



## ESG positioning in private infrastructure fundraising<sup>☆</sup>

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### ABSTRACT

We examine if environmental, social and governance (ESG) positioning by private equity infrastructure funds affects fundraising success. We use novel hand-collected data from a proprietary sample of fund marketing documents. By adapting methodologies from the extant literature on private equity fundraising, we directly address the fundraising event rather than the time between successor funds. Our results from private equity infrastructure fundraising events between 2006 and 2021 indicate that ESG positioning in fund marketing documents does not have a significant impact on fundraising success. This is an important finding as it suggests that investors do not respond to ESG-related claims in marketing materials at the fund level. However, there is some evidence of a weak positive relationship between ESG positioning and fundraising success that we observe in the earlier sample period that has dissipated in more recent years. This might be explained by firms trying to materialize value from “cheap-talk” due to first mover advantage.

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### 1. Introduction

Environmental, Social, and Governance (ESG) issues are an increasingly important topic for institutional investors. Assets held in European sustainable mutual funds rose nearly tenfold from the end of 2010 to the end of 2020 (Bioy, Stuart, Boyadzhiev, Pettite, & Alladi, 2021). Some prominent institutional investors have made public their commitments to ESG. For example, NBIM, the world’s largest investment fund, has excluded sectors and individual stocks from its portfolio on ESG grounds (Atta-Darkua, 2020). Asset managers are adapting to this trend, with Larry Fink, CEO of BlackRock, the world’s largest asset manager, stating the following in his 2021 annual letter to clients: “In

2020, we completed our goal of having 100% of our active and advisory portfolios ESG-integrated”. However, some scepticism around such claims by asset managers seems warranted. For example, self-labelled ESG mutual funds invest in companies with worse track records of compliance with ESG standards and with higher carbon emissions per unit of revenue when compared to non-ESG funds (Raghunandan & Rajgopal, 2022b).

Regulators share this scepticism and have recently started to monitor and regulate ESG statements.<sup>1</sup> The increased scrutiny from regulators highlights the increasing miscommunication problems arising from ESG-related claims in the investment industry in general. However, so far there is no analysis of investors’ reactions to ESG positioning. In this

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<sup>1</sup> For example, in March 2021, the European Commission introduced the Sustainable Finance Disclosure Regulation (SFDR) to create a level playing field for financial market participants with relation to sustainability (KPMG, 2021). In May 2022, the German financial regulator raided the offices of DWS Group, a large asset manager, in relation to allegations that the firm was overstating ESG criteria used in its investment products (Walker & Miller, 2022). In Australia, the Australian Securities and Investments Commission issued a fine for greenwashing for the first time. Tlou Energy, a stock market-listed energy company, received a fine of AUD53,280 (approximately USD36,850) in February 2022 for exaggerated environmental claims (ABC News, 2022).

paper, we fill this gap in the literature and address the question of how investors respond to ESG positioning of private equity funds' marketing materials in the unique setting of infrastructure funds. In particular, we investigate how the emphasis on ESG issues by fund managers in marketing documents is perceived by investors and whether it affects capital under management. The main goal of private equity fund managers is to raise capital for future investments. Fundraising is crucial as it ensures the continuity and reputation of a private equity fund.<sup>2</sup>

Previous research shows that investors are driving the adoption of ESG by private equity fund managers (Zaccone & Pedrini, 2020) and investors report rejecting funds on the basis of ESG concerns (Prequin, 2020). From a theoretical perspective it is not clear ex-ante what effect voluntary ESG-related disclosure of information should have on fundraising process. Theories on the effectiveness of such voluntarily distributed information such as cheap-talk model by Stocken (2000) and costly state falsification models (Korn, 2004; Einhorn & Ziv, 2008) predict diverging outcomes regarding this question. The crucial difference in these models is whether voluntary disclosure imposes costs on those who disclose when claims are in fact false. In the context of infrastructure fund, the effectiveness of funds' ESG positioning in private placement memoranda (PPMs) on fundraising may depend on whether such ESG claims made in these fund marketing documents have actual consequences for fund managers when false and verifiable. Therefore, based on the cheap-talk model we predict that ESG positioning has no effect on fundraising success, while based on costly state falsification models we would expect that there is a positive association between ESG positioning and fundraising success.

To analyse how investors respond to ESG positioning by fund managers, we apply text analysis techniques to a unique international sample of PPMs, i.e., marketing documents for private infrastructure funds. We hand collect data from the documents provided by a specialised intermediary. This allows us to examine a number of novel research questions on how ESG terminology used in the funds' marketing materials impacts fundraising success. In particular, we ask whether a greater emphasis on ESG in a fund's marketing material increases the likelihood of a fund achieving its target size, raising a larger fund, or reaching a final close earlier.

Infrastructure funds are a form of private equity funds that are particularly well-suited for examining the impacts of investor attitudes to ESG-related claims. While buyout funds are free to invest across different sectors and industries, infrastructure funds are focused only on investments that meet some definition of infrastructure. Assets are defined as infrastructure either by the sector in which they operate or by the characteristics of their business model (Weber, Staub-Bisang, & Alfen, 2016). The sectoral definition of infrastructure typically covers transportation (e.g., rail, roads, ports, airports), utilities (e.g., water, electricity, gas), energy (e.g., renewable energy generation, conventional energy generation, midstream), social (e.g., schools, hospitals), and communication infrastructure (e.g., telecom towers, fibre optic networks). The characteristic definition of infrastructure includes assets that demonstrate some of the following: high barriers to entry, economies of scale, inelastic demand, low operating costs, or long duration.

Fund managers often position infrastructure funds as an opportunity for institutional investors to have a positive impact with their capital as well. For example, in renewable energy assets supporting the transition away from fossil fuels and investment in utilities allowing for the capital

expenditure to modernise and increase efficiency. The provision of private capital to fund various infrastructure constructions such as schools, hospitals and other social assets may also be considered a positive ESG outcome. This sentiment is encapsulated by the following statement from a partner at Igneo (formerly "First Sentier"), a large European infrastructure fund manager: "Our environmental, social and governance-led strategy builds on our experience and belief that sustainability is inseparable from infrastructure investment" (IPE Staff, 2019). Such comments appear to be widespread in the industry, with McKinsey's Global Private Markets Review 2021 stating "energy transition remains the main story" for infrastructure fundraising (McKinsey & Company, 2021). Also, infrastructure assets are also particularly susceptible to ESG-related risks (Weber et al., 2016). Given the importance of infrastructure assets to society, negative events, such as an oil-leak from a pipeline, can lead to enhanced regulatory scrutiny or political intervention. This can be termed "social acceptability risk" (Blanc-Brude, Manocha, & Marcelo, 2022). Prominent recent examples include the forced sale of the ASPI road network in Italy after the public and political outcry following the Genoa bridge collapse (Walker & Miller, 2022). These factors mean that poor ESG performance may have financial consequences for infrastructure funds. Blanc-Brude et al. (2022) find that asset and portfolio risk management is the biggest factor in the demand for ESG data by infrastructure investors.

We find that ESG positioning by general partners (henceforth GPs), captured through the use of ESG-related terms in the funds' marketing documents, does not have a significant impact on fundraising success, measured across the likelihood of achieving target size, the percentage of target size reached, and the time taken to achieve a final close. We do, however, find some indication that this relationship may have changed over time, as a generally positive impact from ESG positioning in earlier fundraisings has dissipated in more recent years. This suggests that while investors may previously have attributed some informational value to ESG positioning by GPs, they no longer do.

Our research contributes to several strands of literature. First, it relates to the recent literature that explores ESG outcomes under private equity ownership. Private fund ownership might affect ESG outcomes in portfolio companies and may motivate ESG-concerned investors to scrutinize how fund managers consider ESG in their investment processes. Cohn, Nestoriak, and Wardlaw (2021) find a large and sustained decline in workplace injury rates in firms after buyouts and that improved workplace safety is associated with better financial returns to investors. By contrast, Gupta, Howell, Yannelis, and Gupta (2020) find evidence that PE ownership leads to an increase in short-term mortality rates for patients in nursing homes, and within higher education, Eaton, Howell, and Yannelis (2020) find that buyouts by private equity groups lead to greater capture of government aid and deteriorating student outcomes. Both Gupta et al. (2020) and Eaton et al. (2020) are of particular relevance for our research, as the education and care home sectors are also often included in the investable universe for private infrastructure funds. However, business models employed by infrastructure funds may deviate significantly from those followed by buyout funds. So far as the negative outcomes observed are the result of cost cutting efforts by the private equity owners, private infrastructure funds may not be subject to the same incentive structures. Looking specifically at the asset class of private infrastructure, Garcia and Whittaker (2019) find no relationship between ESG reporting and financial performance at asset level. Infrastructure companies that report ESG data are likely to be larger, are more likely to be corporate entities rather than project finance special purpose vehicles and are less leveraged than their peers.

Second, as private infrastructure funds are a comparatively new asset class, there is little academic literature dedicated to it. Previous research in the space has understandably focused primarily on the risk and return characteristics of infrastructure funds (Amenc, Blanc-Brude, Gupta, & Whittaker, 2022; Duclos, 2019), as well as the classification of such funds as distinct from buy out private equity funds (see, for example, Andonov, Kräussl, & Rauh, 2023). Given the direct impact of

<sup>2</sup> Infrastructure funds, as a subset of private equity funds, have a fundraising period, an investment period and a harvesting period at the end of which all capital is distributed back to investors. To continue investing and, critically, to secure future fee income, fund managers must periodically raise new funds with commitments from investors (Barber & Yasuda, 2017). During fundraising, fund managers, known as general partners (GPs), approach potential investors, known as limited partners (LPs), to get legally binding commitments for their new funds.

infrastructure investments on ESG issues, both in improving and exacerbating them, exploring how infrastructure fund managers and investors in the asset class incorporate ESG into their decision-making would add value to the current literature.

