Indigenous Sustainable Finance: The Impact of Collective Ownership on the Sustainable and Socially Responsible Preferences of Indigenous Asset Owners

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Abstract

This study examined the relationship between collective ownership, sustainability and social responsibility preferences, and the mediating role that indigenous governance structure plays in shaping these preferences within the context of indigenous Māori asset ownership in New Zealand. Using a fractional probit model, we analyzed survey data from Māori asset owners to explore the impact of collective ownership on Environment, Social and Governance (ESG) theme allocations and relative weights assigned to investment opportunity attributes in a discrete choice experiment. Our findings revealed that collective ownership significantly influences preferences related to the Environment theme, indicating a stronger alignment between collective ownership and environmental stewardship among Māori asset owners. However, no significant effects were observed for the Social and Governance themes. We suggest that the cultural significance and values associated with environmental issues may resonate more strongly with the concept of collective ownership, while other influential factors may overshadow the effects of collective ownership on social and governance preferences. Furthermore, we find that multiple tribal affiliations influenced the balance between financial returns and social responsibility considerations, indicating the need to reconcile economic prosperity with broader social and cultural objectives. A mediation analysis showed that governance roles mediate the relationship

between collective ownership and the Environment theme, emphasizing the amplifying effect of governance roles on the association between collective ownership and environmental preferences. Overall, our study highlights the nuanced dynamics and complexities within the realm of ESG preferences among Māori asset owners, calling for further research to explore additional variables and dimensions that shape these preferences.

1 Introduction

Ownership has emerged as a key factor in understanding the motivation driving firms and investors to adopt environmental and social considerations in their investment and financial decision making, with several seminal studies exploring its impact on corporate social responsibility (Johnson and Greening, 1999; Barnea and Rubin, 2010; Oh, Chang and Martynov, 2011). Despite this growing body of research, the relationship between ownership and ESG considerations remains complex and poorly understood, particularly within the context of indigenous asset owners.

In this study, we shed light on indigenous ownership as an organizational form by examining the impact of collective ownership on sustainable investment decision making within Māori Asset Holding Institutions (MAHI), which are indigenous corporations in New Zealand. Through a survey of MAHI and a discrete choice experiment (DCE) of decision makers within these institutions, we investigated the role of collective ownership and indigenous governance structures in shaping ESG preferences and sustainable investment decision making.

Our results suggest that collective ownership, as represented by the number of tribal members elected to the trust board and multiple affiliations with Māori Asset Holding Entities (MAHI), has a significant impact on respondents' preferences related to the Environment theme. Specifically, an increase in the number of tribal members elected to the trust board leads to a discrete increase in the predicted probability of allocating points to the Environment theme. Similarly, being affiliated with multiple MAHI compared to a single MAHI affiliation also increases the predicted probability of allocating points to the Environment theme. These effects are statistically significant.

In contrast, no statistically significant results were found for the Social and Governance themes. This suggests that collective ownership has a stronger influence on preferences and allocations related to the Environment theme compared to the Social and Governance themes. The cultural significance and values associated with environmental stewardship in Māori traditions may explain this differential effect.

Furthermore, our analysis explored the mediating impact of governance roles in the relationship between collective ownership and ESG preferences. The results of a mediation analysis showed that the governance role of survey respondents mediates the relationship between collective ownership and preferences for the Environment theme. This suggests that governance roles act as a mechanism through which collective ownership influences preferences related to the Environment theme, amplifying the relationship between the two.

Using proxies, we also examined the impact of institutionalized historical social capital on social responsibility preferences. Our findings indicate that MAHI with a longer history of treaty settlement and a larger ownership base, representing greater social capital, do not exhibit a significant preference for investments emphasizing social responsibility. This suggests that other factors may be driving social responsibility preferences among Māori asset owners.

Overall, our study contributes to the growing body of literature on the relationship between ownership structure and ESG considerations; to the best of our knowledge this is the first study to investigate ESG preferences in the particular context of indigenous ownership as an organizational form.

Our findings have implications for policymakers, asset managers, and Māori communities. Understanding the factors that shape ESG preferences can inform the development of investment strategies that align with the values and objectives of Māori asset owners. Recognizing the differential effects of collective ownership on different ESG themes can help tailor engagement and communication efforts to address specific concerns and priorities. Moreover, the mediation effect of governance roles highlights the importance of governance structures in influencing asset owners' preferences and decision-making processes.

The sections of the paper are organized as follows. In Section 2, we provide a background to Māori Asset Holding Institutions. Literature is reviewed and hypotheses are developed in Section 3. The survey methodology is discussed in Section 4 and results presented in Section 5. Limitations of the survey methodology are addressed in section 6 and we conclude in Section 7.

2 Background

Māori Asset Holding Institutions (MAHI) are institutional investors which manage assets collective owned by Māori, the indigenous people of New Zealand. These entities are a product of a unique legal process whereby a Māori tribal group, referred to hereafter as iwi (tribe) or hapū (subtribe), reclaims ownership of assets from the state which it them manages for the benefit of the entire group (Cribb,2020). These legal entities are established during the Treaty of Waitangi (Te Tiriti o Waitangi) settlement process and take the form of Māori land trusts, private trusts and incorporations. Most MAHI follow the private trust model whereby a settlement trust is established with a trust board and commercial and social subsidiaries which may then be registered separately as incorporations or charities as indicated in Figure 1.Cribb (2020) argues that this corporate governance structure has significant implications for the sustainable management of MAHI assets.

Insert Figure 1 about here

The Treaty of Waitangi Settlement process was designed following the establishment of the Waitangi Tribunal as a permanent standing commission to investigate historical claims by Māori that the Government had breached the Treaty of Waitangi which was signed between the Māori chiefs and the colonial government in 1840. Breaches of the treaty resulted in significant land loss for Māori through the New Zealand Land Wars and economic and social displacement as the colonial government captured more land from Māori for settlement establishment and production activities (Belgrave,2017). Māori culture and language also declined along with the socio-economic wellbeing of the tribes. Māori descendants through activism and protests in the 1970s forced the government to respond to the needs of Māori by compensating for these historical wrongs (Cribb,2020). With the first compensation/settlement package awarded to the Waikato-Tainui iwi in 1995, at least 100 iwi and hapu have since received settlement and several are still in the process of making and settling claims with the Waitangi Tribunal. A settlement package normally includes an apology from the government, the return of lands historically belonging to the iwi or hapu, return of sites of cultural significance, cash, forestry and fisheries quota which represent historical, cultural and commercial/financial redress. Post Settlement Governance Entities, as they are legally called, are set up to receive, hold and manage the

assets for the future benefit of all tribal members. In setting up a settlement entity there is wide consultation across the iwi or hapu to determine the name, structure, values and goals of the entity. Decisions around how the assets should be managed are also taken collectively. Coffin (2013) points out that management of the assets go beyond commercial objectives and that a MAHI must cater to the economic, environmental, social, political and cultural aspirations of tribal members. The ownership structure of MAHI whereby each tribal member has equal claim to assets is one which is considered to be best facilitated by the private trust model, despite the fact that it is a western corporate governance structure (Sanderson et al.,2007). Furthermore, the management and governance bodies of MAHI are drawn from the ownership base, although non-Māori directors and consultants may be co-opted. These characteristics make MAHI unique institutional investors.

