Financing a Sustainable Future: The Diverging Effects of Equity and Credit Market Development on Corporate Social Responsibility

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Abstract

This study investigates the relation between equity and credit market development and Corporate Social Responsibility (CSR) across 61 countries during the period from 2002 to 2022. Using a fixed effects identification strategy based on the seminal work of Rajan and Zingales (1998), we find that industries more dependent on external finance exhibit significantly better (worse) CSR performance in countries with more developed equity (credit) markets. These results suggest that while equity market development can be a catalyst for promoting CSR and ultimately improving environmental and social outcomes in countries around the world, the development of credit markets can discourage CSR investments, especially in industries that are heavily dependent on external finance.

Keywords: Financial development, Equity markets, Credit markets, External finance dependence, Corporate Social Responsibility, CSR, ESG
JEL classification code: Q01, G15, R11, M14

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1. Introduction

More than a decade ago, *The Economist* magazine published a special report documenting that companies around the globe are engaging in environmental, social, and governance (ESG) initiatives and embedding corporate social responsibility (CSR) into their business operations.[3] This is largely in response to broad societal pressure – including from multinational organizations such as the United Nations and the World Bank – to address climate change and various social issues, as well as direct pressure from customers, suppliers, investors, and mandates from capital market regulators and stock exchanges. While there is extensive literature examining the impact of CSR on corporate financial performance and firm value, there is significantly less research on the fundamental drivers of CSR itself. Why do some companies excel in their relative CSR performance and exhibit a high degree of transparency in reporting material ESG data publicly while other companies perform poorly on relative CSR metrics and exhibit insufficient degree of ESG reporting? Our study contributes to answering this fundamental research question by investigating the role of equity and credit market development in promoting CSR around the world.

We focus on the role of financial development as a potential driver of CSR because the services that the financial sector provides – most importantly, overcoming adverse selection and moral hazard problems, and therefore, reducing the cost of external financing – are likely to be critically important for supporting CSR investments, which involve a high degree of information asymmetry and are inherently difficult to value. Additionally, equity and debt holders have an incentive to promote better CSR performance because it can reduce risk (often referred to as the "insurance-like" property of CSR) and improve overall firm performance (Godfrey, Merrill, and Hansen, 2009; Servaes and Tamayo, 2013; Kim, Li, and Li, 2014; Flammer, 2015; Lins, Servaes, and

[3] Special report, "Just good business", *The Economist*, January 19th, 2008. Available at: https://www.economist.com/special-report/2008/01/19/just-good-business

Tamayo, 2017; Albuquerque, Koskinen, and Zhang, 2018). At the same time, however, if we view CSR as an intangible asset similar to innovation, as proposed by Edmans (2023), then the development of equity markets and credit markets may have opposite effects on CSR.[4] Specifically, the fixed-income payoff structure of debt along with the limited value of intangibles as collateral suggest that creditors are unlikely to capture any of the long-term gains associated with CSR, and therefore, may discourage such (often very costly) investments.[5] Equity, on the other hand, has an option like payoff and stock prices reflect the present value of *all* future cash flows. Therefore, equity holders are well positioned to capture the benefits from the long-term value creation associated with CSR. Furthermore, the presence of a valuable information feedback mechanism from stock prices to the actions of firm managers (Bond, Edmans, and Goldstein, 2012) and the fact that shareholder activism provides an important lever for influencing firms' CSR policies (Dimson, Karakaş, and Li, 2015; Dyck, Lins, Roth, and Wagner, 2019) suggest that equity market development as opposed to credit market development is likely to be the main driver of CSR.

It is also possible that both equity market development and credit market development have a negative impact on CSR, and therefore, the overall effect of financial development on CSR is negative. This would be consistent with the view that CSR investments are associated with agency problems, social externalities, and greenwashing, and therefore, detrimental to the interests of equity and debt holders (Lyon and Montgomery, 2015; Masulis and Reza, 2015; Berrone, Fosfuri,

[4] In their study of the relation between financial development and innovation, Hsu et al. (2014) document that the development of equity (credit) markets promotes (discourages) innovation in a sample of 32 developed and emerging market countries.

[5] According to a recent article in Forbes, Fortune 500 companies spend approximately $20 billion per year on CSR: https://www.forbes.com/sites/esade/2022/12/01/the-end-of-csr-as-we-know-it-and-the-rise-of-businesses-with-a-conscience/. Another study by McKinsey & Company documents that even if we focus only on the diversity, equity, and inclusion (DEI) aspect of CSR, companies globally are projected to spend around $15.4 billion dollars on such initiatives by 2026: https://www.mckinsey.com/featured-insights/diversity-and-inclusion/diversity-equity-and-inclusion-lighthouses-2023

and Gelabert, 2017; Chen, Hung, and Wang, 2018; Cheng, Hong, and Shue, 2023). Ultimately, the impact of equity market development, credit market development, and overall financial development on CSR is an empirical question, and providing an answer is one of the main contributions of this study.

One of the main challenges with identifying a causal relation between financial development (or its components) and CSR is the obvious concern about omitted variable bias and reverse causality. This is analogous to the challenges with studies on the relation between financial development and economic growth (King and Levine, 1993; Levine and Zervos, 1998; Rajan and Zingales, 1998; Beck and Levine, 2004). The following quote from Rajan and Zingales (1998) best illustrates the issue: "In the absence of a well-accepted theory of growth, the list of potential omitted variables that financial-sector development might be a proxy for is large, and the explanatory variables to include a matter of conjecture" (1998: 559). This exact same statement applies to CSR because we are nowhere closer to having a well-accepted theory of CSR than of economic growth. We address this critical issue by adopting the identification strategy pioneered by Rajan and Zingales (1998) which is based on the following argument: "…financial development should disproportionately help firms (or industries) typically dependent on external finance for their growth. Such a finding could be the "smoking gun" in the debate about causality" (1998: 560). This identification strategy is also used by Hsu et al. (2014) in their investigation of the relation between financial development and innovation. In the subsequent empirical analysis, we follow Rajan and Zingales (1998) and Hsu et al. (2014) and use country-industry level data to investigate the impact of equity market development, credit market development, and overall financial development on CSR.

Using a panel of 10,561 observations representing 61 countries and 67 industries over the period from 2002 to 2022 we find that industries that are more dependent on external finance exhibit significantly higher (lower) CSR performance in countries with better developed equity (credit) markets. This provides strong "smoking gun" evidence that equity (credit) market development has a positive (negative) causal effect on CSR. Consistent with the diverging effects of equity market development and credit market development on CSR, we find *no* significant relation between overall financial development and CSR.[6]

Our research contributes to several strands of the academic literature. First, we add to the literature that examines the preferences of equity and debt holders towards CSR. Specifically, our finding of a positive effect of equity market development on CSR supports prior studies which document that shareholders usually respond positively to announcements of improvements in firms' CSR (Klassen and McLaughlin, 1996, Flammer, 2013; Krueger, 2015) and with studies which document that firms with better CSR scores exhibit cheaper cost of equity financing (El Ghoul, Guedhami, Kwok, and Mishra, 2011). Our finding of a negative effect of debt market development on CSR is also consistent with prior studies which document that debt holders do not pay a premium for better CSR performance (Goss and Roberts, 2011; Stellner, Klein, and Zwergel, 2015; Larcker and Watts, 2020; Flammer, 2021) and even push firms to reduce CSR activities when their bargaining power increases following debt covenant violations (He, Zhang, and Zhong, 2021).

We also contribute to the vast literature examining the effects of financial market development on economic growth and other key outcomes, such as aggregate investment and innovation (King

[6] Such a "no result" would also be consistent with the view that many CSR investments are mandatory, and therefore, not very dependent on external financing. This view, however, would predict that the individual components of financial development (equity and credit market development) have no effect on CSR, which is opposite to what we find.

and Levine, 1993; Levine and Zervos, 1998; Rajan and Zingales, 1998; Beck, Levine, and Loayza, 2000; Beck and Levine, 2004; Hsu et al., 2014; Wang, 2022). To the best of our knowledge, there are very few prior studies that explicitly investigate the relation between financial market development (or its components) and CSR. One is a theoretical paper by Scholtens (2006) who concludes that: "…further empirical research will have to establish the actual impact of different types of finance on CSR" (2006: 29), which is exactly what we do in the current paper. The other is a cross-country study by Ng et al., (2020) who do not look at CSR specifically but do find a positive relation between financial development and sovereign ESG ratings in several Asian countries. The main limitations of the Ng et al., (2020) paper are that its results may not be applicable to non-Asian countries, it lacks a clean identification strategy, and therefore, is subject to serious endogeneity concerns, and, perhaps most importantly, it does not examine the effect of equity and credit markets separately, a distinction our findings suggest is critically important.

