“Institutional ownership, environmental, social, and governance performance and disclosure – a review on empirical quantitative research”

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INSTITUTIONAL OWNERSHIP, ENVIRONMENTAL, SOCIAL, AND GOVERNANCE PERFORMANCE AND DISCLOSURE – A REVIEW ON EMPIRICAL QUANTITATIVE RESEARCH

Abstract

Since the financial crisis of 2008–2009, nonfinancial-related shareholder activism increased, as public interest entities (PIEs) should strengthen their environmental, social, and governance (ESG) activities. This study aims to determine whether institutional ownership (IO) impacts ESG performance and disclosure and vice versa. Moreover, IO's moderating and mediating influence on the relationship between ESG and firms' financial consequences is included. This is the first literature review focusing on IO and ESG, describing IO as independent, dependent, moderator, and mediator variable. A structured literature review with 81 empirical-quantitative (archival) studies on that topic is presented based on an agency theoretical framework. Regarding the main results, long-term IO leads to increased ESG performance. Moreover, ESG performance promotes the ratio of institutional investors. Other relationships are rather heterogeneous and too low in an amount yet, stressing major research gaps.

Keywords institutional investors, CSR performance, CSR reporting, principal agent theory, corporate governance, stakeholder management, literature review

JEL Classification M40, M41

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INTRODUCTION

Institutional investor activism has become a major topic during the annual general meetings of Public Interest Entities (PIEs) (Dangaard, 2019; Villalonga, 2018). Since the financial crisis of 2008–2009, a rapid increase in institutional ownership can be found from an international perspective (Sethi, 2005). Shares of most large corporations are owned by institutions rather than individuals (Cox, Brammer, & Millington, 2004), especially in developed countries (Dyck, Lins, Roth, & Wagner, 2019). For example, the proportion of U.S. public equities managed by institutions has risen steadily over the past six decades, from about 7 or 8% of market capitalization in 1950 to about 67 % in 2010 (Aguilar, 2013). In contrast to private investors, institutional investors are companies or organizations that invest money on behalf of other people or organizations. The main examples are mutual funds, pensions, and insurance companies. Institutional investors buy and sell a significant amount of stocks, bonds, or other securities. Many institutional investors fulfill an active monitoring function within the corporate governance system due to their main shareholder influence, strategic goals, and increased financial experience and expertise (Bebchuk, Cohen, & Hirst, 2017).

During the last years, there has been a major increase in the importance of environmental, social, and governance (ESG) issues

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among these investors, e.g., ESG ratings like the Dow Jones Sustainability Index or the FTSE4Good Index and Principles for Responsible Investment (PRI) guidelines by the United Nations (UN) (Dyck et al., 2019). ESG can be classified as "a business organization's configuration of principles of [environmental,] social [and governance] responsibility, processes of [environmental,] social [and governance] responsiveness, and politics, programs and observable outcomes as they relate to the firm's societal relationships" (Wood, 1991, p. 693). The literature stresses that both positive and negative relationships between institutional ownership (IO) and ESG can be realistic (Faller & Knyphausen-Aufseß, 2018). Traditional agency theory assumes that institutional investors are only interested in the short-term financial performance, and they will prevent intensive ESG expenditures to enhance their shareholder value (Bebchuk et al., 2017; Barnea & Rubin, 2010). However, institutional investors will demand ESG issues if it lowers the risk of an investment (Mahoney & Roberts, 2007). As ESG risks have a major impact on firm value (e.g., climate risks), institutional investors may prefer firms with high levels of both financial and ESG performance (Graves & Waddock, 1994).

Given the current relevance of the topic, the following paper synthesizes and discusses empirical research on the impact of IO on ESG and vice versa, as also other ownership types (e.g., managerial ownership) and other stakeholder groups (e.g., customers, suppliers, employees) can foster the ESG activities of a firm. Given the dominance of empirical research on institutional investors (Obermann & Velte, 2018) and its huge power, IO's concentration is justified in this literature review. Therefore, empirical-quantitative (archival) articles are included that analyze 1) the impact of IO on ESG performance and disclosure, 2) the impact of ESG performance and disclosure on IO as a bi-directional relationship, and 3) the moderating and mediating influence of IO on the firms' financial consequences of ESG. To achieve academic quality, 81 double-blind, peer-reviewed journal articles were considered.

The empirical relationship between IO and ESG is very complex. According to principal agent theory, institutional investors are classified as a homogeneous shareholder group with a clear focus on financial performance. It is not surprising that prior meta-analyses dominantly analyze the relationship between ownership structure and financial performance (e.g., Sundaramurthy, Rhoades, & Rechner, 2005; Sanchez-Ballesta & Garcia-Meca, 2007). IO represents a key monitoring instrument as part of the external corporate governance system. ESG issues will not be important for every type of institutional investor and thus not automatically pushed. As prior research stated contradictory empirical results (Faller & Knyphausen-Aufseß, 2018), institutional investors' preferences are heterogeneous in business practice. A more detailed analysis of IO and their different strategic goals are necessary. In contrast to prior research, a clear differentiation between IO ratio, nature, and type as main categories of institutional investors is conducted in the present literature review. Regarding institutional investors' nature, long-term versus short-term, active versus passive, and financial versus sustainable IO can be found in practice. Sustainable (non-financial) and long-term oriented institutional investors will include ESG issues in their decision-making in line with financial goals.

1. AGENCY-THEORETICAL FRAMEWORK

Neoclassical principal agent theory (Jensen & Meckling, 1976) is the key theoretical framework in prior IO research (Bebchuk et al., 2017). Regarding the residual claim of principals' stocks and the assumption of homogeneous shareholders' preferences (Fama & Jensen, 1983), traditional agency theory concentrates on financial value maximizing of PIEs (Jensen & Meckling, 1976). Dispersed ownership leads to the delegation of the management to executives as agents by investors as principals. Information asymmetry between managers and investors results in moral hazards and self-serving actions

because of conflicts of interests between both parties (Harris & Bromiley, 2007). To decrease those agency conflicts, the investors will implement monitoring and incentive-alignment mechanisms, e.g., a useful management compensation system.

As institutional investors are interested in maximizing firm value, they may also include ESG goals, e.g., an appropriate ESG performance and a transparent ESG report. Many researchers, e.g., Goranova and Ryan (2014), stress that IO and ESG are interdisciplinary topics. Modern agency-theoretical approaches, e.g., stakeholder agency theory (Hill & Jones, 1992), neglect the assumption of homogeneity within institutional investors. Thus, it depends on the nature and the special type of institutional investors, whether IO is significantly related to ESG or not. In line with portfolio theory, shareholders' investment decisions are related to risk and return (Hoq, Saleh, Zubayer, & Mahmud, 2010). As institutional investors have a main focus on financial results and investment risks, socially responsible investors (SRI) and long-term investors as special IO nature, explicitly consider ESG aspects in their investment decisions (Clark & Hebb, 2004). Thus, long-term versus short-term investors, SRI versus purely financial investors, active versus passive institutions fulfill heterogeneous investment strategies.

In line with IO nature, specific IO types are focused on quarterly earnings and act as traders, whereas others include non-financial aspects in their decisions, as it influences the risk-return-profile in the long run (Johnson & Greening, 1999). Mutual funds, unit trusts, investment trusts, and investment banks are normally short-term institutional investors with average holding periods of fewer than two years (Graves & Waddock, 1994). In contrast to this, pension funds and life insurance companies are normally long-term investors and hold large shares in portfolio companies (Fauzi, Mahoney, & Rahman, 2007). These investors may have problems to find new beneficial investments, as they have typically diversified holdings across a broad number of firms (Hoq et al., 2010). Thus, long-term investors are active monitors of the management; they are expected to prevent management activities that could erode firm value (Cho, Lee, & Pfeiffer, 2013).

