The interaction term (ESG_ROA_INTERACTION) has a coefficient of -52.25102 with a p-value of 0.0236, which is statistically significant at the 5% level. This negative and significant coefficient suggests that the relationship between ESG performance and ACP is indeed moderated by financial health (proxied by ROA). Specifically, the negative sign implies that financially healthier firms with high ESG ratings are less likely to offer excessively lenient credit terms to customers. This finding is contrary to the initial hypothesis, which expected a positive interaction effect, under the assumption that ESG-compliant and financially strong firms would extend more favorable terms to customers. Instead, these firms seem to prioritize timely collections, possibly as a reflection of prudent financial management aligned with responsible ESG behavior.

The coefficient for ESG_HIGH is 7.339273, and is also statistically significant (p-value = 0.0003), indicating that high ESG-rated firms tend to have longer collection

periods on average, regardless of financial health. However, the significant interaction term indicates that this effect is moderated downward as financial health improves.

| Variable | APP Coefficient | APP Std. Error | APP p-Value | ACP Coefficient | ACP Std. Error | ACP p-Value |
|---|---|---|---|---|---|---|
| **C** | 51.45883 | 5768.917 | 0.9929 | 78.05447 | 12.54523 | 0.0 |
| **ESG_HIGH** | 2869.423 | 943.0639 | 0.0024 | 7.339273 | 2.048953 | 0.0003 |
| **ROA** | 272.9045 | 3930.762 | 0.9447 | -3.811821 | 8.541418 | 0.6554 |
| **ESG_ROA_INTERACTION** | -24701.85 | 10590.3 | 0.0011 | -52.2512 | 23.02408 | 0.0233 |
| **LEVERAGE** | 302.861 | 2581.586 | 0.2417 | 20.98797 | 5.615649 | 0.0002 |
| **CURRENT_RATIO** | 42.82692 | 356.2644 | 0.9043 | -0.075531 | 0.7745 | 0.9223 |
| **LOG_TOTAL_ASSETS** | -21.17346 | 239.943 | 0.9207 | -1.301178 | 0.521858 | 0.0127 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.007042 | 0.004473 | 2.741462 | 0.011746 | 2.005326 |
| **ACP** | 0.015072 | 0.012526 | 5.919647 | 4,00E-06 | 2.119207 |

***Table 6 -*** Results for H4 – ESG × Profitability (ROA)

This regression explores the moderating effect of financial health, measured by leverage, on the relationship between ESG performance and the Average Payment Period (APP). The model includes an interaction term (ESG_LEVERAGE_INTERACTION) to test whether firms with different capital structures exhibit distinct payment behaviors when they have high ESG ratings.

The interaction term is statistically significant, with a coefficient of 1489.82 and a p-value of 0.0239, indicating that leverage significantly moderates the relationship between ESG performance and APP. Specifically, the positive coefficient implies that ESG-rated firms with higher leverage are associated with longer payment periods. In practical terms, this suggests that highly leveraged firms may use their ESG status to justify delayed payments to suppliers, potentially leveraging their reputation to secure more favorable credit terms.

Notably, the main effect of ESG_HIGH is not statistically significant ($p = 0.1119$), which means ESG performance alone does not significantly explain variation in APP without considering leverage. Similarly, the variable LEVERAGE by itself is also non-

significant. However, the significant interaction indicates that the combination of high ESG performance and high leverage is what drives extended payment periods.

The results reveal that the interaction term is positive and statistically significant (coefficient = 38.0479, p = 0.0022), suggesting that highly leveraged firms with strong ESG performance tend to exhibit longer ACPs. This indicates that these firms may offer more lenient credit terms to customers, possibly using their ESG positioning as a strategic buffer to maintain customer relationships despite financial constraints. At the same time, the individual effect of LEVERAGE is also significant (p = 0.0314), which supports the view that leverage independently contributes to longer collection periods. These findings support Hypothesis 4 by demonstrating the moderating role of financial health in the relationship between ESG and financial practices.