Our study also adds to the rapidly growing literature on the fundamental drivers of CSR.[7] Prior research has identified firm-level factors such as board structure, CEO characteristics, and ownership structure, as well as country-level factors, such as cultural values and economic and institutional development, as potential drivers of CSR (Scholtens, 2006; Scholtens and Sievänen, 2013; Harjoto, Laksmana, and Lee, 2015; Cai, Pan, Statman, 2016; Cronqvist and Yu, 2017; Faller and Knyphausen-Aufseß, 2018; Dyck, Lins, Roth, and Wagner, 2019; Ng, Lye, Chan, Lim, and Lim, 2020, Griffin et al., 2021; Zhao et al., 2022; Bilyay-Erdogan et al., 2023, Döring et al. 2023; Drobetz et al., 2023). Harjoto et al. (2015) find that diversity among board members is associated with better CSR performance, while Cronqvist and Yu (2017) identify the presence of a CEO who has a daughter as another driver of CSR, especially its diversity component. Dyck et al. (2019)

[7] See Gillan et al. (2021) for a detailed review of the relevant literature.

find that institutional ownership is associated with improved environmental and social performance, and that institutional shareholders are motivated by both financial returns and social norms.

Most relevant to our study of the effect of financial market development on CSR is the strand of literature that examines the country-level determinants of CSR and ESG. Scholtens and Sievänen (2013) examine the difference in socially responsible investing (SRI) across the Nordic countries and uncover several factors - economic openness, the size of the pension industry, and cultural values - that are associated with the differences in SRI in these four countries. Cai, Pan, and Statman (2016) document that culture and the level of economic and institutional development are key drivers of CSR. Griffin, Guedhami, Li, and Lu (2021) investigate how national culture affects the environmental and social performance of firms and its value implications. These authors find that individualism is associated with better CSR performance and that the benefits of CSR performance in terms of value creation are higher in more individualistic societies. In section 5 of our study, we build upon this prior literature and explore potential sources of heterogeneity in the effect of financial market development on CSR. We argue that one such moderating factor is national culture. Indeed, our empirical findings indicate that the negative effect of credit market development on CSR is attenuated, and the overall effect of financial market development on CSR is positive in more individualistic societies.

Another important factor is the level of economic development. We find that financial markets are more likely to stimulate investments in CSR in high-income countries, which is consistent with the growing body of literature that documents a positive relation between demand for CSR and wealth, indicating that CSR behaves like a luxury good (Cai et al., 2016; Bansal et al., 2022; Andersen, et al., 2024; Meier et al., 2023). Andersen et al. (2024) provide strong evidence in that

domain by showing that positive shocks to wealth due to inheritance increase the likelihood of socially responsible investing. The authors also find evidence that more affluent investors prioritize socially responsible investments alongside financial returns due to the "warm glow" effect. This suggests that the effect of financial markets on CSR might be driven, at least in part, by non-pecuniary factors – investors could simply have a preference for supporting a good cause and be driven by altruistic motives.

Lastly, our research adds to the extensive literature investigating the intersection between law and finance, and especially to the literature on the various benefits of better investor protection (La Porta, Lopez-de-Silanes, and Shleifer, 2006, Doidge, Karolyi, and Stulz, 2007, Dahya, Dimitrov, and McConnell, 2008, Djankov et al., 2008; John, Litov, and Yeung, 2008). Specific to the CSR domain, Breuer et. al., (2018) find that the cost of equity benefits of CSR are contingent on the level of legal protection of investors. We provide further evidence in support of this by documenting that the negative effect of credit market development on CSR is attenuated, and the overall effect of financial market development on CSR is positive in counties with better investor protection. This finding highlights the importance of assuring investors that the capital they provide to support firms' socially responsible efforts would not be misappropriated or wasted on pet projects.

The remainder of the paper proceeds as follows. In Section 2, we develop the hypotheses being tested in this study. In Section 3, we describe the sample and methodology. Section 4 reports the results from our main specification as well as various robustness tests. Section 5 explores possible sources of heterogeneity in the effect of financial market development on CSR. Section 6 provides concluding remarks.

2. Hypotheses Development

An extensive literature documents the important role of financial development in reducing the cost of external financing, increasing aggregate investment, and promoting overall economic growth (King and Levine, 1993; Levine and Zervos, 1998; Beck, Levine, and Loayza, 2000; Beck and Levine, 2004). The services that the financial markets provide, especially the mitigation of adverse selection and moral hazard problems, are likely to be critically important in the context of CSR investments, which involve a high degree of information asymmetry and are inherently difficult to value. Prior studies also suggest that financial market participants (equity holders and creditors) may have important incentives to promote investments in CSR. Specifically, this would be the case if such investments are associated with reductions in risk and improvements in overall firm performance (Godfrey, Merrill, and Hansen, 2009; Servaes and Tamayo, 2013; Kim, Li, and Li, 2014; Flammer, 2015; Lins, Servaes, and Tamayo, 2017; Albuquerque, Koskinen, and Zhang, 2018). For example, investments in CSR could mitigate litigation risk as well as the likelihood of other adverse events such as environmental scandals, product recalls, or strikes (Waddock and Graves, 1997; Chatterji et al., 2009). CSR performance has also been linked to decreased crash risk (Kim et al., 2014). Furthermore, prior evidence suggests that firms with better CSR performance are able to attract a wider range of investors, contributing to a lower cost of equity and higher firm valuation (Hong and Kacperczyk, 2009; Chava, 2014; Attig et al., 2014). Other stakeholders, such as customers and employees, may also reward firms with better CSR performance, leading to increased future cash flows and firm value (Edmans 2011; Servaes and Tamayo 2013; Schiller 2018; Dai, Liang, and Ng, 2021; Krüger, Metzger, and Wu 2023). Therefore, we hypothesize that financial markets have both the incentives and the capacity to stimulate CSR. We state our first hypothesis as follows:

H1: There is a positive effect of overall financial development and its components (equity market development and credit market development) on CSR.

We also consider the implications of the recent paper by Edmans (2023) who postulates that CSR is an intangible asset critical to long-term value creation and is no different from other intangible assets such as innovation. According to this view, equity holders and debt holders may have diverging preferences for CSR given their different payoff structures and investment horizons.[8] Specifically, the fixed-income payoff structure of debt, along with the limited value of intangibles as collateral, suggest that creditors are unlikely to capture many of the long-term gains associated with CSR, and therefore, may view such investments as a waste of scarce resources and discourage CSR. On the other hand, the option-like payoff to equity and the fact that stock prices reflect all future cash flows imply that shareholders would benefit from CSR investments, even if their payoff is delayed far into the future. Additionally, equity markets differ from credit markets in other important ways which could also contribute to a diverging effect on CSR. First, shareholders, especially institutional investors, can directly influence firm management through shareholder activism and incentivize investments in CSR through such direct interventions (Dimson, Karakaş, and Li, 2015; McCahery, Sautner, and Starks, 2016; Dyck, Lins, Roth, and Wagner, 2019). Second, stock prices provide an important feedback mechanism that can guide managerial decision-making, a feature that is largely missing in credit markets (Bond, Edmans, and Goldstein, 2012). Taken together, these arguments would suggest that equity markets are well positioned to influence the firm's CSR policies and to capture the long-term gains associated with

[8] Hsu, Tian, and Xu (2014) provide empirical evidence for the diverging preferences of equity and debt holders for intangible assets. Using a methodology similar to ours, the authors document that equity (debt) market development promotes (discourages) innovation in a sample of 32 developed and emerging market countries.

such investments while credit markets may see the marginal costs of CSR as exceeding the marginal benefits.

These arguments are further supported by the prior literature on the preferences of equity and debt holders for CSR, which documents that shareholders usually respond positively to announcements of improvements in firms' CSR (Klassen and McLaughlin, 1996; El Ghoul et al., 2011; Flammer, 2013; Krüger, 2015) while debt holders either do not pay a premium for better CSR performance (Goss and Roberts, 2011; Larcker and Watts, 2020; Flammer, 2021) or push firms to reduce CSR activities when their bargaining power increases following debt covenant violations (He, Zhang, and Zhong, 2021). We state our second hypothesis as follows:

H2: Equity (credit) market development has a positive (negative) effect on CSR.