MAHI represent a unique ownership type in which each owner has equal and oftentimes multiple ownership across MAHI due to multiple tribal affiliations. Ownership within MAHI is established through what is known as a tribal register. Any Māori person with tribal affiliation to a particular iwi or hapū can apply to be included on the tribal register. As many Māori have genealogical connections, what is known as whakapapa in the Māori world, to more than one iwi they will have ownership claims in multiple MAHI. As observed by Firth (1928) in his seminal work on the economic life of Māori , the primary basis for ownership rights within Māori society is via kinship and tribal association.

Māori asset holding firms mirror the interconnected web of genealogical connections which form the basis of Māori kinship relationships and often mimic the complex relational networks within Māori tribal groups. MAHI are built on complex networks of relationships and ownership claims, which reflect the wider cultural and social context of Māori society. The incorporation of kinship and relational networks into the management and ownership structure of MAHI provides a platform for prioritizing relationships, connection, and responsibility to both current and future generations and Māori cultural values and practices.

3 Related Literature and Hypotheses

Indigenous ownership as an organizational form is a phenomenon which can serve as a model for understanding the evolving role of corporations in the new paradigm of stakeholderism. Indigenous corporations have, however, not been widely studied. Peredo et al.(2004), sought to fill this gap by drawing upon modernization theory, dependency theory and regulation theory to explain how indigenous groups have transformed historical tribal groupings into modern cultural, political and economic enterprises that engage in the capitalist system through entrepreneurial endeavors. Indigenous corporations have emerged out of the resistance of indigenous peoples to the attempts of cultural assimilation which was pursed by colonial governments in keeping with modernization theory which argues that assimilation is a precondition for economic development (Crewe and Harrison,1998). In the post-colonial era, the paradigm of dependency theory has been used as a critique of the neoliberal policies which have given rise to multinationals, industrialized nations and multilateral institutions (Gudynas,2011) by arguing that these institutions represent a new form of colonization in respect of their adverse impact on indigenous communities. Through resistance and mobilization, reclaiming land and resource rights and pursuing alternative development models, indigenous groups have established corporate entities that are distinguished by their emphasis on indigenous values. Indigenous corporations represent forms of social organization predicted by regulation theory (Peredo et al.,2004). In respect of land and resource rights, neoliberal polices resulted in significant privatization and exploitation of natural resources located on indigenous land prompting indigenous groups to mount legal and political challenges to assert their rights to collective ownership and control of these traditional lands. Through legal and political processes, many indigenous groups have secured redress which has provided them with the capital and assets to pursue alternative economic development models which prioritize sustainability, community well-being, and respect for their cultural values and practices. These alternative models challenge the growth-oriented, profit-driven approach of neoliberalism and offer alternatives that prioritize social and environmental justice (Cooter et al.,2019). Indigenous groups have organized as modern corporates which, while operating profitably, are not driven by the profit motive but rather the socio-economic development of tribal communities, preservation and revitalization of tribal culture and assertion of control over their traditional lands of which they

were dispossessed during colonization (Peredo et al., 2004).

A distinct feature of indigenous groups is their quasi-governmental or nation status (Cooter et al.,2019). The corporations they operate are, therefore, integrally tied to the broader political, social and cultural context and there is a constant challenge of balancing these objectives with the imperative of remaining profitability as a means to fund the well-being of the 'nation' or tribe. Cooter, Parker and Richland (2019) frame this problem by asking whether national and tribal distinctiveness as expressed through collective ownership and alternative economic development models promotes or hinders wealth creation. Schumpeterian entrepreneurial theory suggests that the kinship ties which form the basis of collective ownership of indigenous corporations are inimical to the innovation required for wealth creation (Schumpeter,1934) because of the inherent issues of free riding and the conservatism of kin groups which limits risk-taking. This perspective, however, ignores the significant body of evidence which points to the successes of kinship-based family ownership and the prevalence of family-owned firms in modern competitive markets (Stewart,2003).

In respect of literature which speaks specifically to the ownership and governance structure of MAHI, critics argue that imposition of the corporate form, as a precondition for treaty settlements, limits the sovereignty of Māori and creates a Frankenstein-like structure (Cassidy,2021) which forces iwi to operate within the very system which exploited and robbed indigenous people of their lands (Reid and Rout,2016). One of the earliest and most enduring critiques is the theory of neotribal capitalism which argues that MAHI represent a collection of neo-tribal elites who though the transformation of indigeneity, modern reinterpretation of tribal culture and weaponization of historical wrongs by the colonial state have amassed political and economic power to engineer a legal process of privatization of public assets for personal gain (Rata,1991;Rata,2000;Rata,2002;Rata,2012). According to Rata (2000), neotribal capitalism can be considered a local form of capitalism but with the distinguishing features of the corporate tribe as the legal owner of assets rather than individual shareholders and the organization of corporate life around communal kinship relationships and ideologies of culturalism and neotraditionalism. Neotribal capitalism further argues that Māori tribal corporations benefit only a few elites who are able to take advantage of their position in the tribal structure (Rata, 2000).

The theory of neotribal capitalism predicts and raises the specter of MAHI being riddled by agency problems, but this has not been borne out empirically by the numerous case studies of MAHI conducted by both Māori and non-Māori researchers; see New Zealand Productivity Commission (2021) for a review. Furthermore, the highly regarded Iwi Investment Report which is now in its seventh iteration indicates that these entities are operated very successfully and have become a vital part of the New Zealand economy. The 2021 report assessed the return on assets performance of nine MAHI with a combined asset base of approximately $6.3 billion against a benchmark of 9.4% and found that six outperformed the benchmark, one matched the benchmark while the remaining performed slightly below (Barry and McSweeney-Hart,2021).

Case studies of MAHI point to collective ownership and values-based decision making as primary drivers of MAHI success which limits agency problems (Kamalnath, 2021) as these play a similar disciplinary role as the market under the agency theory framework (Karpoff,2021) and thus contradict the predictions of neo-tribal capitalism. As governors and managers feel a strong obligation to the collective tribe, an obligation further enforced by Māori cultural values and norms, they have strong cultural and social incentives to ensure assets are managed in such a way that meets the economic, social, cultural and political needs of the tribe (Cribb,2020). A study of five MAHI by Awatere et al. (2017) demonstrated a relationship between organizational policy and a strategy of operationalizing Māori values which emphasize sustainability and social responsibility. This alternative conception of capitalism and motivation for capital accumulation fits within regulation theory which Peredo et al. (2004) utilized to explain the emergence of indigenous corporations.