| Variable | APP Coefficient | APP Std. Error | APP p-Value | ACP Coefficient | ACP Std. Error | ACP p-Value |
|---|---|---|---|---|---|---|
| **C** | 869.8697 | 5785.011 | 0.8805 | 80.20235 | 12.55857 | 0.0 |
| **ESG_HIGH** | -2314.573 | 1455.237 | 0.1119 | -3.798786 | 3.160102 | 0.2294 |
| **LEVERAGE** | 300.2187 | 2984.738 | 0.9197 | 13.48629 | 6.264184 | 0.0314 |
| **ESG_LEVERAGE_INTERACTION** | 1489.823 | 659.0944 | 0.0239 | 38.04798 | 12.88548 | 0.0022 |
| **ROA** | -3742.238 | 3728.818 | 0.3157 | 2.746347 | 8.089898 | 0.2284 |
| **CURRENT_RATIO** | -14.7823 | 362.678 | 0.9674 | -0.201897 | 0.774879 | 0.7944 |
| **LOG_TOTAL_ASSETS** | -17.94539 | 240.1687 | 0.9401 | -1.301178 | 0.521449 | 0.0124 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.005145 | 0.002571 | 2.075394 | 0.062571 | 2.003494 |
| **ACP** | 0.016581 | 0.014038 | 6.522219 | 1,00E-06 | 2.113462 |

***Table 7-*** Results for H4 – (ESG × Leverage)

## 6. Robustness Analysis

One key limitation of this study stems from the well-documented divergence among ESG rating agencies, which may affect the reliability and consistency of ESG classifications used in empirical analysis. Ratings often vary significantly due to differences in scope (which aspects of ESG are measured), measurement methods (how indicators are quantified), and weighting schemes (how dimensions are prioritized), as noted by Berg et al. (2022). This divergence introduces potential measurement error into the ESG_High variable, which may attenuate the observed relationship between ESG performance and APP and ACP.

To address concerns related to aggregate ESG rating divergence and to deepen the understanding of which ESG dimensions influence operational financial practices, a robustness check will be conducted by disaggregating the ESG score into its Social and Governance components. These two pillars are especially relevant to APP and ACP dynamics, as they capture stakeholder relationships, ethical conduct, and corporate accountability, factors directly linked to how firms treat suppliers and customers. Separate regressions will be estimated using high Social and high Governance pillar scores as explanatory variables (Social_High, Governance_High) in place of the composite ESG indicator. This approach allows for a more granular assessment of whether firms with strong performance in socially responsible and governance-oriented practices are more likely to exhibit stakeholder-friendly payment behaviors during crises.

### 6.1. Results with the Social Pillar

**H1:** Firms with higher scores in the Social pillar tend to maintain shorter APP and longer ACP, reflecting more stakeholder-friendly financial practices.

To further explore the relationship between ESG performance and firms' payment behavior, a robustness test was conducted using the Social pillar score as the independent variable. Specifically, a binary variable SOCIAL_HIGH was created to identify firms in the top quartile of Social scores within their industry and year. The regression model assessed whether firms with stronger social commitments,

particularly in areas such as employee welfare, community engagement, and supply chain ethics, are more likely to maintain shorter Average Payment Periods (APP), reflecting timely payments to suppliers.

The results, however, reveal no statistically significant relationship between SOCIAL_HIGH and APP. The coefficient is negative (-754.06), suggesting that socially responsible firms may pay suppliers slightly faster, but the effect is not significant ($p = 0.3008$). Moreover, the model's R-squared is just 0.0023, indicating that the explanatory power of the regression is minimal. None of the control variables—including firm profitability (ROA), leverage, liquidity (current ratio), or firm size—showed statistical significance in this model.

These findings suggest that firms' social ESG performance does not significantly influence their supplier payment behavior. This result is consistent with earlier regressions using composite ESG scores, reinforcing the notion that financial or strategic considerations may more drive APP than by ESG-related social commitments. Alternatively, it may reflect the limitations of ESG Social ratings in capturing operational behaviors like supplier treatment during financial crises.

The results show that SOCIAL_HIGH has a positive and statistically significant coefficient ($3.62, p = 0.0224$), indicating that firms with stronger social performance tend to allow customers approximately 3.6 more days to pay their debts compared to firms with lower social scores. This finding supports the hypothesis that socially responsible firms may extend more lenient credit terms to customers, reflecting an emphasis on stakeholder support and long-term relationship-building during periods of financial stress.