2. RESEARCH FRAMEWORK

As this study relies on IO's impact on ESG and vice versa, IO can be included as independent, dependent, moderating, or mediator variable. This literature review's first IO variable is the simple ratio of institutions within total corporate ownership (IO ratio). Most of the studies in this review still rely on the IO ratio compared to other ownership types with heterogeneous measures (e.g., top institutions, top three, top five).

In line with IO ratio, heterogeneity within institutional investors can be addressed by its nature and type. Empirical research on different types of institutions and their impact on ESG and vice versa is growing since the last decade. In this literature review, different IO nature proxies are recognized to analyze whether institutional investors demand a high ESG performance and disclosure. Most of the included studies on IO nature focused on long-term versus short-term IO. A classical time-based separation has been made by Bushee (1998). Based on the past investment patterns in portfolio turnover, diversification, and momentum trading with nine variables, institutions are classified into transient, dedicated, and quasi-indexers. Bushee (1998) assumes that transient institutional investors mostly rely on short-term goals in contrast to dedicated institutions' long-term motivation. Regarding the range of activity, Brickley, Lease, and Smith (1988) have also conducted a well-used proxy of IO nature. The authors differentiate between pressure-sensitive (insurances, banks, and non-bank trusts), pressure-resistant (public pension funds, mutual funds, endowments, and foundations), and pressure-indeterminant institutions (private pension funds, brokerage houses, investment counsel firms, miscellaneous financial service firms, and unidentified institutions). According to this differentiation, pressure-sensitive institutions are passive, and pressure-insensitive are active institutions in their monitoring strategy. Pressure-sensitive institutions have current or

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potential business relations with corporations that create potential conflicts of interest with their fiduciary obligations more frequently than other institutional investors. Thus, monitoring activity is reduced.

Rather, current classification of IO nature is the explicit recognition of ESG goals as a complement to institutional investors' traditional financial focus. Dyck et al. (2019) differentiated institutional investors by whether they signed the UN Principles for Responsible Investments (PRI) or not and classified the signatories as socially responsible investors (SRI). Signing the UN PRI commits institutional investors to active engagement and the consideration of ESG issues in their investment decisions. Socially responsible investors possess a homogeneous set of ethical values, according to which they engage in active oversight regarding ESG strategies. As invested financial stakeholders, they are incentivized to monitor managerial behavior in alignment with a multi-attribute value function regarding firms' financial and ESG performance.

In comparison to IO nature, IO type as the third main category of IO proxies focuses on special groups of institutional investors, e.g., pension funds, mutual funds, or investment funds, and their different investment strategies.

ESG proxies are separated in ESG performance and ESG disclosure. Prior research recognized a variety of different proxies. ESG performance or sub-pillars, e.g., environmental performance, social performance, or carbon performance, are normally related to external databases (e.g., Thomson Reuters). Few studies also include ESG spendings, corporate philanthropy donations as ESG performance, or a simple dummy variable (e.g., CDP participation, or categorization as ethical or sin firm). ESG disclosure proxies and their sub-pillars, e.g., carbon disclosure, environmental disclosure, and integrated reporting, mostly rely on individual content analysis and scoring methodology.

The first research question examines whether IO ratio, nature, and type have an impact on ESG performance and disclosure. The second research question investigates the effect of the opposite relationship between ESG performance and disclosure and IO. Finally, empirical research on the firms' financial consequences of ESG performance and disclosure is included by recognizing IO as a moderator or mediator variable.

Figure 1 presents a research framework to analyze the main streams of research.

Table 1 gives an overview of the included IO and ESG proxies in this literature review.

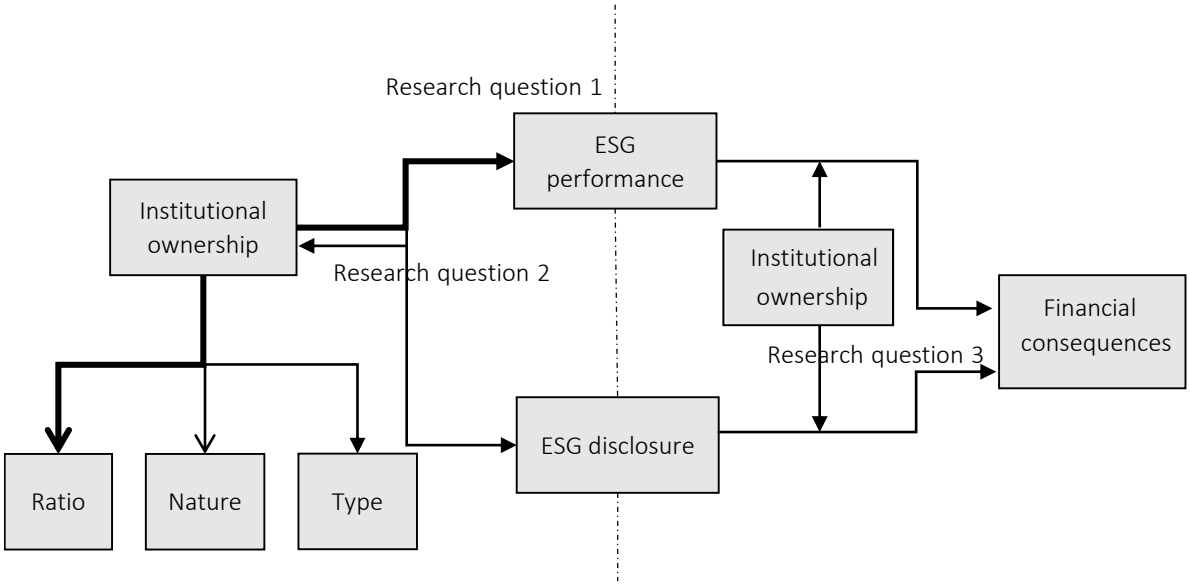

Figure 1. Research framework for the literature review (the majority of included studies are marked)

