

Voluntary Environmental Initiatives and Firm Strategy

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Abstract

Our planet is facing great challenges caused by environmental degradation, and scientists have concluded that the major cause is increased human activity. Businesses are at least substantially responsible for the environmental crisis, but can also be part of the solution. Systems, regulations, and frameworks have been put in place to integrate environmental sustainability into business activity and encourage sustainable behavior amongst firms. But why is it the case that, despite technological and social progress, increases in environmental issue awareness, and government regulation, data from ecological analyses show worsening and alarming results? This question is of great concern to both academic and practitioner communities.

This research program aims to address this question by focusing on voluntary environmental initiatives that emerged in the 1980s to fill voids in inefficient environmental regulations. Voluntary environmental initiatives - such as environmental certifications, disclosures of non-financial information, and companies' own sustainability programs - are popular among companies operating in various industries around the globe. Despite the relatively large body of literature, the evidence from research is fragmented and inconclusive with regards to what kind of companies choose to participate in voluntary environmental initiatives and whether these initiatives are related to improved environmental outcomes or if they simply amount to symbolic acts with no benefit to societal welfare. Moreover, current research is largely focused on a narrow set of developed economies, which undermines our understanding of how these initiatives operate globally.

This thesis starts with an introductory chapter that provides the background and contribution of the dissertation and summarizes the four individual papers. The first two papers (Chapter 2 and 3) use meta-analytical methods to examine antecedents and outcomes of firm participation in voluntary environmental programs and the role of program stringency in these relationships. The third and fourth papers (Chapter 4 and 5) are based on regression analyses on a sample of publicly listed firms globally to examine the role of the state in greenwashing prevention and greenwashing in family firms, respectively.

The outcomes of this research program suggest that adoption of voluntary sustainability initiatives is contingent on an array of firm, program, and institutional factors, and suggest that, for these initiatives to be effective in achieving their goals, stringent regulations and governance mechanisms are critical to prevent symbolic behavior among firms.

Zusammenfassung

Unser Planet steht vor grossen Herausforderungen, die durch Umweltschäden verursacht werden. Wissenschaftler sind zu dem Schluss gekommen, dass menschliche Aktivitäten die Hauptursache für die Umweltschäden sind. Unternehmen sind also – zumindest teilweise – für die Umweltkrise verantwortlich; sie können aber auch Teil der Lösung sein. Um die ökologische Nachhaltigkeit in die Unternehmenstätigkeit zu integrieren und nachhaltiges Verhalten von Unternehmen zu fördern, wurden verschiedene Systeme, Vorschriften und Rahmenbedingungen geschaffen. Aber warum zeigen die Daten von Umweltanalysen trotz des technologischen und sozialen Fortschritts, des zunehmenden Umweltbewusstseins und der staatlichen Regulierung immer schlechtere und alarmierende Ergebnisse? Diese Frage ist sowohl für die Wissenschaft als auch die Praxis derzeit von grosser Bedeutung.

Die vorliegende Dissertation zielt darauf ab, diese Frage zu beantworten, indem sie sich auf freiwillige Umweltinitiativen fokussiert, die in den 1980er Jahren entstanden sind, um die Lücken ineffizienter Umweltvorschriften zu schliessen. Freiwillige Umweltinitiativen wie Umweltzertifizierungen, die Offenlegung nicht-finanzieller Informationen und unternehmenseigene Nachhaltigkeitsprogramme sind bei Unternehmen aus verschiedenen Branchen rund um den Globus beliebt. Trotz der relativ umfangreichen Literatur zu freiwilligen Umweltinitiativen sind die Forschungsergebnisse fragmentiert und es ist nicht klar, welche Art von Unternehmen sich für die Teilnahme an freiwilligen Umweltinitiativen entscheiden, und ob diese Initiativen mit verbesserten Umweltergebnissen einhergehen oder lediglich als Katalysator für symbolisches Verhalten ohne Nutzen für das gesellschaftliche Wohlergehen dienen. Ausserdem konzentriert sich die derzeitige Forschung weitgehend auf eine begrenzte Anzahl von entwickelten Volkswirtschaften, was unser Verständnis dafür untergräbt, wie diese Initiativen weltweit funktionieren.

Diese Arbeit beginnt mit einem Einführungskapitel, welches den Hintergrund und den Beitrag der Dissertation darlegt und die vier Einzelbeiträge zusammenfasst. Die ersten beiden Artikel (Kapitel 2 und 3) untersuchen unter Verwendung metaanalytischer Methoden die Faktoren, welche die Entscheidung der Unternehmen an freiwilligen Umweltprogrammen teilzunehmen beeinflussen, die Ergebnisse durch die Teilnahme, sowie die Rolle der Stringenz der Programme in diesen Zusammenhängen. Der dritte und vierte Artikel (Kapitel 4 und 5) basiert auf einem Datensatz börsennotierter Unternehmen weltweit und untersucht mittels Regressionsanalysen die Rolle des Staates bei der Verhinderung von Greenwashing und die Rolle von Greenwashing in Familienunternehmen.

Die Ergebnisse dieser Dissertation zeigen, dass die Teilnahme an freiwilligen Nachhaltigkeitsinitiativen von einer Reihe von Unternehmens-, Programm- und institutionellen Faktoren abhängen. Damit diese Initiativen jedoch ihre Ziele effektiv erreichen, und um symbolisches Verhalten von Unternehmen zu verhindern, sind strenge Vorschriften und andere Governance-Mechanismen von entscheidender Bedeutung.

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Chapter 1. Introduction

Our society is facing immense environmental challenges: according to World Economic Forum Global Risks Report 2021, climate action failure and other environmental risks are the second highest impact risks after infectious diseases (such as COVID-19, which has killed millions of people across the world over the last two years) (World Economic Forum, 2021). The impact of infectious diseases can be potentially alleviated with vaccines; however, there is no such measure to minimize the effects of environmental degradation—reflected in climate change, pollution, biodiversity loss, and deforestation, among other issues—described by scholars as a “wicked problem” (WEF, 2021) (Rittel & Webber, 1973), and more recently, a “grand challenge” (Ferraro, Etzion, & Gehman, 2015; George et al., 2016). Organizational research identifies “grand challenges” as complex and dynamic challenges that cut across jurisdictional boundaries and represent radical uncertainty for organizations (Ferraro et al., 2015) and “specific critical barrier(s) that, if removed, would help solve an important social problem with a high likelihood of global impact through widespread implementation” (George et al., 2016). Environmental degradation is one of the greatest challenges of the 21st century due to its pervasiveness, irreversibility, and vastly damaging consequences.

Human influence is the dominant cause of the recent aggravation of environmental issues; in the latest report published by the Intergovernmental Panel on Climate Change, climate scientists state unequivocally that humans are responsible for global warming (Intergovernmental Panel on Climate Change, 2021). Since a major part of human activity can be attributed to economic activity, it is fair to say that businesses play a role in contributing to environmental degradation, while at the same time being greatly impacted by various environmental issues. For example, climate change makes extreme weather conditions and natural disasters more frequent and intense, which pose major risks to firm operations and supply chains (Intergovernmental Panel on Climate Change, 2021).

As global concerns about the scale and scope of environmental issues continue to grow (George et al., 2016), societal expectations about the need for firms to become part of the solution have strengthened (Durand, Hawn, & Ioannou, 2019; Fabrizio & Kim, 2019; Marquis, Toffel, & Zhou, 2016). Various societal actors—such as customers, supply chain partners, investors, non-governmental organizations (NGOs), politicians, and local communities—increasingly demand firms to behave responsibly. However, data from ecological analyses show worsening and alarming results, suggesting that the current efforts society is putting into fixing environmental issues are simply not enough to offset the growing environmental damage.

Companies are facing a paradox when it comes to their environmental sustainability strategies due to the extent of the investment required to pursue them (Berrone et al., 2010; Darnall, Henriques, & Sadorsky, 2008). On the one hand, poor environmental performance can lead to regulatory non-compliance and fines, can harm a firm’s reputation, and, eventually, cause a decline in financial performance (Darnall, 2006; Hoffman, 1997). Therefore, firms have incentives to improve their environmental performance. On the other hand, investment in

environmental sustainability is costly and there is no guarantee that it will provide an adequate return, which poses a significant economic risk (Kim & Lyon, 2015). Such concerns may lead to various forms of symbolic actions (i.e., greenwashing), which allow firms to show stakeholders their commitment to the environment and receive legitimacy benefits without altering their sustainability practices (Kramer, 2011).

1.1. Voluntary Sustainability Initiatives

As societal awareness of the human impact on the natural environment started to rise, voluntary sustainability initiatives emerged in the late 1980s to fill voids in ineffective environmental regulatory systems and to provide a platform for firms to pursue environmental strategies that go beyond regulatory requirements. Such voids exist because government-initiated environmental policy and enforcement regimes have not been particularly successful in preventing economic activity from damaging the global biosphere in potentially irreversible ways (Whiteman, Walker, & Perego, 2013). Voluntary sustainability initiatives have two main objectives: first, to decrease environmental damage and improve environmental performance of the firm; and second, to provide firms with legitimacy in recognition of their pro-environmental behavior. Voluntary sustainability initiatives take various forms, including environmental programs or certification standards such as ISO14001 and Fairtrade, as well as in-house initiatives that firms develop to minimize their harm to the environment. For example, Starbucks's 100 Million Trees Programme involves planting a coffee tree for every bag of coffee purchased in their participating U.S. stores (Starbucks, 2017). Another popular form of voluntary sustainability initiatives is environmental disclosure, which firms are increasingly using to communicate their environmental impact and risks to shareholders and stakeholders.

With the emergence of voluntary sustainability initiatives, academics from different fields—including management, accounting, political science, and economics—have started to study the drivers and outcomes of firm engagement in these initiatives. Despite the large body of literature, the evidence is fragmented and inconclusive with regards to what kind of firms engage in these initiatives and whether these initiatives are effective in promoting better environmental practices and outcomes (Aragon-Correa, Marcus, & Vogel, 2020; Rodrigue, Magnan, & Cho, 2013). Most research in this field portrays these initiatives as sources of corporate environmental responsibility (Aragon-Correa et al., 2020; King, Prado, & Rivera, 2012), but they can also act as catalysts for irresponsible behavior towards the natural environment due to problems such as free-riding, adverse selection, and moral hazard (Aragon-Correa et al., 2020; King & Lenox, 2000; Testa, Iraldo, & Daddi, 2018). There has not been much empirical work done to determine in which circumstances these initiatives are effective in achieving their goals or the mechanisms behind them at initiative, firm, and institutional levels. Considering the ubiquity of voluntary sustainability initiatives, such insights would be important for various stakeholders to be able to identify symbolic environmental actions and to help design initiatives that are more effective in driving substantive action. Substantive environmental action, also known as “walking the talk”, refers to the implementation of practices that aim to improve environmental performance of a firm (Sharma & Henriques, 2005), while symbolic environmental action reflects compliance-oriented behavior with little action to support it (Boiral, 2007).

In addition, even though most voluntary sustainability initiatives are global and widely adopted across the world (Delmas, Nairn-Birch, & Balzarova, 2013), the majority of existing research in this area is based on single country data, mostly capturing developed economies such as the U.S. (Aragon-Correa et al., 2020; Baek, 2017). This is problematic, as even though such studies provide useful insights, their evidence is based only on a fraction of developed economies, which precludes us from identifying critical features that make these initiatives more or less effective in different institutional contexts.

This cumulative dissertation aims to address the aforementioned research gaps and shed light on the phenomenon of voluntary sustainability initiatives in the global context by studying two prominent areas of this phenomenon: voluntary environmental programs (VEPs) and environmental disclosures. In particular, the studies included in this dissertation are focused on identifying the drivers of substantive and symbolic engagement in voluntary sustainability initiatives.

Consequently, the overarching research question that guides this dissertation is as follows:

What are the firm, institutional, and sustainability initiative-level factors that drive firm participation in voluntary sustainability initiatives in a) substantive and b) symbolic manners?

1.1.1. VEPs

VEPs are popular alternatives to traditional environmental regulations (Delmas & Montes-Sancho, 2010; King, Lenox, & Terlaak, 2005), and are initiated by various sources, including governments, industries, standard-setting organizations, and non-governmental organizations. VEPs are institutions that aim to improve environmental outcomes through minimizing environmental damage among their participating firms; they also provide firms with competitive benefits to motivate them to act in a more environmentally friendly way (Delmas & Keller, 2005), as firms need incentives to facilitate their continuous participation in VEPs (Callery, 2019). In particular, VEPs give participating firms means of signaling to legitimacy-conferring stakeholders that they are committed to meeting societal expectations for environmental stewardship (Potoski & Prakash, 2005). Currently, there are hundreds of VEPs worldwide, making it worthwhile to study firm participation in these programs and whether these programs are effective in decreasing harm to the natural environment while providing financial benefits to their participants. Accordingly, scholars have started to analyze drivers and outcomes of firm participation in VEPs; these studies have produced mixed results. Chapters 2 and 3 of this dissertation argue that these inconclusive findings stem from the fact that most studies on VEPs are based on single programs, preventing researchers from considering the role of VEP governance characteristics in determining VEP participation drivers and effectiveness.

Chapter 2 of this dissertation focuses on the factors that drive firms' decisions to join VEPs. Scholars have shown interest in analyzing drivers of VEP participation due to VEPs' potential to reduce negative environmental impact, and to understand the reasons behind firms' choices to participate in programs that they are not required to participate in by law. A number of review articles have provided a comprehensive assessment of the literature on this topic, showing that VEP participation is driven by regulatory and stakeholder pressures, improved

legitimacy, and branding benefits (Koehler, 2007; Lyon & Maxwell, 2007). Chapter 2 builds on this research to explore how VEP governance stringency, which captures the strength of program governance mechanisms (clarity of VEP objectives, independence of oversight, strength of sanctions) affects firm participation decisions. Since most research on VEPs is based on single programs, the literature has not examined VEP governance characteristics comparatively among different VEPs (Aragon-Correa et al., 2020). Consequently, scholars have relied mostly on anecdotal evidence on the role of VEP stringency in determining VEP enrollment decisions. Some of the evidence suggests that firms are more likely to participate in more stringent programs since such programs provide more legitimacy (Castka & Corbett, 2016; Prakash & Potoski, 2007), while other scholars argue that firms prefer more lenient programs due to their lower participation costs (Fischer & Lyon, 2014; Koehler, 2007). Chapter 2 aims to settle this debate about VEP stringency.

Using both Hedges and Olkin meta-analysis (HOMA; Hedges & Olkin, 1985) and meta-analytic regression analysis (MARA; Stanley & Jarrell, 2005) on a sample including 23 VEPs from 127 primary studies, this chapter synthesizes the literature on resource-based and institutional factors that are related to VEP participation and develops hypotheses on the interplay of these factors with VEP stringency in driving VEP participation decisions. The chapter argues that higher levels of formal environmental institutional pressures, firm visibility, prior financial performance, and environmental performance encourage firms to participate in more stringent VEPs, while hypothesizing that informal institutional pressures and prior firm experience with other VEPs or quality management standards discourage participation in more strictly governed VEPs.

The results presented in this chapter offer two main insights. First, the chapter helps clarify how VEP stringency impacts firms' participation decisions, as prior evidence on this is limited and conflicting. The results suggest that stringency's effect on firm decisions to participate in a program is nuanced and dependent on the aforementioned institutional and resource-based drivers. In particular, visible firms and firms with higher prior financial performance are more likely to participate in more stringent VEPs, while firms exposed to high informal institutional pressures and firms with prior experience with other VEPs and quality certifications are less likely to enroll in stringent VEPs. Second, the chapter adds to the literature on VEPs by synthesizing prior research on VEP antecedents in a cross-program manner that goes beyond the existing single-program study evidence. In particular, the results show that both formal and informal institutional pressures drive VEP adoption, along with firm visibility level.

Next, Chapter 3 addresses the question of VEP effectiveness. Since VEP enrollment provides legitimacy benefits to its participants, VEPs have been criticized in research and practice for promoting greenwashing behavior among participating organizations (e.g., King & Lenox, 2000; Lyon & Maxwell, 2011). Numerous studies have analyzed whether VEP participation improves corporate environmental and financial performance. VEPs primarily aim to improve corporate environmental performance, but financial performance improvements should follow from legitimacy gains that VEPs provide. Research on VEP effectiveness has produced a wide range of mixed results that cast doubt on whether VEPs can reliably achieve goals of environmental and financial performance improvement (Bowen,

Bansal, & Slawinski, 2018; Potoski & Prakash, 2013). Chapter 3 of this dissertation aims to address this gap by arguing that program stringency can help explain mixed results from prior research, as it determines VEPs' ability to induce substantive environmental improvements from participating firms as well the extent of VEPs' legitimacy benefits and participation costs.

Chapter 3 is a meta-analysis consisting of 45 primary studies and 14 VEPs. First, using HOMA, this chapter synthesizes prior literature on VEP effectiveness. Next, it draws on neo-institutional theory to articulate arguments on how program stringency affects corporate environmental performance through its pressure-generating governance mechanisms and how it affects corporate financial performance by determining program compliance costs and legitimacy benefits. These hypotheses are tested using MARA.

This meta-analysis helps explain mixed findings from single-program studies and suggests that differences in stringency are important for determining VEP effectiveness. In particular, this chapter shows that, on average, VEPs do not improve corporate environmental performance, but that more stringent VEPs are effective in improving corporate environmental performance. Second, the chapter demonstrates that, on average, VEP participation is associated with higher financial performance, but participation in stringent VEPs decreases corporate financial performance. Third, given the first two insights, this chapter challenges the ability of VEPs to achieve their dual goals of corporate environmental and financial performance improvement, since only stringent programs are able to drive environmental performance improvements but lack the ability to generate financial benefits. Thus, these programs involve trade-offs that constrain their capacity to simultaneously meet environmental expectations of society and financial expectations of markets. With that, this chapter makes important contributions to the literature on VEPs and self-regulatory institutions more broadly.

1.1.2. Environmental Disclosures

Academic evidence suggests that firms disclose environmental information as a response to pressures stemming from various stakeholders. Due to increased public awareness of environmental issues and the central role that firms can play to mitigate these issues, stakeholders such as governments, customers, investors, and employees, among others, have been increasingly expecting firms to disclose their environmental impacts and risks (Eccles, Serafeim, & Krzus, 2011).

Disclosure of firms' environmental information is less regulated and standardized compared to financial information disclosure (Serafeim, 2015). First, unlike financial disclosures, environmental disclosures remain voluntary in most countries. Second, there is no unified reporting framework, which complicates comparison of disclosed information among firms. Third, environmental information is difficult to verify, as it is a mix of quantitative and qualitative data published in sustainability reports, firm websites, and other outlets (Perrini, 2006). Aforementioned factors point out that managers have discretion over the information they want to report and information they choose not to disclose. Such selective information disclosure is a form of greenwashing (Marquis et al., 2016), broadly defined as misleading communication of environmental information to stakeholders (Delmas & Burbano, 2011; Kim & Lyon, 2015; Marquis et al., 2016). Greenwashing is problematic, as it can give stakeholders

a false sense of security that a firm is making strides towards more sustainable world and bias their perception and decision-making process.

According to a recent KPMG report, 96% of the world's 250 largest companies by revenue issued a sustainability report in 2020, compared to only 35% in 1999 (KPMG, 2020). Based on academic and anecdotal evidence, it remains unclear whether increased environmental disclosure across firms reflects greater substantive action towards protection of the natural environment (Kim & Lyon, 2015). Chapters 4 and 5 of this dissertation aim to explore this timely question by studying the role of regulations (Chapter 4) and firm ownership structure (Chapters 4 and 5) in firm propensity to greenwash environmental disclosures.

Prior literature on greenwashing has identified various organizational and institutional drivers; however, not much attention has been paid to firm ownership. Firm ownership reflects the distribution of property rights and decision-making power within the organization (Connelly et al., 2010). Research shows that a firm's ownership structure plays an important role vis-à-vis decision making related to environmental compliance, engagement, and the reporting strategy of the firm (Kim, Fairclough, & Dibrell, 2017; Meng, Zeng, & Tam, 2013). Yet, while extant literature recognizes the importance of ownership structure in determining firms' reporting practices, it does not tell us which forms of ownership may have a mitigating or enhancing effect on greenwashing. Such an understanding would be important to strengthen our knowledge of how corporate governance structures may contribute to shaping firms' non-financial disclosures. More practically, such insights would have implications for investors and analysts who are trying to incorporate environmental, social, and governance metrics in their investment decisions, for regulators in their policy decisions, and for shareholders who are increasingly concerned about firm environmental impacts.

Chapter 4 explores the role of the state in preventing firms' propensity to greenwash. There is growing evidence that governments are playing an increasingly important role in promoting corporate environmental sustainability, as global pressures for environmental protection are rising and states feel the need to take action (Marquis & Qian, 2014; Wang, Wijen, & Heugens, 2018). However, little is known about their ability to discourage firms from engaging in greenwashing by selectively disclosing more favorable and benign environmental information. This working paper explores two main mechanisms through which governments can affect firms' behaviors in this area: environmental regulations and state ownership. Drawing on institutional theory, Chapter 4 argues that more stringent environmental regulations are likely to curb greenwashing behavior by incentivizing firms' efforts to protect their environmental legitimacy. Relying on agency theory, the chapter argues that state ownership helps to alleviate agency problems by aligning incentives of owners and managers with regards to environmental protection and disclosure. The paper also explores the impact of external third-party audits on effectiveness of environmental regulations and state ownership in greenwashing mitigation. External audits of sustainability reports are a rapidly growing practice, with 71% of the 250 largest firms by revenue having their sustainability reports audited in 2020 compared to 30% in 2005 (KPMG, 2020). Prior literature has shown that external audits act as additional monitoring mechanisms that can enhance the quality and transparency of sustainability disclosures (Jackson et al., 2020).

Random effects regression analysis of a cross-country dataset with 9,938 observations for 1,731 firms from 34 countries between 2007 and 2017 in Chapter 4 shows that both environmental regulations and state ownership are associated with lower levels of greenwashing. Results also show that external audit of sustainability reports is an important mechanism in greenwashing prevention, acting as a substitute for environmental regulations in this area.

This chapter adds to the literature in four ways. First, it contributes to research on corporate social responsibility that has identified firm ownership as a determinant of firm environmental sustainability but has not provided much empirical evidence in support (Dam & Scholtens, 2012). Research presented in Chapter 4 shows that state ownership can indeed create incentive structures that have a deterring effect on firms' propensity to greenwash in environmental disclosures. Second, this study adds to the debate on the positive side of new state capitalism, wherein state owners work alongside other investors and actively participate in strategic decision-making, by showing that the state as an owner intervenes in the economy in a way that makes firms act in a more responsible way. Third, this chapter shows that third-party audit capabilities are robust, and such audits act as a substitute for environmental regulations in greenwashing prevention. Finally, the majority of work on the role of the state and environmental sustainability has been conducted in the context of China; Chapter 4 adds to the literature by providing cross-country evidence on this topic.

The final chapter in this dissertation, Chapter 5, examines the role of family ownership in greenwashing prevention. Despite the ubiquity of family firms, very little research exists about the unique challenges and opportunities facing family firms vis-à-vis greenwashing. This is even more surprising when one considers the global importance of family firms and the fact that family firms are characterized by distinct characteristics distinguishing them from non-family firms. Family ownership is present in about one third of the S&P500 companies (Anderson & Reeb, 2003), making family firms the most prevalent organizational form in the world (La Porta, Lopez-de-Silanes, & Shleifer, 1999). In addition, family firms' characteristics—such as long-term orientation, legitimacy, and identity concerns—form the concept of socio-emotional wealth, which distinguishes family firms from non-family firms (Gómez-Mejía et al., 2007), suggesting that they may face different incentives and constraints regarding their potential involvement with greenwashing (Berrone et al., 2010). The working paper that forms Chapter 5 draws on agency theory and the socio-emotional wealth perspective to examine mechanisms that might make family firms more likely to greenwash compared to non-family firms. The chapter also examines the two most salient socio-emotional wealth dimensions for stakeholder claims: family influence and control, and family identification vis-à-vis firms' propensity to selectively disclose environmental information.

Based on ordinary least squared regression analysis and propensity score matching of a sample of 1,574 firms in 40 countries, this chapter provides evidence that family firms are more likely to engage in selective disclosure than non-family firms. Results also indicate that family firms with greater degrees of family control and family members' involvement in firm management are particularly likely to selectively disclose environmental information.

This chapter contributes to the academic literatures on greenwashing and family business. First, this working paper confirms some of the findings from prior literature on the drivers of greenwashing and provides novel insights by introducing firm ownership as an important dimension of firm propensity to greenwash. The broader literature on CSR has acknowledged the importance of firm ownership identity for CSR involvement and performance (Dam & Schoeltens, 2013), but our understanding of how firm ownership is related to greenwashing is very limited. Second, unlike most literature on family firms that portrays them as long-term oriented, this chapter demonstrates that family firms are willing to take the risk that greenwashing represents in the long run to avoid bad publicity that unfavorable environmental performance might cause in the short-term. Therefore, this working paper shows that family firms are not always acting according to the long-term horizon when it comes to environmental responsibility.

1.2. Overall Conclusion

This dissertation builds on recent research on voluntary environmental initiatives, namely VEPs and environmental disclosures. By drawing on agency and institutional theories as well as a resource-based view, this dissertation studies the relationship between institutional, firm, and initiative-level factors, and the extent of firms' substantive involvement in these initiatives. Overall, the chapters included in this thesis demonstrate that voluntary environmental initiatives can be effective in promoting environmentally-friendly behavior among firms, but it is vital that these initiatives have strict enforcement mechanisms in place to prevent symbolic behavior. However, strictly governed voluntary sustainability initiatives do not always provide an appropriate return on investment for their participating firms. This indicates that there might be a tradeoff between environmental sustainability and financial performance, at least in the context of VEPs. The chapters also point out the importance of strong environmental regulations and external audits that can work alongside voluntary environmental initiatives in motivating firms to behave responsibly. This corroborates with the ideas put forward by Ostrom (1999) and, more recently, Aragon-Correa and colleagues (2020), who suggested that voluntary environmental initiatives and properly designed environmental regulations can effectively complement each other.

1.3. Structure of Dissertation

The remainder of this dissertation is structured as follows: Chapters 2 and 3 present two meta-analyses on antecedents and effectiveness of firm participation in VEPs. This is followed by Chapter 4, which explores the role of regulations and state ownership in greenwashing prevention, and Chapter 5, which focuses on greenwashing in family firms, and concludes this dissertation.

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Chapter 2. Why Do Firms Participate in Voluntary Environmental Programs? A Meta-Analysis of the Role of Institutions, Resources and Program Stringency

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Abstract

We meta-analyze research on why firms join voluntary environmental programs (VEP) to assess the impact of program stringency, or the extent to which they have rigorous, enforceable standards on these decisions. Stringency creates trade-offs for firms by impacting programs' effectiveness, legitimacy, and adoption costs. Most research consider singular programs and lack cross program variation needed to analyze program stringency's impact. Our meta-analysis addresses this by sampling 127 studies and 23 VEPs. We begin by identifying common institutional and resource-based drivers of participation in the literature, and then analyze how program stringency moderates their impacts. Our results suggest that strictly governed VEPs encourage participation among highly visible and profitable firms, and discourage it when informal institutional pressures are higher, and firms have prior experience with other VEPs or quality management standards. We demonstrate that VEP stringency has nuanced effects on firm participation based on the institutional and resource-based factors facing them.

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Keywords: voluntary environmental programs, meta-analysis, institutional theory, resource-based view

2.1. Introduction

Environmental governance is a central topic in research on organizations and the natural environment because market failures continue to allow firms to degrade ecological systems at alarming rates (Hoffman & Jennings, 2018; Rockström et al., 2009). While regulations are the centerpiece of environmental governance efforts, a number of factors have limited their effectiveness, including political opposition, monitoring costs, and the absence of global authorities (Aragon-Correa, Marcus, & Vogel, 2020; Hoffman, 2011). In this context, voluntary environmental programs (VEPs) have emerged as alternative market-driven policy instruments. VEPs are environmental self-regulatory institutions that provide competitive incentives to improve their environmental performance beyond what is legally mandated (Videras & Alberini, 2000; Berchicci & King, 2007). They include environmental management systems (e.g., ISO 14001), environmental performance mandates (e.g., Forest Stewardship Council), codes of conduct (e.g., UN Global Compact) and written commitments (e.g., Climate Challenge Program) (Darnall, Potoski & Prakash, 2009), which can be sponsored by governments, trade associations, and non-governmental organizations (Darnall, Ji & Potoski 2017). To attract participants, VEPs provide firms their seal of approval, which they use to signal their legitimacy-conferring stakeholders their commitment to environmental protection (Borck & Coglianese, 2009; Prakash & Potoski, 2007).

Scholars have taken a keen interest in studying why firms join VEPs because of their potential to reduce negative environmental impacts, with numerous studies considering both contextual and firm-level factors that drive firms to adopt these programs (e.g., Babakri et al., 2003; Darnall et al., 2009; Delmas & Montes-Sancho, 2010; King, Lenox, & Terlaak, 2005). Further, a number of reviews and commentaries have provided comprehensive assessments of this research showing that participation is often driven by regulatory threats, stakeholder pressures, and programs' provision of reputational benefits, public recognition, and improved branding (e.g., Khanna, 2001; Koehler, 2007; Lyon & Maxwell, 2007). We build on this research by studying how VEP stringency affects firms' propensity to join. VEP stringency refers to a program's ability to ensure that firms make substantive efforts to improve environmental performance (Castka & Corbett, 2016). A program's stringency depends on its governance design, which can involve strict environmental performance standards and enforcement mechanisms or lenient standards and weak enforcement, leading to symbolic participation (Carmin, Darnall, & Mil-Homan, 2003; Darnall et al., 2017). To date, scholars have relied mainly on anecdotal evidence to examine the role of VEP stringency, and developed conflicting accounts of how it drives firm participation, with some suggesting that firms favor stringent programs because of their external legitimacy (Castka & Corbett, 2016; Prakash & Potoski, 2007), and others arguing that they prefer lenient programs because of their lower adoption costs (Ahmed, 2012; Fischer & Lyon, 2014; Koehler, 2007).

To help settle this debate, we meta-analyze research on VEP participation in 23 VEPs from 127 studies. This method helps us overcome a limitation of nearly every study on the topic that has prevented them from considering the role of stringency, which is that they sampled single programs and therefore lack the cross-program variation needed to study its effect (Aragon-Correa, Marcus, & Vogel, 2020; Castka & Corbett, 2015; Tuczek, Castka, & Wakolbinger,

2018). Meta-analytical techniques overcome this limitation by allowing us to aggregate the results from single program studies, code the stringency of each program in the meta-sample, and model the interaction effect of stringency and the antecedents of interest on firms' participation in VEPs (Stanley & Doucouliagos, 2012).

To date, most research on the drivers of VEP participation relies on institutional theory or resource-based view (RBV) explanations (Tuczek et al., 2018). Institutional perspectives have focused on how sociopolitical pressures influence firm decisions to join VEPs as a legitimacy-seeking strategy (Darnall et al., 2009; Delmas & Montes-Sancho, 2010; King et al., 2005). RBV approaches most often consider how VEP participation depends on firms' possession of complementary resources that optimize the benefits that VEPs can provide (Baek, 2017; Darnall, 2006). Our results suggest that stringency diminishes firms' propensity to join VEPs as a result of informal institutional expectations, strengthens their likelihood of joining when they have high visibility and strong financial performance, and weakens their motivation for joining when firms already participate in other VEPs or other quality management standards.

Our study makes several contributions to the literature on VEPs. First, as discussed above, it generates more conclusive evidence about the effect of VEP stringency on firms' adoption of these programs. We show that this effect is nuanced and enhances the power of some drivers and diminishes others. In doing so, we answer the call to conduct "a simultaneous investigation of multiple standards [that] allows researchers to answer questions that are impossible to answer in single-standard studies" (Castka & Corbett, 2015: 301). We also help to resolve the limited and inconclusive results about the effect of stringency on participation from multi-program studies by showing that this effect is nuanced. Our meta-analysis also helps us consolidate and corroborate some of the main findings in the existing literature about the role of institutional and resource-based drivers of firms' participation in these programs. Finally, we extend research on the resource-based motivations for joining VEPs by showing that the "coupling effect" (Castka & Corbett, 2015) of joining multiple VEPs and/or quality management standards can drive firms into lenient programs that enable symbolic participation.

The rest of the paper proceeds as follows: first, we review research on VEP stringency and its ability to drive substantive corporate participation by establishing "institutional rules" (Darnall, Ji, & Vasquez-Brust, 2018: 447), as well as competing views on how it affects firm participation. We then outline existing research on the antecedents of VEP participation, and develop hypotheses for how VEP stringency moderates the effects of these antecedents. Next, we describe our meta-analytical procedures and results. We conclude by discussing the study's results, implications for research and practice, and limitations.