3.1Collective Ownership and the Sustainable Investment and Socially Responsible Preferences of MAHI

Collective ownership in the context of MAHI is best understood through the kinship groups around which Māori society is organized. The largest kinship collection is referred to as iwi (tribe) which brings together all tribal members that trace their whakapapa (ancestry/genealogical connections) to an eponymous ancestor. The second tier of kinship grouping is referred to

as hapū (subtribe) which are a collection of whanau (extended family), the primary unit of social organization in Māori society. The understanding of one's whakapapa (ancestry/genealogical connections) is fundamental to Māori identity and kinship structure and has become the basis upon which ownership is based as reflected in the use of tribal registers as the basis for membership in an iwi.

The collective wishes of the tribal members are generally enacted though the election of tribal representatives from the wider ownership base to sit on the trust board of the MAHI (Cribb, 2020). Elections are held regularly with at least one person from each hapū (sub-tribe) being elected to sit on the trust board for a specified period. Through this mechanism of election of tribal members to the trust board, accountability is maintained directly through means of kinship ties that elected leaders have to their hapū and whanau members; larger iwi with more hapū and therefore a larger ownership base tend to have larger trust boards (Cribb,2020). Cooter, Parker and Richland (2019) highlight the high level of trust and social capital within kinship groups which drives leaders to make decisions which benefit the collective. Interviews with tribal members elected to the trust board within MAHI also highlight a strong sense of obligation to past, present and future generations, the land and to other trustees who represent the various subtribes on the trust board. Decision making around management of tribal assets is therefore multidimensional and takes into consideration cultural, social, economic, and environmental factors (Tunui,2021). Collective ownership in the context of MAHI, therefore, influences decision making around sustainable management of tribal assets for the collective well-being of tribal members who are the collective owners of MAHI with equal share of the total value of assets. The number of tribal members elected to the trust board differs from MAHI to MAHI because each iwi has varying numbers of hapū . Regardless of these differences, the aim is maximum representation of the ownership base. We therefore expect that trust boards which are larger by virtue of the fact that they represent a larger ownership base will exhibit greater preference for sustainable investments.

Hypothesis 1: Collective ownership, as represented by the number of tribal members elected to the trust board, is positively related to the relative importance of ESG and social responsibility in the investment decisions of MAHI.

The modern Māori iwi (tribe) has taken on the legal form of incorporated firms but in their function are kinship driven by virtue of their collective ownership and governance structures which are based on demonstrated genealogical affiliation. Kamalnath (2021) argues that the adaptation of the corporate form by Māori to serve kinship needs, thereby reconciling Māori culture and values, creates a balance between shareholder and stakeholder interests. On the one hand, the complex legal structure of commercial companies being owned by a private trust which in turn is owned collectively by the wider kinship group provides the features of limited liability, separate legal personhood, perpetual succession and separation of ownership and control which will ensure the shareholder objective of wealth maximization is met. On the other hand, the establishment of the private trust allows for political, social and cultural objectives to be met without clashing with shareholder interests (Kamalnath, 2021).

The complexity of MAHI owners with multiple tribal affiliations has served to emphasize the fact that relational, governance, ownership and societal structures within the Māori world are built on complex genealogical connections which span multiple iwi, hapū (sub-tribe) and whānau (extended family) groups. It is for this reason that understanding one's whakapapa (ancestry/genealogical connections) is such an important part of Māori culture. MAHI have been able to manage the complexity of multiple ownership claims across multiple iwi by emphasizing Māori cultural practices and Māori values in particular. Additionally, through a process of consensus building, MAHI also address the complexity of multiple owners with equal ownership claims through collective decision making. This involves building relationship and connections between stakeholders and making use of Māori cultural protocols and norms; functions fulfilled by the social/tribal development subsidiary of MAHI. We therefore expect that multiple MAHI affiliations, as another proxy of collective ownership, will be related to the sustainable investment and socially responsible preferences of MAHI.

Hypothesis 2: Collective ownership,as represented by multiple MAHI affiliations, is positively related to the relative importance of ESG and social responsibility in the investment decisions of MAHI.

We justify the number of tribal members elected to the trust board and multiple MAHI affiliations as reasonable proxies for collective ownership in

the context of Māori asset holding firms as folows.

Māori asset holding firms often aim to represent the collective interests and aspirations of the Māori community. By electing tribal members to the tribal board, these firms ensure that decisions regarding asset management and distribution are made through a democratic process. The elected representatives act as stewards of the collective assets, making decisions that align with the values and goals of the Māori community. Māori asset holding firms are often established to preserve and enhance Māori cultural and historical assets. These assets are not solely monetary; they also include lands, natural resources, cultural artifacts, and intellectual property. By involving tribal members in the decision-making process, the firms acknowledge the importance of cultural connections and the inherent rights of Māori communities to the assets.

Furthermore, the inclusion of representatives with multiple MAHI affiliations contributes to a broader representation of Māori tribal groups and communities. This diverse representation allows for a range of perspectives to be considered in the decision-making process, ensuring that the interests of various tribal entities are taken into account. Through open dialogue, consultation, and consensus-building, these firms aim to make decisions that are in the best interest of the collective group and the overall Māori community. Māori asset holding firms often focus on sustainable development and the long-term well-being of the Māori community. By involving tribal members in the governance structure, including younger generations, these firms encourage inter-generational knowledge sharing and the transmission of cultural values and practices. This helps ensure the continuity and preservation of collective ownership for future generations.

3.2 Corporate Governance and the Sustainable Investment and Socially Responsible Preferences of MAHI

The ownership and corporate social responsibility (CSR) literature has evolved significantly since the seminal studies of Graves and Waddock (1994), Barnea and Rubin (2010) and Oh, Chang and Martynov (2011). As we have described MAHI as institutional investors, we are interested in the stream of the ownership literature which examines this particular owner type. It is now well established in the literature that institutional ownership is positively related to corporate social performance (CSP) (Graves and Waddock, 1994) and is particularly influential in the people and product quality dimensions of corporate social performance (Johnson and Greening, 1999). Neubaum and Zahara (2006) also showed that the impact of institutional ownership on CSP is mediated through activism, coordination, and investment horizon while Mohammad, Abuhijileh and Pucheta-Martinez (2020) show that the impact of institutional ownership is also positively mediated through board independence in respect of CSP reporting. Studies on emerging markets and non-US datasets have further confirmed the positive link between institutional ownership and CSR (Jain and Jamali, 2016; Sahasranamam et al.,2020). More recent evidence from a global study across 41 countries indicates that foreign institutional ownership impacts environmental and social (E&S) performance when the foreign investors are from countries with strong E&S demand and norms (Dyck et al.,2019) thereby highlighting strong social and cultural motivations for institutional investors to drive improvements in E&S performance; the study also found that financial incentives were a significant motivator.