Finally, our research contributes to the literature on private equity fundraising. Many aspects may affect the length of time required for fundraising, such as prior performance, as shown by Kaplan and Schoar (2005), or manager specialisation, as shown by Gejadze, Giot, and Schwienbacher (2017). Interestingly, the literature also shows that fund managers seek to take advantage of investor behaviour: for example, Barber and Yasuda (2017) find evidence that managers manipulate the interim performance of previous funds when they are engaging in fundraising for a new fund. Further, Gompers (1996) finds that less-experienced managers of venture capital funds time initial public offerings (IPOs) of portfolio companies to increase their fundraising outlook rather than for optimal financial outcomes for investors. Consistent with this pattern, it is possible that fund managers might overstate the level of ESG engagement in their investment strategy, if they believe that this will allow them to raise larger funds or to raise their fund faster due to the current sentiment amongst the investors that emphasizes the importance of ESG investments.

## 2. Literature review and hypotheses development

In this section we summarise the previous literature and motivate our key hypothesis. First, we discuss the effects of information disclosure on investor decisions. Second, we discuss why ESG issues should matter for investment value through cost of capital and cash flow perspectives. Finally, we discuss the fundraising process in private equity industry and develop our research hypothesis.

### 2.1. Information disclosure and investor decisions

It is important to understand how investors react to information disclosed in marketing materials and their investment decisions are affected. Previous research shows that investors are driving the adoption of ESG by private equity fund managers (Zaccone & Pedrini, 2020). Investors also report rejecting funds on the basis of ESG concerns (Pre-qin, 2020). From a theoretical perspective it is not clear ex-ante what effect voluntary ESG-related disclosure of information should have on fundraising process. On the one hand, the cheap-talk model by Stocken (2000) predicts that voluntarily disclosed information is not reliable for investors when there are no direct costs of misreporting imposed on managers. On the other hand, costly state falsification models (Korn, 2004; Einhorn & Ziv, 2008) predict that cost of distorting information, including costly consequences, prevents voluntary disclosure from being false, in which case it should be more effective in guiding investor decisions. The models predict different outcomes as to whether voluntarily disclosed information is reliable depending on whether voluntary disclosure imposes costs on those who disclose when it is found to be incorrect.

### 2.2. ESG issues and their impact on investment value

A relatively broad body of literature exists on the various facets of ESG in the investment industry (e.g., Cojoianu, Hoepner, & Lin, 2022; Matos, 2020). Perceptions and transparency around ESG concerns can filter into valuation of investments through cost of capital or cash flows.

First, regarding *cost of capital* effect Heinkel, Kraus, and Zechner (2001) demonstrate in a theoretical model that polluting firms face a higher cost of capital as a result of “green” investors avoiding such companies. Chava (2014) provides evidence of such a negative screening of companies by socially responsible investors. Cheng, Ioannou, and Serafeim (2014) and Jung, Herbohn, and Clarkson (2018) find that better ESG performance in listed firms leads to lower financing costs. Sharfman and Fernando (2008) find that better environmental risk

management reduces the cost of equity capital. Moreover, ESG disclosures can affect firms’ cost of capital through the transmission of risk-relevant information to investors. For example, Kleimeier and Viehs (2018) find that the voluntary disclosure of carbon emissions data is associated with a lower cost of debt in listed firms. However, Edmans (2021) argues that sustainable companies enjoying a lower cost of capital is not a foregone conclusion, as the risks mitigated by more sustainable behaviour are likely idiosyncratic rather than systematic, meaning that such behaviour may not be rewarded with a lower cost of capital by investors.

Second, ESG factors may also affect investment performance through *cash flows*. Clarkson, Li, Richardson, and Vasvari (2011) find that significant improvements in firm environmental performance can lead to improvements in financial performance in subsequent periods. Research by Yadav, Han, and Kim (2016) finds that corporate environmental performance supports the persistence of superior financial performance and can aid recovery from financial underperformance. Matsumura, Prakash, and Vera-Muñoz (2014) find that carbon emissions negatively impact firm value while voluntary disclosure of carbon emissions has a positive impact on firm value.

Investors’ consideration of ESG factors when selecting an investment fund in which to invest can be seen as an indirect cost of capital decision. The extant literature suggests that both investor appeal and risk-relevant information contribute to how investors allocate capital in relation to ESG factors. For example, Hartzmark and Sussman (2019) use the introduction of a sustainability rating by Morningstar as a natural experiment and find that sustainability is valued broadly by investors. Riedl and Smeets (2017) find that intrinsic social preference and social signalling are factors in individuals’ decisions to invest in Socially Responsible Investment (SRI) funds. Finally, Krueger, Sautner, and Starks (2020) provide evidence of institutional investors being concerned about ESG issues in general and climate change risks in particular. Findings on cash flow effects suggest that investors into private equity funds should pay attention to the fund manager’s approach to ESG of investee firms due to the relevance of ESG factors for subsequent performance of the private equity funds.

### 2.3. The fundraising process

The fundraising process for private infrastructure funds is materially the same as that of other private equity funds. Typically, the general partner will formulate a new fund concept, defining the fund’s investment mandate, such as the sectors in which the fund will invest, the size of companies targeted and the region in which the fund intends to make investments. At this stage, the GP will also define the terms of the fund, such as the fees that will be charged and the investment period of the fund (for an overview of the fundraising process see Debevoise & Plimpton, 2020).

Once these aspects have been agreed, they are recorded in the fund’s private placement memorandum and the general partner will approach potential investors to solicit commitments for the fund. When sufficient interest from potential investors has been recorded, the fund can hold a close.<sup>3</sup> Often, further closes are held, allowing for investors to commit to the fund at different points in time. This allows GPs to accommodate investors who started their due diligence processes later or require longer to reach an investment decision. The last close, known as the “final close”, is held at the point when the aggregate capital committed by investors reaches a level which the GP has agreed not to exceed (the “hard cap”). Typically, the fund’s documentation will state a maximum period over which the fund can hold closes. On average it can be held no later than 12 or 18 months after the fund’s first close. New investments (“portfolio companies”) can only be acquired by the fund within the

<sup>3</sup> The fund is then legally incorporated and the commitments become legally binding. A fund must hold at least one close in order to have capital to deploy.

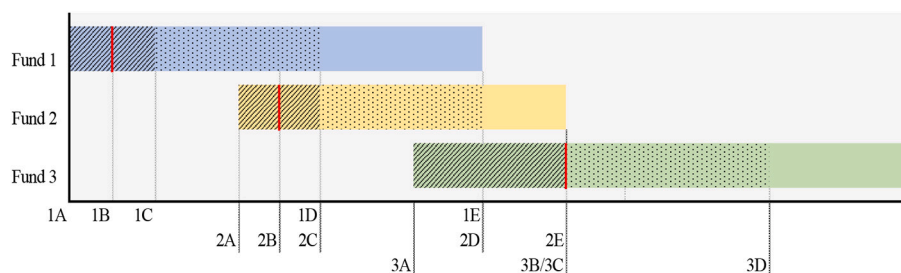


Fig. 1. Illustration of fundraising process.

Illustrative example of fundraising process: the diagram shows the potential overlap between three funds raised by the same general partner. Points marked on the horizontal axis correspond to the fund with the same number on the vertical axis (1,2,3). Points marked A represent the start of fundraising for the fund; points marked by B represent the first close (at which point capital is available to be invested); points marked C represent the end of fundraising for the fund (final close); points marked D represent the end of the investment period for the fund; and points marked E represent the termination of the fund (when all capital has been paid out and the fund contains no investments). In this illustration, Fund 1 begins fundraising at 1A and completes a first close at 1B. From this point onwards, Fund 1 can make investments. However, the fundraising continues until 1C. Fund 1 continues to invest until we reach point 1D, where all of Fund 1's capital is deployed or reserved for further investment into existing portfolio companies. However, prior to this point, the general partner initiates fundraising for Fund 2 at point 2A, when 75% of Fund 1's capital has been invested or reserved for follow-on investment into the existing portfolio companies. Fund 2 holds a first close at 2B and a final close at 2C. Between 2B and 2C, Fund 1 is still investing and thus no investments are made by Fund 2 until after 2C. Fundraising for Fund 3 is initiated at point 3A. However, no close is held until 3B/3C when a first and final close is held. As this point comes after the investment period of Fund 2 has expire (2D), the general partner has no fund from which to invest capital in the period 2D to 3B/3C.

specified investment period, also referred to as the commitment period (Braendel & Chertok, 2010). Following the expiration of this period, further capital calls from limited partners are restricted to circumstances such as the deployment of additional capital into existing portfolio companies. These may be used for the purpose of add-on acquisitions or financing organic growth opportunities (Braendel & Chertok, 2010). The investment period will typically start when the fund holds its first close. Before the fund has held at least one close, its ability to acquire portfolio companies is severely limited by the lack of any secured capital; in some instances, fund managers can secure assets through the use of bridging agreements prior to a first close, for example by funding the transaction with equity capital from the general partner's own balance sheet or that of a related entity, a process known as warehousing.