Our final hypothesis is related to the view that CSR investments are associated with agency problems, social externalities, and greenwashing (Lyon and Montgomery, 2015; Masulis and Reza, 2015; Berrone, Fosfuri, and Gelabert, 2017; Chen, Hung, and Wang, 2018; Cheng, Hong, and Shue, 2023). The agency problems view of CSR, for example, suggests that such investments represent a costly diversion of scarce resources (Friedman, 1970) allowing managers to extract private benefits at the expense of company investors and other stakeholders (Baron, 2009; Barnea and Rubin, 2010). If this is the case, and CSR investments are, on average, detrimental to the interests of equity and debt holders, we would expect that financial market development would curb such investments. Therefore, we state our third hypothesis as follows:

H3: There is a negative effect of overall financial development and its components (equity market and credit market development) on CSR.

3. Data and Methodology

3.1. Sample Construction

We start the sample collection process by gathering information on firm-level CSR scores from the LSEG's (formerly Refinitiv) Environmental, Social, and Governance (ESG) database and aggregating it at the industry level for each country each year. The database covers over 85% of the global market capitalization and is available for the period from 2002 to 2022. The LSEG ESG scores are designed to objectively measure the company's ESG performance based on verifiable publicly reported information. More than 600 measures are analyzed and grouped into ten categories that form the three pillar scores of the final ESG score for each firm-year observation. As our goal is to study the effect of equity and credit market development on CSR, we follow prior literature and focus on the Environmental and Social pillars since the Governance pillar is not traditionally part of the firm's CSR efforts (Dyck et al., 2019; Liang and Renneboog, 2017; Lins, Servaes and Tamayo, 2017). Nevertheless, for completeness, we also use the overall ESG score, which captures the governance dimension as well, as an additional metric in all our tests. Our unit of measurement is at the industry-country-year level and we calculate the industry-level ESG scores as the score of the median firm for each two-digit SIC code industry in each country each year.[9]

Next, we collect measures of financial development for each country in our sample from the World Bank's World Development Indicators (WDI) database. Following Hsu et al. (2014), we proxy for the level of equity market development (*Equity*) with the ratio of stock market capitalization to gross domestic product (GDP) and for the level of credit market development (*Credit*) with the ratio of domestic credit to the private sector by banks to GDP.

[9] In unreported results, we estimate all regressions using the average instead of the median value for each ESG score and find that our main conclusions remain unchanged.

Our identification strategy follows closely the seminal work of Rajan and Zingales (1998) and we employ the methodology described within that study to capture each industry's dependence on external financing, defined as the ratio of capital expenditures minus cash flow from operations to capital expenditures.[10] We gather accounting data from Compustat and estimate the financial dependence of each industry based on information from U.S. publicly traded firms. This approach presumes that the industry-level financial dependence derived from U.S. companies can be extrapolated internationally (i.e., that the industry ranking based on U.S. data is constant across countries). Numerous studies have employed this measure since the influential work of Rajan and Zingales (1998) and the merits of its assumptions have been widely accepted in the academic literature (see, for example, Raddatz, 2006; Kroszner et al., 2007; Chor and Manova, 2012; ; Manganelli and Popov, 2013; Manova, 2013; Hsu et al., 2014; Wang, 2022; among others).

[Table 1 goes about here]

After combining data from the different sources, we arrive at a sample of 10,561 observations representing 61 countries and 67 industries over the period from 2002 to 2022.[11] Table 1 presents summary statistics of the main variables employed in this study. The average of the overall ESG score stands at 44.13 with a standard deviation of 18.34, while the Environmental pillar averages at 38.27 with a relatively high standard deviation of 25.51, indicating higher variability. The Social pillar score has an average of 44.55, with a standard deviation of 22.19. The CSR measures are further broken down into *Resource Use, Emissions, and Environmental Product Innovation* scores

[10] The description and exact computation of the main variables used in this study are reported in Table A1 of the Appendix.
[11] We exclude the U.S. from the sample to avoid bias, but our results are robust to its inclusion.

for the environmental aspects, and *Workforce, Human Rights, Community, and Product Responsibility* scores for the social aspects.

The table also reports the summary statistics for the *Equity* and *Credit* measures, which are largely consistent with those reported in prior studies. The proxy for equity market development has an average of 1.14 and a standard deviation of 1.79, while the credit market development indicator is on average 1.02 with a lower level of variability as indicated by a standard deviation of 0.42. The proxy for Financial Dependence is reported both at a pooled level across all observations and at the industry level. At the industry level, the average financial dependence is slightly negative (-0.33) with a standard deviation of 1.63, indicating that the average industry has been dependent on internal financing over the 2002 – 2022 sample period. The variable shows similar summary statistics at the pooled level.

Table 2 presents a country-level breakdown of average CSR metrics and financial market development indicators. The table reveals significant variability in CSR and financial market development metrics across different countries, reflecting the unique economic and regulatory environments across nations.

[Table 2 goes about here]

3.2. Research Design

The causal effect of equity and credit market development on CSR is difficult to establish in a cross-country regression due to potential omitted variable bias and reverse causality concerns. This challenge is not unlike the one described in Rajan and Zingales (1998) who study the effect of financial development on economic growth. In their seminal work, the authors adopt a fixed effects

identification strategy that tests whether better-developed financial markets lead to higher growth in industries that depend more on external financing. Hsu et al. (2014) adapt this methodology to a three-dimensional panel data structure in their analysis of the link between financial development and innovation. Wang (2022) use the same empirical design to uncover the link between capital account liberalization and innovation.

In our study, we apply this generalized difference-in-difference empirical framework to test whether industries that are more dependent on external finance exhibit disproportionately better or worse CSR performance in countries with more developed equity and credit markets. The key argument that this methodology relies on is that equity/credit market development is more important for CSR performance in industries that depend more heavily on external financing.

To examine the overall effect of financial development (which represents the sum of the equity and credit market development proxies) on CSR, we follow the methodology of those prior studies and estimate the following model:

$$ESG\ score_{i,k,t+1} = \mu_i + \delta_{k,t+1} + \beta_{Overall}\left(Financial\ Dependence_i * Overall_{k,t}\right) + \varepsilon_{i,k,t+1} \quad (1)$$

Then, to investigate the possibly divergent effects of equity and credit market development on CSR, we estimate a version of the model that separates the overall financial market development into its two components and include both the *Equity* and *Credit* variables, each interacted with the proxy for financial dependence:

$$ESG\ score_{i,k,t+1} = \mu_i + \delta_{k,t+1} + \beta_{Equity}\left(Financial\ Dependence_i * Equity_{k,t}\right) + \beta_{Credit}\left(Financial\ Dependence_i * Credit_{k,t}\right) + \varepsilon_{i,k,t+1} \quad (2)$$

where *ESG score*$_{i,k,t+1}$ is one of the measures of CSR of industry *i* in country *k* in year *t+1*. *Financial Dependence*$_i$ is the measure of external financing needs of industry *i*.[12] *Equity*$_{k,t}$ (*Credit*$_{k,t}$) measures the equity (credit) market development of country *k* in year *t*. This specification also includes industry fixed effects (μ_i) as well as fixed effects at the country-year level ($\delta_{k,t+1}$) as in Hsu et al. (2014). The main coefficients of interest are those on the interaction terms $\beta_{Overall}$, β_{Equity} and β_{Credit}, as they capture the effects of overall, equity, and credit market development, respectively, on the CSR/ESG scores under the assumption that financial market development is an important determinant of CSR. It is important to note that if investments in CSR, or the proxy that we use to capture them, are largely independent of external financing, then that would introduce a bias against us finding a significant coefficient on any of the interaction terms. For example, if CSR investments are mostly mandatory, or if ESG scores capture factors that are not necessarily contingent on access to capital, then the coefficients on the interaction terms would be biased towards zero. Our empirical framework is, therefore, well positioned to provide an answer to the question of whether and how financial development and its components influence CSR performance in firms around the globe.

As noted by Hsu et al. (2014), an important advantage of using the three-dimensional (industry-country-year) panel is that it allows for the use of interacted fixed effects to control for a wider range of omitted variables. The country-year fixed effects capture any unobserved

[12] In unreported results, we confirm that our main results continue to hold if we convert the measure of dependence on external financing from continuous to binary (i.e. we use an indicator variable, set at 1 for positive dependence and 0 otherwise).

macroeconomic factors that could affect country-specific CSR trends over time, while the industry fixed effects account for time-invariant differences across industries. We cluster standard errors at the country-year level but, in unreported analysis, we confirm that our main conclusions are robust to clustering at the country-industry level as well as allowing for correlations within both country-years and country-industries.