Table 1. Count of cited published papers

Panel A: by publication year	
Total: 81	2020: 7; 2019: 19; 2018: 10; 2017: 7; 2016: 5; 2015: 2; 2014: 4; 2013: 4; 2012: 5; 2011: 5; 2010: 4; 2009: 1; 2008: 3; 2006: 3; 2003: 1; 1994: 1
Panel B: by region	
Total: 81	Bangladesh: 2; Canada: 1; China: 7; Egypt: 1; France: 1; India: 2; Indonesia: 2; Israel: 1; Italy: 1; Japan: 2; Jordan: 1; Korea: 2; Malaysia: 2; Pakistan: 1; Palestine: 1; Qatar: 1; Saudi-Arabia: 1; South Africa: 3; Spain: 3; Taiwan: 1; Thailand: 1; The Netherlands: 1; Turkey: 1; UK: 1; USA: 35; International: 7
Panel C: by journal	
Total: 81	Business ethics/sustainability journals: 35 Business & Society: 1; Business Strategy and the Environment: 3; Corporate Social Responsibility and Environmental Management: 9; International Journal of Business and Society: 1; International Journal of Energy Economics and Policy: 1; Journal of Business Ethics: 10; Journal of Economic and Social Development: 1; Management and Environmental Quality: 1; Organization & Environment: 1; Social Responsibility Journal: 4; Sustainability: 3
	Accounting and corporate finance journals: 32 Accounting Perspectives: 1; Accounting Research Journal: 2; Accounting, Organizations & Society: 1; Advances in International Accounting: 1; Applied Economics: 1; Asian Journal of Finance & Accounting: 1; Emerging Markets Finance and Trade: 1; European Accounting Review: 1; Finance Research Letters: 1; International Journal of Financial Studies: 1; Journal of Accounting & Public Policy: 1; Journal of Banking & Finance: 4; Journal of Corporate Finance: 4; Journal of Empirical Finance: 1; Journal of Financial Economics: 3; Journal of Financial Reporting and Accounting: 1; Journal of the Japanese and International Economies: 1; Managerial Finance: 1; Research in Accounting in Emerging Economies: 1; Review of Quantitative Finance and Accounting: 1; The Accounting Review: 1; The European Journal of Finance: 2
	Management/corporate governance journals: 14 Academy of Management Journal: 1; Asian Business Management: 1; Corporate Governance: 3; International Journal of Management and Enterprise Development: 1; Journal of Business Research: 1; Journal of Management & Organization: 1; Journal of Management and Governance: 1; Journal of Management: 1; Management Science: 1; Managerial Auditing Journal: 1; Strategic Management Journal: 1; Thunderbird International Business Review: 1
Panel D: by content	
Total: 81	Impact of IO on ESG: 55; Impact of ESG on IO: 14; IO as moderator/mediator variable: 12
Panel E: by IO variable	
Total: 92*	IO ratio: 49; IO nature: 38 (long-term vs. short-term: 18; SRI: 7; active vs. passive: 5; foreign vs. domestic: 8); IO type: 5
Panel F: by regression models (endogeneity concerns)	
Total: 110*	2SLS/IV: 17; Diff-in-Diff: 4; Event study: 2; GMM: 5; Granger causality: 2; OLS: 40; Panel: 24; Probit/logit regression: 11; Propensity score matching: 2; Structural equation model: 2; Tobit regression: 1

Note: * some studies include more than one IO variable and regression model.

3. LITERATURE REVIEW

3.1. Data selection

This structured literature review of empirical articles focuses on the bi-directional relationship between IO, ESG performance, and disclosure. Moreover, IO is recognized as a moderator or mediator variable of the relationship between ESG and firm value. Several keywords are used, e.g., 'Corporate Social Responsibility (CSR)', 'Environmental, Social and Governance (ESG)', 'Environmental Performance', 'Carbon Performance', 'Financial Performance', 'Environmental Reporting', 'Carbon reporting' and related expressions in connection with 'institutional investors', 'institutional ownership', 'sustainable responsible investors', and related expressions. The limitation of the period of empirical research on that topic was not useful.

In a second step, and as in other related literature reviews (Obermann & Velte, 2018), the keywords are applied to five major academic journal databases – ISI Web of Science, ScienceDirect, SAGE Journals, Emerald Insight, and Wiley Online Library, Google Scholar. For the field of business economics, only peer-reviewed journal articles in the English language were considered. This procedure resulted in 185 potentially relevant empirical papers. Contents of their abstracts were examined, and 69 articles whose topics did not fit the research question were excluded. Another 35 articles were dropped as these studies did not refer to the respective research method (empirical-quantitative (archival) research). The final sample of 81 papers was stated. An overview of the cited studies can be found in Table 2, organized by publication year, by region, by journal, by content, by IO variable(s), and by regression model(s).

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Table 2. List of ESG and IO proxies

ESG proxies	IO proxies
Performance: • ESG performance (databases) • Carbon performance (databases) • CDP participation (dummy) • Environmental performance (databases), e.g., environmental capital expenditures, ISO 14001 certification • Environmental and social performance (databases) • ESG spendings (annual reports) • Corporate philanthropy (donations) • Ethical firm (dummy) • Social norm acceptance of sin firms • Irresponsible sin firms (dummy)	**IO nature:** • Long-term versus short-term • Dedicated versus transient • Norm-constrained • Active versus passive • Pressure-sensitive versus pressure-resistant • Local (SRI funds) • Foreign versus domestic • PRI signatory • Social norms
Disclosure: • ESG disclosure (score)/first time ESG disclosure (dummy) • Carbon disclosure (score; dummy) • Environmental disclosure (score) • Integrated reporting (score; word count; dummy)	**IO type:** • Cross-holdings • Financial institutions • Insurance • Investment funds • Securities firms • Pension funds • Endowments Mutual funds
	IR ratio

3.2. Content analysis

The first study in the review was performed in 1994, and the field has grown considerably during the last few years (Panel A). Most of the included studies have been conducted for the U.S.-American capital market (Panel B). The U.S.-American setting is an attractive research objective, as the relevance and influence of IO are very high compared to other regimes. Most studies have been published in Business Ethics and Sustainability Journals (35; Panel C), especially in the Journal of Business Ethics (10) and Corporate Social Responsibility and Environmental Management (9). Furthermore, accounting and corporate finance journals have often been used as a publication medium (32). Table 2 also shows that prior research mainly focused on the impact of IO on ESG (55) and not the other way round (14) (Panel D). Moreover, only a few studies include IO as moderator variables (11), and only one study in our sample addresses IO as mediator. The most relevant IO proxies are IO ratio (49) and IO nature (38), as Panel E indicates. As institutional investors are heterogeneous in their ESG interests, the use of an overall IO ratio is not precise. The research topic is related to major endogeneity concerns, especially due to reversed causality and omitted variable bias. While Panel F indicates that OLS (40) and panel regressions (24) are the most common, advanced regression models, e.g., two-stage least squares (2SLS) with instrumental variables (IV), structure equation models (SEM), difference-in-difference (diff-in-diff) approaches, or generalized method of moments (GMM), are not often used (Wintoki, Linck, & Netter, 2012).

This structured literature review complements prior research in different ways. As the relationship between IO and ESG is controversially discussed since the last decade, no literature review has been conducted yet. In this analysis, several research gaps are identified that should guide future researchers. Only one literature review on the impact of broad ownership structure on ESG has been conducted (Faller & Knyphausen-Aufseß, 2018). This study makes several contributions to prior literature. First, IO is focused, and heterogeneity within institutional investors is included by IO ratio, IO nature, and IO type. Second, the bi-directional relationship between IO and ESG is of special interest, and prior research on the impact of IO on ESG performance and disclosure, on the one hand, and the influence of ESG on IO, on the other hand, is stressed. Moreover, as a moderator and mediator variable on the firms' financial consequences of ESG performance and disclosure, IO is included. Third, only empirical-quantitative (archival) studies are included to increase homogeneity within the number of studies.

The included studies in the literature review are summarized in detail in Tables 3-5. Table 3 in-

cludes only papers on the impact of IO on ESG. Table 4 focuses on empirical-quantitative research on the relationship between ESG performance, disclosure, and IO, assuming a bi-directional relationship. Finally, Table 5 lists the studies that include IO as moderator and mediator variable on IO's impact on firms' financial consequences.