Among the control variables, firm size (log of total assets) is also significant ($p = 0.0095$), with a negative coefficient, suggesting that larger firms tend to collect receivables more quickly.

In conclusion, the results provide evidence that the social dimension of ESG is linked to more flexible customer payment policies.

| Variable | APP Coefficient | APP p-value | ACP Coefficient | ACP p-value |
|---|---|---|---|---|
| **SOCIAL_HIGH** | -754.0603 | 0.3008 | 3.617701 | 0.0224 |
| **ROA** | -3582.44 | 0.3385 | -11.28462 | 0.165 |
| **LEVERAGE** | 3585.788 | 0.165 | 22.58796 | 0.0001 |
| **CURRENT_RATIO** | -14.67705 | 0.9672 | 0.079703 | 0.9182 |
| **LOG_TOTAL_ASSETS** | 57.96541 | 0.8117 | -1.371939 | 0.0095 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP (Social)** | 0.002287 | 0.000137 | 1.063537 | 0.378654 | 2.005968 |
| **ACP (Social)** | 0.011849 | 0.009721 | 5.568455 | 4.2e-05 | 2.104986 |

***Table 8-*** Results for H1 – Effect of Social Pillar Performance on APP and ACP

**H2:** The relationship between Social pillar performance and APP/ACP is stronger during economic crises, such as the COVID-19 pandemic.

To investigate whether the influence of social ESG performance on supplier payment practices intensifies during times of crisis, a Difference-in-Differences (DiD) regression was estimated using an interaction term between SOCIAL_HIGH and a crisis dummy variable (CRISIS, equal to 1 for years 2020–2022). The interaction term SOCIAL_CRISIS captures whether firms with high social ESG ratings behaved differently in terms of APP during the COVID-19 crisis.

The coefficient on SOCIAL_CRISIS is 101.63 (p = 0.4849), which is not statistically significant, indicating that socially responsible firms did not behave differently in terms of payment to suppliers during the crisis. Similarly, the main effect of SOCIAL_HIGH is also statistically insignificant (–1187.72, p = 0.2282), suggesting that social ESG performance does not predict APP in general. The overall R-squared remains low (0.0029), further limiting explanatory power. These results are consistent with prior findings, reinforcing the conclusion that firms' social ESG credentials do not significantly influence supplier payment durations, either in normal conditions or during crisis periods.

The results show that neither SOCIAL_HIGH (coefficient = 3.38, p = 0.1125) nor the SOCIAL_CRISIS interaction term (coefficient = 0.46, p = 0.8836) are statistically

significant. Although the positive sign of SOCIAL_HIGH suggests that firms with stronger social performance may allow customers slightly more time to pay, this effect is not robust. Overall, there is no evidence that social ESG performance significantly influences ACP, either in normal times or during the crisis period.

These findings suggest that although firms with strong social ESG performance may intend to adopt more customer-friendly credit practices, the evidence does not support a significant effect either in normal times or during crises. Therefore, the results do not provide support for Hypothesis 2 in the context of ACP, reinforcing the interpretation that ESG-driven credit policies may reflect consistent values but are not observable in measurable changes in payment behavior.

| Variable | APP Coefficient | APP p-value | ACP Coefficient | ACP p-value |
|---|---|---|---|---|
| **SOCIAL_HIGH** | -1187.717 | 0.2282 | 3.378986 | 0.1125 |
| **CRISIS** | -884.6224 | 0.2187 | 0.721782 | 0.6442 |
| **SOCIAL_CRISIS** | 101.631 | 0.4849 | 0.456029 | 0.8836 |
| **ROA** | -2626.232 | 0.3332 | -11.06214 | 0.1742 |
| **LEVERAGE** | 3724.817 | 0.1498 | 22.40706 | 0.0001 |
| **CURRENT_RATIO** | 8.417039 | 0.9812 | -0.102198 | 0.8955 |
| **LOG_TOTAL_ASSETS** | 63.28934 | 0.7948 | -1.377425 | 0.0093 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.002942 | 0.000795 | 1.377481 | 0.206241 | 2.007523 |
| **ACP** | 0.01202 | 0.009727 | 5.168455 | 0.000212 | 2.105446 |

***Table 9-*** Results for H2 - Interaction Between Social Pillar and Crisis Period

## 6.2. Results with the Governance Pillar

**H1:** Firms with higher scores in the Governance pillar tend to maintain shorter APP and longer ACP, reflecting more responsible and transparent financial behavior.