Furthermore, in section 4.2, we perform a series of tests to show that our findings are robust to the use of several alternative specifications. In one of the models, we include both industry-year and country-year fixed effects, similar to the specification that Wang (2022) employ. This ensures that the effect of any time-varying country characteristics (the overall level of economic development, corruption, trade, government policies, etc.) as well as the effect of any factor that varies across industries and/or across time (technological shifts or other shocks that might affect industries differently) is absorbed by the fixed effects and cannot be affecting the dependent variable. The identification of the coefficients in this setting is based on variation across country–industries and over time within country–industries. We also include an extensive set of control variables that vary at the country-industry-year level and show that our main findings continue to hold.[13]

In another robustness test, we employ a model that includes country-industry fixed effects to alleviate the concern that CSR activity is driven not by the level of financial development of each country, but by some unobservable factor that is specific to each industry within each country. For example, Wang (2022), in their model of innovation, control for a measure of the initial

[13] Prior studies that examine the effect of financial development on economic growth and innovation also include the value added of each industry to the manufacturing sector of each country, a variable that varies at the industry-country-year level. This variable is reported by the United Nations Industrial Development Organization (UNIDO) Industrial Statistics Data, which only covers the manufacturing sector. As our goal is to examine the link between financial market development and CSR across a wide range of industries and countries, we do not include this control variable in our model as it is missing for more than 75% of our sample.

innovation potential at the country-industry level, as suggested by Aghion et al. (2015). We show that our main findings are unchanged when we estimate a specification that includes country-industry fixed effects, which would capture any such factors.

While we acknowledge that endogeneity can never be fully eliminated in the absence of a controlled experiment, our empirical design allows for the inclusion of a comprehensive set of fixed effects and interaction terms to mitigate potential sources of bias. Given the inherent limitations of empirical studies that rely on observational data, we believe that our tests effectively address endogeneity concerns while providing meaningful insights into the relation between financial market development and CSR. We discuss the results of our analysis in the following section.

4. Empirical Results

4.1. Main Findings

To examine the impact of equity and credit market development on the firm's CSR scores, we estimate models (1) and (2) and report the coefficients of interest - β_{Equity} , β_{Credit}, and $\beta_{overall}$ - in Table 3. The dependent variables in these specifications are the overall ESG score as reported by Refinitiv (columns 1 and 2), as well as the Environmental and Social pillars (columns 3-4 and 5-6, respectively). The results reported in columns (2), (4), and (6) reveal no effect of the overall level of financial development on CSR. If we were to stop the analysis at this point, we might conclude that financial market development does not influence firms' investments in CSR. This could be true if CSR efforts are largely independent of external financing - for instance, if they are not capital-intensive or are driven primarily by regulatory mandates. However, another possibility is that the two components of financial market development - equity and credit market

development - have diverging effects on CSR, and therefore, largely offset each other. We explore this possibility in columns (1), (3), and (5). Indeed, the specifications that distinguish between the equity and credit components of financial market development provide further insight into this result and uncover a divergent pattern of the effects of equity and credit market development on CSR. Specifically, equity market development is associated with improved environmental and social scores as well as higher overall ESG scores in industries that are more dependent on external financing. On the other hand, we report a negative effect of credit market development on the three different CSR measures in such industries. These findings provide support for Hypothesis 2 and are consistent with the view that financial markets see CSR as an intangible asset similar to innovation, and that for equity holders the marginal benefits of CSR outweigh the marginal costs while for creditors the marginal costs of CSR largely exceed any associated benefits.

[Table 3 goes about here]

Next, we decompose the Environmental and Social pillars into their individual components to investigate whether the reported results are driven by any specific category. We present the resulting coefficients in Panels A and B of Table 4. We find that the effects of equity and credit market development across the different components of the Environmental and Social pillars are largely consistent with the results reported in Table 3. We also find that the overall level of financial development has no significant effect on any of the individual measures with the exception of the *Community* score, where the positive effect of equity market development appears to outweigh the negative effect of credit market development.

[Table 4 goes about here]

4.2. Robustness Tests

We perform several tests to establish the robustness of our main findings and report the results in Table 5.[14] First, we ensure that highly regulated industries are not driving our findings by dropping from the sample the financial sector (two-digit SIC codes between 60 and 69) and utilities (two-digit SIC code of 49). This reduces the sample size to 8,722 observations. The results, which are reported in Panel A of Table 5, demonstrate that the impact of equity and credit market development on CSR are not merely a consequence of regulatory influences.

Second, we test whether our results are sensitive to the proxies for financial development used in the empirical analysis. We replace the original measure of equity market development with the total value of shares traded and we replace the proxy for credit market development with domestic credit to the private sector, both scaled by GDP (Hsu et al., 2014). Panel B of Table 5 documents that our main results remain qualitatively unchanged with these alternative proxies for equity and credit market development.

Third, we replace the country-year and industry fixed effects in models (1) and (2) with fixed effects for each country-industry pair ($\gamma_{i,k}$) as well as year fixed effects (d_{t+1}) to capture any common time trends in CSR investments:[15]

$$ESG\ score_{i,k,t+1} = \gamma_{i,k} + d_{t+1} + \beta_{Overall}\left(Financial\ Dependence_i * Overall_{k,t}\right) + \varepsilon_{i,k,t+1} \quad (3)$$

[14] For brevity, we do not report the results where the individual components of the Environmental and Social pillars are used as dependent variables, but we confirm that our main findings continue to hold in those specifications.

[15] Note that the country-year fixed effects that we include in all other specifications would capture the year fixed effects, which is why we do not account for time trends except for in this specific case.

$$ESG\ score_{i,k,t+1} = \gamma_{i,k} + d_{t+1} + \beta_{Equity}\left(Financial\ Dependence_i * Equity_{k,t}\right) + \beta_{Credit}\left(Financial\ Dependence_i * Credit_{k,t}\right) + \varepsilon_{i,k,t+1} \quad (4)$$

The coefficients derived from estimating models (3) and (4) with the overall *ESG score* as well as with the *Environmental* and *Social* pillars as dependent variables are reported in Panel C of Table 5. In these specifications, the identifying variation is only within each industry in a country and any time-invariant factors that are specific to a country-industry pair are absorbed by the fixed effects and cannot be biasing the coefficients.

Fourth, we replace the industry dummies in models (1) and (2) with industry-year dummies ($\theta_{i,t+1}$):

$$ESG\ score_{i,k,t+1} = \theta_{i,t+1} + \delta_{k,t+1} + \beta_{Overall}\left(Financial\ Dependence_i * Overall_{k,t}\right) + \varepsilon_{i,k,t+1} \quad (5)$$

$$ESG\ score_{i,k,t+1} = \theta_{i,t+1} + \delta_{k,t+1} + \beta_{Equity}\left(Financial\ Dependence_i * Equity_{k,t}\right) + \beta_{Credit}\left(Financial\ Dependence_i * Credit_{k,t}\right) + \varepsilon_{i,k,t+1} \quad (6)$$

These specifications allow us to capture any industry-specific trends in CSR over time in addition to any within-country trends. In other words, any time-varying country characteristics and any time-varying industry characteristics will be accounted for with the inclusion of both country–year and industry–year fixed effects. The results of estimating models (5) and (6) are reported in Panel D of Table 5 and again show that our main conclusions remain unchanged.

Lastly, we augment models (5) and (6) with additional interactions of country-level controls and the industry-level financial dependence variable to account for any potential correlations between country-level characteristics and financial market development across industries with different levels of dependence on external financing. It is important to note that any country-level factor could only cause potential endogeneity concerns if it has a differential effect on the ESG scores of financially constrained and unconstrained firms and if it is also correlated with the financial development indicators that we include in the regression. This specification is consistent with Wang (2022), who uses a similar fixed effects identification strategy to examine the relation between capital market liberalization and innovation. We interact the *Financial Dependence* variable with an extensive set of characteristics that prior studies have identified as possible determinants of CSR performance (Griffin et al., 2021; Wang, 2022; Bilyay-Erdogan et al., 2023). Wang (2022) includes as interaction terms the capital account liberalization index (*LIB*) developed by Chinn and Ito (2006), the natural log of GDP per capita (*GDP),* government spending as a fraction of GDP (*GOV_exp*), exports and imports as a fraction of GDP (*Trade*), and the human capital index collected from the Penn World Tables (*HCI*). We further augment the regression by accounting for the potential effects of national culture using Hofstede's measure of individualism (*IND*), which Griffin et al. (2021) find is an important determinant of CSR performance. This specification also includes proxies for corruption (*CORR*), legal origin (*Legal*), government effectiveness (*GOV_eff*), inflation (*Inflation*), and the growth rate in GDP per capita (*GDP_gr*). Overall, the results from all the robustness tests reported in Table 5 support our main finding of a positive (negative) impact of equity (credit) market development on CSR. Furthermore, most of the coefficients on the interaction terms of interest across all panels are similar in size and significance to those derived from our main specification reported in Table 3.