3.3. Impact of IO on ESG

3.3.1. ESG performance

Most of the included studies in this literature review are related to IO's influence on ESG performance. IO ratio, nature, and type are separated in line with the presented research framework. Jouini et al. (2018) and Chen et al. (2020) found a positive relationship between IO ratio and ESG performance. According to Chen et al. (202), the relationship was stronger in ESG categories that were financially material. Akbas and Canikli (2019) stated a higher carbon performance by increased IO. In contrast to this, Arora and Dharwadkar (2011) indicated a negative relationship between IO ratio and ESG performance. Chen et al. (2020) also stressed a negative impact when investors are distracted by exogenous shocks. Most of the included studies on that topic find an insignificant link (Chung, Cho, Dooj. Ryu, & Doow. Ryu, 2019; Boubaker, Chourou, Himick, & Saadi, 2017; Lopatta, Jaeschke, & Chen, 2017; Borghesi, Houston, & Naranjo, 2014; Dam & Scholtens, 2012; Walls, Berrone, & Phan, 2012; Barnea & Rubin, 2010; Li & Zhang, 2010; Aggarwal & Dow, 2012 (carbon); Stanny & Ely, 2008 (carbon)). Thus, heterogeneity within IO is huge given their interests in ESG activities.

Regarding IO nature, a growing amount of studies indicate that long-term institutional investors improve ESG performance (Meng & Wang, 2020; Erhemjamts & Huang, 2019; Fu, Tang, & Yan, 2019; Gloßner, 2019; Kim et al., 2019a; Kim et al., 2019b; Lamb & Butler, 2018; Boubaker et al., 2017; Neubaum & Zahra, 2006) and short-term IO decreases ESG performance (Lamb & Butler, 2018; Boubaker et al., 2017; Neubaum & Zahra, 2006). Walls et al. (2012) was the only study in this sample with no significant results. The results for other proxies of IO nature are rather inconclusive or are of too low amount. According to Dyck et al. (2019), sustainable responsible investors (SRI) increase ESG performance. Alda (2019) stated similar results for environmental and carbon performance. In contrast to this, Motta and Uchida (2018) did not find any significance. Pucheta-Martinez and Lopez-Zamora (2018) relied on pressure-resistant (active) investors as directors and stated a positive influence on ESG performance. In contrast to this, according to Wegener et al. (2013), active IO did not influence ESG performance. Mixed evidence is also relevant for foreign IO, as a positive (Dyck et al., 2019; Panicker, 2017) and a negative (Chung et al., 2019; Kim, Wan, Wang, & Yang, 2019b; Motta & Uchida, 2018; Wegener, Elayan, Felton, & Li, 2013 (carbon)) influence on ESG performance or its sub-pillars are available. Gulzar, Cherian, Hwang, Jiang, and Sial (2019) did not state any significance.

Some researchers also addressed IO type and analyzed the impact on ESG performance of pension funds (positive relationship: H.-D. Kim, T. Kim, Y. Kim, & Park, 2019b; Oh et al., 2011) and insignificant results by Mallin et al. (2013), Barnea and Rubin (2010), banks, insurance, and other institutions (positive relationship: Panicker, 2017) and insignificant results by Oh, Chang, and Martynov (2011), mutual funds (insignificant results by Panicker, 2017), and investment funds (insignificant results by Mallin, Michelon, & Raggi, 2013).

3.3.2. ESG disclosure

In line with ESG performance, most of the included studies address IO ratio, assuming homogeneity within institutional investors. A positive impact of IO ratio on ESG disclosure (Zaid, Abuhijleh, & Pucheta-Martinez, 2020; Zhou, 2019; Suyono & Farooque, 2018; Majeed, Aziz, & Saleem, 2015; Sanchez, Sottorio, & Diez, 2011; Saleh, Zulkifli, & Muhamad, 2010), integrated reporting (Raimo, Vitolla, Marrone, & Rubino, 2020; Suttipun & Bomlai, 2019) and carbon disclosure (Akbas & Canikli, 2019; Jaggi, Allini, Macchioni, & Zagaria, 2018) can be stated. Few studies also stressed a negative relationship between IO ratio and ESG disclosure (Abu Qa'dan, & Suwaidan, 2018; Ntim & Soobaraoyen, 2013b; Htay, Rashid, Adnan, & Meera, 2012). Heterogeneous interests of institutional investors concerning ESG disclosure seem to be realistic as insignificant results indicate (D. El-

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Bassiouny & N. El-Bassiouny, 2019; Hu et al., 2018; Habbash, 2016; Nurjayati, Taylor, Rusmin, Tower, & Chatterjee, 2016; Nitm & Soobaraoyen, 2013a; Rashid & Lodh, 2008; Brown, Helland, & Smith, 2006; Naser, Al-Hussaini, Al-Kwari, & Nuseibeh, 2006; Hermawan, Aisyah, Gunardi, & Putri, 2018 (carbon disclosure)).

Other IO proxies are rarely used. Concerning IO nature, Hu, Zhu, Tucker, and Hu (2018) did not significantly impact long-term IO on ESG disclosure. Garcia-Sanchez et al. (2020) and Huang (2010) stressed a positive association between foreign institutional investors and ESG disclosure or its sub-pillars. According to Garcia-Meca and Pucheta-Martinez (2017), pressure-sensitive (passive) IO as directors increases ESG disclosure.

Finally, focusing on IO type, Garcia-Sanchez et al. (2020) found a positive impact of pension funds and a negative influence of cross-holdings, government, and financial institutions on ESG performance.

Table 3. Research on the impact of IO on ESG (panel A) and carbon (panel B)

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): IO proxies	Dependent variable (s): ESG proxies	Significant results
Panel A: ESG						
2020	Chen et al.	Journal of Financial Economics	USA 1,631 firm-year observations 2003–2006 2SLS/IV Probit regression	IO (ratio) (exogenous increase by Russell Index reconstitutions)	ESG performance (rating; KLD database)	+ (stronger in ESG categories what are financially material) – (when investors are distracted by exogenous shocks)
2020	Zaid et al.	Corporate Social Responsibility and Environmental Management	Palestine 33 firms 2013–2018 Pooled OLS/panel (fixed effects)/GMM	IO (ratio) Moderator: board independence	ESG disclosure (score)	+ Moderator: +
2020	Garcia-Sanchez et al.	Business Strategy and the Environment	International 989 firms 2015–2017 OLS	IO nature (foreign, cross-holdings, government, financial institutions, pension funds and endowments, others)	ESG disclosure in line with UN SDG (score)	+ (foreign, pension funds, "others") +/– (cross-holdings, government, financial institutions)
2020	Meng and Wang	Managerial Finance	USA 29,391 firm-year observations 1991–2013 Panel regression	IO nature (long-term/portfolio turnover)	ESG performance (KLD database)	+
2020	Raimo et al.	Business Strategy and the Environment	International 152 firms n.a. OLS	IO (ratio)	Integrated reporting quality (score)	+
2019	Chung et al.	Asian Business Management	Korea 1,618 firm-year observations 2005–2014 Panel/2SLS/IV	IO (ratio; domestic vs. foreign) Moderators: liquidity (Amihud's illiquidity ratio), R&D expenses	ESG performance (KEJI database)	+ (domestic stronger than foreign) Moderators: strengthened by R&D and by low liquidity
2019	Dyck et al.	Journal of Financial Economics	International 3,277 firms 2004–2013 panel	IO nature (PRI signatory, social norms of foreign institutional investors' home countries by Environmental Performance Index and World Value E&S Index)	Environmental and Social Performance (rating by Asset4)	+ (foreign institutional investors domiciled in countries with social norms supportive of strong E&S commitments are the one that impact firms E&S performance)

Table 3 (cont.). Research on the impact of IO on ESG (panel A) and carbon (panel B)

