EUROPEAN CENTRAL BANK
EUROSYSTEM

Working Paper Series

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Impacts of ESG banking regulation on financing new sustainable technologies

No 3089

Abstract

How does environmental, social and governance regulation of banks affect capital provision to the sustainability transition? As ambitious sustainability targets face funding challenges, the financial sector is tasked with channeling more private capital into sustainable investments. However, scaling sustainable technologies often requires investment in non-ESG-compliant assets. The mobility transition to electric vehicles, for example, demands increased supply of battery raw materials like Lithium, Cobalt, Manganese, and Nickel. This paper analyzes how ESG regulation impacts capital provision to mining companies supplying these materials. Concretely, we assess effects of the European Union's Sustainable Finance Disclosure Regulation and of the Taxonomy on banks' public holdings and cost of capital, using two large, novel data sets. We find that the introduction of the ESG regulations has a dampening effect on banks' holdings in battery raw material mining companies, in particular those with poor ESG performance. The companies' cost of capital and lending behavior remain unchanged.

Keywords: Banking, ESG Regulation, Lending, Public Holdings, Sustainable Finance

JEL Classification: G21, G28, Q50

Non-technical Summary

This paper provides an analysis of the evolving landscape of banking regulation focused on environmental, social, and governance (ESG) criteria. It sheds light on the trade-off arising if the scale-up of technologies necessary to reach policy sustainability targets (partially) requires investments into non-ESG-compliant assets, as it is the case, for instance, in the production of windmills, solar panels, and the mobility transition. Regarding the latter, an extensive shift to battery electric vehicles (BEV) requires a considerable expansion of the supply of battery raw materials, such as Lithium, Cobalt, Manganese, and Nickel. The sourcing of such materials often exhibits severe adverse ESG impacts, such as health risk of miners and child labor, corruption, and the financing of conflicts, as well as risks for the protection of land-based ecosystems including extensive energy and water consumption. The paper focuses on understanding the implications of the European Union's (EU) Sustainable Finance Disclosure Regulation (SFDR) and the EU Taxonomy for Sustainable Activities ("the Taxonomy") on banks' capital allocation decisions—i.e., public holdings—to companies active in the mining of BEV battery raw materials.

Based on two new comprehensive datasets merged from S&P's CapitalIQ, Refinitiv Eikon, Bloomberg and the ECB's AnaCredit database, this paper presents an empirical analysis (difference-in-difference approach) to assess how the above regulatory initiatives have influenced banks' public holdings and lending structure, as well as their cost of capital.

The analyses reveal an observable shift in the affected banks' capital allocation behavior, with the public holdings structure moving away from battery raw material companies, especially from those with poor ESG performance. Meanwhile, there are no observable changes in the affected companies' share prices, pointing to a compensation by an increased demand for shares from other entities. This effect entails that the overall level of public holdings remains stable, suggesting that, *ceteris paribus*, the cost of capital does not experience any changes. These findings have several implications. First and foremost, the observation that banks, which are affected by the SFDR and the Taxonomy decrease their public holdings in battery raw material companies, and especially in those, which do not perform well across the ESG dimensions, implies that the regulations lead to the intended effects. The fact that, in the current setup, there is no coinciding increase in the companies' share prices and, thus, cost of capital implies that the ESG regulations currently do not aggravate the underinvestment in battery raw materials sourcing. However, this might change if comparable regulations are introduced more comprehensively on a global level. Furthermore, if EU banks reduce their public holdings in

less ESG compliant companies, the EU's lever to incentivize companies to increase their ESG performance diminishes.

The paper provides a nuanced view of the interplay between ESG banking regulations, capital allocation decisions, and the funding of sustainable technologies. It underscores the effectiveness of ESG regulations in influencing banks' capital allocation strategies towards more sustainable practices, while also pointing out the limitations and unintended consequences of these policies. The research highlights the importance of a balanced regulatory approach, considering the multifaceted nature of sustainable finance.

1 Introduction

How does environmental, social and governance (ESG) related regulation of banks affect capital provision to the sustainability transition? With planetary boundaries being constantly overshot and global temperatures continuously rising, mastering the sustainability transition becomes a more and more pressing task. Meanwhile, underinvestment in sustainable technologies prevails (e.g., IPCC, 2018; BCG, 2021, 2023). Therefore—especially in the European Union (EU)—the financial sector is assigned a key role in channeling more private-sector capital into sustainable investments (e.g., UN, 2015, 2022; EC, 2023; Schreiner and Beyer, 2023). To incentivize financial institutions (FI) accordingly, an adequate regulatory framework is key (Schreiner and Madlener, 2023). Within this context, a mounting number of papers tackles the above question, shedding light on various aspects of ESG-related regulation, and financing the sustainability transition. For many aspects, a thorough foundation of research has already been laid, such as the interaction of ESG and the performance of FIs (de Bandt et al., 2023). A particular challenge, however, which has only been scarcely assessed, is the trade-off, which arises if the scale-up of sustainable technologies (partially) requires investments into non-ESG-compliant assets. This is the case, for instance, in the production of windmills, solar panels, and the mobility transition[2]. Regarding the latter, an extensive shift from internal combustion engine vehicles (ICEV) to battery electric vehicles (BEV) requires a considerable expansion of the supply of battery raw materials, such as Lithium, Cobalt, Manganese, and Nickel[3]. However, the sourcing of such materials often exhibits severe adverse ESG impacts,

[2] The impact of the mobility transition on global greenhouse gas emission reduction can be in the order of magnitude of 2%, if all current electric mobility goals are reached (IEA, 2024). Battery raw materials mining is an integral part of the electric vehicle value chain, and a shortage of such materials (e.g., Lithium, Manganese, Cobalt, etc.) is one of the most critical factors, which can lead to a non-realization of electric mobility targets (IEA, 2020).

[3] The type of required raw materials depends on the battery technology (e.g., size, type), and, in particular, on the type of cathode used. The currently most widespread technology are Lithium-ion batteries, using a nickel-manganese-cobalt cathode (BMZ, 2020).

such as health risk of miners and child labor, corruption, and the financing of conflicts, as well as risks for the protection of land-based ecosystems including extensive energy and water consumption (BMZ, 2020). Compared to the ambitiously set BEV policy targets (IEA, 2023), whose realization would cause an up to ten-fold increase in the demand for BEV battery capacity until 2030 compared to the current capacities, there is already a considerable shortage of such raw materials supply and an equally significant underinvestment regarding the expansion of sourcing capacities (Reuters, 2019; Schmid, 2020; IEA, 2022a; BCG, 2023a). If ESG-related banking regulation effectively channels capital into ESG-compliant activities, and away from non-ESG-compliant ones, such efforts might further curb ESG capital supply. Such an effect could fuel a substantial increase in the costs of capital for the mobility transition and could, thus, constitute a barrier in reaching BEV policy targets[4] (BMR, 2020; Charged, 2022).

Therefore, this paper starts shedding light on the vastly neglected aspect of the above question by empirically studying the effect of ESG-related regulations of banks in the EU on banks' capital allocation behavior to battery raw materials sourcing. Furthermore, we discuss implications of the findings regarding the cost of capital of battery raw material sourcing companies. Taking this two-step approach as opposed to a direct assessment of the cost of capital of battery raw material sourcing companies (e.g., an assessment of the companies' weighted average cost of capital (WACC)), allows us to also capture effects on the capital structure of the affected companies, which do not feed through to the costs of capital, as potential reductions in the capital provision by EU or euro area banks are substituted by other financiers.

In the present paper, we specifically assess the effects on battery raw material mining companies, and, thus, the effect on the mobility transition. The underlying general question

[4] This effect is amplified, as demand for such materials also increases from competing technologies, such as smartphones, other consumer electronics, and energy storage solutions in energy systems with high shares of renewable energy sources (RES).

"*how sustainable financial sector regulations impact capital provision to technologies, which are necessary to realize the sustainability transition but exhibit adverse ESG impacts*" is transferrable to other technologies as well. As mentioned above, this is, for instance, the case for photovoltaic systems or windmills. Therefore, the analyzed effect is relevant for the realization of large parts of global energy transition.

In our empirical study, we make use of the introduction of two "green transition" regulations within a setup of a quasi-natural experiment: firstly, the Sustainable Finance Disclosure Regulation (SFDR) in 2019 (adoption in November 2019, effective as of March 2021); and secondly, the introduction of the EU Taxonomy Regulation ("the Taxonomy") in 2020, which primarily aims at encouraging ESG-compliant businesses activities (and at the same time discouraging non-ESG-compliant ones)[5]. Both regulations mark a unique turning point regarding legally binding ESG-related disclosure requirements. We design a difference-in-difference (DiD) modelling strategy to assess the new green regulations' impact on banks' public holdings in those companies, which are active in the sourcing of battery raw materials[6]. We furthermore assess the impact of these regulatory changes on the share prices of those battery raw material sourcing companies to gain evidence whether the cost of capital of those companies has been affected by both new regulations.

Our principal finding is that the introduction of ESG-related regulations which affect banks headquartered in the EU does indeed have a dampening effect on their public holdings in companies that are active in the sourcing of battery raw materials and, thus, EU banks' capital provision to such companies. However, share prices of affected companies remain, nevertheless, broadly unchanged. Therefore, we can conclude that only the holders of the shares change, while demand for the holdings remains unaffected ("ownership substitution effect"). For the battery raw material sourcing companies, this implies that their access to capital is not

[5] See EU regulations EC 2019/2088 and EC 2020/852
[6] We consider—jointly and separately—Lithium, Cobalt, Manganese, and Nickel, see Section 5.1.1.

affected by the regulations. Thus, in the assessed setup, the EU ESG regulations do not further aggravate underinvestment in the sourcing of battery raw materials. However, there are two aspects to be considered by policy makers going forward: firstly, it is often argued that shareholders of battery raw material mining companies have a strong lever to incentivize a more ESG-compliant behavior of such companies. With EU banks being incentivized to hold fewer shares in such companies, their influence will also diminish. Secondly, we have assessed the current global policy landscape, in which legally binding ESG regulations matter – on a global scale – only to a minority of banks. If the introduction of such regulations would become more widespread, globally, an ownership substitution might not remain the sole effect, but the total demand might decrease. This would then entail a decrease in share prices, and, thus, a *ceteris paribus* increase in the companies' cost of capital. Then, the introduction of ESG-like regulations of banks could have, eventually, an aggravating effect on the underinvestment into battery materials sourcing.

The results of our empirical study are based on two large novel datasets matched from S&P CapitalIQ, Refinitiv Eikon, Bloomberg, and the ECB's AnaCredit databases.

The remainder of the paper is structured as follows: Section 2 provides an overview of the current state of the research and this paper's contribution. Section 3 summarizes the institutional framework in the context of ESG regulations. Section 4 lays out our empirical strategy and Section 5 presents the data and sample selection. Section 6 presents our results, and Section 7 concludes and provides some thoughts on policy recommendations.

2 Current State of the Research and our Contribution

Our paper builds upon and contributes to two increasingly overlapping research fields and strands of literature: Firstly, literature originating from the field of banking regulation, and, secondly, literature focusing on sustainable investment and finance[7].

The literature strand dealing with banking regulation *inter alia* provides theoretical rationale and assesses empirically the effects of different regulatory efforts on various ESG-unrelated and -related impact dimensions. Independently of ESG, those are, for instance, bank funding cost, bank lending, investment, GDP, or welfare. Related directly to the sphere of ESG, these are, for instance, ESG risk exposure or ESG-compliant capital allocation. Within the context of our paper, especially the impact of ESG-specific banking regulation on different ESG impact dimensions is relevant (see Figure A.1). Impact dimensions can relate to banks directly, or to the broader financial and overall economy (see Figure A.2).

Particularly, with regard to the empirical estimations of the effects of banking regulation, contributions to the academic literature are numerous. The Bank for International Settlements (BIS) keeps track of studies assessing economic impacts of various types of financial regulations in their online repository FRAME (Boissay et al., 2019; BIS, 2023). There are five broad types of banking regulation, which can be distinguished: (i) macro-prudential, (ii) balance-sheet-related (e.g., capital, reserve, and liquidity requirements, leverage ratios), (iii) governance- and process-oriented (e.g., risk assessment methodology, corporate governance), (iv) information and disclosure requirements incl. stress tests[8], and (v) steering—e.g.,

[7] With the increased focus on sustainability and ESG, as well as the above-mentioned key role, which has been assigned to the financial sector to provide the financial means to realize the sustainability transition, the overlap between the two research fields and strands of literature has increased significantly.

[8] Regarding information and disclosure requirements, the literature has identified different transmission mechanisms regarding the way in which such requirements can impact the target dimensions. The most relevant transmission mechanisms are a reduction of information asymmetries between banks and their business partners, an incentivization of (costly) information generation closer to a (welfare-)optimal level, and a signaling effect, that other regulatory or supervisory efforts, such as capital requirements, might be introduced in the future (Steuer and

restricting—business activities (e.g., Shirai, 2023). In principle, all these types of regulation might be applied to issues in sustainable finance[9]. Within the context of this paper, the two latter are particularly relevant, due to the SFDR's focus on banks' ESG disclosure, and the Taxonomy's focus on ESG-compliant steering of banks' business activities.

Generally, many empirical assessments find risk-mitigating and market-discipline-increasing effects of information and disclosure requirements (for an extensive literature review see Schreiner and Beyer, 2023). Regarding the impact on bank-level ESG risk exposure and management, Di Tommaso (2020) and Tóth et al. (2021) find reducing effects of EU banks' increased ESG disclosure on banks' risk taking and on the ratio of non-performing loans, pointing to a reduction of ESG risk materialization. Fricke and Schlepper (2024) find dampening effects of banks' greenwashing due to the introduction of the SFDR. In line with these findings, Schreiner and Beyer (2023) find a significant impact of the ECB's climate-risk-related supervision efforts on a reduction of banks' exposure to unmanaged climate risks. Fuchs et al. (2023) find that due to the introduction of the ECB's climate-risk-related supervisory efforts, banks charge higher interest rates for borrowers with high transition risks. Regarding the impact on ESG-compliant capital allocation, Roychowdhury et al. (2019) provide a literature review, covering contributions until 2018/19. Basu et al. (2022) find that increased social disclosure has an adverse effect on home mortgage lending to disadvantaged communities, pointing to "social washing". On a more positive note, Wang (2023) finds that ESG disclosure regulations incentivize banks' debtors to improve their ESG performance.

Tröger, 2022; Schreiner and Beyer, 2023) Furthermore, banks' reaction to public pressure represents another way in which increased disclosure impacts bank behavior (Wang, 2023).

[9] In addition to the five types of banking regulation, also other types of sustainability-related policies and incentives can have an impact on banks' behavior. For instance, Laeven and Popov (2022) and Ivanov et al. (2023) assess the impact of the introduction of a carbon pricing policy (e.g., the introduction of a carbon tax) on banks' credit to greenhouse gas emitting firms. They find that that high emission firms face, *inter alia*, shorter loan maturities and higher interest rates within the economy, where the carbon pricing policy has been introduced. However, they also show that the lending to coal, oil and gas companies in foreign countries increases, showing evasive effects.

Similarly, Becker et al. (2022), Dai et al. (2023) and Badenhoop et al. (2023) find disclosure under the SFDR causing a decarbonization of banks' portfolios, an increase in investments in green funds, however, a coinciding decrease in the share of social investments. Regarding the impact of the Taxonomy, empirical evidence is less clear. Different potential impacts of the regulation are, for instance, shown by Pastor et al. (2021), Kirschenmann (2022) and Sautner et al. (2022). Regarding the ECB's climate-risk-related supervisory efforts, Schreiner and Beyer (2023) find a positive impact on banks' green bond issuance, ESG assets under management (AUM), and lending to debtors with a higher environmental rating. Regarding the impact on systemic ESG risk, Aevoae et al. (2023) assess the impact of increased ESG disclosure (ESG scores), documenting a beneficial impact of the ESG scores disclosure on banks' contribution to system-wide distress. Also, Tóth et al. (2021) find a significant impact of EU banks' ESG disclosure on financial stability. Regarding the impact on the achievement of ESG targets, Campiglio (2016) discusses the role of banking regulation and monetary policy in financing the transition to a low-carbon economy. Dikau and Volz (2018) discuss the legitimacy and potential instruments of banking supervision to support banks' provision of sustainable finance. Gasparini et al. (2023) provide a general discussion of the effect of financial regulations on the transition to net zero. However, empirical literature quantifying such impacts is still scarce. In addition to the contributions rooted in the banking regulation and supervisory literature, also contributions from the broader field of sustainable investment and finance describe such effects from a slightly different angle, treating (banks') capital provision as one factor amongst others in achieving (components of) sustainability targets. For instance, Schreiner and Madlener (2023) provide an extensive literature review and discuss the role of financial sector regulation on the achievement of global climate goals. Related to BEV raw materials sourcing, Schmid (2020) discusses Challenges to the European automotive industry in securing critical raw materials for electric mobility.

Our original contribution is, hence, twofold: within the context of banking regulation and supervision, we provide a novel assessment of ESG regulation on the structure of public holdings on the one hand as well as an assessment of the impact of climate-risk-related banking supervision on the other hand, based on the usage of two large novel datasets. Within the context of sustainable investment and finance, we contribute to the debate by assessing the vastly neglected aspect that ESG regulation and supervision potentially aggravate the underinvestment into assets, which are, nevertheless, necessary to achieve sustainability targets, and thereby exhibit adverse ESG impacts.

3 Institutional Framework: ESG Regulation

Given the considerable investments, which are required to comply with ESG targets worldwide, and recognizing the potential of the financial sector to channel the required capital into ESG-compliant investments, as well as the need for adequate regulation and supervision of FIs to realize this potential, many economies have started to set up sustainable finance initiatives[10]. However, outside the EU, legally binding regulations are very scarce (cf., e.g., Feridun and Güngör, 2020; Wang, 2023). Distinctively, within the EU, as part of the Sustainable Finance Action Plan, the SFDR (2019, 2021) and the Taxonomy (2020) have been introduced as two of the first legally binding and far-reaching ESG regulations affecting

[10] Such initiatives exist on both the national and the supra-national level, and primarily comprise non-binding classifications, recommendations, and action plans. On the national level, for instance, Australia has set up its Federal Government's sustainable financing strategy in 2022, and the Canadian Securities Administrators (CSA) have been considering new climate-related disclosure standards. In the United States (US), ESG policies are less homogenous. On the one hand, for instance, rules on climate-related disclosures were announced in March 2022, on the other hand, in particular on the state level, a number of anti-ESG rules has been introduced, such as the No Boycott Legislation or the Prohibition of ESG Discrimination (Morgan Lewis, 2023). On the supra-national level, the Task Force on Climate-related Financial Disclosures (TCFD) of the Financial Stability Board (FSB) has published disclosure standards in 2015, the Network for Greening the Financial System (NGFS), established in December 2017, provides recommendations regarding the enablement of sustainable finance, as well as the United Nations Environment Programme Finance Initiative (UNEP FI). For an overview see Table A.1 and Table A.2 in Appendix A.2.

banks[11]. This fact allows us to use their introduction as quasi-natural shocks to banks. The SFDR's disclosure requirements aim at generating "all the information necessary to properly inform end investors about the sustainability-related impacts of their investments". The Taxonomy aims at reallocating capital flows from brown to green firms. It establishes criteria that determine whether an economic activity is ESG-compliant ("Taxonomy-aligned") with a strong focus on environmental sustainability (Schütze et al., 2020; Sautner et al., 2022). Thus, it provides the first standardized criteria for sustainable finance and forms the basis for further regulation steering FIs' business activities (Kirschenmann, 2022).

4 Empirical Strategy

Our goal is to study the effects of the introduction of banks' ESG regulations (i.e., the adoption and entering into force of the SFDR and the adoption of the Taxonomy) as an external shock. We assess the impact of ESG regulations on banks' public holdings of battery raw material sourcing companies. Furthermore, we analyze effects on the corresponding share prices to derive implications with regard to capital provision to the companies. We therefore estimate a Difference-in-Difference (DiD) panel regression model with multi-dimensional fixed effects of the following structure:

$$Y_{ibct} = \beta_{i0} + \beta_{i1} treat_{ibct} + \beta_{i2} post_{ibct} + \beta_{i3} treat_{ibct} \times post_{ibct} + X_{ibct}\gamma_i^T + a_{ibct} + \varepsilon_{ibct}\,, \quad (1)$$

where Y_{bct} represents the main dependent variable, i.e., the public holdings structure of bank b in battery raw material sourcing company c at time t, $treat_{ibct}$ defines the treatment vs. control groups, $post_{ibct}$ specifies the shock, X_{ibct} the matrix of the control variables, a_{ibct} the

[11] The SFDR applies to financial market participants headquartered in the EU. Financial market participants with fewer than 500 employees are not required to produce a principal adverse impact statement, though they must explain why if they choose not to comply. In addition to the legally binding regulaitons, within the EU and on the Member States' national level, other non-binding measures exist (González Martínez, 2021; Bruno and Lasagio, 2022).

fixed effects, and ε_{ibct} the error term. We separately assess banks' public holding structure Y_{ibct} of companies active in the sourcing of (1) Lithium, (2) Cobalt, (3) Manganese, and (4) Nickel, which are represented by the index $i \in \{1,2,3,4\}$.

As discussed, we study the impact of the introduction of ESG regulations of banks on financing the sustainability transition, i.e., banks' capital provision to the sourcing of battery raw materials, which are necessary to realize aspects of the sustainability transition, but which exhibit adverse ESG impacts.

We consider the following two-step effect: In the first step, we investigate the shock's impact on EU banks' holdings of shares in battery raw material sourcing companies. This allows us to observe potential effects of the adoption of the SFDR and the Taxonomy on the holder structure of such shares, i.e., the amount of shares held by EU banks. A change in the holder structure—which, in the case of our analysis, is a reduction in EU banks' public holdings in such companies, implying that EU banks sell such shares—has two potential consequences. These are assessed in a second step: either the previous EU banks' demand of such shares is replaced by an increasing demand of other investors' demand ("ownership substitution effect")[12], or the overall demand diminishes ("demand reduction effect"). From the development of the corresponding share prices, we infer which of the two effects prevails. We postulate that, in the case of an ownership substitution effect, share prices of companies whose shares were held by the treated banks should remain unaffected by the shocks, while in the case of a demand reduction effect, such share prices should decrease.

[12] Within our analysis, we do not further address the question of by which investors the shares in battery raw material mining companies are potentially substituted. However, it stands to reason that non-bank investors affected by ESG-related regulations react to the introduction of such regulations in a similar way as the affected banks. Therefore, we can assume that any potential demand substitute for shares primarily roots back to investors who are not affected by ESG-related regulations, such as banks or institutional investors from non-EU economies.

4.1 Effects of ESG Regulations on Public Holdings of Mining Companies

As a first step of our analysis, we assess the adoption of the SFDR in Q4/2019 and its entering into force in Q1/2021, as well as the adoption of the Taxonomy in Q3/2020 (cf. Ampudia et al., 2023). In our main regression, we estimate the staggered introduction of the SFDR according to the following model:

$$Y_{ibct} = \beta_{i0} + \beta_{i1} treat_{ibct} + \beta_{i2} post_{ibct}^{Q4/2019} + \beta_{i3} treat_{ibct} \times post_{ibct}^{Q4/2019} + \beta_{i4} post_{ibct}^{Q1/2021} + \beta_{i5} treat_{ibct} \times post_{ibct}^{Q1/2021} + X_{ibct}\gamma_i^T + a_{ibct} + \varepsilon_{ibct}\,, \quad (2)$$

and the adoption of the Taxonomy in Q3/2020 according to

$$Y_{ibct} = \beta_{i0} + \beta_{i1} treat_{ibct} + \beta_{i2} post_{ibct}^{Q3/2020} + \beta_{i3} treat_{ibct} \times post_{ibct}^{Q3/2020} + X_{ibct}\gamma_i^T + a_{ibct} + \varepsilon_{ibct}\,, \quad (3)$$

Where $treat_{ibct}$ is a dummy variable equal to unity if the bank is headquartered in the EU and is, thus, affected by the shock, and zero, if the banks is headquartered outside the EU, and thus not affected by any legally binding ESG regulation[13]. $post_{ibct}^{Q4/2019}$ is a dummy variable equal to one from Q4/2019 to Q4/2020, while the SFDR has been introduced, but not yet entered into force; $post_{ibct}^{Q3/2020}$ a dummy variable equal to one from Q1/2021 onwards. $post_{ibct}^{Q3/2020}$ is a dummy variable equal to one from Q3/2020 onwards. $treat_{1bct}$ is interacted with the time dummies to construct the DiD setup.

Moreover, we include several macroeconomic, bank-specific, company-specific, and ESG-specific control variables in our analysis. We account for GDP growth, inflation, banks' total public holdings, companies' ESG ratings and disclosure, companies' dividends, share prices, revenues, and credit risk as well as the introduction of non-binding ESG measures and US anti-ESG regulations. Furthermore, we include raw material prices, which - assuming well-

[13] For a discussion of the exact composition of the treatment and control group, see Section 5.1.3.

functioning markets – might reflect all drivers for raw materials' supply and demand. On the supply side, those drivers are, for instance, production challenges caused by the Covid-19 pandemic and the geopolitical environment (e.g., Nickel supply from Russia), and structural underinvestment in new supply capacity during the three years preceding 2021 when metal prices were low. On the demand side, drivers include, for instance, BEV targets, demand from competing use of the raw materials, as well as demand changes due to technological developments. In addition to the controls, we also include country, time, company- and bank-level fixed effects to account for the according time-invariant factors.

As a robustness check to our baseline regression models (eqs. (2) and (3)), we test the effects of the SFDR and the Taxonomy separately. We also investigate whether results might change if basing the analyses on a single regression model that would include all three shocks simultaneously, i.e., the adoption of the SFDR in Q4/2019, the adoption of the Taxonomy in Q3/2020, and the entering into force of the SFDR in Q1/2021:

$$\begin{aligned} Y_{ibct} = {} & \beta_{i0} + \beta_{i1} treat_{ibct} + \beta_{i2} post_{ibct}^{Q4/2019} + \beta_{i3} treat_{ibct} \times post_{ibct}^{Q4/2019} \\ & + \beta_{i2} post_{ibct}^{Q3/2020} + \beta_{i3} treat_{ibct} \times post_{ibct}^{Q3/2020} + \beta_{i4} post_{ibct}^{Q1/2021} \\ & + \beta_{i5} treat_{ibct} \times post_{ibct}^{Q1/2021} + X_{ibct} \gamma_i^T + a_{ibct} + \varepsilon_{ibct} \,. \end{aligned} \tag{4}$$

4.1.1 Effects of ESG Regulation on Capital Provision to Mining Companies

As a second step of our analysis we aim to identify whether an ownership substitution effect or a demand reduction effect prevails. As a proxy to measure this effect we use the share prices of the companies, whose shares are held by banks of our treatment and control groups and compare the development of these two groups of shares in the post-treatment period. In case of an ownership substitution effect, share prices of companies whose shares are held by the treated banks are expected to remain unaffected by the shocks, i.e., exhibit parallel trends where, in case of a demand reduction effect, the share prices of companies, whose public holdings were held by the treated banks, would be expected to decrease relative to the control group. In order

to demonstrate whether parallel trends prevail, we make use of the normalized difference approach proposed by Imbens and Wooldridge (2009). The test suggests that, if parallel trends prevail, the normalized differences of the prices of the two groups of shares are smaller than 0.25.