2.2. Theory and Hypotheses

VEPs seek to improve environmental outcomes by encouraging rather than mandating their participants to adopt better practices. If they become widely diffused, they can also create mimetic and normative pressures on other firms to follow suit (Prakash & Potoski, 2012). Their emergence coincides with the industry's view that traditional command and control environmental regulations are costly and inefficient "one-size-fits-all" prescriptions that stifle

environmental and technological innovation, as well as efforts by governments to reduce their own monitoring and compliance costs (Rivera & de Leon, 2008). Firms join VEPs to gain their seal of approval, which they can use to signal legitimacy-conferring stakeholders (including communities, customers, and regulators) their commitment to the environment (Berchicci & King, 2007). This helps stakeholders make sense of firms' environmental performance because they frequently lack evaluative information, or the capacity to inspect and monitor business practices that are known to cause negative environmental impacts (Darnall, 2006). Because of this information void, skeptical stakeholders often falsely stereotype firms as poor environmental performers regardless of their actual performance. VEPs mitigate these problems for stakeholders by warranting firms' efforts (Berchicci & King, 2007; Barnett & King, 2008). Still, firms' decision to participate in VEPs is not always straightforward. Some VEPs have high adoption costs that outweigh their potential competitive benefits (Ahmed, 2012). Others with lower adoption costs are seen as greenwashing tools (Castka & Corbett, 2016). Both issues are related to VEP stringency, which affects whether they offer firms the right balance of carrots and stick for improving environmental performance and improving legitimacy with key stakeholders (Darnall et al., 2017).

2.2.1. VEP Stringency

AVEP's stringency is a function of its governance design (Berchicci & King, 2007; Darnall & Carmin, 2005; Prakash & Potoski, 2012). Governance design refers to the set of criteria or rules that VEPs institute to induce participating firms to meet their objectives (Borck & Coglianesse, 2009). Three particular rules have emerged that have significant influence on VEP effectiveness: *type of environmental standards*, *type of monitoring criteria*, and *presence of sanctions* for participating firms that fail to comply with a program's standards (Darnall & Carmin, 2005; Darnall et al., 2017; King & Lenox, 2000). We discuss each below.

Environmental performance standards are the environmental outcomes that VEPs require members to achieve (Carmin et al., 2003). They can be environmental performance targets, which require firms to achieve measurable outcomes for protecting ecosystems, reducing natural resource consumption or mitigating pollution; environmental management systems, where firms are required to adopt practice systems that purport to reduce environmental impacts; codes of conduct that aim to normalize sustainable values in organizations; and, written commitments by firms to improve their environmental practices or performance (Berchicci & King, 2007; Darnall & Carmin, 2005; Darnall et al., 2017). Environmental performance targets are most likely to induce substantive efforts from firms because they provide unambiguous expectations that are rooted in actual ecological outcomes. Other standards are either open to interpretation or to policy-practice decoupling, which can lead to symbolic adoption by firms (Darnall et al., 2017; Wijen, 2014).

Monitoring criteria refer to how programs conduct oversight of firm compliance with VEP environmental performance standards (King & Lenox, 2000). Stringent monitoring prevents firms from claiming compliance without substantiating the claim and involves third party oversight by accredited bodies or VEPs with no connections to industry. Lenient monitoring involves industry or trade associations conducting oversight (for industry-sponsored VEPs),

self-monitoring, or absence of oversight. Only third-party oversight mitigates moral hazard that leads to shirking and symbolic participation by ensuring that neutral bodies oversee firms (Berchicci & King, 2007).

Finally, *sanctions* refer to a VEP's ability to penalize firms that are out of compliance with its environmental performance standards. The most stringent penalty is expulsion from the VEP, which allows a program to withhold the benefits that programs offer to participating firms (Koehler, 2007). Programs can also attempt to shame their participants by publicizing their non-compliance; however, this penalty is less stringent because it allows firms to continue to publicize their VEP membership (Darnall & Carmin, 2005; Delmas & Burbano, 2011).

It is important to note that these different components of a VEP's governance work as a system. VEPs with strong monitoring and penalties and weak environmental performance standards are likely to induce strong compliance, albeit on trivial improvements. Similarly, exceptional standards may mean little if weak oversight and/or sanctions enable symbolic effort (Darnall et al., 2017).

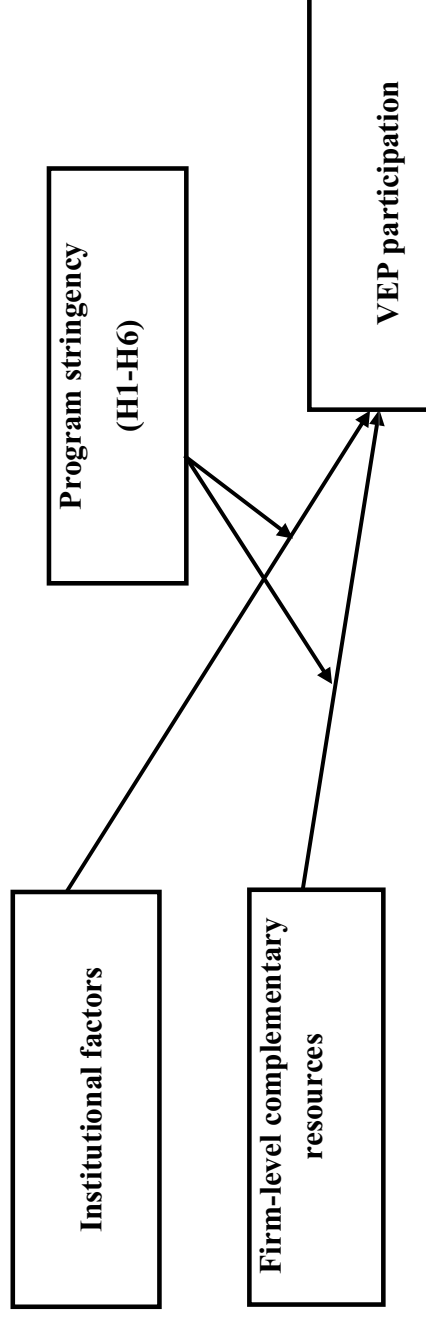
2.2.2. VEP Stringency and Firm Participation

There has been limited research on how VEP stringency affects firm decisions to join a program, with several viewpoints emerging. First, there is some evidence that more stringent VEPs are attractive to firms because they weed out members that may shirk program obligations and undermine programs' legitimacy (Darnall et al., 2018). Conversely, other research suggests that firms prefer lenient programs because of their lower adoption costs. Ahmed (2012) demonstrates that more lenient VEPs attract participants for this reason, while stringent programs with higher adoption costs fail to provide sufficient participation incentives. Similarly, Fischer and Lyon (2014) demonstrate that, in a competition for participants, lenient VEPs should be able to seize market share away from stringent ones because they provide more optimal competitive benefits. Finally, some have argued or demonstrated that stringency has diminishing returns for participating firms. In particular, they argue that firms may prefer well-governed VEPs with respect to monitoring and penalties, because external stakeholder value strong oversight and compliance mechanisms. At the same time, they expect that firms may wish to avoid VEPs with stringent environmental performance standards, which have the highest compliance costs and may not be as critical for external stakeholders (Prakash & Potoski, 2007). This view has support from a study by Castka and Corbett (2016) that relies on survey evidence from experts.

To develop more conclusive evidence on the role of VEP stringency vis-à-vis firm participation, we use meta-analytical techniques to aggregate the existing body of single-program studies, and model how cross program variation in stringency impacts the results of these studies. To this end, we followed standard practices in meta-analytical research designs by surveying the literature for key factors leading to VEP participation and theorizing how our variable of interest, program stringency, shapes their impacts (Heugens, van Essen, & van Oosterhout, 2009; Lipsey & Wilson, 2001; Stanley et al., 2013). Our search confirmed prior reviews of the topic finding that institutional theory and the resource-based view were predominant theoretical perspectives for explaining how factors that drive firms to join VEPs

(Tuczek et al., 2018). Thus, we chose those theoretical perspectives as the starting point for developing our conceptual model. We then narrowed our selection of antecedents to those receiving substantial enough empirical consideration in the literature to include in our meta-analysis (Kirca et al., 2012). This process led to the identification of three institutional and three resource- based factors that drive VEP participation in ways that should depend on program stringency: formal institutional pressures, informal institutional pressures and firm's visibility; and, firm's prior financial performance, prior environmental performance and prior experience adopting other VEPs or quality management standards (see Figure 1).

Figure 1. Summary of the Hypotheses



2.2.2.1. *VEP Stringency, Institutional Pressures and VEP Participation*

The most widely used lens for explaining why firms join VEPs is institutional theory (Tuczek et al., 2018). In this area, scholars have focused on how VEPs help firms maintain or protect their “corporate environmental legitimacy” (Berchicci & King, 2007; Darnall, 2006; Delmas & Montes-Sancho, 2010; King & Lenox, 2000), or “the generalized perception or assumption that a firm’s corporate environmental performance is desirable, proper or appropriate (Bansal & Clelland, 2004: 94). Corporate environmental legitimacy is a strategic issue for firms because their performance and survival depend on whether stakeholders, including communities, customers, investors, regulators and suppliers, believe that their actions are a net benefit to society. Otherwise, they may withhold critical resources (Frooman, 1999).

Stakeholders exert environmental legitimacy pressures on firms through environmental institutions, or “humanly devised constraints that structure human interaction” (North, 1990: 3) for protecting the environment. Broadly, there are two types of institutions, formal institutions, which include policies, regulations, laws, and formal contracts, and informal institutions such as norms, widely-held values, and pre-conscious cultural belief systems (Peng, 2002). Formal institutions work through legal systems and regulators that are tasked with ensuring firms’ compliance with government mandates. Informal institutions work through non-governmental stakeholder groups, such as community and advocacy groups, industry associations, and academic institutions (North, 1990). Their influence capacity is derived from their ability to mobilize social pressures on firms to uphold moral obligations, norms, and customs (Hoffman, 1999). Firms can have varying levels of sensitivity to institutional pressures involving their environmental legitimacy because stakeholders face extensive information search costs when evaluating firms’ environmental performance (Darnall & Carmin, 2005; Oliver, 1991). Thus, environmental legitimacy pressures that firms face can also depend on their visibility, or the extent to which they have well-known brands or operations, which may reduce stakeholder search costs and/or incentivize them to incur those costs (Rivera & de Leon, 2004). Below, we discuss how each of these institutional factors interacts with VEP stringency to drive firms to join programs.

Research has demonstrated that formal institutions drive firms to join VEPs by generating regulatory scrutiny of corporate environmental performance, especially when firms operate in polities or industries with stringent environmental regulations (Barnett & King, 2008; Mazur & Welch, 1999). In turn, regulatory scrutiny generates coercive pressures on firms in the form of higher incidence of inspection, fines, court proceedings, and/or new regulatory actions if an industry’s collective industrial impacts on the environment are deemed too high (Blackman, 2012; Rivera & de Leon, 2004). In response, many firms join VEPs to signal regulators that they are proactively trying to meet their environmental expectations (Darnall et al., 2009).

We expect firms to prefer stringent VEPs when managing formal environmental institutional expectations. Generally, firms want to preclude actions from regulatory stakeholders involving the enforcement of formal institutional expectations because they can involve costly sanctions or new regulations (Darnall et al., 2009). While VEPs can help firms assuage this concern, not every program is necessarily legitimate with regulatory stakeholders,

as they have the tools and resources of government that allow them to evaluate a VEP's governance design and stringency, as well as its subsequent impact on corporate environmental performance (Darnall et al., 2017). Thus, they often can distinguish between VEPs that promote symbolic or substantive behavior, which should increase their skepticism towards lenient VEPs. This gives firms incentives to join more stringent programs as formal environmental institutional pressures become stronger because such programs are more likely to assuage regulators. More formally, we predict that:

Hypothesis 1: VEP stringency positively moderates the relationship between formal environmental institutional pressures and firms' participation in VEPs.

Informal institutions can also drive firms to join VEPs to manage their environmental legitimacy. Environmental norms, value systems and cultural expectations generate pressures on firms when non-governmental stakeholders are able to mobilize customer support through media campaigns, whether end consumers or business customers who may be concerned about their suppliers' environmental performance (Frooman, 1999; King et al., 2005). Accordingly, VEP participation is higher in polities with more "individuals participating in formalized organizations or groups with the primary focus of protecting the natural environment" (Darnall et al., 2009: 288), or in industries where peers are concerned about being negatively stereotyped because of the environmental behavior of "a few bad apples" (Barnett & King, 2008).

We expect VEP stringency to weaken firms' tendency to join VEPs in response to informal environmental institutional pressures. Non-governmental stakeholders who champion such pressures can find it more difficult to distinguish between stringent and lenient VEPs than regulators because they have fewer resources for evaluating programs and less agency in the policy process (Darnall et al., 2009; Darnall et al., 2017). Further, they do not directly sanction firms for environmental illegitimacy; rather, they must mobilize consumers and business customers to do so through their purchasing behavior. This indirect influence mechanism limits non-governmental stakeholders' power over firms as they must rely on customers to discern VEP's stringency, who are less likely to have that level of attention for the task. This provides firms leeway to join lenient VEPs to protect or maintain their environmental legitimacy (Fischer & Lyon, 2014), or conversely, fewer incentives for firms to join stringent VEPs. Thus, we more formally predict that:

Hypothesis 2: VEP stringency negatively moderates the relationship between informal environmental institutional pressures and firms' participation in VEPs.

A number of studies have shown that firms' visibility motivates higher participation in VEPs (Arora & Cason, 1996; Moon & de Leon, 2007; Rivera & de Leon, 2004). Visibility is driven by public listings (Rivera & de Leon, 2004), strong brand recognition (Rivera, 2002), and/or the production of final goods that are consumer facing as opposed to intermediate goods (Arora & Cason, 1996; Moon & de Leon, 2007). High visibility motivates VEP participation because it can seize the attention of legitimacy-conferring stakeholders, whether governments, trading partners, or the general public, and motivate them to scrutinize firms' environmental records. Such scrutiny, in turn, exposes firms to potential blowback from important stakeholders, and motivates them to join a VEP as a way to mitigate that risk (Khanna et al., 2007).

We expect VEP stringency to strengthen visible firms' tendency to join such programs. Visible firms may prefer stringent VEPs to lenient ones because the heightened scrutiny facing them applies not only to their existing environmental problems, but also to how they subsequently choose to manage them (Tashman, Marano, & Kostova, 2019). Thus, legitimacy-conferring stakeholders are more likely to evaluate a VEP's stringency to ensure that the program does not allow the firm to shirk their commitments to improving their environmental performance. Accordingly, if managers believe their choice of VEPs is also being more carefully evaluated, they should be more wary of lenient VEPs, which may be recognized as ineffective programs (Darnall et al., 2009). Stringent VEPs, on the other hand, send clearer signals to legitimacy-conferring stakeholders that firms are tackling their environmental responsibilities substantively. This should increase their attractiveness to managers of firms when their legitimacy challenges stem from visibility. Based on these arguments, we predict that:

Hypothesis 3: VEP stringency positively moderates the relationship between firms' visibility and their participation in VEPs.

2.2.2.2. VEP Stringency, Resource-Based Advantages and VEP Participation

The second most used perspective for explaining why firms join VEPs is the resource-based view (RBV) (Tuczek et al., 2018). It is well known that the RBV argues that the source of competitive advantage for firms are their "resources," or their unique assets, capabilities, skills, knowledge and routines, which allow them to develop, produce and commercialize superior products and services (Barney, 1991). This can also apply to resources that make firms more environmentally sustainable, which can increase their efficiency and innovativeness, improve their brands, and enhance their stakeholder relationships (Hart, 1995). Since VEPs aim to help firms develop such resources, it follows that they should offer firms some avenue for developing resource-based sources of competitive advantage (Rivera, 2002). One impediment to this, however, is that these programs provide "club" benefits to all firms who join (Potoski & Prakash, 2005b), and sometimes generate reputational spillovers to non-participants in the same industry (Borck & Coglianese, 2009). Thus, VEP participation is not a uniquely valuable resource on its own. Further, VEPs have compliance and certification costs that can outweigh any advantages they create for some firms (Bansal & Hunter, 2003; Kollman & Prakash, 2001).

Research has shown that resource-based advantages from participating in VEPs tend to accrue to firms with complementary resources (Bansal & Hunter, 2003; Darnall, 2006; Darnall & Edwards, 2006; King et al., 2005; Tuczek et al., 2018). Complementary resources are those that are necessary for firms to earn rents from a strategy or technology (Teece, 1986). They are generally developed during the course of other productive activities, but create incidental synergies with those strategies or technologies (Christmann, 2000). Accordingly, studies have shown that resources that complement environmental strategies drive firms to join VEPs to gain these synergies (Tuczek et al., 2018). Here, we consider three complementary resources receiving significant research attention: strong prior financial performance, strong prior

environmental performance, and prior experience with VEPs or other quality management standards.

Superior prior financial performance gives firms excess capital, and in turn, strategic flexibility to adopt longer time horizons for realizing improvements in efficiency and/or branding that could result from implementing VEP standards (Rivera, 2002; Hart, 1995). It also can provide firms with the ability to deploy knowledge gained from VEPs for innovative activities such as novel pollution control or prevention technologies (Darnall, 2006). Finally, it allows firms to absorb costs associated with adapting business processes to fit program's standards or certify compliance, if required (Arora & Cason, 1995; Moon & de Leon, 2007).

We argue that firms with superior prior financial performance will gravitate towards stringent VEPs, because these programs have higher levels of resource complementarity for them. First, because more stringent VEPs are better at inducing substantive environmental improvements, they provide firms stronger incentives to pursue proactive environmental strategies, which yield longer run financial benefits to firms that have the financial flexibility to adopt them (Bansal, 2005; Hart, 1995; Russo & Fouts, 1997; Sharma & Vredenberg, 1998).

Weaker programs with less influence over firm behavior are less likely to help firms become strategic with their environmental practices. Second, stringent VEPs are exclusive "clubs" that have higher levels of credibility with external stakeholders. In turn, they provide better branding and reputational benefits to firms that can afford to meet their requirements (Prakash & Potoski, 2007). Since lenient VEPs attract poorer performers who can undermine the program's reputation, they offer less complementary value in this way. Based on these arguments, we predict that:

Hypothesis 4: VEP stringency positively moderates the relationship between firms' prior financial performance and their participation in VEPs.

Research has also demonstrated that firms with strong prior environmental performance are also more likely to join VEPs for several reasons. First, they have fewer VEP adoption and compliance costs because they can more easily meet or exceed the program's standards (Darnall, 2006). They also find it easier to incorporate new knowledge from VEPs into their existing practices because they have better experience with environmental practices (Sharma & Vredenburg, 1998). Finally, firms with superior prior environmental performance also use VEPs to differentiate themselves from firms with environmental legitimacy problems, or to develop "greener" brands (Arora & Cason, 1996; Potoski & Prakash, 2005a; Rivera, 2002).

We expect such firms to prefer stringent VEPs. First, they should want to join more exclusive VEPs to avoid being associated with poor environmental performers who could tarnish the program's credibility (Prakash & Potoski, 2007). As discussed above, lenient VEPs sometimes allow poor environmental performers to participate in purely symbolic ways, which can harm the credibility of those programs. Strong environmental performance should also decrease compliance costs of stringent VEPs for firms (Darnall et al. 2009). Firms with strong environmental performance are also in better positions to benefit more from stringent programs because they facilitate learning networks with other high performing participants, where high

environmental performers can collaborate on extending their competitive advantages (Berliner & Prakash, 2012). In light of these considerations, we hypothesize that:

Hypothesis 5: VEP stringency positively moderates the relationship between firms' prior environmental performance and their participation in VEPs.

Finally, there is significant research on how the prior adoption of other VEPs or quality management standards drives firms to enroll in new VEPs (Castka & Corbett, 2015; Corbett & Kirsch, 2001; Darnall, 2006). Castka and Corbett (2015) refer to this as the “coupling” effect, where multiple VEPs and/or quality management standards are co-adopted, so firms can leverage capabilities learned from one program into others. Some research also explores how the coupling effect can lead to standards-specific “competencies”, where firms develop unique knowledge on implementing standards that can be embedded throughout organizations (De Vries et al., 2018). Such competencies can allow firms with prior experience in such programs to easily implement new VEP standards (Darnall, 2006). For example, numerous studies have considered how the quality management standard ISO 9001 coexists with the ISO 14001 environmental management system based on their similar process requirements (e.g., Castka & Corbett, 2015; Castka & Balzarova, 2018; Darnall, 2006; Heras-Saizarbitoria & Boiral, 2013; King & Lenox, 2001).

We expect VEP stringency to negatively moderate the relationship between participation and the prior adoption of other VEPs or quality management standards. As discussed above, stringent VEPs are more likely to induce substantive improvements, often by using environmental performance targets. Such targets can require firms to develop specific practices that are capable of solving the idiosyncratic environmental issues under the purview of the program (Wijen, 2014). However, because of their level of specificity, they may be incompatible with other standards that focus on commonality, as opposed to idiosyncratic environmental problems (Castka & Corbett, 2015; Smith & Fischlein, 2010). We also expect stringent monitoring and sanctions to make new VEPs less complementary with existing ones or quality management standards, as they can constrain firms' flexibility in how they choose and/or install practices in a way that complies with stringent VEP mandates (Wiegmann, 2019). Based on these considerations, we predict that: Hypothesis 6: VEP stringency negatively moderates the relationship between firms' prior experience with other VEPs or quality management standards and new VEP participation.

Hypothesis 6: VEP stringency negatively moderates the relationship between firms' prior experience with other VEPs or quality management standards and new VEP participation.

2.3. Methods

We use meta-analytical techniques to aggregate and study the existing empirical literature on the drivers of VEP participation from single-program studies (Hunter & Schmidt, 2004; Stanley et al., 2013) and the moderating role of VEP stringency. This research method is appropriate because (a) there have been many empirical studies on the topic, but this research has generally not been generalizable because of its predominant focus on single programs; (b) it allows us to identify heterogeneity in effect sizes due to study or methodological characteristics; and (c) it allows us to explore moderators that are not part of primary studies

(in our case, VEP stringency) (Albertini, 2013; Hedges & Olkin, 1985; Lipsey & Wilson, 2001).

2.3.1. Literature Search and Sample

To identify studies for the meta-analytic sample, we first searched the literature for potential articles using a five-step search strategy that follows established norms in the management and economics disciplines for meta-analytical research (Heugens et al., 2009; Stanley et al., 2013). First, we read several prominent review articles about VEPs (e.g., Berchicci & King, 2007; Borck & Coglianese, 2009; Darnall & Sides, 2008; Tucek et al., 2018) to develop the list of keywords to guide our literature search. This list included terms related to VEPs¹ and the names of 46 high profile programs.² Second, we conducted searches in Google Scholar and Business Source Premier for those keywords and programs. Third, we manually searched 21 economics, management, policy, and political science journals based on our initial article searches to ensure that key publications were not omitted.³ Fourth, we used a “snowballing” technique that backward- tracks references of the retrieved articles and forward- tracks the articles that cited them by using Google Scholar (Duran et al., 2016). Finally, we solicited unpublished empirical studies fitting our search criteria from five Academy of Management’s listservs (i.e., *Organization and the Natural Environment*; *Social Issues in Management*; *International Management*; *Organization and Management Theory*; *Business Policy and Strategy*). To be included in our sample, studies had to measure variables associated with our constructs of interest, calculate bivariate and/or partial correlation coefficients between those variables and VEP participation, and provide statistical information for calculating coefficient significance (i.e., t test, z test, and/or standard errors). If statistical information was missing, we contacted the authors to obtain that information. We identified variables for constructs in our model by reviewing retrieved papers grounded in institutional theory and the RBV and recording their measures. Other papers were included if they contained the coefficients and statistical information described above, even if when they did not use institutional theory or the RBV. We chose this approach because there are numerous important atheoretical studies on this topic, including seminal works by Arora and Cason (1995; 1996) and Khanna and Damon (1999), and we wanted to ensure that we were not restricting our sample to papers from the management discipline and its focus on organizational theory. Lastly, we included papers that modelled VEP participation in first-stage selection models that ultimately predicted VEP outcomes. It is important to note that, while our process represents recent best practices in meta-analytical research (Buckley, Devinney & Tang, 2013; Duran et al., 2016; Stanley et al., 2013), it excluded many quantitative, qualitative, and conceptual papers lacking the necessary coefficients and statistical information. We explore this important limitation in more detail in the final section of the paper.

The search process yielded a final sample of 127 primary studies (111 published and 16 unpublished papers) covering 23 programs. The years included in these studies range from 1988 to 2019. The sample is global, but the majority (71%) of primary studies are based on U.S. data. Table 1 contains a list of the VEPs included in sample as well as their levels of stringency based on our conceptualization and coding approach, which we further illustrate in the measures section below. One author extracted and coded effects from each study, while a

second coded a subsample of 200 randomly selected effect sizes to assess the level of agreement in coding practices (Stanley et al., 2013). The two coders had a high degree of inter-rater agreement (Cohen's kappa: 0.98).

Table 1. VEPs Included in the Analyses and their Stringency Scores

VEP Name	Environmental Performance Target Score	Monitoring Score	Sanctioning Score	Total Stringency Score
33/50	0	1	0	1
ARET	1	0	0	1
Business for Social Responsibility	0	0	0	0
Certification for Sustainable Tourism	1	1	0	2
Clean Industry	1	1	0	2
Climate Challenge	0	0	0	0
Climate Wise	0	0	0	0
Ecological Blue Flag Program	1	1	1	3
EMAS	0	1	1	2
Energy Star Buildings	1	0	1	2
Global Compact	0	0	1	1
Global Reporting Initiative	0	0	0	0
Green Lights	0	0	0	0
ISO 14001	0	1	1	2
LEED	1	1	1	3
Oeko-Tex 100 Program	1	1	1	3
Responsible Care	0	0	0	0
Metal Finishing Strategic Goals Program	1	0	0	1
State Voluntary Cleanup Program (Colorado, Oregon)	1	0	1	2
Sustainable Slopes	0	0	0	0
Voluntary Challenge and Registry	0	0	0	0
Voluntary Reporting of Greenhouse Gases	0	0	0	0
Waste Wise	0	0	0	0

2.3.2. Measures in Primary Studies

VEP Participation: Our primary studies included three operationalizations of participation in VEPs from the sampled literature: (1) most studies (95%) used a dummy variable, where 1 denotes a firm's membership, and 0 denotes non-membership; some used (2) percentage probability of participation in a VEP (e.g., Christmann & Taylor, 2001); and (3) extent of a firm's VEP certified production (e.g., Passetti & Tenucci, 2016).

Institutional drivers: We examined the institutional drivers of VEP participation through the concepts of *formal environmental expectations*, *informal environmental expectations*, and *visibility*. The sampled studies measured formal environmental expectations at the industry-, state- and country-levels of analysis. Industry-level formal institutional expectations reflect the strength of industry-specific regulations such as the Metal Products and Machinery Point Source Category, which imposes specific operating standards for wastewater discharges in the metal finishing industry (e.g., Brouhle, Griffiths, & Wolverton, 2009). State-level formal institutional expectations were captured by indices such as the U.S. state-based League of Conservation Voters score (e.g., Vidovic & Khanna, 2012) or Mazur and Welch's (1999) index of state environmentalism. Country-level regulatory formal institutional expectations reflect the stringency of national environmental regulations and are captured by survey-based measures of perceived stringency of national environmental regulations (e.g., Passetti & Tenucci, 2016).

Our sample captured *informal environmental expectations* through several measures: (1) size of industry association membership, (2) non-governmental organizations' (NGOs') membership per capita, and (3) various socio-economic characteristics of local communities. Size of industry association was used as a proxy of the strength of *informal environmental expectations* because it captures firms' exposure to peer expectations to protect an industry's environmental reputation (e.g., Montiel & Husted, 2009). NGOs' environmental presence was measured in several ways in the sample studies, including Sierra Club membership dues collected in a given U.S. state (e.g., Delmas & Montiel, 2009), the percent of a given U.S. state's population belonging to the Sierra Club (e.g., Vidovic & Khanna, 2012), the number of environmental NGOs in a given country (e.g., Kayser, Toffel & Maxwell, 2013), and survey-based measures capturing the perceived intensity of NGOs' environmental pressures (e.g., Darnall & Kim, 2012). Studies in our sample proxied community-driven expectations with several socio-economic indicators, including income per capita (e.g., Ullah, Wei & Xie, 2014), percentage of population living in poverty (e.g., Gamper-Rabindran & Finger, 2013), percentage of people who did not graduate from secondary school (e.g., Potoski & Prakash, 2005a), population density (e.g., Antweiler & Harrison, 2007), and community contributions to environmental NGOs (e.g., Brouhle et al., 2009).

Visibility: This independent variable was operationalized in several ways by studies in our sample, including self-reported survey measures about businesses' brand recognition (e.g., Delmas & Montes-Sancho, 2010; King & Lenox, 2000), counts of news items mentioning a given business (e.g., Albers & Günther, 2010), criticism and praise in news coverage (e.g., Berrone, Fosfuri, & Gelabert, 2017), and dummy variables measuring whether businesses were

publicly traded (e.g., Rivera & De Leon, 2004), and produced consumer-facing goods (e.g., Innes & Sam, 2008).

Resource-based drivers: Sample studies measured the resource-based drivers of VEP participation in terms of *prior financial performance*, *prior environmental performance* and *prior experience adopting other VEPs or quality management standards*. Sampled studies measured *prior financial performance* using (1) accounting measures, such as return on assets (e.g., Moon & de Leon, 2007), (2) sales growth (e.g., Heras-Saizarbitoria, Molina-Azorín, & Dick, 2011), (3) sales (e.g., Khanna & Damon, 1999), (4) average profit margin (e.g., Chapple, Cook, Galt, & Paton, 2001) and (5) market measures such as Tobin's Q (e.g., King & Lenox, 2001). *Prior environmental performance* was measured as (1) the number of environmental enforcement actions facing a given business (e.g., Innes & Sam, 2008), (2) size of environmental fines (e.g. Blackman, 2012), (3) the amount of toxic and greenhouse gas emissions (e.g., Antweiler & Harrison, 2007), and (4) the number of accidental spills (e.g., Brouhle, Graham, & Harrington, 2013). In coding these effect sizes, we ensured that higher values of these variables reflected better environmental performance, which required changing some of the coded coefficients' signs. Finally, sampled studies measured *prior experience adopting other VEPs and quality management standards* using dummy variables capturing whether businesses had already adopted ISO 9000, or different VEPs before (e.g., Darnall, 2006; King et al., 2005).

2.3.3. Coding of Moderators

VEP governance stringency: We measured this variable by coding each VEP in our sample for the presence of governance characteristics identified by Carmin et al. (2003), Darnall and Carmin (2005), and Darnall et al. (2017). The resulting measure is a count score with a range of 0 – 3 that is based on whether the VEP has stringent (1) environmental performance standards, (2) monitoring criteria, and/or (3) and sanctions. Our coding sources were descriptions of VEP governance designs in primary studies and VEP websites. Two authors conducted the coding, and worked together to identify and resolve coding differences. To construct the overall stringency score, we used the following method: first, programs received one point if their environmental performance standards involved establishing specific environmental performance targets (e.g., emissions reductions, toxic release reductions, reductions in natural resource consumption) and 0 points if they had other requirements; second, they received one point if they required third party oversight by accredited bodies or VEPs with no connections to industry, and 0 points if they were not subjected to such oversight; and third, they received one point if they had a policy of expelling businesses that failed to comply with their mandates, and 0 points if they lacked such a policy.

Methodological and study artifacts: We controlled for several methodological and study artifacts in our moderator analyses using meta-analytic regression. Specifically, we controlled for whether coded coefficients were *partial* or *bivariate* (reference group) with a dummy variable. We controlled for whether studies used *panel* or *cross-sectional* designs (reference group) with a dummy variable. We controlled for the *median year of sample window* of each study to allow for the possibility that the focal relationship is changing over time. We controlled

for whether VEPs applied to *firms* or *facilities* (reference group) with a dummy variable. We also included a dummy variable capturing whether the *sample is U.S. or non-U.S.-based* (reference group). Finally, we controlled for whether studies were *published* or *unpublished* (reference group) with a dummy variable since publication bias is an issue in meta-analyses (Gonzalez-Mulé & Aguinis, 2018).