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): IO proxies	Dependent variable (s): ESG proxies	Significant results
2019	El-Bassiouny et al.	Management and Environmental Quality	International 88 firms 2014 OLS	IO (ratio)	ESG disclosure (quality; score)	+ (only Egypt) +/– (Germany, USA)
2019	Erhemjamts and Huang	Journal of Business Research	USA 15,217 firm-year observations 2003–2013 OLS/logit regression/2SLS/IV	IO nature (long-term/churn rate) ESG performance Moderator: IO (long-term)	ESG performance, environmental, and social performance (KLD database) Buy-and-hold return	+ + Moderator: more pronounced
2019	Fu et al.	Journal of Empirical Finance	USA 90,426 firm-quarter observations 1995–2012 Panel/2SLS/ Diff-in-Diff	IO nature (long-term; churn rate) Moderators: market myopia (bid-ask-spread, managerial agency risks (free cash flow) and motivated investor	Environmental and social performance (KLD database)	+ Moderators: more pronounced by market myopia, managerial agency risks, and motivated investors
2019	Gloßner	Journal of Banking & Finance	USA 1991-2003 38,845 firm-year observations Pooled OLS/first difference regression/ Diff-in-Diff/IV	IO nature (long-term; churn rate) Moderator: institutional blockholder Subsample: firms with high and low earnings management (accruals) Shareholder proposals	Environmental and Social Performance (KLD)	+ (long-term) + (more pronounced) + (short term investors and earnings management) + (more targeted by longer investor duration)
2019	Gulzar et al.	Sustainability	China 4,256 firm-year observations 2008–2015 OLS/2SLS	IO (foreign; dummy)	ESG performance (CSMAR database)	+/–
2019	Kim et al.	Journal of Banking & Finance	USA 22,073 firm-year observations 1992–2012 Propensity score matching/ Diff-in-Diff/2SLS/IV	IO nature (long-term; churn rate and turnover/ dedicated)	Environmental and Social Performance (KLD database)	+ + (active long term investors)
2019	Kim et al.	Management Science	USA 770 firms 1994–2010 OLS	IO nature (local; local SRI funds, public pension funds, dedicated (long-term)	Environmental performance (total quantity of toxic chemicals)	–
2019	Suttipun & Bomlai	International Journal of Business and Society	Thailand 150 firms 2012–2015 OLS	IO (ratio)	Integrated reporting (word count)	+
2019	Zhou	Applied Economics	China 1,779 firms 2010–2016 panel	IO (ratio)	ESG disclosure (dummy)	+

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Table 3 (cont.). Research on the impact of IO on ESG (panel A) and carbon (panel B)

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): IO proxies	Dependent variable (s): ESG proxies	Significant results
2018	Abu Qa'dan et al.	Social Responsibility Journal	Jordan 51 firms 2013–2015 Panel	IO (ratio)	ESG disclosure (index; score)	–
2018	Hu et al.	Accounting Research Journal	China 1,839 firms 2010 Probit regression	IO nature (short-term (mutual, insurance), long-term (public pension fund NSSF); ratio	ESG disclosure (dummy; yes/no)	+/-
2018	Jouini et al.	International Journal of Management and Enterprise Development	France 65 firms 2010–2014 T-test	IO (dummy)	ESG performance (ESGHub database)	+
2018	Lamb and Butler	Business & Society	USA 153 firms 1994–2006 Fixed panel regression	IO nature (transient (short-term), dedicated (long-term)	ESG performance (strengths and concerns; KLD database)	-(transient; ESG strengths) +(dedicated; ESG concerns)
2018	Motta and Uchida	Journal of the Japanese and International Economies	Japan 471 firms 2007–2010 Logit regression	IO nature (domestic; sustainable (PRI))	Improvement in ESG performance (Toyo Keizai database; dummy)	+ (environment), +/– (social, governance, employee) **+/–** (PRI)
2018	Pucheta-Martinez and Lopez-Zamora	Corporate Social Responsibility and Environmental Management	Spain 1,092 firm-year observations 2014–2013 OLS	IO nature as directors (pressure-sensitive (passive) versus pressure-resistant (active)	Environmental disclosure (dummy; score)	+ (pressure-resistant institutions)
2018	Suyono and Farooque	Accounting Research Journal	Indonesia 145 observations 2010–2014 OLS	IO (ratio) Moderator: earnings management (accruals)	ESG disclosure (content analysis; score)	+ Moderator: +
2017	Boubaker et al.	Thunderbird International Business Review	USA 3,440 firms 2003–2009 OLS/fixed panel regression/Granger causality test	IO (ratio; nature (dedicated; long-term))	ESG performance (KLD database)	+/– (ratio) + (long-term); -(short-term) (not the other way round)
2017	Garcia-Meca and Pucheta-Martinez	Corporate Social Responsibility and Environmental Management	Spain 1,332 observations 2004–2012 panel	Institutional investors as directors (pressure-sensitive (passive) versus pressure-resistant (active)	ESG disclosure (score)	+ (pressure-sensitive institutions)
2017	Lopatta et al.	Corporate Social Responsibility and Environmental Management	International (25 countries) 8,952 firm-year observations 2003–2012 OLS	IO (ratio)	ESG performance (GES rating)	+/–
2017	Panicker	Social Responsibility Journal	India 1,722 firms 2014–2016 Random effects tobit regression	IO (mutual fund, banks, insurance and other financial institutions, foreign; ratio)	ESG involvement as annual ESG spending (annual reports)	+ (banks, insurance and other institutions, foreign) +/– (mutual)

Table 3 (cont.). Research on the impact of IO on ESG (panel A) and carbon (panel B)

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): IO proxies	Dependent variable (s): ESG proxies	Significant results
2016	Habbash	Journal of Economic and Social Development	Saudi Arabia 267 observations 2007–2011 OLS	IO (ratio)	ESG disclosure (score)	+/–
2016	Nurhayati et al.	Social Responsibility Journal	India 100 firms 2010 OLS	IO (promoter; ratio)	ESG disclosure (score)	+/–
2015	Majeed et al.	International Journal of Financial Studies	Pakistan 100 firms 2007–2011 OLS	IO (ratio)	ESG disclosure (score)	+
2014	Borghesi et al.	Journal of Corporate Finance	USA 11,711 observations 1992–2006 Panel/2SLS/IV	IO (ratio)	ESG performance (rating by KLD database)	+/–
2013	Mallin et al.	Journal of Business Ethics	USA 100 firms 2005–2007 Structure equation model (SEM)	IO nature (ratio of investment funds; pension fund (dummy)	ESG performance (rating by KLD database)	+/–
2013a	Ntim and Soobaroyen	Corporate Governance	South Africa 600 observations 2002–2009 Panel (fixed effects)/2SLS/IV	IO (ratio)	ESG disclosure (score)	+/–
2013b	Ntim and Soobaroyen	Journal of Business Ethics	South Africa 75 firms 2003–2009 OLS/panel (fixed effects)	IO (Ratio)	ESG disclosure (black economic empowerment disclosure; score)	–
2012	Dam and Scholtens	Corporate Governance	International 691 firms 2005 OLS	IO (ratio)	ESG performance (rating by EIRIS database)	+/–
2012	Htay et al.	Asian Journal of Finance & Accounting	Malaysia 12 banks 1996–2005 OLS	IO (ratio)	ESG disclosure (score)	–
2012	Walls et al.	Strategic Management Journal	USA 313 firms 1997–2005 Panel	IO (Ratio; long-term/ turnover)	Environmental performance (rating by KLD database)	+/– Interaction effects: long-term investors and outsiders in the board on environmental performance; investor ratio, high CEO salary/low CEO stock option on environmental performance
2011	Arora and Dharwadkar	Corporate Governance	USA 518 firms 2001–2005 Panel regression (random)	IO (ratio) Moderators: slack (cash and account receivables; debt to equity ratio); attainment discrepancy as the difference between aspired and actual financial performance	ESG performance (rating by KLD database)	–