[Table 5 goes about here]

5. Sources of heterogeneity in the effect of financial market development on CSR

To gain a better understanding of the behavioral and economic factors that drive the impact of financial market development on CSR, we conduct additional analysis, examining several possible sources of heterogeneity in the main effects reported in the previous section. While the benefits of financial development for economic growth have been well documented in the literature, our findings suggest that, due to the diverging effects of equity and credit market development on CSR, the overall effect of financial development on the environmentally and socially responsible investment practices of firms over the past two decades has been largely neutral. In this section, we ask whether certain factors could lead to a heterogeneous effect of overall financial market development on CSR by, for example, mitigating the negative effect of credit market development and/or amplifying the positive effect of equity market development on CSR. We examine three such factors - economic development, national culture, and the level of investor protection.

Wang (2020) finds that high-income countries are better positioned to capture the benefits of capital market liberalization and to stimulate innovation. We posit that financial market development may have a differential effect on CSR in developed and emerging market countries. The regulatory and institutional environment in high-income countries could encourage CSR through more transparent and efficient capital markets as well as higher ESG reporting standards. In contrast, weak regulatory institutions and the lack of mandatory disclosure requirements in low-income countries may not incentivize CSR practices to the same extent. Furthermore, a growing body of literature suggests that responsible investing behaves like a luxury good, exhibiting high-

income elasticity of demand (Bansal et al., 2022; Meier et al., 2023; Andersen, et al., 2024). This implies that affluent investors are more inclined to prioritize socially responsible investments alongside financial returns, providing firms in developed countries with strong incentives to invest in CSR in order to meet these investor preferences. In contrast, less affluent investors will have less of a preference for long-term sustainability as firms in low-income economies are often focused on survival and immediate profitability.

The second factor that could cause heterogeneity in the effect of financial market development on CSR is national culture. Griffin et al. (2021) document that the positive impact of environmental and social performance on firm value is stronger in more individualistic societies, which place a greater emphasis on independence, equality, and transparency. In these societies, CSR may be viewed as a strategic investment that generates long-term benefits, such as building brand and employee loyalty, accessing socially responsible investors, and meeting consumer demand for ethical business practices. Aligning with these broader societal expectations, investors in individualistic societies would exhibit a preference for better CSR performance for both pecuniary and non-pecuniary reasons and thus would create incentives for firms to invest in CSR. In collectivistic cultures, where social harmony and in-group relationships are more valued, there may be less public or investor pressure on firms to pursue CSR, and therefore, the deepening of the financial markets may not incentivize improvements in CSR.

The third factor that we consider is the level of investor protection. In countries with stronger investor protection, financial markets may be more supportive of long-term investments, including CSR initiatives. When investors are confident that their rights are protected, they will be less focused on short-term returns and more willing to supply capital to firms engaging in CSR, which often requires longer time horizons to generate financial returns. This contrasts with weaker

investor protection regimes, where financial markets may pressure firms to prioritize short-term over long-term investments (La Porta et al., 2000). Furthermore, if agency problems are not mitigated, managers might pursue value-reducing CSR activities (Masulis and Reza 2015, Cheng, Hong, and Shue 2023). In countries with stronger alignment between the interests of managers, owners, and creditors, investors have greater assurance that managers will not engage in self-serving behaviors, enabling them to allocate more resources toward value-increasing CSR investments without concerns of capital being diverted or wasted. In weaker investor protection environments, investors may view CSR as an unnecessary expense, fearing that management may misuse such investments, thus limiting capital access for CSR.

To test these predicted effects, we introduce a triple interaction term to the specifications reported in Panel E of Table 5. Specifically, we estimate the following models:

$$
\begin{aligned}
ESG\ score_{i,k,t+1} &= \theta_{i,t+1} + \delta_{k,t+1} + \beta_{triple}\left(Dummy_{k,t} * Financial\ Dependence_i * Overall_{k,t}\right) \\
&+ \beta_{Overall}\left(Financial\ Dependence_i * Overall_{k,t}\right) \\
&+ \beta_{dummy}\left(Financial\ Dependence_i * Dummy_{k,t}\right) \\
&+ \beta_k\left(Financial\ Dependence_i * X_{k,t}\right) + \varepsilon_{i,k,t+1}
\end{aligned}
\tag{7}
$$

$$
\begin{aligned}
ESG\ score_{i,k,t+1} &= \theta_{i,t+1} + \delta_{k,t+1} \\
&+ \beta_{tripleEquity}\left(Dummy_{k,t} * Financial\ Dependence_i * Equity_{k,t}\right) \\
&+ \beta_{tripleCredit}\left(Dummy_{k,t} * Financial\ Dependence_i * Credit_{k,t}\right) \\
&+ \beta_{Equity}\left(Financial\ Dependence_i * Equity_{k,t}\right) \\
&+ \beta_{Credit}\left(Financial\ Dependence_i * Credit_{k,t}\right) \\
&+ \beta_{dummy}\left(Financial\ Dependence_i * Dummy_{k,t}\right) \\
&+ \beta_k\left(Financial\ Dependence_i * X_{k,t}\right) + \varepsilon_{i,k,t+1}
\end{aligned}
\tag{8}
$$

where *Dummy* is an indicator variable that captures each of the three factors discussed above. We report the results of estimating the two models with the overall ESG score as a dependent variable in Table 6.[16] In columns (1) and (3), the indicator variable *Income* is equal to 1 for high income countries, which are those with GDP per capital above a certain threshold, defined by the World Bank. In columns (2) and (4), *IND* indicates highly individualistic societies, defined as those with individualism score higher than the median value. In columns (3) and (6), *Anti-Dir* identifies countries with investor protection above the median value, proxied for with the Revised Anti Director Index of Djankov et al. (2008). All specifications also control for the full set of interaction terms used in Panel E of Table 5 as well as industry-year and country-year fixed effects.

The estimates presented in columns (1) – (3) show that the effect of financial development on CSR is not uniform across countries. As predicted, we find that the overall effect of financial development on CSR is positive in high-income economies, in more individualistic societies, and

[16] We also estimate the models with the Environmental and Social pillars of the ESG score as dependent variables and confirm that the results are qualitative the same. We do not report those results for brevity.

in countries with better investor protection. This effect could manifest itself through a significantly enhanced positive impact of equity markets or by reducing the negative effect of credit markets on CSR, or both. In columns (4) – (6) of Table 6, we find that, while equity markets tend to stimulate CSR across the board, credit markets exhibit a heterogeneous effect on CSR. Specifically, we find that the negative effect of credit market development on CSR is mitigated in countries where we expect investors to have a stronger preference for CSR (i.e. in high-income economies, in more individualistic societies, and in countries with better investor protection), supporting our predictions.

[Table 6 goes about here]

6. Conclusion

Prior literature offers convincing evidence that financial development has been instrumental in promoting overall economic growth and technological innovation. The financial sector has also been called upon to help address some of the world's biggest environmental and social challenges.[17] In this study, we investigate the extent to which financial market development and its components, equity market development and credit market development, have been instrumental in advancing the environmental and social initiatives of corporations around the world.

Using a fixed effects identification strategy based on the seminal work of Rajan and Zingales (1998), we find that industries that are more dependent on external finance exhibit significantly

[17] See the recent report by the United Nations Task Force on Digital Financing of the Sustainable Development Goals (SDGs) available here.

better (worse) CSR performance in countries with more developed equity (credit) markets. This suggests that while equity markets play a critical role in promoting CSR, credit markets may discourage companies' environmental and social initiatives, especially in industries that are heavily dependent on external finance. These results are consistent with the view that CSR is an intangible asset similar to innovation (Edmans, 2023), and with the empirical findings in Hsu, Tian, and Xu (2014) who document that equity (debt) market development promotes (discourages) investment in such assets.

An important implication of our study for governments and regulators is that policies that encourage the expansion of equity markets, such as stock market liberalization, are likely to lead not only to improved economic growth (Bekaert, Harvey, and Lundblad, 2005; Moshirian, 2008) but also to improved environmental and social outcomes. Our finding that stock market development promotes CSR contributes to the evidence from prior studies that shareholders stand to benefit from improvements in firms' CSR. As described in the business ethics literature, these benefits do not have to be limited to financial gains but can also be related to non-pecuniary considerations (Brown and Forster, 2013). This is also consistent with Fama and French's (2007) taste-based framework of asset prices and Edmans' (2023) description of the positive social externalities associated with CSR. Additional evidence from Riedl and Smeets (2017) suggests that investors in socially responsible mutual funds are largely motivated by a desire to invest in accordance with their social preferences as opposed to by purely financial motives. Dyck, Lins, Roth, and Wagner (2019) also document that institutional investors who push for improvements in CSR are motivated by both financial and social reasons. Our findings further highlight how ethical considerations, beyond purely financial motives, could incentivize socially responsible investments in the corporate world.