Theoretical work around institutional ownership and CSR has been promulgated by Campbell (2007) who proposed an Institutional Theory of CSR which highlights various corporate governance mechanism as drivers of CSR. Theoretical work by others has argued that institutional owners are universal owners of national economies (Hawley and Williams, 2000; Quigley,2021) and as such, have an obligation to drive CSR in the firms and assets in which they have ownership stake. We extend these theoretical frameworks to the indigenous context and argue that MAHI are the universal owners of the Māori economy which is currently valued at $70 billion (Statistics New Zealand, 2022) and is expected to reach $100 billion in 2030. The latest data indicates that Māori asset holding institutions collectively hold 31% of the

value of the Māori economy (Statistics New Zealand, 2022).

Taken more broadly, the literature highlights the impact of corporate governance on corporate social responsibility (CSR) through the following corporate governance mechanisms: formal (legal and political factors) and informal institutions (norms, values and culture), ownership structure, governance and board structure (board size, board independence, CEO duality, executive compensation, decision making processes), and CEO demographic and socio-psychological characteristics (Jain and Jamali, 2016).

Detailed case studies by Tarena-Prendergast (2015), Cribb (2020) and Tunui (2021) demonstrate that the governance structure of MAHI affects decision making around sustainable management of tribal assets and social responsibility. In particular, Tunui (2021) points to the governance role of trust board members as having a significant impact on decision making. If corporate governance mechanisms play a mediating role in the relationship between institutional ownership and corporate social responsibility (Jain and Jamali,2016;Zaman et al.,2022) we expect whether or not a respondent plays a governance role to potentially explain or strengthen the link between collective ownership and the relative importance of ESG and social responsibility in investment decision making within MAHI.

Hypothesis 3: The relationship between collective ownership and the relative importance of ESG and social responsibility in the investment decisions of MAHI is mediated by the governance role of decision makers.

3.3 The Role of Institutionalized Historical Social Capital

Institutionalized historical social capital refers to the accumulated social capital, norms, and practices that have developed over time within an institution or organization. Collective ownership reinforces the development of institutionalized historical capital through shared identity and values, intergenerational continuity and trust and cooperation. We argue that institutionalized historical social capital is a feature of collective ownership that influences the investment choices within MAHI. We further propose a longer history of treaty settlement and a larger ownership base as proxies for institutionalized historical social capital.

Treaty settlements typically involve negotiations, agreements, and relationships formed over an extended period. These settlements reflect a historical process that has shaped the relationships between iwi and other stakeholders, including the government. The longer the history of treaty settlement, the more opportunities there have been to build and strengthen social networks, trust, and cooperation, which are fundamental components of social capital.

A larger ownership base implies a broader membership and participation within the MAHI organization. When more individuals are involved in an organization, there is a greater potential for social interactions, collaboration, and the exchange of resources and information. This increased social interconnectedness and shared experiences contribute to the accumulation of social capital. Moreover, a larger ownership base suggests a greater level of trust and support among members, which are vital elements of social capital.

Roskruge (2021) argues that social organizations like MAHI, which possess institutionalized social capital, can influence investment choices. This implies that historical social capital, rooted in the process of treaty settlement, shapes the values, norms, and practices within the organization. Our assertion is, therefore, that institutions with stronger historical social capital are more likely to prioritize social responsibility in their investment decisions.

Comparatively, Feng, Bai, and Kang (2023) relate institutionalized historical social capital to increased risk-taking in investment decisions within the Chinese context. While the Chinese context may exhibit different dynamics, it highlights the potential influence of historical social capital on investment choices, albeit in a different direction.

Putnam (2001) defines social capital as the value inherent in forms of social organization and argues for its measurement through growth and size of membership. Feng, Bai and Kang (2023) suggest that historical institutional social capital influences investment choices and is more prominent in older institutions while Putman (2001) suggests that social capital increases with membership size and thereby increases the influence it has on investment choices.

Based on Putnam's (2001) definition of social capital, which emphasizes the value inherent in social organization and membership size, we suggest

that organizations with greater historical social capital (represented by longer treaty settlement history and a larger ownership base) will exhibit a greater preference for investments emphasizing social responsibility. This is based on our intuition that social capital accumulated over time and through a broader membership base enhances a MAHI's commitment to social responsibility in their investment practices.

Hypothesis 4: MAHI with greater institutionalized historical social capital, as represented by a longer history of treaty settlement and a larger ownership base, have a greater preference for investments which emphasize social responsibility.

Our paper extends the ownership and sustainable finance literature by deepening understanding of how ownership structures and cultural contexts influence sustainable investment and social responsibility. Specifically, we shed light on the dynamics of collective ownership in an indigenous Māori context.

Our empirical findings have implications for both academic research and practical applications. Academically, the study contributes to the literature on indigenous governance, asset management, and sustainable finance, providing empirical evidence in a unique cultural and organizational context. Practically, the findings could inform policy discussions, strategic decision-making within MAHI, and the design of governance structures that align with Māori values and aspirations.

4 Survey Methodology

4.1 Distribution and response

We survey a sample population of the over 100 MAHI which exists in New Zealand. Our survey, which was conducted in early 2023,targeted responses from trustees at the level of the tribal governance body/trust board, directors and trustees at the level of the commercial governance body and managers at the level of the social and commercial subsidiaries. While there are non-Māori directors and managers working in MAHI, these corporations are collectively owned entities of a single indigenous group representing a minority population and as such, we take the sample to be representative of the collective

owners of the assets vested in these asset holdings institutions through the treaty settlement process.

Surveys of remote and indigenous communities are notoriously difficult as the survey methodology is not considered to be compatible with indigenous research methodologies and indigenous ways of knowing (Held,2019); a recent survey study of 230 firms in New Zealand received only 24 (10%) responses from Māori firms (Harr et al.,2021). Indigenous research methodologies generally advocate approaches which foster relationship building and empowerment of indigenous people to exercise sovereignty and control over the research process (George et al.,2020;Bull,2017); as such, much of the research on indigenous corporations have been interview-based case studies of specific corporations usually carried out by an indigenous researcher with kinship ties to the corporation. We believe our survey to be the first broad-based survey of MAHI. To overcome the handicap of the survey methodology within indigenous contexts we frame the design of the survey through extensive informal interviews, carried out using a Kaupapa Māori research approach (see Pihama et al.,2002), with a collection of 10 Māori scholars, investment managers and trustees of MAHI whom we describe as key informants; the design process also benefitted from the fact that one of the authors is a well-respected Māori academic with professional ties to several MAHI and is a trustee for the MAHI established for one of the tribal groups to which she has kinship ties. The survey was designed using Māori terms and concepts to honor the language, oral traditions and medium of knowledge transmission of Māori as an indigenous group; this is an important principle of Kaupapa Māori research (Smith,2015).