The results indicate that the coefficient on GOVERNANCE_HIGH is positive (748.54), suggesting that firms with high governance scores tend to have longer payment periods. However, this effect is not statistically significant ($p = 0.3002$), indicating that there is no reliable evidence that governance-focused firms behave differently in terms of APP.

These findings imply that corporate governance strength, as measured by ESG ratings, does not meaningfully predict how quickly firms pay their suppliers. This result is consistent with earlier conclusions regarding the overall ESG score and the Social pillar, further suggesting that APP may be driven more by liquidity constraints or strategic financial considerations than by ESG-related values**.** Consequently, the results provide no support for Hypothesis 1 when tested through the Governance dimension.

The regression results show that GOVERNANCE_HIGH is not statistically significant (coefficient = 0.49, $p = 0.7564$), indicating that firms with higher governance scores do not systematically differ in their customer credit terms compared to their lower-scoring counterparts. This result suggests that good governance, as defined by ESG frameworks, does not appear to influence how lenient firms are in collecting payments from their clients. In conclusion, the results do not support Hypothesis 1 in the context of the governance pillar and ACP.

| Variable | APP Coefficient | APP p-value | ACP Coefficient | ACP p-value |
|---|---|---|---|---|
| **GOVERNANCE_HIGH** | 748.5376 | 0.2999 | 0.487011 | 0.7564 |
| **ROA** | -3862.951 | 0.3009 | -10.02978 | 0.2167 |
| **LEVERAGE** | 3515.851 | 0.1738 | 22.2147 | 0.0001 |
| **CURRENT_RATIO** | 1.696155 | 0.9962 | -0.189883 | 0.8067 |
| **LOG_TOTAL_ASSETS** | -19.05897 | 0.9372 | -1.18376 | 0.0245 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.002289 | 0.000139 | 1.063471 | 0.37821 | 2.004441 |
| **ACP** | 0.009666 | 0.007571 | 4.930688 | 0.000408 | 2.109112 |

***Table 10-*** Results for H1 – Effect of Governance Pillar Performance on APP and ACP

**H2:** The relationship between Governance pillar performance and APP/ACP is stronger during economic crises, such as the COVID-19 pandemic.

The coefficient on GOVERNANCE_CRISIS is positive (161.09; p = 0.2471), but not statistically significant, indicating that firms with strong governance practices did not behave differently in terms of APP during the crisis. Likewise, the individual effects of GOVERNANCE_HIGH (p = 0.1082) and CRISIS (p = 0.6761) are also not significant. These results provide no evidence to support Hypothesis 2 in the context of governance ESG and supplier payment behavior.

Similarly, for ACP, the interaction term GOVERNANCE_CRISIS is positive (3.60; p = 0.2492) but not significant, and the main effect of GOVERNANCE_HIGH is also insignificant (p = 0.5232). This suggests that governance ESG performance alone does not meaningfully influence how firms manage customer credit terms, nor does it alter behavior during the crisis. Overall, the findings provide no support for Hypothesis 2 within the governance pillar.

| Variable | APP Coefficient | APP p-value | ACP Coefficient | ACP p-value |
|---|---|---|---|---|
| **GOVERNANCE_HIGH** | 1682.737 | 0.1082 | -1.417314 | 0.5232 |
| **CRISIS** | -202.8899 | 0.6761 | -0.016762 | 0.9915 |
| **GOVERNANCE_CRISIS** | 161.085 | 0.2471 | 3.596991 | 0.2492 |
| **ROA** | -2869.308 | 0.3008 | -10.1478 | 0.2118 |
| **LEVERAGE** | 3662.38 | 0.1569 | 22.02539 | 0.0001 |
| **CURRENT_RATIO** | 18.88708 | 0.9678 | -0.207182 | 0.7897 |
| **LOG_TOTAL_ASSETS** | -14.96205 | 0.9508 | -1.189685 | 0.0238 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.003442 | 0.000433 | 1.143757 | 0.332498 | 2.004656 |
| **ACP** | 0.010419 | 0.007433 | 3.489425 | 0.000999 | 2.109526 |