The investment period is crucial to understanding and measuring fundraising success, as fund documentation typically prohibits GPs from raising funds with similar strategies until at least 75% of the current fund has been invested or committed to portfolio companies. Over 91% of funds have some such restriction (MJ Hudson, 2021).

This rule is in place to prevent conflicts of interests arising that would be detrimental to the fund's investors. Firstly, a general partner may become distracted by fundraising activity resulting in worse investments in the current fund. Research by Abuzov (2019) shows that distracted GPs make worse investments, suggesting that this may be a valid concern. Secondly, this restriction substantially prevents the general partner from managing two funds simultaneously which would compete against one another for potential investments. Given the restriction requires the fund to be on 75% invested or committed, it is possible that some overlap between funds of the same series exists. In practice, a subsequent fund in the same series will not make its first investment until the previous fund of the series is fully committed to portfolio companies. We note that there exists a conflict of interests between investors and general partners in this case, as general partners benefit from fundraising activity by securing a future income stream on a subsequent fund whilst investors benefit only from the performance of the fund in which they are invested. Fig. 1 illustrates the typical fundraising process for private equity funds.

#### 2.4. Hypothesis development

Private equity managers have strong motivation for integrating ESG concepts into their investment processes due to pressure from investors being the main factor (Zaccone & Pedrini, 2020). From the investment point of view, they will channel ESG considerations into valuation either

through the cost of capital or through cash flows. Given the intrinsic link between infrastructure and sustainability (Weber et al., 2016), infrastructure as an asset could be thought of as being inherently positive from an ESG perspective.

However, investors may scrutinize private infrastructure funds' ESG credentials for two reasons. First, some investors may be critical of certain sectors for environmental reasons or certain countries for social reasons, such as human rights violations. Some investments made by infrastructure funds may not be compatible with investors' ESG guidelines (through their environmental profile or through their association with regimes considered problematic).<sup>4</sup> Second, investors may believe that fund managers deviate in their ability or willingness to manage ESG risks. Given the critical role that infrastructure assets play in the societies they serve, poor management can lead to regulatory or political intervention to the detriment of investment performance, i.e., social acceptability risk (Blanc-Brude et al., 2022). Specific examples from infrastructure investments include residential schools for pupils with complex needs in the UK belonging to the infrastructure fund-owned Hesley Group being closed in 2021 following an inspection by the regulator Ofsted raised safeguarding concerns (Burke, 2021). Such instances occurring under private equity ownership may face enhanced scrutiny given findings by Gupta et al. (2020) of higher mortality rates in private equity owned nursing homes.

If investors are solely focused on maximising returns, the attractiveness of an infrastructure fund may be lessened by an explicit focus on ESG factors. An ESG focus may entail direct costs, such as the cost of additional due diligence on social or environmental issues or additional reporting requirements. It may also involve indirect costs in the form of foregone returns through the reduction of the universe of potential investments. Conversely, some practitioners take the view that the analysis of ESG factors has the potential to lower risks or increase returns from an investment. For example, KKR's, 2021 Sustainability Report (KKR, 2021) states that "sustainable investing is a key lever of value creation". If a fund manager finds evidence of poor oversight of managerial control (governance) or risk of violations of emissions regulation (environmental) during the due diligence on a potential investment, this information could lead to better investment decisions and consequently

<sup>4</sup> For example, two large infrastructure funds jointly acquired a 40% stake in ADNOC Oil Pipelines (Reuters Staff, 2019), where both the nature of the asset (the transportation of oil) and the location (Abu Dhabi, United Arab Emirates) may not fulfil investors' ESG expectations.

better returns for investors in the fund. Moreover, remedying such issues during ownership could decrease the firm's cost of capital, thus raising its value (Chava, 2014; Kleimeier & Viehs, 2018). Additionally, the implementation of ESG-related improvements could potentially improve the financial performance of the portfolio company on an operational level (Yadav et al., 2016). If this is true, however, properly incentivised GPs should be incorporating such considerations into their investment decisions regardless of how they outwardly market their ESG focus, so far as these benefits outweigh the additional due diligence costs incurred. It is therefore unclear how a purely return-optimising investor would respond to ESG positioning.

Another aspect to consider in terms of whether investors react to ESG positioning is the reliability of information provided by the fund managers. The theories on corporate information environment and reliability of voluntarily disclosed information offer scepticism regarding whether investors should react to the ESG positioning in fund marketing documents. The cheap-talk models and costly state falsification models (Korn, 2004; Einhorn & Ziv, 2008) predict that only in those circumstances where distribution of misleading information results in substantial costs, managers have incentive to release reliable information. Indeed, Bingler, Kraus, Leippold, and Webersinke (2022, 2023) show that corporations' cheap-talk on climate risk significantly increases with negative environment-related news on themselves, implying that cheap-talk is used with greenwashing purposes, potentially with no real consequences. Raghunandan and Rajgopal (2022a) show that mutual funds that claim to have high level of ESG standards do not necessarily have high ESG portfolios. Similarly, Kim and Yoon (2023) find that mutual funds that sign up to an ESG initiative do not differ from other funds in ESG activities. This implies that ESG claims in those funds are cheap talk. In the case of ESG positioning by fund managers in the marketing document, the consequences of false or exaggerated ESG positioning or ESG commitment are less clear due to the terms and conditions that protect fund managers from various circumstances. Also, the document is intended to communicate the characteristics of investment opportunities rather than to provide legally binding clauses. Hence, fund managers may feel incentives to position themselves with ESG leadership stance in line with the increased investor interests on the topic, while the reliability of information is not high. This allows them to gain from first-mover advantage. First-mover advantage can be created through either technological leadership, pre-emption of assets or buyer switching costs (Lieberman & Montgomery, 1988). In the context of our findings, ESG positioning may have worked as short-lived technological leadership that facilitated fund raising. However, given that such positioning activity in marketing documents does not accompany exclusivity (easily replicable) or investor switching costs, the value of it seems to have dissipated quickly. If investors perceive the reliability of information as the theories predict, ESG positioning at the fundraising period may not necessarily lead to contribute to more successful outcome.

However, the literature has shown that positive ESG ratings lead to greater inflows into mutual funds (Hartzmark & Sussman, 2019) and that investors' engagement in SRI funds is not entirely motivated by beliefs around financial outcomes (Riedl & Smeets, 2017). In so far as these decisions are emotionally driven, we might expect the effect to be less pronounced in the private infrastructure space where investors are typically institutional. Nonetheless, even if the professionals responsible for selecting the funds, or their advisors, are sceptical about the true emphasis on ESG topics in the fund manager's investment process and believe the fund manager to be overstating this emphasis, they may still have an incentive to select funds which emphasise ESG in their marketing, as this would be beneficial in their communication with stakeholders and leave them less open to external criticism. There also seems to be evidence institutional investors are concerned with environmental risks (Krueger et al., 2020). In a recent investor survey conducted by the private market data provider, Preqin, 56% of investors believe that ESG funds perform approximately in-line with other funds and 23% believed that ESG funds typically perform better (Preqin, 2020). The same survey

finds that 35% of investors have rejected funds on the basis of an inadequate ESG policy. This is consistent with findings by Zaccone and Pedrini (2020) that investors are putting pressure on private equity managers to integrate ESG into their investment processes.

In general, the effectiveness of funds' ESG positioning in PPMs over fund raising is an empirical question. It is important for fund managers and investors but depends on whether such ESG claims made in fund marketing documents impose costs when exposed to be false and are verifiable ex-post. Given, until recently the costs of making misleading claims about ESG issues were negligible our results could be consistent with the predictions of cheap-talk models of no effect of ESG positioning on fundraising success. In addition, the ESG claims can be verified ex-post so only initial claims can have some real value due to first-mover advantage. We therefore state the null hypothesis as:

**H0.** ESG positioning in PPMs has no effect on likelihood of fundraising success.

Alternatively, if the ESG positioning has value for investors as predicted by costly state verification models we would therefore hypothesise that ESG positioning in a fund's marketing documents would be perceived positively by potential investors and result in more successful fundraising. We therefore state the alternative hypothesis as:

**H1.** ESG positioning in PPMs is associated with a higher likelihood of fundraising success.

### 3. Data and methodology

#### 3.1. Data description

We construct a novel dataset of infrastructure funds from information provided in the funds' private placement memoranda. PPMs are extensive legal documents which are designed to provide potential investors with the information required to make an informed investment decision. PPMs include such information as details of the manager's track record, a description of the investment strategy, information on the investment team and other relevant individuals as well as the terms of the fund, including fees, target size and investment period. From the PPMs, we extract target fund size, maximum permitted fundraising length (fundraising limit), United Nations Principles of Responsible Investment (UN PRI) signatory status, fundraising launch date, and the performance of preceding funds in the series.

We construct our dataset from PPMs provided by an anonymous intermediary. The intermediary receives PPMs from fund managers who are in the process of raising a new fund and wish to solicit capital commitments from the intermediary. As the PPMs are received prior to any decision or recommendation to invest in a fund, the information in our dataset does not reflect the investments that the intermediary has made, but rather those that have engaged with the intermediary during their fundraising efforts. Data sourced from PPMs has been used in the extant literature on private equity performance and fundraising; see, for example, Braun, Fernández Tamayo, Lopez de Silanes, Phalippou, and Sigrist (2023), Castellaneta and Gottschalg (2016), and Lopez-De-Silanes, Phalippou, and Gottschalg (2015). To our knowledge, we are the first to construct a dataset from PPMs of infrastructure funds.