A potential change in share prices has implications regarding the mining companies' overall cost of capital (e.g., WACC) in different ways. When issuing new shares while share prices are low, the company can raise less capital per share. This implies that more shares must be issued to raise the needed funds, and decrease the company's maximum amount of capital, which it can raise. Furthermore, the company's cost of equity is directly affected by the share price. Decreasing share prices generally reflect an unfavorable market view of a company's future prospects. This can increase its cost of equity, since the return required by investors is generally higher if they perceive higher risk associated with the company's future. Finally, the cost of debt may also be influenced, albeit indirectly. A decreasing share price often correlates with a deteriorating financial position and credit ratings, which can lead to higher interest rates on debt because lenders perceive the company as riskier.

4.2 Parallel Trends

Critical for the validity of our findings is the exogeneity of changes in banks' public holdings in and lending to battery raw material sourcing companies. Therefore, the differences in the trends we capture should not have preceded the adoption of the SFDR and the Taxonomy from 2019 onwards, i.e., that the banks headquartered in the EU were not already before 2019 starting to hold less shares in battery raw material sourcing companies (i.e. not "picking a continuation of longer-term trends", see, e.g., Angrist and Pischke). The same applies for bank lending during the period preceding the introduction of the ECB's climate-risk-related supervision in 2020. For testing the "parallel trends assumption", we perform two different tests:

firstly, we follow the normalized difference approach by Imbens and Wooldridge (2009) to examine trends in banks' public holdings and lending preceding the shocks in 2019 and 2020. According to this test, there must not be a divergence of the dependent variables (all battery raw materials, Lithium, Manganese, Cobalt, Nickel public holdings; bank lending to battery raw material sourcing companies) prior to the treatment. We calculate the normalized differences as averages by treatment status scaled by the square root of the sum of the variances. This approach has an advantage over the t-test, as it is a scale-free measure of differences in distributions independent of the sample size (Imbens and Wooldridge, 2009). An absolute normalized difference smaller than 0.25 indicates that there is no significant difference in the evolution of characteristics between treated and control groups (Mueller et al., 2023). For all dependent variables (all battery raw materials, Lithium, Manganese, Cobalt, Nickel public holdings; bank lending to battery raw material sourcing companies), the normalized differences (0.00; 0.12; 0.05; 0.22; 0.13; 0.14) remain well below the 0.25 rule of thumb. The same holds for the normalized differences of the majority of the controls. The most severe deviation from the threshold is for the total public holdings of banks holding Lithium, Cobalt, Manganese and Nickel shares. To demonstrate that these deviations between the treatment and control groups in the pre-treatment period do not undermine the informative value of our results, we perform robustness checks excluding the respective control variables from our analyses, finding that the results remain unchanged with respect to significance levels. Furthermore, for banks' public holdings in Manganese companies, we find that the majority of the normalized differences of the company-specific controls exceeds the 0.25 threshold. Here, we perform two robustness checks suggesting that these results do not undermine the informative value of our results: on the one hand, considering the outcomes of the sequential regressions we see that the absence of the controls does not change the significance of the results. On the other hand, the consideration of the pre-treatment period below suggests that parallel trends prevail.

Secondly, we perform additional tests and consider the pre-treatment period before the adoption of the SFDR, the Taxonomy and the ECB's climate-risk-related supervisory efforts, i.e., the time period from Q1/2015 until the respective introduction of the ESG regulation and supervision. We split the time period into the quarters Q1/2015 to Q1/2017 (Q2/2017) (first period I) and Q1/2017 (Q2/2017) to Q3/2019 (Q4/2019) (second period I), as well as into the quarters Q1/2015 to Q3/2017 (Q4/2017) (first period II) and Q3/2017 (Q4/2017) to Q3/2019 (Q4/2019) (second period II). We then estimate the following models:

$$Y_{ibct} = \beta_{i0} + \beta_{i1} treat_{ibct} + \beta_{i2} post^{n}_{ibct} + \beta_{i3} treat_{ibct} \times post^{n}_{ibct} + X_{ibct}\gamma_i^T + a_{ibct} + \varepsilon_{ibct}\,, \tag{6}$$

with $n \in \{\mathrm{Q1/2017}, \mathrm{Q2/2017}, \mathrm{Q3/2017}, \mathrm{Q4/2017}\}$. We observe no significant trend change in the pre-treatment period (exemplarily displayed for first and second period I).

5 Data and Sample Selection

In this Section, we discuss the data we use to test the relationships introduced in Section 4, including a detailed discussion of the dependent and independent variables (for an overview see Table A.3), as well as the selection of the samples for control and treatment groups.

5.1 Dependent Variables

As introduced above, as dependent variable, we both jointly and separately consider banks' public holdings in battery raw material companies, which are active in the exploration and mining of Lithium, Cobalt, Manganese and Nickel. While the exact demand for these raw materials is dependent on several factors including the development of different battery technologies, in each development scenario, they constitute key components of BEV batteries (BMZ, 2020; IEA, 2022). To construct the dependent variable, we use different data sets from S&P's CapitalIQ. CapitalIQ provides quarterly financial data of companies and financial institutions worldwide, such as ownership structure and balance sheet information.

To identify relevant battery material companies, we perform keyword and thematic searches on CapitalIQ, which we quality check by comparing them with lists of relevant players in the Lithium, Cobalt, Manganese and Nickel markets, which are published in several market reports, as well as by visiting the companies' websites. Generally speaking, there are two types of battery material companies serving the market: the major shares of the market are served by large-scale mining companies (which can be either public or private), while further mining is performed by artisanal and small-scale miners (BMZ, 2020; BCG, 2023). Amongst large-scale mining companies, two setups can be distinguished in terms of reporting: either, the mining is performed directly under the aegis of the mining company, with the corresponding activities appearing on the respective company's balance sheet, or a special purpose vehicle (SPV) is set up. In the latter case, the mining activities do not directly appear on the company's balance sheet but are reported separately. Regarding CapitalIQ's coverage of the different types of companies and setups, coverage for large-scale mining companies is the best, and also, SPVs are included in the database, while small-scale miners are not included. Considering public holdings as a dependent variable, our main interest is in large-scale public companies, which also constitute a major share of the market. Based on CapitalIQ data, we identify the banks, which hold shares of the companies, and obtain quarterly data of banks' public holdings of battery raw material mining companies for a time period from Q1/2015 to Q3/2023. To account for the fact that especially large-scale mining companies are often active in the mining of multiple raw materials, we further adjust the total public holdings identified for the respective company by the share of the companies' activities in the mining of the relevant raw material based on the capital expenditure breakdown available on the balance sheet[14]. Following this

[14] We choose the capital expenditure as opposed to the revenues to approximate the companies' activities related to the relevant raw material to avoid endogeneity effects, which would arise since revenues are highly correlated which raw material prices.

procedure, we obtain the following samples: For 'Overall'[15] (Lithium, Cobalt, Manganese, Nickel), we identify 3,424 (870, 786, 346, 1422) bank-company combinations, of which 312 (65, 95, 44, 108) involve banks headquartered in the EU and are, thus, part of the treatment group.

5.2 Independent Variables and Controls

As introduced in Section 4, we account for different macroeconomic, company-related, bank-related, and ESG-related control variables. We obtain GDP growth and inflation data from CapitalIQ, as well as banks' total public holdings, companies' dividends, share prices, revenues, and credit risk. Companies' ESG ratings and disclosure are based on the Bloomberg database, which is one of the few data sources that provides ESG ratings. Historical data reaches back to 2015. Carbon prices are obtained from the World Bank's Carbon Pricing Dashboard; and raw material prices from the Refinitiv Eikon database. Furthermore, we account for bank- and company-level, as well as country and time fixed effects (for details, see output tables in the Appendix). Another potential influencing factor given the assessed time period of 2019 to 2022 could be policy efforts to address the pandemic. We recognize that pandemic-related policy measures could potentially influence the outcomes in our study. This is especially the case, since some of the COVID-19 aids were subject to ESG-related conditions, such as the EU's Recovery and Resilience Facility. However, we argue that the nature of these interventions does not significantly undermine our identification strategy. This is especially the case, since those COVID aid programs primarily affecting banks and their asset management arms were not subject to such conditions (e.g. the ECB's Pandemic Emergency Purchase Program in the euro zone, or the Paycheck Protection Program in the US). Hence, we do not include corresponding controls into our analysis.

[15] I.e., the joint consideration of public holdings in companies active in the sourcing of the four battery raw materials.

5.3 Treatment and Control Groups

As described in Sections 3 and 4, we, generally, use banks headquartered in the EU as treatment group, and banks headquartered outside the EU as control group. Regarding the treatment group, we exclude any banks which have undergone major corporate structural shifts (e.g. mergers and acquisitions). Regarding the control group, we exclude any banks from the sample, which are headquartered in countries, in which legally binding ESG regulations have been introduced. This is the case for banks headquartered in China and Hong Kong. For the UK, a legally binding ESG regulation has already been announced as well. However, this regulation will enter into force not before 2025. Therefore, we keep banks headquartered in the UK in the control group in the basis regression and perform robustness checks with a control group excluding UK-headquartered banks.

6 Empirical Results

In this Section, we present the results of the empirical analysis, including the main results as well as outcomes of the robustness checks. Furthermore, we discuss the role of battery raw material mining companies' ESG performance by means of additional analyses involving subsets of our data sample.

6.1 The Impact of ESG Regulation on Public Holdings in Mining Companies

Tables A.18 to A.40 show the main results (sequential regressions) for the five different model versions (Overall, Lithium, Cobalt, Manganese and Nickel) introduced in Section 4 in equations (eqs.) (2) and (3). We estimate the effects of the SFDR and the Taxonomy on banks' public holdings and we lag the effects by one, two and three quarters, respectively. We use different combinations of bank- and company-level, as well as country and time fixed effects.

For the overall analysis of all battery raw materials, we find that the introduction of all three regulatory interventions has statistically significant dampening effects on EU banks' public

holdings in battery raw material mining companies. Comparing the magnitude of the effects, the entering into force of the SFDR in Q3/2021 has the strongest dampening effects, followed by the adoption of the Taxonomy in Q3/2020 and the adoption of the SFDR in Q1/2019. These findings are robust comparing the results based on eqs. (2) and (3) with the results based on eq. (4), i.e., the separate vs. the joint assessment of the SFDR and the Taxonomy. Furthermore, we observe significant lagged effects by one, two and three quarters[16]. The results are robust to the inclusion and exclusion of control variables (see sequential regressions) as well as to disregarding various combinations of fixed effects specifications in the model. In terms of the control variables, we generally observe a more pronounced effect for bigger companies (proxy: revenues), and for younger companies.

Within the separate analyses of the four battery raw materials (Lithium, Cobalt, Manganese, Nickel) or each of the dependent variables, with respect to the effects of the adoption and entering into force of the SFDR in Q4/2019 and Q1/2021, we observe stronger negative and significant effects of the actual entering into force of the SFDR in Q1/2021 as compared to its earlier endorsement in Q4/2019. Regarding the adoption of the Taxonomy in Q3/2020, we observe statistically significant negative effects. In the following, we discuss the results in detail for both the adoption and entering into force of the SFDR and the adoption of the Taxonomy on each of the four dependent variables.

Regarding treated banks' Lithium public holdings, both the adoption and the entering into force of the SFDR have a significant dampening effect. In comparison, the effect of the entering into force in Q1/2021 is stronger than the one of the adoption in Q4/2019. Further, the adoption

[16] The occurrence of these lagged effects can be a result of different mechanisms. In the simplest case, it can be a lagged reaction of banks to the introduction of ESG-related regulations. Beyond that, the occurrence of these lagged effects can also be an indicator that the adoption of the SFDR and the Taxonomy not only have a direct effect on the affected banks, but also an indirect one. For instance, institutional investors aiming at becoming more ESG-compliant (e.g., since they are affected by the ESG-related regulations themselves), might exert pressure on banks regarding their holding structure. Since the related interaction takes some time, this might result in lagged effects.

of the Taxonomy also has a significant dampening effect. These effects remain similar performing the robustness check of the regression model presented in eq. (5), including the staggered introduction of the SFDR, the adoption of the Taxonomy, and the entering into force of the Taxonomy. In terms of the controls, the company size has a further statistically significant effect within both analyses, revealing that a larger company size also dampens public holdings of Lithium companies. Furthermore, within both analyses, we observe also lagged effects by one and two quarters. Regarding the Cobalt public holdings, only the entering into force of the SFDR has a dampening effect of a moderate statistical significance, while the adoption does not have any impact of statistical significance. Also, for the adoption of the Taxonomy, we observe statistically significant dampening effects on treated banks' Cobalt public holdings (see Table A.35). Again, this result is robust to the check testing all three effects in the model presented in eq. (5). For both the adoption of the Taxonomy and the entering into force of the SFDR, we also observe effects lagged by one, two and three quarters. Regarding the Manganese public holdings, we observe statistically significant dampening effects of the adoption of the Taxonomy and the entering into force of the SFDR. This result is robust to the analysis results of the model in eq. (5). Again, we observe lagged effects, in particular for the adoption of the Taxonomy. For the Nickel public holdings, we, similarly, observe dampening effects of the entering into force of the SFDR and the adoption of the Taxonomy of moderate statistical significance. Again, this result is robust to the comparison with the results of the model in eq. (5). We observe lagged effects by one, two and three quarters.

6.2 The Impact of ESG Regulation on the Cost of Capital of Mining Companies

In order to draw conclusions on the mining companies' costs of capital, we consider the development of their share prices, as described in Section 4.1.2. The analysis of the normalized differences reveals that the parallel trends within the share prices prevail in the consideration of all battery raw materials, as well as in the separate analyses for Lithium, Cobalt, and Nickel

(see Tables A.48 to A.52). This suggests that only the holders of the shares change, while demand remains unaffected, meaning that an ownership substitution effect prevails. For the battery raw material sourcing companies, this implies that their cost of capital is not affected by the regulations. Hence, we conclude that the EU ESG regulations do not have a direct further aggravating effect on the already prevailing underinvestment into the sourcing of battery raw materials. However, there are two aspects to be considered by policy makers going forward: Firstly, it is often argued that shareholders of battery raw material mining companies have a strong lever to incentivize a more ESG-compliant behavior of such companies. With EU banks holding lesser shares in such companies, their influence will also diminish. Secondly, we have assessed the current global policy landscape, in which legally binding ESG regulations affect banks. If the introduction of such regulations becomes more comprehensive globally, an ownership substitution might not remain the sole effect, but the total demand might decrease. This would then entail a decrease in share prices, and, thus, a *ceteris paribus* increase in the companies' cost of capital. Then, the introduction of ESG regulations imposed on banks could have an aggravating effect on the underinvestment into battery materials sourcing.

6.3 The Impact of Mining Companies' ESG Performance

To the end of generating further insight regarding the impact of the environmental, social and governance ratings and disclosure on the banks' public holding structure, we take a twofold approach: on the one hand, we consider the impact of ESG-related control variables within the above analysis. On the other hand, we perform additional checks by splitting the sample of banks into "ESG low and high performers".

Our results show a statistically significant, but small positive impact of the disclosure-adjusted S-rating of the mining companies, both in the context of the SFDR and the Taxonomy. However, we do not observe any statistically significant impact of the disclosure-adjusted E-rating (see Tables A.18 to A.20). For additional robustness checks, we define all companies

within the first to third quartiles of the disclosure-adjusted E-, S- and G-ratings as "ESG low performers", and all companies within the fourth quartile as "ESG high performers". For these two groups, we analyze the bank behavior based on eq. (2) to (4). The additional analyses reveal that for the ESG low performers, the results remain unchanged, and we keep observing dampening effects for the adoption and entering into force of the SFDR, as well as for the adoption of the Taxonomy. For the ESG high performers, we do not observe any statistically significant effects. These results suggest that the dampening effect only applies to public holdings of battery raw material mining companies with a comparably bad ESG rating, while the public holdings of battery raw materials with comparably good ESG ratings remain unaffected (see Tables A.45 to A.47).

Bringing these two findings together, we can conclude that the introduction and execution of ESG regulation—on the example of the SFDR and the Taxonomy—has a dampening effect on banks' public holdings in those battery raw material companies with a comparably bad ESG rating, and that improvements in the ESG rating, especially in the S-rating, can mitigate those effects.

7 Conclusions

7.1 Key Results

ESG banking regulation can be an effective lever to support sustainable growth and the implementation of a sustainability transition. However, there is a potential trade-off between incentivizing banks to allocate capital in a more ESG-compliant way and to not inhibit capital provision to activities. A trade-off is evident: industrial activities providing battery raw

materials, which are less ESG-compliant are, however, essential to achieve proclaimed sustainability policy targets.

We have assessed this potential trade-off by analyzing the impact of EU ESG regulations affecting banks—i.e., the SFDR and the Taxonomy—in two steps: firstly, we have analyzed the impact on banks' capital allocation—i.e., on their public holdings of and lending to battery raw material companies. Secondly, we have investigated the impact on banks' cost of capital, to the end of further understanding whether the potential decreases in public holdings and lending entail a real effect on the affected companies' ability to raise capital.

With regard to the effects of EU-wide ESG regulations that have an impact on banks, we find statistically significant dampening effects of the adoption and entering into force of the SFDR and the Taxonomy on the banks' public holdings in companies active in the sourcing of battery raw materials (Lithium, Cobalt, Manganese and Nickel). Those effects are more pronounced for the entering into force of the regulation as compared to its adoption. Furthermore, assessing the role of the (disclosure-adjusted) ESG-rating of the companies, we find that the dampening effect does not prevail for those companies, which are better rated (i.e., which belong to the fourth quartile of the sample). Concerning the share prices, we observe continued parallel trends of share prices of companies, whose shares are held by banks affected by the ESG regulation, and those, whose shares are held by the unaffected banks. From this observation, we can conclude that the decreasing demand for shares of the affected banks is compensated by an increasing demand of the unaffected banks, i.e., that we observe an ownership substitution effect. This implies that there are no *ceteris paribus* changes in the cost of capital of battery raw material mining companies caused by the introduction of the ESG regulations SFDR and the Taxonomy. Still, the change in the shareholder structure has two implications: firstly, the lever of EU banks to incentivize a more ESG-compliant behavior of battery raw material mining companies diminishes with the decrease in their shares held. Secondly, if the introduction of similar regulations becomes more comprehensive globally, an

ownership substitution might not remain the sole effect, but the total demand might decrease. This might entail an increase in the cost of capital of battery raw material mining companies if they do not manage to increase their ESG performance.

7.2 Implications and Policy Recommendations

The above findings have several implications with regard to ESG regulation. First and foremost, the observation that banks, which are affected by the SFDR and the Taxonomy decrease their public holdings in battery raw materials, and especially in those, which do not perform well across the ESG dimensions, implies that the regulations lead to the intended effects. Also, in the current setup, there is no coinciding increase in the companies' share prices and, thus, cost of capital. Hence, the ESG regulations currently do not aggravate the underinvestment in battery raw materials sourcing. However, as mentioned above, this may change if comparable regulations are introduced more comprehensively on a global level. Furthermore, the lever to incentivize companies to increase their ESG performance diminishes.

Nevertheless, policy makers might consider continuing efforts towards incentivizing companies aiming to increase their ESG performance beyond national or EU borders. This could, for instance, be realized by forging alliances and further promoting internationally harmonized regulations.

Overall, maintaining the balance between not dis-incentivizing the financial sector to provide capital to ESG-uncompliant companies or assets on the one hand, while at the same time not sacrificing the leverage to incentivize more ESG-compliant industrial behavior on the other hand remains a key challenge for current and future policy making.

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Appendix

A.1 Literature Classification

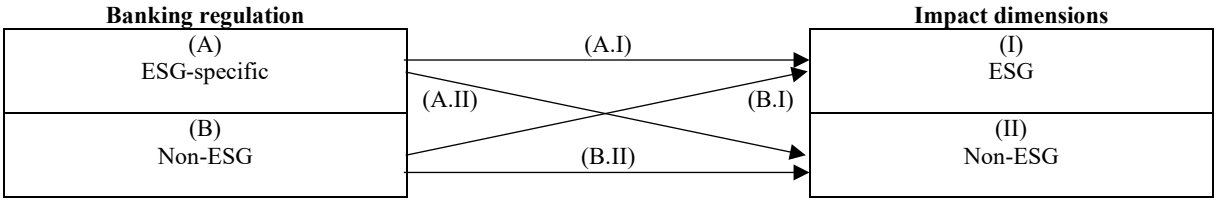


Figure A.1: Banking Regulation and Impact Dimensions

	Bank level	System level (Financial economy)	Macroeconomic level (Overall economy)
(I) ESG	• Bank-level ESG risk exposure & management (incl. climate risk) • ESG-compliant capital allocation (e.g., green lending, green bonds issuance etc.) • ESG-compliant business conduct (e.g., meeting ESG requirements such as women quota in management boards)	• Systemic ESG risk (incl. climate risk)	• Achievement of ESG targets (e.g., investments into sustainable technologies, carbon emission reduction) • Welfare
(II) Non-ESG	• Bank-level risk exposure & management (e.g., probability of default / crises) • Banks' business performance (e.g., funding costs, revenues)	• Systemic risk • Financial economy indicators (e.g., interbank & interest rates)	• Macroeconomic indicators (e.g., gross domestic product (GDP), inflation)

Figure A.2: Impact Dimensions

A.2 ESG Measures and Regulations

Table A.1: Sustainable Finance—Non-binding Measures and Binding Regulations

Country	Non-binding measures	Binding regulations
AU	Announcement of Federal Government's sustainable financing strategy (12/2022)	n.a.
CA	Canadian Securities Administrators' (CSA) proposition of climate-related disclosure requirements (10/2021, subject to public consultation)	n.a.; *CSA's proposed climate-related disclosure requirements may become legally binding in the future*
CH	Report on sustainability in the financial sector with 15 measures for implementation between 2022 and 2025	n.a.
CN	Various regulations and measures introduced (2017) (Wang and Ziying, 2023)	Various regulations and measures introduced (2017) (Wang and Ziying, 2023)
HK	Various regulations and measures introduced in 2019 (HKMA, 2023)	Various regulations and measures introduced in 2019 (HKMA, 2023)
JP	Basic Guidelines on Climate Transition Finance (05/2022) (FSA, 2021)	Cabinet Office Ordinance on Disclosure of Corporate Information (01/2023)
OM	Green Financing Roadmap (09/2023) (FCME, 2023)	n.a.
SG	• Guidelines on Environmental Risk Management (Banks) (MAS, 2020) (12/2020) • Information Paper on Environmental Risk Management (Banks) (MAS, 2022) (05/2022) • ASEAN Taxonomy for sustainable Finance (11/2021) (ASEAN, 2021)	n.a.

UK	UK Green Finance Strategy (03/2023)	UK Sustainable Disclosure Regulation (SDR) (04/2022) announcing legally binding regulation for 2025 onwards
US	No harmonized national measures	No comprehensive national regulation; various and specific regulations on the state level (e.g., California's Divestiture of Thermal Coal)
ZA	Technical Paper Financing a Sustainable Economy (01/2021), (National Treasury, 2021)	n.a.

Table A.2: Supra-national Non-binding Measures

	Non-binding Measures*				
Coordinator	United Nations	G20	Basel Committee	Financial Stability Board	EU
Measure Name	United Nations Environment Programme Finance Initiative (UNEP FI)	G20 Sustainable Finance Working Group	Principles for the effective management of climate-related financial risks	TCFD	Non-binding components of Renewed Sustainable Finance Strategy (RSFS) incl. Sustainable EU Investment Plan (part of EU Green Deal)
Issuance / Founding Date	1992	2016	06/2022	2015	2019
	Participating Economies*				
EU	x	x		x	x
EZ	x	x	x	x	x
BE	x		x	x	
CY	x		x	x	
CZ	x			x	
DE	x	x	x	x	
DK	x			x	
FR	x	x	x	x	
IE	x		x	x	
IT	x	x	x	x	
LU	x		x	x	
NL	x		x	x	
AU	x	x		x	
CA	x	x	x	x	
CH	x		x	x	
CN	x	x		x	
HK	x			x	
IM	x				
JP	x	x	x	x	
OM	x				
SA	x	x		x	
SG	x			x	
UK	x	x	x	x	
US	x	x	x	x	
ZA	x	x		x	

* Coordination involving public institutions, e.g., international organizations. In addition, may initiatives amongst private sector player stakeholders only exist, which are not listed here.
** x indicates for which economies the non-binding measures apply.