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Table 3 (cont.). Research on the impact of IO on ESG (panel A) and carbon (panel B)

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): IO proxies	Dependent variable (s): ESG proxies	Significant results
2011	Oh et al.	Journal of Business Ethics	Korea 118 firms 2005 OLS	IO type (pension funds; insurance firms; securities firms; investment and commercial banks)	ESG performance (rating by KEJI index)	+ (pension funds)
2011	Sanchez et al.	Corporate Social Responsibility and Environmental Management	Spain 125 firms 2004 Structural Equation Model	IO (ratio)	ESG disclosure (score)	+
2010	Barnea and Rubin	Journal of Business Ethics	USA 2,649 firms 2003 OLS/probit regression/2SLS/IV	IO (ratio, pension funds)	ESG performance (rating by KLD database)	+/–
2010	Huang	Journal of Management & Organization	Taiwan 297 firms 2006–2007 OLS	IO nature (foreign/ domestic)	ESG disclosure (score)	+ (foreign; worker and supplier performance)
2010	Li and Zhang	Journal of Business Ethics	China 692 firms 2007 OLS	IO (ratio)	ESG performance (rating by SNAI)	+/–
2010	Saleh et al.	Managerial Auditing Journal	Malaysia 200 firms 2000–2005 panel	IO (ratio)	ESG disclosure (score)	+
2008	Rashid and Lodh	Research in Accounting in Emerging Economies	Bangladesh 21 firms 2003–2007 OLS	IO (ratio)	ESG disclosure (score)	+/–
2006	Brown et al.	Journal of Corporate Finance	USA 207 firms 1998 Probit regression/ OLS/3SLS	IO (ratio)	Corporate Philantrophy (disclosure, charitable givings, charitable foundation, cash contributions)	+/–
2006	Naser et al.	Advances in International Accounting	Qatar 21 firms 1999–2000 OLS	IO (ratio)	ESG disclosure (content analysis; score)	+/–
2006	Neubaum and Zahra	Journal of Management	USA 357 and 383 firms 1995 and 2000 OLS	IO nature (long-term/pension funds with at least 1 % shares Short-term/ banking and mutual funds with at least 1% shares Moderator: IO activism (number of unique annual episodes in reports and press releases) and coordination (average of unique acts of coordinated activism)	ESG performance (rating by KLD database)	+ – More pronounced by higher frequency and coordination of activism

Table 3 (cont.). Research on the impact of IO on ESG (panel A) and carbon (panel B)

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): IO proxies	Dependent variable (s): ESG proxies	Significant results
Panel B: Carbon performance and disclosure						
2019	Akbas and Canikli	Sustainability	Turkey 84 2014–2016 Logistic regression/ probit regression	IO (ratio)	Participation to CDP (dummy) Carbon disclosure (dummy)	+ +
2019	Alda	Business Strategy and the Environment	UK 1,253 firms 2002–2018 OLS/logit regression/ Granger causality	IO nature (social responsible pension funds)	Environmental performance, Carbon performance (Eikon database)	+ Also the other way round
2018	Jaggi et al.	Organization & Environment	Italy 671 firm-year observations 2010–2013 Panel (fixed effect)/2SLS/IV	IO (ratio)	Carbon disclosure (score)	+
2018	Hermawan et al.	International Journal of Energy Economics and Policy	Indonesia 22 firms 2014–2016 OLS	IO (ratio)	Carbon disclosure (score)	+/-
2013	Wegener et al.	Accounting Perspectives	Canada 2006–2009 319 firms Logistic regression/2SLS	IO nature (domestic; active)	Participation in the CDP (dummy)	+ (domestic)
2012	Aggarwal and Dow	The European Journal of Finance	USA 230 (426) firm-year observations 2009 OLS	IO (ratio)	Environmental (impact) performance (EIS) (Newsweek rating; KLD rating)	+/-
2008	Stanny and Ely	Corporate Social Responsibility and Environmental Management	USA 494 firms 2006 Logistic regression	IO (ratio)	Participation in the CDP (dummy)	+/-

3.4. Impact of ESG on IO

The relationship between IO and ESG might be bi-directional; thus, some studies also analyze the opposite relationship. There are empirical indications that IO ratio increases ESG performance (Mili, Gharbi, & Teulon, 2019; Dai & Kong, 2016; Gao, Dong, Ni, & Fu, 2016; Li & Lu, 2016; Liu, Lu, & Veenstra, 2014; Wahba, 2008). According to Nofsinger et al. (2019), IO ratio decreases environmental and social weaknesses. However, no significant results could be stated for environmental and social strengths. Chen and Gavious (2015) did not find any value implications for IO by increased ESG performance. Graves and Waddock (1994) conducted the first study on that topic; the authors also noted insignificant results. Relying on long-term institutional investors as IO nature, Harjoto, Kim, Laksmana, and Walton (2019), Oikonomou, Yin, and Zhao (2020), and Li and Lu (2016) found a positive impact of ESG performance. In line with their results on IO ratio, according to Nofsinger, Sulaeman, and Varma (2019), long-term IO decreases environmental and social weaknesses, but there are insignificant results for strengths. Hong and Kasperczyk (2009) is the only study in the sample that addresses the relationship between pension funds as IO type and found a negative influence of irresponsible sin firms. Moreover, only one study will be identified (Ahmed, Islam, Mahtab, & Hasan, 2014) on the impact of ESG disclosure on IO. The authors did not state any significant relationship between IO ratio and ESG disclosure.

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Table 4. Research on the impact of ESG on IO

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): ESG proxies	Dependent variable (s): IO proxies	Significant results
2019	Conway	Journal of Financial Reporting and Accounting	South Africa 2006–2015 OLS	Integrated reporting (dummy; score)	IO (ratio)	+
2019	Harjoto et al.	Review of Quantitative Finance and Accounting	USA 4,617 firms 1991–2004 OLS/event study/2SLS/IV	ESG performance (KLD database) after a stock split (dummy)	IO nature (dedicated; long-term)	+
2019	Mili et al.	Journal of Management and Governance	USA 240 firms n.a. OLS	Ethical firm (dummy; Ethics Quotient)	IO (ratio)	+
2019	Nofsinger et al.	Journal of Corporate Finance	USA 49,133 firm-year observations 2001–2013 Panel regression/ propensity score matching/	Environmental and Social Performance (KLD database; strength and weaknesses)	IO (Ratio; long-term (churn ratio)	– (weaknesses) +/– (Strengths)
2019	Oikonomou et al.	European Journal of Finance	USA 22,801 firm-year observations 1991–2012 Panel/2SLS/IV	ESG performance (KLD database)	IO nature (long-term; churn rate)	+ Also the other way round (!)
2016	Dai and Kong	Emerging Markets Finance and Trade	China 1,473 firms 2008 panel	Corporate philantrophy (magnitude of donations) Moderator: analyst coverage	IO (ratio)	+ Moderator: firms without analyst coverage will more likely increase IO after the donation (but only short-term effect)
2016	Gao et al.	European Accounting Review	The Netherlands 491 observations 2004–2012 panel	ESG performance (rating by Ministry of Economic Affairs in the Netherlands)	IO (ratio)	+
2016	Li and Lu	Journal of Business Ethics	China 3,843 firm-year observations 2004-10 OLS	Environmental capital expenditures	Investment decisions of institutional investors (ratio; long-term investors by churn rate) Abnormal stock returns	+ (ratio; long-term invest in state-owned firms) + (state-owned firms)
2015	Chen and Gavious	Finance Research Letters	Israel 452 firm-year observations 2007–2012 Event study	ESG firm (dummy)	Value implications for IO (number/ ratio)	+/–
2014	Ahmed et al.	Corporate Social Responsibility and Environmental Management	Bangladesh 152 firms n.a. OLS	ESG reporting (score; rating)	IO (Ratio)	+/–