We supplement the information contained in the PPMs with data from the commercial data vendor Preqin. Preqin covers approximately 2150 infrastructure funds and provides information that is only known post-fundraising and is therefore not included in the PPMs, including data on timing and size of fund closes. To merge the data between PPMs and Preqin, we manually match the funds' legal names. In a small number of instances where no exact match can be found by legal name, we apply discretion to match the data. For example, "Manager A CP Fund II" and "Manager A Capital Partners Fund II" are considered the same fund. Likewise, when there is mixed use of Roman and Arabic numbering such as "Fund IV" and "Fund 4," they are considered the

**Table 1**  
Variable definitions.

Variable	Definition	Data source / calculation basis
Target Size Reached	Dummy variable which takes the value of one if the fund size at final closed was equal or above the target fund size	Own calculation based on target size stated in PPM and final fund size data from Preqin
% of Target Size	The fund size at final close divided by the target size of the fund	Own calculation based on target size stated in PPM and final fund size data from Preqin
Time in market	The number of months between fundraising launch and final close	Preqin
ESG Word Count	Sum of the frequencies of the following words in the PPM: esg, ethical, ethically, ethics, socially, responsibility, sustainability, sustainable	Own calculation based on information contained in the PPM
Scaled ESG Word Count	The occurrence of ESG relevant terms (used to calculate ESG Word Count) appearing per 100,000 words in the fund's private placement memorandum	Own calculation based on information contained in the PPM
UN PRI	Dummy variable which takes the value of one if the manager was a UN PRI signatory at the time of the fundraising launch	UN PRI signatory directory
Fundraising Limit	The maximum number of months during which the fund can be raise capital (from first close)	PPM
Pre-2007	Dummy variable which takes the value of one if the fundraising launch date took place prior to 2007 (i.e., before the global financial crisis)	Own calculation based on fundraising launch date data from Preqin
High Performer	Dummy variable which takes the value of one if the target IRR of the fund is exceeded by the planned life of the fund in years, as described in the fund's documentation	Own calculation based on information contained in the PPM
Fund Term	The planned life of the fund in years, as described in the fund's documentation	PPM
Europe	Dummy variable which takes the value of one if the fund is classified under the Preqin region "Europe"	Preqin
North America	Dummy variable which takes the value of one if the fund is classified under the Preqin region "North America"	Preqin
Recent	Dummy variable which takes the value of one if the fund launched fundraising in 2017 or later	Own calculation based on fundraising launch date data from Preqin
Target Size	The target size of the fund in USD millions	Target size stated in PPM

same fund provided the rest of the names are matched. Occasionally, a fund can be renamed post-fundraising in accordance with a corporate action at the manager level, in which case we track down the old naming as much as possible to match. As the classification of a fund as an infrastructure fund can be subjective, we focus only on those funds that are clearly classified by Preqin as infrastructure funds; buyout, venture capital and natural resources funds are removed.

As our analysis requires the PDFs to be read using the R statistics package, we exclude all PPMs that are not readable and that are not written in English. Our efforts yield a total data set of 155 funds with readable PPMs, of which 132 have completed their fundraising. Number of observations are lost in some specifications due to the incomplete matching with the Preqin data.

Table 1 defines variable used and the sources of data. Of the 155

**Table 2**  
Summary statistics.

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
Target Size Reached	128						
No	34	26.60%					
Yes	94	73.40%					
% Target Size	128	120%	38.1%	20%	99%	141%	295%
Time in market	153	21.9	18.4	0.2	12.1	26.9	191.3
ESG Word Count	155	34.7	30.5	0	17	41	205
Scaled ESG Word Count	155	90.1	76.8	0	42.8	115.9	578.6
Fundraising Limit	146	15.25	4.0	6	12	18	30
UN PRI	155						
No	70	45.16%					
Yes	85	54.84%					
Pre-2007	153						
No	148	96.73%					
Yes	5	3.27%					
High Performer	155						
No	119	76.77%					
Yes	36	23.23%					
Fund Term	151	13.42	5.4	6	10	15	35
Europe	155						
No	76	49.03%					
Yes	79	50.97%					
North America	155						
No	76	55.49%					
Yes	69	44.51%					
Recent	153						
No	82	53.59%					
Yes	71	46.41%					
Target Size	151	2279.8	2947.1	100	700	2500	17,500

All the variables are defined in Table 1.

funds in our sample, 79 have a regional focus on Europe, 69 on North America, and 7 on Asia, Australasia or Diversified Multi-Regional. The vintage years of the matched funds range from 2006 to 2021. While Preqin covers 2150 infrastructure funds, this is reduced to 1595 once funds of funds have been removed and the criteria have been narrowed to only include closed-end funds which raise capital from multiple investors. Similar to our sample, the vast majority (1538) are of vintage year 2005 or later. Europe focused funds constitute the largest group at 572, followed by North America at 427. Table 2 provides an overview of the summary statistics for our sample.

A potential source of bias in our data stems from the way in which fund managers interact with potential investors and intermediaries. When a GP, or a placement agent acting on their behalf, initiates contact with a potential investor, full information on the fund may not yet be available or the fundraiser may elect not to provide it until the interested LP has signed a non-disclosure agreement (NDA). It is therefore common that if the fund being marketed does not fit the investment criteria of the potential investor, the process will not reach a stage at which full information, including the PPM, is provided. If the intermediary who provided our PPMs has investment criteria that exclude parts of the infrastructure market, this will be reflected in our sample. While we recognise the possibility of the bias in the sample, we believe that our sample is fairly representative of the industry and that the issue is minimal given that the intermediary is one of the largest players in the industry that receives a large amount of PPMs every year. A comparison of our matched sample of 155 funds to the 1595 relevant infrastructure funds covered by Preqin does not suggest a pronounced bias.

### 3.2. Variables

#### 3.2.1. Measures of ESG positioning

As we are interested in ESG positioning, we focus on the emphasis which the GP places on ESG within the PPMs. To do so, we identify a number of targeted words that are commonly used by fund managers and investors and are synonymous or strongly associated with the term “ESG”; a list of all targeted words used is included in Table 1. In contrast to literature studying the sentiment of a financial text (see e.g., Feldman, Govindaraj, Livnat, & Segal, 2010), we are interested directly in prevalence of specific terms. As such, the interpretation of the derived variable is not the main interests in our study. Furthermore, the targeted phrases are unlikely to be subject to negation. Fund managers are not required to highlight any historical ESG issues or weaknesses in their PPMs. Any explanation of ESG issues that arose in portfolio companies in previous funds are therefore likely only to be described in the PPM if used as examples where the fund manager had a positive influence. In either case, the use of ESG-related terminology naturally has a positive rather than negating effect on the emphasis placed on ESG for the reader. Rather than employing stemming or lemmatization to our corpus, we instead count different forms of the ESG-related terms. This allows us to ignore forms of the terms which are commonly used in the description of investment processes or infrastructure assets. For example, “social infrastructure” is commonly used to describe investments by infrastructure funds in assets such as universities, prisons, or social housing. As the sequence of words in which our targeted phrases appear is not critical and given the unambiguous nature of the target phrases themselves, a bag of words approach using targeted phrases is particularly insightful (Loughran & McDonald, 2016). Specifically, we follow broadly the bag of words methodology applied by Loughran, McDonald, and Yun (2009). First, we remove all punctuations and stop words (“and”, “or”, “the”, etc.). While it is common in to exclude tables when applying textual analysis to financial documents, we elect not to do so. This decision is motivated by our focus on the occurrence of specific key words rather than measures of sentiment. Therefore, if the terms ESG, sustainability or ethics appear within a table, they remain relevant for the reader. For example, a fund manager may use a table format to illustrate how ESG considerations are integrated into their investment process, or they may do so in a paragraph of text; the information conveyed remains relevant in either case. We use the R statistics software to count and sum the occurrences of the individual target words before summing the individual word totals together to create our *ESG Word Count* variable. Additionally, we create the *Scaled ESG Word Count* variable by dividing the variable by the total number of words in the document to standardise the measure according to the length of the documents containing those words. This allows us to address a potential concern that the total number of ESG-related terms in a document may capture total size (and thus informational value) of PPM in general rather than ESG positioning.

#### 3.2.2. Control variables

If fund managers believe that potential investors will respond positively to ESG in the marketing documents, they may attempt to improve their fundraising prospects by increasing the emphasis on ESG in their fund’s PPM. By contrast, many of the other factors known to be associated with fundraising success, such as strong relative past performance (Barber & Yasuda, 2017; Kaplan & Schoar, 2005) or manager experience (Cumming, Fleming, & Suchard, 2005), cannot be altered by the manager at the time of fundraising. As successful fund managers often receive offers for capital commitments in excess of the contractual limit on the fund’s size, known as the “hard cap”, high-quality fund managers have little incentive to overemphasise ESG factors. As such, we expect that an emphasis on ESG in infrastructure PPMs will be negatively correlated with factors associated with measures of fund managers’ quality. It is therefore important that we control for these factors in our analyses.