2.3.4. Meta-Analytic Procedures

2.3.4.1. HOMA Procedure

We used Hedges-Olkin type meta-analysis (HOMA) to estimate the direct relationship between institutional and resource-based VEP drivers and VEP participation, in order to establish baseline evidence for the existence of generalizable effect sizes across the extant literature. HOMA allowed us to calculate meta-analytical mean correlations using Pearson product-moment correlations (r) and partial correlation coefficients ($r_{xy.z}$) as effect sizes in separate analyses to allow comparing results. While r exhibits scale-free linearity between our variables of interest, it ignores the possible effects of other variables that might be included in the analysis as controls. HOMAs using the partial correlations $r_{xy.z}$ address this constraint because these effects exclude the influence of other variables on the dependent variable (Doucouliagos & Ulubaşoğlu, 2008). The HOMA procedure we used also specified random effects in line with recent methodological guidelines (Geyskens et al., 2009). To account for sample differences across effect sizes in different studies, we weighted each effect size by its inverse variance weight (w) (the inverse of the squared standard error) (Hedges & Olkin, 1985). These weights were then used to compute the standard error of the mean effect size and its corresponding 95% confidence interval.

2.3.4.2. MARA Procedure

To test our hypotheses, we rely on meta-analytic regression analysis (MARA). MARA is a weighted least squared-based technique that estimates the effect of study level moderator variables on primary study effect sizes. Similar to multiple regression analysis, MARA constructs a linear regression model involving a set of predictors, which in this case are the potential moderators (VEP stringency and various methodological and study artifacts) on the dependent variable (i.e., the effect size from primary studies). We followed several norms in the management and economics literatures, including using both (r) and ($r_{xy.z}$) as our effect estimates for the MARA procedure (Stanley & Doucouliagos, 2012), weighting effect sizes by their inverse variance weight (w) to capture the differences in the precision of the information contained in them, and estimating random effects (Aguinis, Gottfredson, & Wright, 2011; Geyskens et al., 2009; Gonzalez-Mulé & Aguinis, 2018). Our MARAs were based on the following regression equation:

$$R_i = y_0 + y_m D_i + b_m S_i + u_i,$$

where R_i is the partial and bivariate correlation between our antecedents of interest and VEP participation, y_0 is the constant term, D is the VEP stringency score, S is a vector of methodological and study artifacts and u_i is the random component.

2.4. Results

2.4.1. HOMA Results

Table 2 contains HOMA results for institutional and resource-based drivers of VEP participation. Overall, these results show strong evidence that the examined institutional factors motivate VEP participation and moderate evidence that the examined resource-based factors drive VEP participation. Specifically, formal institutional expectations ($r = 0.10$, $p < 0.01$; $r_{xy.z} = 0.03$, $p < 0.01$), informal institutional expectations ($r = 0.05$, $p < 0.01$; $r_{xy.z} = 0.02$, $p < 0.01$) and visibility were all consistent drivers of VEP participation ($r = 0.20$, $p < 0.05$; $r_{xy.z} = 0.02$, $p < 0.01$). Resource-based factors showed a more mixed picture. There was moderate support for the notion that prior financial performance ($r = 0.05$, $p < 0.05$; $r_{xy.z} = 0.01$, $p < 0.10$) and experience with other VEPs and quality management standards ($r = 0.11$, n.s., $r_{xy.z} = 0.08$, $p < 0.01$) drive firms to join VEPs. However, results for prior environmental performance were mixed with bivariate analyses suggesting a negative relationship ($r = -0.07$, $p < 0.01$) while partial analyses indicate that firms with better prior environmental performance are more likely to enroll in a VEP ($r_{xy.z} = 0.11$, $p < 0.01$). We explore the implications of these results in more detail in the discussion section.

Table 2. HOMA Results of VEP Antecedents' Impacts on VEP Participation

Predictor	Pearson product-moment correlation (r)						Partial correlation coefficient ($r_{xy.z}$)					
	k	N	Mean	SE	Q test	I ²	k	N	Mean	SE	Q test	I ²
Institutional drivers – VEP participation												
Formal institutional expectations	68	514210	0.10 ^{***}	0.02	10250.67	99%	292	2117634	0.03 ^{***}	0.00	3762.98	92%
Informal institutional expectations	34	274424	0.05 ^{***}	0.01	1088.98	97%	258	1254252	0.02 ^{***}	0.00	1661.73	85%
Visibility	17	46964	0.20 ^{**}	0.10	5721.39	99%	139	265929	0.02 ^{***}	0.01	1263.11	89%
Resource-based drivers – VEP participation												
Prior financial performance	27	47079	0.05 ^{**}	0.01	151.27	83%	109	415850	0.01 [*]	0.00	457.30	76%
Prior environmental performance	60	545507	-0.07 ^{***}	0.02	11033.19	99%	422	2908531	0.11 ^{***}	0.01	134260.91	99%
Other VEPs and quality management standards	3	48229	0.11	0.07	58.83	97%	35	148543	0.08 ^{***}	0.01	273.68	88%

Notes: k = number of effect sizes; N = total sample size; Mean = mean effect sizes; * p<0.10; ** p<0.05; *** p<0.01; SE = the standard error of mean correlation; Q test = Cochran's homogeneity test statistic; I2 = scale-free index of heterogeneity.

2.4.2. MARA Results

Tables 3 and 4 contain results for hypotheses predicting the moderating effect of VEP stringency on the relationship between institutional- and resource-based factors and VEP participation. These tables also report results about the effects of methodological and study artifacts on the focal relationships. Models 1 to 3 in Table 3 pertain to the institutional drivers of VEP participation, while models 4 to 6 in Table 4 pertain to the resource-based drivers. Model 1 indicates that stringency does not moderate the relationship between formal environmental expectations and VEP participation ($\beta = -0.00$; n.s.). Thus, we do not find support for Hypothesis 1, which predicted that VEP stringency positively moderates the relationship between formal environmental institutional pressures and firms' enrollment in VEPs. Model 2 supports our prediction (Hypothesis 2) that program stringency weakens the effect of informal environmental expectations on VEP participation ($\beta = -0.02$, $p < 0.01$). Finally, model 3 supports Hypothesis 3, which predicted that program stringency strengthens the relationship between visibility and VEP participation ($\beta = 0.03$, $p < 0.01$). Overall, results provide partial support for our hypotheses on the moderating role of VEP stringency on institutional antecedents of VEP participation.

Table 3. MARA Results of Program Stringency's Moderation Effects on the Relationships between Institutional Drivers and VEP Participation

Variable	Model 1 Formal Environmental Expectations	Model 2 Informal Environmental Expectations	Model 3 Visibility
VEP stringency	-0.00	-0.02***	0.03***
<i>Methodological and Study Artifacts</i>			
Published study	-0.02	0.06***	-0.13***
Median year of sample window	-0.01***	0.00***	-0.01***
Partial correlation	-0.07***	-0.03***	-0.18***
Panel design	-0.02*	-0.03***	-0.06***
USA	-0.03**	-0.02*	0.01
Firm-level	0.02*	-0.03***	0.00
k	354	283	153
R ²	0.07	0.10	0.23
Q _{model} (p)	53.76	82.60	97.67
Q _{residual} (p)	69.46	752.15	321.86
V	0.01	0.00	0.01

Note: * p<0.10; ** p<0.05; *** p<0.01

Model 4 supports our prediction that program stringency magnifies the relationship between prior financial performance and VEP participation ($\beta = 0.01$, $p < 0.10$) in Hypothesis 4. Model 5 fails to support Hypothesis 5, which predicted that program stringency positively moderates the relationship between prior environmental performance and VEP participation ($\beta = 0.02$, n.s.). Finally, model 6 supports Hypothesis 6, which predicted that program stringency weakens the likelihood of firms with experience with other VEPs or quality management standards joining VEPs ($\beta = -0.05$, $p < 0.01$). Overall, results demonstrate moderate support for hypotheses on how VEP stringency moderates the relationships between RBV factors and VEP participation.

Table 4. MARA Results of Program Stringency's Moderation Effects on the Relationships between Resource-Based Drivers and VEP Participation

Variable	Model 4 Prior Financial Performance	Model 5 Prior Environmental Performance	Model 6 Other VEPs and Quality Management Standards
VEP stringency	0.01*	0.02	-0.05***
<i>Methodological and Study Artifacts</i>			
Published study	-0.04***	-0.12***	0.12***
Median year of sample window	0.00	-0.00	-0.01**
Partial correlation	-0.04***	0.18***	-0.01
Panel design	-0.01	0.03	0.01
USA	0.05***	-0.08**	-0.16***
Firm-level	0.03*	0.07***	0.16***
k	136	473	38
R ²	0.14	0.17	0.84
Q _{model} (p)	42.64	117.11	178.19
Q _{residual} (p)	269.19	574.91	33.27
V	0.00	0.04	0.00

Note: * p<0.10; ** p<0.05; *** p<0.01

Tables 3 and 4 also report results for control variables. In four out of the six models, the effect of a study being published is negatively related to the focal relationship, meaning that we did not find clear evidence of a “file drawer problem” (Rosenthal, 1979). The significant negative effects of median sample year in model 1, model 3 and model 6 suggest that these particular drivers of VEP enrollment become weaker over time; in the remaining models the effect of time is not relevant. Partial effect sizes have a significant and negative moderating effect in five out of six models (here the reference group was a study’s reliance on bivariate effects), suggesting that partial correlations yield weaker relationships between the VEP drivers and VEP participation. Similarly, studies that rely on panel design show weaker relationships between institutional factors and VEP participation (here cross-sectional designs were the reference group); however, they were not relevant for resource-based factors. The U.S. sample dummy indicates that U.S studies had weaker effects in four out of the six examined VEP participation drivers. Finally, with the exception of models 2 and 3, the effects of firm-level VEPs strengthen the impact of VEP drivers on VEP participation (here facility-level was the reference group).

2.4.3. Robustness Tests

We employed several sensitivity analysis techniques to examine the effects of outliers and publication bias on our results. To identify outliers, we used the one-sample removed analysis (Borenstein, et al., 2009) and the multivariate multidimensional influence diagnostics (Viechtbauer & Cheung, 2010). We found similar results as those presented in Table 2. We also performed the triangulation method to test for potential publication bias in our HOMA analyses (Harrison, Banks, Pollack, O’Boyle & Short, 2017). This method consists of three tests: (1) Duval and Tweedie’s (2000) trim and fill, (2) cumulative meta-analysis (Borenstein et al., 2009), and (3) selection models (Hedges & Vevea, 2005). The results of these tests were consistent with our main analyses, except in the case of prior finance performance (partial effect size only), which is not significantly related VEP participation after controlling for publication bias. These results are available from the authors upon request.

We also performed one additional set of MARA analyses as part of our robustness tests. Results of these analyses are included in the Appendix in Tables 5 and 6. Specifically, we performed MARA with separate scores for stringency and governance as conceptualized by Castka and Corbett (2016) and Smith and Fischlein (2010). The first set of authors use the terms “stringency to refer to the substantive requirements associated with a label, and governance for the processes by which those requirements are set and enforced” (1507) via “auditing methods and their ability to sanction violators” (1505). These concepts fit closely with strength of environmental performance standards (i.e., stringency) and strength of monitoring criteria and sanctions (i.e., governance). To capture this, we measured stringency with a dummy variable that equals to 1 if a VEP relied on environmental performance targets (e.g., emissions reductions, toxic release reductions, reductions in natural resource consumption), and 0 otherwise. We then measured governance as a sum of two dummy variables capturing whether the VEP had third party oversight for monitoring and expulsion mechanisms for sanctions (1 if it had them, 0 otherwise, respectively). When summed together, the governance score had a range from 0 to 2. Finally, we entered the separate stringency and

governance variables into our MARA models. These results confirm that institutional and resource-based drivers of VEP participation depend on program's governance design. They also suggest that the effect is nuanced, and that stringency and governance (as defined by Castka & Corbett, 2016) may play distinctive roles in driving VEP participation, depending on a firm's primary motivation for joining one. We unpack these results and their implications in the discussion.

2.5. Discussion

Our meta-analysis considered how VEP stringency affects firm decisions to join programs in conjunction with known institutional and resource-based drivers from existing single program studies. We chose this approach because “a simultaneous investigation of multiple standards allows researchers to answer questions that are impossible to answer in single-standard studies” (Castka & Corbett, 2015: 301). Prior research has already developed strong evidence that firms join VEPs to preempt regulations, appease stakeholders, and seek access to resource-based benefits including “marketing and other financial benefits to firms [that] rely on the ability of firms to gain a competitive advantage through participation by signaling to stakeholders” (Matisoff, 2015: 111; see also Khanna, 2001; Koehler, 2007; Lyon & Maxwell, 2007; Smith & Fischlein, 2010). Our study builds on these cumulative findings to make two main contributions. First, it addresses an unresolved debate about whether VEP stringency motivates or discourages firms from joining programs. Second, our HOMA results provide more systematic evidence on how institutional and resource-based factors influence firm participation decisions. We discuss each contribution in turn.

First, we help clarify how VEP stringency affects firms' participation. Some researchers have suggested that firms prefer more stringent programs because they send stronger signals to stakeholders about their efficacy, while others have developed evidence that firms prefer lenient programs that have lower adoption costs (Ahmed, 2012; Castka & Corbett, 2016; Fischer & Lyon, 2014; Koehler, 2007; Prakash & Potoski, 2007). Our results suggest instead that stringency's effect on firm participation in VEPs is nuanced, and contingent on different institutional and resource-based factors. To start, they suggest that the impact of stringency on VEP participation varies depending on the firm's institutional context. In particular, the absence of a significant interaction between formal institutional expectations and stringency suggests that firms do not see the latter as a signaling mechanism that helps mitigate regulator concerns. Since regulators may be more preoccupied with firms' ultimate environmental performance than VEP governance, firms may likewise focus on improving performance in a substantive way to appease those pressures, and be less concerned with VEP governance design. At the same time, the negative interaction between informal institutional expectations and stringency suggests that firms are prone to leveraging asymmetric information about lenient VEPs' efficacy with non-governmental stakeholders to manage those environmental legitimacy pressures in symbolic ways. In such cases, joining VEPs appears to be a strategic effort to protect environmental legitimacy without incurring the costs of meeting stakeholder expectations in substantive ways (Oliver, 1991). The positive interaction between stringency and visibility on VEP participation suggests that firms prefer programs that motivate substantive action on environmental performance when they have stakeholders capable of

scrutinizing them. This is encouraging because more visible firms are larger, powerful corporate actors with stronger brands and greater potential to generate mimetic effects that attract other less visible firms into more stringent VEPs (Aragon-Correa et al., 2020).

In addition, our results help explain how stringency affects VEPs' complementarity with firms' resource base. First, in finding that prior financial performance and stringency positively interact to affect VEP participation, our results suggest that financial success breeds a willingness to take more substantive action on environmental performance, which could ultimately feedback to firms in ways that improve their financial performance (Berchicci & King, 2007). Prior research demonstrates that substantive environmental commitments help firms develop proactive environmental strategies, where firms profit from their sustainability efforts (Sharma & Vredenberg, 1998). With this in mind, economically successful firms may opt into stringent VEPs to pursue virtuous pays-to-be-green cycles. Second, and surprisingly, stringency conditions did not interact with prior environmental performance to affect VEP participation, even though sustainable firms have incentives to gravitate to stringent programs to differentiate themselves from poor performers. It is possible that the tendency for strong environmental performers to join VEPs (King & Lenox, 2000; Rivera, 2002), and poor environmental performers to avoid them (Short & Toffel, 2010) smooths out stringency as a contextual factor. Finally, in finding that stringency weakens the relationship between prior VEP/quality management standard engagement and new VEP adoption, we help establish that leniency gives firms the flexibility to implement the new program in a way that fits with their approach to existing standards in their resource base. As we theorized, more stringent programs can be less compatible with each other because they can require high levels of specificity and rigor, and by extension, limited flexibility. Stringent programs take this approach because they govern environmental issues that are idiosyncratic to their socioecological contexts (Wijen, 2014). We believe this result suggests that the "coupling" effect discussed by Tuczek and colleagues (2018) can ironically lead to decoupling substance from practice since firms tend to adopt multiple programs when they are lenient. Future research should investigate whether there are common microfoundations of stringent VEPs that could increase their compatibility if they are known to managers. Overall, our results suggest that stringency significantly affects firms' ability to leverage their resource base to address environmental matters.

Our second contribution is that our HOMA synthesizes findings from existing research on individual VEPs on the institutional and resource-based drivers of firms' participation. Prior research has yielded strong anecdotal evidence around these factors (Khanna, 2001; Koehler, 2007; Lyon & Maxwell, 2007). We provide another layer of evidence that these results hold in a cross-program study (Aragon-Correa et al., 2020; Tuczek et al., 2018). In particular, we show that environmental institutional pressures, whether formal or informal, consistently drive VEP participation, along with visibility or susceptibility to institutional pressures, while VEPs are less able to attract firms in weaker regulatory contexts where they are most needed (Schepers, 2010).

Our HOMA results also corroborate prior research on the resource-based drivers of VEP participation and provide additional evidence that firms are interested in leveraging prior experience in these programs through the "coupling" effect. First, the positive effect of prior

financial performance on participation is consistent with single program studies that find it gives firms patient capital needed to use VEP adoption strategically (e.g., Arora & Cason, 1995; Darnall, 2006; King & Lenox, 2001, Moon & de Leon, 2007). The tentative support from partial correlations for a positive relationship between prior environmental performance and VEP participation suggests that VEPs do in fact offer low-hanging competitive fruit for firms that already have strong environmental performance (e.g., Bansal & Hunter, 2003; Prakash & Potoski, 2005a). This result also has implications for studies of VEP effectiveness that use selection models to control for prior environmental performance in first stage analyses. In particular, it supports prior research suggesting that selection models may over-control for prior environmental performance in the first analytical stage given its likely correlation with post hoc environmental performance. As a result, they may fail to detect benefits that VEPs create such as positive spillovers of environmental practices to non-participating firms (Matisoff, 2015). Second, results from our partial correlations analyses provide tentative support for prior research showing that firms join multiple VEPs or quality management standards to pursue the coupling effect, where firms attempt to leverage the knowledge gained from implementing multiple standards, and even develop that knowledge into standards competencies (Castka & Balzarova, 2018; De Vries et al., 2018). Still, harmonizing standards from multiple VEPs and/or quality management programs is resource intensive and challenging (Wiegmann, 2019). Further, as discussed above, firms taking this approach seem to join lenient VEPs that promote symbolic environmental practices.

Finally, our robustness tests add to the early evidence about whether specific rules of VEPs governance are more influential in attracting firms, and in doing so they answer calls to investigate whether “certain rules may play a stronger role than others” (Darnall et al., 2017: 448). One other study by Castka and Corbett (2016) addressed this question, finding that firms prefer programs with strong monitoring and enforcement criteria, but had no preference on the environmental performance standards. Thus, our results are confirmatory, but also provide new granularity by configuring the effect of stringency with institutional and resource-based drivers of participation.

2.5.1. Limitations and Future Research

Our study has several limitations that offer opportunities for future research. First, our measures of VEP stringency are summative of the presence of stringent attributes in a program’s governance design, which values all three attributes as equal in their impact on VEP participation, when they are actually likely to vary. Further, the dichotomous measures that make up this variable fail to capture nuanced differences in the quality of environmental performance targets and practices in environmental management systems across VEPs. We operationalized stringency in this way because more robust independent measures have yet to be developed. However, future research should consider developing measures of stringency that capture not only the design of the program’s governance mechanisms, but also the actual rigor through which its rules are implemented and enforced. One possibility is to use VEP effects on corporate environmental performance as a proxy for VEP stringency. Second, our study’s database excluded many quantitative (e.g., Castka & Corbett, 2016), qualitative (e.g., Boiral, 2007) and conceptual papers (e.g., Smith & Fischlein, 2010) with critical insights about

the institutional and resource-based drivers of VEP participation. Thus, even though we have the largest meta-analytical sample on VEP participation to date (to our knowledge), its insights are limited to the focal research question on how VEP stringency impacts firm participation. Thus, we leave open many research questions that could be examined empirically from this broader literature. For example, researchers could build on Smith and Fischlein's (2010) arguments that VEP attractiveness to firms depends in part on the relational advantages of their leaders and sponsors. Third, our methodology required us to only sample single-program studies, meaning that we were unable to include several multi- program studies of the drivers of VEP participation. Fourth, several high profile VEPs, such as the Forest Stewardship Council and Marine Stewardship Council, were not in our sample because of a lack of quantitative research on them. We believe that this is an important research opportunity for scholars interested in this topic. Finally, the HOMA contains lower than ideal numbers of observations since we relied on sub-samples of institutional- and resource-based drivers of VEP participation. Future research could address this limitation after more studies of individual programs have been conducted by replicating our meta-analysis.

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Table 5. MARA Meta-Analytic Results of Program Stringency on Institutional Drivers of VEP Participation

Variable	Model 1 Formal Environmental Expectations	Model 2 Informal Environmental Expectations	Model 3 Visibility
Stringency	0.07***	0.07***	0.04
Governance	0.00	-0.01**	0.03***
<i>Methodological and Study Artifacts</i>			
Published study	-0.03**	0.04***	-0.13***
Median year of sample window	-0.01***	0.00***	-0.01***
Partial correlation	-0.07***	-0.04***	-0.17***
Panel design	-0.01	-0.04***	-0.05***
USA	-0.03*	-0.01	0.01
Firm-level	0.04***	-0.02*	0.00
k	354	283	153
R ²	0.09	0.18	0.24
Q _{model} (p)	75.08	153.50	100.42
Q _{residual} (p)	749.47	679.66	320.83
V	0.01	0.00	0.01

Note: * p<0.10; ** p<0.05; *** p<0.01

Table 6. MARA Meta-Analytic Results of Program Stringency on Resource-Based Drivers of VEP Participation

Variable	Model 4 Prior Financial Performance	Model 5 Prior Environmental Performance	Model 6 Other VEPs and Quality management standards
Stringency	-0.05	0.06	0.01
Governance	0.02**	0.02	-0.05***
<i>Methodological and Study Artifacts</i>			
Published study	-0.04***	-0.12***	0.10**
Median year of sample window	0.00	-0.00	-0.00**
Partial correlation	-0.04***	0.18***	-0.01
Panel design	-0.01	0.02	0.01
USA	0.06***	-0.08**	-0.14***
Firm-level	0.03**	0.07***	0.14***
k	136	473	38
R ²	0.14	0.17	0.87
Q _{model} (p)	44.86	115.89	204.22
Q _{residual} (p)	266.78	571.72	31.05
V	0.00	0.04	0.00

Note: * p<0.10; ** p<0.05; *** p<0.01

Endnotes

¹ Our search terms included: codes of conduct, eco-label, environmental certification, environmental self-regulation, environmental voluntary agreement, environmental management system, fair trade, multi-stakeholder partnership, VEP, voluntary environmental initiative, voluntary environmental program, voluntary environmental standard.

² We searched the following 46 program names: Alliance for Environmental Innovation, Audubon Cooperative Sanctuary Program, Building America, Business Charter for Sustainable Development, Business for Social Responsibility, Caux Roundtable, Certified Environmental Drycleaner, Chemical Strategies Partnership, Climate Challenge Program, Coalbed Methane Outreach Program, Coalition for Environmentally Responsible Economies, Coatings Care, Commuter Choice Leadership Initiative, Energy Star, Environmental Leadership Program, Environmental Technology Verification Program, Forest Stewardship Council, Global e-Sustainability Initiative, Global Reporting Initiative, Great Lakes Automotive Pollution Prevention Project, Great Printers Project, Green Power Market Development Group, Hospitals for a Healthy Environment, International Hotels Environment Initiative, ISO 14001, Kimberly Accords, Landfill Methane Outreach Program, Marine Stewardship Council, Mercury Challenge Program, Merit Partnership for Pollution Prevention, Mobile Air Conditioning Climate Protection Partnership, National Environmental Performance Track, National Waste Minimization Partnership Program, Project XL, Rainforest Alliance, Recycled Paper Coalition, Responsible Care, Sustainable Apparel Coalition, Sustainable Forestry Initiative, the Natural Step, UN Global Compact, US Automotive Pollution Prevention Project, UTZ, Waste-Wise, Water Alliances for Voluntary Efficiency, and 33/50.

³ The journals in our search list were *Academy of Management Journal*, *American Economic Review*, *American Journal of Political Science*, *American Political Science Review*, *Business and Society*, *Ecological Economics*, *Environmental and Resource Economics*, *Journal of Business Ethics*, *Journal of Cleaner Production*, *Journal of Economics and Management Strategy*, *Journal of Environmental Economics and Management*, *Journal of Management*, *Journal of Policy Analysis and Management*, *Journal of the Association of Environmental and Resource Economists*, *Organization & Environment*, *Organization Science*, *Policy Sciences*, *Policy Studies Journal*, *Review of Economics and Statistics*, *Strategic Management Journal*.

Chapter 3. When are Voluntary Environmental Programs More Effective? A Meta-Analysis of the Role of Program Stringency

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Abstract

We meta-analyze research on voluntary environmental programs' (VEPs) impacts on corporate environmental and financial performance to assess how their governance rigor impacts their effectiveness. As self-regulatory institutions, VEPs incentivize firms to reduce their environmental impacts by granting participants third-party seals of approval, which should help firms' legitimacy and performance. Studies on their effectiveness are inconclusive, in part because they often sampled single programs and were unable to model program characteristics that shape firm behavior and performance. We draw on institutional theory to argue that one characteristic warranting consideration is stringency, or the rigor of VEPs' governance mechanisms. Specifically, it should determine VEPs' ability to induce substantive environmental improvements from firms and the value of the legitimation benefits they receive. Our meta-analysis of 45 studies and 14 VEPs finds that more stringent VEPs drive stronger environmental performance and weaker financial performance. Thus, it appears that stringent VEPs can improve corporate environmental performance, but offer weak financial incentives for firms to join them.

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3.1. Introduction

Research in corporate sustainability has grown significantly in recent decades as the grand environmental challenges facing society have come into focus (George et al., 2016). One inescapable conclusion from this research area is that corporate activity, enabled by voids in environmental regulation, has disrupted macro-ecological systems like the climate, the ocean, and global biodiversity (Whiteman, Walker, & Perego, 2013). In this context, voluntary environmental programs (VEPs) have emerged to help resolve some of the negative environmental externalities of corporate activity (Berchicci & King, 2007). VEPs are self-regulatory institutions devised by industry, non-governmental organizations and/or government agencies that help firms collectively solve their mutual contributions to environmental problems (Ostrom, 1990; Barnett & King, 2007). Though they lack the coercive power of government, they attract corporate participants by offering a potentially valuable competitive benefit: the ability to use participation in a VEP to signal legitimacy-conferring stakeholders with environmental concerns (Potoski & Prakash, 2005). Thus, VEPs have a dual mandate of helping firms improve their environmental and financial performance (Lyon & Maxwell, 2007).

Scholars have considered the effectiveness of VEPs at boosting each dimension of performance in two substantial, but separate streams of research, yielding mixed results that cast doubt on whether they reliably achieve either goal, let alone both at the same time (Aragón-Correa, Marcus, & Vogel, 2020; Berchicci & King, 2007; Bowen, Bansal, & Slawinski, 2018; Lyon & Maxwell, 2007). One important limitation contributing to the mixed findings is that most empirical studies consider individual programs and overlook program-level characteristics that shape their effectiveness (Aragón-Correa et al., 2020). Scholars have pointed to one program characteristic in particular, stringency, which should be consequential in this regard (e.g., Berchicci & King, 2007; Castka & Corbett, 2016; King & Lenox, 2000). Stringency refers to the strength of programs' governance design (Darnall, Potoski, & Prakash, 2010), which includes environmental standards for firms to meet, oversight of firm compliance with those standards, and sanctions for firms that fall short of program expectations (Carmin, Darnall, & Mil-Homens, 2003; Darnall, Ji, & Potoski, 2017). Many scholars believe that higher levels of stringency are key for inducing better environmental performance outcomes since they imply firms must follow strict rules to stay in the VEP. It should also affect corporate financial performance because it shapes both programs' legitimacy with external actors, and the costs to firms of complying with program standards (Prakash & Potoski, 2007). Although scholars have theorized about the role of stringency in determining VEP effectiveness, they have yet to directly test the idea because the extant empirical literature has largely considered individual VEPs, and therefore lack the cross-program variation that is needed to consider whether a program characteristic can determine its effectiveness (Aragón-Correa et al, 2020).

We address this gap by meta-analyzing existing research on how VEP participation impacts both corporate environmental and financial performance, and modeling how VEP's stringency impacts each outcome. Our conceptual model draws on neo-institutional theory to characterize VEPs as extra-governmental self-regulatory institutions that firms join to appease institutional expectations for improving corporate environmental performance (Berchicci &

King, 2007). It then explains how VEP stringency affects corporate environmental performance by establishing within-program institutional pressures on participating firms through their governance mechanisms. Finally, it explains how stringency impacts firms' financial performance by determining program compliance costs and the legitimation and reputational benefits programs can confer to firms.

We make three contributions to research on VEPs and their effectiveness as self-regulatory institutions. In particular, our meta-analysis helps explain mixed results from existing empirical research on individual programs and demonstrates that differences in stringency are key factors in program effectiveness. Specifically, our results indicate that VEPs do not help firms become more sustainable on average, but that more stringent programs are better equipped to meet this goal. By implication, within-program institutional pressures are critical factors in VEP effectiveness at inducing better environmental behavior from firms. Second, we find that VEPs do generally improve corporate financial performance, but that the effect diminishes with increasing levels of program stringency. This suggests that the legitimation and reputational benefits that stringent VEPs provide to firms are outweighed their increased compliance costs. Finally, taken together, our results call to question whether VEPs can achieve their dual mandate of providing firms market-based incentives to become more sustainable. In particular, they demonstrate that stringent programs have the best chance of driving substantive improvements in corporate environmental performance, but lack the ability to generate compelling financial rewards for firms to join them.

The paper proceeds as follows. First, we review the literature on VEPs and their impact on corporate environmental and financial performance. Next, we present hypotheses on how VEPs' stringency affects corporate environmental and financial performance. We then explain our methods, results, and research implications.

3.2. The Emergence of VEPs

We are now firmly in a new geological epoch, the "Anthropocene Era", which is characterized by strong and observable negative impacts of industrial-economic activity on macro-ecological systems (Hoffman & Jennings, 2018). These behaviors, in turn, have been enabled by vast regulatory voids in environmental governance (Whiteman et al., 2013). Such voids exist for many reasons, including the global scope of many environmental issues (Aravind & Christmann, 2011), polluting industries' efficacy at mounting political opposition to proactive environmental legislation (Hoffman, 2011), and the constraining effect of command-and-control regulations on firms' ability to respond to their idiosyncratic socioecological contingencies (Porter & Van der Linde, 1995). For these reasons, non-state actors have worked tirelessly to challenge firms' environmental legitimacy (Bansal & Clelland, 2004; Moon & de Leon, 2007). Environmental legitimacy refers to "the generalized perception or assumption that a firm's corporate environmental performance is desirable, proper, or appropriate" (Bansal & Clelland, 2004, p. 94). As it is critical to maintaining vital stakeholder relationships, threats to environmental legitimacy often drive firms to seek out various means of protecting it (King & Lenox, 2000; Delmas & Keller, 2005).

In this context, VEPs have emerged to help fill voids in environmental governance systems by inducing firms to improve their environmental impacts with the promise of helping them protect their reputations (Lyon & Maxwell, 2007). VEPs take several forms, including codes of conduct, written agreements, self-reporting schemes, and programs that mandate reaching environmental performance targets or adopting environmental management systems (Prado, 2013; Aragón-Correa et al., 2020). In each case, they function as self-regulatory institutions, or non-governmental governance mechanisms that facilitate collective action on solving common problems for their members when uncoordinated individual actions fail to do so (Berchicci & King, 2007). VEPs, in particular, address two collective action issues. First, for society-at-large, they incentivize firms to pursue environmental performance that goes beyond legal expectations; and second, for firms, they address collective environmental legitimacy problems that are difficult for them to tackle individually because they can share collective environmental reputations (Barnett & King, 2008). This occurs because many legitimacy-conferring stakeholders, including consumers, non-governmental organizations, value-chain partners, and government agencies, frequently lack the capacity to monitor individual firm's environmental performance on their own (Darnall, 2006). As a result, they often develop negative stereotypes about entire classes of firms, such as polluting industries, based on the poor behavior of some in their cohort, which makes it "difficult for any single firm to unilaterally reduce its pooled risk" (Lenox, 2006, p. 678). VEPs can help mitigate this pooled risk by giving environmentally-concerned stakeholders third-party warranties about participating firms' environmental performance that disassociates them from poor performers. The resulting improvements in environmental legitimacy should in turn help firms manage their reputations and improve their competitiveness (Potoski & Prakash, 2005; Berchicci & King, 2007).