Table 4 (cont.). Research on the impact of ESG on IO

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s): ESG proxies	Dependent variable (s): IO proxies	Significant results
2014	Liu et al.	Accounting, Organizations and Society	USA 447 observations 1980–2007 OLS	Social norm acceptance of sin firms (changes in consumption levels of alcohol, gambling, and tobacco based on survey data from Gallup Corporation, Inter-University Consortium for Political and Social Research (ICPSR) and American Gaming Association Moderator: future expected performance	IO (ratio)	+ Moderator: less pronounced
2009	Hong and Kasperczyk	Journal of Financial Economics	USA 193 firms 1962–2006 Panel	Irresponsible „Sin" firms (alcohol, tobacco, and gambling; dummy)	IO nature (pension funds as norm-constrained institutions)	–
2008	Wahba	Corporate Social Responsibility and Environmental Management	Egypt 156 firms 2003–2005 OLS/least absolute value	Environmental Performance (dummy: ISO 14001 certification yes or no) Moderator: Financial Performance	IO (ratio)	+ Moderator: +/– (only by high financial performance)
1994	Graves and Waddock	Academy of Management Journal	USA 430 firms 1991 OLS	ESG performance (rating by KLD database)	IO (number; ratio)	+ (number) +/– (ratio)

3.5. IO as moderator and mediator variable

Prior research is not only interested in the relationship between IO and ESG and vice versa. Moreover, IO may also moderate or mediate the influence of ESG on firms' financial consequences. Concerning IO ratio, the ESG disclosure-firm value link becomes positive by an increased IO ratio (Rehman et al., 2020). IO ratio also moderates the positive CEO power-ESG disclosure relationship (Jouber, 2019). Buchanan et al. (2018) found that IO positively moderates the ESG performance-firm value relationship during the financial crisis and negatively before the crisis. Moreover, IO ratio moderates the negative relationship between ESG performance and cost of equity (Suto & Takehara, 2017) and the positive ESG-financial performance relationship (Jo & Harjoto, 2011). These results are contrasted by Cho et al. (2013); the authors found that IO ratio does not moderate the impact of ESG performance on information asymmetry.

Some studies also include IO nature as a moderator variable. Erhemjamts and Huang (2019) found that long-term IO moderates the relationship between ESG performance and buy-and-hold returns. According to Nguyen, Kecskes, and Mansi (2020), long-term institutional investors strengthen the positive link between ESG performance and Tobin's Q. Moreover, the first-time ESG report is negatively related to equity costs, and this relationship is more strengthened by long-term IO and superior ESG performance (Dhaliwal, Li, Tsang,

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& Yang, 2011). In contrast to this, Kim, H. Li, and S. Li (2014) stressed that the relationship between ESG performance and stock price crash risk is more pronounced by less long-term IO. Cahan, C. Chen, and L. Chen (2017) included norm-constrained IO and found a positive moderator influence of the ESG performance-IO ratio relationship.

Finally, McGuire, Dow, and Argheyd (2003) address pension funds as IO type and stressed that the IO moderator strengthens the positive relationship between CEO compensation and ESG performance.

Harjoto, Jo, and Kim (2017) is the only study in this sample that found a non-linear relationship between ESG performance and IO ratio. Moreover, IO ratio mediates the negative relationship between ESG performance and stock return volatility.

Table 5. Research on moderator/mediator analysis of IO on firms' financial consequences of ESG

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s) Moderator variable(s)	Dependent variable(s)	Significant results
2020	Nguyen et al.	Journal of Banking and Finance	USA 21,257 firm-year observations 1991-2009 Cross-sectional analysis (Fama-MacBeth), time series	ESG performance (KLD database) Moderator: IO nature (long-term)	Tobin's Q	+ Moderator: strengthened by long-term institutions
2020	Rehman et al.	Sustainability	China 10,118 firm-year observations 2008-2012 Panel/GMM	ESG disclosure (dummy) Moderator: IO (ratio)	Market value (Ohlson model)	– Moderator: link becomes positive
2019	Jouber	Corporate Social Responsibility and Environmental Management	International 1,440 firm-year observations 2010-2017 Panel (fixed)	CEO power (model by Bebchuk et al. 2011) Moderator: IO (ratio)	ESG disclosure (score)	+ Moderator: +
2018	Buchanan et al.	Journal of Corporate Finance	USA 2006-2009 6,136 firm-year observations Diff-in-diff method	ESG performance (Bloomberg database) Moderator: financial crisis; IO (ratio)	Firm value (Tobin's Q)	+ (before the crisis); - (during the crisis) Moderator: - (before the crisis); + (during the crisis)
2017	Cahan et al.	Journal of Business Ethics	USA 1991-2011 4,071 firms Panel regression	ESG performance (KLD database) Moderator: IO nature (norm-constrained: pensions, universities, and religious, charitable, and non-for-profit institutions; dummy) IO with voting rights	IO (ratio)	+ (norm-constrained) (and also the other way round)
2017	Harjoto et al.	Journal of Business Ethics	USA 13,033 firm-year observations 1991-2012 OLS/path analysis	ESG performance (KLD database) Mediator: IO (ratio)	IO (ratio; type) Stock return volatility	+/– (non-linear; concave) –

Table 5 (cont.). Research on moderator/mediator analysis of IO on firms' financial consequences of ESG

Year of publication	Author(s)	Journal	State Sample years	Independent variable(s) Moderator variable(s)	Dependent variable(s)	Significant results
2017	Suto and Takehara	Social Responsibility Journal	Japan 2,680 firm-year observations 2007-2013 2SLS/IV	ESG performance (rating) Moderator: IO (ratio)	Cost of capital (equity (Fama French), debt (income statement) and WACC)	– Moderator: -(cost of equity)
2014	Kim et al.	Journal of Banking and Finance	USA 12,978 firm-year observations 1995-2009 OLS/GMM/IV	ESG performance (KLD database) Moderator: IO nature (long-term; dedicated)	Stock price crash risk (conditional skewness of return distribution)	– More pronounced by less long-term IO (!)
2012	Cho et al.	Journal of Accounting and Public Policy	USA 29,853 firm-year observations 2003-2009 OLS/GMM	ESG performance (KLD database) Moderator: IO (ratio)	Information asymmetry (bid-ask spread)	– Moderator: higher IO indicates that there is no link between ESG and information asymmetry (!)
2011	Jo and Harjoto	Journal of Business Ethics	USA 12,527 observations 1993-2004 2SLS/IV/GMM	ESG performance (strengths and concerns; rating by KLD STATS) Moderator: IO (ratio)	Firm performance (Tobin's Q)	+ +
2011	Dhaliwal et al.	The Accounting Review	USA 1,109 observations 1993-2007 2SLS/IV	First-time ESG report (Dummy; yes/no) Moderator: IO nature (dedicated; long-term)	Cost of equity (models by Gebhardt et al., Claus and Thomas, and Easton)	– (more pronounced by dedicated institutional investors by superior ESG performance) Bidirectional negative relationship
2003	McGuire et al.	Journal of Business Ethics	USA 374 firms 1999 OLS	CEO compensation Moderator: IO type (pension funds)	ESG performance (rating by KLD database)	+ (salaries and long-term compensation and weak ESG performance) Moderator: more pronounced