Previous literature studying private capital fundraising finds the performance of previous funds (see e.g., Barber & Yasuda, 2017; Loos & Schwetzler, 2017) relative to vintage year benchmarks by the same manager to be a significant factor in fundraising success. Infrastructure funds are distinct from both buyout and venture capital funds in that they are heterogenous in their return targets; while there is a strong convention of buyout funds targeting an internal rate of return (IRR) of 20%, the target IRR infrastructure funds commonly ranges from 6% to 20% reflecting different risk appetites. A vintage year peer group ranking is therefore less relevant for our sample. Furthermore, the much smaller universe of infrastructure funds means that many vintage years are prohibitively sparsely populated. Analysis by Amenc et al. (2022) also finds quartile rankings to not be a reliable measure of relative performance for private infrastructure funds. Instead, we seek to capture performance by including a dummy variable which takes the value of one if either the immediate predecessor or the second predecessor fund have an interim IRR above the target IRR of the current fund at the time of the current fund’s fundraising. We include the two most recent predecessor funds rather than simply the immediate predecessor to allow for the fact that infrastructure funds often have low or negative IRRs early in their life as the fund is still deploying capital and investors carry the costs and fees of the fund (often referred to as the “j-curve”). Previous literature also shows that managers with higher recent realisations demonstrate more successful fundraisings (Barber & Yasuda, 2017). In unreported specifications we included a dummy variable which takes a value of one if the sum of the DPI (“Distributed to Paid In”) ratios of the three immediate predecessor funds lies above one; however, we did not find the variable to be significant and omitted it from our models as it risked capturing the same effect as the historical performance.

As attitudes to ESG may have changed over time, we include dummy variables for recent fundraising launches and an include interaction term in some specifications. We classify fundraising launches from 2017 onwards as recent, as this splits our sample evenly. As our sample consists primarily of funds from Europe and North America, and European investors are generally considered by practitioners to be more ESG-aware, we also include a dummy variable and an interaction term for Europe to test if there are regional differences in investor response to ESG positioning.

While a vintage year affect is observed for private equity fundraisings in the literature, we did not observe the fundraising launch year or vintage year to be significant in our regression (unreported) with the exception 2006, the only year in our sample prior to the global financial crisis. In light of our small sample size, we therefore omit year fixed effects in favour of a dummy variables for fundraisings launched prior to the global financial crisis and for funds launched recently (i.e., from 2017 onwards). We also include dummy variables to capture whether the manager was a signatory of the United Nation’s Principles of Responsible Investing at the time of the fundraiser, which may capture tangible ESG credentials as distinct from ESG positioning.

### 3.3. Modeling approach

In this section we discuss the model used and three different proxies for our dependent variable, i.e., fundraising success: 1) achieving target fund size, 2) percentage of target size reached, and 3) time in market.

#### 3.3.1. Achieving target fund size

The extant literature on private equity fundraising generally takes the approach of starting with a fund K-1 and observing whether, when and at what size a successor fund K is raised by the same GP. With this perspective, Larocque, Shive, and Stevens (2021), Loos and Schwetzler (2017), and Chung, Sensoy, Stern, and Weisbach (2012) model the probability of a fund K being raised within a specified period following the launch of fund K-1. The period over which a successor fund K is raised should be proportionate to the economic life of the fund K-1; while GPs will engage in fundraising earlier, they must have raised a

successor fund by the end of the life of fund K-1 or they will cease to receive fee income. For private equity buyout funds, terms are generally homogenous. For infrastructure funds, however, fund terms can range from 10 years to over 20 years, making this approach impractical. Furthermore, the approach excludes first-time funds, which are more prevalent within infrastructure funds. Therefore, we opt for alternative measures of fundraising success in our sample.

Our novel dataset includes the target fund sizes set by GPs. The GP's ability to reach the stated target size presents an intuitive measure of fundraising success. We therefore first examine whether the frequency of ESG-related terms appearing in a fund's PPM affects the likelihood of it reaching its target size. To do this, we use a probit model. The model takes the form:

$$\text{Target Size Reached}_i = \Phi(\beta_0 + \beta_1 \text{ESG Positioning}_i + \beta_2 \text{Controls}_i + \epsilon_i) \quad (1)$$

where *Target Size Reached* is a binary variable which takes the value of one if the fund size at final close was equal or above the target fund size. *ESG Positioning* is proxied by 1) *ESG Word Count* that is sum of the frequencies of the following words in the PPM: esg, ethical, ethically, ethics, socially, responsibility, sustainability, sustainable and 2) *Scaled ESG Word Count* that is defined as *ESG Word Count* per 100,000 words in the fund's private placement memorandum. The model measures the probability of Fund *i* reaching or exceeding its target size as stated in its PPM. The independent variables follow normal distribution  $\Phi$ .

A consideration with this approach is that, in theory, a fund manager could simply continue to raise capital until they reach their target size. In practice, however, the length of time a fund manager has to raise capital for a fund is contractually limited within the fund's legal documents, which typically state a maximum of 12 or 18 months. Extensions to this period are possible, but typically require the consent of existing investors. We account for this variation by including the maximum permitted fundraising length as a control variable across specifications.

### 3.3.2. Percentage (%) of target size reached

Whilst funds achieving their target size offers a convenient binary measure of fundraising success, it is also possible to view the percentage of target size achieved as a continuous measure of fundraising success. Funds are not restricted by their target size and, in some cases, can hold a final close well above their initial target. While investors will often encourage the GP to adopt a "hard cap", which sets a contractual limit on commitments raised for the fund, this will typically lie substantially above the target size and may be set during the fundraising process or not at all. Previous literature on private equity fundraising measures fundraising success via fund size (Loos & Schwetzler, 2017) or growth in fund size from one fund generation to the next (Barber & Yasuda, 2017; Laroque et al., 2021). However, change in fund size methodology is less ideal when applied to our dataset due to the high proportion of first-time funds. As our dataset includes target size, we are able to measure fundraising outcome relative to the target, rather than the predecessor fund size, allowing for the inclusion of first-time funds in our regressions. This approach is also employed in recent research by Braun et al. (2023), who also gain access to fund target sizes from a sample PPMs.

$$\% \text{ of Target Size}_i = \beta_0 + \beta_1 \text{ESG Positioning}_i + \beta_2 \text{Controls}_i + \epsilon_i \quad (2)$$

where the dependent variable is replaced with *% of Target Size*, which is the fund size at final close divided by the target size of the fund. The coefficients are estimated by OLS in this model.

### 3.3.3. Time in market

The extant literature on private equity fundraising has generally focused on the time between successive funds as a measure of fundraising success, with shorter periods considered more successful. Both Barber and Yasuda (2017) and Gejadze et al. (2017) use the time elapsed between funds K-1 and K as a proxy for fundraising length. In Fig. 1 this

period is represented by the period between 1B and 2B. Barber and Yasuda (2017) define the fundraising period as the number of quarters from the launch of fund K-1 to the first cash-flow of fund K. While intuitive, this measure has a number of shortcomings. Firstly, as described above, even with a successful fundraise, fund K will not start investing until capital required for new investments exceeds what is available in fund K-1. Fees for fund K will also only start to accrue at this point. As such, the first cash flow from fund K following a successful fundraising will primarily be a function of the deployment of fund K-1. Less successful fundraises that take longer may leave a gap between the investment period of fund K-1 ending and the investment period of K starting and thereby also affect the time between funds (see Funds 2 and 3 in Fig. 1). However, it is unclear which factor has the greater effect on the time between funds.

Furthermore, in recent years, the use of subscription line credit facilities has become commonplace. This is a form of fund-level debt, secured against the fund's right to call commitments from LPs, and is used by the GPs to fund investments and pay for expenses without calling capital from LPs. LPs' capital is then later called by the GPs to pay off the credit facility. This allows GPs to aggregate the amounts required for investments and expenses over a period of time, reducing the number of capital calls and the need for the fund to carry a cash balance. Albertus and Denes (2019) find that the use of such credit facilities increased very significantly from 2014 to 2018. The increased use of credit facilities introduces a further element of noise into the time between funds measure, as the first cash flow to the fund K will be substantially dependent on the availability of and the GP's inclination to use a credit facility.

To avoid these issues and accommodate the first-time funds in our sample, we adopt a methodology of measuring the fundraising period directly, in line with recent research by Braun et al. (2023). To do this, we observe the time taken by the fund achieve a final close, the point beyond which no further investor commitments to the fund can be made. This fundraising period is also referred to as "time in market". In Fig. 1, this is illustrated by the period between points A and C for each fund respectively.

As noted above, funds are typically contractually limited to a fundraising period of 12 or 18 months but can be extended by some fixed amount of time with the consent of existing investors. The higher the investor interest in the fund, the faster the GP is likely to obtain the commitments. Investors typically require a minimum period of time before they can formally commit to a fund at a close, as the necessary tax and legal due diligence can only be initiated once a fund has launched its fundraising and all legal documents are available. In practice, this can take several months as side letters are negotiated. For a slower fundraising, the final close will likely take place close to the contractual maximum for the fundraising period or occasionally later if the GP can extend the period.

To test our hypothesis that ESG positioning should lead to a shorter fundraising period, we use a Cox proportional hazard model, which is well-suited to the temporal variation in the length of time taken to raise a fund. Within the context of this model, "failure" is the termination of fundraising by the fund achieving a final close in a given month after the fundraising launch. The majority of our fundraising start dates are sourced from Preqin. When Preqin data is not available, we estimate the fundraising start date from dates on which the earliest official marketing material for the fund was received by the intermediary. We specify the hazard rate for time to completion of fundraising for fund *i* at *t* as.

$$h(t|x_i) = h_o(t) \exp(x_{it}' \beta_x) \quad (3)$$

where  $h_o(t)$  is the baseline hazard ratio with *t* being time in market measured by the number of months between fundraising launch and final close and  $x_{it}$  are fund characteristics, including our key independent variable *ESG Positioning* and our control variables.