Invitation to the online survey was emailed to a sample of 342 directors and managers at the level of the commercial governance body and the social and commercial subsidiaries and also to a sample of 334 trustees at the level of the trust board. The combined 676 individuals to which the invitation was sent represent a total of 100 discreet and independently operated MAHI. The list of individuals and MAHI which served as the sample population were compiled through a snowballing process of suggestions from key informants and internet search of the websites of MAHI; we therefore acknowledge that our sample suffers from a sample selection bias and address this issue in a subsequent section. We received responses from 114 individuals who are collectively associated with 50 of the 100 MAHI to which the survey was sent.

Our response rate for individuals surveyed is therefore 17 percent which compares favorably with the response rate of 7 percent obtained by Houkamau and Sibley (2019) in their survey of the Māori population while our response rate for MAHI is 50 percent which is almost two times the rate obtained by Harr et al. (2022) who also surveyed Māori enterprises.

4.2 Survey Design

We derive our dependent variables by measuring sustainable investment preferences in two ways: Firstly, through point allocation to ESG themes and sub-themes. Our ESG point allocation measure is adopted from Mclean at al. (2022) which surveyed asset managers in New Zealand, and we draw comparison with their findings on ESG themes and sub-themes.

Secondly, we explore the preference for investment opportunity attributes by asking respondents to rank four hypothetical investment opportunities in a discrete choice experiment.

One investment opportunity emphasizes social responsibility, one emphasizes environmental protection and sustainability, and another emphasizes the indigenous rights of Māori. We also include an investment opportunity focused solely on earning above market returns and describe this as a traditional investment opportunity. How respondents rank each investment opportunity's attributes allows us to proxy preferences for these investment opportunities using an experiment of investment decision making. We present five attributes of each investment opportunity: its social responsibility attribute, its environmental performance attribute, its ability to enhance indigenous rights, its sustainability performance attribute and its return on investment in relation to the market rate of return. We describe the return on investment as below market return, average market return and above market return which reflects the classification of previous studies (Clark-Murphy and Soutar,2004). To increase engagement and make the exercise culturally relevant we make us of Māori words which are closely related to the attributes based on definitions provided by Mead (2003).

We implemented a partial-profile approach for the discrete choice experiment and utilized the PAPRIKA (Potentially All Pairwise Rankings of all Possible Alternatives) method developed by Hansen and Ombler (2008). PAPRIKA reduces the number of pairs respondents have to rank by identi-

fying all implicitly ranked pairs through the corollary suggested by the pairs which respondents explicitly rank and discarding these while maintaining the undominated pairs (Hansen and Ombler,2008). The PAPRIKA method addresses the significant cognitive load required if respondents were required to rank 72 (2x2x2x3x3) investment opportunities which represent all possible combinations of the 5 investment attributes and 2,2,2,3,3 levels to choose from as indicated in Table 1. An average of 12 trade-offs between pairs of the investment opportunity attributes is randomly presented to participants in a web-based software designed on the PAPRIKA method. Participants were directed to the software after completing the previous sections of the survey questionnaire. We obtain mean weights for the social responsibility attribute and use these as a dependent variable.

Insert Table 1 here

4.3 Survey Summary Statistics

Table 2 shows the descriptive statistics of the characteristics of our sample. The sample is dominated by male participants who make up 62% of the sample with females making up 38%. This may be a result of the sample selection bias we sign-posted earlier and which we will address in section 6. Not surprisingly, the sample is also dominated by respondents who identify as Māori (90%). To get a sense of the ownership structure across the sample we asked respondents to indicate whether or not they had roles within multiple MAHI and 46% of the sample indicated that this was this case while the remaining 54% indicated they only had a single role. We expect the multiple roles to be a result of the multiple kinship and tribal ties that is common among Māori and this result provides some evidence of how kinship ties impact the complex ownership structure of MAHI discussed in section 2. There was a near even split between respondents in the sample who had a governance role (48%) and those who were employed (42%) within a MAHI. Another way we tried to tease out information on the ownership structure was to survey respondents on whether they were associated with the governance, commercial or social/tribal development level of the MAHI. Almost half of the respondents (49%) performed their role at the level of the commercial subsidiary, while 41% were associated with the trust board or governance body. Trustees (48%) and directors (21%) make up the majority of roles at the level of the

trust board or governance body while the CEO/CIO/CFO/COO (24%) and board director (24%) roles which make up the majority are evenly split at the commercial and social/ tribal subsidiary. The majority of the sample is involved in making both spending/distribution and investment decisions (63%).

Insert Table 2 about here

We report Māori Asset Holding Institutions characteristics in Figure 2. Figure 2 shows the 2018 Census estimated count of iwi and hapu (tribal members) associated with each MAHI; this count represents the number of collective owners and membership size of each MAHI in our sample.

Insert Figure 2 about here

5 Results

5.1 Collective ownership, ESG and social responsibility preferences

We proxy for collective ownership through the number of tribal members elected to the trust board from the ownership base and whether or not survey respondents have multiple tribal affiliations, thereby giving them ownership claims to the assets of multiple MAHI.

We estimate the following fractional probit model which relates our proxy variables for collective ownership to the ESG theme allocations made by respondents:

$$\omega_{\text{ESG}j} = \beta_0 + \beta_1 \text{TrustBoardSize}_j + \beta_2 \text{D}^{\text{Multiple}} j + \beta_3 X_j + \epsilon_j \quad (1)$$

Where ω_{ESGj} is respondent j's proportional allocation of 100 points between Environmental, Social and Governance themes;$TrustBoardSizej$ is the number of tribal members elected to the trust board of the MAHI with which respondent j is associated; $D^{\text{Multiple}} j$ represents a binary variable which is equal to 1 when respondent j is affiliated with more than one MAHI and 0 otherwise and Xj is a vector of respondent and MAHI characteristics.

Results from the coefficient estimates and marginal effects of Equation 1 are presented in Table 3.

Insert Table 3 about here

The coefficient estimates on our proxy variables for collective ownership are positive and statistically significant for the Environment theme.

The marginal effect for our trust board size variable represents the discrete change in the predicted probability of the outcome variable (Environment) when the number of tribal members elected to the trust board of a MAHI increases by one unit. In this case, for each additional tribal member elected to the trust board, the predicted probability of the outcome variable (Environment) increases by approximately 0.0044. This effect is statistically significant at the 5% level.

The marginal effect for the multiple MAHI affiliation variable indicates the discrete change in the predicted probability of the outcome variable (Environment) when respondents are affiliated with multiple MAHI compared to when they are not. In this case, when respondents are affiliated with multiple MAHI (compared to not being affiliated with multiple MAHI), the predicted probability of the outcome variable (Environment) increases by approximately 0.0478. This effect is statistically significant at the 5% level.