A.3 Data and Descriptive Statistics

A.3.1 Variables Overview

Table A.3: Variables Overview

Variable Name	Variable	Unit	Description	Database
Public holdings battery raw material mining companies	*_ph (meaning batmat_ph ni_ph, cob_ph, mn_ph, ni_ph)	EUR	Banks' public holdings Lithium, Cobalt, Manganese, Nickel exploration & mining activities of companies	S&P CapitalIQ
All public holdings	all_ph	EUR	Banks' total public holdings	S&P CapitalIQ
Carbon price	co_hq_co2_pr	EUR	Carbon price at the mining companies' headquarter location	World Bank
Companies' share prices	co_share_pr	EUR	Quarterly share price of battery raw material companies	S&P CapitalIQ
Companies' dividends	co_div	EUR	Dividends of battery raw material companies	S&P CapitalIQ
Companies' revenues	co_rev	EUR	Revenues of battery raw material companies	S&P CapitalIQ
Companies' credit risk	co_credit_risk	Scale 0 to 1	Credit risk (S&P Credit rating) of battery raw material companies	S&P CapitalIQ
Companies' headquarter location	co_hq_loc	n.a.	Country in which the company's headquarter is legally registered	S&P CapitalIQ
Companies' environmental rating	co_E_rtg	Scale 0 to 10	Companies' environmental rating on a scale from 0 (lowest) to 10 (highest)	Bloomberg
Companies' environmental disclosure	co_E_disc	%	Companies' disclosure of data points constituting the Bloomberg environmental score	Bloomberg
Companies' social rating	co_S_rtg	Scale 0 to 10	Companies' environmental rating on a scale from 0 (lowest) to 10 (highest)	Bloomberg
Companies' social disclosure	co_S_disc	%	Companies' disclosure of data points constituting the Bloomberg social score	Bloomberg
Companies' governance rating	co_G_rtg	Scale 0 to 10	Companies' environmental rating on a scale from 0 (lowest) to 10 (highest)	Bloomberg
Companies' governance disclosure	co_G_disc	%	Companies' disclosure of data points constituting the Bloomberg governance score	Bloomberg
Non-binding ESG measures	bnk_esg_nbm	dummy	Dummy variable indicating introduction of non-binding ESG measures	See Tables A.1 and A.2
Binding ESG regulations	bnk_esg_breg	dummy	Dummy variable indicating introduction of binding ESG regulations. Robustness check: exclusion of banks headquartered in countries, where such regulations exist	See Table A.1
Binding anti-ESG regulations	bnk_anti_esg_breg	dummy	Dummy variable indicating introduction of binding anti-ESG regulations in some US states	Various
Lithium price	li_price	EUR	Lithium price; average Lithium Carbonate and Lithium Hydroxite	Refinitiv Eikon
Cobalt price	cob_price	EUR	Cobalt price	Refinitiv Eikon
Manganese price	mn_price	EUR	Manganese price	Refinitiv Eikon

Nickel price	ni_price	EUR	Nickel price; average class 1 (premium) and class 2 Nickel	Refinitiv Eikon
Copper price	cop_price	EUR	Copper price	Refinitiv Eikon
Aluminum price	al_price	EUR	Aluminum price	Refinitiv Eikon
Tin price	tin_price	EUR	Tin price	Refinitiv Eikon
YY GDP change	yy_gdp_chg	%	YY GDP change	S&P CapitalIQ
YY inflation	yy_infl	%	YY inflation	S&P CapitalIQ

This table provides an overview of all main variables used throughout the empirical analysis for banks' public holdings and lending. All variables are available quarterly from Q1/2015 to Q3/2023.

A.3.2 Descriptive Statistics: ESG Regulation—Public Holdings Battery Raw Materials

Table A.4: Public Holdings Battery Raw Materials—Descriptive Statistics

VARIABLES	Observations (matched)	Mean	Std. Dev.	Min	P25	Median	P75	Max
batmat_ph	119,526	$1.4*10^6$	$1.8*10^7$	0.00	0.00	0.00	0.00	$1.1*10^9$
batmat_ph_s	119,526	0.14	1.76	0.00	0.00	0.00	0.00	108.48
all_ph	119,526	$4.3*10^9$	$1.5*10^{10}$	$(3.1*10^6)$	$1.3*10^7$	$2.2*10^8$	$1.9*10^9$	$1.0*10^{12}$
all_ph_s	119,526	4.31	15.39	(0.00)	0.01	0.22	1.92	1,042.22
co_share_pr	119,526	45.83	178.42	(0.25)	0.04	3.13	18.91	4,352.43
co_share_pr_s	119,526	4.58	17.84	(0.03)	0.00	0.31	1.89	435.24
co_div	119,526	0.06	0.19	0.00	0.00	0.00	0.02	14.88
co_credit_risk	119,526	0.20	0.30	0.00	0.00	0.00	0.58	0.75
co_rev	119,526	1,225.54	3,718.93	(569.09)	0.00	31.43	901.37	64,300.26
co_rev_s	119,526	1.23	3.72	(0.57)	0.00	0.03	0.90	64.30
co_E_rtg	119,526	1.58	2.37	0.00	0.00	0.00	3.44	8.26
co_E_disc	119,526	0.20	0.30	0.00	0.00	0.00	0.44	1.00
co_E	119,526	1.00	1.70	0.00	0.00	0.00	1.50	7.13
co_S_rtg	119,526	1.52	2.37	0.00	0.00	0.00	2.55	8.30
co_S_disc	119,526	0.18	0.46	0.00	0.00	0.00	0.29	1.00
co_S	119,526	0.95	3.07	0.00	0.00	0.00	0.77	7.20
co_G_rtg	119,526	2.58	3.24	0.00	0.00	0.00	6.31	8.62
co_G_disc	119,526	0.38	0.48	0.00	0.00	0.00	1.00	1.00
co_G	119,526	2.50	3.23	0.00	0.00	0.00	6.25	8.62
co_hq_co2_pr	119,526	18.47	32.09	0.00	0.00	0.00	32.07	207.30
yy_gdp_chg	119,526	0.03	0.02	(0.03)	0.03	0.04	0.03	0.06
yy_infl	119,526	0.04	0.02	0.03	0.03	0.04	0.03	0.09
li_price	119,526	20,221.74	20,375.20	4,879.25	6,555.64	10,509.27	23,087.15	73,319.68
li_price_s	119,526	2.02	2.04	0.49	0.66	1.05	2.31	7.33
cob_price	119,526	18.51	6.79	10.16	12.52	15.91	23.00	33.06
mn_price	119,526	4.42	0.72	2.67	3.98	4.41	4.90	6.52
ni_price	119,526	6.25	2.28	3.64	4.56	5.51	7.13	12.82
bnk_esg_nbm	119,526	0.04	0.19	0.00	0.00	0.00	0.00	1.00
bnk_esg_breg	119,526	0.08	0.27	0.00	0.00	0.00	0.00	1.00
bnk_anti_esg_breg	119,526	0.01	0.07	0.00	0.00	0.00	0.00	1.00

This table reports descriptive statistics for the variables used in the main empirical analysis for banks' public holdings in the overall battery raw material sourcing. The baseline sample consists of 119,526 batmat_ph observations between Q1/2015 and Q3/2023. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.3.3 Descriptive Statistics: ESG Regulation—Public Holdings Lithium

Table A.5: Public Holdings Lithium—Descriptive Statistics

VARIABLES	Observations (matched)	Mean	Std. Dev.	Min	P25	Median	P75	Max
li_ph	30,065	$8.8*10^3$	$3.0*10^5$	0.00	0.00	0.00	0.00	$2.1*10^7$
li_ph_s	30,065	0.09	2.99	0.00	0.00	0.00	0.00	205
all_ph	30,065	$4.7*10^9$	$1.6*10^{10}$	0.00	$1.3*10^7$	$2.0*10^8$	$1.9*10^9$	$1.4*10^{11}$
all_ph_s	30,065	47.39	159.82	0.00	0.13	2.01	18.87	1,348.08
co_share_pr	30,065	18.76	42.12	0.00	0.01	0.25	9.95	383.99
co_share_pr_s	30,065	1.88	4.21	0.00	0.00	0.03	1.00	38.40
co_div	30,065	0.07	0.15	0.00	0.00	0.00	0.00	1.79
co_credit_risk	30,065	0.16	0.28	0.00	0.00	0.00	0.00	0.70
co_rev	30,065	370.92	1,130.36	(36.48)	0.00	0.00	299.98	14,241.38
co_rev_s	30,065	3.71	11.30	(0.36)	0.00	0.00	3.00	142.41
co_E_rtg	30,065	1.33	2.15	0.00	0.00	0.00	3.15	8.26
co_E_disc	30,065	0.15	0.25	0.00	0.00	0.00	0.31	0.79
co_S_rtg	30,065	1.40	2.42	0.00	0.00	0.00	2.23	8.28
co_S_disc	30,065	0.14	0.25	0.00	0.00	0.00	0.17	0.80
co_G_rtg	30,065	2.45	3.29	0.00	0.00	0.00	6.40	7.90
co_G_disc	30,065	0.36	0.47	0.00	0.00	0.00	1.00	1.00
co_hq_co2_pr	30,065	17.01	29.59	0.00	0.00	0.00	20.45	135.77
bnk_hq_co2_pr	30,065	14.14	28.78	0.00	0.00	0.00	13.12	135.77
yy_gdp_chg	30,065	0.03	0.02	(0.03)	0.03	0.03	0.04	0.06
yy_infl	30,065	0.04	0.02	0.03	0.03	0.04	0.05	0.09
li_price	30,065	20,221.74	20,375.20	4,879.25	6,555.64	10,509.27	23,087.15	73,319.68
li_price_s	30,065	2.02	2.04	0.49	0.66	1.05	2.31	7.33
bnk_esg_nbm	30,065	0.04	0.19	0.00	0.00	0.00	0.00	1.00
bnk_esg_breg	30,065	0.07	0.26	0.00	0.00	0.00	0.00	1.00
bnk_anti_esg_breg	30,065	0.01	0.08	0.00	0.00	0.00	0.00	1.00

This table reports descriptive statistics for the variables used in the main empirical analysis for banks' public holdings in Lithium sourcing. The baseline sample consists of 30,065 li_ph observations between Q1/2015 and Q3/2023. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.3.4 Descriptive Statistics: ESG Regulation—Public Holdings Cobalt

Table A.6: Public Holdings Cobalt—Descriptive Statistics

VARIABLES	Observations (matched)	Mean	Std. Dev	Min	P25	Median	P75	Max
cob_ph	27,160	$2.5*10^6$	$2.7*10^7$	0.00	0.00	0.00	0.00	$8.1*10^8$
cob_ph_s	27,160	0.25	2.74	0.00	0.00	0.00	0.00	80.47
all_ph	27,160	$7.1*10^9$	$2.0*10^{10}$	$(3.1*10^6)$	$2.2*10^7$	$6.3*10^8$	$3.2*10^9$	$1.0*10^{11}$
all_ph_s	27,160	7.14	19.53	0.00	0.02	0.63	3.21	100.02
co_share_pr	27,160	10.83	25.35	0.00	0.05	1.35	14.59	437.52
co_share_pr_s	27,160	1.08	2.54	0.00	0.00	0.13	1.46	43.75
co_div	27,160	0.06	0.30	0.00	0.00	0.00	0.03	14.88
co_credit_risk	27,160	0.18	0.28	0.00	0.00	0.00	0.57	0.72
co_rev	27,160	1,337.76	5,085.30	(569.09)	0.00	15.04	626.13	64,300.26
co_rev_s	27,160	1.34	5.09	(0.57)	0.00	0.02	0.63	64.30
co_E_rtg	27,160	1.74	2.47	0.00	0.00	0.00	3.91	7.64
co_E_disc	27,160	0.21	0.30	0.00	0.00	0.00	0.44	0.97
co_S_rtg	27,160	1.53	2.29	0.00	0.00	0.00	2.37	8.02
co_S_disc	27,160	0.20	0.61	0.00	0.00	0.00	0.29	6.83
co_G_rtg	27,160	2.70	3.18	0.00	0.00	0.00	6.12	8.16
co_G_disc	27,160	0.41	0.47	0.00	0.00	0.00	1.00	1.00
co_hq_co2_pr	27,160	28.12	37.72	0.00	0.00	8.24	45.76	207.30
yy_gdp_chg	27,160	0.03	0.02	(0.03)	0.03	0.03	0.04	0.06
yy_infl	27,160	0.04	0.02	0.03	0.03	0.04	0.05	0.09
cob_price	27,160	18.51	6.79	10.16	12.52	15.91	23.00	33.06
bnk_esg_nbm	27,160	0.06	0.23	0.00	0.00	0.00	0.00	1.00
bnk_esg_breg	27,160	0.08	0.28	0.00	0.00	0.00	0.00	1.00
bnk_anti_esg_breg	27,160	0.01	0.07	0.00	0.00	0.00	0.00	1.00

This table reports descriptive statistics for the variables used in the main empirical analysis for banks' public holdings in Cobalt sourcing. The baseline sample consists of 27,160 cob_ph observations between Q1/2015 and Q3/2023. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.3.5 Descriptive Statistics: ESG Regulation—Public Holdings Manganese

Table A.7: Public Holdings Manganese—Descriptive Statistics

VARIABLES	Observations (matched)	Mean	Std. Dev	Min	P25	Median	P75	Max
mn_ph	11,900	$1.1*10^6$	$1.5*10^7$	0.00	0.00	0.00	0.00	$6.7*10^8$
mn_ph_s	11,900	1.06	14.49	0.00	0.00	0.00	0.00	673.97
all_ph	11,900	$5.0*10^9$	$1.6*10^{10}$	$(3.1*10^6)$	$1.7*10^7$	$4.4*10^8$	$2.3*10^9$	$1.0*10^{11}$
all_ph_s	11,900	4.96	15.92	0.00	0.02	0.44	2.31	100.02
co_share_pr	11,900	70.31	97.46	0.00	0.16	26.96	106.86	1,496.00
co_share_pr_s	11,900	7.03	9.74	0.00	0.02	2.69	10.68	149.60
co_div	11,900	0.06	0.17	0.00	0.00	0.00	0.00	1.40
co_credit_risk	11,900	0.23	0.32	0.00	0.00	0.00	0.66	0.72
co_rev	11,900	1,976.02	3,141.47	(569.09)	0.00	240.97	2,288.24	14,626.71
co_rev_s	11,900	1.98	3.14	(0.56)	0.00	0.24	2.29	14.63
co_E_rtg	11,900	2.07	2.57	0.00	0.00	0.00	4.39	7.64
co_E_disc	11,900	0.24	0.29	0.00	0.00	0.00	0.57	0.75
co_S_rtg	11,900	1.74	2.32	0.00	0.00	0.00	3.36	8.30
co_S_disc	11,900	0.22	0.29	0.00	0.00	0.00	0.49	0.82
co_G_rtg	11,900	2.73	2.90	0.00	0.00	2.99	5.08	8.07
co_G_disc	11,900	0.45	0.45	0.00	0.00	0.70	0.86	1.00
co_hq_co2_pr	11,900	25.54	36.54	0.00	0.00	0.00	44.24	135.77
yy_gdp_chg	11,900	0.03	0.02	(0.02)	0.03	0.03	0.04	0.06
yy_infl	11,900	0.04	0.02	0.03	0.03	0.04	0.05	0.09
mn_price	11,900	4.43	0.72	2.67	3.98	4.41	4.90	6.52
bnk_esg_nbm	11,900	0.05	0.21	0.00	0.00	0.00	0.00	1.00
bnk_esg_breg	11,900	0.09	0.28	0.00	0.00	0.00	0.00	1.00
bnk_anti_esg_breg	11,900	0.00	0.06	0.00	0.00	0.00	0.00	1.00

This table reports descriptive statistics for the variables used in the main empirical analysis for banks' public holdings in Manganese sourcing. The baseline sample consists of 11,900 mn_ph observations between Q1/2015 and Q3/2023. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.3.6 Descriptive Statistics: ESG Regulation—Public Holdings Nickel

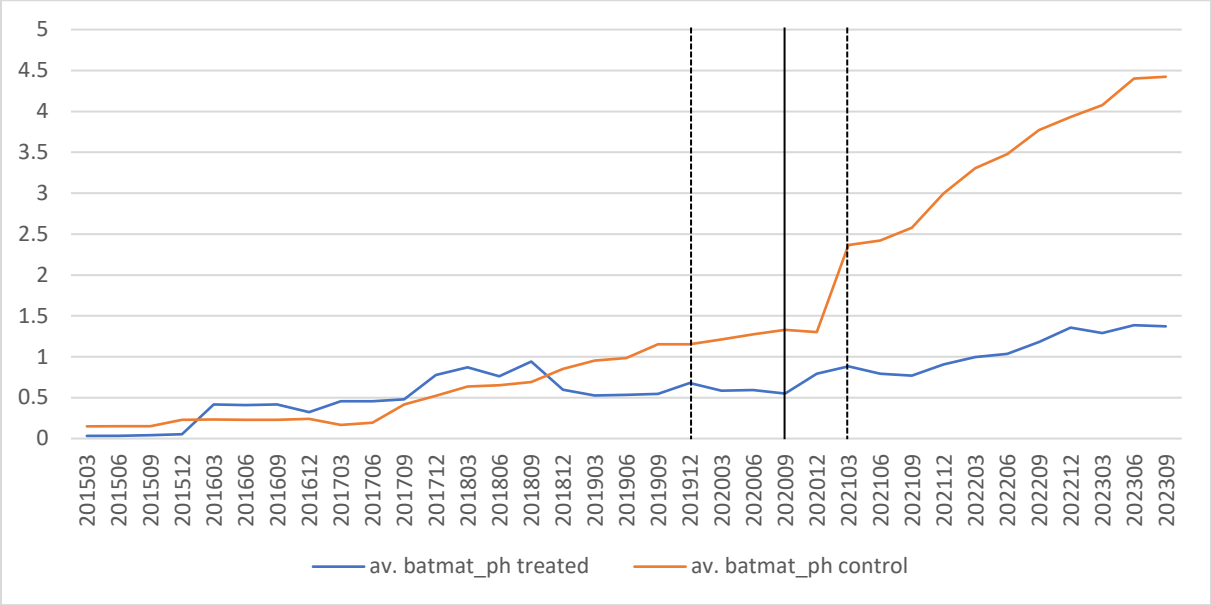
Table A.8: Public Holdings Nickel—Descriptive Statistics

VARIABLES	Observations (matched)	Mean	Std. Dev	Min	P25	Median	P75	Max
ni_ph	41,685	$1.6*10^6$	$1.1*10^7$	0.00	0.00	0.00	1,169.00	$3.7*10^8$
ni_ph_s	41,685	1.62	10.73	0.00	0.00	0.00	0.00	367.96
all_ph	41,685	$4.2*10^9$	$1.6*10^{10}$	$(3.1*10^6)$	$1.1*10^7$	$1.8*10^8$	$1.8*10^9$	$1.0*10^{12}$
all_ph_s	41,685	4.20	16.05	(0.00)	0.01	0.18	1.78	1,042.22
co_share_pr	41,685	92.06	269.96	(0.25)	0.97	10.03	24.37	4,325.43
co_share_pr_s	41,685	0.92	2.70	0.00	0.01	0.10	0.24	43.52
co_div	41,685	0.05	0.13	0.00	0.00	0.00	0.03	2.07
co_credit_risk	41,685	0.20	0.30	0.00	0.00	0.00	0.57	0.75
co_rev	41,685	1,505.50	4,029.86	(569.09)	0.00	382.30	1,022.69	64,300.26
co_rev_s	41,685	1.51	4.03	(0.57)	0.00	0.00	1.02	64.30
co_E_rtg	41,685	1.47	2.33	0.00	0.00	0.00	3.39	7.64
co_E_disc	41,685	0.21	0.33	0.00	0.00	0.00	0.54	1.00
co_S_rtg	41,685	1.41	2.27	0.00	0.00	0.00	2.52	8.30
co_S_disc	41,685	0.19	0.50	0.00	0.00	0.00	0.27	1.00
co_G_rtg	41,685	2.48	3.29	0.00	0.00	0.00	6.51	8.62
co_G_disc	41,685	0.36	0.49	0.00	0.00	0.00	1.00	1.00
co_hq_co2_pr	41,685	13.54	28.40	0.00	0.00	0.00	11.33	207.30
yy_gdp_chg	41,685	0.03	0.02	(0.03)	0.03	0.03	0.04	0.06
yy_infl	41,685	0.03	0.02	0.03	0.03	0.04	0.05	0.09
ni_price	41,685	6.25	2.28	3.64	4.56	5.51	7.13	12.82
bnk_esg_nbm	41,685	0.04	0.18	0.00	0.00	0.00	0.00	1.00
bnk_esg_breg	41,685	0.08	0.27	0.00	0.00	0.00	0.00	1.00
bnk_anti_esg_breg	41,685	0.01	0.07	0.00	0.00	0.00	0.00	1.00

This table reports descriptive statistics for the variables used in the main empirical analysis for banks' public holdings in Nickel sourcing. The baseline sample consists of 41,685 ni_ph observations between Q1/2015 and Q3/2023. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

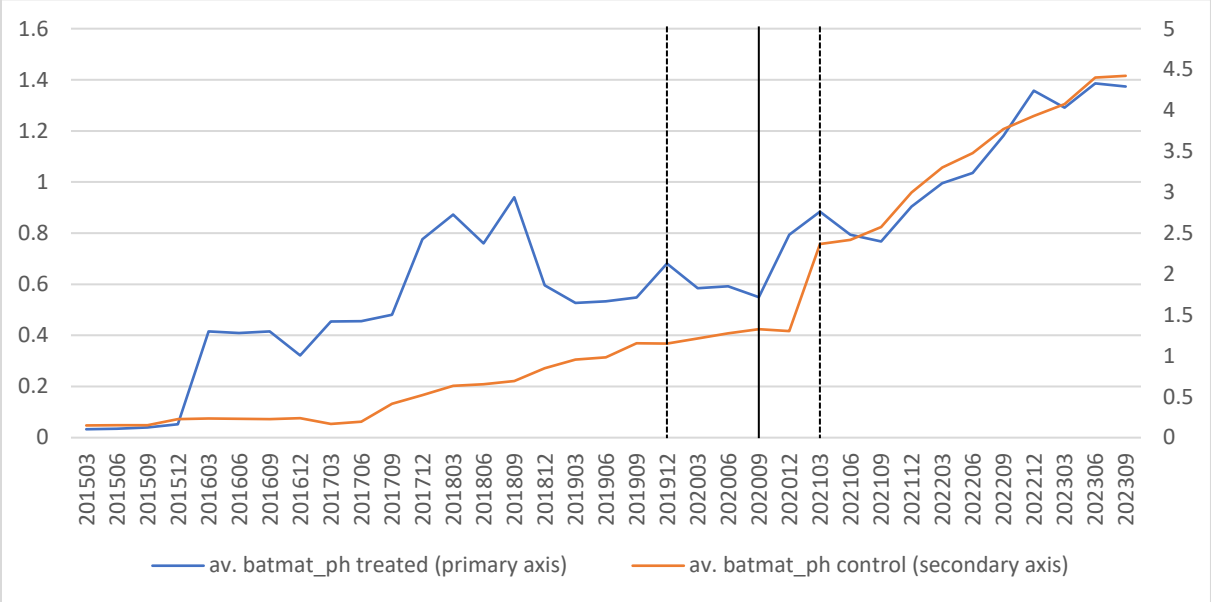
A.4 Parallel Trends

A.4.1 Parallel Trends: ESG Regulation—Public Holdings Battery Raw Materials



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.3a: Public Holdings Battery Raw Materials (batmat_ph, per-bank average, M EUR)



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.3b: Public Holdings Battery Raw Materials (batmat_ph, per-bank average, M EUR)

Table A.8: Public Holdings Battery Raw Materials—Parallel Trends Normalized Differences

	Treated		Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
batmat_ph_s	0.05	0.41	0.05	0.54	0.00
all_ph_s	8.43	20.79	2.79	11.00	0.33
co_share_pr_s	1.08	2.59	1.22	2.13	0.06
co_div	0.04	0.22	0.05	0.12	0.01
co_credit_risk	0.16	0.28	0.20	0.30	0.15
co_rev_s	1.76	5.91	0.93	2.95	0.18
co_E_rtg	1.39	2.07	1.24	2.00	0.08
co_E_disc	0.18	0.28	0.16	0.27	0.08
co_S_rtg	1.13	1.82	1.21	2.00	0.04
co_S_disc	0.16	0.43	0.15	0.51	0.01
co_G_rtg	2.35	3.13	2.37	3.14	0.01
co_G_disc	0.36	0.47	0.36	0.47	0.00
co_hq_co2_pr	17.16	21.86	8.91	17.34	0.42
yy_gdp_chg	0.03	0.00	0.03	0.00	0.00
yy_infl	0.03	0.00	0.03	0.00	0.00
li_price_s	1.13	5.34	1.13	5.34	0.00
cob_price	17.92	6.66	17.92	6.66	0.00
mn_price	4.52	0.91	4.52	0.91	0.00
ni_price	4.81	0.84	4.81	0.84	0.00
bnk_esg_nbm	0.00	0.00	0.01	0.08	0.11
bnk_esg_breg	0.00	0.00	0.03	0.18	0.27
bnk_anti_esg_breg	0.00	0.00	0.00	0.00	n.a.

This table reports statistics of relevant co-variates over the pre-shock period (Q1/2015 to Q3/2019) dividing the sample between treated (EU headquartered banks) and control group (non-EU headquartered banks). The last column reports normalized differences between treatment and control groups (differences in averages by treatment status, scaled by the square root of the sum of the variances). An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

Table A.9: batmat_ph - Parallel Trends

VARIABLES	(1) batmat_ph Parallel Trends
treat	-14.32**
	(6.289)
afterPT	0
	(1.74e-07)
treat_afterPT	-1.755
	(2.671)
all_ph_s	0.00361**
	(0.00137)
co_share_pr_s	-0.239
	(0.156)
co_div	-4.629***
	(1.550)
co_credit_risk	9.245**
	(4.042)
co_fd_yr	0.00316***
	(0.00105)
co_rev	-0.000906***
	(0.000288)
co_E	2.070
	(1.459)
co_S	0.150
	(1.137)
co_G	5.423
	(3.545)
co_hq_co2_pr	0.687***
	(0.178)
bnk_esg_nbm	8.553
	(7.542)
bnk_esg_breg	-2.112
	(2.389)
bnk_anti_esg_breg	0
	(6.57e-07)
Constant	15.76**
	(6.701)
Observations	65,056
R-squared	0.069

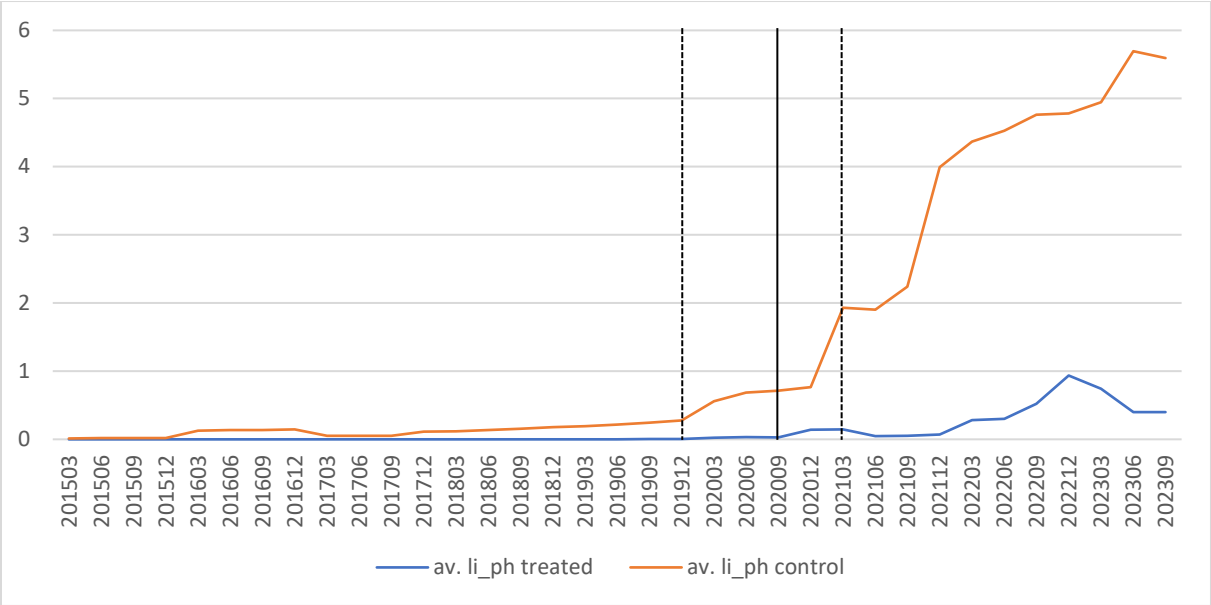
Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method.