The negative effect of credit market development on CSR that we document, as well as our findings on the factors that mitigate this negative effect, also have profound implications for businesses and policy makers. As the level of investor protection is one such factor, national governments and regulators should increase their efforts in promoting better investor protection which would, at least in part, offset the reluctance of creditors to support CSR. Furthermore, companies that want to pursue investments in CSR can garner investor support if they put stronger corporate governance mechanisms in place, especially if they plan to finance such investments with debt. Given the fact that in many countries credit markets are even more important than equity markets as a source of external finance, our findings suggest that improving investor protection at the firm and country level could be critically important for incentivizing businesses to pursue socially responsible investments. Additionally, policy makers in such countries should emphasize collaboration between the private and public sector to stimulate CSR.

Our study also offers practical insights for international development efforts led by organizations such as the World Bank and the United Nations, which aim at improving economic growth and financial market development in low-income countries. Such initiatives should prioritize the growth of equity markets which can contribute to addressing local and global environmental and social challenges.

For market participants interested in responsible investing, our research can inform capital allocation decisions. Investors can allocate funds to regions where financial market development aligns with CSR initiatives or advocate for policy changes that promote sustainable practices in countries where this is not the case.

Multinational firms operating globally can use our study's findings to tailor their CSR strategies based on the financial market development and specific characteristics of each region.

For instance, if they rely heavily on credit markets, they may prioritize CSR initiatives in more individualistic societies or high-income countries, while pursuing different sustainability approaches in countries where credit markets tend to discourage such efforts.

By recognizing the diverging effects of different financial market structures, as well as the factors that moderate these effects, regulators, business leaders, international organizations, and other market participants can better design strategies that harness the full potential of financial markets to advance both economic and social goals.

Limitations and Future Research

While our study provides valuable insights into the role of financial market development as a determinant of CSR, it is not without limitations. First, the identification strategy, while grounded in the established literature, cannot fully eliminate endogeneity concerns. Although we employ a rigorous fixed-effects approach and include a range of robustness checks, the possibility of omitted variables or reverse causality remains. In the absence of a natural experiment, eliminating endogeneity concerns is inherently challenging.

Second, our reliance on ESG scores from the LSEG database is a potential limitation, as CSR ratings can vary across data providers. While LSEG provides comprehensive coverage, using a single source may limit the generalizability of our findings. Future work can validate our results by examining ESG ratings from different data providers.

Finally, while our study covers a broad sample of countries and documents several economic and institutional factors that impact the role of financial market development on CSR, there could be other factors that future research could explore. Building on our findings, researchers could examine additional regional and institutional differences to better understand how financial market

development (and its components) shapes CSR practices in different contexts and offer further insight into the policies that could promote corporate sustainability.

Appendix

Table A1. Variable Descriptions

Variable:	Source:	Description:
CSR measures:		
ESG score	LSEG's (formerly Refinitiv) Environmental, Social and Governance (ESG) database	Weighted average of: environmental pillar score + social pillar score + governance pillar score
Environmental		Weighted average of: resource use score + emissions reduction score + environmental product innovation score
Social		Weighted average of: workforce score + human rights score + community score + product responsibility score
Financial Development measures:		
Equity	The World Bank	Market capitalization of listed domestic companies (% of GDP).
Credit		Domestic credit to private sector by banks (% of GDP).
Overall		The sum of *Equity* and *Credit*
Financial Dependence	Compustat North America	The ratio of capital expenditures minus cash flow from operations to capital expenditures for the median firm by industry. Cash flow from operations is the sum of total funds from operations plus increases in accounts payable, decreases in receivables, and decreases in inventories. The measure is computed for each firm over the 2002- 2022 sample period and the median value by 2-digit SIC code is the industry-level measure of external financial dependence.

Variable:	Source:	Description:
Additional Control Variables:		
IND	Hofstede (1980, 2001,2011)	Individualism
CORR	The World Bank	Control of corruption
Legal	La Porta et al. (2008)	Legal origin indicator – equals 1 if the legal origin is classified as common law and zero otherwise
GOV_eff	The World Bank	Government effectiveness
GOV_exp	The World Bank	Government spending as a fraction of GDP
LIB	Chinn and Ito (2006)	Capital account liberalization index
Trade	The World Bank	Exports and imports as a fraction of GDP
HCI	Penn World Tables	Human capital index
GDP	The World Bank	The logarithm of GDP per capita
GDP_gr	The World Bank	Annual percentage growth rate of GDP per capita based on constant local currency
Inflation	The World Bank	Inflation, consumer prices (annual %)

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Table 1. Summary statistics

The table reports summary statistics, including means, standard deviations, and selected percentiles, of the CSR measures as well as the Equity and Credit market development measures across all country-industry-year observations. The last two rows contain the summary statistics of the proxy for financial dependence at the pooled level and at the industry level, respectively. The sample covers the period from 2002 to 2022 and includes 67 industries across 61 countries. Industry is defined by the two-digit standard industry classification (SIC) codes. Variable definitions are provided in the Appendix (Table A1).

	Obs	Average	Standard Deviation	25th Percentile	50th Percentile	75th Percentile
ESG score	10,561	44.13	18.34	30.25	43.78	57.40
Environmental	10,561	38.27	25.51	16.93	37.55	58.48
E: Resource Use Score	10,561	41.64	29.76	14.36	42.01	66.25
E: Emissions Score	10,561	42.53	30.63	14.00	42.38	68.18
E: Env. Product Innovation Score	10,561	20.50	27.08	0.00	0.00	38.07
Social	10,561	44.55	22.19	27.41	43.57	60.86
S: Workforce Score	10,561	57.99	26.15	39.36	60.90	79.51
S: Human Rights Score	10,561	27.07	31.00	0.00	13.81	50.00
S: Community Score	10,561	47.31	26.76	24.56	46.50	68.75
S: Product Responsibility Score	10,561	41.94	30.01	16.18	40.93	67.02
Equity	10,561	1.14	1.79	0.47	0.76	1.10
Credit	10,561	1.02	0.42	0.66	1.01	1.29
Financial Dependence	10,561	-0.25	1.65	-0.47	-0.10	0.18
Financial Dependence (industry-level)	67	-0.33	1.63	-0.84	-0.22	0.22

Table 2. Summary statistics by country

The table reports country-level averages of the CSR proxies (*ESG score*, *Environmental*, and *Social*) as well as the two measures of financial market development (*Equity* and *Credit*) used in the main analysis. Columns (1), (2), and (3) contain pooled averages of the CSR measures, while columns (4) and (5) represent the time series averages of the financial development proxies. The sample covers the period from 2002 to 2022 and includes 67 industries across 61 countries. Industry is defined by the two-digit standard industry classification (SIC) codes. Variable definitions are provided in the Appendix (Table A1).

	1	2	3	4	5
	ESG score	**Environmental**	**Social**	**Equity**	**Credit**
United Arab Emirates	33.02	21.07	28.81	0.58	0.74
Argentina	32.76	20.39	32.36	0.11	0.13
Australia	36.33	21.24	35.50	1.06	1.30
Austria	47.56	44.75	48.60	0.31	0.91
Belgium	42.03	40.50	39.95	0.67	0.64
Bahrain	24.05	12.77	14.51	0.64	0.74
Brazil	48.19	41.06	51.73	0.51	0.62
Canada	39.21	26.04	40.94	1.22	1.23
Switzerland	41.92	40.41	42.41	2.17	1.56
Chile	40.39	33.03	40.71	0.94	0.80
China	29.32	21.01	22.47	0.61	1.55
Colombia	55.44	49.98	59.65	0.45	0.45
Cyprus	52.59	57.22	62.96	0.17	1.77
Czechia	46.96	43.60	49.96	0.15	0.49
Germany	49.02	44.24	53.21	0.47	0.88
Denmark	23.61	9.37	19.49	0.53	1.69
Egypt	23.75	19.17	16.46	0.20	0.28
Spain	57.16	58.21	63.84	0.75	1.28
Finland	40.00	33.76	35.47	0.11	0.88
France	57.30	61.73	60.97	0.79	0.98
United Kingdom	44.43	39.76	45.08	1.16	1.48
Greece	40.18	31.18	40.50	0.35	0.87
Hong Kong	44.54	37.81	42.15	10.84	2.04
Hungary	68.71	70.91	73.54	0.17	0.43
Indonesia	43.31	32.66	50.09	0.45	0.31
India	49.29	42.37	54.06	0.85	0.51
Ireland	43.15	34.61	41.94	0.45	0.80
Israel	31.95	16.12	32.24	0.66	0.67
Italy	49.41	39.65	51.55	0.33	0.80
Japan	40.91	40.26	34.39	0.89	1.03
Kazakhstan	58.04	77.71	64.61	0.24	0.22
Kenya	49.83	45.69	51.32	0.23	0.33
South Korea	47.64	46.69	45.34	0.91	1.43
Kuwait	28.95	17.35	26.44	0.90	0.95
Luxembourg	43.68	35.49	44.24	1.05	0.98