There is skepticism in the academic community over the effectiveness of VEPs at improving corporate environmental or financial performance because the extensive research on this topic is inconclusive (Aragón-Correa et al., 2020). Scholars have found that VEP participation improves corporate environmental performance (e.g., Innes & Sam, 2008; Potoski & Prakash, 2005), has no effect (e.g., Rivera & De Leon, 2004; Pizer, Morgenstern, & Shih, 2011) or even leads to poor performance by attracting firms that shirk program obligations (e.g., Gamper-Rabindran & Finger 2013; King & Lenox, 2000). Independently, some research found that VEPs improve firm competitiveness (e.g., King & Lenox, 2002), have no effect (e.g., Heras-Saizarbitoria, Molina-Azorín, & Dick, 2011), or have negative effects on it (e.g., Paulraj & de Jong, 2011). To make sense of these findings, numerous scholars have suggested that VEP stringency is a critical contingency that could affect both outcomes (e.g., Castka & Corbett, 2016; Lyon & Maxwell, 2007; Darnall & Sides, 2008; Darnall et al., 2017; King & Lenox, 2000; Prakash & Potoski, 2012). This factor, however, has received little empirical attention because most studies sample individual programs and/or do not systematically evaluate cross-program differences (Aragón-Correa et al., 2020).

3.2.1. VEP Stringency

VEP stringency depends on the strength of their internal institutional mechanisms for inducing substantive corporate participation (Borck & Coglianese, 2009; King & Lenox, 2000).

Scholars have focused on three of these mechanisms in particular, namely: type of environmental performance standards, type of monitoring criteria, and presence of sanctions for non-compliant firms (Darnall, Ji, & Vázquez-Brust, 2018; King & Lenox, 2000; Koehler, 2007). Environmental performance standards are objectives set by VEPs for their environmental impacts, while monitoring and sanctions capture VEPs' ability to enforce their standards on participating firms (Castka & Corbett, 2016). Below, we discuss each mechanism in more detail.

3.2.1.1. Type of environmental performance standards

Environmental performance standards refer to the outcomes that programs expect from corporate members. VEPs set several types of standards, including environmental performance targets, the adoption of environmental management practices and systems, written commitments to improve environmental performance, and environmentally responsible codes of conduct (Carmin et al., 2003; Berchicci & King, 2007; Prakash & Potoski, 2007; Terlaak, 2007). Environmental performance targets involve measurable ecological outcomes for protecting ecosystems, reducing emissions or natural resource consumption, or improving ecological indicators, such as water and air quality, or biodiversity (Darnall & Carmin, 2005; Prakash & Potoski, 2007). They are the most stringent of these standards because they create unambiguous norms that minimize the potential for firms to misinterpret VEP expectations, a key driver of both symbolic participation and freeriding. They also can provide flexibility in how firms can pursue those outcomes, which enhances their effectiveness (Darnall et al., 2018; Wijen, 2014).

Environmental management practices and systems are less stringent standards relative to environmental performance targets because they only mandate how firms should attempt to improve their environmental performance, rather than requiring actual improvements based on specific targets (Darnall et al., 2018). Therefore, they may be vulnerable to decoupling because they focus firms on adopting practices that may have ambiguous linkages to environmental outcomes (Aravind & Christmann, 2011). They also constrain firms from customizing practices to fit with their specific contexts and contingencies (Wijen, 2014). Lastly, written commitments and codes of conduct lack benchmarks for firms to pursue, or best practices to follow (Terlaak, 2007). Thus, they are ambiguous standards that allow firms to exploit information asymmetries with VEP sponsors, which increases the risk that firms might shirk program objectives. They also provide limited guidance for well-meaning firms to translate such statements into improved environmental performance.

3.2.1.2. Type of monitoring criteria

Research uniformly considers independent oversight of firm compliance with program objectives the only stringent form of monitoring (Potoski & Prakash, 2013). Independent oversight requires firms to submit to external compliance audits and prevents them from misstating their actual efforts to VEP sponsors. In doing so, it generates clear normative pressures on firms to substantively pursue programs' environmental performance standards by subjecting them to independent authorities with mandates to disclose non-compliance (Aragón-

Correa et al., 2020). Some VEPs allow participants to self-monitor or allow their industry groups to oversee their compliance. Such monitoring schemes are prone to moral hazard and free-riding from self-interested corporate actors who may claim substantive effort while actually making symbolic commitments towards improving environmental performance (King & Lenox, 2000). Thus, self- and industry-led monitoring are lenient monitoring mechanisms (Berchicci & King, 2007).

3.2.1.3. *Presence of sanctions for non-compliance*

Some VEPs have credible sanctions for non-complying firms (King & Lenox, 2000; Delmas & Keller, 2005; Aragón-Correa et al., 2020). Credible sanctions are coercive mechanisms that allow VEPs to withhold their benefits from program participants (King & Lenox, 2000). The most credible sanction is expulsion from the program since it directly rescinds firms' association with VEPs and any legitimation benefits that they provide (Koehler, 2007). Programs can also publicize the names of non-compliant organizations to shame them with their stakeholders (Gunningham, 1995). Shaming without expulsion, however, allows non-compliant firms to remain in VEPs and continue to self-publicize their participation in a program. This, in turn, generates ambiguous signals to stakeholders that limits their ability to evaluate firm's environmental legitimacy (Oliver, 1991). Thus, sanctions other than expulsion are lenient mechanisms that lack coercive power.

3.2.1.4. *Systemic nature of VEP stringency mechanisms*

It is important to note that these mechanisms work as a system. VEPs with strong monitoring and penalties and weak environmental performance standards are likely to induce strong compliance with trivial standards (Darnall & Carmin, 2005). Similarly, exceptional standards may mean little if weak oversight and/or sanctions enable symbolic effort. Thus, it is important to consider the totality of VEPs' design when assessing their effectiveness (Darnall et al., 2017).

3.3. VEP Stringency and Corporate Performance

3.3.1. VEP Stringency and Corporate Environmental Performance

To explain how VEP effectiveness depends on program stringency, we draw on neo-institutional theory, which is concerned with how firms respond to the sets of institutional pressures in order to maintain their legitimacy and competitiveness (Scott, 2013). As discussed above, VEPs are extra-governmental self-regulatory institutions that contain internal mechanisms that influence participating firms' behavior in ways that address collective action problems that face them (Barnett & King, 2008). We argue that the most stringent VEPs, which rely on environmental performance targets, independent oversight, and expulsion mechanisms, generate multifaced internal institutional pressures on firms to induce the strongest environmental improvements from firms. Environmental performance targets and independent monitoring both apply strong normative pressures on firms by, respectively, presenting clear and explicit standards, and credible independent audits of their compliance with those

standards. In addition, sanctions involving expulsion apply coercive pressure on firms by threatening to withhold the key reputational benefits that VEPs offer to protect their legitimacy.

Lenient programs, on the other hand, are more likely to facilitate symbolic effort from firms for two reasons. First, they often contain weak enforcement mechanisms that enable firms to shirk their commitments to improving corporate environmental performance by exaggerating their environmental performance without being held to accountable by independent authorities or avoiding improvements without the threat of expulsion (King & Lenox, 2000; Prakash & Potoski, 2007). Second, they may lack environmental performance targets, which sets ambiguous goals for firms, even when they mandate environmental management systems, that makes them vulnerable to decoupling. Opportunistic firms can adopt mandated practices or codes symbolically by focusing on making their practices appear robust rather than effective (Aravind & Christmann, 2011). Further, well-intentioned firms may inadvertently decouple VEP objectives from environmental performance improvements because the linkages between environmental practices and performance are often opaque (Bromley & Powell, 2012; Wijen, 2014). In sum, more lenient VEPs generate weaker internal normative and coercive pressures, which are necessary for inducing substantive participation from firms. In light of these considerations, we predict that:

Hypothesis 1. VEP stringency positively moderates the effect of voluntary environmental program participation on corporate environmental performance.

3.3.2. VEP Stringency and Corporate Financial Performance

We also expect that within-program institutional pressures determined by VEP stringency will impact participating firms' corporate financial performance. Specifically, we argue that higher levels of stringency lead to lower levels of corporate financial performance by inducing firms to make substantive corporate environmental performance investments that outweigh their legitimation and reputational benefits. While stringent VEPs may have the most credibility with legitimacy-conferring stakeholders (Darnall et al., 2017), more lenient VEPs might confer similar reputational benefits to firms because many stakeholders find it difficult to discern between program quality (Berchicci & King, 2007). In particular, they face high information search costs for evaluating VEP quality, because the cause and effect of program participation is difficult to observe (Henriques, Husted, & Montiel, 2013; Wijen, 2014). As a result, stakeholders often instead consider programs' level of public exposure, which can depend on their membership sizes and the publicity that members generate for programs. Programs with sizable memberships tend to have moderate or lenient levels of stringency, as more stringent programs deter participants because of their compliance costs (Fischer & Lyon, 2014). For example, the widely-diffused VEP ISO 14001 has gained global prominence, in part, because it lacks credible sanctions and does not mandate environmental performance standards, while the stringent Forest Stewardship Council has made only modest inroads into the global forestry industry (Aragón-Correa et al., 2020; Potoski & Prakash, 2007). As Prakash and Potoski (2006: 65) explain: stringent "programs diminish opportunities to achieve scale economies and network effects for broadcasting the [VEP's] club brand that large membership provides." In other words, they can fail to generate exposure needed for stronger legitimacy

and reputational benefits. Thus, lenient VEPs may offer similar benefits while creating lower compliance costs, which help them promote superior corporate financial performance.

Importantly, numerous scholars have suggested that VEPs generally can help firms achieve operational efficiencies and innovation that are associated with the pursuit of eco-efficiencies (e.g., Baek, 2017; Moon, Bae, & Jeong, 2014), especially when they involve environmental management systems and their reliance on quality management principles (Darnall, 2006). Still, we argue that stringent VEPs, especially those with environmental performance targets, may provide only similar operational benefits to environmental management systems. In particular, VEPs with environmental performance targets often force compliant firms to make significant changes to organizational practices that achieve their environmental improvement mandates, whereas environmental management systems more often help firms streamline existing practices to make them more efficient (Boiral, 2007). In light of these arguments, we offer the following prediction:

Hypothesis 2. VEP stringency negatively moderates the effect of voluntary environmental program participation on corporate financial performance.

3.4. Methods

3.4.1. Literature Search and Coding

To maximize the number of articles about how VEPs influence corporate environmental and financial performance, we relied on five search strategies. First, we read several review articles (e.g., Carmin et al., 2003; Berchicci & King, 2007; Borck & Coglianese, 2009) and one prior meta-analysis (Darnall & Sides, 2008), and collected all the relevant studies they cited and analyzed. Second, we searched Google Scholar and Business Source Premier, using the following keywords associated with VEP attributes: codes of conduct, eco-label, environmental certification, environmental self-regulation, environmental voluntary agreement, environmental management system, fair trade, multi-stakeholder partnership, VEP, voluntary environmental initiative, voluntary environmental program, voluntary environmental standard. We also searched Google Scholar and Business Source Premier for 46 prominent VEPs in our initial article searches.¹ Third, we manually searched 21 journals from disciplines such as economics, management, policy and political science that published articles on VEPs based on our initial article searches.² Fourth, we used a “snowballing” technique to collect all relevant articles cited in the retrieved articles, as well as relevant articles citing them on Google Scholar (Davis & Rothstein, 2006). Finally, we inquired about unpublished empirical work that fit our search criteria through five *Academy of Management listservs* (*Organization and the Natural Environment*; *Social Issues in Management*; *International Management Division*; *Organization and Management Theory*; *Business Policy and Strategy*) to alleviate the possibility of a “file drawer” problem (Rosenthal, 1979). To fit our criteria, studies had to report statistical information (e.g., t-statistic, correlation coefficient, F-statistic) for calculating effect sizes between VEP participation and corporate environmental or financial performance. If such information was not available, we contacted authors to obtain it. Our dataset includes primary studies that are based on U.S. samples to control for variations in the regulatory environment

(Darnall & Sides, 2008). We obtained the sample consisting of 45 primary studies (37 published and 8 unpublished papers) based on the data from 1987 until 2013 and published from 2000 until 2019. The full list of these primary studies is included in the Appendix. Table 7 lists all programs included in our analyses.

Table 7. VEPs in Meta-Analytical Sample

VEP Name	Environmental Performance Target Score	Monitoring Score	Sanctioning Score	Total Stringency Score
<i>33/50</i>	0	1	0	1
<i>Climate Challenge</i>	0	0	0	0
<i>Climate Leaders</i>	0	0	0	0
<i>Climate Wise</i>	0	0	0	0
<i>Energy Star Buildings</i>	1	0	1	2
<i>Forest Stewardship Council</i>	1	1	1	3
<i>Green Lights</i>	0	0	0	0
<i>Global Reporting Initiative</i>	0	0	0	0
<i>ISO 14001</i>	0	1	1	2
<i>LEED</i>	1	1	1	3
<i>Responsible Care</i>	0	0	0	0
<i>Sustainable Slopes</i>	0	0	0	0
<i>Tox-Minus</i>	0	0	0	0
<i>Waste Wise</i>	0	0	0	0

To extract relevant data for all variables and study characteristics for the meta-analysis, we carefully examined and coded all sampled articles using a coding protocol based on Lipsey and Wilson's (2001) best practices. Since we rely on objective data for all variables, intercoder unreliability or subjectivity did not represent a concern. Nonetheless, we cross-checked our coding by having two authors code all effect sizes, and resolving differences via discussion until a consensus was reached (Stanley & Doucouliagos, 2012).

3.4.2. Variables

3.4.2.1. VEP participation

We included two operationalizations that are commonly used in the literature: a dummy variable (1 if a firm was a member, 0 if it was a non-member), and the percentage score for firms' probability of participation in the VEP. Many scholars use the latter measure in their primary studies to control for self-selection bias, which is calculated using either the Heckman procedure or propensity score matching. To account for the different nature of these measurements, we separately meta-analyzed the relationship between VEP participation and corporate environmental and financial performance (1) for all studies, (2) only for studies that control for endogeneity, and (3) only for studies that do not control for endogeneity.

3.4.2.2. Environmental performance

We included six types of environmental performance measures that are commonly found in the literature: (1) *total emissions* (e.g., King and Lenox, 2000), (2) *difference between actual and predicted emissions* (e.g., Berrone, Fosfuri, & Gelabert, 2017), (3) *environmental performance indices* (e.g., Russo & Harrison, 2005), (4) *environmental practices* such as adoption of pollution prevention technologies (e.g., Bi, Deltas, & Khanna, 2011) and source reduction activities (e.g., Hoang et al., 2016) (5) *amounts of natural resource use* (e.g., Arimura et al., 2015), and (6) *survey-based measures* of environmental performance (e.g., Simpson, 2012), which capture respondents' perceptions of their firm's environmental performance. All other environmental performance measures were coded as other. Coefficients on measures of emissions and amounts of natural resource use were reverse coded so that higher values implied better environmental performance (i.e., lower emissions or lower use of natural resources).

3.4.2.3. Financial performance

We included three types of firm-level financial performance measures: (1) *financial market-based measures* (i.e., market-to-book ratio, stock performance, and Tobin's Q; e.g., Lenox, 2006); (2) *accounting-based measures* (i.e., profit margin, return on assets (ROA), return on sales (ROS); e.g., de Jong, Paulraj, & Blome, 2014); and (3) *survey-based measures* (e.g., Melnyk et al., 2002), which capture respondents' perceptions of their firm's financial performance.

3.4.2.4. VEP stringency

We measured stringency by coding for the presence of institutional mechanisms identified in prior research (Carmin et al., 2003; Darnall and Carmin, 2005; Darnall et al., 2017) and developing count score with a range from 0-3 based on whether the program has (1) environmental performance standards, (2) monitoring criteria, (3) sanctioning criteria. We measured for the presence of these mechanism in a VEP based on descriptions in primary studies and VEP websites. Coding was performed by two authors who worked together to identify and resolve coding differences. To construct the overall stringency score, we used the following method: the program received one point for having the most stringent mechanism in place for each of the three components of VEP governance stringency – environmental performance standards, monitoring and sanctions. Thus, a score of 3 would indicate that a VEP has a full set of stringent measures (i.e., specific environmental performance targets, independent oversight by accredited bodies or VEPs with no connections to industry, a policy of expelling firms that do not comply with the specified mandate) and a score of 0 would indicate that a VEP has not established stringent measures in any of the three governance mechanisms.

3.4.2.5. Methodological and study artifacts

We included a number of methodological and study artifacts associated with each effect size as controls in our moderator analyses. We controlled for whether the primary study was *published* or *unpublished* (reference group) with a dummy variable since publication bias can be an issue in meta-analyses (Gonzalez-Mulé & Aguinis, 2018). We controlled for whether the coded coefficient is *partial* or *bivariate* (reference group) with a dummy variable, as well as whether the coefficient is based on *cross-sectional* or *panel* data (reference group). We included a dummy variable capturing whether the effect size was calculated with *endogeneity control* or not (reference group) (van Essen, Otten, & Carberry, 2015). We included a control to account for the timing of the study measured by its *median year of sample window*. We controlled for whether VEPs applied to *firms*, *facilities* (reference group in environmental performance analyses) or *products* (reference group in financial performance analyses) with a dummy variable. We included these controls because VEPs can target these different levels of analysis in organizations. We included the following controls for *industries* that were represented in our sample: chemical, manufacturing, service, energy, mixed/other (reference group) and environmental and financial performance measurements that were discussed in detail earlier. Among *environmental performance measures*, other measures of environmental performance were included in a reference group; among financial performance measures survey measures of financial performance were included in a reference group.

3.4.3. Analysis

3.4.3.1. Hedges-Olkin type meta-analysis (HOMA)

Prior to testing our hypotheses, we determined the meta-analytical mean correlations between VEP participation and corporate environmental and corporate financial performance

using Hedges-Olkin type meta-analysis (HOMA) (Hedges & Olkin, 1985; Lipsey & Wilson, 2001; Geyskens et al., 2009). Through HOMA, we calculated both Pearson product-moment correlations (r) and partial correlation coefficients ($r_{xy,z}$) as effect sizes. In line with recent guidelines, we used random effects techniques to account for heterogeneous samples in primary studies (Lipsey & Wilson, 2001, Geyskens et al., 2009). If multiple effect sizes were reported in one study (e.g., different operationalizations of environmental or financial performance), we included all of them in the sample. To account for accuracy differences across effect sizes, we weighted each effect size by its inverse variance weight w , the inverse of the squared standard error (Lipsey & Wilson, 2001). We then used these weights to compute the standard error of the mean effect size and its corresponding confidence interval.

3.4.3.2. Meta-analytic regression analysis (MARA)

Meta-analytic regression analysis (MARA) is a weighted least squared-based technique that estimates the effect of moderator variables (e.g., VEP governance stringency) on the main relationships of interest (Lipsey & Wilson, 2001). In the current study, the dependent variables were estimates of relationships between VEP participation and corporate environmental and financial performance, respectively. MARA effect sizes indicate how given predictors impact (i.e., moderate) the relationships that are captured by the dependent variables. Accordingly, our main predictor variable was *VEP Stringency*. MARA also allows us to control for any bias introduced by methodological and study artifacts from individual studies in our sample. For this end, we included a range of methodological and study artifacts controlling whether a primary study was published or not, whether the effect size was based on partial or bivariate correction and on cross-sectional or panel data, whether endogeneity controls were included and whether a VEP operated at the firm, facility or product-level, and for time. We also included environmental and financial performance operationalizations and industry controls.

We followed meta-analytic norms (Stanley & Doucouliagos, 2012) by estimating both (r) and ($r_{xy,z}$), and weighted these effect sizes by their inverse variance weight (w) to capture the differences in precision of the information contained in them (Aguinis, Gottfredson, & Wright, 2011). We also employed random effect estimations in these analyses (Geyskens et al. 2009; Gonzalez-Mulé & Aguinis, 2018).

3.5. Results

3.5.1. HOMA Results

The primary HOMA results of interest are the meta-analytic mean correlations between VEP participation and corporate environmental and financial performance, respectively. For HOMA partial correlation estimates, we also report whether they are based on primary datasets that (1) included endogeneity controls or (2) did not include such controls.

Table 8 reports the HOMA results for the relationships between VEP participation and corporate environmental performance for both Pearson product-moment correlations (r) and partial correlation coefficients ($r_{xy,z}$). These results present mixed findings. The mean correlations of r were negative and significant ($r = -0.03$; $s.e. = 0.01$; $p=0.002$) indicating that

there is a negative relationship between VEP participation and environmental performance. The mean correlations of $r_{xy,z}$ were both positive and significant ($r_{xy,z} = 0.02$; s.e. = 0.00; $p=0.000$). This was the case both for studies that controlled for endogeneity ($r_{xy,z} = 0.01$; s.e.=0.00; $p=0.000$), and for those that did not ($r_{xy,z} = 0.02$; s.e. = 0.00; $p=0.000$)

Table 8. Hedges and Olkin Meta-analysis (HOMA) Results for the VEP Participation – Environmental Performance Relationship

Analysis group	k	N	Mean	SE	Pearson product-moment correlation (<i>r</i>)					Q test	p-val.	I ²
					95% c.i. low	95% c.i. hi	95% c.i. low	95% c.i. hi	95% c.i. hi			
<i>All studies</i>	30	847012	-0.03**	0.01	0.002	-0.04	-0.01	-0.01	-0.01	349.48	0.000	92%
<i>Studies that control for endogeneity</i>	NA											
<i>Studies that do not control for endogeneity</i>	NA											
Analysis group	k	N	Mean	SE	Partial correlation coefficient (<i>r</i> _{xyz})					Q test	p-val.	I ²
					95% c.i. low	95% c.i. hi	95% c.i. low	95% c.i. hi	95% c.i. hi			
<i>All studies</i>	420	11853942	0.02***	0.00	0.000	0.01	0.01	0.02	0.02	8610.34	0.000	95%
<i>Studies that control for endogeneity</i>	172	4695585	0.01***	0.00	0.000	0.01	0.01	0.01	0.01	911.89	0.000	81%
<i>Studies that do not control for endogeneity</i>	248	7158357	0.02***	0.00	0.000	0.02	0.02	0.03	0.03	7619.29	0.000	97%

Notes: mean = mean effect sizes; k = number of effect sizes; N = total sample size; SE = the standard error of mean correlation; Q = Cochran's homogeneity test statistic; I² = scale-free index of heterogeneity; NA means that no effect sizes were available for a specific operationalization of a given variable in a specific analysis. ***p<0.001; ** p<0.01; * p<0.05; #p<0.1.

Table 9. Hedges and Olkin Meta-analysis (HOMA) Results for the VEP Participation – Financial Performance

Analysis group	k	N	Mean	SE	Pearson product-moment correlation (<i>r</i>)					Q test	p-val.	I ²
					95% c.i. low	95% c.i. hi	95% c.i. low	95% c.i. hi	95% c.i. hi			
All studies	499	165312	0.01***	0.00	0.000	0.00	0.01	0.01	0.01	583.21	0.005	15%
Studies that control for endogeneity	NA											
Studies that do not control for endogeneity	NA											
Analysis group	k	N	Mean	SE	Partial correlation coefficient (<i>r_{xy.z}</i>)					Q test	p-val.	I ²
					95% c.i. low	95% c.i. hi	95% c.i. low	95% c.i. hi	95% c.i. hi			
All studies	31	827281	0.03***	0.00	0.000	0.02	0.03	0.03	0.03	272.88	0.000	89%
Studies that control for endogeneity	3	1179	0.18***	0.03	0.000	0.12	0.24	0.24	0.24	0.0108	0.995	0%
Studies that do not control for endogeneity	28	826102	0.02***	0.00	0.000	0.02	0.03	0.03	0.03	241.30	0.000	89%

Notes: mean = mean effect sizes. k = number of effect sizes; N = total sample size; SE = the standard error of mean correlation; Q = Cochran's homogeneity test statistic; I² = scale-free index of heterogeneity; NA means that no effect sizes were available for a specific operationalization of a given variable in a specific analysis. ***p<0.001; ** p<0.01; * p<0.05; †p<0.1

Table 9 reports the HOMA results for the relationships between VEP participation and corporate financial performance. These results show that, overall, VEP participation is associated with somewhat higher levels of corporate financial performance. The mean of r was positive and significant ($r = 0.01$; $s.e. = 0.00$; $p=0.000$), while the mean of $r_{xy,z}$ suggested a more robust effect ($r_{xy,z} = 0.03$; $s.e. = 0.00$; $p=0.000$). Studies that controlled for endogeneity ($r_{xy,z} = 0.18$; $s.e. = 0.03$; $p=0.000$), and studies that did not ($r_{xy,z} = 0.02$; $s.e. = 0.00$; $p=0.000$) both yielded positive and significant mean correlation coefficients.

3.5.2. MARA Results

The MARA results in Table 10 present the test of our hypothesis regarding how VEP stringency impacts participants' environmental performance. Model 1 in Table 10 contains control variables only. Model 2 in Table 4 reports tests of Hypothesis 1, which predicted that VEP stringency positively affects participants' environmental performance. The stringency coefficient is positive and statistically significant ($\beta = 0.01$; $s.e.=0.01$; $p=0.005$), providing support for Hypothesis 1. In both models, results suggest that firms operating in chemical and manufacturing industries report stronger positive effects on participants' environmental performance while firm-level VEPs tend to have a negative impact on participants' environmental performance compared to facility-level VEPs. Results also suggest that environmental performance of VEP participants becomes weaker over time.

Table 10. Meta-analytic Regression Analysis (MARA) Results for Environmental Performance

	Model 1	Model 2
Stringency		0.01** (0.01)
Published study	0.01 (0.02)	0.02* (0.01)
Partial correlation	0.04*** (0.01)	0.05*** (0.01)
Cross-sectional	0.04*** (0.01)	0.04*** (0.01)
Endogeneity control	0.00 (0.01)	-0.00 (0.01)
Time	-0.00*** (0.00)	-0.00*** (0.00)
Firm	-0.10*** (0.02)	-0.07** (0.02)
Chemical	-0.04*** (0.01)	-0.03** (0.01)
Manufacturing	-0.04*** (0.01)	-0.05*** (0.01)
Service	0.13** (0.04)	0.12** (0.04)
Energy	0.04† (0.02)	0.05* (0.02)
Total Emissions	-0.01 (0.02)	-0.00 (0.02)
Difference in emissions	-0.02 (0.02)	-0.01 (0.02)
Environmental Performance Indices	-0.04 (0.02)	-0.03 (0.03)
Environmental practices	-0.03 (0.02)	-0.01 (0.02)
Natural resource use	0.08* (0.04)	0.08* (0.04)
Survey-Based Measures	-0.01 (0.06)	-0.01 (0.06)
<i>K</i>	450	450
<i>Q</i> _{model} (<i>p</i>)	237.81 (0.00)	245.66 (0.00)
<i>Q</i> _{residual} (<i>p</i>)	5144.58 (0.00)	5135.72 (0.00)
<i>V</i>	0.00072	0.00072

Notes: standard errors in parentheses. ***p<0.001; ** p<0.01; * p<0.05; †p<0.1

Model 3 in Table 11 reports the results for methodological and study artifacts for VEP participation and corporate financial performance analyses. Model 4 in Table 11 reports tests of Hypothesis 2 which predicted that VEP governance stringency negatively affects VEP participants' corporate financial performance. The coefficient on stringency in Model 4 is negative and significant at 10% level ($\beta = -0.01$; s.e.=0.01; $p=0.067$), providing some marginal

for Hypothesis 2. Among methodological and study artifacts, results suggest that inclusion of endogeneity controls has a statistically significant effect on financial performance of VEP participants, and this effect is positive. Results also show that VEP participation is positively related to financial performance among firms operating in the manufacturing industry, but is negatively related to financial performance for firms in the chemical industry.

Table 11. Meta-analytic Regression Analysis (MARA) Results for Financial Performance

	Model 3	Model 4
Stringency		-0.01‡ (0.01)
Published study	-0.01 (0.01)	0.01 (0.01)
Partial correlation	0.02 (0.02)	0.03 (0.02)
Cross-sectional	-0.00 (0.01)	-0.00 (0.01)
Endogeneity control	0.14** (0.05)	0.14* (0.05)
Time	-0.00 (0.00)	-0.00 (0.00)
Firm	-0.04 (0.04)	-0.07 (0.05)
Facility	-0.04 (0.04)	-0.05 (0.04)
Chemical	-0.10** (0.04)	-0.12** (0.04)
Manufacturing	0.19** (0.06)	0.19** (0.06)
Financial Market-Based Measures	-0.07 (0.05)	-0.07 (0.05)
Accounting- Based Measured	-0.03 (0.04)	-0.03 (0.04)
<i>K</i>	530	530
$Q_{\text{model}} (p)$	86.05(0.00)	89.73 (0.00)
$Q_{\text{residual}} (p)$	521.46(0.45)	519.95 (0.47)
<i>V</i>	0.00024	0.00023

Notes: standard errors in parentheses. ***p<0.001; ** p<0.01; * p<0.05; ‡p<0.1

3.5.3. Robustness tests

We performed several additional analyses to address a number of problems that commonly affect meta-analyses; results from the additional tests are available upon request from the authors. First, we ran artifact-corrected meta-analytic methods to corroborate our HOMA (Hunter & Schmidt, 2004), which have been increasingly used in recent years. These results are similar to those of the HOMA analysis and support our findings. We also conducted a “one-sample removed analysis” to assess the influence of each individual sample on the HOMA analysis (Borenstein et al., 2009). These results are also similar. Next, to account for the high proportion of ISO14001 programs, we ran a robustness check that excluded ISO14001 studies, which produced results that were consistent with the analyses based on the full samples. We also tested for the presence of publication bias in our sample by creating crafted funnel plots of effect and sample sizes. These figures show a symmetrical pattern with nearly half of the samples to the left of the mean effect size and half to the right; thus, suggesting absence of

publication bias (Duval & Tweedie, 2000). Finally, we used a) Duval and Tweedie's trim and fill (Duval, 2005), (b) cumulative meta-analysis (CMA), and (c) moderate selection models (Harrison, et al., 2017). The results of these tests suggest the absence of publication bias in our meta-analysis.

3.6. Discussion

Our main contributions are to research on the effectiveness of VEPs as self-regulatory institutions. The promise of VEPs depends on their ability to create market-based incentives for firms to improve their environmental performance without the sanctioning power of the state. Prior research has produced extensive mixed results about VEP effectiveness from studies of individual programs, and questions of whether program-level contingencies impact VEP effectiveness are still open (Aragón-Correa et al., 2020). We help address these issues by meta-analyzing extant empirical research on the relationship between VEP participation and corporate environmental and financial performance. We considered how program stringency was a critical design variable for substantively changing firm behavior and creating benefits for firms for their participation (Berchicci & King, 2007; Delmas & Montes-Sancho, 2010; Prakash & Potoski, 2006).

Our results confirm that stringency is critical in determining whether VEPs can effectively improve participants' environmental performance, and that it negatively impacts VEPs' ability improve their financial performance. In particular, HOMA results provide mixed evidence about the impact of VEP participation on corporate environmental performance, suggesting that this relationship depends on unexplored contingencies like stringency, while MARA results show that higher levels of stringency make these programs effective. Additionally, HOMA result suggest that the average VEP helps firms improve their financial performance, regardless of stringency, but MARA results indicate that higher levels stringency negatively impact this effect. Below we discuss the research implications of the meta-analysis

3.6.1. Research Implications

First, our results suggest VEPs rely heavily on their internal institutional mechanisms to make them effective at achieving their first goal, improving corporate environmental performance. In particular, they indicate that programs relying on combinations of normative pressures derived from clear environmental performance targets with flexible implementation policies and normative and coercive pressures from independent oversight expulsion mechanisms, respectfully, are more likely to drive firms to make real improvements in their environmental outcomes. Conversely, our results show that as VEPs become more lenient, they gain avenues for symbolic improvements in environmental performance including complying with weak mandates, decoupling practices from stronger mandates, misstating environmental performance efforts to independent overseers and external legitimacy-conferring stakeholders or ignoring mandates when they face weak potential sanctions. This result contrasts with some previous research that has argued that more lenient VEPs can drive more widespread improvements in corporate environmental performance by attracting broader corporate participation (Matisoff, 2015; Prakash & Potoski, 2012).