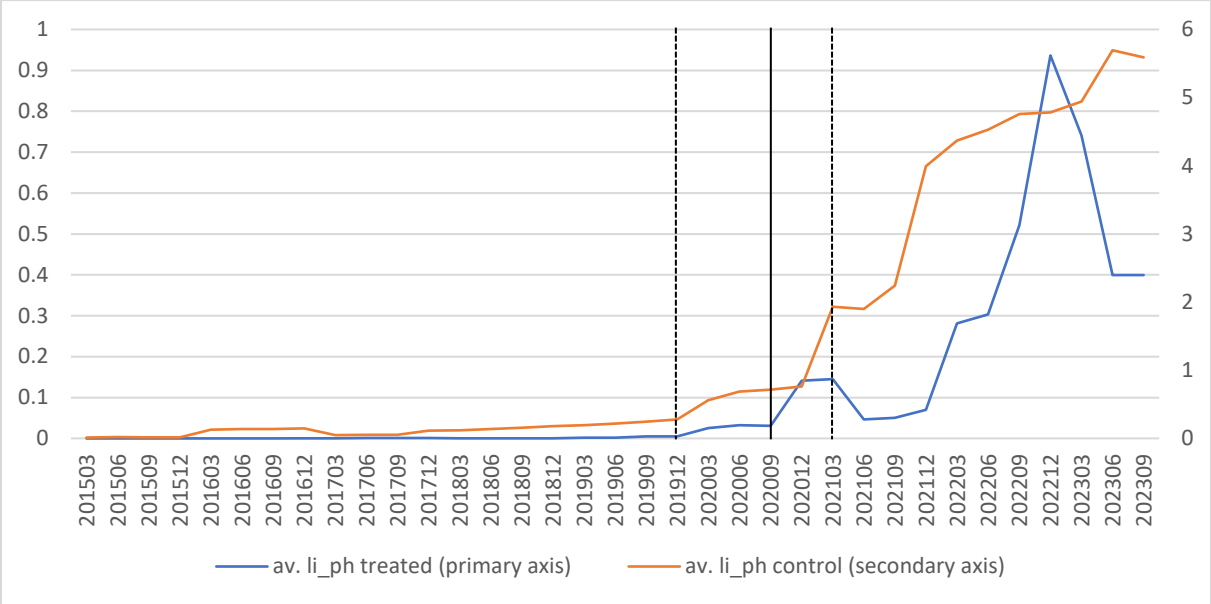
Time fixed effects treated by means of "absorbing" (Correia, 2016).

A.4.2 Parallel Trends: ESG Regulation—Public Holdings Lithium



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.4a: Public Holdings Lithium (li_ph, per-bank average, M EUR)



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.4b: Public Holdings Lithium (li_ph, per-bank average, M EUR)

Table A.10: Public Holdings Lithium—Parallel Trends Normalized Differences

	Treated		Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
li_ph_s	0.00	0.05	0.00	0.00	0.12
all_ph_s	4.44	9.28	39.41	139.59	0.35
co_share_pr_s	0.98	2.49	1.48	2.89	0.19
co_div	0.04	0.09	0.07	0.15	0.25
co_credit_risk	0.14	0.27	0.17	0.29	0.10
co_rev	2.37	6.38	2.85	7.92	0.07
co_E_rtg	0.87	1.54	1.03	1.67	0.10
co_E_disc	0.10	0.19	0.11	0.19	0.06
co_S_rtg	1.09	2.12	1.18	2.14	0.05
co_S_disc	0.09	0.19	0.09	0.19	0.02
co_G_rtg	1.89	3.05	2.30	3.23	0.13
co_G_disc	0.28	0.44	0.33	0.47	0.13
co_hq_co2_pr	12.99	19.04	7.74	15.59	0.30
bnk_hq_co2_pr	12.03	7.55	7.18	15.41	0.40
yy_gdp_chg	0.03	0.00	0.03	0.00	0.00
yy_infl	0.03	0.00	0.03	0.00	0.00
li_price	1.14	0.55	1.14	0.55	0.00
bnk_esg_nbm	0.00	0.00	0.01	0.07	0.10
bnk_esg_breg	0.00	0.00	0.03	0.17	0.25
bnk_anti_esg_breg	0.00	0.00	0.00	0.00	n.a.

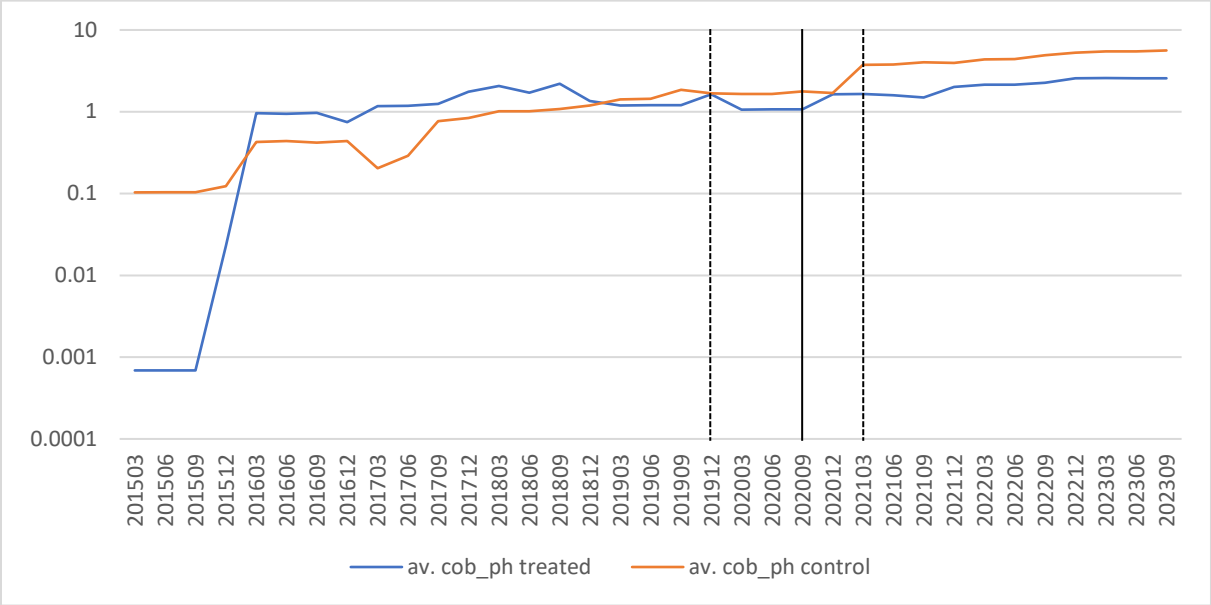
This table reports statistics of relevant co-variates over the pre-shock period (Q1/2015 to Q3/2019) dividing the sample between treated (EU headquartered banks) and control group (non-EU headquartered banks). The last column reports normalized differences between treatment and control groups (differences in averages by treatment status, scaled by the square root of the sum of the variances). An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

Table A.11: Public Holdings Lithium—Parallel Trends Pre-treatment Period

VARIABLES	(1) li_ph Parallel Trends
o.treat	-
afterPT	-0.313
	(0.930)
treat_afterPT	-1.841
	(1.305)
all_ph_s	0.000775
	(0.000469)
co_share_pr_s	-0.0706
	(0.116)
co_div	-0.494
	(2.105)
co_credit_risk	-0.706
	(2.108)
co_fd_yr	-0.00419
	(0.00651)
co_rev	-0.000200
	(0.000312)
co_E_rtg	0.0642
	(0.163)
co_E_disc	-1.146
	(1.586)
co_S_rtg	0.290
	(0.196)
co_S_disc	-3.031*
	(1.688)
co_G_rtg	0.115
	(0.328)
co_G_disc	-2.178
	(2.487)
co_hq_co2_pr	-0.0676
	(0.0786)
bnk_hq_co2_pr	0.195*
	(0.0936)
yy_gdp_chg	-112.4*
	(53.89)
yy_infl	63.57*
	(35.66)
li_price	2.27e-05
	(4.73e-05)
bnk_esg_nbm	20.54
	(14.55)
bnk_esg_breg	-3.069*
	(1.496)
o.bnk_anti_esg_breg	-
Constant	10.73
	(12.26)
Observations	16,530
R-squared	0.157

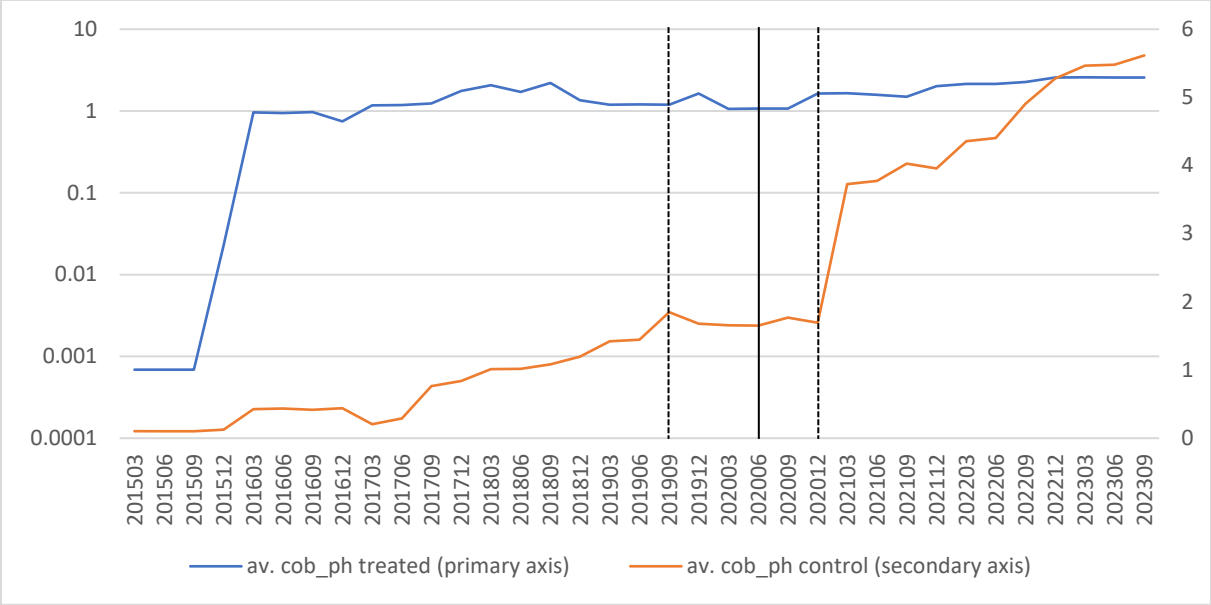
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method
Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016)

A.4.3 Parallel Trends: ESG Regulation—Public Holdings Cobalt



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.5a: Public Holdings Cobalt (cob_ph, per-bank average, M EUR)



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.5b: Public Holdings Cobalt (cob_ph, per-bank average, M EUR)

Table A.12: Public Holdings Cobalt—Parallel Trends Normalized Differences

	Treated		Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
cob_ph_s	0.10	0.67	0.07	0.67	0.05
all_ph_s	16.65	27.18	1.01	3.12	0.81
co_share_pr_s	1.17	3.92	1.05	2.20	0.04
co_div	0.05	0.34	0.05	0.16	0.00
co_credit_risk	0.15	0.27	0.21	0.29	0.20
co_rev	1.86	7.35	1.02	3.88	0.14
co_E_rtg	1.35	2.08	1.42	2.17	0.04
co_E_disc	0.17	0.27	0.18	0.27	0.03
co_S_rtg	1.10	1.78	1.32	2.00	0.12
co_S_disc	0.15	0.58	0.19	0.71	0.06
co_G_rtg	2.48	3.16	2.69	3.17	0.07
co_G_disc	0.38	0.47	0.41	0.47	0.08
co_hq_co2_pr	19.66	23.11	13.04	20.07	0.31
yy_gdp_chg	0.03	0.00	0.03	0.00	0.00
yy_infl	0.03	0.00	0.03	0.00	0.00
cob_price	17.29	6.66	17.29	6.66	0.00
bnk_esg_nbm	0.00	0.00	0.01	0.09	0.13
bnk_esg_breg	0.00	0.00	0.04	0.19	0.27
bnk_anti_esg_breg	0.00	0.00	0.00	0.00	n.a.

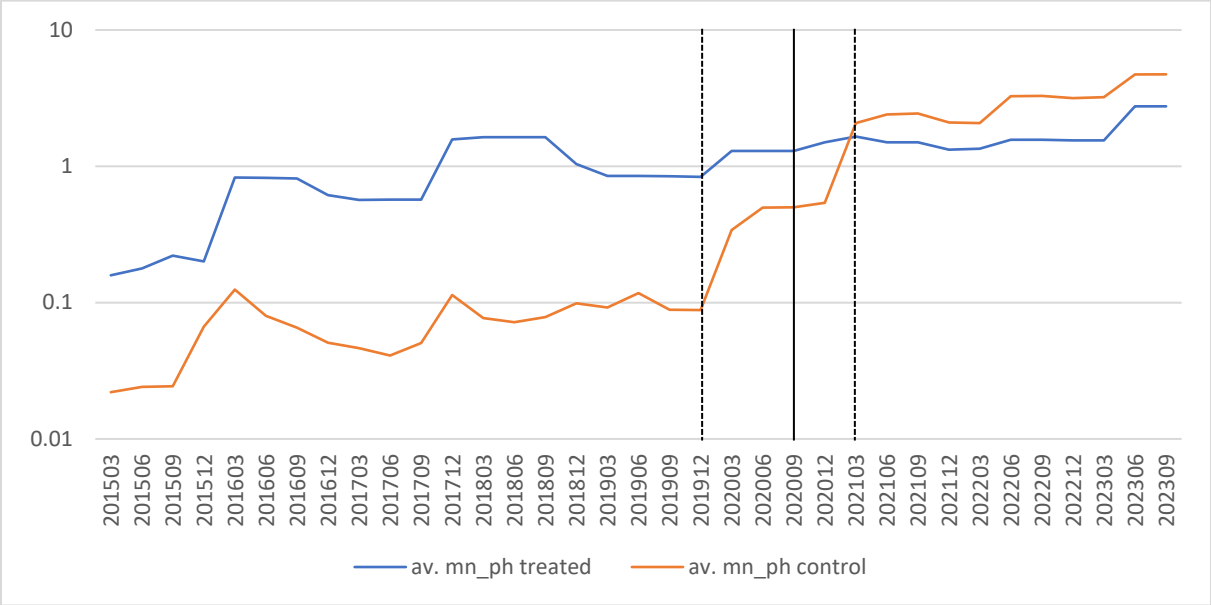
This table reports statistics of relevant co-variates over the pre-shock period (Q1/2015 to Q3/2019) dividing the sample between treated (EU headquartered banks) and control group (non-EU headquartered banks). The last column reports normalized differences between treatment and control groups (differences in averages by treatment status, scaled by the square root of the sum of the variances). An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

Table A.13: Public Holdings Cobalt—Parallel Trends Pre-treatment Period

VARIABLES	(1) cob_ph Parallel Trends
o.treat	-
afterPT	4.570
	(2.811)
treat_afterPT	-13.16
	(8.800)
all_ph_s	0.0517**
	(0.0123)
co_div	-4.033
	(2.085)
co_share_pr_s	-1.178
	(0.948)
co_rev	-0.000445
	(0.000410)
co_E_rtg	0.0347
	(2.074)
co_E_disc	-12.44
	(7.160)
co_S_rtg	0.836
	(0.930)
co_S_disc	-0.438
	(0.294)
co_G_rtg	5.387
	(3.537)
co_G_disc	-42.51
	(29.87)
cob_price	-0.108
	(0.149)
bnk_esg_nbm	1.870
	(20.66)
bnk_anti_esg_breg	0
	(0)
bnk_esg_breg	0
	(0)
yy_gdp_chg	-74.31
	(162.6)
yy_infl	-347.6
	(347.7)
co_hq_co2_pr	1.051*
	(0.379)
Constant	-2.478
	(10.46)
Observations	14,915
R-squared	0.491

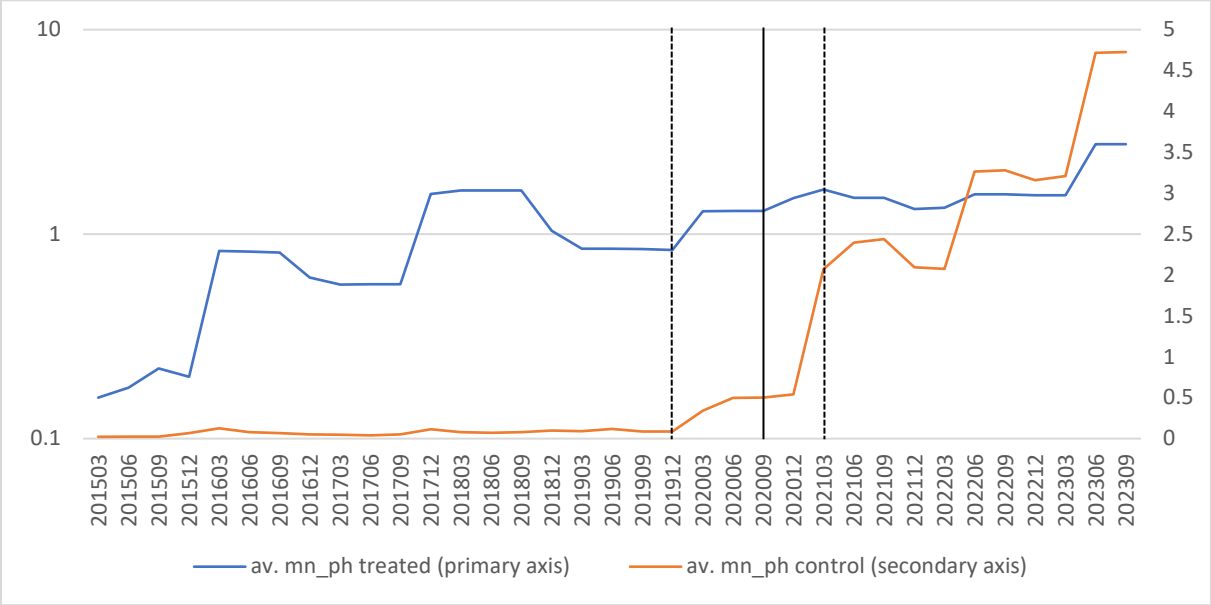
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method
Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016)

A.4.4 Parallel Trends: ESG Regulation—Public Holdings Manganese



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.6a: Public Holdings Manganese (mn_ph, per-bank average, M EUR)



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.6b: Public Holdings Manganese (mn_ph, per-bank average, M EUR)

Table A.14: Public Holdings Manganese—Parallel Trends Normalized Differences

	Treated		Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
mn_ph_s	0.82	4.66	0.07	0.53	0.22
all_ph_s	21.77	29.93	1.24	4.37	0.96
co_share_pr_s	12.90	15.27	5.43	6.55	0.63
co_div	0.09	0.22	0.03	0.08	0.39
co_credit_risk	0.27	0.34	0.23	0.31	0.13
co_rev	2.39	2.49	1.52	2.53	0.35
co_E_rtg	2.40	2.14	1.59	2.21	0.37
co_E_disc	0.32	0.28	0.19	0.25	0.51
co_S_rtg	1.72	1.69	1.24	1.82	0.27
co_S_disc	0.23	0.26	0.16	0.24	0.29
co_G_rtg	3.64	2.90	2.34	2.64	0.47
co_G_disc	0.61	0.45	0.41	0.43	0.45
co_hq_co2_pr	21.68	20.41	13.59	19.50	0.41
yy_gdp_chg	0.03	0.00	0.03	0.00	0.00
yy_infl	0.03	0.00	0.03	0.00	0.00
mn_price	4.52	0.91	4.52	0.91	0.00
bnk_esg_nbm	0.00	0.00	0.01	0.11	0.15
bnk_esg_breg	0.00	0.00	0.03	0.17	0.25
bnk_anti_esg_breg	0.00	0.00	0.00	0.00	n.a.

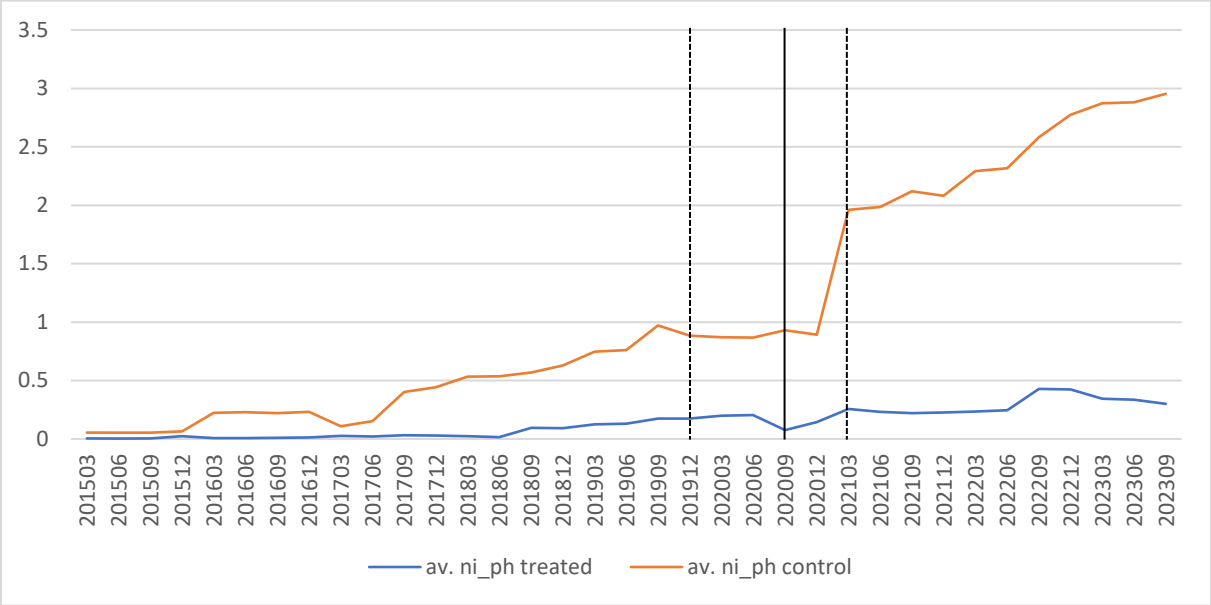
This table reports statistics of relevant co-variates over the pre-shock period (Q1/2015 to Q3/2019) dividing the sample between treated (EU headquartered banks) and control group (non-EU headquartered banks). The last column reports normalized differences between treatment and control groups (differences in averages by treatment status, scaled by the square root of the sum of the variances). An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

Table A.15: Public Holdings Manganese—Parallel Trends Pre-treatment Period

VARIABLES	(1) mn_ph Parallel Trends
o.treat	-
afterPT	-0.130
	(0.400)
treat_afterPT	5.635
	(4.646)
all_ph_s	0.00263
	(0.00368)
co_hq_co2_pr	-0.0346
	(0.0742)
co_share_pr_s	-1.643
	(1.088)
co_div	-2.467**
	(1.093)
co_rev	-4.34e-05
	(5.96e-05)
co_E_rtg	5.053
	(5.066)
co_E_disc	-34.38
	(34.09)
co_S_rtg	0.412
	(0.923)
co_S_disc	16.43**
	(7.853)
co_G_rtg	-1.867
	(1.464)
co_G_disc	5.845
	(5.762)
mn_price	0.0934
	(0.145)
bnk_esg_nbm	-1.578
	(2.230)
o.bnk_esg_breg	-
o.bnk_anti_esg_breg	-
o.yy_gdp_chg	-
o.yy_infl	-
Constant	-1.035
	(2.267)
Observations	6,574
R-squared	0.644

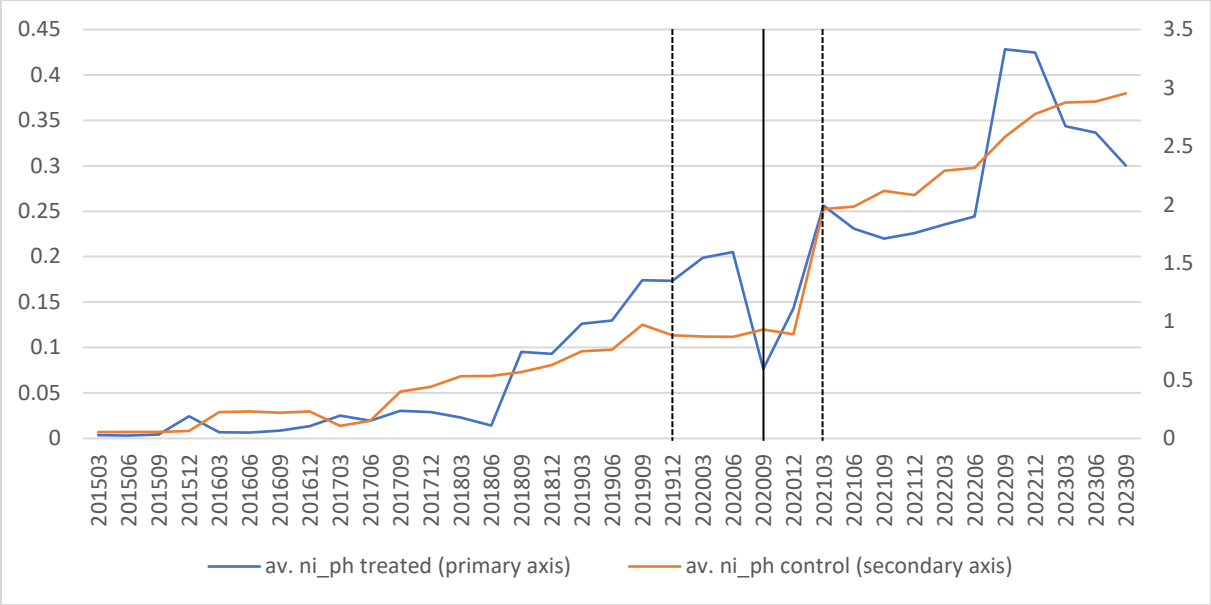
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method
Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016)

A.4.5 Parallel Trends: ESG Regulation—Public Holdings Nickel



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.7a: Public Holdings Nickel (ni_ph, per-bank average, M EUR)



Note: dotted horizontal lines indicate adoption (Q4/2019) and entering into force (Q1/2021) of the SFDR, solid line indicates adoption of the Taxonomy (Q3/2020)

Figure A.7b: Public Holdings Nickel (ni_ph, per-bank average, M EUR)

Table A.16: Public Holdings Nickel—Parallel Trends Normalized Differences

	Treated		Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
ni_ph_s	0.06	0.61	0.64	6.51	0.13
all_ph_s	0.58	1.22	3.42	12.50	0.32
co_share_pr_s	0.10	0.11	0.13	0.17	0.22
co_div	0.03	0.08	0.04	0.08	0.11
co_credit_risk	0.18	0.30	0.20	0.30	0.09
co_rev_s	2.33	7.00	1.14	3.21	0.22
co_E_rtg	1.33	2.16	1.17	2.02	0.08
co_E_disc	0.19	0.31	0.18	0.30	0.03
co_S_rtg	0.86	1.53	1.10	1.82	0.14
co_S_disc	0.17	0.44	0.16	0.55	0.00
co_G_rtg	2.02	3.09	2.25	3.15	0.08
co_G_disc	0.29	0.45	0.34	0.46	0.09
co_hq_co2_pr	6.15	22.15	6.14	15.25	0.50
yy_gdp_chg	0.03	0.00	0.03	0.00	0.00
yy_infl	0.03	0.00	0.03	0.00	0.00
ni_price	4.81	0.84	4.81	0.84	0.00
bnk_esg_nbm	0.00	0.00	0.00	0.06	0.08
bnk_esg_breg	0.00	0.00	0.04	0.19	0.28
bnk_anti_esg_breg	0.00	0.00	0.00	0.00	n.a.