**Table 3**  
ESG-related word count and reaching target size.

	Dependent variable:								
	Target Size Reached								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ESG Word Count	0.013** (0.006)	0.013** (0.007)	0.012* (0.007)	0.014** (0.007)	0.013* (0.007)	0.021** (0.008)	0.020 (0.013)	0.033* (0.020)	0.042*** (0.016)
UN PRI		-0.142 (0.259)	-0.217 (0.271)	-0.188 (0.280)	-0.183 (0.281)	-0.173 (0.288)	-0.295 (0.303)	-0.458 (0.334)	-0.262 (0.307)
Fundraising Limit			-0.008 (0.030)	0.003 (0.031)	0.005 (0.031)	0.019 (0.033)	0.021 (0.033)	0.027 (0.035)	0.026 (0.034)
Pre-2007				4.984 (302.447)	5.033 (302.457)	5.082 (302.320)	5.031 (292.072)	5.549 (288.274)	5.619 (301.695)
High Performer					0.218 (0.305)	0.159 (0.313)	0.076 (0.319)	0.173 (0.339)	0.250 (0.329)
Fund Term						-0.039 (0.026)	-0.055* (0.028)	-0.049* (0.029)	-0.033 (0.027)
Europe							0.692 (0.992)	0.831 (0.993)	
North America							0.274 (0.802)	0.293 (0.821)	
Recent								2.113*** (0.589)	1.971*** (0.556)
ESG Word Count x Europe							0.002 (0.016)	0.004 (0.014)	
ESG Word Count x Recent								-0.038** (0.018)	-0.041** (0.017)
Constant	0.251 (0.212)	0.319 (0.250)	0.524 (0.551)	0.275 (0.584)	0.205 (0.590)	0.328 (0.612)	0.148 (1.022)	-0.611 (1.093)	-0.492 (0.702)
Observations	128	128	122	121	121	119	119	119	119
Log Likelihood	-71.329	-71.181	-67.480	-64.619	-64.364	-60.469	-59.109	-51.725	-53.983
Akaike Inf. Crit.	146.657	148.363	142.961	139.239	140.728	134.938	138.217	127.450	125.965
Null deviance	148.19 (df = 127)	148.19 (df = 127)	140.41 (df = 121)	137.71 (df = 120)	137.71 (df = 120)	134.38 (df = 118)	134.38 (df = 118)	134.38 (df = 118)	134.38 (df = 118)
Residual deviance	142.66 (df = 126)	142.36 (df = 125)	134.9 (df = 118)	129.24 (df = 116)	128.73 (df = 115)	120.94 (df = 112)	118.22 (df = 109)	103.45 (df = 107)	107.97 (df = 110)
LR Chi-sq	5.531**	5.825**	5.448	8.470*	8.980	13.445**	16.165*	30.933***	26.417***

This table reports the Probit model estimation results for the likelihood a new fund achieving its target size. The dependent variable equals one if the fund's size at final close was equal to or greater than the fund's target size as laid out in the fund's PPM. The main independent variable of interest is ESG Word Count. All the variables are defined in Table 1. Significance levels are as follows: \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

## 4. Results

### 4.1. Main results

The results of tests of our hypothesis pertaining to the link between fund ESG positioning and fundraising success are somewhat mixed, as reported in Tables 3–8. The probit analysis indicates some degree of significance across most specifications when using the simple *ESG Word Count* (Table 3), with a higher frequency of ESG-related terms in the PPM increasing the likelihood of a fund reaching its target size. However, as displayed in Table 4, some of the observed significance is lost once the word counts are scaled by the total number of words in the document, with the *Scaled ESG Word Count* showing no or weak significance across most specifications. The linear models do not show any significant relationship between the count of ESG-relevant terms and the percentage of the fundraising target reached either when simple *ESG Word Count* (Table 5) or when *Scaled ESG Word Count* (Table 6) are employed to capture fund ESG positioning. Finally, in the Cox proportional hazard results (Tables 7 and 8), we observe statistically significant results for the ESG-related term count only when we include a dummy for recent fundraisings and an interaction term.

Taken together, these results provide at best weak support for the hypothesis that fund ESG positioning leads to fundraising success. Our findings are therefore largely in line with the null-hypothesis of no effect, as implied by the cheap-talk model. The cheap-talk model states that voluntarily distributed information lacks credibility when there are no real consequences from distributing misinformation, therefore

expects that it should not influence decision making of recipients of information. This is not a particularly puzzling outcome given that the marketing documents of infrastructure funds are not legally binding contracts and potentially contain difficult-to-verify claims. Our finding is in line with those in Bingler et al. (2022, 2023), Kim and Yoon (2023), and Raghunandan and Rajgopal (2022a) who find that information distribution regarding ESG is often cheap-talks rather than credible signalling.

However, when we include a dummy variable for more recent funds (those which initiated their fundraising in 2017 or later) and introduce an interaction term for this dummy variable with the ESG-related word count, we observe a more interesting outcome. In some specifications (see Table 3), a higher word count is significantly associated with a higher likelihood of achieving target size for funds in earlier years, where the interaction term is opposite in sign and similar in magnitude. We obtain similar results in Cox hazard models as well (see Tables 7 and 8). In these specifications the higher frequency of ESG-related terms is associated with shorter fundraising lengths (higher hazard ratios), although this effect is offset by an opposite effect of similar magnitude for the interaction term (see Table 7). While statistically weaker, the same observation is true when for *Scaled ESG Word Count* (Table 8). In other words, a high emphasis on ESG in a fund's PPM is broadly associated with both a higher likelihood of the fund reaching its target size and of reaching final close earlier, but this effect has been negated in more recent fundraisings.

While this result might seem counterintuitive given the increased significance of ESG in the investment industry, it could be explained by a

**Table 4**  
Scaled ESG word count and reaching target size.

	Dependent variable:								
	Target Size Reached								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Scaled ESG Word Count	0.004* (0.002)	0.004* (0.002)	0.004 (0.002)	0.004* (0.003)	0.004* (0.003)	0.006** (0.003)	0.0004 (0.007)	-0.0001 (0.008)	0.009** (0.004)
UN PRI		-0.096 (0.257)	-0.173 (0.268)	-0.159 (0.279)	-0.152 (0.279)	-0.123 (0.284)	-0.172 (0.296)	-0.415 (0.330)	-0.247 (0.302)
Fundraising Limit			-0.014 (0.030)	-0.004 (0.030)	-0.001 (0.030)	0.010 (0.032)	0.008 (0.033)	0.020 (0.034)	0.023 (0.034)
Pre-2007				4.863 (302.154)	4.938 (302.188)	4.938 (301.786)	4.792 (300.256)	5.152 (293.975)	5.348 (300.855)
High Performer					0.266 (0.299)	0.248 (0.304)	0.196 (0.307)	0.215 (0.331)	0.314 (0.322)
Fund Term						-0.037 (0.026)	-0.042 (0.027)	-0.041 (0.029)	-0.032 (0.027)
Europe							-0.104 (1.099)	0.271 (1.140)	
North America							-0.045 (0.831)	0.088 (0.871)	
Recent								1.740*** (0.529)	1.570*** (0.512)
Scaled ESG Word Count x Europe							0.006 (0.008)	0.008 (0.008)	
Scaled ESG Word Count x Recent								-0.007 (0.005)	-0.008 (0.005)
Constant	0.292 (0.221)	0.339 (0.258)	0.666 (0.547)	0.441 (0.574)	0.332 (0.587)	0.515 (0.605)	0.880 (1.112)	0.192 (1.203)	-0.190 (0.675)
Observations	128	128	122	121	121	119	119	119	119
Log Likelihood	-72.293	-72.224	-68.422	-65.640	-65.240	-62.037	-61.231	-53.703	-56.138
Akaike Inf. Crit.	148.586	150.448	144.843	141.279	142.481	138.074	142.462	131.407	130.275
Null deviance	148.19 (df = 127)	148.19 (df = 127)	140.41 (df = 121)	137.71 (df = 120)	137.71 (df = 120)	134.38 (df = 118)	134.38 (df = 118)	134.38 (df = 118)	134.38 (df = 118)
Residual deviance	144.59 (df = 126)	144.45 (df = 125)	136.84 (df = 118)	131.28 (df = 116)	130.48 (df = 115)	124.07 (df = 112)	122.46 (df = 109)	107.41 (df = 107)	112.28 (df = 110)
LR Chi-sq	3.602*	3.740	3.565	6.429	7.227	10.308	11.920	26.975***	22.107***

This table reports the Probit model estimation results for the likelihood a new fund achieving its target size. The dependent variable equals one if the fund's size at final close was equal to or greater than the fund's target size as laid out in the fund's PPM. The main independent variable of interest is Scaled ESG Word Count. All the variables are defined in Table 1. Significance levels are as follows: \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

loss of value in using ESG-related terms in the placement memoranda as investors became more sophisticated in how they evaluate ESG. For example, investors may now be conducting separate ESG due diligence on the fund manager, rather than relying on information provided in the marketing documents. ESG positioning may have previously been considered a proxy for the manager's ESG credentials but has ceased to be seen as such due to increased investor sophistication on the topic. This implies that there existed temporary first-mover advantage in using ESG-related terms in the infrastructure fund placement memoranda.