Our results also help resolve questions about whether VEPs can meet their promise of helping participating firms improve their financial performance. HOMA results show that these programs do in fact improve corporate financial performance, on the average, before accounting for any program-level variation. We believe this suggests that VEP participation improves firms' external environmental legitimacy, and by extension the quality of their stakeholder relationships and stocks of social capital, which in turn improves firms' competitiveness (Bansal & Clelland, 2004). For example, the Big Four automakers of the U.S. automotive industry each require their suppliers to have ISO14001 certification (King, Lenox, & Terlaak, 2005) implying that it opens new market opportunities for firms in that sector. At the same time, MARA results show that stringency constrains the financial benefits that firms can accrue from joining these programs, implying that stringent VEPs disincentivize corporate participation by generating compliance costs for firms that outweigh their excess legitimization benefits. This suggests that legitimacy-conferring stakeholders do not value the way VEPs are governed as much as the general seals of approval that VEPs give to participating firms. One reasons for this may be that such stakeholders find it difficult to observe VEPs' internal governance systems or how they might be related to corporate environmental performance, and are willing to make judgements based mainly on VEP participation (Wijen, 2014).

Finally, taken together, our findings suggest that, as currently constituted, VEPs are unlikely to achieve their dual goals of improving corporate environmental and financial performance simultaneously, because lenient programs provide firms with financial benefits even though they are unlikely to improve their sustainability outcomes. Thus, the promise of VEPs does appear to be constrained by trade-offs in markets that make them unable to reward firms for ecologically sustainable behavior (Vogel, 2005). To reconcile these trade-offs, we concur with Khanna and Damon (1999) and Ostrom (1999), and, more recently, Aragón-Correa and colleagues (2020), who suggested that VEPs and policy-makers need to collaborate more closely on creating an external institutional framework that can help VEPs create better value for society-at-large. More specifically, policy-makers could establish regulations that mandate certain levels of VEPs stringency, which reduce competition from lenient programs. Alternatively, regulators and VEPs could coordinate their efforts more closely, so the former are responsible for setting explicit environmental performance targets and stringent compliance mechanisms, while VEPs could focus on helping firms design competitive responses to environmental regulation by acting as forums for developing innovative sustainability practices (Doh, Tashman, & Benischke, 2019). Either idea could remove ambiguity for environmentally-concerned stakeholders about what constitutes an effective VEP and allow firms to tailor their practices to their own socioecological and economic contingencies (Wijen, 2014).

3.6.2. Limitations and Future Research Directions

While our study is the most comprehensive investigation to date on how VEPs influence corporate environmental and financial performance, as well as how stringency shapes these relationships, it has several limitations. First, we were not able to simultaneously evaluate the relationship between how VEPs impact corporate environmental and financial performance, respectively, because of the paucity of studies that analyzed both effects. Future research could directly address this question to generate evidence on whether VEPs can meet their goal of

creating win-win outcomes. Such research should involve a substantial cross-section of programs like in our study, in order to account for the role of VEP governance in determining these relationships. Second, our study included only a limited number of effect sizes for VEPs that set explicit environmental performance targets due to lack of quantitative research on the effectiveness of such programs. In the future, as more research on these types of programs emerges, it will be important to continue to assess their relative effectiveness. Lastly, our study focused on primary studies in the United States, and therefore avoided research from other countries to control for institutional variation. Thus, our study did not examine how firms' home countries and their formal institutions and national governance systems impact VEP effectiveness. These country-level factors are likely important because the strength of home-country formal institutions shapes the regulatory backdrop for VEPs, and ultimately their effectiveness (Khanna & Damon, 1999). We believe that this gap represents a promising future research opportunity to advance our understanding of how the interplay of formal and self-regulatory institutions impact firm behaviors (Aragón-Correa et al., 2020).

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Appendix

Primary Studies Included in the Analysis

Author	Year	Title	Journal
Arimura T. H., Darnall N., Ganguli R. & Katayama H.	2016	The Effect of ISO 14001 on Environmental Performance: Resolving Equivocal Findings	Journal of Environmental Management
Berrone P., Fosfuri A. & Gelabert L.	2017	Does Greenwashing Pay Off? Understanding the Relationship Between Environmental Actions and Environmental Legitimacy	Journal of Business Ethics
Bi X. & Khanna M.	2012	Reassessment of the Impact of the EPA's Voluntary 33/50 Program on Toxic Releases	Land Economics
Bi X. & Khanna M.	2013	Preventing vs Recycling of Toxic Releases: Role of the 33/50 Voluntary Environmental Program	unpublished
Bi X. & Khanna M.	2017	Inducing Pollution Prevention Adoption: Effectiveness of the 33/50 Voluntary Environmental Program	Journal of Environmental Planning and Management
Bi X., Deltas G. & Khanna M.	2011	Adoption of Pollution Prevention: The Role of Information Spillover, Mandatory Regulation, and Voluntary Participation	unpublished
de Jong P., Paulraj A. & Blome C.	2014	The Financial Impact of ISO 14001 Certification: Top-Line, Bottom-Line, or Both?	Journal of Business Ethics
Delmas M. A. & Montes-Sancho M. J.	2010	Voluntary Agreements to Improve Environmental Quality: Symbolic and Substantive Cooperation	Strategic Management Journal
Dutt N. & King. A.	2014	The Judgment of Garbage: End-of-Pipe Treatment and Waste Reduction	Management Science
Fisher-Vanden K. & Thornburn K. S.	2011	Voluntary Corporate Environmental Initiatives and Shareholder Wealth	Journal of Environmental Economics and Management
Friedman K.	2011	What Factors Affect an Organization's Degree of Participation in Voluntary Programs? An Analysis of the US Green Power Partnership Program	unpublished
Gamper-Rabindran S.	2006	Did the EPA's Voluntary Industrial Toxics Program Produce Emissions? A GIS Analysis of Distributional Impacts and by-Media Analysis of Substitution	Journal of Environmental Economics and Management

Gamper-Rabindran S. & Finger S.R.	2013	Does Industry Self-Regulation Reduce Pollution? Responsible Care in the Chemical Industry	Journal of Regulatory Economics
Goetsche M., Steindl T. & Gietl S.	2016	Do Customers Affect the Value Relevance of Sustainability Reporting? Empirical Evidence on Stakeholder Interdependence	Business Strategy and the Environment
Griffith C., Wheeler W. & Wolwerton A.	2016	Evaluating the Effectiveness of Voluntary Programs: Did Ohio's Tox-Minus Initiative Affect Participants' TRI Emissions?	unpublished
Heo K., Krutilla K. & Good D. H.	2009	Can Voluntary Environmental Program Reduce Greenhouse Gas Emissions? An Analysis of the US DOE's Climate Challenge Program	unpublished
Hoang P. C., McGuire W. & Prakash A.	2016	Is there Life after Death? The Enduring Effects of the 33/50 Program on Emission Reductions	unpublished
Holtermans R. & Kok N.	2019	On the Value of Environmental Certification in the Commercial Real Estate Market	Real Estate Economics
Innes R. & Sam A. G.	2008	Voluntary Pollution Reductions and the Enforcement of Environmental Law: An Empirical Study of the 33/50 Program	Journal of Law and Economics
Keele D. M & DeHart S.	2011	Partners of USEPA Climate Leaders: an Event Study on Stock Performance	Business Strategy and the Environment
King A. & Lenox M.	2000	Industry Self-regulation Without Sanctions: the Chemical Industry's Responsible Care Program	The Academy of Management Journal
King A., Lenox M. J. & Terlaak A.	2005	The Strategic Use of Decentralized Institutions: Exploring Certification with the ISO 14001 Management Standard	Academy of Management Journal
Lenox M.	2006	The Role of Private Decentralized Institutions in Sustaining Industry Self-Regulation	Organization Science
Lo C.K.Y., Yeung A.C.L. & Cheng T.C.E.	2012	The Impact of Environmental Management Systems on Financial Performance in Fashion and Textiles Industries	International Journal of Production Economics
Melnyk S.A., Sroufe R. P., Calantone R. L. & Montabon F. L.	2002	Assessing the Effectiveness of US Voluntary Environmental Programmes: An Empirical Study	International Journal of Production Resources
Moon S., Bae S. & Jeong M-G.	2014	Corporate Sustainability and Economic Performance: An Empirical Analysis of a Voluntary Environmental Program in the USA	Business Strategy and the Environment
Narasimhan R., Schoenherr T. & Jacobs B. W.	2015	The Financial Impact of FSC Certification in the United States: A Contingency Perspective	Decision Sciences
Noh Y.	2012	The Effect of Environmental Management on U.S. Public Firms' Financial Performance and Equity Structure: a Longitudinal Analysis Using ISO 14001	unpublished

Paulraj A. & de Jong P.	2011	The Effect of ISO 14001 Certification Announcements on Stock Performance	International Journal of Operations & Production Management
Pizer W., Morgenstern R. & Shih J.-S.	2011	The performance of Industrial Sector Voluntary Climate Programs: Climate Wise and 1605(b)	Energy Policy
Potoski M. & Prakash A.	2005	Covenants with Weak Swords: ISO14001 and Facilities' Environmental Performance	Journal of Policy Analysis and Management
Potoski M. & Prakash A.	2005	Green Clubs and Voluntary Governance: ISO 14001 and Firms' Regulatory Compliance	American Journal of Political Science
Rivera J. & de Leon P.	2004	Is Greener Whiter? Voluntary Environmental Performance of Western Ski Areas	Policy Studies Journal
Rivera J., de Lean P. & Koerber C.	2006	Is Greener Whiter Yet? The Sustainable Slopes Program after Five years	Policy Studies Journal
Robinson S., Singh A.J. & Das P.	2016	Financial Impact of LEED and Energy Star Certifications on Hotel Revenues	Journal of Hospitality Financial Management
Russo M.	2009	Explaining the Impact of ISO 14001 on Emission Performance: a Dynamic Capabilities Perspective on Process and Learning	Business Strategy and the Environment
Russo M. V. & Harrison N. S.	2005	Organizational Design and Environmental Performance: Clues from the Electronics Industry	The Academy of Management Journal
Sam A. G., Khanna M. & Innes R.	2009	Voluntary Pollution Reduction Programs, Environmental Management, and Environmental Performance: an Empirical Study	Land Economics
Simpson D.	2012	Knowledge Resources as a Mediator of the Relationship Between Recycling Pressures and Environmental Performance	Journal of Cleaner Production
Toffel M. W.	2005	Resolving Information Asymmetries in Markets: The Role of Certified Management Programs	unpublished
Vidovic N. & Khanna N.	2007	Can Voluntary Pollution Prevention Programs Fulfil their Promises? Further Evidence from the EPA's 33/50 Program	Journal of Environmental Economics and Management
Vidovic N. & Khanna N.	2012	Is Voluntary Pollution Abatement in the Absence of a Carrot or Stick Effective? Evidence from Facility Participation in the EPA's 33/50 Program	Environmental Resource Economics
Welch E. W., Mazur A. & Bretschneider S.	2000	Voluntary Behaviour by Electric Utilities: Levels of Adoption and Contribution of the Climate Challenge Program to the Reduction of Carbon Dioxide	Journal of Policy Analysis and Management
Welch E. W., Rana A. & Mori Y.	2003	The Promises and Pitfalls of ISO 14001 for Competitiveness and Sustainability	Greener Management International

Zhou R., Bi X. & Segerson K.	2019	Evaluating Voluntary Environmental Programs with Spill over Effects	Journal of the Association of Environmental and Resource Economists
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Notes

¹ We searched the following 46 program names: Alliance for Environmental Innovation, Audubon Cooperative Sanctuary Program, Building America, Business Charter for Sustainable Development, Business for Social Responsibility, Caux Roundtable, Certified Environmental Drycleaner, Chemical Strategies Partnership, Climate Challenge Program, Coalbed Methane Outreach Program, Coalition for Environmentally Responsible Economies, Coatings Care, Commuter Choice Leadership Initiative, Energy Star, Environmental Leadership Program, Environmental Technology Verification Program, Forest Stewardship Council, Global e-Sustainability Initiative, Global Reporting Initiative, Great Lakes Automotive Pollution Prevention Project, Great Printers Project, Green Power Market Development Group, Hospitals for a Healthy Environment, International Hotels Environment Initiative, ISO 14001, Kimberly Accords, Landfill Methane Outreach Program, Marine Stewardship Council, Mercury Challenge Program, Merit Partnership for Pollution Prevention, Mobile Air Conditioning Climate Protection Partnership, National Environmental Performance Track, National Waste Minimization Partnership Program, Project XL, Rainforest Alliance, Recycled Paper Coalition, Responsible Care, Sustainable Apparel Coalition, Sustainable Forestry Initiative, the Natural Step, UN Global Compact, US Automotive Pollution Prevention Project, UTZ, Waste-Wise, Water Alliances for Voluntary Efficiency, and 33/50.

² The journals in our search list were *Academy of Management Journal*, *American Economic Review*, *American Journal of Political Science*, *American Political Science Review*, *Business and Society*, *Ecological Economics*, *Environmental and Resource Economics*, *Journal of Business Ethics*, *Journal of Cleaner Production*, *Journal of Economics and Management Strategy*, *Journal of Environmental Economics and Management*, *Journal of Management*, *Journal of Policy Analysis and Management*, *Journal of the Association of Environmental and Resource Economists*, *Organization and Environment*, *Organization Science*, *Policy Sciences*, *Policy Studies Journal*, *Review of Economics and Statistics*, *Strategic Management Journal*.

Chapter 4. A Cross-Country Study of the State's Multifaceted Impact on Greenwashing

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Abstract

There is growing evidence that governments are playing an increasingly important role in promoting corporate environmental sustainability. However, little is known about their ability to discourage firms from engaging in greenwashing by selectively disclosing more favorable and benign environmental information. In this paper, we explore two important mechanisms through which governments can affect firms' behaviors in this area – environmental regulations and state ownership. We also study whether the presence of external audit impacts the effectiveness of environmental regulations and state ownership in greenwashing mitigation. Our analysis is based on a sample of 1,731 firms from 34 countries between 2007 and 2017 and shows that both environmental regulations and state ownership are effective in preventing greenwashing by exerting coercive pressures and creating governance structures to align objectives between owners and managers. Finally, our results suggest that external audit of non-financial disclosure intensifies the influence of environmental regulations on audited firms and provides an additional layer of monitoring that is effective enough to substitute the negative impact of regulations firm propensity to greenwash.

Publication Status

Working paper

Keywords: greenwashing, non-financial disclosure, sustainability reporting, state ownership, environmental regulations

4.1. Introduction

As global concerns about the scale and scope of environmental issues continue to grow (George, Howard-Grenville, Joshi, & Tihanyi, 2016), societal expectations about the need for firms to become part of the solution have also strengthened (Durand, Hawn, & Ioannou, 2019; Fabrizio & Kim, 2019; Marquis, Toffel, & Zhou, 2016). One important way through which firms are attempting to respond to these pressures is by disclosing their efforts and impacts in the environmental arena. According to a recent KPMG report, 96% of the world's 250 largest companies by revenue issued a sustainability report in 2020 compared to only 35% in 1999 (KPMG, 2020). However, it remains unclear whether increased corporate environmental disclosure reflects greater substantive action that minimizes the harm to the natural environment (Kim & Lyon, 2015).

This question is particularly important in light of the growing evidence that firms often engage in selective disclosure, a form of greenwashing that entails selectively disclosing more favorable and relatively benign environmental performance indicators to strengthen their environmental legitimacy without revealing the full scope of their environmental impacts (Delmas & Burbano, 2011; Kim & Lyon, 2015; Marquis et al., 2016). Greenwashing has become an important topic both among scholars and practitioners because an increasing number of stakeholders rely on environmental disclosure to properly evaluate firms' environmental impacts and risks, reward positive corporate behaviors and investigate pressures to mitigate negative impacts on the environment (Jira & Toffel, 2013; Marquis et al., 2016). For example, 68% of energy leaders in the US think that: "More often than not, companies that announce environmental sustainability initiatives in the U.S. are not taking the steps to actually back them up (i.e., more talk than action)" (State of the U.S. Energy Report, 2021).

Importantly, governments have started to play an increasingly central role with regard to firms' environmental sustainability impacts and disclosures (Marquis & Qian, 2014; Wang, Wijen, & Heugens, 2018). Indeed, as global pressures for natural environmental protection keep rising, states have felt compelled to take action, and many countries and supranational organizations like the European Union already have agendas in place to promote environmental protection (OECD, 2010). Governments use a variety of mechanisms such as regulation, pollution levies, subsidies, and share ownership to induce environmentally-friendly practices among firms operating within their boundaries (Henriques & Sadorsky, 1996; Kemp, Soete, & Weehuizen, 2012). Generally, research shows that these mechanisms improve firms' propensity to engage in environmental disclosures (Delmas, 2002; Henriques & Sadorsky, 1996), but that they vary in their effectiveness (Sun & Zhang, 2019).

Less is known, however, about the extent to which governments can affect the transparency and reliability of firms' environmental disclosures. Research in this area is scarce and mostly focused on the Chinese context, revealing that the Chinese government may have been able to discourage greenwashing through monitoring efforts (Marquis & Qian, 2014) and sanctions, such as monetary penalties (Sun & Zhang, 2019). However, questions remain about the generalizability of these findings to other regulatory contexts where the state may not play such a central role in the economy. In addition, extant research examines the mechanisms through which governments can impact firms' greenwashing behaviors in isolation. For

example, Marquis and Qian (2014) show that government monitoring discourages symbolic CSR actions in China. While a step in the right direction, this approach limits our understanding of the overall role that governments may play vis-à-vis greenwashing.

To begin addressing this gap, in this paper we develop a comprehensive investigation of the role of the state vis-à-vis greenwashing by examining the two main mechanisms through which governments can influence firms' environmental disclosure - environmental regulations and direct state ownership, as well as their interactions. Environmental regulations have been recognized as an important driver of corporate environmental practices (Delmas & Toffel, 2004), but there is limited evidence as to whether they are effective in deterring greenwashing. State ownership has been much less explored with regards to its impact on firms' environmental practices and disclosure, but is nonetheless, a relevant dimension since 20% of worldwide investment is carried out by states (International Finance Corporation, 2018) and state ownership is present in more than a fifth of the world's largest firms (OECD, 2018). One of the governments' goals is to maximize the public good, and environmental protection is part of this broader social welfare (Kotchen, 2014). Thus, states, in their roles as corporate owners, might have an incentive to alleviate firm propensity to greenwash. We also consider the role of external auditing in influencing firms' propensity to greenwash. The external audit is an external governance mechanism (Aguilera, et al. 2015) that verifies disclosed information and is considered as an important tool for improving the quality and transparency of non-financial disclosure (Adams & Evans, 2004; Dando & Swift, 2003; Jackson, et al., 2020; Wickert, 2016).

We explore these questions by relying on a large cross-country panel dataset with 9,938 observations for 1,731 firms from 34 countries between 2007 and 2017. Our model draws on institutional and agency theories to argue that the state's regulatory and monitoring capacity are two important deterrents of firms' greenwashing behavior. Moreover, we argue that external auditing is an external corporate governance mechanism which, under certain conditions, may act as a substitute for environmental regulations and state ownership. Drawing on institutional theory, we propose that more stringent environmental regulations are likely to reduce corporate greenwashing by incentivizing firms' efforts to protect their environmental legitimacy. Then, drawing on agency theory, we argue that state ownership alleviates principal agency problems by aligning the incentives of owners and managers with regard to environmental practices and disclosure. Our results support our arguments by showing that both environmental regulations and state ownership are associated with lower levels of greenwashing. In addition, we show that the external audit of sustainability reports intensifies institutional pressures stemming from environmental regulations and acts as a substitute of the role of environmental regulations vis-à-vis greenwashing.

Our study advances research in sustainability and corporate governance in four ways. First, research on corporate social responsibility (CSR) identifies firm ownership as a relevant determinant of firm CSR engagement, but this evidence is limited, and the literature calls for future studies on ownership and CSR (Dam & Scholtens, 2012). We contribute to the broader literature on CSR by showing that both environmental regulations and state ownership are associated with lower levels of greenwashing and by providing fine-grained evidence on the combined effect of regulations and state ownership on greenwashing. Second, we add to the

debate on the positive side of state capitalism which is focused on the state being an efficient economic actor that works alongside private investors (Musacchio, Lazzarini, & Aguilera, 2015). We add to this literature by uncovering novel arguments on the different mechanisms by which this new form of state ownership positively intervenes in the economy to trigger good sustainability practices. More specifically, we develop conceptual logic to explain the reasons behind lower levels of greenwashing. Third, we respond to a call to develop theoretical hypotheses and provide empirical evidence on the relationship between the external audit of CSR reports and transparency of non-financial reporting (Pinnuck et al., 2020). We show that the capabilities of the external audit are robust, and they can even substitute the role of environmental regulation in promoting transparency of environmental disclosures. With that, we contribute to the nascent literature on sustainability auditing. Finally, while almost all prior research on the role of the state in environmental responsibility and irresponsibility has been conducted in the context of China, in this paper we bring novel cross-national evidence on the role of the state in deterring greenwashing by relying on a global sample of 34 countries. The Chinese state has specific features which may not be generalizable to other contexts. Thus, it is important to extend this research to other institutional contexts to provide a more comprehensive picture of state influence on greenwashing.

4.2. Theoretical background

4.2.1. Environmental Disclosure and Greenwashing

Research suggests that firms engage in environmental disclosure as a response to social and political pressures and to mitigate legitimacy threats (Kim & Lyon, 2015; Marquis et al., 2016). Due to increased awareness of environmental issues, a growing number of stakeholders such as governments, investors, employees, customers, non-governmental organizations (NGOs) among others have been increasingly expecting firms to disclose their environmental impacts and risks (Eccles, Serafeim, & Krzus, 2011; Jira & Toffel, 2013). Most firms comply with these stakeholder demands by disclosing some environmental information, but prior research and some practical evidence indicate that, under increased pressure to disclose their environmental impacts, firms may not always provide the most accurate and reliable reporting where they might misrepresent or omit critical information (Financial Times, 2020; Marquis et al., 2016).

Disclosures of firms' environmental impacts differ from financial disclosures in some fundamental ways. In particular, they tend to be much less regulated and standardized than financial disclosures (Serafeim, 2015; Tschopp & Huefner, 2015). For instance, environmental disclosures remain voluntary in most countries and lack a uniform reporting framework. In addition, they often include information that is not always easily verifiable as it consists of a mix of quantitative and qualitative data (Perrini, 2006). Moreover, voluntary environmental disclosures are often dispersed over a wide range of sources, including media releases, web sites and sustainability reports. These characteristics make it easier for firms to strategically report misleading information by engaging in a cost-benefit calculation, and by disclosing environmental information when benefits of such disclosure exceed costs (Deegan & Rankin, 1999; Verrecchia, 1983). Also, most stakeholders lack the specific knowledge and skills that

are needed to verify the quality and trustworthiness of non-financial disclosures (Bowen & Aragon-Correa, 2014) which makes such strategic disclosures possible. This is problematic as greenwashing can mislead stakeholders who rely on disclosed information to form their opinions about firms' environmental efforts, risks, and performance that in turn inform their decisions, such as investment decisions or voting preferences.

Firms' misleading communications that direct stakeholders to adopt an overly positive view about firms' environmental performance, practices or products are usually referred to as greenwashing (Lyon & Montgomery, 2015). In this paper, we specifically focus on selective disclosure, which is a form of greenwashing that entails disclosing positive information about a company's environmental performance without including the full details about its negative impacts (Lyon & Maxwell, 2011; Marquis et al., 2016). In essence, companies that engage in selective disclosure only reveal part of their real impacts, since they may not be necessarily disclosing false information, but may choose to omit material information that would be damaging to their reputation. In this way, they mislead stakeholders by focusing only on information that enhances or at least does not damage their environmental legitimacy. Selective disclosure relies on verifiable information about environmental performance, which makes it less subjective compared to other types of misleading disclosure (Lyon & Montgomery, 2015).

It is important to note that overstating a firm's environmental impacts in corporate disclosures can be a risky behavior because, if it is detected and exposed, it can generate negative legitimacy spillovers and increased regulatory oversight among other penalties (Berrone, Fosfuri, & Gelabert, 2017; Delmas & Burbano, 2011; Ferrón-Vílchez, Valero-Gil, & Suárez-Perales, 2021; Tashman, Marano, & Kostova, 2019). These costs can easily outweigh the potential short-term benefits of greenwashing. For example, by examining a sample of Canadian firms in visibly polluting industries, Walker & Wan (2012) show that greenwashing negatively affects the financial performance of firms. Despite the risks, some firms still choose to greenwash.

4.2.2. Hypotheses development

Extant literature identifies the state as a major source of pressure for firms with regards to environmental protection (Henriques & Sadosky, 1996) and as the main determinant of the environmental practices adopted by firms (Delmas & Toffel, 2004; Wang et al., 2018). Our research suggests that there are two main mechanisms through which states can tackle environmental externalities by the private sector. First, they rely on environmental regulation that establishes certain environmental performance goals and monitor compliance (Kemp et al., 2012). Driven by the need to comply with environmental regulations, firms adopt strategies aimed to protect the natural environment to be perceived as legitimate. Legitimacy granted by the state is particularly important for firms as it can help to prevent more stringent regulations and inspections and protect from potentially higher costs of compliance (Henriques & Sadosky, 1996). Second, as owners of firms, states can also use their position to enact change in the company's behaviors (Aguilera et al., 2021; Wright et al., 2021). Research shows that with the rise of state capitalism, strategic state ownership, where governments work alongside private investors in contrast to being a sole owner, (Musacchio et al., 2015; Tihanyi et al.,

2019), allows states to have an influence on the environmental strategies of firms that they own, but also to set norms for other firms and investors. In light of this evidence, we explore the multifaceted role of the state vis-à-vis firms' greenwashing behaviors through these two mechanisms and their interaction. In addition, we examine how external auditing affects state-driven effects on greenwashing. The external audit is an external governance mechanism that makes institutional pressures stemming from environmental regulations more pronounced and that enhances firm legitimacy by minimizing information asymmetries between owners and managers which consequently, lowers agency costs in contributing to the state's efforts in this area. Thus, an external audit can potentially enhance the effectiveness of environmental regulations and state ownership in the area of environmental disclosure by providing effective governance that improves compliance in the area of environmental disclosures.

4.2.2.1. *Environmental Regulations and Greenwashing*

State regulations are key drivers of firms' behaviors (Pfeffer & Salancik, 1978). Environmental regulations include command and control mechanisms such as standards and prohibitions related to inputs, processes and outputs as well as a range of economic instruments such as environmental taxes (Botta & Koźluk, 2014). For example, the European Directive on Non-Financial Reporting requires large companies that operate in certain industries to disclose their social and environmental impacts. Environmental regulations give monitoring and enforcement powers to government agencies over firms' environmental behavior and threaten or suspend firm operations based on inspection results of their environmental practices and performance. States can also use monetary punishment mechanisms such as fines. All these mechanisms are perceived by firms as coercive pressures (Delmas & Toffel, 2004) that are costly for firms to comply with, but non-compliance can possibly pose an even higher cost due to the threat to their environmental legitimacy that can trigger a negative spill-over to other stakeholders besides the state.

Overall, the literature recognizes that environmental regulations have a positive influence on firms' environmental performance (Bryant, Griffin, & Perry, 2020; Henriques & Sadosky, 1996) and environmental disclosure (Huang & Kung, 2010; Marquis, Zhang, & Zhou, 2011). There is also some, albeit limited research suggesting that more stringent environmental regulations can help deter greenwashing. For instance, in their theoretical assessment of greenwashing, Delmas and Burbano (2011) point out that a lax regulatory environment is the main driver of greenwashing. Sun and Zhang (2019) study greenwashing in China, and find that states' sanctions, such as environmental penalties, are powerful tools for minimizing greenwashing. Marquis and Qian (2014) and Kim and Lyon (2015) support this finding by showing that firms produce more substantive CSR reports when they are closely monitored by government authorities.

We suggest that the stringency of environmental regulations in a given country will negatively influence local firms' propensity to greenwash for two main reasons. First, more stringent environmental regulations put firms in the position of greater regulatory monitoring and oversight of their processes and environmental performance as regulatory inspections are more likely in such contexts (Bryant et al., 2020). Regulatory inspections may involve

interviewing facility or site representatives, reviewing records and reports, taking photographs, collecting samples and observing operations to evaluate compliance with environmental regulations and requirements. Even though regulatory inspections do not specifically target assessing the quality of a firm's environmental disclosure, review of such disclosures is often included in the scope of the regulatory inspection as they represent the main source for firms to communicate their environmental information to regulators and other stakeholders (the United States Environmental Protection Agency). Greater scrutiny of a firm's behavior is likely to result in higher coercive institutional pressures for firms to comply with the rules set by the state and is likely to act as a preventive mechanism from greenwashing as the risk of being uncovered and penalized is higher compared to environments with lower regulatory scrutiny.

Second, public agencies also possess certain normative and cognitive features that frame decision-making (Selznick, 1949) and help to diffuse environmentally-friendly norms and environmental awareness in the community that are often reflected in business practices. For example, through the successful sustainability-related agenda of Norway's Sovereign Wealth Fund, the Norwegian government is also able to exercise a strong normative influence on the environmental practices of Norwegian firms and their investment targets (Vasudeva, 2013). These norms become embedded in organizations, and individuals making them are less likely to engage in behaviors that violate the social norms (Vasudeva, 2013). Greenwashing is an example of such behavior. Moreover, if greenwashing is uncovered in a society that is concerned about environmental sustainability, the punishment from other stakeholders (i.e., NGOs) and legitimacy loss is likely to be more severe as environmental awareness and values are higher in those contexts (Fernandez-Feijoo, Romero, & Ruiz, 2014).

Thus, we predict that:

Hypothesis 1: Stringency of environmental regulations are negatively related to greenwashing.

4.2.2.2. State Ownership and Greenwashing

While states typically pursue their political agenda through regulatory mechanisms, they may also make use of their ownership stakes in companies to enact change in the environmental arena (Aguilera et al., 2021).

According to the agency theory, the separation between principals (owners) and agents (management) creates information asymmetries as principals designate agents to make decisions on their behalf (Jensen & Meckling, 1976). Agents are likely to have different objectives than the principals because while principals aim to maximize the goals of the nation, agents strive to advance their career or use their position for personal benefits (Heugens et al.). Thus, agents may choose to disclose environmental information strategically in order to cover up the firm's actual performance from the principals (Donnelly & Mulcahy, 2008). Greenwashing can help agents to be recognized for achieving better than actual environmental performance, and this recognition might be important for their reputation and career growth. To mitigate agency problems, principals need to design incentives and monitoring mechanisms to ensure a better alignment of principal and agent objectives (Jensen & Meckling, 1976).

We identify two main mechanisms through which state ownership can impact firms' propensity to greenwash. First, as the objectives of states' business investments tend to be multifaceted, the state as an owner may lessen managers' propensity to pursue short-term profit maximization goals at the expense of longer-term objectives in the social and environmental arenas (Shi, Aguilera, & Wang, 2020). In particular, states may invest because they want to protect a certain firm in a strategic industry or to fulfill its political or social goals which does not correspond to traditional profit-maximizing investment. As a result, even though state owners and managers might pursue different goals, managers have fewer incentives to greenwash because their performance is not tied only to short-term value creation. In contrast, managers in firms without significant state ownership are likely to be under greater pressure to perform financially and they are exposed to the market of corporate control, and thus, might have more incentives to greenwash to cover up certain negative aspects of their environmental performance. Greenwashing can help these firms to be perceived more legitimate and make them potentially more competitive (Berrone et al., 2017; Cormier & Magnan, 2015; Lamin & Zaheer, 2012) by underscoring positive aspects of environmental performance and initiatives of their firms without disclosing all the negative aspects. However, greenwashing is risky and can cause major legitimacy losses if uncovered (Berrone et al., 2017), especially for managers in firms with state ownership that are tasked with social objective fulfillment.

Second, state owners often appoint executives and managers to the firm that have connections with the government, which is a mechanism that helps to minimize information asymmetries between the state and managers and to improve the government's ability to monitor managers (Yiu, Wan, & Xu, 2019). These political connections have a binding effect between the firm and the state, which makes firms with a significant state ownership stake more likely to follow the state's agenda, including the pursuit of its social and political objectives (Marquis & Qian, 2014). These appointees can also act as inside monitors or informants to state owners, which helps to further reduce information asymmetry between managers and the state (Lazzarini, 2015). Appointing politically connected managers allows state owners to directly influence monitoring of the firm and curb behaviors that are not consistent with the objectives of the state (Heugens et al., 2020), such as greenwashing. Greenwashing is not desirable by the state because it directly violates the environmental sustainability agenda that includes reliable environmental disclosure and because if it is uncovered, it can attract negative media attention that can harm legitimacy and public trust in the state. Thus, the state as an owner can appoint executives and managers with bureaucratic embeddedness that results in greater scrutiny and increases pressure on managers to engage in more transparent environmental disclosure and deter greenwashing.