***Table 11-*** Results for H2 - Interaction Between Governance Pillar and Crisis Period

## 6.3. Results with the ESG score as a continuous variable

To enhance the robustness of the baseline findings, Hypothesis 1 (H1) was re-estimated using the ESG score as a continuous variable (ESG_COMBINED_SCORE) rather than a binary classification. This alternative specification aims to capture the full variation in ESG performance and mitigate the potential loss of explanatory power associated with a top-quartile dummy. The regressions were conducted separately for the Average Payment Period (APP) and Average Collection Period (ACP), while controlling for profitability (ROA), leverage, liquidity (current ratio), and firm size (log of total assets).

In the APP regression, the coefficient on ESG_COMBINED_SCORE is positive (16.88) but statistically insignificant ($p = 0.421$), indicating no clear association between ESG performance and supplier payment behavior. None of the control variables exhibit significance either, and the overall explanatory power of the model is negligible (adjusted $R^2 \approx 0$). This result reinforces the conclusion drawn from the baseline model with the binary ESG variable: firms with higher ESG scores do not appear to expedite payments to suppliers, even when ESG is measured on a continuous scale.

By contrast, the ACP regression yields a positive and statistically significant coefficient for ESG_COMBINED_SCORE (0.276, $p = 0.0076$), suggesting that firms with stronger ESG performance tend to offer more generous credit terms to customers. This finding is consistent with the notion that ESG-oriented firms are more attuned to stakeholder needs, particularly during periods of economic strain, and thus adopt more flexible financial practices

Taken together, these results provide partial support for Hypothesis 1. While no significant relationship is observed between ESG scores and supplier payment timing (APP), the evidence does suggest that high-ESG firms adopt more stakeholder-friendly collection practices (ACP), consistent with a broader commitment to financial responsibility and social equity.

| Variable | APP Coefficient | APP p-value | ACP Coefficient | ACP p-value |
|---|---|---|---|---|
| **ESG_COMBINED_SCORE** | 16.88330 | 0.4210 | 0.27564 | 0.0076 |
| **ROA** | -3933.647 | 0.2250 | -11.34449 | 0.1591 |
| **LEVERAGE** | 3447.421 | 0.1840 | 19.21391 | 0.0006 |
| **CURRENT_RATIO** | 29.18751 | 0.9350 | 0.16455 | 0.8303 |
| **LOG_TOTAL_ASSETS** | -26.79706 | 0.9130 | -1.860371 | 0.0004 |
| **Constant** | -478.5802 | 0.9340 | 74.78402 | 0.0000 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.0021 | –0.00005 | 0.9783 | 0.4295 | 2.0059 |
| **ACP** | 0.0254 | 0.0233 | 12.0788 | 0.0000 | 2.1109 |

***Table 12-*** Results for H1 – Effect of ESG Score as Continuous Variable on APP and ACP

To examine whether the influence of ESG performance on payment behavior is more pronounced during times of crisis, Hypothesis 2 (H2) was tested using a Difference-in-Differences specification with ESG scores treated as a continuous variable. An interaction term (ESG_CRISE_C) was created by multiplying the continuous ESG score (ESG_COMBINED_SCORE) with a crisis dummy (CRISIS), allowing the estimation of differential effects during the COVID-19 period. Two regressions were estimated separately for Average Payment Period (APP) and Average Collection Period (ACP), including control variables for firm financial characteristics.

The coefficient on the interaction term ESG_CRISE_C is negative (–25.31) in the APP model, in line with the hypothesis that ESG-committed firms might shorten their payment periods during crisis periods to support suppliers. However, the result is statistically insignificant ($p = 0.543$), and the main ESG coefficient

(ESG_COMBINED_SCORE) is also insignificant (28.58; p = 0.1721), suggesting no meaningful association between ESG performance and APP in general. The model's adjusted $R^2$ is very low (≈ 0.0006), further underscoring its limited explanatory power.