This table reports statistics of relevant co-variates over the pre-shock period (Q1/2015 to Q3/2019) dividing the sample between treated (EU headquartered banks) and control group (non-EU headquartered banks). The last column reports normalized differences between treatment and control groups (differences in averages by treatment status, scaled by the square root of the sum of the variances). An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

Table A.17: Public Holdings Nickel—Parallel Trends Pre-treatment Period

VARIABLES	(1) ni_ph Parallel Trends
o.treat	-
afterPT	0.684
	(0.783)
treat_afterPT	-8.751
	(4.434)
all_ph_s	0.0328*
	(0.0112)
bnk_esg_nbm	-2.149**
	(0.640)
bnk_esg_breg	0
	(9.05e-09)
bnk_anti_esg_breg	0
	(2.02e-05)
co_rev	-0.000477
	(0.000429)
co_share_pr_s	-0.0753
	(0.216)
co_div	-9.114
	(6.881)
co_credit_risk	0
	(3.21e-10)
co_fd_yr	0
	(0)
co_hq_co2_pr	1.653**
	(0.487)
co_E_rtg	-1.670
	(1.016)
co_E_disc	1.929
	(6.706)
co_S_rtg	0.294
	(1.166)
co_S_disc	0.160
	(0.309)
co_G_rtg	-2.882
	(1.968)
co_G_disc	106.8*
	(41.97)
ni_price	0.623
	(0.294)
Constant	-45.63**
	(13.83)
Observations	26,999
R-squared	0.414

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method
Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016)

A.5 Regression Results

A.5.1 Regression Results—Public Holdings Battery Raw Materials

Table A.18: Effect of the SFDR on Banks' Public Holdings of all Battery Mining Companies—Sequential Regressions

VARIABLES	(1) batmat_ph_s	(2) batmat_ph_s	(3) batmat_ph_s	(4) batmat_ph_s	(5) batmat_ph_s	(6) batmat_ph_s	(7) batmat_ph_s	(8) batmat_ph_s	(9) batmat_ph_s	(10) batmat_ph_s	(11) batmat_ph_s	(12) batmat_ph_s	(13) batmat_ph_s	(14) batmat_ph_s	(15) batmat_ph_s
treat	-8.548**	-0.0533	-2.654	-7.884***	-7.833***	-7.582***	-7.924***	-7.621***	-7.495***	-7.459***	-7.313***	-16.17	-14.18	-14.92	-14.84
	(3.878)	(2.059)	(1.958)	(2.446)	(2.440)	(2.417)	(2.462)	(2.444)	(2.384)	(2.380)	(2.437)	(10.66)	(10.90)	(10.81)	(10.78)
after19_21		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		(0)	(6.00e-08)	(9.88e-08)	(1.85e-07)	(8.40e-08)	(7.79e-08)	(2.63e-07)	(1.03e-07)	(2.13e-07)	(7.66e-07)	(1.26e-06)	(0)	(0)	(1.11e-07)
treat_after19_21	2.503	-5.991***	-6.741***	-6.731***	-6.589***	-6.596***	-6.596***	-6.865***	-6.846***	-6.825***	-7.013***	-7.330***	-7.168***	-6.725***	-6.737***
	(2.699)	(1.047)	(1.066)	(1.142)	(1.117)	(1.145)	(1.111)	(1.175)	(1.267)	(1.304)	(1.244)	(1.458)	(1.491)	(1.505)	(1.494)
after21		0	0	0	0	0	0	0	0	0	0	0	0	0	0
		(0)	(1.93e-08)	(8.17e-08)	(1.52e-08)	(1.23e-07)	(2.59e-08)	(4.64e-08)	(1.27e-07)	(1.32e-07)	(2.12e-07)	(2.40e-08)	(0)	(0)	(2.35e-07)
treat_after21		-23.17***	-24.45***	-24.43***	-24.07***	-24.09***	-24.09***	-23.90***	-23.68***	-23.75***	-22.60***	-27.38***	-25.12***	-23.38***	-23.84***
		(5.357)	(5.326)	(5.331)	(5.283)	(5.290)	(5.290)	(5.263)	(5.114)	(5.135)	(4.747)	(6.167)	(5.759)	(5.284)	(5.350)
all_ph_s			0.00463***	0.00458***	0.00464***	0.00459***	0.00459***	0.00456***	0.00453***	0.00451***	0.00400***	0.00294	0.00295	0.00295	0.00293
			(0.00137)	(0.00119)	(0.00119)	(0.00121)	(0.00121)	(0.00121)	(0.00123)	(0.00123)	(0.00134)	(0.00180)	(0.00180)	(0.00180)	(0.00180)
co_share_pr_s				-0.00619	-0.000456	-0.00135	-0.00136	-0.00495	0.00354	0.00323	0.0407	0.101	0.0974	0.0895	0.0901
				(0.0910)	(0.0907)	(0.0908)	(0.0908)	(0.0909)	(0.0896)	(0.0898)	(0.0884)	(0.0878)	(0.0877)	(0.0870)	(0.0869)
co_div					-19.79***	-17.83***	-17.71***	-12.00***	-11.31**	-11.51**	-11.08**	-8.779**	-8.888**	-8.662**	-8.653**
					(6.571)	(5.945)	(5.896)	(4.090)	(4.193)	(4.259)	(4.227)	(3.739)	(3.746)	(3.698)	(3.692)
co_credit_risk						-6.324	-5.612	7.938*	13.71***	13.82***	15.92***	14.09***	14.05***	14.01***	13.98***
						(4.454)	(4.350)	(4.040)	(4.822)	(4.941)	(5.287)	(4.961)	(4.961)	(4.956)	(4.957)
co_fd_yr							0.0134***	0.0132***	0.0136***	0.0137***	0.0137***	0.0126***	0.0126***	0.0129***	0.0129***
							(0.00326)	(0.00323)	(0.00331)	(0.00340)	(0.00335)	(0.00333)	(0.00333)	(0.00335)	(0.00336)
co_rev								-0.00249***	-0.00228***	-0.00222***	-0.00192***	-0.00121***	-0.00121***	-0.00117***	-0.00116***
								(0.000562)	(0.000518)	(0.000492)	(0.000401)	(0.000357)	(0.000356)	(0.000345)	(0.000344)
co_E									-4.317	-7.326**	4.933	4.369	4.726	4.767	4.810
									(2.617)	(3.261)	(5.980)	(5.636)	(5.555)	(5.557)	(5.559)
co_S										3.240**	4.749**	5.631**	5.469**	5.466**	5.453**
										(1.373)	(2.059)	(2.161)	(2.149)	(2.140)	(2.136)
co_G											-21.48*	-22.33*	-22.21*	-22.32*	-22.30*
											(12.36)	(12.75)	(12.78)	(12.78)	(12.77)
co_hq_co2_pr												0.381**	0.362**	0.336**	0.335**
												(0.154)	(0.151)	(0.143)	(0.143)
bnk_esg_nbm													17.76*	11.61	10.73
													(9.950)	(7.836)	(7.747)
bnk_esg_breg														13.85**	13.56**
														(6.096)	(6.083)
bnk_anti_esg_breg															-19.34***
															(5.313)
Constant	15.00***	15.00***	13.28***	14.07***	15.39***	18.24***	-8.766	-12.42	-11.78	-10.62	-10.08	0.737	-1.675	-1.711	-1.708
	(1.860)	(1.853)	(1.856)	(4.089)	(3.995)	(4.296)	(7.296)	(7.825)	(8.040)	(7.211)	(7.390)	(10.95)	(11.41)	(11.17)	(11.15)
Observations	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,526	119,526	119,526	119,526
R-squared	0.006	0.006	0.008	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.021	0.040	0.040	0.041	0.041

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.19: Effect of the Taxonomy on Banks' Public Holdings of all Battery Mining Companies—Sequential Regressions

VARIABLES	(1) batmat_ph_s	(2) batmat_ph_s	(3) batmat_ph_s	(4) batmat_ph_s	(5) batmat_ph_s	(6) batmat_ph_s	(7) batmat_ph_s	(8) batmat_ph_s	(9) batmat_ph_s	(10) batmat_ph_s	(11) batmat_ph_s	(12) batmat_ph_s	(13) batmat_ph_s	(14) batmat_ph_s
treat	-8.969	-3.537	-8.766***	-8.719***	-8.467***	-8.808***	-8.525***	-8.395***	-8.354***	-8.232***	-17.02	-14.98	-15.69	-15.61
	(8.364)	(2.121)	(2.649)	(2.645)	(2.621)	(2.667)	(2.654)	(2.594)	(2.589)	(2.640)	(10.64)	(10.89)	(10.80)	(10.76)
after20	25.24***	0	0	0	0	0	0	0	0	0	0	0	0	0
	(4.336)	(0)	(1.44e-07)	(0)	(4.26e-08)	(3.98e-08)	(3.28e-09)	(0)	(0)	(3.70e-07)	(6.34e-07)	(1.27e-06)	(4.49e-08)	(0)
treat_after20	-19.78***	-20.89***	-20.87***	-20.50***	-20.53***	-20.53***	-20.41***	-20.24***	-20.30***	-19.34***	-23.31***	-21.35***	-19.85***	-20.23***
	(4.633)	(4.854)	(4.860)	(4.807)	(4.816)	(4.815)	(4.779)	(4.642)	(4.668)	(4.284)	(5.540)	(5.126)	(4.604)	(4.653)
all_ph_s		0.00463***	0.00458***	0.00463***	0.00459***	0.00458***	0.00456***	0.00453***	0.00450***	0.00400***	0.00293	0.00294	0.00294	0.00293
		(0.00137)	(0.00119)	(0.00119)	(0.00121)	(0.00121)	(0.00121)	(0.00123)	(0.00123)	(0.00134)	(0.00180)	(0.00180)	(0.00180)	(0.00180)
co_share_pr_s			-0.00640	-0.000672	-0.00157	-0.00158	-0.00516	0.00338	0.00306	0.0405	0.0996	0.0963	0.0884	0.0890
			(0.0910)	(0.0908)	(0.0908)	(0.0908)	(0.0909)	(0.0896)	(0.0898)	(0.0884)	(0.0878)	(0.0878)	(0.0871)	(0.0870)
co_div				-19.79***	-17.82***	-17.70***	-11.98***	-11.28**	-11.48**	-11.05**	-8.751**	-8.865**	-8.638**	-8.629**
				(6.576)	(5.950)	(5.902)	(4.090)	(4.190)	(4.256)	(4.225)	(3.745)	(3.751)	(3.702)	(3.696)
co_credit_risk					-6.327	-5.615	7.966*	13.72***	13.83***	15.92***	14.12***	14.08***	14.03***	14.00***
					(4.454)	(4.350)	(4.041)	(4.822)	(4.942)	(5.288)	(4.964)	(4.965)	(4.959)	(4.960)
co_fd_yr						0.0134***	0.0132***	0.0136***	0.0137***	0.0137***	0.0126***	0.0126***	0.0129***	0.0129***
						(0.00326)	(0.00323)	(0.00331)	(0.00340)	(0.00335)	(0.00333)	(0.00332)	(0.00335)	(0.00336)
co_rev							-0.00249***	-0.00229***	-0.00223***	-0.00193***	-0.00122***	-0.00122***	-0.00117***	-0.00117***
							(0.000563)	(0.000519)	(0.000493)	(0.000402)	(0.000358)	(0.000356)	(0.000346)	(0.000345)
co_E								-4.332	-7.336**	4.940	4.380	4.743	4.783	4.825
								(2.619)	(3.260)	(5.984)	(5.640)	(5.559)	(5.561)	(5.564)
co_S									3.230**	4.744**	5.604**	5.442**	5.441**	5.427**
									(1.372)	(2.058)	(2.158)	(2.146)	(2.137)	(2.134)
co_G										-21.50*	-22.35*	-22.23*	-22.34*	-22.32*
										(12.36)	(12.75)	(12.78)	(12.78)	(12.78)
co_hq_co2_pr											0.376**	0.357**	0.331**	0.330**
											(0.153)	(0.150)	(0.143)	(0.142)
bnk_esg_nbm												18.13*	11.90	11.05
												(9.996)	(7.876)	(7.794)
bnk_esg_breg													13.98**	13.71**
													(6.116)	(6.104)
bnk_anti_esg_breg														-18.98***
														(5.104)
Constant	6.368***	13.28***	14.08***	15.39***	18.25***	-8.761	-12.42	-11.80	-10.64	-10.11	0.585	-1.863	-1.887	-1.888
	(1.088)	(1.858)	(4.080)	(3.987)	(4.294)	(7.281)	(7.810)	(8.027)	(7.200)	(7.380)	(10.94)	(11.41)	(11.17)	(11.15)
Observations	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,526	119,526	119,526	119,526
R-squared	0.033	0.007	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.021	0.040	0.040	0.041	0.041

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.20: Effect of the SFDR and the Taxonomy on Banks' Public Holdings of all Battery Mining Companies—Sequential Regressions

VARIABLES	(1) batmat_ph_s	(2) batmat_ph_s	(3) batmat_ph_s	(4) batmat_ph_s	(6) batmat_ph_s	(7) batmat_ph_s	(8) batmat_ph_s	(9) batmat_ph_s	(10) batmat_ph_s	(11) batmat_ph_s	(12) batmat_ph_s	(13) batmat_ph_s	(15) batmat_ph_s	(16) batmat_ph_s	(17) batmat_ph_s	(18) batmat_ph_s
treat	-16.54*	-0.0533	-0.0533	-2.654	-7.884***	-7.833***	-7.582***	-7.924***	-7.621***	-7.495***	-7.459***	-7.313***	-16.17	-14.18	-14.92	-14.84
	(8.444)	(2.059)	(2.059)	(1.958)	(2.446)	(2.440)	(2.417)	(2.462)	(2.445)	(2.384)	(2.380)	(2.437)	(10.66)	(10.90)	(10.81)	(10.78)
after19_20	-3.240*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	(1.968)	(0)	(0)	(4.81e-08)	(9.01e-08)	(1.34e-07)	(1.12e-08)	(2.97e-07)	(4.13e-07)	(2.28e-07)	(4.06e-08)	(4.20e-07)	(6.91e-08)	(1.30e-06)	(7.65e-07)	(1.63e-06)
treat_after19_20	2.562	2.467	-5.794***	-6.500***	-6.493***	-6.521***	-6.512***	-6.511***	-6.659***	-6.619***	-6.578***	-6.756***	-7.073***	-6.938***	-6.548***	-6.557***
	(2.142)	(2.820)	(1.069)	(1.088)	(1.148)	(1.141)	(1.159)	(1.118)	(1.184)	(1.283)	(1.320)	(1.256)	(1.460)	(1.494)	(1.505)	(1.495)
after20_21		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		(0)	(0)	(3.57e-08)	(2.13e-07)	(7.62e-08)	(1.53e-07)	(2.71e-07)	(2.92e-08)	(2.82e-07)	(3.14e-07)	(5.75e-07)	(2.15e-07)	(3.01e-07)	(7.41e-07)	(6.06e-07)
treat_after20_21		1.867	-6.287***	-7.102***	-7.089***	-6.691***	-6.723***	-6.724***	-7.173***	-7.187***	-7.195***	-7.400***	-7.715***	-7.512***	-6.992***	-7.007***
		(2.820)	(1.017)	(1.032)	(1.133)	(1.122)	(1.162)	(1.139)	(1.191)	(1.270)	(1.306)	(1.243)	(1.483)	(1.514)	(1.535)	(1.522)
after21			0	0	0	0	0	0	0	0	0	0	0	0	0	0
			(0)	(1.63e-09)	(1.12e-07)	(7.47e-08)	(1.37e-07)	(7.26e-08)	(1.39e-07)	(5.60e-08)	(5.05e-08)	(2.32e-07)	(5.39e-08)	(9.61e-08)	(1.48e-07)	(1.74e-08)
treat_after21			-23.17***	-24.45***	-24.43***	-24.07***	-24.09***	-24.09***	-23.90***	-23.68***	-23.75***	-22.60***	-27.38***	-25.12***	-23.38***	-23.84***
			(5.357)	(5.326)	(5.331)	(5.283)	(5.290)	(5.290)	(5.263)	(5.114)	(5.135)	(4.747)	(6.167)	(5.759)	(5.284)	(5.350)
all_ph_s				0.00463***	0.00458***	0.00464***	0.00459***	0.00459***	0.00456***	0.00453***	0.00451***	0.00400***	0.00294	0.00295	0.00295	0.00293
				(0.00137)	(0.00119)	(0.00119)	(0.00121)	(0.00121)	(0.00121)	(0.00123)	(0.00123)	(0.00134)	(0.00180)	(0.00180)	(0.00180)	(0.00180)
co_hq_loc_za					0	0	0	0	0	0	0	0	0	0	0	0
					(0)	(0)	(2.38e-09)	(0)	(0)	(0)	(0)	(8.86e-09)	(1.49e-09)	(3.84e-08)	(1.14e-09)	(2.44e-08)
co_share_pr_s					-0.00618	-0.000455	-0.00135	-0.00136	-0.00494	0.00354	0.00323	0.0407	0.101	0.0974	0.0895	0.0902
					(0.0910)	(0.0907)	(0.0908)	(0.0908)	(0.0909)	(0.0896)	(0.0898)	(0.0884)	(0.0878)	(0.0877)	(0.0870)	(0.0869)
co_div						-19.79***	-17.83***	-17.71***	-12.00***	-11.31**	-11.51**	-11.07**	-8.778**	-8.887**	-8.661**	-8.652**
						(6.572)	(5.945)	(5.897)	(4.091)	(4.194)	(4.259)	(4.228)	(3.740)	(3.746)	(3.698)	(3.692)
co_credit_risk							-6.324	-5.612	7.938*	13.71***	13.82***	15.92***	14.09***	14.05***	14.01***	13.98***
							(4.454)	(4.350)	(4.040)	(4.822)	(4.941)	(5.287)	(4.961)	(4.961)	(4.956)	(4.957)
co_fd_yr								0.0134***	0.0132***	0.0136***	0.0137***	0.0137***	0.0126***	0.0126***	0.0129***	0.0129***
								(0.00326)	(0.00323)	(0.00331)	(0.00340)	(0.00335)	(0.00333)	(0.00333)	(0.00335)	(0.00336)
co_rev									-0.00249***	-0.00228***	-0.00222***	-0.00192***	-0.00121***	-0.00121***	-0.00117***	-0.00116***
									(0.000562)	(0.000518)	(0.000492)	(0.000401)	(0.000357)	(0.000356)	(0.000345)	(0.000344)
co_E										-4.317	-7.327**	4.933	4.369	4.726	4.767	4.810
										(2.617)	(3.261)	(5.980)	(5.636)	(5.555)	(5.557)	(5.559)
co_S											3.240**	4.749**	5.631**	5.469**	5.466**	5.453**
											(1.373)	(2.059)	(2.161)	(2.149)	(2.140)	(2.136)
co_G												-21.48*	-22.33*	-22.21*	-22.32*	-22.30*
												(12.36)	(12.75)	(12.78)	(12.78)	(12.77)
co_hq_co2_pr													0.381**	0.362**	0.336**	0.335**
													(0.154)	(0.151)	(0.143)	(0.143)
bnk_esg_nbm														17.76*	11.61	10.73
														(9.950)	(7.836)	(7.747)
bnk_esg_breg															13.85**	13.56**
															(6.096)	(6.083)
bnk_anti_esg_breg																-19.34***
																(5.313)
Constant	16.02***	13.30***	15.00***	13.28***	14.07***	15.39***	18.24***	-8.766	-12.42	-11.78	-10.62	-10.08	0.737	-1.675	-1.712	-1.708
	(2.029)	(1.867)	(1.853)	(1.856)	(4.089)	(3.995)	(4.296)	(7.296)	(7.825)	(8.040)	(7.211)	(7.390)	(10.95)	(11.41)	(11.17)	(11.15)
Observations	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,840	119,526	119,526	119,526	119,526
R-squared	0.029	0.007	0.006	0.008	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.021	0.040	0.040	0.041	0.041

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.21: Effect of the SFDR on Banks' Public Holdings of all Battery Mining Companies—Baseline Regression

VARIABLES	(1) batmat_ph Contemporaneous	(2) batmat_ph Lagged 1Q	(3) batmat_ph Lagged 2Q	(4) batmat_ph Lagged 3Q
treat	-14.84	-15.30	-15.86	-16.50
	(10.78)	(11.10)	(11.45)	(11.83)
after19_21	0			
	(1.81e-06)			
after21	0			
	(1.53e-06)			
treat_after19_21	-6.737***			
	(1.494)			
treat_after21	-23.84***			
	(5.350)			
all_ph_s	0.00293	0.00293	0.00292	0.00292
	(0.00180)	(0.00183)	(0.00187)	(0.00190)
co_share_pr_s	0.0901	0.0926	0.0958	0.0999
	(0.0869)	(0.0868)	(0.0867)	(0.0866)
co_div	-8.653**	-8.923**	-9.122**	-9.290**
	(3.692)	(3.809)	(3.905)	(3.966)
co_credit_risk	13.98***	14.10***	14.08**	14.02**
	(4.957)	(5.079)	(5.215)	(5.369)
co_fd_yr	0.0129***	0.0133***	0.0137***	0.0142***
	(0.00336)	(0.00344)	(0.00353)	(0.00362)
co_rev	-0.00116***	-0.00115***	-0.00113***	-0.00110***
	(0.000344)	(0.000352)	(0.000361)	(0.000370)
co_E	4.810	4.974	5.170	5.463
	(5.559)	(5.740)	(5.927)	(6.170)
co_S	5.453**	5.643**	5.867**	6.060**
	(2.136)	(2.185)	(2.247)	(2.315)
co_G	-22.30*	-22.97*	-23.70*	-24.53*
	(12.77)	(13.22)	(13.72)	(14.27)
co_hq_co2_pr	0.335**	0.332**	0.328**	0.325**
	(0.143)	(0.142)	(0.142)	(0.142)
bnk_esg_nbm	10.73	10.61	10.46	10.30
	(7.747)	(7.628)	(7.494)	(7.349)
bnk_esg_breg	13.56**	13.59**	13.62**	13.63**
	(6.083)	(6.079)	(6.071)	(6.057)
bnk_anti_esg_breg	-19.34***	-19.13***	-18.91***	-18.68***
	(5.313)	(5.288)	(5.267)	(5.222)
L.after19_21		0		
		(1.86e-06)		
L.after21		0		
		(1.57e-06)		
L.treat_after19_21		-8.397***		
		(1.977)		
L.treat_after21		-24.33***		
		(5.510)		
L2.after19_21			0	
			(1.02e-06)	
L2.after21			0	
			(2.28e-06)	
L2.treat_after19_21			-10.09***	
			(2.438)	
L2.treat_after21			-24.83***	
			(5.806)	
L3.after19_21				0
				(1.21e-10)
L3.after21				0
				(5.94e-11)
L3.treat_after19_21				-11.79***
				(2.906)
L3.treat_after21				-25.32***
				(6.039)
Constant	-1.708	-1.325	-0.896	-0.405
	(11.15)	(11.41)	(11.71)	(12.06)
Observations	119,526	116,102	112,678	109,254
R-squared	0.041	0.041	0.042	0.043

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.22: Effect of the Taxonomy on Banks' Public Holdings of all Battery Mining Comp.—Baseline Regression