All in all, limited incentives to greenwash and lower information asymmetries between state owners and managers are likely to make firms with significant state ownership less likely to greenwash. Thus, we predict that:

Hypothesis 2: State ownership is negatively related to greenwashing.

Most research on state ownership has treated its influence on firm environmental practices as monolithic, but there are different types of state-owned enterprises, depending on the state entity owning the shares, which can range from central state agencies to the administrative

units of small villages to state-owned investment funds. These entities are distinct in their environmental mandates and concerns, as we further detail below. As a result, the state's influence on firms is likely to vary depending on the nature of the entity that owns the shares (Wang et al., 2018). The existing literature identifies three main types of state owners, namely centrally-owned state firms, which are owned by a central state entity such as regulatory agency, locally owned state firms, which are owned by a local state entity such as province, municipality or district (Wang et al., 2018), and sovereign wealth funds, which are known as state-owned institutional investors (Vasudeva, Nachum, & Say, 2018). States with large amounts of financial reserves stemming from natural resources and trade surpluses invest these financial reserves in the global economy through state-owned sovereign wealth funds (Aizenman & Glick, 2009; Inoue, Lazzarini, & Musacchio, 2013).

The central state is a dominant actor and policymaker in relation to environmental protection (Wang et al., 2018) as environmental issues are global by nature and need to be addressed primarily by central states (Qi, Ma, Zhang, & Li, 2008). As a direct extension of the state, firms owned by a central state entity are likely to be guided not only by financial objectives but also by the social and political agendas of the state that includes environmental protection. As environmental issues are becoming more acute, central states have become to be obliged to prioritize environmental protection as it is an essential component for politicians to gain votes and to remain in power (Hsu, Liang, & Matos, 2020). Therefore, to minimize agency costs, firms owned by central state agencies are likely to have monitoring and incentive mechanisms in place to align the firms' objectives and behaviors with the goals of the central state, which in turn should decrease the propensity of managers to greenwash.

Local states have their own political and social agendas, and they do not necessarily need to be consistent with the agenda of the central state. Local states can be quite hierarchically distant from central states, which gives them discretion and autonomy. Typically, local states prioritize economic development over environmental protection (Qi et al., 2008) which is reflected in their more short-term oriented financial goals. Literature on corporate misconduct identifies financial pressure as the main reason for managerial misconduct (Shi et al., 2020). However, local states do serve as agents or delegates of the central state which requires them to put at least some level of effort into implementing targets and plans in all policy areas, including environmental protection (Qi et al., 2008; Wang et al., 2018). For example, after 2007 in China, provincial governments started to organize offices and form task forces to design plans to tackle climate change as a response to the emerging climate-change-related agenda of the central government (Qi et al., 2008). Thus, we expect the propensity of managers to greenwash in firms with local state ownership to be relatively low, but higher compared to firms with central state ownership.

Sovereign wealth funds are state-owned investment funds that tend to pursue long-term-oriented investment strategies and that do not have a formal responsibility towards shareholders (Aguilera, Capapé, & Santiso, 2016; Vasudeva et al., 2018). Sovereign wealth funds are guided both by financial objectives as well as political and social objectives that are established by the state (Bernstein, Lerner, & Schoar, 2013; Megginson & Fatak, 2015). There are some funds, such as Norway's Government Global Pension Fund, that show exemplary commitment to

sustainability (Kim, Lee, & Kang, 2021; Vasudeva, 2013), but there is also a great deal of heterogeneity among sovereign wealth funds due to their size, country of origin and sources of wealth. Since sovereign wealth funds do not have any responsibility towards shareholders, they operate in a more opaque environment as they are not subject to investor scrutiny. Also, since sovereign wealth funds invest internationally, states have fewer incentives to monitor their environmental disclosures as firm operations take place in foreign countries, and states are less concerned about the transparency of environmental disclosures in other countries. Moreover, most sovereign wealth funds are based in countries with relatively low corporate governance standards, and corporate governance practices of sovereign wealth funds tend to reflect the ones of their host countries (Aizenman & Glick, 2009). Due to the opacity of sovereign wealth fund operations and the prevalence of potentially problematic governance standards among them, we predict that sovereign wealth funds will devote fewer resources to principal agency cost minimization to prevent greenwashing compared to central and local states. Thus, sovereign wealth funds will be more likely to greenwash compared to firms with central and local state ownership.

Hypothesis 2a: The negative impact of state ownership on greenwashing is greater for central state ownership, followed by local state ownership and sovereign wealth funds.

4.2.2.3. State Ownership, Environmental Regulations and Greenwashing

We expect environmental regulations and state ownership to have a reinforcing effect on greenwashing because together they expose firms to pressures for environmentally friendly actions and their disclosure and create appropriate governance systems and incentives that reduce managers' propensity to greenwash. State environmental regulations support national objectives in the area of natural environmental protection by setting targets and exerting coercive pressures on firms with an aim to promote corporate environmental sustainability (Henriques & Sadorsky, 1996) that can potentially act as mitigating mechanisms of greenwashing. In addition, the state as an owner is likely to act in a way that fulfills its social and political goals, including pursuing objectives that are related to the protection of the natural environment. To achieve this, states as owners create governance structures that align the interests of owners and managers minimizing agency costs and reducing managers' propensity to greenwash. The strength of environmental regulations can reinforce state owners' efforts in this area by increasing their attention to the subject of corporate sustainability in general and by providing guidance and external monitoring that further contributes to reducing principal agency problem and mitigating managerial propensity to greenwash. At the same time, state owners can support the achievement of environmental policy targets by making sure that they have proper incentives in place for managers to act in an environmentally friendly manner and provide reliable environmental disclosures. Instead, when environmental regulations are lenient, state owners are likely to pay less attention to environmental sustainability as it is less of a priority at the national level, and therefore, is less likely to create governance structures to align incentives between owners and managers in a way that limits the incidence of greenwashing.

Thus, we predict that state ownership and regulations would have a reinforcing negative effect on greenwashing.

Hypothesis 3: The combined effect of state ownership and stringent environmental regulations mitigates greenwashing.

4.2.2.4. External Audit of Non-Financial Disclosure

As the number of firms that disclose non-financial information continues to rise, audit or assurance of non-financial disclosure is becoming a common practice. In fact, 62% of the largest 250 firms by revenue globally had their sustainability reports assured in 2020 (KPMG, 2020). Firms decide to audit their non-financial disclosure to remove information asymmetries with interested stakeholders and increase the credibility and legitimacy of their disclosures (Muslu et al., 2019; Perego & Kolk, 2012). Audit of non-financial disclosure includes an evaluation of the provided information with the goal to assess its completeness and reliability. Non-financial disclosure audits can be internal, which means they are conducted by a designated employee within the firm, or external, which means they are conducted by an independent third-party entity, such as a “Big Four” accounting firm. Here, when discussing auditing, we are focusing on external independent third-party audits of non-financial disclosure.

We expect the external audit of environmental disclosures to strengthen the mitigating effect of regulations and state ownership on greenwashing. First, the objective of an external audit is to verify whether the firm is complying with regulations and to assure the reliability of the issued report. According to institutional theory, external audit of non-financial disclosure enhances firm legitimacy (Aguilera et al., 2015). It does so because external audits of non-financial disclosure are typically handled by professionals who are trained and experienced in detecting inconsistencies and errors related to non-financial disclosure. A recent study indicates that approximately 20% of inspected reports in their sample were returned for error correction or revision related to scope, methodology or definitions (Ballou et al., 2018). For example, Dell was asked to correct its Scope 3 emissions and hazardous waste amounts due to improvements in calculation methodology (Ballou et al., 2018). External audit represents an independent examination of firms’ environmental disclosure that is expected to be conducted in accordance with state environmental regulations thus, strengthening states’ capacity to mitigate greenwashing.

In line with the agency theory logic, third-party audit represents an external corporate governance mechanism that reduces information asymmetries between managers and owners and reduces agency costs (Wong & Millington, 2014). External monitoring performed by auditors is targeted to find drawbacks and inconsistencies in firm processes and disclosure related to the natural environment is likely to be effective in identifying greenwashing, and thus, contributes to agency cost mitigation which eventually reduces managerial propensity to greenwash. When an external audit of non-financial disclosure is absent, state owners should be able to mitigate greenwashing, but to a lesser extent than when external auditors are involved because they have lower monitoring capacity (i.e., regulatory inspections are relatively rare)

and are potentially less skilled to identify greenwashing which gives managers more room to greenwash without being caught.

Hypothesis 4a: The influence of stringency of environmental regulations on greenwashing is strengthened when external audit of non-financial disclosure is present.

Hypothesis 4b: The influence of state ownership on greenwashing is strengthened when external audit of non-financial disclosure is present.

4.3. Methodology

4.3.1. Sample, Data and Measures

To test our hypotheses, we developed a panel dataset of listed firms globally covering the years between 2007 and 2017. We built our dataset by drawing on a database of financial and corporate governance information provided by NRG and environmental disclosure information provided by Trucost. The initial sample consisted of 26,320 firm-year observations for 4,571 corporations listed on the main stock exchanges of 45 countries. After merging this dataset with other relevant sources of information (i.e., ASSET 4) and excluding observations with missing data, we generated a final sample of 9,938 observations from 1,731 companies headquartered in 34 countries for the years between 2007 and 2017. The panel is unbalanced due to annual changes in stock index membership as well as the changing number of firms that issue environmental disclosures and that responded to information requests from Trucost Plc., which provided key information about firms' environmental disclosures. The sample covers the following industries: basic materials, consumer goods, consumer services, financials, health care, industrials, oil and gas, technology, telecommunications, utilities. We derived our selective disclosure and environmental damage data from Trucost Plc. Trucost Plc. is an organization that is part of S&P Global, and provides the world's most comprehensive data on environmental metrics (Trucost Plc., 2008). We used NRG Metrics to extract data on state ownership and other corporate governance variables included in the model. NRG Metrics is a global corporate governance data provider and has been widely used in recent academic literature (Cho, Ibrahim, & Yan, 2019; Miroshnychenko et al., 2020). We used a variety of other sources to obtain both firm and country-level independent and control variables.

4.3.1.1. Dependent Variable

We measure our dependent variable, *selective disclosure magnitude*, following Marquis and colleagues' approach (2016). *Selective disclosure magnitude* represents the extent to which a firm's disclosure creates a perception of an overly positive environmental image by disclosing relatively benign environmental information instead of revealing a full picture of the firm's environmental damage (Marquis et al., 2016). It is calculated based on the difference between Trucost's absolute disclosure ratio and weighted disclosure ratio. The absolute disclosure ratio represents the amount of relevant indicators (based on the industry in which the firm operates) that the firm disclosed in its annual reports, regulatory filings, and corporate website in a given

year regardless of their relative importance. The weighted disclosure ratio takes into account the extent of environmental damage associated with each indicator according to the estimations performed by Trucost researchers. Essentially, selective disclosure magnitude measures the extent to which symbolic disclosure (represented by the absolute disclosure ratio) exceeds substantive disclosure (represented by the weighted disclosure ratio) (Marquis et al., 2016).

Absolute disclosure magnitude ranges from -1 to 1. When absolute disclosure ratio exceeds weighted disclosure ratio, selective disclosure magnitude is positive which indicates that the firm disclosed many of its less harmful environmental indicators but few if any of its more harmful indicators (i.e., symbolic disclosure). The firm can disclose a vast amount of environmental information which can create an impression of transparency, but if the relevance of this information is low in terms of how harmful indicators are that the firm disclosed, selective disclosure magnitude can be large. If the absolute disclosure ratio equals to weighted disclosure ratio, it means that the firm met disclosure expectations which indicates that all indicators are disclosed regardless of whether they are harmful or not. Finally, negative values of selective disclosure (which implies that the weighted disclosure ratio is greater than the absolute disclosure ratio) show that the firm is disclosing more harmful environmental indicators and that it is in fact exceeding disclosure expectations.

4.3.1.2. Independent Variables

Stringency of environmental regulations was measured using the OECD environmental policy stringency index. This index comprises data on environmental policies for 28 OECD countries and 6 BRIICS countries (Brazil, Russia, India, Indonesia, China and South Africa) to create a comparable time-variant measure of environmental policy stringency. The index ranges from 0 to 6 (highest degree of stringency) and is based on the stringency level of 14 environmental policy instruments (OECD, 2017). Its components include environment-related taxes, policies promoting renewable energy, energy efficiency and performance standards, and efforts to disclose environmental information (Botta & Kozluk, 2014). Data was only available until 2015; data points for 2016 and 2017 were populated using 2015 values.

To measure *state ownership*, we first identified firms where the largest owner is the state. Second, we calculated the percentage of shares owned by the state among firms where the state is the largest owner. Data on state ownership was obtained from NRG Metrics.

To capture different types of state ownership, we relied on the following measures. First, *central state ownership* is a dichotomous variable that takes a value of 1 if the largest amount of shares owned by the state belongs to the central state or an entity of the central state, such as a regulatory agency, and 0 otherwise. This variable was obtained from NRG Metrics. Second, *local state ownership* is a dichotomous variable that takes a value of 1 if the largest amount of shares owned by the state belongs to a local state entity (e.g., regional or provincial governments), and 0 otherwise. This variable was obtained from NRG Metrics. Lastly, *sovereign wealth fund* is a dichotomous variable that takes a value of 1 if the largest amount of shares owned by the state belongs to a sovereign wealth fund, and 0 otherwise. This variable was sourced from NRG Metrics.

External audit captures whether a given firm relies on external audit of its CSR reports and is measured with a dichotomous variable that takes a value of 1 if the firm's sustainability report has been audited by an independent third-party auditor, and 0 otherwise. This variable was obtained from Asset 4 Thomson Reuters.

4.3.1.3. *Control Variables*

We included six firm-level corporate governance controls. First, we control for *board size* as prior research shows that it is a relevant determinant of environmental disclosure quality (Jizi, 2017; Jizi et al., 2014) and environmental law violations (Kassinis & Vafeas, 2002). Smaller boards are better coordinated and exhibit more efficient communication (Dey, 2008), but they often have a high workload which might limit their monitoring ability (John & Senbet, 1998). Larger boards also typically have more diverse expertise on the board which improves the level of expertise and monitoring (Guest, 2009). Board size is measured as the total number of seats on the board of directors. This variable was obtained from NRG Metrics. We also include a measure of *board independence*, which is measured by the percentage of independent board members. Research shows that board independence is an important determinant of the quality of environmental disclosure by providing better monitoring of managerial decisions and actions (Jizi, 2017). The data was sourced from NRG Metrics. We also control for *managerial ownership* because it aligns interests between owners and managers and can have an influence on managerial decision-making. Managerial ownership data came from NRG Metrics and is measured by the percentage of shares owned by management. We control for the presence of a *CSR committee* on the board as research shows that it can affect the quality of disclosed environmental information by providing advice and oversight in this area (Helfaya & Moussa, 2017; Peters & Romi, 2014). This data is captured with a dichotomous variable that takes a value of 1 if a CSR committee is present, and 0 otherwise. Data for this control variable was obtained from NRG Metrics. We also control for the adoption of *CSR criteria in executive compensation* provided by Asset 4 Thomson Reuters, which we measure as the percentage of executives whose compensation includes CSR criteria. We control for this practice because executives whose compensation depends on CSR outcomes are more likely to influence the environmental disclosures of their firms (Flammer, Hong, & Minor, 2019). We also account for *dual-class stock structure* through a dichotomous variable which takes a value of 1 if a dual-class stock structure is present, and 0 otherwise. This structure is frequently used for controlling shareholders to enhance their control rights relative to their cash flow rights (La Porta, Lopez-de-Silanes, & Shleifer, 1999; Villalonga & Amit, 2009). Dual-class stocks allow controlling shareholders to appropriate private benefits (Claessens et al., 2002; Villalonga & Amit, 2006) exacerbating the principal-agency problem which might have an impact on managers' propensity to greenwash.

In addition, we included several other firm controls. First, we controlled for *firm size*. Larger firms tend to face greater public scrutiny of their environmental and social impacts (Christmann & Taylor, 2006). We controlled for size using a logarithm of annual revenues which is common among studies of the drivers of corporate environmental and social disclosure (Marquis et al., 2016; Reid & Toffel, 2009). The variable is winsorized at 95% level to control for outliers. This variable was obtained from WRDS. We also control for *capital intensity* as it

can influence firm environmental damage and consequently, propensity to engage in greenwashing as firms with greater environmental damage are typically highly scrutinized (Marquis et al., 2016; Tashman et al., 2019). Capital intensity is a logarithm of a ratio of total assets to total sales, and it is based on WRDS data. We also control for *financial performance* as prior literature on environmental disclosure indicates that financial performance influences firm disclosures in this area since firms with financial difficulties are more likely to use environmental disclosure as legitimating strategy (Neu, Warsame, & Pedwell, 1998). This variable is measured as annual return on assets (ROA) (Marquis et al., 2016), and is calculated as net income divided by starting-year assets. The variable is winsorized at 95% level to take outliers into account. Data was obtained from WRDS. Moreover, we control for *firm visibility*. Prior research on corporate environmental disclosure suggests that firms that bring about greater environmental damage are usually also subject to greater external pressures to disclose environmental information, which is then further scrutinized by their external stakeholders (Cho & Roberts, 2010; Marquis et al., 2016; Short & Toffel, 2008). We used Trucost's estimate of environmental impact as a proxy for visibility (Marquis et al., 2016). Trucost estimates the annual tonnage of pollution emissions released as well as natural resource consumption based on the firm's revenues and the industry that the firm operates in. Then, to obtain the annual cost (in millions of U.S. dollars), Trucost multiplies pollution and natural resource use consumption estimation by their respective environmental damage cost factors, which are based on economic research on the pricing of environmental externalities (Trucost Plc., 2008). The variable is in logarithmic form due to its skewed distribution and is winsorized at 95% level.

We also included several country-level controls. First, as research shows that firms' environmental practices and civil society concerns about the environment tend to be correlated with a country's degree of economic development (Guler, Guillén, & Macpherson, 2002), we control for the *gross domestic product (GDP)* per capita in a given year (in current U.S. dollars). The country's annual GDP data per capita were obtained from the World Bank Indicators. This variable was log-transformed to reduce skewness. We also control for *state capacity*, which represents how effective a state is in accomplishing its goals or policies (Cingolani, 2013). This variable is measured using the state capacity index, which was developed by Hanson and Sigman (2020). Since the index covers data until 2015, we populated 2016 and 2017 data points with 2015 values. In addition, we control for *press freedom* in the country as prior research has shown that media is an effective regulator of corporate misconduct (Liebman & Milhaupt, 2008). Press freedom is operationalized using the annual press freedom index (multiplied by -1, so higher values reflect greater freedom) developed by Reporters Without Borders. We also control for whether *Kyoto Protocol ratification* because this treaty requires local firms to disclose their greenhouse gas emissions, which may also impact their propensity to greenwash by exposing firms to additional regulatory pressure (Marquis et al., 2016). Kyoto Protocol is an annual dichotomous variable that takes a value of 1 during the first year when the Kyoto Protocol was ratified in a given country. The variable takes a value of 0 for all the years when Kyoto Protocol was not ratified. These data were obtained from the website for the United Nations Framework Convention on Climate Change.

Lastly, we included industry controls as prior research has shown that levels of environmental and social disclosure vary by industry (Reid & Toffel, 2009). We created industry dummies based on each firm's primary industry which was provided by NRG Metrics. We have a total of 10 industry sectors represented in the sample, namely: basic materials, consumer goods, consumer services, financials, health care, industrials, oil and gas, technology, telecommunications, and utilities.

4.3.2. Empirical Analysis

We used Stata 15.1 to conduct a random effects regression analysis that accounts for the panel structure of our data. Our main results are robust to using fixed effects, but some of our time-invariant variables were omitted in the fixed effects model. Thus, we decided to rely on random effects model that produces accurate estimates for variables that are either time-invariant or display little within-firm variation (Allison, 1994). Random effects specification is also consistent with prior literature on ownership (e.g., Le & O'Brien, 2010). To control for multiple observations per firm and country, we clustered standard errors by country. All models include year dummies to control for overall temporal trends. To facilitate interpretation of interaction effects, we standardized coefficients of two continuous variables that are included in moderator analyses (i.e., *state ownership*, *environmental regulations*).

4.4. Results

Table 12. Descriptive Statistics

#	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Selective disclosure	-0.17	0.29	1.00																				
2	Stringency of environmental regulations	2.27	1.29	-0.03	1.00																			
3	State ownership	3.19	11.76	-0.06	-0.20	1.00																		
4	Central state ownership	0.09	0.29	-0.09	-0.22	0.65	1.00																	
5	Local state ownership	0.01	0.09	-0.04	-0.01	0.23	-0.03	1.00																
6	Sovereign wealth fund	0.05	0.21	-0.01	-0.07	0.11	-0.07	-0.02	1.00															
7	Dual class shares	0.10	0.31	-0.02	-0.06	0.07	0.04	0.01	0.02	1.00														
8	Board size	10.50	3.89	-0.11	-0.04	0.15	0.17	0.08	-0.01	0.09	1.00													
9	Board independence	60.30	27.83	0.07	0.14	-0.08	-0.09	0.00	0.02	0.00	-0.06	1.00												
10	Managerial ownership	2.06	7.32	0.08	0.03	-0.07	-0.07	-0.02	-0.04	0.03	-0.10	-0.02	1.00											
11	CSR committee	0.12	0.32	-0.13	0.04	0.03	0.08	-0.02	-0.02	-0.03	0.07	0.11	-0.05	1.00										
12	CSR compensation incentives	0.21	0.40	-0.11	0.17	0.00	0.01	0.00	0.04	-0.02	0.02	0.18	-0.04	0.14	1.00									
13	External audit	0.27	0.45	-0.24	-0.02	0.09	0.15	0.02	0.06	0.03	0.24	-0.13	-0.11	0.09	0.14	1.00								
14	Size	9.10	2.76	-0.17	-0.18	0.13	0.16	-0.02	-0.05	0.06	0.32	-0.37	-0.14	0.10	-0.12	0.29	1.00							
15	Firm visibility	2.26	2.04	-0.43	-0.04	0.12	0.10	0.07	-0.02	0.02	0.24	-0.06	-0.09	0.24	0.14	0.24	0.44	1.00						
16	Financial performance	0.08	0.18	-0.05	-0.11	0.11	0.11	0.00	0.02	0.00	0.00	-0.14	0.01	-0.01	0.00	0.07	-0.02	0.05	1.00					
17	Capital intensity	0.36	0.38	-0.07	0.01	-0.01	-0.03	0.01	-0.02	-0.03	-0.10	-0.04	0.03	0.00	-0.03	-0.02	-0.10	0.12	-0.04	1.00				
18	GDP per capita	10.52	0.77	0.10	0.35	-0.18	-0.23	0.01	0.04	-0.04	-0.12	0.31	-0.01	-0.15	0.12	-0.07	-0.33	-0.12	-0.17	0.00	1.00			
19	Press freedom	17.88	12.61	0.01	-0.22	0.06	0.04	-0.03	-0.02	-0.02	-0.02	-0.15	0.02	0.04	-0.12	0.00	0.18	0.05	0.04	0.02	-0.54	1.00		
20	Kyoto ratified	0.65	0.48	-0.13	-0.10	0.08	0.11	0.06	0.13	0.00	0.03	-0.40	-0.03	-0.11	-0.04	0.24	-0.18	-0.03	0.25	0.02	-0.28	0.08	1.00	
21	State capacity	1.78	0.55	0.04	0.42	-0.24	-0.26	0.01	0.07	0.00	-0.12	0.36	-0.03	-0.06	0.15	-0.06	-0.35	-0.12	-0.12	0.02	0.66	-0.43	0.06	1.00

Table 13 presents the results of our regressions. Model 1 reports the results for Hypotheses 1 and 2. Models 2 - 4 contain types of state ownership, which are relevant for Hypothesis 2a. Models 5-7 contain separate regressions involving the interactions of stringency of environmental regulations and state ownership (Hypothesis 3) as well as the interactions of stringency of environmental regulations and external audit (Hypothesis 4a) and state ownership and external audit (Hypothesis 4b). All models include year and industry controls.

Table 13. Random Effects Regression on Selective Disclosure

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Stringency of environmental regulations	-0.99*** (0.36)	-1.01*** (0.36)	-0.99*** (0.36)	-0.99*** (0.36)	-1.01*** (0.37)	-1.39*** (0.47)	-0.99*** (0.36)
State ownership	-0.07*** (0.03)				-0.06** (0.03)	-0.07*** (0.03)	-0.07*** (0.03)
Stringency of environmental regulations * state ownership					0.01 (0.01)		
Central state ownership			-3.05*** (0.96)				
Local state ownership				-1.90 (3.34)			
Sovereign wealth funds		-1.16 (1.09)					
Dual class shares	-2.77* (1.58)	-2.91* (1.58)	-2.88* (1.58)	-2.93* (1.57)	-2.77* (1.58)	-2.65* (1.59)	-2.77* (1.57)
Board size	0.05 (0.09)	0.04 (0.09)	0.05 (0.09)	0.05 (0.09)	0.05 (0.09)	0.04 (0.09)	0.05 (0.09)
Board independence	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Managerial ownership	0.06** (0.03)	0.06** (0.03)	0.06** (0.03)	0.06** (0.03)	0.06** (0.03)	0.06** (0.03)	0.06** (0.03)
CSR committee	1.44 (0.88)	1.33 (0.85)	1.48* (0.87)	1.34 (0.85)	1.44 (0.88)	1.50* (0.88)	1.44 (0.88)
CSR compensation incentives	-1.69 (1.10)	-1.72 (1.08)	-1.68 (1.10)	-1.75 (1.10)	-1.69 (1.10)	-1.72 (1.10)	-1.69 (1.10)
External audit	-1.98*** (0.76)	-1.96** (0.76)	-1.95*** (0.75)	-1.98*** (0.75)	-1.98*** (0.76)	-1.78*** (0.55)	-1.97** (0.77)
External Audit * Stringency of environmental regulations						0.98** (0.50)	
External audit * state ownership							-0.00 (0.05)
Revenue	0.22 (0.66)	0.20 (0.64)	0.22 (0.66)	0.20 (0.64)	0.22 (0.66)	0.20 (0.65)	0.22 (0.66)
Environmental damage	-4.78*** (0.67)	-4.80*** (0.67)	-4.79*** (0.67)	-4.81*** (0.67)	-4.78*** (0.67)	-4.80*** (0.67)	-4.78*** (0.67)
ROA	1.09 (1.18)	1.08 (1.19)	1.10 (1.18)	1.08 (1.18)	1.08 (1.19)	1.12 (1.18)	1.09 (1.18)
Capital Intensity	0.14 (1.26)	0.12 (1.25)	0.11 (1.25)	0.12 (1.25)	0.15 (1.26)	0.07 (1.21)	0.14 (1.26)
GDP per capita	2.84** (1.35)	2.92** (1.31)	2.75** (1.31)	2.91** (1.31)	2.85** (1.35)	2.75** (1.34)	2.84** (1.35)
Press freedom	-0.08** (0.04)	-0.09** (0.03)	-0.08** (0.03)	-0.09** (0.03)	-0.08** (0.04)	-0.08** (0.03)	-0.08** (0.04)
Kyoto ratified	-3.98 (6.26)	-3.56 (6.08)	-4.07 (6.00)	-3.62 (6.09)	-4.05 (6.28)	-3.97 (6.04)	-3.97 (6.28)
State capacity	-0.87 (2.32)	-0.66 (2.26)	-0.83 (2.28)	-0.69 (2.26)	-0.87 (2.31)	-0.78 (2.28)	-0.87 (2.31)
Constant	-39.05** (17.64)	-41.30** (17.07)	-38.29** (17.28)	-40.98** (16.95)	-39.15** (17.67)	-37.98** (17.44)	-39.04** (17.58)
Observations	9,938	9,938	9,938	9,938	9,938	9,938	9,938
Number of firms	1,731	1,731	1,731	1,731	1,731	1,731	1,731

Notes: robust standard errors clustered by country in parentheses. Year and industry effects are included, but not reported for brevity. *** p<0.01, ** p<0.05, * p<0.1

As shown in Model 1, both Hypothesis 1 and Hypothesis 2 were supported. Stringency of environmental regulations has a statistically significant negative effect on greenwashing ($b = -0.99$, $s.e. = 0.36$, $p = 0.01$) and state ownership also has a negative effect on greenwashing ($b = -0.07$, $s.e. = 0.03$, $p = 0.01$).

Testing of Hypothesis 2a is based on the comparison of coefficients for the three types of state ownership – i.e., central state ownership, local state ownership and sovereign wealth funds. As shown in Models 2-4, central state ownership has a significant negative effect on greenwashing ($b = -3.05$, $s.e. = 0.96$, $p = 0.00$) while both local state ownership and sovereign wealth funds are not significantly associated with greenwashing. Thus, we find marginal support for Hypothesis 2a which states that firms with central state ownership exhibit the strongest negative effect on greenwashing, followed by firms with local state ownership and sovereign wealth funds.

Model 5 indicates that the effect of the interaction of stringency of environmental regulations and state ownership on greenwashing is not statistically significant. Thus, we do not find support for Hypothesis 3, which argued that environmental regulations and state ownership have a combined negative effect on greenwashing.

Contrary to our prediction, Model 6 shows that the interaction effect of environmental policy stringency and external audit is positively associated with greenwashing ($b = 0.98$, $s.e. = 0.50$, $p = 0.05$) indicating that the negative influence of environmental regulations becomes weaker in the presence of external audit. Thus, we do not find support for Hypothesis 4a. We decided to further probe this result by relying on simple slopes analysis (Aiken & West, 1991). (marginal effects reported in Table 14), which is pictured in Figure 2 and indicates that when an external audit is present, the stringency of environmental policy does not significantly influence greenwashing. However, when an audit is absent, stringency of environmental policy has a significant negative effect on greenwashing ($b = -1.39$, $s.e. = 0.47$, $p = 0.00$). This suggests that there is a potential substitution effect between environmental policy stringency and external audit on mitigating greenwashing as when an audit is present, the significant negative direct effect of environmental regulations on greenwashing is not significant when audit is present. In other words, the presence of external audit weakens the effect of environmental regulations on greenwashing.

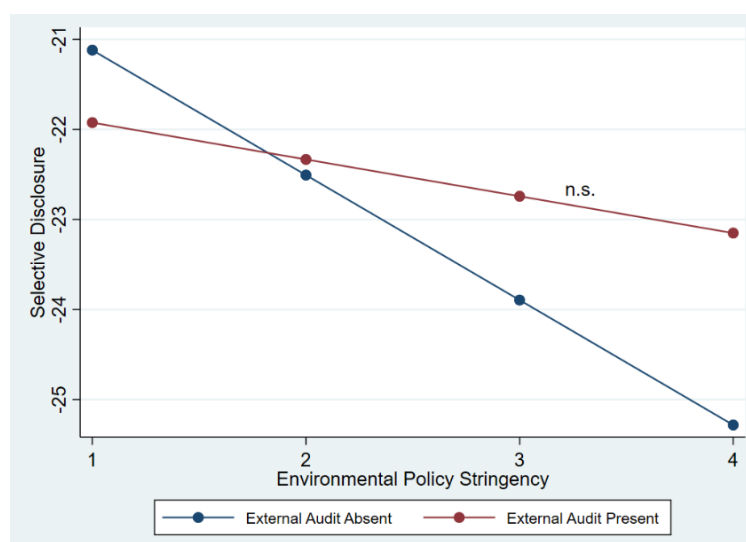
Table 14. Average Marginal Effects of External Audit and Environmental Regulations Predicting Selective Disclosure

Environmental regulations when external audit is absent and resent	Marginal effect
External audit is absent	-1.39*** (0.47)
External audit is present	-0.41 (0.38)

Notes: Delta-method standard errors in parentheses.

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

Figure 2. The Effect of Environmental Stringency on Greenwashing in Absence and Presence of External Audit



Note: Chart is based on Marginal effect analysis from Table 3.

Finally, Model 7 shows that the combined effect of state ownership and external audit does not significantly influence greenwashing which does not provide support for Hypothesis 4b.

4.4.1. Robustness Checks

We performed multiple tests to ensure the robustness of our findings. First, we ran analyses with lagged controls and independent variables to take into account the time effect. Second, we recoded selective disclosure to include the situation where greenwashing is present (selective disclosure is greater than 0) or when firm disclosure expectations are met (selective disclosure is 0) and to exclude over disclosure (selective disclosure is below 0). Third, we conducted an analysis based on propensity score matching. Fourth, we ran fixed-effects analyses to check

whether the results are robust to our random effects analyses results. Most of the results of the aforementioned analyses and significance levels proved robust.