In contrast, the ACP regression provides stronger support for H2. The coefficient on ESG_COMBINED_SCORE is positive and significant (0.150; p < 0.01), indicating that firms with higher ESG scores generally grant more lenient credit terms. The CRISIS dummy is negative and significant (–12.66; p = 0.0311), showing that during 2020–2022 firms overall shortened collection periods, likely reflecting liquidity pressures. Importantly, the interaction ESG_CRISE_C is positive and significant (2.86; p = 0.0042), suggesting that high-ESG firms offset part of this general tightening by maintaining longer ACPs relative to their peers. These results therefore provide strong support for Hypothesis 2 in the context of ACP when ESG is measured continuously.

| Variable | APP Coefficient | APP p-value | ACP Coefficient | ACP p-value |
|---|---|---|---|---|
| **ESG_COMBINED_SCORE** | 28.57987 | 0.1721 | 0.14993 | 0.0000 |
| **CRISIS** | 948.2087 | 0.7263 | –12.66062 | 0.0311 |
| **ESG_CRISE_C** | –25.31185 | 0.5430 | 2.856541 | 0.0042 |
| **LEVERAGE** | 3449.797 | 0.1721 | 17.34871 | 0.0011 |
| **Constant** | –1494.094 | 0.4059 | 39.44043 | 0.0000 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.0028 | 0.0006 | 1.2970 | 0.2622 | 2.0062 |
| **ACP** | 0.0218 | 0.0201 | 12.9192 | 0.0000 | 2.0874 |

***Table 13-*** Results for H2 - Interaction Between Continuous ESG Score and Crisis Period

### 6.4. Results with Fixed Effects

To control for unobserved heterogeneity across firms and over time, Hypothesis 1 (H1) was re-estimated using a two-way fixed effects panel model. This specification accounts for both time-invariant firm-specific characteristics and period-specific effects, thus allowing for a more robust assessment of the relationship between ESG performance and payment behavior.

In the APP regression, the coefficient for ESG_COMBINED_SCORE is positive (23.61) but statistically insignificant ($p = 0.5152$). This indicates that, after accounting for firm and time fixed effects, there is no significant evidence that firms with higher ESG scores reduce their payment periods to suppliers. The model's adjusted $R^2$ remains relatively low (0.066), and none of the control variables are statistically significant. These findings reinforce the earlier conclusion that ESG performance is not systematically associated with supplier-oriented financial behavior.

Conversely, in the ACP regression, the ESG coefficient remains positive (0.019) but again not statistically significant ($p = 0.5652$). Interestingly, the control variable ROA is statistically significant and negative ($p = 0.0002$), suggesting that more profitable firms tend to enforce stricter collection policies. Despite a high adjusted $R^2$ of 0.8389, reflecting the strength of the fixed effects in capturing firm and time variation, the ESG variable itself does not explain variation in ACP when accounting for those effects.

These fixed-effects results suggest that once firm and time-specific effects are properly controlled for, the relationship between ESG performance and payment behavior weakens or disappears altogether. Thus, the previously observed association between ESG scores and ACP (in simpler models) may reflect cross-sectional differences rather than firm-level changes over time. Overall, these findings do not support Hypothesis 1 under the fixed effects framework.

| Variable | APP Coefficient | APP p-value | ACP Coefficient | ACP p-value |
|---|---|---|---|---|
| **ESG_COMBINED_SCORE** | 23.60606 | 0.5152 | 0.018921 | 0.5652 |
| **ROA** | -5081.607 | 0.2619 | –15.49326 | 0.0002 |
| **LEVERAGE** | -2979.147 | 0.6213 | 1.575759 | 0.7732 |
| **Constant** | -110.3408 | 0.9678 | 52.32854 | 0.0000 |

| Model | R-squared | Adjusted R-squared | F-statistic | Prob(F-statistic) | Durbin-Watson stat |
|---|---|---|---|---|---|
| **APP** | 0.2068 | 0.0662 | 1.4709 | 0.0000 | 1.4653 |
| **ACP** | 0.8631 | 0.8389 | 35.6045 | 0.0000 | 1.3249 |

***Table 14***- Results for H1 - Effect of ESG Score and Fixed Effects on APP and ACP

## 7. Conclusion

This dissertation set out to examine whether firms with stronger ESG performance adopt more socially responsible financial practices in their trade credit management, focusing specifically on the Average Payment Period (APP) and the Average Collection Period (ACP). Using a panel of Euro Stoxx 600 firms over the 2017–2023 period and exploiting the COVID-19 pandemic as an exogenous shock, the study applied a Differences-in-Differences framework complemented by interaction terms and robustness tests.