As it relates to our control variables, the dummy variable indicating whether or not respondents have a governance role was also positive and statistically significant for the Environment theme. The marginal effect for this variable indicates the discrete change in the predicted probability of the outcome variable (Environment) when respondents have a governance role compared to when they do not have a governance role. Here, when respondents have a governance role (compared to not having a governance role), the predicted probability of the outcome variable (Environment) increases by approximately 0.0495. This effect is statistically significant at the 1% level.

Hypothesis 1 is therefore supported for the Environment theme. As no statistically significant results are obtained for the Social and Governance themes on the collective ownership variables, hypothesis 1 is not supported for these ESG themes.

These results indicate that collective ownership, as represented by the

number of tribal members elected to the trust board and multiple MAHI affiliations, has a stronger influence on respondents' preferences and allocations related to the Environment theme compared to the Social and Governance themes. The specific values and cultural significance associated with environmental issues may resonate more strongly with the concept of collective ownership and the preservation of natural resource resulting in the differential effect observed across the ESG themes.

Māori cultural values and traditions often emphasize the importance of kaitiakitanga (guardianship) of the environment. This cultural focus on environmental stewardship may lead to a stronger alignment between collective ownership and environmental preferences among Māori asset owners. Conversely, the Social and Governance themes may involve a broader range of factors and considerations that are not as directly linked to the concept of collective ownership.

The lack of statistically significant results for the Social and Governance themes could also be attributed to the presence of other influential factors not included in the model. These factors might have a stronger impact on social and governance preferences among Māori asset owners, overshadowing the effects of collective ownership variables. It is also possible that the operationalization of collective ownership in the study, through variables such as trust board size and multiple MAHI affiliations, may capture specific aspects of ownership that are more relevant to the Environment theme. The influence of collective ownership on social and governance preferences may require different or additional measurement approaches that were not captured in the study. The specific characteristics and composition of the study sample could also play a role. It is possible that the respondents in the study had stronger associations or concerns with environmental issues, leading to more pronounced effects for the Environment theme compared to the Social and Governance themes.

Overall, these findings suggest that while collective ownership has a significant impact on preferences related to the Environment theme among Māori asset owners, other factors may be driving preferences and allocations in the Social and Governance themes. Further research and exploration of additional variables and dimensions could help uncover the underlying dynamics and factors that influence preferences across different ESG themes within the

Māori asset ownership context.

To test the impact of collective ownership on the relative importance of social responsibility preferences we utilize the relative weights on the five attributes from the discrete choice experiment and estimate the following fractional probit model which relates our variables for collective ownership to the relative weights on the attributes generated from the tradeoffs made by respondents in the discreet choice experiment:

$$\omega_{\mathrm{IOA}j} = \beta_0 + \beta_1 \mathrm{TrustBoardSize}_j + \beta_2 \mathrm{D}^{\mathrm{Multiple}} j + \beta_3 X_j + \epsilon_j \quad (2)$$

Where ω_{IOAj} is respondent j's partial weights assigned to the five investment opportunity attributes in the discreet choice experiment;$TrustBoardSizej$ is the number of tribal members elected to the trust board of the MAHI with which respondent j is associated; $D^{\mathrm{Multiple}} j$ represents a binary variable which is equal to 1 when respondent j is affiliated with more than one MAHI and 0 otherwise and Xj is a vector of respondent and MAHI characteristics.

Results from the coefficient estimates of the financial return attribute are presented in Table 4.

Insert Table 4 here

Among the five investment opportunity attributes (social responsibility, environmental performance ability to enhance indigenous rights, sustainability performance and return on investment in relation to the market rate of return) between which respondents made trade offs in the discrete choice experiment, only the financial return attribute exhibited statistically significant on one of our proxy variables for collective ownership, namely the multiple MAHI affiliation variable, indicating that collective ownership as represented by multiple tribal affiliations seems to be influencing a balance between the need for MAHI to make a profit while meeting social responsibility and other needs.

The marginal effect for the multiple MAHI affiliation variable indicates the discrete change in the predicted probability of the outcome variable (Return on Investment) when respondents are affiliated with multiple MAHI compared to when they are not. In this case, when respondents are affiliated with multiple MAHI (compared to not being affiliated with multiple MAHI), the predicted probability of the outcome variable (Return on Investment)

increases by approximately 0.043106. This effect is statistically significant at the 5% level.

The statistically significant marginal effect for the multiple MAHI affiliation variable indicates that respondents affiliated with multiple MAHI have a higher predicted probability of assigning importance to the financial return attribute when making trade-offs in the discrete choice experiment. This finding suggests that collective ownership, as represented by multiple tribal affiliations, influences the balance between the need for MAHI to generate profits and the consideration of social responsibility and other needs. These results provide insights into the complex decision-making processes and trade-offs made by Māori asset owners. It indicates that having affiliations with multiple MAHI may shape preferences toward financial returns, potentially reflecting the need to balance economic prosperity with other social and cultural considerations. However, it's important to note that the analysis focuses specifically on the financial return attribute and its relationship with collective ownership variables. The results do not provide evidence of significant effects on other attributes such as social responsibility, environmental performance, indigenous rights, or sustainability performance. This suggests that collective ownership, as captured by the proxy variables in the model, may not have a significant influence on the relative importance assigned to these attributes.

The finding that only the financial return attribute was statistically significant in relation to the proxy variable for collective ownership (multiple MAHI affiliations) suggests that when respondents are affiliated with multiple MAHI, they prioritize the financial return aspect of investment opportunities over other attributes. This could indicate that the pursuit of financial gains is given higher importance when making investment decisions, even within the context of collective ownership and social responsibility considerations. It is possible that respondents perceive financial returns as a critical factor in sustaining and supporting the objectives and needs of multiple MAHI entities. Additionally, other factors such as risk perception, economic pressures, or strategic considerations may play a role in driving the significance of the financial return attribute and aligns with the literature on tribal ownership of assets held collectively (Cooter, Parker and Richland,2019).

5.2 Mediating impact of governance roles on collective ownership, ESG and social responsibility preferences

To test whether governance role mediates the relationship between collective ownership and ESG and social responsibility preferences, we follow the mediation analysis approach of Zhao, Lhynch and Chen (2010) and Broadback, Guenster and Mezger (2018). The first condition to be met is that our collective ownership variables must be significant in explaining the mediator: governance role of respondents.

To test this relationship, we estimate the following regression:

$$D^{\text{GovernanceRole}}j = \beta_0 + \beta_1 \text{TrustBoardSize}_j + \beta_2 \text{D}^{\text{Multiple}}j + \beta_3 X_j + \epsilon_j \quad (3)$$

Where $D^{\text{GovernanceRole}}j$ is a binary variable which is equal to 1 when respondent j has a governance role and 0 otherwise;$TrustBoardSizej$ is the number of tribal members elected to the trust board of the MAHI with which respondent j is associated; $D^{\text{Multiple}}j$ represents a binary variable which is equal to 1 when respondent j is affiliated with more than one MAHI and 0 otherwise and Xj is a vector of respondent and MAHI characteristics.