Alternatively, ESG positioning may have been less common in earlier fundraising years, thus strongly differentiating the funds employing this strategy. With the growing popularity of ESG an increase in positioning amongst fund managers could have led to a loss of informativeness of such a communication included in PPMs. As shown in Fig. 2, we do observe an increase ESG positioning over time, although there continues to be a significant variation in positioning between GPs. We therefore consider the second explanation less likely. Fig. 2 shows the ESG-related word counts of the PPMs plotted against the funds' vintage years.

Across our specifications, we obtain a number of interesting results pertaining to control variables included in the models. While UN PRI signatory status at the time of fundraising is not associated with significantly different likelihood of reaching the fund target size (see Tables 3 and 4), the corresponding coefficients reach conventional levels of statistical significance in regressions explaining the percentage of the target size reached (see Tables 5 and 6). Given that the corresponding coefficient estimates are negative, it is somewhat surprising that

investors do not seem to value an objective commitment to ESG standards. This finding is even more surprising given that we find strong evidence that UN PRI signatory status is associated with shorter fundraising periods (see Tables 7 and 8).

Managers with high historical performance, relative to their current target returns, are able to reach their fund close sooner (see Tables 7 and 8). However, such high-performing managers surprisingly do not appear to be more likely to reach their fund target size or to reach higher proportion of the target size (see Tables 3–6). This stands in contrast to the literature on private equity fundraising, where past performance has been shown to be a significant factor in fundraising success (Barber & Yasuda, 2017; Kaplan & Schoar, 2005; Larocque et al., 2021). However, the private equity literature benefits from the ability to credibly measure relative performance within vintage year peer groups. Our findings may simply reflect the difficulty that investors face in measuring the relative attractiveness of a manager's track record within the comparably small and heterogeneous infrastructure fund, as described by Amenc et al. (2022). For example, it is possible that a manager whose first fund underperformed expectations due to one or more risky investments performing poorly may adjust their investment strategy to be more risk averse for their second fund. In this scenario, the manager could set a target return for the second fund below the return achieved by the prior fund, which would lead to the manager being classified as a "high performer" by our measure.

Unsurprisingly, a longer permitted fundraising period is associated with a lower hazard ratio (see Tables 7 and 8). Possible interpretations

**Table 5**  
ESG word count and % target size.

	Dependent variable:								
	% Target Size								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ESG Word Count	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.004 (0.003)	0.005 (0.004)	0.003 (0.002)
UN PRI		-0.092 (0.072)	-0.133* (0.075)	-0.108 (0.073)	-0.107 (0.073)	-0.111 (0.073)	-0.133* (0.076)	-0.146* (0.076)	-0.120 (0.072)
Fundraising Limit			0.001 (0.009)	0.006 (0.008)	0.007 (0.008)	0.006 (0.008)	0.007 (0.008)	0.007 (0.008)	0.007 (0.008)
Pre-2007				0.597*** (0.194)	0.600*** (0.196)	0.595*** (0.194)	0.585*** (0.197)	0.662*** (0.198)	0.683*** (0.195)
High Performer					0.011 (0.076)	0.017 (0.076)	0.001 (0.077)	0.003 (0.076)	0.017 (0.075)
Fund Term						-0.003 (0.007)	-0.006 (0.007)	-0.005 (0.007)	-0.002 (0.006)
Europe							0.270 (0.254)	0.258 (0.250)	
North America							0.110 (0.219)	0.113 (0.216)	
Recent								0.257** (0.112)	0.256** (0.110)
ESG Word Count x Europe							-0.003 (0.003)	-0.002 (0.003)	
ESG Word Count x Recent								-0.004 (0.003)	-0.004* (0.003)
Constant	1.201*** (0.052)	1.251*** (0.065)	1.285*** (0.153)	1.148*** (0.150)	1.144*** (0.153)	1.180*** (0.157)	1.022*** (0.274)	0.916*** (0.276)	1.052*** (0.165)
Observations	128	128	122	121	121	119	119	119	119
R	0.00004	0.013	0.026	0.112	0.112	0.120	0.136	0.177	0.162
Adjusted R	-0.008	-0.003	0.001	0.082	0.074	0.073	0.065	0.092	0.101
Residual Std. Error	0.384 (df = 126)	0.384 (df = 125)	0.383 (df = 118)	0.359 (df = 116)	0.361 (df = 115)	0.358 (df = 112)	0.359 (df = 109)	0.354 (df = 107)	0.352 (df = 110)
F Statistic	0.005 (df = 1; 126)	0.811 (df = 2; 125)	1.054 (df = 3; 118)	3.666*** (df = 4; 116)	2.913** (df = 5; 115)	2.548** (df = 6; 112)	1.906* (df = 9; 109)	2.092** (df = 11; 107)	2.655** (df = 8; 110)

This table reports the results of the linear model estimation for the percentage of target size reached. The % Target Size is defined as the size of the fund at final close divided by the target size stated in the fund's private placement memorandum. The main independent variable of interest is ESG Word Count. All the variables are defined in Table 1. Significance levels are as follows: \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

include managers seeking to stay in the market longer to increase their fund size they can achieve. Alternatively, managers who are more pessimistic about the time it will take them to raise the fund will seek to allow themselves more time to do so when establishing the terms of the fund.

We observe few significant differences for European funds and North American funds relative to funds from other regions, perhaps reflecting the global nature of infrastructure investors. The only exception are the results of Cox hazard models (see Tables 7 and 8), indicating that European (and in some cases North American) funds tend to raise money somewhat faster than funds from other regions. Although ESG issues tend to be more prominent in Europe than in many other parts of the world, ESG positioning does not benefit fundraising by European funds differently: the interaction term for European funds and ESG-related positioning is not significant in any of the specifications.

We find strong evidence that more recent funds had more fundraising success. They experienced higher likelihoods of achieving their target size (see Tables 3 and 4), reached higher percentages of their target fund size (see Tables 5 and 6), and were able to close sooner (see Tables 7 and 8). All of these could have been expected given the rising interest in the asset class amongst institutional investors. Interestingly, we also find that fund that launched their fundraising before the global financial crisis (i.e., pre-2007) significantly exceeded their target size (see Tables 5 and 6) and were able to close sooner (according to some specifications reported in Tables 7 and 8). However, we are wary of interpreting this observation too strongly, as the number of relevant funds is very small.

#### 4.2. Additional analyses and robustness checks

One possible shortcoming in our analysis is that the frequency of ESG-related terms does not accurately capture the emphasis that GPs place on ESG in promoting their funds. A fund's PPM could contain a section dedicated to ESG, which describes the importance of ESG-considerations for the fund without explicitly using high numbers of ESG-related terms. To test this possibility, we repeat our analysis using a binary variable for the inclusion of an ESG section in the fund's PPM in place of the word counts used above. We also consider the possibility that the set of terms we use is too broad. We intentionally focus on a longer list of terms in our main regressions as ESG terminology has changed over time. Focusing on a set of terms that is too narrow therefore increases the risk of variable capturing unintended time-varying effects. To explore this possibility, we use a variable which sums only ethics-terms ("ethics", "ethical", "ethically"), which we expect to be less time varying in their usage. The results (unreported) in both cases do not show any significant relationship between ethics-related terms and fundraising success.

Lastly, we note that there is a potential endogeneity issue in our analysis. If fund managers are aware of investors' beliefs and preferences, they may increase positive ESG positioning in order to improve their chances of fundraising success. Further, it is possible that emphasis on ESG is inversely related to perceived GP quality. If a fund manager is aware that their fundraising is likely to be difficult due to factors such as poor historical performance, they might focus their marketing documents more strongly on ESG issues in the hope of improving fundraising

**Table 6**  
Scaled ESG word count and % target size.

	Dependent variable:								
	% Target Size								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Scaled ESG Word Count	-0.0002 (0.0005)	-0.0001 (0.0005)	-0.0001 (0.001)	0.0001 (0.0005)	0.0001 (0.0005)	0.0002 (0.001)	0.0002 (0.002)	0.0001 (0.002)	0.001 (0.001)
UN PRI		-0.086 (0.072)	-0.127* (0.075)	-0.103 (0.073)	-0.103 (0.073)	-0.108 (0.073)	-0.126 (0.076)	-0.153** (0.077)	-0.124* (0.073)
Fundraising Limit			-0.0002 (0.008)	0.005 (0.008)	0.006 (0.008)	0.005 (0.008)	0.005 (0.009)	0.006 (0.008)	0.007 (0.008)
Pre-2007				0.580*** (0.193)	0.585*** (0.195)	0.581*** (0.194)	0.554*** (0.198)	0.604*** (0.200)	0.643*** (0.196)
High Performer					0.016 (0.076)	0.022 (0.076)	0.014 (0.077)	0.006 (0.076)	0.018 (0.075)
Fund Term						-0.003 (0.007)	-0.004 (0.007)	-0.003 (0.007)	-0.002 (0.007)
Europe							0.154 (0.289)	0.173 (0.286)	
North America							0.068 (0.230)	0.078 (0.227)	
Recent								0.204* (0.113)	0.190* (0.112)
Scaled ESG Word Count x Europe							-0.0002 (0.002)	0.0001 (0.002)	
Scaled ESG Word Count x Recent								-0.001 (0.001)	-0.001 (0.001)
Constant	1.218*** (0.055)	1.265*** (0.067)	1.312*** (0.151)	1.181*** (0.148)	1.174*** (0.152)	1.205*** (0.155)	1.147*** (0.304)	1.055*** (0.310)	1.100*** (0.170)
Observations	128	128	122	121	121	119	119	119	119
R	0.001	0.012	0.026	0.109	0.109	0.117	0.125	0.160	0.144
Adjusted R	-0.007	-0.004	0.002	0.078	0.071	0.069	0.052	0.073	0.082
Residual Std. Error	0.384 (df = 126)	0.384 (df = 125)	0.383 (df = 118)	0.360 (df = 116)	0.361 (df = 115)	0.358 (df = 112)	0.362 (df = 109)	0.358 (df = 107)	0.356 (df = 110)
F Statistic	0.112 (df = 1; 126)	0.768 (df = 2; 125)	1.063 (df = 3; 118)	3.545*** (df = 4; 116)	2.821** (df = 5; 115)	2.463** (df = 6; 112)	1.726* (df = 9; 109)	1.850* (df = 11; 107)	2.321** (df = 8; 110)