VARIABLES	(1) batmat_ph Contemporaneous	(2) batmat_ph Lagged 1Q	(3) batmat_ph Lagged 2Q	(4) batmat_ph Lagged 3Q
treat	-15.61	-16.19	-16.74	-17.64
	(10.76)	(11.08)	(11.43)	(11.84)
after20	0			
	(0)			
treat_after20	-20.23***			
	(4.653)			
all_ph_s	0.00293	0.00292	0.00292	0.00291
	(0.00180)	(0.00183)	(0.00187)	(0.00190)
co_share_pr_s	0.0890	0.0921	0.0957	0.0993
	(0.0870)	(0.0869)	(0.0867)	(0.0865)
co_div	-8.629**	-8.954**	-9.145**	-9.283**
	(3.696)	(3.792)	(3.882)	(3.970)
co_credit_risk	14.00***	14.10***	14.07**	14.02**
	(4.960)	(5.079)	(5.215)	(5.370)
co_fd_yr	0.0129***	0.0133***	0.0137***	0.0142***
	(0.00336)	(0.00344)	(0.00353)	(0.00362)
co_rev	-0.00117***	-0.00115***	-0.00112***	-0.00110***
	(0.000345)	(0.000351)	(0.000361)	(0.000370)
co_E	4.825	4.976	5.161	5.462
	(5.564)	(5.741)	(5.926)	(6.171)
co_S	5.427**	5.628**	5.867**	6.051**
	(2.134)	(2.183)	(2.247)	(2.313)
co_G	-22.32*	-22.97*	-23.68*	-24.53*
	(12.78)	(13.22)	(13.72)	(14.27)
co_hq_co2_pr	0.330**	0.328**	0.327**	0.322**
	(0.142)	(0.142)	(0.142)	(0.141)
bnk_esg_nbm	11.05	10.87	10.64	10.52
	(7.794)	(7.668)	(7.526)	(7.389)
bnk_esg_breg	13.71**	13.72**	13.71**	13.74**
	(6.104)	(6.095)	(6.084)	(6.073)
bnk_anti_esg_breg	-18.98***	-18.81***	-18.67***	-18.42***
	(5.104)	(5.135)	(5.216)	(5.171)
L.after20		0		
		(5.95e-07)		
L.treat_after20		-20.91***		
		(4.880)		
L2.after20			0	
			(1.37e-06)	
L2.treat_after20			-22.15***	
			(5.127)	
L3.after20				0
				(0)
L3.treat_after20				-22.21***
				(5.226)
Constant	-1.888	-1.429	-0.918	-0.480
	(11.15)	(11.41)	(11.70)	(12.06)
Observations	119,526	116,102	112,678	109,254
R-squared	0.041	0.041	0.042	0.043

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.23: Effect of the SFDR and the Taxonomy on Banks' Public Holdings of all Battery Mining Companies—Baseline Regression

VARIABLES	(1) batmat_ph Contemporaneous	(2) batmat_ph Lagged 1Q	(3) batmat_ph Lagged 2Q	(4) batmat_ph Lagged 3Q
treat	-14.84	-15.30	-15.89	
	(10.78)	(11.10)	(11.45)	
after19_20	0			
	(1.63e-06)			
treat_after19_20	-6.557***			
	(1.495)			
after20_21	0			
	(6.06e-07)			
treat_after20_21	-7.007***			
	(1.522)			
after21	0			
	(1.74e-08)			
treat_after21	-23.84***			
	(5.350)			
all_ph_s	0.00293	0.00293	0.00292	0.00291
	(0.00180)	(0.00183)	(0.00187)	(0.00190)
co_share_pr_s	0.0902	0.0927	0.0961	0.0996
	(0.0869)	(0.0868)	(0.0867)	(0.0866)
co_div	-8.652**	-8.923**	-9.123**	-9.245**
	(3.692)	(3.806)	(3.897)	(3.960)
co_credit_risk	13.98***	14.09***	14.07**	13.99**
	(4.957)	(5.079)	(5.215)	(5.365)
co_fd_yr	0.0129***	0.0133***	0.0137***	0.0142***
	(0.00336)	(0.00344)	(0.00353)	(0.00362)
co_rev	-0.00116***	-0.00115***	-0.00113***	-0.00110***
	(0.000344)	(0.000352)	(0.000361)	(0.000370)
co_E	4.810	4.972	5.163	5.499
	(5.559)	(5.739)	(5.925)	(6.170)
co_S	5.453**	5.644**	5.874**	6.042**
	(2.136)	(2.185)	(2.248)	(2.313)
co_G	-22.30*	-22.96*	-23.69*	-24.60*
	(12.77)	(13.22)	(13.72)	(14.28)
co_hq_co2_pr	0.335**	0.332**	0.329**	0.324**
	(0.143)	(0.142)	(0.142)	(0.142)
bnk_esg_nbm	10.73	10.60	10.44	10.38
	(7.747)	(7.628)	(7.492)	(7.339)
bnk_esg_breg	13.56**	13.58**	13.61**	13.61**
	(6.083)	(6.079)	(6.071)	(6.056)
bnk_anti_esg_breg	-19.34***	-19.13***	-18.91***	-18.69***
	(5.313)	(5.291)	(5.297)	(5.249)
L.after19_20		0		
		(2.26e-06)		
L.treat_after19_20		-7.133***		
		(1.435)		
L.after20_21		0		
		(3.92e-07)		
L.treat_after20_21		-10.29***		
		(3.209)		
L.after21		0		
		(1.96e-07)		
L.treat_after21		-24.33***		
		(5.512)		
L2.after19_20			0	
			(1.56e-06)	
L2.treat_after19_20			-6.587***	
			(1.291)	
L2.after20_21			0	
			(4.93e-07)	
L2.treat_after20_21			-15.36***	
			(3.424)	
L2.after21			0	
			(3.42e-07)	

L2.treat_after21			-24.85***	
			(5.817)	
oL3.after19_20				0
				(0)
L3.treat_after19_20				-9.123***
				(2.326)
L3.after20_21				0
				(0)
L3.treat_after20_21				-16.55***
				(3.409)
L3.after21				0
				(0)
L3.treat_after21				-25.61***
				(6.048)
Constant	-1.708	-1.317	-0.859	-7.742
	(11.15)	(11.41)	(11.70)	(9.643)
Observations	119,526	116,102	112,678	109,254
R-squared	0.041	0.041	0.042	0.043

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.24: Effect of the SFDR on Banks' Public Holdings of all Battery Mining Companies—Fixed Effects

VARIABLES	(1) batmat_ph No Fixed Effects	(2) batmat_ph Time Fixed Effects	(3) batmat_ph Time & Entity Fixed Effects
treat	-14.92	-14.84	
	(10.78)	(10.78)	
after19_21	6.066***	0	
	(2.075)	(1.81e-06)	
after21	16.78***	0	
	(5.794)	(1.53e-06)	
treat_after19_21	-6.717***	-6.737***	-7.383***
	(1.618)	(1.494)	(1.867)
treat_after21	-23.60***	-23.84***	-20.83***
	(5.259)	(5.350)	(4.809)
all_ph_s	0.00301	0.00293	0.00618
	(0.00179)	(0.00180)	(0.00414)
co_share_pr_s	0.0863	0.0901	0.00494
	(0.0861)	(0.0869)	(0.0941)
co_div	-8.758**	-8.653**	-1.479
	(3.747)	(3.692)	(1.955)
co_credit_risk	13.27**	13.98***	0
	(4.887)	(4.957)	(0)
co_fd_yr	0.0128***	0.0129***	0
	(0.00348)	(0.00336)	(0)
co_rev	-0.00113***	-0.00116***	-0.000870**
	(0.000338)	(0.000344)	(0.000420)
co_E	4.555	4.810	13.22
	(5.487)	(5.559)	(11.55)
co_S	5.666**	5.453**	10.84**
	(2.167)	(2.136)	(4.108)
co_G	-21.86*	-22.30*	-51.48*
	(12.68)	(12.77)	(30.08)
co_hq_co2_pr	0.342**	0.335**	0.302**
	(0.143)	(0.143)	(0.140)
bnk_esg_nbm	12.96*	10.73	2.283
	(7.626)	(7.747)	(6.232)
bnk_esg_breg	13.72**	13.56**	29.62**
	(6.336)	(6.083)	(10.96)
bnk_anti_esg_breg	-13.92***	-19.34***	-18.63***
	(4.286)	(5.313)	(4.506)
o.treat			-
o.after19_21			-
o.after21			-
Constant	-19.47	-1.708	-5.899
	(13.51)	(11.15)	(10.60)
Observations	119,526	119,526	119,526
R-squared	0.040	0.041	0.352

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.25: Effect of the Taxonomy on Banks' Public Holdings of all Battery Mining Companies—Fixed Effects

VARIABLES	(1) batmat_ph No Fixed Effects	(2) batmat_ph Time Fixed Effects	(3) batmat_ph Time & Entity Fixed Effects
treat	-16.04	-15.61	
	(10.79)	(10.76)	
after20	10.39**	0	
	(3.970)	(0)	
treat_after20	-20.30***	-20.23***	-17.70***
	(4.670)	(4.653)	(4.293)
all_ph_s	0.00303	0.00293	0.00614
	(0.00179)	(0.00180)	(0.00413)
co_share_pr_s	0.0922	0.0890	0.00380
	(0.0859)	(0.0870)	(0.0941)
co_div	-8.372**	-8.629**	-1.453
	(3.605)	(3.696)	(1.951)
co_credit_risk	12.56**	14.00***	0
	(4.852)	(4.960)	(0)
co_fd_yr	0.0128***	0.0129***	0
	(0.00347)	(0.00336)	(0)
co_rev	-0.00110***	-0.00117***	-0.000881**
	(0.000340)	(0.000345)	(0.000421)
co_E	4.721	4.825	13.24
	(5.531)	(5.564)	(11.55)
co_S	5.738**	5.427**	10.82**
	(2.177)	(2.134)	(4.106)
co_G	-21.74*	-22.32*	-51.52*
	(12.65)	(12.78)	(30.09)
co_hq_co2_pr	0.353**	0.330**	0.297**
	(0.141)	(0.142)	(0.139)
bnk_esg_nbm	12.75*	11.05	2.475
	(7.355)	(7.794)	(6.242)
bnk_esg_breg	13.77**	13.71**	29.88**
	(6.336)	(6.104)	(11.00)
bnk_anti_esg_breg	-14.13***	-18.98***	-18.35***
	(4.397)	(5.104)	(4.425)
o.treat			-
o.after20			-
Constant	-23.63	-1.888	-5.940
	(14.91)	(11.15)	(10.60)
Observations	119,526	119,526	119,526
R-squared	0.040	0.041	0.352

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.26: Effect of the SFDR and the Taxonomy on Banks' Public Holdings of all Battery Mining Companies—Fixed Effects

VARIABLES	(1) batmat_ph No Fixed Effects	(2) batmat_ph Time Fixed Effects	(3) batmat_ph Time & Entity Fixed Effects
treat	-14.92	-14.84	
	(10.79)	(10.78)	
after19_20	6.024***	0	
	(2.075)	(1.63e-06)	
treat_after19_20	-6.539***	-6.557***	-7.152***
	(1.669)	(1.495)	(1.801)
after20_21	6.521**	0	0
	(2.449)	(6.06e-07)	(3.37e-06)
treat_after20_21	-6.984***	-7.007***	-7.730***
	(1.650)	(1.522)	(1.972)
after21	16.67***	0	0
	(5.674)	(1.74e-08)	(1.23e-06)
treat_after21	-23.60***	-23.84***	-20.83***
	(5.248)	(5.350)	(4.809)
all_ph_s	0.00301	0.00293	0.00618
	(0.00179)	(0.00180)	(0.00414)
co_share_pr_s	0.0860	0.0902	0.00495
	(0.0864)	(0.0869)	(0.0941)
co_div	-8.761**	-8.652**	-1.477
	(3.749)	(3.692)	(1.955)
co_credit_risk	13.27**	13.98***	0
	(4.887)	(4.957)	(0)
co_fd_yr	0.0128***	0.0129***	0
	(0.00349)	(0.00336)	(0)
co_rev	-0.00113***	-0.00116***	-0.000871**
	(0.000338)	(0.000344)	(0.000420)
co_E	4.553	4.810	13.22
	(5.485)	(5.559)	(11.55)
co_S	5.665**	5.453**	10.84**
	(2.167)	(2.136)	(4.109)
co_G	-21.86*	-22.30*	-51.48*
	(12.68)	(12.77)	(30.08)
co_hq_co2_pr	0.342**	0.335**	0.302**
	(0.143)	(0.143)	(0.140)
bnk_esg_nbm	12.97*	10.73	2.283
	(7.641)	(7.747)	(6.232)
bnk_esg_breg	13.72**	13.56**	29.62**
	(6.334)	(6.083)	(10.96)
bnk_anti_esg_breg	-13.89***	-19.34***	-18.63***
	(4.246)	(5.313)	(4.506)
o.treat			-
o.after19_20			-
Constant	-19.75	-1.708	-5.899
	(13.71)	(11.15)	(10.60)
Observations	119,526	119,526	119,526
R-squared	0.040	0.041	0.352

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, mining companies' ESG ratings and disclosure, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Fixed effects treated by means of "absorbing" (Correia, 2016).

A.5.2 Regression Results—Public Holdings Lithium

Table A.27: Effect of the SFDR on Banks' Public Holdings of Lithium Battery Mining Companies—Sequential Regressions

VARIABLES	(1) li_ph_s	(2) li_ph_s	(3) li_ph_s	(4) li_ph_s	(5) li_ph_s	(6) li_ph_s	(7) li_ph_s	(8) li_ph_s	(9) li_ph_s	(10) li_ph_s	(11) li_ph_s	(12) li_ph_s
o.treat	-	-	-	-	-	-	-	-	-	-	-	-
after19_temp	-7.461*	6.916***	7.244***	7.286***	7.379***	7.376***	7.697***	7.687	3.155	-0.576	-0.326	-0.532
	(4.067)	(2.152)	(2.539)	(2.538)	(2.569)	(2.570)	(2.631)	(5.303)	(6.834)	(7.093)	(6.925)	(6.877)
treat_after19_temp	6.797*	-6.290***	-6.572***	-6.437***	-6.446**	-6.470***	-6.401**	-6.495**	-19.28**	-18.49**	-17.71**	-17.69**
	(4.108)	(2.174)	(2.502)	(2.466)	(2.498)	(2.494)	(2.492)	(2.687)	(8.282)	(8.428)	(8.079)	(8.080)
after21		41.70***	42.33***	44.20***	45.11***	45.01***	46.47***	36.19**	20.57	16.56	16.55	16.69
		(14.78)	(15.52)	(16.04)	(16.44)	(16.47)	(16.99)	(15.90)	(19.10)	(10.74)	(10.74)	(10.79)
treat_after21		-37.95**	-38.45**	-38.39**	-38.47**	-38.51**	-38.48**	-39.61**	-102.7**	-96.50**	-92.73**	-92.83**
		(14.85)	(15.42)	(15.37)	(15.49)	(15.48)	(15.48)	(17.05)	(48.24)	(47.52)	(45.70)	(45.70)
all_ph_s			-0.00226	-0.00196	-0.00236	-0.00239	-0.00225	-0.00372	-0.00381	-0.00383	-0.00382	-0.00383
			(0.00354)	(0.00340)	(0.00356)	(0.00355)	(0.00353)	(0.00454)	(0.00455)	(0.00456)	(0.00457)	(0.00457)
co_share_pr_s				-1.286***	-1.814***	-1.740***	-1.826***	2.229	2.533	2.468	2.459	2.469
				(0.400)	(0.633)	(0.642)	(0.670)	(1.854)	(1.890)	(1.882)	(1.883)	(1.886)
co_div					-0.186	1.214	16.88*	41.31	44.07	45.86	45.88	45.64
					(6.837)	(6.729)	(9.839)	(27.82)	(27.88)	(29.57)	(29.57)	(29.50)
co_credit_risk						-4.492	10.20	16.48	17.16	17.10	17.02	17.03
						(5.872)	(9.394)	(15.00)	(15.18)	(15.49)	(15.50)	(15.51)
co_rev							-0.00501**	-0.00550**	-0.00637**	-0.00649**	-0.00646**	-0.00645**
							(0.00217)	(0.00232)	(0.00265)	(0.00262)	(0.00262)	(0.00262)
co_hq_co2_pr								0.385	0.237	0.225	0.226	0.227
								(0.547)	(0.471)	(0.525)	(0.526)	(0.525)
bnk_hq_co2_pr									1.167*	1.100*	1.045*	1.042*
									(0.618)	(0.624)	(0.593)	(0.593)
bnk_esg_nbm										22.08	20.45	20.18
										(18.49)	(17.53)	(17.58)
bnk_esg_breg											6.546	6.469
											(6.337)	(6.351)
bnk_anti_esg_breg												-7.514
												(4.850)
Constant	14.33***	0.939	1.756	3.509*	4.432**	4.986**	3.034	-11.93	-19.05*	-18.63	-18.76	-18.99
	(4.579)	(0.996)	(1.602)	(1.849)	(2.071)	(2.214)	(2.041)	(8.412)	(11.24)	(17.21)	(17.15)	(17.22)
Observations	30,065	30,065	30,065	30,065	30,065	30,065	30,065	30,065	30,065	30,065	30,065	30,065
R-squared	0.022	0.027	0.027	0.027	0.028	0.028	0.028	0.041	0.045	0.045	0.045	0.045

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Lithium prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.28: Effect of the Taxonomy on Banks' Public Holdings of Lithium Battery Mining Companies—Sequential Regressions

VARIABLES	(1) li_ph_s	(2) li_ph_s	(3) li_ph_s	(4) li_ph_s	(5) li_ph_s	(6) li_ph_s	(7) li_ph_s	(8) li_ph_s	(9) li_ph_s	(10) li_ph_s	(11) li_ph_s
o.treat	-	-	-	-	-	-	-	-	-	-	-
after20	33.64***	34.01***	35.43***	35.91***	35.80***	36.82***	25.44**	15.23	10.10	10.09	10.07
	(11.82)	(12.41)	(12.79)	(13.02)	(13.03)	(13.38)	(12.54)	(14.47)	(8.471)	(8.472)	(8.463)
treat_after20	-30.55**	-30.84**	-30.78**	-30.78**	-30.81**	-30.79**	-32.41**	-81.76**	-74.74**	-71.06**	-71.09**
	(11.87)	(12.33)	(12.29)	(12.36)	(12.36)	(12.35)	(13.68)	(36.55)	(36.40)	(34.58)	(34.58)
all_ph_s		-0.00159	-0.00129	-0.00166	-0.00169	-0.00156	-0.00303	-0.00313	-0.00317	-0.00316	-0.00317
		(0.00339)	(0.00327)	(0.00341)	(0.00341)	(0.00339)	(0.00436)	(0.00437)	(0.00438)	(0.00438)	(0.00438)
co_share_pr_s			-1.164***	-1.474***	-1.385***	-1.452***	2.415	2.588	2.430	2.422	2.428
			(0.351)	(0.508)	(0.504)	(0.522)	(1.895)	(1.917)	(1.848)	(1.848)	(1.850)
co_div_s				-3.974	-2.267	11.41	35.38	40.36	44.09	44.13	43.98
				(6.417)	(6.482)	(8.167)	(26.20)	(26.46)	(29.27)	(29.27)	(29.22)
co_credit_risk					-5.453	7.439	13.73	16.51	18.51	18.40	18.41
					(5.725)	(8.249)	(14.47)	(14.93)	(15.79)	(15.80)	(15.80)
co_rev						-0.00440**	-0.00494**	-0.00610**	-0.00649**	-0.00645**	-0.00645**
						(0.00193)	(0.00221)	(0.00263)	(0.00262)	(0.00261)	(0.00261)
co_hq_co2_pr							0.519	0.298	0.233	0.235	0.236
							(0.536)	(0.431)	(0.515)	(0.516)	(0.515)
bnk_hq_co2_pr								1.128**	1.028*	0.963*	0.961*
								(0.564)	(0.583)	(0.547)	(0.548)
bnk_esg_nbm									24.34	21.35	21.23
									(18.13)	(16.64)	(16.68)
bnk_esg_breg										8.558	8.524
										(6.888)	(6.900)
bnk_anti_esg_breg											-4.513
											(4.582)
Constant	1.539	2.158	3.668**	4.506**	5.173**	3.504*	-12.66	-19.14*	-23.13	-23.31	-23.55
	(1.019)	(1.629)	(1.830)	(2.023)	(2.216)	(2.064)	(8.554)	(11.00)	(17.19)	(17.13)	(17.22)
Observations	30,450	30,450	30,450	30,450	30,450	30,450	30,450	30,450	30,450	30,450	30,450
R-squared	0.026	0.026	0.025	0.027	0.027	0.027	0.040	0.044	0.044	0.044	0.044

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Lithium prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.29: Effect of the SFDR on Banks' Public Holdings of Lithium Battery Mining Comp.—Baseline Regression

VARIABLES	(1) li_ph_s Contemporaneous	(2) li_ph_s Lagged 1Q	(3) li_ph_s Lagged 2Q	(4) li_ph_s Lagged 3Q
o.treat	-	-	-	-
after19_temp	1.295			
	(7.627)			
after21	19.65			
	(12.49)			
treat_after19_temp	-17.12**			
	(8.057)			
treat_after21	-91.36**			
	(45.50)			
all_ph_s	-0.00404	-0.00419	-0.00436	-0.00448
	(0.00470)	(0.00483)	(0.00498)	(0.00512)
co_share_pr_s	0.360	0.348	0.477	0.781
	(0.796)	(0.884)	(1.000)	(1.222)
co_div	50.95	50.35	49.93	49.96
	(33.06)	(32.18)	(31.82)	(31.87)
co_credit_risk	14.14	13.95	14.03	13.82
	(16.29)	(16.66)	(17.07)	(17.51)
co_fd_yr	-0.501	-0.526	-0.541	-0.535
	(0.338)	(0.356)	(0.366)	(0.363)
co_rev	-0.0103**	-0.0104**	-0.0105**	-0.0106**
	(0.00471)	(0.00477)	(0.00482)	(0.00482)
co_hq_co2_pr	0.185	0.173	0.148	0.149
	(0.535)	(0.550)	(0.542)	(0.548)
bnk_hq_co2_pr	1.017*	1.026*	1.045*	1.098*
	(0.593)	(0.603)	(0.608)	(0.623)
bnk_esg_nbm	19.84	17.13	14.55	13.77
	(17.67)	(17.25)	(16.69)	(16.41)
bnk_esg_breg	7.271	7.063	6.489	5.097
	(6.019)	(5.900)	(5.847)	(5.717)
bnk_anti_esg_breg	-7.099	-10.42**	-13.35**	-13.12**
	(4.761)	(5.196)	(5.779)	(5.617)
L.after19_temp		1.537		
		(10.34)		
L.after21		25.60*		
		(13.53)		
L.treat_after19_temp		-22.09**		
		(10.22)		
L.treat_after21		-95.59**		
		(48.13)		
L2.after19_temp			6.609	
			(10.15)	
L2.after21			38.02**	
			(15.46)	
L2.treat_after19_temp			-28.93**	
			(13.22)	
L2.treat_after21			-101.8**	
			(51.54)	
L3.after19_temp				15.07
				(10.73)
L3.after21				56.10***
				(19.94)
L3.treat_after19_temp				-39.26**
				(18.58)
L3.treat_after21				-109.4**
				(54.81)
Constant	982.7	1,033	1,068	1,074
	(661.5)	(696.0)	(718.2)	(715.7)
Observations	30,065	29,206	28,347	27,488
R-squared	0.047	0.048	0.050	0.051

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Lithium prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.30: Effect of the Taxonomy on Banks' Public Hold. of Lithium Battery Mining Comp.—Baseline Regression

VARIABLES	(1) li_ph_s Contemporaneous	(2) li_ph_s Lagged 1Q	(3) li_ph_s Lagged 2Q	(4) li_ph_s Lagged 3Q
o.treat	-			
after20	12.39			
	(9.776)			
treat_after20	-70.14**			
	(34.45)			
all_ph_s	-0.00334	-0.00347	-0.00360	-0.00373
	(0.00449)	(0.00462)	(0.00476)	(0.00490)
co_share_pr_s	0.351	0.400	0.650	0.962
	(0.782)	(0.883)	(1.040)	(1.275)
co_div	49.02	48.16	46.23	46.28
	(32.63)	(32.06)	(30.81)	(30.88)
co_credit_risk	15.68	15.93	16.35	16.36
	(16.49)	(16.91)	(17.47)	(17.79)
co_fd_yr	-0.491	-0.515	-0.527	-0.526
	(0.333)	(0.349)	(0.359)	(0.355)
co_rev	-0.0102**	-0.0104**	-0.0105**	-0.0105**
	(0.00467)	(0.00475)	(0.00479)	(0.00477)
co_hq_co2_pr	0.195	0.185	0.166	0.146
	(0.524)	(0.530)	(0.550)	(0.524)
bnk_hq_co2_pr	0.940*	0.981*	1.030*	1.027*
	(0.548)	(0.568)	(0.601)	(0.580)
bnk_esg_nbm	20.72	20.11	19.39	18.05
	(16.82)	(16.88)	(16.91)	(17.66)
bnk_esg_breg	9.143	8.204	6.951	7.222
	(6.663)	(6.419)	(6.017)	(6.508)
bnk_anti_esg_breg	-4.094	-4.066	-4.385	-6.087
	(4.534)	(4.610)	(4.806)	(5.528)
L.after20		13.89		
		(11.17)		
L.treat_after20		-76.47**		
		(37.86)		
L2.after20			17.12	
			(16.97)	
L2.treat_after20			-84.33**	
			(42.53)	
L3.after20				19.10*
				(11.09)
L3.treat_after20				-85.44**
				(42.22)
L4.after20				
L4.treat_after20				
Constant	959.0	1,008	1,036	1,033
	(649.7)	(685.4)	(708.4)	(696.0)
Observations	30,450	29,580	28,710	27,840
R-squared	0.046	0.048	0.049	0.050

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Lithium prices, YY GDP change, and YY-inflation.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

A.5.3 Regression Results—Public Holdings Cobalt

Table A.31: Effect of the SFDR on Banks' Public Holdings of Cobalt Battery Mining Companies—Sequential Regressions