The second condition is that our collective ownership variables must be significant in explaining ω_{ESGj} and ω_{IOAj} in a total effect specification without the mediator. To test this condition, we estimate:

$$\omega_{\text{ESG}j} = \beta_0 + \beta_1 \text{TrustBoardSize}_j + \beta_2 \text{D}^{\text{Multiple}}j + \beta_3 X_j + \epsilon_j \quad (4)$$

$$\omega_{\text{IOA}j} = \beta_0 + \beta_1 \text{TrustBoardSize}_j + \beta_2 \text{D}^{\text{Multiple}}j + \beta_3 X_j + \epsilon_j \quad (5)$$

The mediation is then determined by whether or not the mediator $D^{\text{GovernanceRole}}j$ has significant coefficients in specifications explaining ω_{ESGj} and ω_{IOAj} as estimated in Equation 1 and Equation 2.

Results from the mediation analysis are presented in Table 5.

Insert Table 5 about here

All the conditions outlined above are only satisfied for the collective ownership proxy variable which indicates whether or not a respondent is affiliated

with multiple MAHI and the Environment theme. Governance role therefore only has a mediating effect on the preference for the Environment theme.

As reported in Table 5, the collective ownership proxy variable which indicates whether or not a respondent is affiliated with multiple MAHI has a negative marginal effect on the governance role mediator, significant at the 10% level and therefore meets the first condition for mediation. The collective ownership proxy variable which indicates the number of tribal members elected to the trust board had an insignificant effect on the governance role mediator. Column (5) shows results for estimating the total effect model that explains the Environment theme without the impact of the mediator variable. The total marginal effect of the collective ownership proxy variable which indicates whether or not a respondent is affiliated with multiple MAHI is 0.0349 and is significant at the 10% level; the second condition for mediation is therefore met for the collective ownership proxy variable which indicates whether or not a respondent is affiliated with multiple MAHI and the Environment theme. No statistically significant results were obtained for the Social and Governance themes.

Column (6) shows results for estimating the total effect model that explains the financial return attribute without the impact of the mediator variable. The total marginal effect of the collective ownership proxy variable which indicates whether or not a respondent is affiliated with multiple MAHI is 0.1547 and is significant at the 10% level; the second condition for mediation is therefore met for the collective ownership proxy variable which indicates whether or not a respondent is affiliated with multiple MAHI and the financial return attribute. No statistically significant results were obtained for the social responsibility, environmental performance, indigenous rights, or sustainability performance attributes.

To assess the third condition for mediation, we import the results for the Environment theme and the financial return attribute from Table 3 and Table 4. These results show that the marginal effect of the governance role mediator is significant for the Environment theme but not the financial return attribute. The third condition is therefore met for the Environment theme but not the financial return attribute.

Finally, we compare the marginal effect of the collective ownership proxy variable which indicates whether or not a respondent is affiliated with mul-

tiple MAHI on the Environment theme in the total effect model reported in column 5 with the marginal effect reported in column 9. We observe a larger marginal effect in the model reported in column 9 than in the total effect model reported in column 5.

To fulfill the third condition, the marginal effect of the governance role mediator should be significant for the Environment theme and financial return attribute. The results show that the governance role mediator had a significant effect on the Environment theme, meeting the third condition. However, no statistically significant results were found for the financial return attribute. Considering these conditions, it can be concluded that governance role mediates the relationship between collective ownership (specifically, affiliation with multiple MAHI) and preferences for the Environment theme among MAHI asset owners. The larger marginal effect observed in the model with the mediator variable compared to the total effect model further supports this conclusion. Hypothesis 2 is therefore partially confirmed.

The inclusion of the mediator variable (governance role) captures an additional pathway through which collective ownership influences the Environment theme. The governance role acts as a mechanism through which collective ownership exerts its influence on the Environment theme. This mediation effect appears to amplify the relationship between collective ownership and the Environment theme, leading to a larger marginal effect.

We portray the results of the mediation model in Figure 3.

Insert Figure 3 about here

5.3 Institutionalized Historical Social Capital and Social Responsibility

To investigate the assertion that MAHI with a longer history of treaty settlement and a larger ownership base and therefore greater institutionalized historical social capital have a greater preference for investments which emphasize social responsibility we estimate the following equation:

$$\omega_{SRIj} = \beta_0 + \beta_1 PopulationSizej + \beta_2 Agej + \beta_3 Xj + \epsilon_j \qquad (8)$$

Where ω_{SRIj} is respondent j's partial weights assigned to the social responsibility attribute in the discreet choice experiment;$PopulationSizej$ represents the the population size of the iwi with which respondent j's MAHI is associated; $Agej$ is the number of years since a MAHI has received its treaty settlement and Xj is a vector of respondent and MAHI characteristics.

No significant results were observed for the variables used to represent institutionalized historical social capital; therefore, no support is provided for hypothesis 3.

6 Validation of Survey Responses

While surveys provide valuable insights from a previously unstudied population of asset owners in the finance domain, it is important to acknowledge the limitations associated with this methodology. We address several concerns regarding selection bias, self-serving responses, and the robustness of key variables in our study.

6.1 Sample Selection Bias

To evaluate the potential selection bias in our sample, we compare our findings with those of Houkamau and Sibley (2019), who surveyed 7019 individuals from the general Māori population. We focus on the Group Membership Evaluation dimension of the MMM-ICE3 scale, which measures Māori identity. Our analysis (Table 6) reveals a slightly higher mean with less variation in our sample, along with a slightly higher Cronbach's alpha. The small mean difference of 0.82 suggests that the propensity for our sample to strongly identify as Māori would likely be observed in a similar sample from the general Māori population. Moreover, considering that we surveyed governance and high-level decision makers within tribal entities, the higher result on our measure of Māori identity aligns with expectations.

To further address participation bias, we compare two sub-samples: Māori and non-Māori. Our rationale is that if selection bias exists and affects the two sub-samples differently, we should observe distinct responses to questions influenced by this bias. Table 6 displays the comparison of responses to the question, "what is the level of importance you attach to Māori values in the investment decision-making process?" Interestingly, we find no statistical difference in the mean responses between respondents identifying as Māori and those who do not. This suggests that the level of importance attached to Māori values in the investment decision-making process is similar regardless of respondents' self-identification as Māori.

insert Table 6 about here

6.2 Self-serving responses

We evaluate the internal validity of responses by examining consistency among decision makers associated with the same MAHI. Our correlation analysis indicates a high degree of consistency in responses. We also maintain internal consistency by using mixed scales and altering the order of final questions seen by each respondent, leveraging the Qualtrics software. To assess external validity, we compare the investment portfolio allocations reported by respondents with those disclosed in the annual reports of their respective MAHI. As shown in Table 7, the asset size and sector allocation responses provided by respondents align, on average, with the published data in the annual reports.

insert Table 7 about here

6.3 Key variables robustness

To address concerns regarding alternative drivers and confounding factors, we conduct placebo tests to explore potential relationships that would be present if our baseline results were flawed. Specifically, we perform multivariate regressions, replacing the collective ownership variables with variables that should have no specific impact on the ESG preferences of MAHI decision makers. In Table 8, we report the results of these tests, which demonstrate insignificant correlations. This indicates that our survey results accurately reflect the influence of collective ownership on ESG preferences within MAHI.

insert Table 8 about here

7 Conclusion

This study examined the relationship between collective ownership, ESG (Environmental, Social, and Governance) preferences, and social responsibility among Māori asset owners. Our findings shed light on the influence of collective ownership on asset owners' preferences and allocations across different ESG themes.