4.5. Discussion and Conclusion

4.5.1. The multifaceted influence of the state on greenwashing

The rapid increase of environmental disclosures among firms has raised questions as to whether this trend reflects a move towards greater transparency and accountability among corporations worldwide or towards their embracing of more symbolic strategies whereby firms are more concerned about strengthening their environmental legitimacy and less about improving their actual environmental impacts. Indeed, there is some preliminary, albeit limited, evidence that environmental disclosures are often misaligned with firms' actual environmental impacts and risks (Marquis et al., 2016). Concurrently, in light of the increasing urgency of the climate change crisis, governments all over the world have been playing a more and more central role with regard to firms' environmental behaviors (Clò et al., 2017). However, little is known about their ability to discourage firms from engaging in greenwashing.

Therefore, in our study, we seek to advance this area of inquiry by exploring how the state uses its powers as a regulator and firm owner vis-à-vis greenwashing. Moreover, we examine how these mechanisms interact with another centrally important tool for fostering firms' transparency and accountability, namely external auditing. All in all, our quantitative evidence based on a global sample of 1,731 firms from 34 countries suggests that both of these mechanisms are effective in limiting firms' propensity to greenwash by selectively disclosing information about their environmental impacts. Interestingly, we find that external audit and stringent environmental regulations result in increased levels of greenwashing. A strong regulatory framework provides auditors with more credibility as well as more extensive targets and tools that they can use while assessing environmental disclosure which makes it easier for them to identify and report greenwashing.

In addition, they indicate that external auditing provides monitoring and expertise that create a powerful mechanism when it comes to limiting firms' propensity to greenwash. We explain these effects by suggesting that environmental regulations exert coercive institutional pressures on firms that negatively influence firms' propensity to greenwash.

The influence of these mechanisms is not equally strong, however. Our results suggest that among different types of state owners, we find that only firms with central state ownership are associated with lower levels of greenwashing. This is consistent with our arguments that firms with state ownership are an extension of the central state that devotes resources for environmental protection.

4.5.2. Contributions

Our study makes several theoretical contributions. Our main contribution is to disentangle the dual role of state influence on increasing transparency of environmental disclosure and greenwashing mitigation. Existing studies have acknowledged that the state is a major driver

of environmentally friendly practices of firms (Delmas & Toffel, 2004; Henriques & Sadorsky, 1996; Wang et al., 2018) and that coercive regulatory pressures incentivize transparent disclosure (Delmas & Burbano, 2011), but to the best of our knowledge, researchers have not yet examined the impact of state ownership on greenwashing or its interaction with environmental regulations. Therefore, by bringing both mechanisms of state influence into focus vis-à-vis greenwashing, our study puts forward a more comprehensive examination of the state's role in this area. Not only do our results confirm the importance of environmental regulations as a deterrent for greenwashing, but we also show the importance of state ownership as a mechanism that states can use to achieve their political and social goals. We concur with prior literature that stringent environmental regulations are associated with less greenwashing (Delmas & Burbano, 2011; Kim & Lyon, 2015; Marquis & Qian, 2014; Sun & Zhang, 2019). Moreover, our study suggests that, in their roles as owners, states may be able to reduce firms' propensity to greenwash by aligning their long-term goals related to environmental sustainability and disclosure with the goals of their managers. Thus, we add to the literature on corporate social responsibility by demonstrating the importance of firm ownership factors as potential drivers or deterrents of greenwashing as our results show that state ownership is effective in deterring greenwashing. With this, we go beyond the view that the state can only have an influence on environmental disclosure through regulations as pictured by prior research on greenwashing and move toward a broader understanding of state influence on environmental disclosure practices of firms by considering the role of state ownership in mitigating greenwashing in addition to state regulatory powers in this area. We believe our findings point to the value of future research that may consider the state as well as other ownership types vis-à-vis greenwashing and non-financial disclosure more broadly.

We also contribute to the debate on the positive state capitalism by studying the role of state ownership where the state is the largest owner, but not necessarily a sole owner. This side of literature portrays state ownership as an active and efficient owner who works alongside of other investors to contribute to the economic success of the firm (Musacchio et al., 2015). Our findings add to this literature by showing that state owners globally take national goals related to the protection of the natural environment into account, which is reflected in the lower amount of greenwashing of firms they own. Thus, state capitalism does not only represent well-governed firms that work together with investors to achieve financial gains but also to promote environmental sustainability.

To date, most audit research is concerned with audit of financial reports (Cohen & Simnett). This paper adds to the nascent literature on auditing of CSR reports by forming theoretical predictions and by empirically examining the moderating role of audit of CSR reports in the ability of the state as an owner and as a regulator to prevent greenwashing. Our findings are in line with the work by Pinnuck and others (2020) that audit prevents firms from overstating or selectively disclosing environmental information. We provide more depth by showing that audit acts as a substitute for environmental regulations in promoting transparency of environmental disclosures.

Finally, most research on the role of the state in promoting environmental sustainability has been conducted in the context of China due to the prevalence of state ownership in China

and due to the extent of state influence in the economy more generally (Wang et al., 2018). By analyzing a global sample based on data from 34 countries we provide empirical evidence on the role of the state vis-à-vis greenwashing that is more generalizable than most prior evidence in this area.

Our study has several practical implications for policymakers and investors. At a general level, it shows that the influence of the state in combating greenwashing among firms is multifaceted. More specifically, our findings suggest that both environmental policy and state ownership are effective tools for deterring greenwashing, but that external audit of non-financial disclosure can act as a substitute for the influence of environmental regulations in this area. This implies that investors as well as other users of environmental reports should expect to find more transparent information in reports assured by external auditors.

4.5.3. Limitations

Our study has several limitations that serve as opportunities for future research in this area. First, our study relies on a large sample consisting of 1,731 firms in 34 countries, and our data covers 11 years. This contributes to some of our measures being more coarse compared to a single-country sample study. For example, it would be beneficial to use a more fine-grained measure of stringency of environmental regulations to tease out separate effects for regulatory inspections and environmental reporting requirements among other factors. However, given the depth of our sample, it is not possible to collect these data without incurring significant missing data issues. Future research could address this limitation by focusing on a more limited sample of countries that would allow for a more fine-grained examination of certain mechanisms of environmental policy.

Next, due to our reliance on archival data, we are not able to capture the underlying managerial motivations for engaging in environmental disclosure. We control for external audit of sustainability reports that should account for a certain degree of lack of managerial experience or attention in this area, but it is not possible to fully take this issue into account. Moreover, while we show that environmental regulations induce state-owned firms to limit their engagement in greenwashing, we do not directly assess the improvement in the legitimacy of these companies as a result of these behaviors. These two limitations suggest that our work could be advanced by employing primary data-based methodologies that rely on interviews and surveys of managers as well as key stakeholders. Such an approach could be deployed to examine a direct assessment of managers' cognitive processes vis-à-vis greenwashing, or stakeholders' legitimacy-related perceptions with regards to the transparency and reliability of firms' environmental disclosures.

4.5.4. Conclusions

In the present study, we have developed novel arguments on the ability of the state to deter corporate greenwashing through environmental regulations and stake ownership in firms as well as the role of external audit as an external corporate governance mechanism that is designed to uncover greenwashing. Our analysis based on a panel dataset that includes 1,731 firms in 34 countries from 2007 until 2017, suggests that environmental regulations are able to

deter greenwashing by exerting coercive pressures on firms to facilitate compliance with environmental policies. Our analysis also indicates that state ownership reduces managerial propensity to greenwash which we attribute to governance structures creation that align goals of owners and managers with regards to the protection of the natural environment. In addition, our results indicate that external audit provides strong enough monitoring that can substitute the mitigating effect of environmental regulations on greenwashing. These findings have important implications. First, the state uses numerous mechanisms to promote environmentally friendly behaviors among firms that can either complement or undermine one another in fostering change in environmental disclosure practices of firms. Second, external audit of non-financial disclosure is a strong deterrent of greenwashing that substitutes the role of environmental regulations state in this area.

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Chapter 5. Irresponsible Families: Analysis of Greenwashing in Family Firms

Authors

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Abstract

There is growing evidence that environmental disclosures are often misaligned from firms' actual impacts on the natural environment. This study investigates family firms' propensity to selectively disclose environmental information, or in other words, to greenwash. By drawing on agency theory and socio-emotional wealth perspective, I first compare greenwashing patterns in family and non-family firms. Then, following recent research on family firm heterogeneity, I explore two socio-emotional wealth dimensions that may influence family firms' propensity to greenwash - family control and influence and family firm identity. My analysis based on a sample of 1, 574 firms from 40 countries between 2007 and 2017 reveals that family firms are more prone to greenwashing compared to non-family firms. Results also indicate that family firms with a greater degree of family control and influence, are particularly likely to selectively disclose environmental information. Overall, the results show that family firms are willing to face the risks of greenwashing being exposed in the future, suggesting that they do not always make decisions based on long-term considerations when it comes to environmental disclosures.

Publication Status

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Keywords: greenwashing, environmental disclosure, non-financial disclosure, family firms

5.1. Introduction

Firms have been increasingly exposed to different pressures from numerous stakeholders to act more responsibly (Durand, Hawn, & Ioannou, 2019; Fabrizio & Kim, 2019; Marquis, Toffel, & Zhou, 2016). One important way through which firms are attempting to respond to these pressures is by disclosing to their stakeholders the set of actions and initiatives that they are undertaking towards addressing environmental, social and governance (ESG) issues. In fact, the literature argues that environmental issues are particularly important because they can have both a direct and an indirect impact on firms' bottom lines (Flammer, Toffel, & Viswanathan, 2019); direct impact (e.g., resulting from extreme weather conditions) poses a threat to firms' operations and supply chains while indirect impact describes potentially adverse reputational consequences caused by poor environmental performance. Due to the higher value placed by stakeholders on transparency with respect to firm environmental performance and environmental risk exposure, in recent years, environmental disclosure has become a common practice (Fabrizio & Kim, 2019). According to research conducted by the Governance and Accountability Institute, 90% of S&P500 companies issued a sustainability report in 2019 compared to only 20% in 2011 (Governance and Sustainability Institute, 2020). Nonetheless, concerns related to environmental degradation continue to rise, indicating that more widespread environmental disclosure might not reflect greater substantive action to decrease human damage to the natural environment (IPCC, 2021; Kim & Lyon, 2015).

In this paper, I explore this tension by focusing on selective disclosure, which is a form of greenwashing (Lyon & Montgomery, 2015) (greenwashing and selective disclosure are used interchangeably throughout the paper), in the context of family firms. I follow the existing literature and define this type of disclosure as a symbolic strategy whereby firms selectively disclose more favorable and relatively benign environmental performance indicators in their environmental reports to strengthen their environmental legitimacy without revealing the full scope of their environmental damage (Delmas & Burbano, 2011; Kim & Lyon, 2015; Marquis et al., 2016). Prior research illustrates that environmental disclosures are often misaligned with firms' actual corporate policies, actions, and outcomes despite the demand for greater transparency and accountability with regards to such disclosures (Aragón-Correa, Marcus, & Hurtado-Torres, 2016; Kim & Lyon, 2011, 2015; Marquis et al., 2016). Some existing work has also provided initial explanations of why greenwashing may be appealing to some firms. Greenwashing may potentially be appealing to some firms as it can help to enhance the opinion of certain stakeholders about a firm or its products, at least in the short run (Kim & Lyon, 2015). However, exaggerating a firm's environmental impacts in corporate disclosures can also be risky because, if detected and exposed, it may damage the trust between a firm and its stakeholders and generate negative legitimacy spillovers and increased regulatory oversight among other penalties (Delmas & Burbano, 2011; Lyon & Maxwell, 2011). These costs can easily overweight the potential short-term benefits of greenwashing (Hawn & Ioannou, 2016; Testa et al., 2018).

Provided that incidents of greenwashing by corporates have accelerated in recent years (Kim & Lyon, 2015), the literature has started to explore firm and institutional-level factors that make firms more likely to greenwash (e.g., Delmas & Burbano, 2011; Kim & Lyon, 2014;

Marquis et al., 2016). Nevertheless, this literature remains fragmented (Lyon & Montgomery, 2015; Pope & Wæraas, 2016), and very limited attention has been paid to firm ownership. This is an important gap in the literature because firm ownership – which reflects the distribution of property rights and decision-making power within the organization (Connelly et al., 2010) – plays a key role when it comes to understanding decision-making across different areas of environmental compliance and management, including environmental management system adoption (Darnall & Edwards, 2006), environmental information disclosure (Meng, Zeng, & Tam, 2013), and environmental conduct (King & Shaver, 2001) among others. Accordingly, to advance our understanding of how firm ownership may impact greenwashing, in this paper I focus on a particular type of ownership: family firms.

Broadly, a family firm is a firm where members of the founding family own a considerable amount of equity (i.e., blockholders), where they hold positions in top management or are on the board of directors (Chen, Chen & Cheng, 2008). Roughly two-thirds of companies worldwide and one-third of publicly listed firms can be considered family firms (Family Firm Institute, 2017), which makes family firms the most prevalent organizational form in the world (Dyer Jr, 2003; La Porta, Lopez-de-Silanes, & Shleifer, 1999). Family firms exhibit distinct features that guide their decision-making process (Berrone et al., 2010; Duran et al., 2016; Gomez-Mejia et al., 2011). According to a voluminous literature, decision-making in family firms, in contrast to non-family firms, is heavily influenced by a set of non-economic factors, such as emotional attachment to the firm, family values, and altruism (Gomez-Mejia et al., 2011). These factors collectively characterize the socio-emotional wealth (SEW) concept, which is a distinguishing feature of family firms (Berrone, Cruz, & Gomez-Mejia, 2012; Berrone et al., 2010; Gomez-Mejia et al., 2011). SEW may lead family firms to pursue goals and strategies that prioritize particular family outcomes (Chrisman et al., 2012) as family firm management tends to be guided by gains or losses of their SEW (Gómez-Mejía et al., 2007). Family firms are also facing pressures from a different set of stakeholders compared to non-family firms, and typically family is the largest stakeholder (Bingham et al., 2011).

Prior research provides some initial evidence that family firms tend to respond to environmental stakeholder pressures in a way that is different from non-family firms (Bingham et al., 2011). Family firms appear to be more effective in responding to the demands of their stakeholders than non-family firms as they adopt a more relational orientation towards their stakeholders (Berrone et al., 2010; Bingham et al., 2011; Cennamo et al., 2012). On the other hand, some studies demonstrate that SEW can have a “dark side” by generating a negative impact on proactive stakeholder engagement within family firms (Cruz et al., 2014; Kellermanns, Eddleston, & Zellweger, 2012). For example, family ties can create a certain mentality that makes firms prioritize the needs of the family above non-family stakeholders (Kidwell, 2017). Thus, family firms’ responses to stakeholder pressures are far from being uniform.

Considering the ubiquity of family firms (Dyer Jr, 2003) and the distinct non-economic factors that guide their decision-making process (Gomez-Mejia et al., 2011), my goal in this study is twofold: first, I aim to explore whether family firms are more inclined to selectively disclose environmental information compared to non-family firms; second, I aim to take the

broader conversation about the link between firm ownership and selective disclosures forward by exploring how different dimensions of family ownership may be associated with greenwashing. Prior work shows that sufficient heterogeneity exists *within* family firms that enables me to do so (Chua et al., 2012; Marques, Presas, & Simon, 2014; Neubaum, Kammerlander, & Brigham, 2019). I draw on entrenchment and alignment hypotheses rooted in agency theory (Jensen & Meckling, 1976; Wang, 2006) as well as on SEW perspective (Gómez-Mejía et al., 2007) to explore the mechanisms that make family firms both more and less likely to greenwash. In particular, I focus on the degree of family control and involvement and family identity of family firms as these dimensions have been identified by the literature on family business as relevant in determining family firm responses to various stakeholder pressures (Cennamo et al., 2012; Gomez-Mejia et al., 2014).

This paper aims to make some key contributions to the literature. First, it contributes to the literature on greenwashing by responding to a call for more work on theorizing and modeling mechanisms related to firm propensity to greenwash (Lyon & Montgomery, 2015). With that, it enriches the current conversation by adding firm ownership dimension to a list of greenwashing determinants and by investigating the role of non-economic motives, which are so prevalent among family firms. It also adds more depth to the current discussion by characterizing particular mechanisms that are associated with the propensity to greenwash, as captured by family influence and control characteristics of family firms. Second, this paper contributes to the family business literature by adding more depth to the current discussion on the drivers of irresponsible behavior in family firms. It shows that family control and influence dimension of SEW is an important driver of greenwashing, which contrasts some of the prior evidence and points out that family firms do not always make their decisions based on a long-term horizon, but rather on the preservation of other SEW aspects that are the most salient to family owners (Berrone et al., 2010; Wang, 2006).

5.2. Environmental Disclosure and Greenwashing

The worsening condition of the natural environment led to increased public awareness of the role that humans, and businesses, in particular, play in causing environmental degradation. As a result, various stakeholders ranging from governments to investors started to make firms accountable by requiring them to disclose their environmental impacts and risks (Eccles, Serafeim, & Krzus, 2011; Grewal & Serafeim, 2020; Jira & Toffel, 2013), which, unlike financial disclosures, are voluntary in most countries. According to the literature, the major reason for the increased environmental disclosure among firms is their willingness to protect their environmental legitimacy and to manage relationships with their stakeholders (Grewal & Serafeim, 2020; Kim & Lyon, 2015).

However, there is a growing scholarly and anecdotal evidence that firms disclose environmental information that is not complete or overstated which makes these disclosures not reliable (Marquis et al., 2016). For example, a team of researchers has recently used artificial intelligence to analyze the trustworthiness of corporate disclosures of climate risk and concluded that firms tend to engage in cherry-picking or selectively disclosing less material information (Bingler, Kraus, & Leippold, 2021). Firms tend to selectively disclose

environmental information as it is more difficult to evaluate the quality of non-financial disclosures (that environmental disclosures are part of) compared to financial disclosures because there is no unified reporting framework for non-financial disclosures (Grewal & Serafeim, 2020). Moreover, non-financial information is often a mix of quantitative and qualitative evidence that is spread out across different sources such as sustainability reports and websites (Perrini, 2006). These features make the evaluation process of non-financial disclosures much more subjective compared to that of financial disclosures.

The term “greenwash” first appeared in the literature in 1986 when a field biologist and activist Jay Westerveld criticized the hotel industry for emphasizing the reuse of towels to save the environment while performing poorly in other areas of sustainable business practices (Pearson, 2010). Since then, research on greenwashing started to receive greater attention (Lyon & Montgomery, 2015) due to anecdotal evidence of increased instances of greenwashing and growing pressure for businesses to behave responsibly towards the natural environment (Kim & Lyon, 2015; Marquis et al., 2016). Even though our understanding of greenwashing has evolved, Lyon and Montgomery (2015) concluded in their review study of greenwash that we still do not have a consensus on what greenwash represents precisely. Broadly speaking, greenwash can be conceptualized as misleading communication that directs stakeholders to adopt an overly positive view about firms’ environmental performance, practices, or products (Lyon & Montgomery, 2015).

In this paper, I conceptualize greenwash as *selective disclosure*, which is a form of greenwashing where firms selectively disclose environmental information without revealing the full scope of their environmental damage (Marquis et al., 2016). Firms that engage in selective disclosure do not necessarily supply false or overstated information, but they might omit material information that could potentially have a negative impact on their environmental legitimacy. By not disclosing the full scope of their environmental damage and environmental risk exposure, firms paint an overly positive picture of their efforts geared towards the protection of the natural environment which is misleading to their stakeholders who base their decisions on the information disclosed in sustainability reports (Kim & Lyon, 2011, 2015; Marquis et al., 2016).

However, overstating and selectively disclosing environmental information is a risky strategy. Various stakeholders including politicians, investors and NGOs are becoming more skilled in identifying greenwashing. There are also various tools available in the market today that rely on artificial intelligence and big data to effectively target greenwashers; such tools are often used by investors and analysts to evaluate the reliability of firms’ environmental disclosures. If uncovered and exposed, greenwashing can have a negative impact on firm legitimacy which can eventually hurt financial performance (Berrone, Fosfuri, & Gelabert, 2017; Delmas & Burbano, 2011; Walker & Wan, 2012). Essentially, managers engage in a gamble when it comes to information disclosure in which they choose between taking the risk of incurring potential losses in the future in an attempt to achieve a more immediate gain that selective disclosure can provide (Gomez-Mejia et al., 2014).

Despite the risks, some firms still choose to greenwash. Prior literature shows that firm propensity to greenwash is driven by both internal firm characteristics as well as by external

environment. Given the recognition of the importance of corporate governance factors in strategic decision-making, and firm ownership in particular (Aguilera et al., 2021; Meng et al., 2013), it is surprising that literature on the relationship between ownership and greenwashing is scarce.

5.3. Theory and Hypotheses Development

Despite the large body of work, we still do not have a clear answer to why some firms adopt environmental practices beyond regulatory compliance while others engage in a more symbolic approach or in other words, greenwashing (Delmas & Toffel, 2004). One possible explanation for these inconclusive findings is the divergent utilities of firm owners (Berrone et al., 2010; Gomez-Mejia et al., 2014). Facing an array of often conflicting stakeholder pressures, owners need to make choices that often reflect the preferences of some corporate actors, but not others. Over the last decade, scholars have focused on researching the ability and motives of different owners to use their ownership position to pursue their agendas (Ryan & Schneider, 2002; Thomsen & Pedersen, 2000). A significant part of this work revolves around family ownership due to its ubiquity and idiosyncrasy.

Although the exact numbers on family firm presence vary depending on the source, evidence from research points out that family firms are a dominating form of ownership globally (La Porta et al., 1999). According to Family Firm Institute, family firms generate 70-90 percent of annual global GDP (Family Firm Institute, 2017). Scholars have used various definitions of family firms (O'Boyle Jr, Pollack, & Rutherford, 2012) with most of them relying on family ownership level and family's involvement in firm management (Arregle et al., 2017). In this paper, I follow recent research on family business (e.g., Arregle et al., 2012) and assume that family firms are those with substantial family control, which is empirically measured by the amount of equity that the family owns as well as by family's presence in top management or board of directors. Extensive voting rights and key managerial positions within the organization allow family firms with substantive control to exert strong influence on firm's strategic decisions and processes (Jones, Makri, & Gomez-Mejia, 2008).

Agency theory has been widely used to explain the decision-making process in family firms (Le Breton-Miller & Miller, 2009). The extant literature identifies two competing perspectives that guide decision-making in family firms – alignment versus entrenchment (Anderson & Reeb, 2003; Wang, 2006). These competing perspectives are rooted in two different agency problems. The alignment hypothesis is based on the agency problem between owners and managers which is also known as Agency Problem I (Villalonga & Amit, 2006). Alignment hypothesis predicts that Agency Problem I is reduced in family firms due to lower separation of ownership and control stemming from the family being a large and powerful shareholder whose superior monitoring power aligns family's interests with managerial interests and reduces managerial opportunism (Anderson & Reeb, 2003; Wang, 2006). A much more pronounced agency problem in family firms is between controlling and noncontrolling shareholders which is often labeled as Agency Problem II (Villalonga et al., 2015). Family's presence in management reinforces its ownership and voting privileges, which consequently, gives the family more power within the firm and lowers the monitoring capabilities of the board

of directors. This leads to the entrenchment of family owners that allows them to appropriate private benefits at the expense of minority shareholders (Stulz, 1988; Wang, 2006).

Some family business researchers argue that agency theory is unable to capture certain idiosyncrasies of family firms (Gomez-Mejia et al., 2014; Gómez-Mejía et al., 2007), especially the emotional aspects of family firms (Baron, 2008). A growing body of literature shows that decision-making in family firms is also influenced by non-economic motives that stem from family members' desire to preserve SEW that they derive from ownership and management of the firm (Gómez-Mejía et al., 2007). SEW is based on behavioral agency theory (Wiseman & Gomez-Mejia, 1998), and its central argument is that dominant family owners make decisions based on socioemotional reference points and not just bases on economic ones (Gomez-Mejia, Makri, & Kintana, 2010; Zellweger et al., 2012). Proponents of SEW argue that in comparison to non-family firms, whose main decision-making criteria is an assessment of the value of business decisions, a key reference point for family firm owners is a potential loss of their SEW (Gómez-Mejía et al., 2007). Gomez-Mejia and colleagues (2011) put forward three main non-economic factors that drive decision-making in family firms – emotional attachment to the business, family values that dominate management, and altruism towards family members. These factors stem from viewing the firm as an extension of the family (Schein, 1995), having a long-term horizon (Le Breton-Miller & Miller, 2009; Le Breton–Miller & Miller, 2006), trying to create and preserve a positive reputation and image for their family successors (Deephouse & Jaskiewicz, 2013), and enjoying family's influence over the firm (Gómez-Mejía et al., 2007). Empirical evidence provides support that SEW can drive corporate decisions, such as diversification (Gomez-Mejia et al., 2010), risk-taking (Gómez-Mejía et al., 2007), environmental compliance and disclosure (Arena & Michelon, 2018; Berrone et al., 2010), and R&D investment (Chrisman & Patel, 2012; Duran et al., 2016).

Research also suggests that family firms develop unique responses that differ from those of non-family firms with regards to demands of various stakeholders, such as employees (Cruz, Gómez-Mejia, & Becerra, 2010), environmentalists (Berrone et al., 2010), local communities (Danco & Ward, 1990), and investors (Gomez-Mejia et al., 2014). I concur with Gomez-Mejia and colleagues (2014) and Arena and Michelon (2018) that agency theory alone might not be sufficient in explaining family firms' responses to stakeholder pressures related to information disclosures. Thus, in this paper, I use arguments from both agency theory and SEW to develop a theoretical model on family firms' propensity to selectively disclose environmental information.

5.3.1. Family Firms and Greenwashing

Research on greenwashing in family firms is scarce. To the best of my knowledge, the sole exception is the study by Kim and colleagues (2017) that investigates the link between managerial attention to environmental issues and actions to protect the natural environment. Based on the analysis of 97 publicly traded family and non-family firms in polluting industries over 10 years, this study finds that managerial attention to environmental sustainability in family firms is related to pro-active actions aimed at minimizing harm to the natural environment, but in non-family firms increased managerial attention to environmental issues

is related to less proactive environmental action which indicates greenwashing (Kim et al., 2017). These findings support the authors' arguments that family firms aim to preserve their SEW, leading to a lower propensity to greenwash, while non-family firms are motivated by short-term financial objectives making them more prone to greenwashing.

Literature on financial disclosure and family ownership is more extensive and provides mixed empirical evidence that is in line with two contradictory theoretical perspectives that dominate this line of research – alignment and entrenchment hypotheses. There is a number of studies that examine the differences in financial disclosure quality between family firms and non-family firms. Some evidence suggests that family firms provide higher earnings quality (Wang, 2006; Warfield, Wild, & Wild, 1995) than non-family firms which is consistent with the alignment effect of family ownership. There is also evidence that family firms are more likely to disclose bad news (i.e., negative financial earnings) (Chen et al., 2008) instead of withholding them which provides further support for alignment theory. However, there is also evidence that in comparison to non-family firms, family firms are three times more likely to engage in financial misconduct measured by the number of federal enforcement actions (Anderson, Martin, & Reeb, 2017). This finding is in line with entrenchment theory, and the authors attribute it to family founders' overconfidence and hubris.

Numerous studies have investigated the extent to which family firms behave more responsibly than non-family firms in social and environmental terms, and their findings are also mixed. For example, Berrone and co-authors (2010) argue that family firms pollute less than non-family firms because of their desire to protect their SEW. They analyze a sample of 194 U.S. public firms and find support for their hypothesis that family firms pollute less than non-family firms due to concerns about their reputation and legitimacy within the community where they operate (Berrone et al., 2010). Similarly, Dyer & Whetten (2006) find that family firms are more likely to act in a socially responsible way than their non-family counterparts to preserve their image and reputation. However, in their study based on publicly listed European firms, Cruz and colleagues (2014) conclude that family firms are not always behaving responsibly. Their analysis indicates that family firms can be socially responsible and irresponsible at the same time as they are likely to pay more attention to external dimensions of CSR to satisfy external pressures, but they tend to neglect internal CSR (Cruz et al., 2014). A study based on the cross-national sample of 46 countries finds that family ownership is associated with negative ESG rankings. More recently, Labelle and colleagues (2018) studied a sample of 1264 firms and found family firms to be less socially responsible compared to non-family firms. Finally, qualitative work by Dangelico, Nastasi & Pisa (2019) based on Italian context concludes that there is no difference between the two types of ownership when it comes to green innovation.

I suggest that family firms are less prone to greenwash compared to non-family firms for two main reasons. First, I argue that reputational concerns that pose a threat to family's SEW discourage family owners to engage in greenwashing. Firms choose to selectively disclose environmental information to mask their undesirable environmental performance. Such behavior can have potential immediate benefits such as improved image and environmental legitimacy (Kim & Lyon, 2015), but in the long run, there is a risk that greenwashing will become uncovered and exposed as stakeholders are actively monitoring environmental

disclosures of firms (Hawn & Ioannou, 2016). Due to the voluntary nature of non-financial disclosure, greenwashing is not illegal in most jurisdictions (Du & Wu, 2019), but it is considered to be a practice aimed to mislead stakeholders (Walker & Wan, 2012) and, if uncovered, it might be viewed unfavorably by external stakeholders (Berrone et al., 2017) and cause a great loss to family's SEW. Thus, the risks that greenwashing poses and the possible threats of SEW loss will outweigh its potential short-term benefits to family owners.

Second, according to the agency theory, principals (owners) and agents (managers) have divergent objectives, which causes Agency Problem I (Villalonga & Amit, 2006). In family firms, Agency Problem I is often mitigated via alignment hypothesis due to the large blocks of stocks being owned by a long-term shareholder – the family (Wang, 2006). Concentrated family ownership creates greater monitoring by controlling owners (Shleifer & Vishny, 1997), suggesting that family owners might monitor their firms more effectively. Controlling family owners often appoint their family members as corporate executives, such as chairman and CEOs (Villalonga & Amit, 2006), which helps the family to further scrutinize managerial behavior and influence decision-making within the firm. Strong monitoring also minimizes the hazard from information asymmetries between owners and managers (Salvato & Moores, 2010; Wang, 2006) that lowers the incentives to selectively disclose environmental information. Consequently, strong monitoring allows family owners to communicate firms' environmental risks and impacts more effectively to other shareholders and creditors and lessen the potential risk of misreporting.

In sum, greenwashing represents a threat to family's SEW which should discourage family owners to greenwash because family owners are loss averse with respect to SEW (Gómez-Mejía et al., 2007). As large and powerful shareholders, family members are in the position to effectively monitor managers and prevent greenwashing. Thus,

H1a: Family firms have a lower propensity to greenwash than non-family firms

Empirical evidence suggests that family firms do not always behave responsibly towards their stakeholders (Anderson et al., 2017; Cruz et al., 2014). One explanation for this is the entrenchment hypothesis which is based on the argument that concentrated ownership gives power to controlling owners to expropriate outside stakeholders such as minority shareholders, suppliers and the natural environment among others, to achieve their objectives (Villalonga & Amit, 2006). These objectives include both financial objectives since in family firms there is little separation between personal and family finances as families invest their wealth into one firm in an undiversified manner (Anderson, Mansi, & Reeb, 2003) as well as non-financial utilities captured by SEW (Kappes & Schmid, 2013; Rees & Rodionova, 2015). Drawing on entrenchment theory and SEW, I argue that family owners might have both incentives and the ability to greenwash for three main reasons.

First, family members usually hold important leadership positions in the firm's top management team as well on the board of directors (Anderson & Reeb, 2003; Gompers, Ishii, & Metrick, 2010). According to the estimate reported by Chen and colleagues (2008), founding families hold about 22% of directorships and are the CEOs of 62% of family firms. Family members' presence undermines board independence and consequently, decreases the objective monitoring capabilities of the board. Without effective monitoring, family owners are more

likely to expropriate the interests of non-family shareholders and stakeholders, for example, by investing elsewhere funds allocated for environmental initiatives (El Ghouli et al., 2016; Kovermann & Wendt, 2019). Personal wealth of the family is invested into the firm, which can make family owners less inclined to invest in environmental sustainability initiatives that do not always yield the desired return on investment (Rees & Rodionova, 2015). However, reporting unfavorable environmental performance may lead to reputational damage which represents a loss to SEW. To avoid that, entrenched family owners might decide not to disclose unfavorable environmental indicators. Research supports this by showing that financial auditors assess the risk of fraud as being higher in family firms because family businesses tend to have more informal enforcement procedures and because their desire to preserve SEW can dominate reporting decisions (Krishnan & Peytcheva, 2019).