Morocco	31.18	17.49	28.78	0.52	0.62
Mexico	45.75	41.28	46.30	0.35	0.24
Malta	28.70	18.08	31.26	0.33	0.75
Mauritius	46.55	47.43	53.39	0.65	0.87
Malaysia	43.56	33.73	46.39	1.31	1.19
Nigeria	61.70	42.21	63.74	0.13	0.12
Netherlands	53.58	50.46	60.01	0.89	1.09
Norway	52.14	49.83	53.46	0.59	1.13
New Zealand	39.18	27.13	37.48	0.43	1.40
Oman	18.08	3.16	10.39	0.31	0.60
Panama	36.82	23.75	37.89	0.27	0.77
Peru	40.56	26.43	43.67	0.44	0.45
Philippines	37.28	33.85	37.36	0.76	0.42
Papua New Guinea	33.03	21.28	35.28	0.44	0.17
Poland	38.81	33.25	37.23	0.31	0.51
Portugal	54.39	52.73	59.37	0.34	1.24
Qatar	20.13	6.51	13.87	0.96	0.97
Romania	61.34	49.88	67.41	0.10	0.26
Russian Federation	37.11	35.60	33.32	0.41	0.50
Saudi Arabia	24.97	13.72	17.83	1.51	0.46
Singapore	37.61	28.72	36.10	2.19	1.10
Sweden	35.03	21.37	34.12	0.77	1.22
Thailand	51.06	42.76	57.18	0.98	1.15
Türkiye	50.19	45.80	52.59	0.26	0.58
Viet Nam	22.62	12.73	16.45	0.52	1.21
South Africa	48.78	40.01	51.50	2.47	0.61

Table 3. ESG scores and financial development

The table presents coefficients of panel regressions (at the industry-country-year level) of ESG scores on interaction terms between the level of financial dependence ($Fin\ Dep_i$) and proxies for financial development ($Equity_{k,t}$, $Credit_{,t}$, and $Overall_{,t}$). The dependent variables are the overall *ESG Score* and the *Environmental* and *Social* pillars. The sample covers the period from 2002 to 2022 and includes 67 industries across 61 countries. Industry is defined by the two-digit standard industry classification (SIC) codes. Variable definitions are provided in the Appendix (Table A1). All specifications include industry fixed effects as well as country-year fixed effects. The standard errors used to compute t-statistics (the latter reported in brackets) are robust to heteroskedasticity and clustering at the country-year level. Coefficient estimates significantly different from zero at the 10%, 5%, and 1% level are identified with *, **, and ***, respectively.

	1	2	3	4	5	6
	ESG Score	**ESG Score**	**Environmental**	**Environmental**	**Social**	**Social**
Fin Dep$_i$ * Equity$_{k,t}$	0.218**		0.355***		0.306***	
	[2.48]		[4.50]		[3.39]	
Fin Dep$_i$ * Credit$_{k,t}$	-1.360*		-2.387***		-1.687**	
	[-1.91]		[-3.62]		[-2.29]	
Fin Dep$_i$ * Overall$_{k,t}$		0.022		0.015		0.059
		[0.37]		[0.16]		[0.81]
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,561	10,561	10,561	10,561	10,561	10,561
Adj. R-sq	33.60%	33.40%	40.40%	40.00%	40.20%	40.00%

Table 4. Environmental and Social component scores and financial development

The table presents coefficients of panel regressions (at the industry-country-year level) of ESG scores on interaction terms between the level of financial dependence ($Fin\ Dep_i$) and proxies for financial development ($Equity_{k,t}$, $Credit_{,t}$, and $Overall_{,t}$) . In Panel A, the dependent variables are the overall *ESG Score* and the *Environmental* and *Social* pillars. In Panels B and C, the dependent variables are the three components comprising the *Environmental* pillar (resource use score, emissions reduction score, and environmental product innovation score) as well as the four components of the *Social* pillar (workforce score, human rights score, community score, and product responsibility score), respectively. The sample covers the period from 2002 to 2022 and includes 67 industries across 61 countries. Industry is defined by the two-digit standard industry classification (SIC) codes. Variable definitions are provided in the Appendix (Table A1). All specifications include industry fixed effects as well as country-year fixed effects. The standard errors used to compute t-statistics (the latter reported in brackets) are robust to heteroskedasticity and clustering at the country-year level. Coefficient estimates significantly different from zero at the 10%, 5%, and 1% level are identified with *, **, and ***, respectively.

Panel A. Environmental components and financial development

	1	2	3	4	5	6
	Resource Use Score	**Resource Use Score**	**Emissions Score**	**Emissions Score**	**Env. Product Innovation Score**	**Env. Product Innovation Score**
Fin Dep$_i$ * Equity$_{k,t}$	0.376***		0.182**		-0.062	
	[4.59]		[2.03]		[-0.66]	
Fin Dep$_i$ * Credit$_{k,t}$	-2.625***		-2.243***		-0.174	
	[-3.69]		[-2.75]		[-0.22]	
Fin Dep$_i$ * Overall$_{k,t}$		0.004		-0.118		-0.076
		[0.04]		[-1.30]		[-1.41]
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,561	10,561	10,561	10,561	10,561	10,561
Adj. R-sq	36.80%	36.50%	39.00%	38.80%	33.40%	33.40%

Panel B. Social components and financial development

	1	2	3	4	5	6	7	8
	Workforce Score	**Workforce Score**	**Human Rights Score**	**Human Rights Score**	**Community Score**	**Community Score**	**Product Responsibility Score**	**Product Responsibility Score**
Fin Dep$_i$ * Equity$_{k,t}$	0.312***		0.261**		0.446***		0.011	
	[3.09]		[2.41]		[3.77]		[0.08]	
Fin Dep$_i$ * Credit$_{k,t}$	-1.705*		-2.072**		-1.231		-1.011	
	[-1.95]		[-2.16]		[-1.34]		[-1.02]	
Fin Dep$_i$ * Overall$_{k,t}$		0.062		-0.028		0.238***		-0.116
		[0.88]		[-0.35]		[3.32]		[-1.54]
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,561	10,561	10,561	10,561	10,561	10,561	10,561	10,561
Adjusted R-sq	38.70%	38.50%	39.60%	39.40%	29.40%	29.30%	32.40%	32.40%

Table 5. Robustness Tests

The table presents robustness checks for our main results, as presented in Table 2. In Panel A, we report the coefficients of estimating the panel regressions in a subsample that excludes heavily regulated financial industries (two-digit SIC code between 60 and 69) as well as utilities (two-digit SIC code of 49). In Panel B, we use alternative proxies for financial development. Specifically, we replace the proxy for *Equity* with the total value of shares traded scaled by GDP and the proxy for *Credit* with domestic credit to private sector scaled by GDP. Both variables are sourced from the World Bank. In Panel C, we estimate the model with country-industry fixed effects. In Panel D, we replace the industry dummies with industry-year dummies. In panel E, we augment the specification from Panel D with interaction terms between various country-level controls and the industry level measure of financial dependence. The dependent variables are the overall *ESG Score* and the *Environmental* and *Social* pillars. The sample covers the period from 2002 to 2022 and includes 67 industries across 61 countries (except in Panel A). Industry is defined by the two-digit standard industry classification (SIC) codes. Variable definitions are provided in the Appendix (Table A1). The standard errors used to compute t-statistics (the latter reported in brackets) are robust to heteroskedasticity and clustering at the country-year level. Coefficient estimates significantly different from zero at the 10%, 5%, and 1% level are identified with *, **, and ***, respectively.