4. RESEARCH RECOMMENDATIONS

4.1. Extension of IO proxies and other methodological implications

While the number of empirical studies on IO and ESG-related topics increased during the last years, the author deducts several significant research gaps. Some useful recommendations for future research are given in this chapter. Regarding this literature review, most included studies concentrate on IO ratio without recognizing the nature and institutional investors' type. Instead, institutional investors' different information interests should be analyzed in more detail in future research designs. As long-term IO has already been included as an important proxy for IO nature, very little is known about the impact of SRI on ESG or its sub pillars (e.g., carbon performance and disclosure) (Dyck et al., 2019; Alda, 2019; Motta and Uchida, 2018). Thus, future research should address long-term and non-financial institutional investors because long-term investors and SRI cannot be classified as synonyms. Long-term institutional in-

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vestors can purely rely on financial performance and may not care much about significant ESG investments.

Regarding ESG disclosure, traditional content analysis and scoring methods have been mainly used to evaluate the quality of these reports. To recognize the risk of information overload, readability of ESG disclosure is a major challenge. As textual analysis has been included in prior empirical ESG research, this research method should also be adapted for this topic. Moreover, the current focus on archival (secondary) studies regarding IO research should be complemented by experiments, interviews, and surveys of boards of directors and key institutional investors to get deeper insights about their heterogeneous preferences.

In line with a more detailed analysis of IO proxies, other methodological issues are addressed. Endogeneity concerns (e.g., reversed causality and omitted variables) are important in recent empirical IO research (Wintoki et al., 2012). Advanced analytical approaches, including dynamic regression models (GMM estimation), IV approaches, or SEM, should at least be included as robustness checks in future studies (Wintoki et al., 2012). Moreover, with one exception (Harjoto et al., 2017), prior research includes linear regression models, assuming that IO's maximum ratio will lead to increased ESG performance and disclosure and vice versa. Instead, archival research on other ESG topics indicates that an optimal level of those indicators and a non-linear relationship fits business practice (indicating a U-shape or inverted U-shape curve). Moreover, Harjoto et al. (2017) is the only study in this review that included IO as a mediator variable. Future researchers should recognize mediator analyses on the IO-ESG link.

4.2. Content-related implications

ESG disclosure is related to business practice's two main problems: greenwashing and information overload (Mahoney, Thorne, Cecil, & LaGore, 2013). Future research should include these challenges. First, literature promotes the concept of integrated reporting to increase the decision usefulness of financial and ESG disclosure (Velte & Stawinoga, 2017a). While prior research stressed the value relevance of integrated reporting for investors (e.g., Barth, Cahan, Chen, & Venter, 2017), only three studies rely on integrated reporting in this literature review (Raimo et al., 2020; Suttipun & Bomlai, 2019; Conway, 2019). As these studies rely on IO ratio, there is a low amount of knowledge on IO nature's impact and type on integrated reporting (quality) and vice versa. Moreover, IO variables should be included as moderator and mediator variables on the firms' financial consequences of integrated reporting. Assuming that integrated reporting decreases the risks of greenwashing and information overload by the integrated thinking approach, IO activism might put pressure on the top management to compile an integrated report of high quality (Raimon et al., 2020). Given the low research density, future studies should re-assess SRI investors' effect or examine whether there is an association between investors' signing of the UN PRI and the publication of an integrated report with high quality.

In line with integrated reporting, institutional investors demand a transparent and credible ESG disclosure. Top management can provide external independent assurance of ESG reports by a third party voluntarily. International standard setters on ESG disclosure, e.g., the Global Reporting Initiative (GRI, 2018), explicitly recommend implementing assurance to increase the decision usefulness of ESG reports. Assurance of ESG disclosure has also been established as a key topic in empirical research. Prior literature reviews (e.g., Velte and Stawinoga 2017b) stressed the complexity of corporate governance-related influences of sustainability assurance within this field. However, there is a lack of knowledge on the impact of IO on the decision to conduct an ESG assurance, the choice of the assurance provider (accountants versus consultants), and the range of assurance (reasonable versus limited assurance level). Up to now, few studies included ownership concentration in empirical research on ESG assurance. Miras-Rodriguez and Di Pietra (2018) assume that block holders demand assurance of ESG disclosure and found positive results. In contrast to this, Kuzey and Uyar (2017), De Beelde and Tuybens (2015), Castelo Branco, Delgado, Gomes, and Pereira Eugenio (2014) and Ruhnke and Gabriel (2013) did not state any significance between ownership concentration and ESG assurance.

CONCLUSION

Institutional investor activism has become a major corporate governance issue from research, regulatory, and practice view (Bebchuk et al., 2017). While prior empirical research stressed the heterogeneity of IO and found heterogeneous results (e.g., Faller & Knyphausen-Aufseß, 2018; Friede, 2019), there is no literature review up to now on the bi-directional relationship between institutional investors and ESG and possible moderating influences of IO. Thus, this paper aims to discuss the connection between IO ratio, nature, and type as institutional investor categories and ESG performance and disclosure. 81 empirical-quantitative (archival) studies published in peer-reviewed journals are included. In contrast to prior literature reviews, a clear differentiation between 1) the impact of IO on ESG variables, 2) the influence of ESG on IO proxies, and 3) the moderating and mediating influence of IO on firms' financial consequences of ESG activities is included.

Regarding IO nature, long-term, sustainable, and active investors are assumed to strengthen ESG performance and disclosure, and those investors are also attracted by high ESG performance and disclosure to invest their money in a sustainable firm. Moreover, specific groups of institutional investors, e.g., pension funds or mutual funds, should have a different attitude on ESG performance and disclosure. According to the literature review, contradictory and insignificant empirical results in the review sample and a low amount of studies in specific research questions (e.g., on mediator analyses and ESG disclosure impact on IO) can be found. However, according to this literature review, there are indications that 1) long-term IO increases ESG performance, and 2) ESG performance leads to a higher IO ratio.

This analysis is not only relevant for research but also standard setters and business practice. First, long-term institutional investors have a huge impact on ESG performance, and ESG performance leads to a higher IO ratio. Recent regulations on shareholder rights and ESG from an international perspective, e.g., the European "Green Deal", will promote this IO activism in the future. Executive directors and audit committees should be aware of the increased power of institutional investors in ESG activities. Thus, ESG-driven monitoring of top managers is not only conducted by non-executives within the board, but also by some groups of institutional investors. This research topic is not only relevant in US-American one-tier systems with a traditional shareholder value focus but also two-tier systems with a stakeholder value view. As part of their investor relations management, executives should carefully analyze the current status and the development of IO within the firm, especially its nature and types. Given the current climate change discussion and the Fridays for future debate, many institutional investors (e.g., pension funds, SRI) connect financial and climate issues. Thus, financial performance and ESG performance represent relevant figures for investor relations management. The demand for successful integration of financial and ESG key performance indicators (integrated reporting) is likely to increase during the next years.

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