The results reveal a clear asymmetry in how ESG considerations are reflected in operational financial behavior. Firms with higher ESG scores are more likely to extend credit to their customers, leading to longer ACP, particularly during crisis years. By contrast, there is no consistent evidence that ESG-oriented firms accelerate their payments to suppliers. This divergence suggests that the translation of ESG principles into financial decisions is not uniform across stakeholder groups. Customer-facing leniency may carry stronger reputational payoffs, making it a more visible channel through which ESG commitments are expressed, while supplier-side practices appear more constrained by liquidity management and strategic trade-offs.

The moderating analyses provide further nuance. Firm size significantly conditions the ESG–ACP relationship: larger firms with high ESG ratings are more likely to extend credit to customers, consistent with their greater resources and visibility. Financial health also plays a role, but in a more complex way. While ESG-oriented firms are generally more lenient toward customers, those with higher profitability tend to enforce stricter collection policies, suggesting a balance between benevolence and discipline. This pattern reflects the reality that ESG-driven behavior operates within financial constraints and reputational incentives, rather than replacing them.

Taken together, these findings contribute to the literature in three important ways. First, they provide evidence that ESG principles do shape firms' operational decisions, but in a selective and asymmetric manner. Second, they highlight the conditions, such as firm size and profitability, under which ESG effects are more pronounced or

attenuated. Finally, they raise broader questions about the scope and limits of ESG as a proxy for corporate responsibility, showing that its impact may be more reputationally salient than operationally balanced.

In sum, this dissertation demonstrates that ESG performance is not a guarantee of uniformly responsible financial conduct. Instead, it is a factor that interacts with firm characteristics and external pressures to produce nuanced and sometimes uneven outcomes. This insight calls for a more critical understanding of what ESG ratings capture, and of how firms prioritize among different stakeholders when faced with financial and reputational trade-offs.

## 8. Limitations of the Study and Future Research

Like any empirical study, this dissertation has limitations that should be acknowledged, both to contextualize the findings and to point toward future avenues of research.

First, the analysis relies on ESG ratings from a single provider (Refinitiv). Although widely used in the literature, these scores are subject to well-documented divergences across agencies, reflecting differences in scope, measurement, and weighting. This variability introduces potential measurement error, which may partly explain why supplier-related behaviors such as APP do not emerge as consistently linked to ESG performance. Since current ESG metrics often emphasize environmental disclosures and broad governance structures, more operational dimensions, like payment practices toward suppliers, may be insufficiently captured. Future work could address this limitation by combining multiple ESG datasets or constructing bespoke indicators based on sustainability reports or textual analysis.

Second, the study focuses on a single systemic shock: the COVID-19 pandemic. While this event provided a unique opportunity to test corporate responsibility under stress, its specific features, like supply chain disruptions, liquidity hoarding, and policy interventions, may limit the generalizability of the results. Other types of crises, such as energy price shocks, inflationary episodes, or geopolitical conflicts, may produce different dynamics in trade credit management. Extending the analytical framework to such contexts would help establish whether the patterns observed here are idiosyncratic to COVID-19 or represent broader crisis-related behaviors.

Third, the methodological approach, while robust, carries its own constraints. The Differences-in-Differences design assumes parallel trends between treatment and control groups, an assumption that may not hold perfectly across heterogeneous industries. Although pre-trend analyses were conducted, unobservable sectoral dynamics may still bias estimates. Moreover, the models capture associations at the firm-year level but cannot fully disentangle the underlying managerial motivations behind observed behaviors.

Finally, this dissertation is limited to two financial practices: the Average Payment Period and the Average Collection Period. While these metrics are central to trade credit management, they represent only part of the broader spectrum of stakeholder-oriented financial decisions. Future research could explore additional dimensions, such as supply chain restructuring, sustainability-linked financing, or compensation policies tied to ESG targets, to build a more comprehensive understanding of how ESG principles are operationalized in day-to-day financial conduct.

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