VARIABLES	(1) cob_ph_s	(2) cob_ph_s	(3) cob_ph_s	(4) cob_ph_s	(5) cob_ph_s	(6) cob_ph_s	(7) cob_ph_s	(8) cob_ph_s	(9) cob_ph_s	(10) cob_ph_s
o.treat	-	-	-	-	-	-	-	-	-	-
after19_temp	-0.705	6.176	4.768*	4.938**	4.218	4.170	17.60*	17.48*	17.34*	8.389
	(7.161)	(2.830)	(1.569)	(1.499)	(2.066)	(2.491)	(6.703)	(6.641)	(6.498)	(5.375)
treat_after19_temp	-0.190	-5.185*	-19.52	-19.60	-19.24	-19.54	-21.01	-20.94	-20.79	-20.46
	(5.332)	(1.724)	(8.999)	(8.911)	(8.739)	(8.711)	(9.640)	(9.650)	(9.349)	(9.326)
after21		38.62*	32.57*	32.78*	34.93*	36.03*	38.86*	39.11*	37.70*	52.44
		(13.18)	(12.58)	(12.62)	(13.47)	(13.89)	(14.31)	(14.56)	(14.52)	(28.96)
treat_after21		-28.04	-53.94*	-53.88*	-53.46*	-52.92*	-53.65*	-53.86*	-52.24*	-49.32*
		(13.36)	(17.99)	(17.97)	(17.83)	(17.61)	(18.45)	(18.55)	(17.87)	(16.55)
all_ph_s			0.0382*	0.0384*	0.0384*	0.0381*	0.0343	0.0343	0.0339	0.0323
			(0.0146)	(0.0146)	(0.0146)	(0.0146)	(0.0151)	(0.0152)	(0.0148)	(0.0153)
co_div				-5.966	-4.631	-4.363	4.501	4.429	4.514	4.788
				(4.520)	(3.121)	(3.018)	(7.862)	(7.882)	(7.873)	(7.581)
co_share_pr_s					-7.010	-6.700	-2.870	-2.781	-2.641	-2.891
					(3.227)	(3.090)	(3.344)	(3.323)	(3.280)	(3.490)
co_rev						-0.00206	0.00347	0.00347	0.00353	0.00370
						(0.000970)	(0.00367)	(0.00367)	(0.00364)	(0.00380)
bnk_esg_nbm							5.558	5.324	0.306	-1.304
							(9.977)	(10.10)	(6.022)	(4.749)
bnk_anti_esg_breg								-15.31	-14.70	-19.46
								(12.46)	(12.40)	(13.96)
bnk_esg_breg									11.59	13.45
									(11.52)	(10.11)
co_hq_co2_pr										-0.278
										(0.404)
Constant	19.71**	7.581	-3.634	-3.409	4.096	6.187	-91.81	-91.74	-92.10	-76.46
	(6.144)	(3.997)	(6.470)	(6.412)	(5.294)	(5.366)	(73.12)	(73.07)	(72.89)	(61.70)
Observations	27,160	27,160	27,160	27,160	27,160	27,160	27,125	27,125	27,125	27,125
R-squared	0.376	0.382	0.385	0.385	0.385	0.386	0.408	0.408	0.408	0.409

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Cobalt prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.32: Effect of the Taxonomy on Banks' Public Holdings of Cobalt Battery Mining Companies—Sequential Regressions

VARIABLES	(1) cob_ph_s	(2) cob_ph_s	(3) cob_ph_s	(4) cob_ph_s	(5) cob_ph_s	(6) cob_ph_s	(7) cob_ph_s	(8) cob_ph_s	(9) cob_ph_s
o.treat	-	-	-	-	-	-	-	-	-
after20	33.59**	27.53**	27.72**	29.10*	29.79*	33.02**	33.17**	31.94**	27.10
	(12.78)	(11.81)	(11.87)	(12.73)	(13.17)	(13.59)	(13.73)	(13.74)	(17.29)
treat_after20	-24.12*	-51.19**	-51.07**	-50.73**	-50.49**	-50.40**	-50.56**	-49.06**	-47.99**
	(12.61)	(18.32)	(18.28)	(18.12)	(17.91)	(19.01)	(19.08)	(18.54)	(17.83)
all_ph_s		0.0421**	0.0422**	0.0423**	0.0422**	0.0382**	0.0382**	0.0378**	0.0368**
		(0.0143)	(0.0143)	(0.0143)	(0.0143)	(0.0150)	(0.0150)	(0.0146)	(0.0149)
co_div			-5.695	-4.642*	-4.440*	4.454	4.385	4.480	4.757
			(3.065)	(2.457)	(2.311)	(6.956)	(6.900)	(6.847)	(6.952)
co_share_pr_s				-5.629	-5.323	-3.049	-2.952	-2.837	-3.332
				(3.434)	(3.257)	(3.428)	(3.409)	(3.360)	(3.682)
co_rev					-0.00162	0.00344	0.00344	0.00349	0.00345
					(0.000998)	(0.00386)	(0.00386)	(0.00383)	(0.00395)
bnk_esg_nbm						5.699	5.568	-0.308	-1.894
						(9.417)	(9.416)	(5.317)	(5.268)
bnk_anti_esg_breg							-13.78	-13.37	-17.91
							(11.62)	(11.35)	(13.59)
bnk_esg_breg								12.17	11.01
								(11.60)	(9.772)
co_hq_co2_pr									-0.139
									(0.364)
Constant	8.600*	-4.254	-4.022	1.828	3.384	-90.17	-90.21	-90.32	-90.35
	(4.240)	(6.665)	(6.597)	(5.775)	(5.926)	(75.93)	(75.95)	(75.91)	(73.66)
Observations	27,510	27,510	27,510	27,510	27,510	27,475	27,475	27,475	27,475
R-squared	0.385	0.388	0.388	0.388	0.388	0.410	0.410	0.410	0.410

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Cobalt prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.33: Effect of the SFDR on Banks' Public Holdings of Cobalt Battery Mining Comp.—Baseline Regression

VARIABLES	(1) cob_ph Contemporaneous	(2) cob_ph Lagged 1Q	(3) cob_ph Lagged 2Q	(4) cob_ph Lagged 3Q
o.treat	-	-	-	-
after19_temp	8.389			
	(5.375)			
after21	52.44			
	(28.96)			
treat_after19_temp	-20.46			
	(9.326)			
treat_after21	-49.32*			
	(16.55)			
all_ph_s	0.0323	0.0335	0.0335	0.0329
	(0.0153)	(0.0154)	(0.0157)	(0.0159)
co_div	4.788	5.977	5.883	6.054
	(7.581)	(8.950)	(9.435)	(8.930)
co_share_pr_s	-2.891	-3.361	-4.069	-4.716
	(3.490)	(3.369)	(3.521)	(3.615)
co_rev	0.00370	0.00354	0.00364	0.00362
	(0.00380)	(0.00364)	(0.00372)	(0.00371)
cob_price	0.393	-0.0191	-0.108	-0.240
	(0.278)	(0.279)	(0.354)	(0.403)
bnk_esg_nbm	-1.304	0.205	0.0444	1.435
	(4.749)	(4.794)	(5.298)	(5.111)
bnk_anti_esg_breg	-19.46	-17.79	-17.70	-15.61
	(13.96)	(13.29)	(14.02)	(13.34)
bnk_esg_breg	13.45	11.82	11.14	11.31
	(10.11)	(10.07)	(9.974)	(9.593)
co_hq_co2_pr	-0.278	-0.205	-0.170	-0.173
	(0.404)	(0.362)	(0.340)	(0.328)
L.after19_temp		20.00		
		(9.425)		
L.after21		28.33		
		(15.46)		
L.treat_after19_temp		-24.25*		
		(9.141)		
L.treat_after21		-49.09*		
		(16.81)		
L2.after19_temp			20.15	
			(9.911)	
L2.after21			22.17	
			(12.57)	
L2.treat_after19_temp			-27.37*	
			(10.48)	
L2.treat_after21			-47.80*	
			(16.92)	
L3.after19_temp				21.73
				(11.95)
L3.after21				11.66
				(10.48)
L3.treat_after19_temp				-28.94
				(12.35)
L3.treat_after21				-44.37*
				(17.19)
Constant	-76.46	-95.71	-97.50	-100.6
	(61.70)	(72.33)	(73.48)	(75.33)
Observations	27,125	26,350	25,575	24,800
R-squared	0.409	0.419	0.430	0.441

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Cobalt prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.34: Effect of the Taxonomy on Banks' Public Hold. of Cobalt Battery Mining Comp.—Baseline Regression

VARIABLES	(1) cob_ph Contemporaneous	(2) cob_ph Lagged 1Q	(3) cob_ph Lagged 2Q	(4) cob_ph Lagged 3Q
o.treat	-			
after20	27.10			
	(17.29)			
treat_after20	-47.99**			
	(17.83)			
all_ph_s	0.0368**	0.0361**	0.0339*	0.0340*
	(0.0149)	(0.0154)	(0.0161)	(0.0163)
co_div	4.757	5.135	5.350	6.800
	(6.952)	(7.263)	(7.178)	(8.345)
co_share_pr_s	-3.332	-4.011	-4.242	-5.214
	(3.682)	(3.803)	(3.782)	(3.975)
co_rev	0.00345	0.00355	0.00340	0.00329
	(0.00395)	(0.00395)	(0.00391)	(0.00384)
cob_price	0.0513	0.0534	0.284	-0.258
	(0.258)	(0.263)	(0.225)	(0.346)
bnk_esg_nbm	-1.894	-2.701	-3.902	-5.089
	(5.268)	(5.039)	(5.251)	(5.505)
bnk_anti_esg_breg	-17.91	-18.80	-20.17	-22.93
	(13.59)	(13.90)	(14.02)	(15.31)
bnk_esg_breg	11.01	10.59	10.99	8.235
	(9.772)	(9.701)	(9.589)	(10.07)
co_hq_co2_pr	-0.139	-0.140	-0.208	-0.0646
	(0.364)	(0.363)	(0.395)	(0.324)
L.after20		30.50		
		(19.71)		
L.treat_after20		-47.86**		
		(18.15)		
L2.after20			49.97	
			(27.67)	
L2.treat_after20			-47.03**	
			(17.98)	
L3.after20				27.22
				(16.55)
L3.treat_after20				-46.83**
				(18.00)
Constant	-90.35	-86.28	-71.39	-84.59
	(73.66)	(71.82)	(64.71)	(72.27)
Observations	27,475	26,690	25,905	25,120
R-squared	0.410	0.421	0.432	0.443

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Cobalt prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

A.5.4 Regression Results—Public Holdings Manganese

Table A.35: Effect of the SFDR on Banks' Public Holdings of Manganese Battery Mining Companies—Sequential Regressions

VARIABLES	(1) mn_ph_s	(2) mn_ph_s	(3) mn_ph_s	(4) mn_ph_s	(5) mn_ph_s	(6) mn_ph_s	(7) mn_ph_s	(8) mn_ph_s	(9) mn_ph_s	(10) mn_ph_s
o.treat	-	-	-	-	-	-	-	-	-	-
after19_temp	-4.352	0.806	-0.214	-0.940	-1.098	-1.065	-1.066	-0.0921	-0.489	1.766
	(3.780)	(3.806)	(3.800)	(3.785)	(3.778)	(3.778)	(3.779)	(3.956)	(3.951)	(5.760)
treat_after19_temp	6.105	2.485	-10.91	-11.65	-12.58	-12.46	-12.46	-11.59	-11.09	-11.85
	(10.51)	(10.58)	(10.71)	(10.66)	(10.64)	(10.65)	(10.65)	(10.65)	(10.64)	(10.64)
after21		28.95***	24.47***	-0.533	1.356	2.046	2.049	-0.628	-2.085	5.878
		(3.090)	(3.141)	(3.995)	(3.998)	(4.062)	(4.073)	(4.309)	(4.311)	(7.991)
treat_after21		-20.32**	-41.19***	-48.77***	-44.67***	-44.86***	-44.86***	-41.07***	-36.15***	-37.29***
		(8.590)	(9.012)	(9.006)	(9.012)	(9.014)	(9.015)	(9.209)	(9.240)	(9.248)
all_ph_s			0.0268***	0.0263***	0.0254***	0.0253***	0.0253***	0.0236***	0.0240***	0.0252***
			(0.00357)	(0.00356)	(0.00356)	(0.00356)	(0.00356)	(0.00357)	(0.00357)	(0.00360)
co_hq_co2_pr				0.794***	0.809***	0.804***	0.804***	0.754***	0.658***	0.721***
				(0.0790)	(0.0789)	(0.0791)	(0.0792)	(0.0810)	(0.0827)	(0.0853)
co_share_pr_s					-11.71***	-10.77***	-10.76***	-8.485***	-8.108***	-8.443***
					(1.791)	(2.038)	(2.310)	(2.430)	(2.427)	(2.432)
co_div						-9.184	-9.155	-9.479	-8.851	-10.08
						(9.492)	(10.19)	(10.42)	(10.40)	(10.42)
co_rev							-5.73e-06	0.000578	0.000602	0.000806
							(0.000738)	(0.00101)	(0.00100)	(0.00101)
bnk_esg_nbm								51.21***	38.01***	40.05***
								(8.311)	(8.630)	(8.731)
bnk_esg_breg									32.36***	34.15***
									(5.799)	(5.840)
bnk_anti_esg_breg										-7.703
										(22.63)
Constant	11.24***	2.164	-8.058***	-20.13***	-12.42***	-12.59***	-12.59***	-6.197	-6.269	-2.618
	(1.460)	(1.762)	(2.226)	(2.521)	(2.779)	(2.785)	(2.839)	(8.947)	(8.935)	(11.00)
Observations	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900
R-squared	0.013	0.020	0.024	0.033	0.036	0.036	0.036	0.044	0.047	0.047

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Manganese prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.36: Effect of the Taxonomy on Banks' Public Holdings of Manganese Battery Mining Companies—Sequential Regressions

VARIABLES	(1) mn_ph_s	(2) mn_ph_s	(3) mn_ph_s	(4) mn_ph_s	(5) mn_ph_s	(6) mn_ph_s	(7) mn_ph_s	(8) mn_ph_s	(9) mn_ph_s	(10) mn_ph_s
o.treat	-	-	-	-	-	-	-	-	-	-
after20	3.207	4.920	4.859	4.572	4.549	4.573	4.615	3.813	3.317	3.318
	(6.886)	(6.879)	(6.841)	(6.840)	(6.840)	(6.840)	(7.040)	(7.033)	(7.017)	(7.017)
treat_after20	-17.31**	-35.04***	-43.71***	-41.84***	-42.08***	-42.00***	-42.03***	-36.67***	-29.21***	-29.29***
	(7.167)	(7.635)	(7.630)	(7.668)	(7.671)	(7.672)	(7.769)	(7.823)	(7.868)	(7.872)
all_ph_s		0.0237***	0.0248***	0.0244***	0.0243***	0.0243***	0.0254***	0.0251***	0.0246***	0.0245***
		(0.00356)	(0.00354)	(0.00355)	(0.00355)	(0.00355)	(0.00358)	(0.00358)	(0.00357)	(0.00357)
co_hq_co2_pr			0.830***	0.837***	0.832***	0.827***	0.843***	0.807***	0.673***	0.674***
			(0.0724)	(0.0724)	(0.0726)	(0.0730)	(0.0755)	(0.0757)	(0.0776)	(0.0776)
co_share_pr_s				-6.424**	-5.327*	-4.996*	-7.542**	-6.957**	-5.538*	-5.548*
				(2.657)	(2.799)	(2.852)	(3.161)	(3.159)	(3.157)	(3.157)
co_div					-10.61	-8.190	-5.577	-5.851	-5.611	-5.620
					(8.522)	(9.408)	(9.480)	(9.469)	(9.447)	(9.447)
co_rev						-0.000634	0.000128	7.88e-05	0.000165	0.000164
						(0.00104)	(0.00108)	(0.00108)	(0.00107)	(0.00107)
bnk_esg_nbm								40.13***	17.97**	17.75**
								(7.427)	(7.979)	(8.004)
bnk_esg_breg									50.75***	50.66***
									(6.776)	(6.781)
bnk_anti_esg_breg										-7.233
										(20.76)
Constant	10.27***	-1.266	-22.60***	-18.01***	-17.96***	-16.94***	5.194	2.413	-1.131	-0.999
	(2.785)	(3.278)	(3.754)	(4.206)	(4.206)	(4.532)	(14.53)	(14.52)	(14.50)	(14.50)
Observations	12,110	12,110	12,110	12,110	12,110	12,110	12,110	12,110	12,110	12,110
R-squared	0.257	0.260	0.268	0.268	0.268	0.268	0.271	0.273	0.276	0.276

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Manganese prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method.Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.37: Effect of the SFDR on Banks' Public Hold. of Manganese Battery Mining Comp.—Baseline Regression

VARIABLES	(1) mn_ph Contemporaneous	(2) mn_ph Lagged 1Q	(3) mn_ph Lagged 2Q	(4) mn_ph Lagged 3Q
o.treat	-	-	-	-
after19_temp	1.766			
	(5.760)			
after21	5.878			
	(7.991)			
treat_after19_temp	-11.85			
	(10.64)			
treat_after21	-37.29***			
	(9.248)			
all_ph_s	0.0252***	0.0254***	0.0259***	0.0264***
	(0.00360)	(0.00369)	(0.00381)	(0.00395)
co_hq_co2_pr	0.721***	0.710***	0.705***	0.702***
	(0.0853)	(0.0867)	(0.0884)	(0.0906)
co_share_pr_s	-8.443***	-8.822***	-9.168***	-9.450***
	(2.432)	(2.511)	(2.587)	(2.664)
co_div	-10.08	-9.845	-10.52	-10.28
	(10.42)	(10.60)	(10.89)	(11.08)
co_rev	0.000806	0.000875	0.000890	0.000908
	(0.00101)	(0.00103)	(0.00105)	(0.00107)
bnk_esg_nbm	40.05***	41.04***	41.30***	42.44***
	(8.731)	(8.872)	(9.039)	(9.291)
bnk_esg_breg	34.15***	34.55***	34.97***	35.51***
	(5.840)	(5.959)	(6.086)	(6.220)
bnk_anti_esg_breg	-7.703	-6.422	-5.902	-4.239
	(22.63)	(22.96)	(23.31)	(23.72)
L.after19_temp		5.424		
		(4.818)		
L.after21		4.082		
		(6.878)		
L.treat_after19_temp		-14.45		
		(10.79)		
L.treat_after21		-35.98***		
		(9.614)		
L2.after19_temp			5.585	
			(4.236)	
L2.after21			2.999	
			(7.081)	
L2.treat_after19_temp			-19.09*	
			(10.97)	
L2.treat_after21			-35.00***	
			(10.05)	
L3.after19_temp				4.923
				(4.301)
L3.after21				-2.712
				(8.279)
L3.treat_after19_temp				-22.08**
				(11.15)
L3.treat_after21				-33.19***
				(10.59)
Constant	-2.618	-5.894	-5.870	-7.359
	(11.00)	(10.44)	(10.72)	(12.01)
Observations	11,900	11,560	11,220	10,880
R-squared	0.047	0.048	0.048	0.048

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Manganese prices, YY GDP change, and YY-inflation.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.38: Effect of the Taxonomy on Banks' Public Hold. of Mn Battery Mining Comp.—Baseline Regression

VARIABLES	(1) mn_ph Contemporaneous	(2) mn_ph Lagged 1Q	(3) mn_ph Lagged 2Q	(4) mn_ph Lagged 3Q
o.treat	-	-	-	-
after20	3.318			
	(7.017)			
treat_after20	-29.29***			
	(7.872)			
all_ph_s	0.0245***	0.0261***	0.0279***	0.0296***
	(0.00357)	(0.00376)	(0.00396)	(0.00420)
co_hq_co2_pr	0.674***	0.670***	0.664***	0.649***
	(0.0776)	(0.0791)	(0.0807)	(0.0824)
co_share_pr_s	-5.548*	-5.723*	-5.805*	-5.803*
	(3.157)	(3.233)	(3.313)	(3.431)
co_div	-5.620	-5.047	-4.524	-4.175
	(9.447)	(9.595)	(9.727)	(9.876)
co_rev	0.000164	0.000158	0.000165	9.99e-05
	(0.00107)	(0.00109)	(0.00110)	(0.00116)
bnk_esg_nbm	17.75**	18.23**	18.78**	19.75**
	(8.004)	(8.137)	(8.276)	(8.424)
bnk_esg_breg	50.66***	51.02***	51.52***	52.41***
	(6.781)	(6.898)	(7.021)	(7.153)
bnk_anti_esg_breg	-7.233	-6.849	-6.363	-5.644
	(20.76)	(20.99)	(21.22)	(21.47)
L.after20		2.992		
		(8.040)		
L.treat_after20		-31.38***		
		(8.153)		
oL2.after20			0	
			(0)	
L2.treat_after20			-33.35***	
			(8.457)	
L3.after20				6.287
				(8.499)
L3.treat_after20				-32.82***
				(8.773)
Constant	-0.999	-0.306	0.513	-0.342
	(14.50)	(15.36)	(15.20)	(15.87)
Observations	12,110	11,764	11,418	11,072
R-squared	0.276	0.283	0.291	0.299

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Manganese prices. Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

A.5.5 Regression Results—Public Holdings Nickel

Table A.39: Effect of the SFDR on Banks' Public Holdings of Nickel Battery Mining Companies—Sequential Regressions

VARIABLES	(1) ni_ph_s	(2) ni_ph_s	(3) ni_ph_s	(4) ni_ph_s	(5) ni_ph_s	(6) ni_ph_s	(7) ni_ph_s	(8) ni_ph_s	(9) ni_ph_s	(10) ni_ph_s
o.treat	-	-	-	-	-	-	-	-	-	-
after19_temp	-0.0557	1.640	1.467	1.599	1.719	1.698	1.724	1.631	1.649	2.407
	(2.045)	(1.639)	(1.601)	(1.482)	(1.523)	(1.530)	(1.570)	(1.545)	(1.586)	(1.826)
treat_after19_temp	0.515	-0.712	-0.478	-0.609	-0.730	-0.712	-0.757	-0.812	-0.752	-1.126
	(1.707)	(1.682)	(1.688)	(1.575)	(1.612)	(1.618)	(1.656)	(1.654)	(1.656)	(1.843)
after21		9.516**	9.102**	8.241**	8.462**	8.581**	9.060**	8.499*	8.716*	6.653
		(2.651)	(2.647)	(2.473)	(2.555)	(2.668)	(2.794)	(3.069)	(3.142)	(3.305)
treat_after21		-6.888*	-6.861*	-6.002*	-6.218*	-6.320*	-6.325*	-6.609*	-6.584*	-7.935*
		(2.520)	(2.532)	(2.351)	(2.426)	(2.519)	(2.564)	(2.508)	(2.514)	(2.987)
all_ph_s			0.00175	0.00176	0.00174	0.00173	0.00172	0.00173	0.00174	0.00182
			(0.00174)	(0.00174)	(0.00173)	(0.00173)	(0.00173)	(0.00173)	(0.00173)	(0.00178)
bnk_esg_nbm				13.43	13.60	13.50	13.37	13.43	13.41	11.10
				(12.85)	(12.87)	(12.90)	(12.91)	(12.94)	(12.94)	(12.37)
bnk_esg_breg					-5.574*	-5.652	-5.622	-5.701	-5.720	-5.135*
					(2.345)	(2.408)	(2.418)	(2.432)	(2.457)	(2.038)
bnk_anti_esg_breg						-4.900	-5.112	-4.865	-5.080	-5.246*
						(2.265)	(2.327)	(2.403)	(2.459)	(1.760)
co_rev							-0.000533*	-0.000517*	-0.000360	-0.000383
							(0.000179)	(0.000182)	(0.000157)	(0.000170)
co_share_pr_s								0.0268	0.0243	0.0197
								(0.0393)	(0.0394)	(0.0430)
co_div									-6.602*	-8.277
									(2.805)	(4.306)
co_credit_risk										0
										(0)
co_fd_yr										0
										(0)
co_hq_co2_pr										0.0206
										(0.0690)
o.co_credit_risk										
o.co_fd_yr										
Constant	7.347**	4.281**	3.623**	3.592**	3.807**	3.817**	4.562**	4.499**	4.555**	4.053
	(1.705)	(0.797)	(1.105)	(1.112)	(1.075)	(1.070)	(1.102)	(1.101)	(1.114)	(2.986)
Observations	41,685	41,685	41,685	41,685	41,685	41,685	41,685	41,685	41,685	41,375
R-squared	0.434	0.438	0.439	0.439	0.440	0.440	0.440	0.440	0.440	0.440

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Nickel prices. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.40: Effect of the Taxonomy on Banks' Public Holdings of Nickel Battery Mining Companies—Sequential Regressions

VARIABLES	(1) ni_ph_s	(3) ni_ph_s	(4) ni_ph_s	(5) ni_ph_s	(6) ni_ph_s	(7) ni_ph_s	(8) ni_ph_s	(9) ni_ph_s	(10) ni_ph_s	(11) ni_ph_s	(12) ni_ph_s
o.treat	-	-	-	-	-	-	-	-	-	-	-
after20	-0.421	-0.376	-0.501	-0.473	-0.502	-0.651	-1.753	-1.723	-1.780	-1.775	-2.359
	(3.016)	(2.988)	(2.983)	(2.996)	(2.994)	(3.030)	(3.260)	(3.275)	(3.299)	(3.288)	(3.408)
treat_after20	-13.40**	-13.22**	-11.56**	-11.12**	-11.29**	-11.26**	-11.98**	-11.80**	-11.79**	-11.75**	-16.99**
	(3.632)	(3.582)	(3.363)	(3.046)	(3.090)	(3.097)	(3.067)	(3.078)	(3.060)	(3.085)	(5.290)
all_ph_s		0.00513*	0.00513*	0.00514*	0.00513*	0.00537*	0.00538*	0.00549*	0.00548*	0.00549*	0.00553*
		(0.00182)	(0.00182)	(0.00182)	(0.00182)	(0.00186)	(0.00186)	(0.00187)	(0.00187)	(0.00188)	(0.00190)
bnk_esg_nbm			18.53**	15.78*	15.36*	15.27*	15.34*	15.61*	15.50*	15.28*	11.64
			(4.996)	(5.380)	(5.369)	(5.405)	(5.890)	(5.967)	(6.073)	(5.970)	(5.125)
bnk_esg_breg				5.956	5.814	5.367	5.116	4.863	4.864	5.331	3.614
				(5.769)	(5.750)	(5.690)	(5.611)	(5.560)	(5.532)	(5.441)	(4.627)
bnk_anti_esg_breg					-8.885**	-8.449*	-8.182**	-8.302**	-8.398**	-8.527**	-6.977
					(2.737)	(2.707)	(2.239)	(2.212)	(2.125)	(2.195)	(3.052)
co_rev						-0.00125*	-0.00125*	-0.000627	-0.00116*	-0.00122*	-0.00136*
						(0.000410)	(0.000416)	(0.000357)	(0.000490)	(0.000500)	(0.000569)
co_share_pr_s							0.0857	0.0798	0.0800	0.0792	0.128
							(0.0674)	(0.0677)	(0.0676)	(0.0674)	(0.0704)
co_div								-24.27*	-22.16*	-22.36*	-20.50
								(7.875)	(8.277)	(8.421)	(8.992)
co_credit_risk									7.268	7.677	13.76
									(6.593)	(6.626)	(9.923)
co_fd_yr										0.0122*	0.0125*
										(0.00448)	(0.00462)
co_hq_co2_pr											0.301
											(0.138)
Constant	13.15***	10.97**	10.32**	9.940**	10.03**	11.91**	11.55**	11.84**	11.11**	-12.58	-15.83
	(2.133)	(1.980)	(1.965)	(1.784)	(1.791)	(2.166)	(2.236)	(2.236)	(2.440)	(7.594)	(9.544)
Observations	49,770	49,770	49,770	49,770	49,770	49,770	49,770	49,770	49,770	49,770	49,421
R-squared	0.048	0.053	0.053	0.054	0.054	0.054	0.055	0.055	0.055	0.056	0.059

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Nickel prices. Robust standard errors in parentheses.