This table reports the results of the linear model estimation for the percentage of target size reached. The % Target Size is defined as the size of the fund at final close divided by the target size stated in the fund's private placement memorandum. The main independent variable of interest is Scaled ESG Word Count. All the variables are defined in Table 1. Significance levels are as follows: \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

prospects. Conversely, if a fund manager is already confident that they will reach their target size, they may not see the need to adopt or emphasise ESG policies and will avoid doing so to avoid subjecting themselves to associated costs such as reporting requirements. For this reason, to mitigate such issues, we include a measure of past performance in our regression analyses.<sup>5</sup>

## 5. Conclusion

Our research examines the impact of ESG positioning on private infrastructure fundraising. Using a proprietary dataset of funds' marketing documents (PPMs), supplemented with data from Preqin database, we use the ESG-related word count in the PPMs to test the effect of ESG positioning on the fundraising success measured by: fund achieving its target size, the ability to raise larger funds, and the length of time required to complete the fundraising.

Overall, our results show that investors in private infrastructure funds do not respond to increased emphasis of fund ESG position in line with the prediction of the cheap-talk model. This is a material finding. While we do not test for greenwashing, our results indicate that infrastructure investors are not susceptible to GPs emphasising ESG in their

marketing documentation, which would render "greenwashing" and "cheap ESG talk" ineffective.

There is some evidence though, that ESG positioning had a positive impact on fundraising before 2017 in terms of achieving target size and time taken to reach final close. However, this effect has dissipated in funds raised more recently from 2017 onwards. We consider two possible explanations for this. Firstly, it is possible that investors learned over time and have become more sophisticated in how they evaluate GPs' ESG credentials. Potential investors may more recently have obtained access to more objective ESG-related information, including details of past investments, allowing them to ignore what GPs claim to do and to instead focus on tangible or observable measures. Alternatively, the proliferation of ESG positioning in response to increased investor attention, may have led to a weakening of the signal as the GP universe became more homogenous with regards to ESG positioning. However, continued significant dispersion amongst funds leads us to consider the latter explanation less likely. This is a meaningful finding in the context of how investors react to ESG claims in marketing materials in the PE industry. If investors do not respond to ESG positioning in marketing materials, ESG positioning should have no effect on investment decisions of sophisticated investors in the long run.

While the limitations of our sample size make it difficult to explore this further, rising scepticism towards ESG positioning is a highly relevant topic in the context of greenwashing which may warrant closer examination in future research. Our research also gives rise to questions about whether and how potential investors evaluate GP's ESG credentials. Future research could explore the greenwashing more explicitly,

<sup>5</sup> In unreported specifications we also included measures of manager quality, such as total manager assets under management and the total number of funds raised. As these variables were not statistically significant, we have not included them in the current specifications.

**Table 7**  
ESG word count and time in market.

	Cox proportional hazard model: Time in Market								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>
	p-value	p-value	p-value	p-value	p-value	p-value	p-value	p-value	p-value
ESG Word Count	1.004	1.003	1.001	1.001	1.001	1.002	1.013	1.027	1.021
UN PRI		1.941	1.888	1.881	1.927	2.107	2.005	2.238	2.322
Fundraising Limit			0.922	0.922	0.920	0.925	0.912	0.908	0.921
Pre-2007				0.957	1.052	3.401	3.359	5.315	5.634
High Performer				>0.9	>0.9	1.625	1.517	1.480	1.586
Fund Term					1.666	1.012	0.997	1.003	1.018
Europe					0.018	0.5	0.9	0.9	0.4
North America							4.643	4.194	
ESG Word Count * Europe							2.167	2.163	
Recent							0.987	0.990	
ESG Word Count * Recent								2.421	2.565
Observations	153	153	144	144	144	141	141	141	141
Number of events	131	131	124	124	124	122	122	122	122
Concordance	0.546	0.603	0.643	0.643	0.658	0.663	0.681	0.693	0.685
	(se = 0.027)	(se = 0.028)	(se = 0.028)	(se = 0.028)	(se = 0.026)	(se = 0.027)	(se = 0.027)	(se = 0.025)	(se = 0.025)

This table reports estimation results of the Cox proportional hazard models. The failure event is defined as the reaching a final close and the unit of time used is months. The main independent variable of interest is ESG Word Count. All the variables are defined in Table 1.

<sup>1</sup> HR = Hazard Ratio

**Table 8**  
Scaled ESG word count and time in market.

	Cox proportional hazard model: Time in Market								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>	HR <sup>1</sup>
	p-value	p-value	p-value	p-value	p-value	p-value	p-value	p-value	p-value
Scaled ESG Word Count	1.002	1.001	1.001	1.001	1.001	1.001	1.004	1.006	1.005
UN PRI		1.928	1.868	1.863	1.900	2.095	1.973	2.101	2.196
Fundraising Limit			0.923	0.923	0.921	0.926	0.913	0.914	0.927
Pre-2007				0.969	1.067	3.366	3.082	4.105	4.667
High Performer				>0.9	>0.9	1.637	1.526	1.471	1.580
Fund Term					1.671	1.009	0.997	1.004	1.016
Europe					0.017	0.6	0.9	0.8	0.4
North America							4.343	3.812	
Scaled ESG Word Count * Europe							2.249	2.139	
Recent							0.996	0.997	
Scaled ESG Word Count * Recent								1.878	1.978
Observations	153	153	144	144	144	141	141	141	141
Number of events	131	131	124	124	124	122	122	122	122
Concordance	0.538	0.600	0.648	0.647	0.663	0.666	0.678	0.685	0.676
	(se = 0.029)	(se = 0.029)	(se = 0.028)	(se = 0.028)	(se = 0.026)	(se = 0.026)	(se = 0.027)	(se = 0.026)	(se = 0.026)

This table reports estimation results of the Cox proportional hazard models. The failure event is defined as the reaching a final close and the unit of time used is months. The main independent variable of interest is Scaled ESG Word Count. All the variables are defined in Table 1.

<sup>1</sup> HR = Hazard Ratio

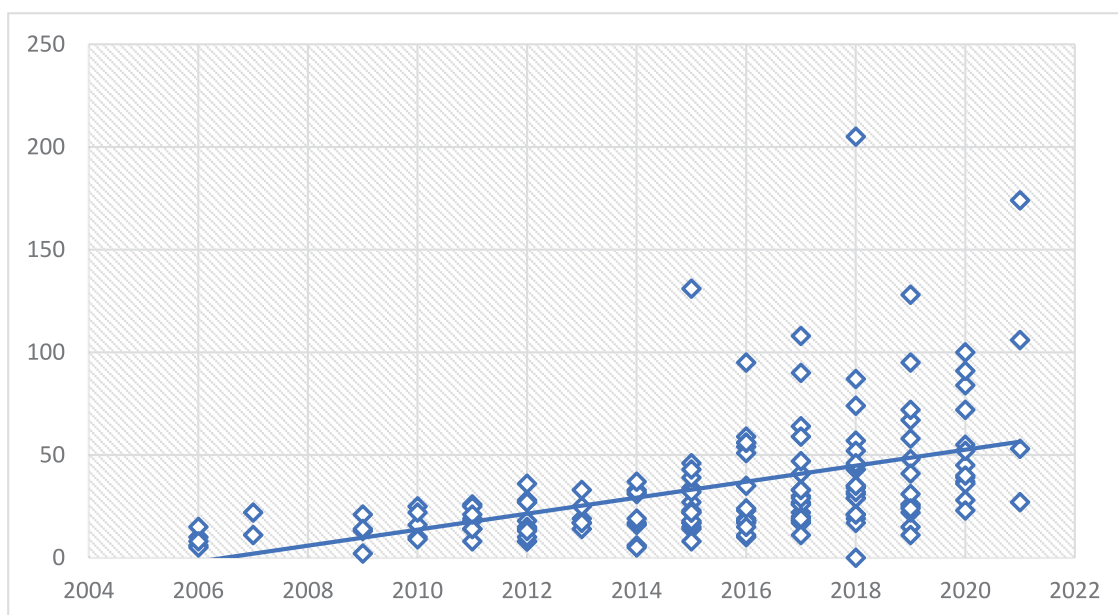


Fig. 2. ESG-related terms by fundraising launch year.

by comparing positioning in fund documentation to portfolio or asset-level outcomes, such as sector allocations or violations of environmental standards respectively. As our results suggest that investor behaviour has changed over time, an interesting area for future research would also be whether investors learn from GPs behaviour, for example by responding to negative ESG events in their portfolios. Such an analysis would shed further light on the relevance of ESG issues in general for private equity investors.

#### Data availability

The authors do not have permission to share data.

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