Second, it is often the case that family firms are run by overconfident family members who might be more inclined to take risky decisions (Anderson, Reeb, & Zhao, 2012; Anderson et al., 2017). For example, the famous Volkswagen emissions scandal and the financial fraud scandal at Parmalat were at least partially driven by the ambitions of overconfident family owners (Amann & Stachowicz-Stanusch, 2012; Financial Times, 2019). These individuals have often built their firms from scratch, and possess more confidence in running their business in comparison to professional management (Anderson et al., 2017). These factors make highly confident family owners even more inclined to use their privileges of controlling shareholders to engage in risky behaviors such as withholding certain environmental information from sustainability reports.

Third, directors and managers of family firms often receive their positions due to their standing in the family and not based on merit and talent (Chrisman, Chua, & Litz, 2004). Consequently, such family executives might lack the same level of sophistication and skillset as managers in firms without family ownership (Anderson et al., 2017) to properly monitor managerial decisions related to non-financial disclosures. In addition, a lack of skills would also make it difficult for family executives to detect greenwashing in a timely manner.

Overall, family owner entrenchment, overconfidence, and lack of skillset can potentially lead to selective disclosure. Thus,

H1b: Family firms have a higher propensity to greenwash than non-family firms

5.3.2. Family Control and Influence

Divergent findings on responsible behavior in family firms encouraged researchers to explore family firm heterogeneity with regards to family firm engagement with CSR initiatives (e.g., Richards, Zellweger, & Gond, 2017) and their disclosure practices (Arena & Michelon, 2018; Gomez-Mejia et al., 2014). Family firms are not all created equal, and there is a substantive amount of variation in family's ownership level, degree of family's participation in firm management, and extent of family's identification with the firm. In the subsequent hypotheses, I argue that the salience of particular SEW dimensions affects family firms' disclosure decisions. According to Berrone et al. (2012), SEW consists of five major dimensions – *family control and influence*, *family identity*, *sense of dynasty*, *emotional attachment*, and *social ties*. I focus on two dimensions of SEW that have been documented in

the literature to be relevant to firms' communications with their stakeholders – *family control and influence* and *family identity* (Cennamo et al., 2012; Cruz et al., 2014; Gomez-Mejia et al., 2014).

Family control and influence dimension refers to the desire and ability of family owners to maintain control and influence over the firm and its strategic decision-making (Berrone et al., 2012). Desire to control decisions within the firm can also take place in non-family firms, but in a more distant and authoritarian way which is different from family owners' approach as their firm is an integral part of their lives (Lubatkin et al., 2005). Family owners can exercise control by occupying the key managerial and board positions within the firm (Gomez-Mejia et al., 2011) or by having a more informal influence within the firm, for example, by managing relationships with stakeholders (Cennamo et al., 2012).

Family members who emphasize the control dimension of SEW are more sensitive to the negative consequences of selective disclosure since they can have a strong negative impact on the family's ability to preserve that influence (Gomez-Mejia et al., 2014). If detected, selective disclosure is not only likely to generate negative reactions from external stakeholders, but also from internal ones. This includes other shareholders who might question the family's ability to manage the firm (Gomez-Mejia et al., 2014) as selective disclosure puts the firm in a potentially difficult position that can negatively impact the firm's market value (Hawn & Ioannou, 2016). Lack of support from other shareholders will make it significantly more difficult for the family to keep the same level of high influence within the firm. Thus, even though greenwashing helps to mask immediate shortcomings related to environmental performance, it is risky for family firms that strive to maintain a powerful position within the firm and the ability to impose their will on other shareholders.

Therefore, I predict:

H2a: Family control and influence is negatively related to greenwashing

Greater family control and influence can also open doors for more entrenchment. Family owners for whom control aspects of SEW are important are more pressured to meet or exceed expectations of analysts and other stakeholders to portray the image that they are in control of the firm (Gomez-Mejia et al., 2014). Thus, family owners with strong considerations over their control and influence are more likely to refrain from disclosing current unfavorable environmental information with hopes that it would improve in the future. Controlling family owners have discretion when it comes to strategic decisions, such as environmental disclosure, because family members hold key managerial positions and because by engaging with the firm and closely working with managers, family owners create long-term relationships and loyalty with their employees (Weber et al., 2003). This should potentially make employees less inclined to act against the preferences of the family owners.

Moreover, reporting environmentally damaging indicators might attract higher scrutiny from regulators and outside shareholders (Healy & Palepu, 2001). That is problematic for family firms that prioritize family control over the firm since it threatens family owners' ability to control the firm without the influence of regulators and non-family shareholders (Gomez-

Mejia et al., 2014) which is an integral part of preserving family's SEW, and its influence and control dimension, in particular.

The above arguments suggest that when control is prioritized, family owners are more likely to selectively disclose environmental information. Therefore,

H2b: Family control and influence is positively related to greenwashing

5.3.3. Family Firm Identity

Family firms are not identical in their pursuit of corporate reputation (Zellweger, Nason, Nordqvist, & Brush, 2013). The intertwined nature of the family and firm which is often reflected by the choice to include the family name in firm's name makes the firm become an extension of the family and its values (Berrone et al., 2010). A family's name in the firm's name is a symbolic characteristic that enhances family members' awareness and identification with the firm (Deephouse & Jaskiewicz, 2013; Zellweger, Sieger, & Halter, 2011). Because their name is tied to a firm, family members have a deeper emotional attachment to the firm, and they perceive and approach firms' success and difficulties on a more personal level (Deephouse & Jaskiewicz, 2013).

Heightened identification with the firm makes members of such family firms protective of the image they are projecting to external stakeholders (Berrone et al., 2010; Craig & Dibrell, 2006). Consequently, they are likely to make strategic decisions that protect firm legitimacy and reputation (Gomez-Mejia et al., 2014; Zellweger et al., 2011). Transparency of disclosure should be crucial for such family firms as it helps to preserve their legitimacy and image. Negative publicity and scandals associated with greenwashing can be very damaging for firms' reputation and by extension, to the family's personal reputation as there is an overlap between a firm and family identities (Deephouse & Jaskiewicz, 2013). Moreover, these reputational damages are likely to be long-term as family owners cannot quickly sell their shares to stop being associated with the firm (Gomez-Mejia et al., 2014). Therefore, family-owned firms for whom family firm identity is salient would favor transparency over selective disclosure to protect their firm from potentially devastating reputational losses of being caught in a greenwashing scandal. Thus,

H3: Family members' identification with the firm is negatively related to greenwashing

5.4. Methodology

5.4.1. Sample and Data

The sample is based on multiple databases. The starting point of the study is Trucost Plc. database that contains information on environmental disclosures and environmental damage. Trucost Plc. provides the most comprehensive coverage of environmental metrics (Trucost Plc., 2008). I merged it with NRG Metrics database, which contains data on family ownership, family firm characteristics, and other corporate governance measures. NRG Metrics is a corporate governance data provider that comprises data on 8,000 firms from the largest stock exchanges in 46 countries. Once I merged the datasets, I added data from other relevant sources,

such as Asset 4 Thomson Reuters and WRDS. After accounting for missing data, the final dataset is an unbalanced panel of 1, 574 firms headquartered in 40 countries with a total of 8,132 observations from 2007 to 2017. Depending on the measurement of family ownership, roughly 25% of this sample consists of family firms. The panel is unbalanced primarily because firms' disclosures vary by year and because of variation in annual stock exchange memberships. The sample includes the following industries: basic materials, consumer goods, consumer services, financials, health care, industrials, oil and gas, technology, telecommunications, utilities.

5.4.2. Variables and Measures

5.4.2.1. *Dependent Variable*

The dependent variable is measured as *selective disclosure magnitude* as previously described by Marquis and others (2016). Selective disclosure magnitude captures the extent to which firms' environmental disclosures are misaligned with disclosure expectations based on the industry the firm operates in. *Selective disclosure magnitude* is calculated as a difference between Trucost's absolute disclosure ratio and weighted disclosure ratio. The absolute disclosure ratio reflects the amount of relevant indicators that the firm disclosed in various sources including sustainability and integrated reports, regulatory filings, and corporate websites. The weighted disclosure ratio takes into account the importance or materiality of each disclosed indicator. Materiality calculations are performed by Trucost scientists, and these calculations are based on environmental damage associated with each environmental indicator. In other words, selective disclosure captures the extent of symbolism in a firm's environmental disclosures (Marquis et al., 2016).

Selective disclosure ranges from -1 to 1. When the absolute disclosure ratio exceeds weighted disclosure ratio, selective disclosure is positive indicating that the firm disclosed many indicators, but their materiality based on the damage associated with them is relatively low. If the absolute disclosure ratio is equal to weighted disclosure ratio, then the firm disclosed exactly that information that was expected. Finally, in cases where weighted disclosure exceeds absolute disclosure, the firm's disclosures exceed materiality expectations standards set by Trucost Plc.

5.4.2.2. *Independent Variables*

Following the seminal paper by Villalonga and Amit (2006), I define family firms in two different ways as there is no universally accepted definition of family firms. First, I define family firms as those firms where the founder or descendant or family member is a director or officer or a large shareholder who owns more than 5% of equity (*Family 5% ownership and management*). Second, family firms are defined by having the family as the largest shareholder in terms of percentage of total shares owned (*Family largest shareholder*). Family firm definitions are listed in Table 15. I also use an alternate continuous measure of family firms for auxiliary analyses, *Family ownership stake*, which is measured by the ratio of the number of

shares of all classes held by the family to total shares outstanding. Data for all three measurements was sourced from NRG Metrics.

Family management is a proxy for the control and influence dimension of SEW. It is measured by a dichotomous variable that is set equal to 1 if the largest shareholder is a family or an individual who holds the CEO, Chairman, or Vice-Chairman position, and 0 otherwise. This variable was obtained from NRG Metrics.

Family name is a proxy for the family identity dimension of SEW. It is measured as a dichotomous variable that equals to 1 if the company's name is the same as the name of the founder, 0 otherwise. This variable was also obtained from NRG Metrics.

Table 15. Family Firm Definitions

Definition 1	Founder or descendant or family member is a director or officer or a large shareholder who owns more than 5% of equity
Definition 2	Family is the largest shareholder in terms of percentage of total shares owned

5.4.2.3. Control Variables

I include seven firm-level corporate governance controls. First, I control for whether the CEO of the firm is a *founder* or *descendant* since some studies show that whether the CEO of the family firm is a founder or descendant matters for firms' disclosure practices (Anderson et al., 2017; Richards et al., 2017). Both variables are measured by a dichotomous variable that takes a value of 1 when the CEO is a founder (descendant) of the firm, 0 otherwise. Data for both variables were sourced from NRG Metrics. Second, following Villalonga and Amit (2006), I control for *control-enhancing mechanisms* in family firms. Dual-class stocks, pyramids and cross holdings enhance controlling families' control rights relative to their cash flow rights which exacerbates agency problem and makes it easier for the controlling family to derive private benefits (La Porta et al., 1999; Villalonga & Amit, 2006). This is a dichotomous variable that is set to 1 if a company has more than one share class, pyramids, or cross holding, 0 otherwise. The data for this variable comes from NRG Metrics. Next, I control for *board independence* as prior research shows that providing monitoring over managerial decisions, it is an important determinant of the quality of environmental reporting (Jizi, 2017). This variable was obtained from NRG Metrics. I also control for the presence of the *CSR committee of the board* because it oversees the process of environmental disclosure which can increase the quality of disclosed information (Peters & Romi, 2014). The CSR committee of the board is a dichotomous variable that takes a value of 1 if CSR committee is present, and 0 otherwise. I sourced this variable from NRG Metrics. Next, I control for the presence of *CSR compensation incentives* in executive compensation as prior research shows that it influences executive decision-making in the area of environmental disclosures (Flammer, Hong, & Minor, 2019). This variable was obtained from Asset 4 Thomson Reuters, and it is measured by the percentage of executives whose compensation includes CSR criteria. I include a control for the presence of *external audit* of sustainability reports that is measured by a dichotomous variable taking a

value of 1 if the firm's sustainability report has been audited by an independent third-party auditor, and 0 otherwise. The external audit verifies the reliability and completeness of the disclosed information which makes it important in assuring the quality of environmental disclosure (Jackson et al., 2020; Wickert, 2016). This variable was obtained from Asset 4 Thomson Reuters.

In addition, I include three other firm-level controls. First, I control for *firm size* measured by a logarithm of annual sales by following prior work on environmental disclosures (Marquis et al., 2016; Reid & Toffel, 2009). To avoid the influence of outliers, this variable is winsorized at 95% level. The data was sourced from WRDS. Second, because research shows that financial performance is a relevant determinant of environmental disclosures (Neu, Warsame, & Pedwell, 1998), I control for firm's financial performance using *Tobin's Q*. Tobin's Q is measured as a ratio of firm's market value to total assets. This variable is obtained from WRDS. Third, I control for firm's visibility as visible firms are exposed to greater public scrutiny which might make them less inclined to selectively disclose environmental information (Marquis et al., 2016b). Following the work of Marquis and others (2016), I use Trucost's estimate of *environmental damage* as a proxy for visibility. Trucost Plc. calculates the cost of environmental damage by measuring the annual tonnage of pollution emissions released as well as natural resource consumption adjusted for firm's revenue and industry and multiplies it by environmental damage cost factors based on economic research on the pricing of environmental externalities (Trucost Plc., 2008). The variable is in the logarithmic form to account for its skewed distribution. To account for outliers, the variable is winsorized at 95% level.

5.4.3. Empirical Analysis

5.4.3.1. Multivariate Regression Analysis

I conducted two sets of analyses using Stata 15.1 – one for a full sample including family firms and non-family firms and another one for family firm sample only. Following Villalonga & Amit (2006), for both sets of analyses, I used multivariate OLS regression technique with robust standard errors clustered by firm to account for interdependence between observations from the same firm. All regressions include industry, year and country controls.

5.4.3.2. Propensity Score Matching

To minimize sample selection bias, I conducted propensity score matching (PSM) (Bettis et al., 2014; Rosenbaum & Rubin, 1983) analysis on a full sample of family firms and non-family firms. "The propensity score is the conditional probability of assignment to a particular treatment given a vector of observed covariates" (Rosenbaum & Rubin, 1983: 41). In this study, the treatment group consists of both definitions of family firms, and the control group consists of non-family firms. The matching is performed using Stata command *psmatch2* (Leuven & Sianesi, 2003) based on firm size, industry and year. I utilized two types of matching – nearest neighbor, no replacement and nearest neighbor, replacement in control group allowed. Matching with replacement can result in decreased bias as it allows control firms that look

similar to treated firms to be used multiple times (Stuart, 2010). Within the `psmatch2` procedure in Stata, logistic regression is then performed to calculate treatment effect due to the binary nature of the outcome (i.e., selective disclosure) (Stuart, 2010).

5.5. Results

Table 16 provides descriptive statistics and correlations. Multicollinearity does not appear to be an issue in this sample.

Table 16. Descriptive Statistics

#	Variable	Mean	SD	Mean	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Selective disclosure	-0.29	0.33	-0.98	0.92	1															
2	Family 5% ownership and management	0.21	0.41	0	1	0.05	1														
3	Family ownership stake	3.91	12.39	0	91.55	0.01	0.6	1													
4	Family largest shareholder	0.12	0.32	0	1	0.03	0.65	0.8	1												
5	Family name	0.16	0.37	0	1	-0.01	0.12	0.14	0.12	1											
6	Family management	0.00	0.07	0	1	0.04	0.13	0.06	0.07	0.02	1										
7	CEO founder	0.03	0.16	0	1	0.04	0.32	0.06	0.1	-0.05	0.01	1									
8	CEO descendant	0.02	0.15	0	1	0.01	0.29	0.2	0.19	0.12	0.19	-0.01	1								
9	Control mechanisms	0.18	0.38	0	1	0.01	0.01	0.01	0.01	0	0.01	-0.02	-0.01	1							
10	Sales	8.50	1.48	5.23	10.79	-0.01	-0.13	-0.09	-0.09	0.05	-0.02	-0.16	0	0.01	1						
11	Tobin's Q	1.11	1.18	0	21.50	0.12	0.11	0.09	0.1	0.04	0.06	0.06	0.01	0.02	-0.18	1					
12	Environmental damage	2.83	2.15	0.05	6.76	-0.38	-0.04	-0.01	-0.01	0	-0.02	-0.07	0.03	-0.01	0.42	-0.25	1				
13	Board independence	60.37	26.98	0	100	0.11	-0.08	-0.08	-0.06	0.07	-0.02	-0.01	-0.05	0.02	0.03	0.08	-0.03	1			
14	CSR committee	0.17	0.38	0	1	-0.05	0	-0.02	0.01	0.01	-0.03	0.02	-0.05	0	0.1	0.01	0.21	0.17	1		
15	External audit	0.41	0.49	0	1	-0.06	-0.07	-0.04	-0.06	-0.04	-0.02	-0.05	-0.03	0	0.29	-0.09	0.12	-0.14	0.02	1	
16	CSR compensation incentives	0.27	0.44	0	1	-0.02	-0.06	-0.05	-0.05	0	-0.01	-0.01	-0.04	0	0.07	-0.04	0.09	0.21	0.12	0.09	1

Table 17 presents regression results for the full sample of family firms and non-family firms. Models 1 and 2 report results for Hypotheses 1a and 1b. Model 1 contains results for a family firm Definition 1 stating that a family firm is a firm where the founder or descendant or family member is a director or officer or a large shareholder who owns more than 5% of equity. The coefficient for this family firm definition is positive and statistically significant ($b = 0.05$, $s.e. = 0.02$, $p = 0.001$) indicating a positive relationship between family ownership and selective disclosure. Model 2 captures family firm Definition 2, according to which family is the largest shareholder. The coefficient for family firm Definition 2 is also positively related to selective disclosure ($b = 0.04$, $s.e. = 0.02$, $p = 0.069$). All in all, analyses including two different definitions of family firms provide support for Hypothesis 1b that states that family firms are more likely to greenwash compared to non-family firms indicating that entrenchment theory dominates alignment theory in the case of selective disclosure.

Table 17. OLS Regression on Selective Disclosure (Full Sample)

Variable	Model 1	Model 2
Family 5% ownership and management	0.05*** (0.02)	
Family largest shareholder		0.04* (0.02)
Board independence	-0.00 (0.00)	-0.00 (0.00)
CSR committee	0.00 (0.02)	0.00 (0.02)
CSR compensation incentives	-0.01 (0.01)	-0.01 (0.01)
External audit	-0.03* (0.01)	-0.03* (0.01)
Sales	0.04*** (0.01)	0.04*** (0.01)
Tobin's Q	0.01 (0.01)	0.01 (0.01)
Environmental damage	-0.06*** (0.01)	-0.06*** (0.01)
Constant	-0.51*** (0.06)	-0.49*** (0.06)
Observations	8,132	8,132
R-squared	0.28	0.27

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 18 depicts PSM results for the full sample of family firms and non-family firms. Models 1 and 2 represent nearest neighbor propensity score matching without replacement in control groups for subsamples for family firm Definition 1 and family firm Definition 2, respectively. Models 3 and 4 represent nearest neighbor propensity score matching with replacement for the same two subgroups based on the two family firm definitions. Model 1 shows that family firms are more likely to greenwash ($b = 0.03$, $s.e. = 0.01$, $p = 0.001$) while the effect of a family being the largest owner is not significant in Model 2. Similarly, Model 3 provides evidence that family firms have a higher propensity to greenwash than non-family firms ($b = 0.02$, $s.e. = 0.01$, $p = 0.026$), but Model 4 does not provide any statistically significant results. Overall, these analyses show that family firms under Definition 1 are more likely to engage in greenwashing, but it is not the case for family firms under Definition 2.

Table 18. PSM Estimation for Selective Disclosure

	Model 1	Model 2	Model 3	Model 4
	Family 5% ownership and management no replacement	Family largest shareholder no replacement	Family 5% ownership and management with replacement	Family largest shareholder with replacement
Variable	Selective disclosure	Selective disclosure	Selective disclosure	Selective disclosure
Treatment effect	0.03*** (0.01)	0.01 (0.01)	0.02** (0.01)	0.01 (0.01)
Constant	-0.26*** (0.00)	-0.27*** (0.00)	-0.26*** (0.00)	-0.27*** (0.00)
Observations	14,640	14,640	14,640	14,640
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Table 19 presents regression results for the subsamples of family firms based on family firm definitions. Models 1-3 are based on the family firm Definition 1 and Models 4-6 are based on the family firm Definition 2. Since there is an overlap between family firm Definition 1 and family management, the family management variable is only included in Models 4-6. Family management has a positive and statistically significant effect in Models 4-6 ($b = 0.22$, $s.e. = 0.11$, $p = 0.042$; $b = 0.21$, $s.e. = 0.11$, $p = 0.042$; $b = 0.23$, $s.e. = 0.11$, $p = 0.042$). These results provide support for Hypothesis 2b that family firms with higher family influence and control are more likely to engage in selective disclosure. Finally, the variable that captures the inclusion of family name in a firm's name does not have a statistically significant relationship with firms' propensity to selectively disclose environmental information. Thus, Hypothesis 3 is not supported.

Table 19. OLS Regression on Selective Disclosure (Family Firm Sample)

Variable	Model 1 Family 5% ownership and management	Model 2 Family 5% ownership and management	Model 3 Family 5% ownership and management	Model 4 Family largest shareholder	Model 5 Family largest shareholder	Model 6 Family largest shareholder
Family management				0.22** (0.11)	0.21* (0.11)	0.23** (0.11)
Family name	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.05 (0.04)	-0.05 (0.04)	-0.05 (0.04)
CEO founder		0.05 (0.034)			0.07 (0.06)	
CEO descendant			0.01 (0.04)			-0.03 (0.05)
Control mechanisms	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)
Sales	0.05*** (0.01)	0.05*** (0.01)	0.05*** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.04*** (0.01)
Tobin's Q	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03** (0.01)	0.03*** (0.01)	0.03*** (0.01)
Environmental damage	-0.07*** (0.01)	-0.07*** (0.01)	-0.07*** (0.01)	-0.06*** (0.01)	-0.06*** (0.01)	-0.06*** (0.01)
Constant	-0.48*** (0.09)	-0.51*** (0.09)	-0.48*** (0.09)	-0.71*** (0.17)	-0.72*** (0.18)	-0.71*** (0.18)
Observations	2,737	2,737	2,737	1,503	1,503	1,503
R-squared	0.32	0.32	0.312	0.34	0.35	0.35

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

5.5.1. Auxiliary Analysis

I conducted an additional analysis to test for a nonlinear relationship between the extent of family ownership and firm propensity to greenwash. In this analysis, family ownership is measured as a continuous variable capturing the percentage of shares held by the family in relation to total shares outstanding. It is important to conduct such test as research by Labelle and others (2018) shows that at lower levels of family control, family firms invest more in social initiatives, but when family control is greater than the threshold of 36%, social performance starts decreasing. Following this evidence, I test whether family firms' propensity to greenwash changes at a certain level of family ownership. The results of the analyses show no statistically significant nonlinear effect between family ownership level and family firms' propensity to greenwash. Results are available from the author upon request.

5.6. Discussion and Conclusion

The purpose of this study is to investigate whether family firms are more inclined to engage in selective disclosure of environmental information compared to non-family firms and

whether family firms that exhibit certain SEW dimensions are more prone to selective disclosure. Specifically, I focus on influence and control and family identity dimensions of SEW as they have been shown to be relevant for determining communications with stakeholders (Gomez-Mejia et al., 2014). Relying on alignment and entrenchment hypotheses based on agency theory logics and SEW perspective, I first examine competing hypotheses on family firms being more or less likely to engage in selective disclosure compared to firms with other ownership types. Then I turn to my predictions of the impact of influence and control dimension and family identity dimension of SEW on firms' propensity to engage in selective disclosure. I formulate competing predictions on family control and influence vis-à-vis selective disclosure that form the second hypothesis. Finally, hypothesis three states that firms that exhibit the family identity dimension are less likely to engage in selective disclosure.

The results based on regression analysis and propensity score matching indicate that family firms are more likely to greenwash than firms with other ownership types which is consistent with the entrenchment hypothesis stating that family owners use their power to their benefit making them more prone to disclose only those environmental indicators that are beneficial for firm's image. Propensity score analyses indicate that only family firms based on a family firm definition 1 are related to higher levels of greenwashing while results for family firms defined by family being the largest shareholder (family firm definition 2) are not significant. This underscores that family members' presence in the firm's management and board of directors facilitates greenwashing. Further analyses of family firm heterogeneity vis-à-vis-greenwashing support that by demonstrating that firms with strong family control and influence (captured by family members' involvement in firm management) are even more prone to greenwash. This is consistent with my argument that such firms prioritize their control and influence which makes them avoid situations that might involve outsiders and might portray that they cannot control the firm without outside help. To avoid scrutiny of regulators and other stakeholders, family owners, who are often overconfident and prone to risky decisions, might decide to withhold harmful environmental information. Surprisingly, I do not find a statistically significant relationship between family identity and a firm's propensity to greenwash while research indicates that this SEW dimension is related to more transparent reporting practices (Achleitner et al., 2014; Arena & Michelon, 2018). A possible explanation for this is that even though family members' name is included in firm's name, they do not always have high involvement in the management of the firm which precludes them from influencing decisions related to environmental disclosure. Overall, my results support a recent family firm survey conducted by PricewaterhouseCoopers that reveals that environmental sustainability is placed low on family firms' priority list (PricewaterhouseCoopers, 2021). According to the survey based on responses of 2,801 senior family firm executives from 87 countries, 37% of family firms have a sustainability strategy in place, but only 15% of family firms recognize environmental sustainability as one of their priority areas for the next five years (PricewaterhouseCoopers, 2021).

5.6.1. Contributions

The study makes several theoretical contributions. First, this paper adds to the literature on greenwashing which some researchers have claimed to be undertheorized (Lyon &

Montgomery, 2015) and in need of more research (Marquis et al., 2016). The growing literature on greenwashing has considered various firm and institutional level-drivers of greenwashing (Delmas & Burbano, 2011; Kim & Lyon, 2015; Marquis et al., 2016), and the current study confirms the importance of some of the previously examined factors for greenwashing mitigation. In particular, similarly to Marquis and colleagues (2016), the results show that firm visibility level (proxied by the extent of environmental damage) is a strong deterrent of greenwashing.

More importantly, the current paper adds an important dimension to the literature on greenwashing by identifying family ownership as a critical factor in determining firms' propensity to engage in selective disclosure of environmental information. Corporate governance factors, and firm ownership specifically, are almost absent from this line of research even though a broader literature on CSR has acknowledged the importance of firm ownership type and concentration in determining the extent of environmentally responsible behavior of firms (Aguilera et al., 2007; Dam & Scholtens, 2012, 2013). Theoretically, I examine non-economic motives of family firm owners vis-à-vis environmental disclosures and show that family firms are willing to take risks associated with greenwashing to preserve their firm from being criticized and scrutinized for poor environmental performance, which is reflected in higher propensity to selectively disclose environmental information among family firms. Similarly to Anderson and colleagues (2017), I explain such behavior by family's desire to remain in control and by high overconfidence of family owners which makes them more prone to risk-taking. This finding can also be attributed to the lower expertise and skillset level of certain family executives which makes it more challenging for them to prevent greenwashing.

The result that family ownership drives greenwashing contrasts the findings of the paper by Kim, Fairlough and Dibrell (2017) that indicates that top management team's attention to environmental issues is linked to proactive environmental action, where in non-family firms increased attention to such issues is linked to lower levels of proactive environmental behavior, indicating greenwashing. My measure of greenwashing is selective disclosure, which is a comparison of firm's symbolic transparency with firm's substantive transparency, is different from the one used by Kim and colleagues (2017) that measures greenwashing by the extent that top management team's attention to environmental issues results in proactive environmental action. Considering that my measure is about substantiveness of communication rather than about the link between managerial attention to environmental issues and environmental actions, it is not surprising that our findings differ. To the best of my knowledge, this is the first study that examines selective disclosure in family-owned firms. Further research is encouraged to examine this area of greenwashing in family firms.

Second, this study contributes to family business literature by providing novel evidence on non-financial disclosure practices in family firms. I examine the relationship between SEW dimension of influence and control and firm propensity to selectively disclose environmental information. I find that family firms that exhibit high influence and control dimensions are associated with higher levels of selective disclosure. This finding is consistent with Arena & Michelon (2018), that show that firms for which family control and influence SEW dimension

is most salient, tend to disclose less environmental information. The present study takes it a step forward by showing that a lower quantity of disclosures in such firms also does not equate to the most material environmental indicators which is represents selective disclosure. According to the literature, family owners are long-term oriented in their decisions and are likely to act in a way that satisfies stakeholder demands to preserve their reputation for future generations (Le Breton-Miller & Miller, 2009; Le Breton–Miller & Miller, 2006). My findings suggest that family firms are sensitive with regards to their reputation with stakeholders, and that is reflected in their high propensity to greenwash. This finding also suggests that family owners do not always base their decisions related to the protection of the natural environment according to the long-term perspective as greenwashing can negatively impact family owners' SEW in the long run by damaging the firm's reputation.

Also, most studies in the intersection of family business and the natural environment are based on samples of polluting industries (Berrone et al., 2010; Kim et al., 2017) due to the high extent of environmental damage produced in these industries. However, research shows that environmental disclosures in polluting industries are much more transparent because of higher levels of scrutiny (Cojoianu et al., 2020). Therefore, this study includes both polluting and non-polluting industries in the sample to provide more complete evidence on environmental disclosure quality in family firms.

Finally, the current study is based on the global sample which allows to take variations in different institutional environments into account which most prior family firm studies do not do since they are based on single country samples (Cruz et al., 2014; Dyer Jr & Whetten, 2006).

5.6.2. Implications for Practice

The extent to which firms accurately disclose their environmental impacts and risks has implications for various stakeholders including investors, governments, NGOs, supply chain partners, and customers. These stakeholders rely on environmental disclosures to evaluate firms' environmental performance and preparedness to face environmental risks, which then informs their decision-making process including decisions related to investment, business partnership, and regulations. Overall, the study suggests that family firms are more prone to produce symbolic environmental disclosures, especially those firms with higher degrees of family involvement in management. Stakeholders should be more careful and apply a filter while evaluating information disclosed in sustainability reports by such family firms. If possible, stakeholders should also compare information disclose by family firms to those of other firms that operate in similar industries to understand if all material environmental indicators have been disclosed.

5.6.3. Limitations

This study is not without limitations. First, this study is based on a global sample of archival data which does not allow to observe the underlying drivers of selective disclosure. Selective disclosure measure captures the extent to which full environmental damage is reflected in the reported indicators. Decisions related to environmental reporting are usually made by the top management team, and selective disclosure may be a result of a lack of

managerial attention to the topic. I encourage future research using surveys or qualitative methodologies to tackle this question.

Second, as in most studies relying on SEW, the issue is to empirically measure SEW dimensions. I was able to capture two dimensions that are the most relevant to information disclosure practices in family firms (family control and influence and family identity), but there are three more dimensions of SEW as conceptualized by Berrone and colleagues (2012). Future studies can explore whether the remaining SEW dimensions are related to greenwashing and how these dimensions interact with each other vis-à-vis greenwashing.

Finally, data limitations prevented me from including private firms in the analysis. I encourage future research to explore environmental disclosure practices in private firms and test whether my theory and empirical results hold in the context of private firms that.

5.6.4. Conclusion

By drawing on entrenchment and alignment hypotheses from agency theory and SEW perspective, the current study suggests that the entrenchment hypothesis dominates making family-owned firms more likely to engage in risky behavior of selectively disclosing environmental information to avoid reputational damages and further scrutiny related to poor environmental performance. This effect is more pronounced in family firms where family control and influence prevail. My finding suggests that family firms do not always adopt long-term horizon when it comes to environmental issues.

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Curriculum Vitae

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Education and Academic Positions

- 2016 - Ph.D. in Management, University of St. Gallen.
- 2020 - 2021 Visiting Scholar, London Business School
- 2018 Visiting Scholar, Northeastern University
- 2018 Visiting Scholar, University of South Carolina.
- 2011 - 2012 M.A. in Economics, Eastern Michigan University.
- 2006 - 2010 B.A. in International Business, University of Detroit Mercy.

Publications

Tashman P., Flankova S., van Essen M. and Marano V. Why do Firms Participate in Voluntary Environmental Programs? A Meta-analysis of the Role of Institutions, Resources and Program Stringency. Forthcoming. **Organization & Environment.** DOI: <https://doi.org/10.1177/1086026621990063>

Professional Experience

- 2016 – University of St. Gallen
 PhD Student, Research Associate
- 2015 – 2016 Allnex Latvia
 Cost Accountant
- 2014 – 2016 Ministry of Welfare of the Republic of Latvia
 Project Expert
- 2012 – 2013 Volkswagen Group of America
 Finance Intern
- 2010 – 2011 Hollingsworth Logistics Management
 Inventory Analyst