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

Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.41: Effect of the SFDR on Banks' Public Holdings of Nickel Battery Mining Companies—Baseline Regression

VARIABLES	(1) ni_ph Contemporaneous	(2) ni_ph Lagged 1Q	(3) ni_ph Lagged 2Q	(4) ni_ph Lagged 3Q
o.treat	-	-	-	-
after19_temp	2.407			
	(1.826)			
after21	6.653			
	(3.305)			
treat_after19_temp	-1.126			
	(1.843)			
treat_after21	-7.935*			
	(2.987)			
all_ph_s	0.00182	0.00163	0.00143	0.00123
	(0.00178)	(0.00158)	(0.00135)	(0.00122)
bnk_esg_nbm	11.10	10.69	10.49	10.47
	(12.37)	(12.30)	(12.22)	(12.21)
bnk_esg_breg	-5.135*	-5.303*	-5.120*	-4.778
	(2.038)	(2.017)	(2.021)	(2.059)
bnk_anti_esg_breg	-5.246*	-5.403*	-5.348*	-5.109*
	(1.760)	(1.962)	(1.884)	(2.059)
co_rev	-0.000383	-0.000389*	-0.000441	-0.000428
	(0.000170)	(0.000161)	(0.000199)	(0.000187)
co_share_pr_s	0.0197	0.0209	0.0205	0.0214
	(0.0430)	(0.0429)	(0.0423)	(0.0421)
co_div	-8.277	-7.926	-7.613	-7.771
	(4.306)	(4.832)	(4.126)	(3.972)
co_credit_risk	0	0	0	0
	(0)	(4.33e-09)	(3.01e-08)	(1.30e-08)
co_hq_co2_pr	0.0206	0.0175	0.0149	0.0154
	(0.0690)	(0.0673)	(0.0645)	(0.0641)
L.after19_temp		2.750		
		(1.387)		
L.after21		5.666		
		(2.993)		
L.treat_after19_temp		-1.398		
		(2.083)		
L.treat_after21		-8.255*		
		(2.855)		
L2.after19_temp			3.144	
			(1.442)	
L2.after21			4.705	
			(3.283)	
L2.treat_after19_temp			-2.030	
			(1.565)	
L2.treat_after21			-8.424*	
			(2.799)	
L3.after19_temp				3.030
				(1.558)
L3.after21				3.487
				(3.869)
L3.treat_after19_temp				-2.490
				(1.729)
L3.treat_after21				-8.445*
				(2.816)
Constant	4.053	3.299	2.856	2.361
	(2.986)	(2.949)	(3.692)	(4.233)
Observations	41,375	40,185	38,995	37,805
R-squared	0.440	0.454	0.470	0.489

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Nickel prices, and companies' founding year. Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1. Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.42: Effect of the Taxonomy on Banks' Public Holdings of Nickel Battery Mining Comp.—Baseline Regression

VARIABLES	(1) ni_ph Contemporaneous	(2) ni_ph Lagged 1Q	(3) ni_ph Lagged 2Q	(4) ni_ph Lagged 3Q
o.treat	-	-	-	-
after20	-2.359			
	(3.408)			
treat_after20	-16.99**			
	(5.290)			
all_ph_s	0.00553*	0.00557*	0.00560*	0.00564*
	(0.00190)	(0.00192)	(0.00194)	(0.00195)
bnk_esg_nbm	11.64	11.51	11.29	11.14
	(5.125)	(4.955)	(4.845)	(4.878)
bnk_esg_breg	3.614	3.507	3.494	3.413
	(4.627)	(4.502)	(4.377)	(4.238)
bnk_anti_esg_breg	-6.977	-6.935*	-6.944*	-6.858*
	(3.052)	(2.896)	(2.902)	(2.882)
co_rev	-0.00136*	-0.00135*	-0.00132	-0.00132
	(0.000569)	(0.000573)	(0.000577)	(0.000590)
co_share_pr_s	0.128	0.131	0.123	0.121
	(0.0704)	(0.0705)	(0.0696)	(0.0689)
co_div	-20.50	-21.25	-21.69	-22.23
	(8.992)	(9.437)	(9.669)	(10.07)
co_credit_risk	13.76	13.91	13.93	14.11
	(9.923)	(10.19)	(10.46)	(10.69)
co_fd_yr	0.0125*	0.0128*	0.0132*	0.0135*
	(0.00462)	(0.00466)	(0.00474)	(0.00486)
co_hq_co2_pr	0.301	0.291	0.274	0.257
	(0.138)	(0.132)	(0.129)	(0.128)
L.after20		-5.476		
		(3.834)		
L.treat_after20		-17.08**		
		(5.069)		
oL2.after20			0	
			(0)	
L2.treat_after20			-17.23**	
			(4.624)	
L3.after20				1.690
				(4.012)
L3.treat_after20				-17.00**
				(4.552)
Constant	-15.83	-14.55	-16.23	-17.10
	(9.544)	(10.09)	(10.64)	(10.85)
Observations	49,421	48,000	46,579	45,158
R-squared	0.059	0.060	0.061	0.062

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' ESG ratings and disclosure, Nickel prices. Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Results based on stata's reghdfe OLS estimation method. Time, company, and bank level fixed effects treated by means of "absorbing" (Correia, 2016).

A.6 The Impact of ESG Performance

A.6.1 ESG Regulation: Impact of ESG Performance

Table A.43: Effect of the SFDR on Banks' Public Holdings of all Battery Mining Companies—Companies with the Best and Worst ESG-Ratings

	(1)	(2)
	batmat_ph	batmat_ph
VARIABLES	Best ESG	Worst ESG
treat	0.699	-41.18**
	(1.183)	(18.76)
after19_21	0	0
	(4.12e-06)	(3.19e-06)
treat_after19_21	0.951	0
	(5.251)	(6.69e-07)
after21	0	-9.642***
	(6.24e-07)	(2.349)
treat_after21	-0.322	-32.74***
	(1.249)	(7.421)
all_ph_s	0.00751*	0.00269
	(0.00436)	(0.00200)
co_share_pr_s	0.204	-0.0123
	(0.221)	(0.123)
co_div	1.164	-4.553
	(4.443)	(5.176)
co_credit_risk	19.45	34.95**
	(44.39)	(16.40)
co_fd_yr	0.0897*	0.0135***
	(0.0446)	(0.00360)
co_rev	0.000114**	-0.00390***
	(4.40e-05)	(0.00120)
co_E	1.629	51.65
	(2.865)	(35.29)
co_S	-2.997*	-2.252
	(1.645)	(24.75)
co_G	-7.929**	-111.3
	(3.098)	(66.77)
co_hq_co2_pr	-0.0145	0.234
	(0.0203)	(0.208)
bnk_esg_nbm	3.561	8.109
	(3.585)	(8.022)
bnk_esg_breg	2.164	18.71**
	(1.505)	(8.704)
bnk_anti_esg_breg	-2.128	-31.49***
	(1.574)	(7.672)
Constant	-214.2*	19.40
	(109.4)	(22.21)
Observations	13,790	77,190
R-squared	0.319	0.050

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Best ESG: first to third quartile of disclosure-adjusted E-, S- and G-rating

Worst ESG: fourth quartile of disclosure-adjusted E-, S- and G-rating

Results based on stata's reghdfe OLS estimation method.

Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.44: Effect of the Taxonomy on Banks' Public Holdings of all Battery Mining Companies—Companies with the Best and Worst ESG-Ratings

VARIABLES	(1) batmat_ph Best ESG	(2) batmat_ph Worst ESG
treat	0.814	-42.27**
	(0.920)	(18.78)
after20	0	0
	(1.57e-06)	(5.21e-06)
treat_after20	0.0191	-27.78***
	(1.283)	(6.313)
all_ph_s	0.00751*	0.00268
	(0.00435)	(0.00200)
co_share_pr_s	0.204	-0.0141
	(0.220)	(0.123)
co_div	1.163	-4.497
	(4.480)	(5.184)
co_credit_risk	19.46	34.88**
	(44.23)	(16.41)
co_fd_yr	0.0903*	0.0135***
	(0.0452)	(0.00360)
co_rev	0.000109**	-0.00389***
	(4.64e-05)	(0.00120)
co_E	1.637	51.16
	(2.862)	(35.23)
co_S	-3.007*	-1.715
	(1.650)	(24.79)
co_G	-8.058**	-111.2
	(3.056)	(66.77)
co_hq_co2_pr	-0.0158	0.228
	(0.0201)	(0.207)
bnk_esg_nbm	3.646	8.536
	(3.570)	(8.073)
bnk_esg_breg	2.167	18.95**
	(1.504)	(8.749)
bnk_anti_esg_breg	-2.053	-30.98***
	(1.586)	(7.547)
Constant	-215.3*	19.18
	(110.5)	(22.20)
Observations	13,790	77,190
R-squared	0.319	0.050

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Best ESG: first to third quartile of disclosure-adjusted E-, S- and G-rating

Worst ESG: fourth quartile of disclosure-adjusted E-, S- and G-rating

Results based on stata's reghdfe OLS estimation method.

Time fixed effects treated by means of "absorbing" (Correia, 2016).

Table A.45: Effect of the SFDR and the Taxonomy on Banks' Public Holdings of all Battery Mining Companies—Companies with the Best and Worst ESG-Ratings

VARIABLES	(1) batmat_ph Best ESG	(2) batmat_ph Worst ESG
treat	0.699	-41.18**
	(1.183)	(18.76)
after19_20	0	0
	(4.12e-06)	(7.33e-07)
treat_after19_20	0.951	-9.350***
	(3.318)	(2.327)
after20_21	0	0
	(1.11e-06)	(7.75e-07)
treat_after20_21	2.492	-10.08***
	(5.251)	(2.429)
after21	0	0
	(6.24e-07)	(7.25e-07)
treat_after21	-0.322	-32.74***
	(1.249)	(7.421)
all_ph_s	0.00751*	0.00269
	(0.00436)	(0.00200)
co_share_pr_s	0.204	-0.0123
	(0.221)	(0.123)
co_div	1.164	-4.551
	(4.443)	(5.178)
co_credit_risk	19.45	34.95**
	(44.39)	(16.40)
co_fd_yr	0.0897*	0.0135***
	(0.0446)	(0.00360)
co_rev	0.000114**	-0.00390***
	(4.40e-05)	(0.00120)
co_E	1.629	51.64
	(2.865)	(35.30)
co_S	-2.997*	-2.248
	(1.645)	(24.75)
co_G	-7.929**	-111.3
	(3.098)	(66.77)
co_hq_co2_pr	-0.0145	0.234
	(0.0203)	(0.208)
bnk_esg_nbm	3.561	8.109
	(3.585)	(8.022)
bnk_esg_breg	2.164	18.71**
	(1.505)	(8.704)
bnk_anti_esg_breg	-2.128	-31.49***
	(1.574)	(7.673)
Constant	-214.2*	19.40
	(109.4)	(22.21)
Observations	13,790	77,190
R-squared	0.319	0.050

Only select control variables displayed. For reasons of readability, the following control variables have been removed from the representation: mining companies' headquarter location, banks' headquarter location, Lithium, Cobalt, Manganese and Nickel prices, YY GDP change, and YY-inflation. Robust standard errors in parentheses.

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

Best ESG: first to third quartile of disclosure-adjusted E-, S- and G-rating

Worst ESG: fourth quartile of disclosure-adjusted E-, S- and G-rating

Results based on stata's reghdfe OLS estimation method.

Time fixed effects treated by means of "absorbing" (Correia, 2016).

A.7 Share Prices

A.7.1 Share Prices: All Battery Raw Materials

Figure A.8: Average Share Prices All Battery Raw Material Companies (co_share_pr, EUR)

Table A.46: Share Prices All Battery Raw Materials—Parallel Trends Normalized Differences

	Held by Treated		Held by Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
co_share_pr	49.42	190.79	46.04	178.78	0.02
co_share_pr (pre-treatment)	10.80	25.88	12.16	21.24	0.06
co_share_pr (post-treatment)	95.30	273.80	86.28	257.69	0.03

This table reports statistics of relevant co-variates of the share prices of All Battery Raw Material companies, whose shares are held by banks of the treated and the control groups. The statistics are reported for the overall period (Q1/2015 to Q3/2023), the pre-treatment period (Q1/2015 to Q3/2019) and the post-treatment period (Q4/2019 to Q3/2023). The last column reports normalized differences between the two groups, i.e., differences in averages by treatment status, scaled by the square root of the sum of the variances. An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.7.2 Share Prices: Lithium

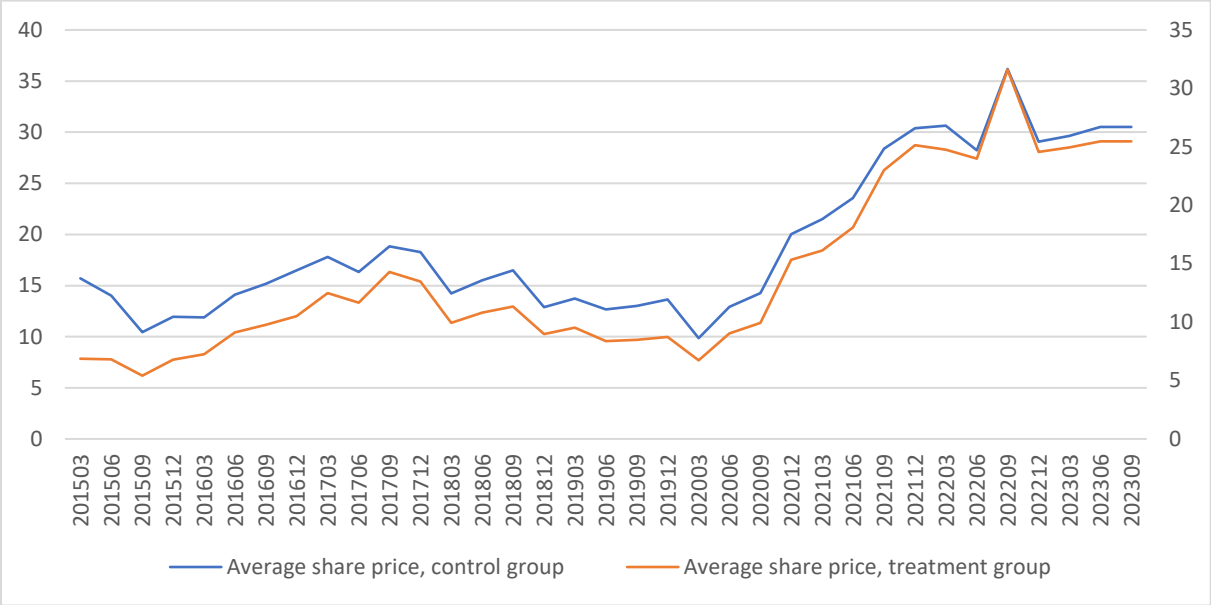


Figure A.9: Average Share Prices Lithium Companies (co_share_pr, EUR)

Table A.47: Share Prices Lithium—Parallel Trends Normalized Differences

	Held by Treated		Held by Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
co_share_pr	14.36	40.94	19.06	42.21	0.11
co_share_pr (pre-treatment)	9.72	37.65	14.68	28.67	0.19
co_share_pr (post-treatment)	19.87	1.04	24.27	53.58	0.08

This table reports statistics of relevant co-variates of the share prices of Lithium companies, whose shares are held by banks of the treated and the control groups. The statistics are reported for the overall period (Q1/2015 to Q3/2023), the pre-treatment period (Q1/2015 to Q3/2019) and the post-treatment period (Q4/2019 to Q3/2023). The last column reports normalized differences between the two groups, i.e., differences in averages by treatment status, scaled by the square root of the sum of the variances. An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.7.3 Share Prices: Cobalt

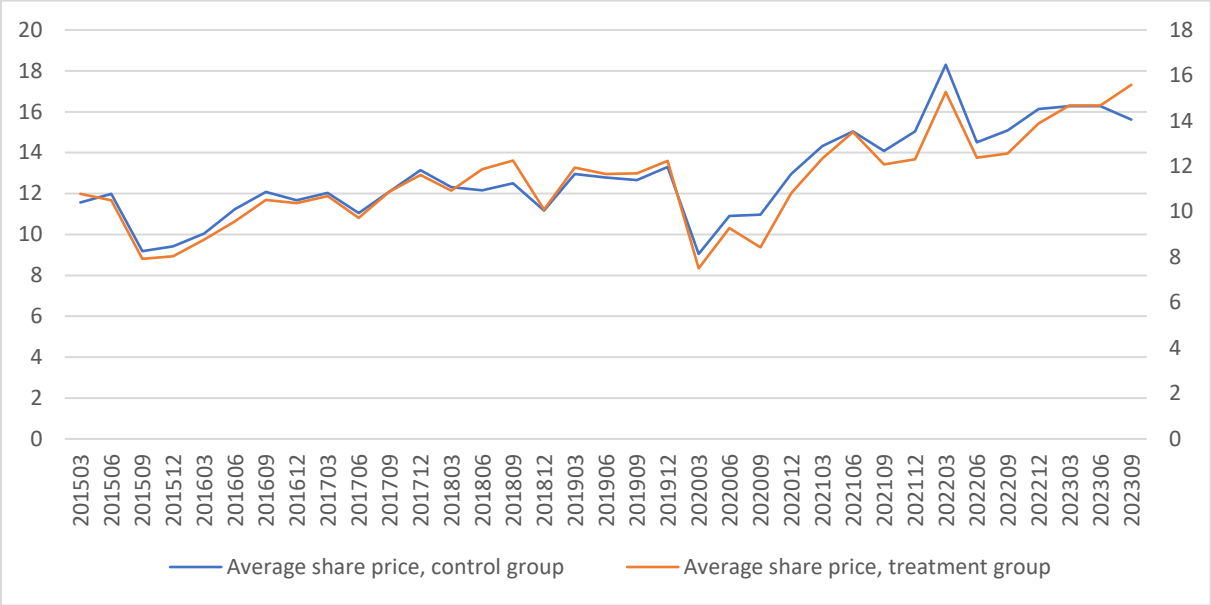


Figure A.10: Average Share Prices Cobalt Companies (co_share_pr, EUR)

Table A.48: Share Prices Cobalt—Parallel Trends Normalized Differences

	Held by Treated		Held by Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
co_share_pr	12.85	39.23	11.35	22.50	0.05
co_share_pr (pre-treatment)	11.69	39.21	10.52	22.05	0.04
co_share_pr (post-treatment)	14.24	39.22	12.35	22.98	0.06

This table reports statistics of relevant co-variates of the share prices of Cobalt companies, whose shares are held by banks of the treated and the control groups. The statistics are reported for the overall period (Q1/2015 to Q3/2023), the pre-treatment period (Q1/2015 to Q3/2019) and the post-treatment period (Q4/2019 to Q3/2023). The last column reports normalized differences between the two groups, i.e., differences in averages by treatment status, scaled by the square root of the sum of the variances. An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.7.4 Share Prices: Manganese

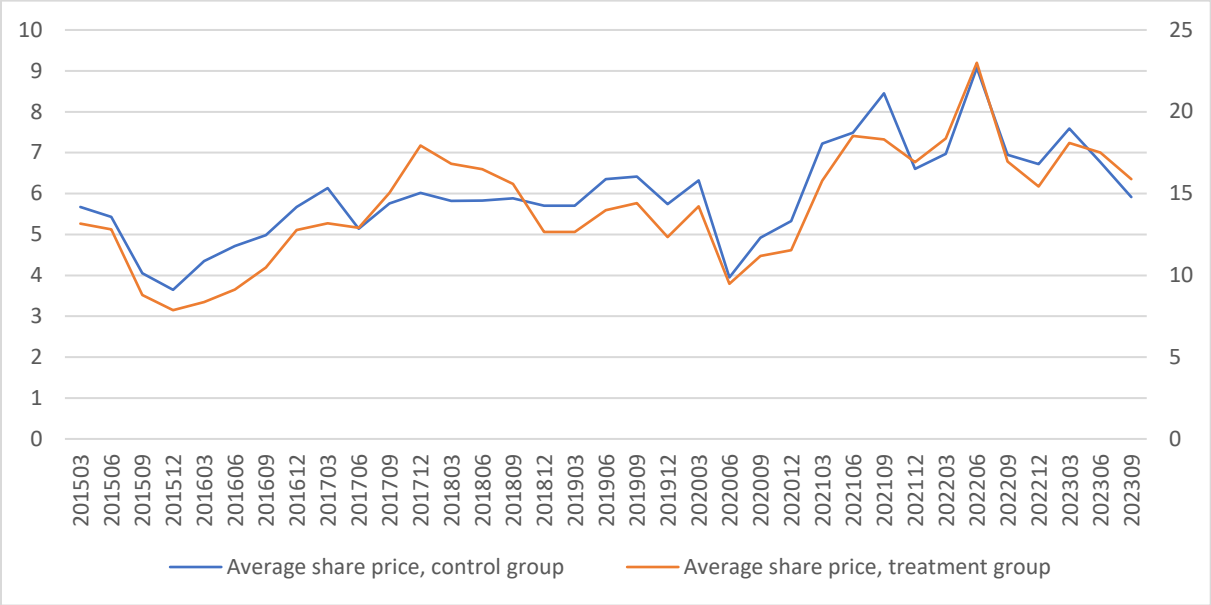


Figure A.11: Average Share Prices Manganese Companies (co_share_pr, EUR)

Table A.49: Share Prices Manganese—Parallel Trends Normalized Differences

	Held by Treated		Held by Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
co_share_pr	14.25	15.93	6.03	8.00	0.65
co_share_pr (pre-treatment)	12.90	15.28	5.47	6.56	0.63
co_share_pr (post-treatment)	15.85	16.55	6.70	9.39	0.68

This table reports statistics of relevant co-variates of the share prices of Manganese companies, whose shares are held by banks of the treated and the control groups. The statistics are reported for the overall period (Q1/2015 to Q3/2023), the pre-treatment period (Q1/2015 to Q3/2019) and the post-treatment period (Q4/2019 to Q3/2023). The last column reports normalized differences between the two groups, i.e., differences in averages by treatment status, scaled by the square root of the sum of the variances. An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

A.7.5 Share Prices: Nickel

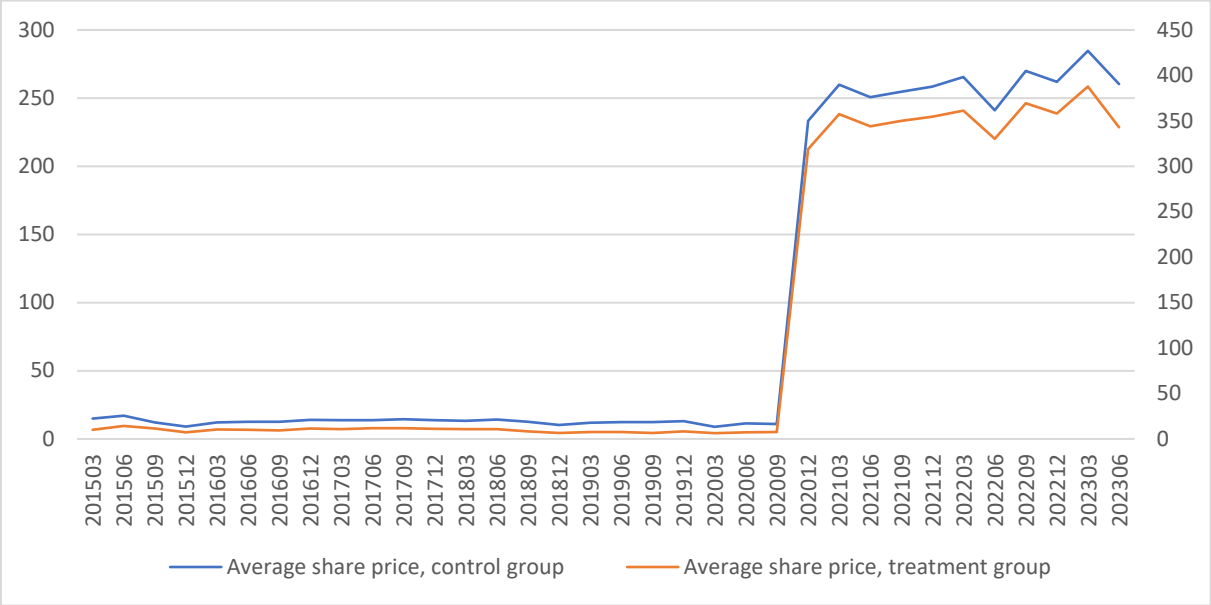


Figure A.12: Average Share Prices Nickel Companies (co_share_pr, EUR)

Table A.50: Share Prices Nickel—Parallel Trends Normalized Differences

	Held by Treated		Held by Control		Norm. Diff.
VARIABLES	Mean	Std. Dev.	Mean	Std. Dev.	
co_share_pr	117.18	309.36	90.00	266.36	0.09
co_share_pr (pre-treatment)	9.91	11.03	13.01	16.79	0.22
co_share_pr (post-treatment)	244.56	423.52	181.42	373.46	0.16

This table reports statistics of relevant co-variates of the share prices of Nickel companies, whose shares are held by banks of the treated and the control groups. The statistics are reported for the overall period (Q1/2015 to Q3/2023), the pre-treatment period (Q1/2015 to Q3/2019) and the post-treatment period (Q4/2019 to Q3/2023). The last column reports normalized differences between the two groups, i.e., differences in averages by treatment status, scaled by the square root of the sum of the variances. An absolute difference smaller than 0.25 indicates that there is no significant difference between the groups. See Table A.3 for detailed variable definitions incl. units.
Rounded values shown.

Acknowledgements

We are grateful for comments from participants of the ECB Banking Supervision Research Seminar Series and by Veerle De Vuyst, Klaus Düllmann, Maria Jose Romero Rico, Alex Popov, Spyros Palligkinis, Ralf Bock, Huyen Nguyen and an anonymous referee. This paper was written during Lena Schreiner's stay at the ECB's Directorate Supervisory Strategy and Risk in 2023.
The views expressed in this paper are those of the authors and do not necessarily reflect those of the ECB or the SSM.

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PDF ISBN 978-92-899- 7403-5 ISSN 1725-2806 doi:10.2866/ 5512487 QB-01-25-177-EN-N