Panel A. Removing regulated industries

	1	2	3	4	5	6
	ESG Score	**ESG Score**	**Environmental**	**Environmental**	**Social**	**Social**
$Fin\ Dep_i * Equity_{k,t}$	0.292**		0.349***		0.340**	
	[2.45]		[3.01]		[2.39]	
$Fin\ Dep_i * Credit_{k,t}$	-2.824**		-3.068*		-3.875***	
	[-2.36]		[-1.90]		[-2.79]	
$Fin\ Dep_i * Overall_{k,t}$		-0.046		-0.022		-0.117
		[-0.29]		[-0.15]		[-0.54]
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,722	8,722	8,722	8,722	8,722	8,722
Adj. R-sq	33.00%	32.60%	39.50%	39.20%	39.90%	39.60%

Panel B. Alternative measures of equity and credit market development						
	1	**2**	**3**	**4**	**5**	**6**
	ESG Score	**ESG Score**	**Environmental**	**Environmental**	**Social**	**Social**
Fin Dep$_i$ * Equity$_{k,t}$	0.346***		0.426***		0.439***	
	[3.39]		[3.56]		[3.91]	
Fin Dep$_i$ * Credit$_{k,t}$	-1.439***		-2.021***		-1.713***	
	[-4.97]		[-6.47]		[-5.33]	
Fin Dep$_i$ * Overall$_{k,t}$		-0.108		-0.197**		-0.109
		[-1.57]		[-2.10]		[-1.28]
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,137	10,137	10,137	10,137	10,137	10,137
Adj. R-sq	33.00%	32.70%	39.50%	39.30%	39.30%	39.10%

Panel C. Country-industry fixed effects						
	1	**2**	**3**	**4**	**5**	**6**
	ESG Score	**ESG Score**	**Environmental**	**Environmental**	**Social**	**Social**
Fin Dep$_i$ * Equity$_{k,t}$	0.270**		0.262**		0.329***	
	[2.37]		[2.27]		[3.19]	
Fin Dep$_i$ * Credit$_{k,t}$	-1.592***		-1.069		-2.513***	
	[-3.01]		[-1.38]		[-3.86]	
Fin Dep$_i$ * Overall$_{k,t}$		0.068		0.118		0.02
		[0.72]		[1.19]		[0.23]
Country-Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,561	10,561	10,561	10,561	10,561	10,561
Adj. R-sq	75.30%	75.30%	74.70%	74.70%	74.70%	74.60%

Panel D. Country-Year and Industry-Year fixed effects						
	1	**2**	**3**	**4**	**5**	**6**
	ESG Score	**ESG Score**	**Environmental**	**Environmental**	**Social**	**Social**
Fin Dep$_i$ * Equity$_{k,t}$	0.235***		0.323***		0.328***	
	[5.44]		[6.27]		[6.99]	
Fin Dep$_i$ * Credit$_{k,t}$	-1.460***		-2.097***		-1.808***	
	[-5.13]		[-6.66]		[-5.66]	
Fin Dep$_i$ * Overall$_{k,t}$		0.025		0.022		0.063*
		[0.84]		[0.60]		[1.96]
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,561	10,561	10,561	10,561	10,561	10,561
Adj. R-sq	30.60%	30.40%	38.50%	38.30%	37.70%	37.40%

Panel E. Country-Year and Industry-Year fixed effects + Controls						
	1	2	3	4	5	6
	ESG Score	ESG Score	Environmental	Environmental	Social	Social
Fin Dep$_i$ * Equity$_{k,t}$	0.618***		0.301		0.783***	
	[3.00]		[1.21]		[3.29]	
Fin Dep$_i$ * Credit$_{k,t}$	-0.305		-2.470***		-1.381**	
	[-0.59]		[-3.99]		[-2.16]	
Fin Dep$_i$ * Overall$_{k,t}$		0.408**		-0.331		0.289
		[2.34]		[-1.45]		[1.33]
Fin Dep$_i$ * IND$_{k,t}$	0.012	0.017	-0.009	0.004	0.005	0.015
	[0.95]	[1.35]	[-0.56]	[0.27]	[0.37]	[1.14]
Fin Dep$_i$ * CORR$_{,t}$	0.287	0.291	-0.144	-0.134	0.664	0.672
	[0.49]	[0.49]	[-0.20]	[-0.18]	[1.05]	[1.04]
Fin Dep$_i$ *Legal$_{k,t}$	-0.546	-0.726**	0.985**	0.444	-0.404	-0.826*
	[-1.39]	[-2.03]	[2.06]	[0.99]	[-0.88]	[-1.90]
Fin Dep$_i$ * GOV_eff$_{,t}$	-2.083***	-2.193***	-0.76	-1.088	-2.507***	-2.763***
	[-2.86]	[-2.98]	[-0.86]	[-1.19]	[-3.10]	[-3.39]
Fin Dep$_i$ * GOV_exp$_{,t}$	0.029**	0.022*	0.050***	0.029**	0.045***	0.029**
	[2.24]	[1.86]	[3.37]	[2.20]	[2.90]	[1.98]
Fin Dep$_i$ * LIB$_{k,t}$	1.489	1.293	1.684	1.096	2.051*	1.592
	[1.59]	[1.42]	[1.53]	[1.01]	[1.96]	[1.55]
Fin Dep$_i$ * Trade$_{k,t}$	0.008***	0.009***	0.006*	0.011***	0.008**	0.012***
	[2.65]	[3.69]	[1.79]	[3.56]	[2.32]	[3.98]
Fin Dep$_i$ * HCI$_{k,t}$	0.459	0.296	0.781	0.292	0.936*	0.554
	[0.92]	[0.63]	[1.36]	[0.54]	[1.71]	[1.06]
Fin Dep$_i$ * GDP$_{k,t}$	-1.187***	-1.264***	-1.164***	-1.395***	-1.120***	-1.301***
	[-3.53]	[-3.66]	[-3.02]	[-3.59]	[-3.13]	[-3.44]
Fin Dep$_i$ * GDP_Gr$_{k,t}$	-0.019	-0.019	-0.058	-0.057	-0.065	-0.065
	[-0.42]	[-0.41]	[-1.12]	[-1.02]	[-1.41]	[-1.37]
Fin Dep$_i$ * Inflation$_{k,t}$	-0.282***	-0.291***	-0.248***	-0.275***	-0.286***	-0.307***
	[-4.43]	[-4.52]	[-3.52]	[-3.81]	[-3.90]	[-3.98]
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,229	8,229	8,229	8,229	8,229	8,229
Adj. R-sq	28.40%	28.40%	36.80%	36.70%	35.00%	34.90%

Table 6. Heterogeneity in the effect of financial development on CSR

The table presents coefficients of panel regressions (at the industry-country-year level) of the ESG score on triple interaction terms between the level of financial dependence (*Fin Dep*), proxies for financial development (*Equity* , *Credit* , and *Overall*) and indicator variables that capture high income countries (columns 1 and 4), highly individualistic societies (columns 2 and 5) and countries with high investor protection (columns 3 and 6). All specifications also control for the interaction terms included in Panel E of Table 5 as well as interactions between financial dependence and each of the three dummy variables (*Income*, *IND*, *Anti-Dir*) in turn. Industry is defined by the two-digit standard industry classification (SIC) codes. Variable definitions are provided in the Appendix (Table A1). All specifications include industry-year fixed effects as well as country-year fixed effects. The standard errors used to compute t-statistics (the latter reported in brackets) are robust to heteroskedasticity and clustering at the country-year level. Coefficient estimates significantly different from zero at the 10%, 5%, and 1% level are identified with *, **, and ***, respectively.

	1	2	3	4	5	6
	ESG Score	**ESG Score**	**ESG Score**	**ESG Score**	**ESG Score**	**ESG Score**
Fin Dep$_i$ * Overall$_{k,t}$	0.011	-0.214	0.306			
	[0.04]	[-0.66]	[1.14]			
Fin Dep$_i$ * Overall$_{k,t}$ * Income	0.731**					
	[2.20]					
Fin Dep$_i$ * Overall$_{k,t}$ * IND		0.849**				
		[2.35]				
Fin Dep$_i$ * Overall$_{k,t}$ * Anti-Dir			0.840***			
			[2.71]			
Fin Dep$_i$ * Equity$_{k,t}$				0.517**	0.822*	1.024*
				[2.07]	[1.90]	[1.83]
Fin Dep$_i$ * Equity$_{k,t}$ * Income				-0.191		
				[-0.44]		
Fin Dep$_i$ * Equity$_{k,t}$ * IND					-0.24	
					[-0.49]	
Fin Dep$_i$ * Equity$_{k,t}$ * Anti-Dir						-0.034
						[-0.06]
Fin Dep$_i$ * Credit$_{k,t}$				-5.406***	-2.270***	-0.994
				[-4.53]	[-2.68]	[-1.22]
Fin Dep$_i$ * Credit$_{k,t}$* Income				5.910***		
				[4.79]		
Fin Dep$_i$ * Credit$_{k,t}$* IND					2.924***	
					[4.00]	
Fin Dep$_i$ * Credit$_{k,t}$* Anti-Dir						2.488***
						[3.44]
Interaction controls	Yes	Yes	Yes	Yes	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,229	8,229	7,646	8,229	8,229	7,646
Adj. R-sq	28.50%	28.70%	29.90%	28.70%	28.70%	29.90%