Collective ownership, as represented by the number of tribal members elected to the trust board and multiple affiliations with Māori Asset Holding Entities (MAHI), has a significant impact on respondents' preferences related to the Environment theme. Specifically, an increase in the number of tribal members elected to the trust board leads to a discrete increase in the predicted probability of allocating points to the Environment theme. Similarly, being affiliated with multiple MAHI compared to a single MAHI affiliation also increases the predicted probability of allocating points to the Environment theme. These effects are statistically significant.

In contrast, no statistically significant results were found for the Social and Governance themes. This suggests that collective ownership has a stronger influence on preferences and allocations related to the Environment theme compared to the Social and Governance themes. The cultural significance and values associated with environmental stewardship in Māori traditions may explain this differential effect.

Furthermore, our analysis explored the mediating role of governance structure in the relationship between collective ownership and ESG preferences. The results revealed that governance roles mediate the relationship between collective ownership (specifically, affiliation with multiple MAHI) and preferences for the Environment theme. This suggests that governance roles act as a mechanism through which collective ownership influences preferences related to the Environment theme, amplifying the relationship between the two.

Additionally, we examined the impact of institutionalized historical social capital on social responsibility preferences. Our findings indicate that MAHI with a longer history of treaty settlement and a larger ownership base, representing greater social capital, do not exhibit a significant preference for investments emphasizing social responsibility. This suggests that

other factors may be driving social responsibility preferences among Māori asset owners.

Overall, our study provides insights into the complex dynamics of collective ownership, ESG preferences, and social responsibility among Māori asset owners. While collective ownership variables have a significant impact on preferences related to the Environment theme, other factors may influence preferences in the Social and Governance themes. Further research is needed to uncover these underlying dynamics and explore additional variables and dimensions that may contribute to ESG and social responsibility preferences within the Māori asset ownership context.

These findings have implications for policymakers, asset managers, and Māori communities. Understanding the factors that shape ESG preferences can inform the development of investment strategies that align with the values and objectives of Māori asset owners. Recognizing the differential effects of collective ownership on different ESG themes can help tailor engagement and communication efforts to address specific concerns and priorities. Moreover, the mediation effect of governance roles highlights the importance of governance structures in influencing asset owners' preferences and decision-making processes.

In conclusion, this study contributes to the growing literature on collective ownership, ESG preferences, and social responsibility by providing insights specific to the Māori asset ownership context. By considering the cultural, historical, and institutional dimensions, our findings contribute to a more nuanced understanding of how collective ownership influences ESG preferences and social responsibility considerations among indigenous asset owners.

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Appendix

Figure 1. Private trust model of Māori Asset Holding Institution

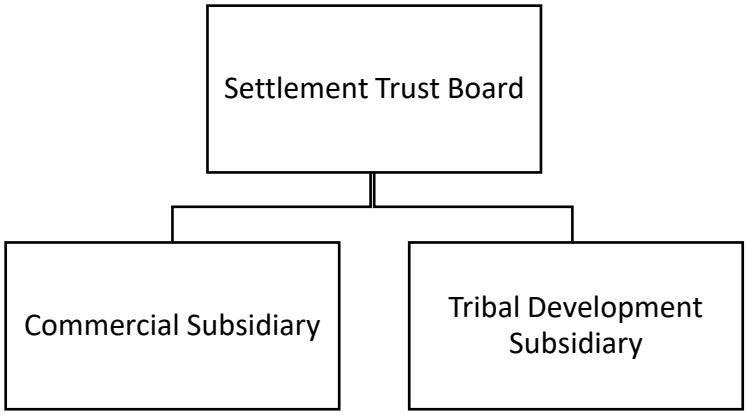

Figure description: This chart illustrates the governance structure of Māori Asset Holding Institutions

Figure 2 Iwi/hapu population size and years since treaty settlement per MAHI

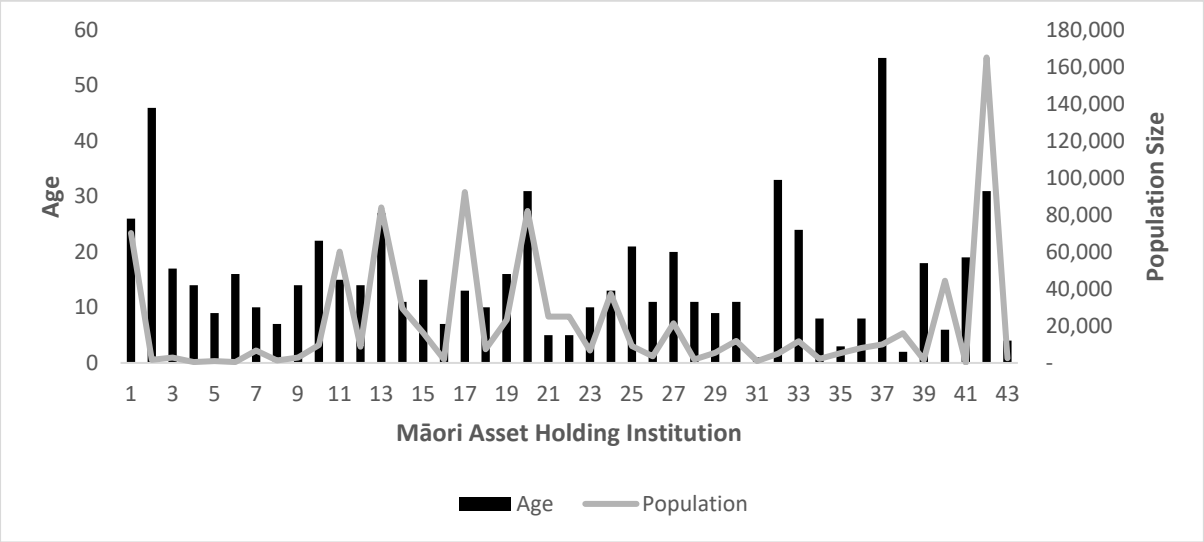

Figure description: This chart shows the population size of the iwi(tribe) with which the MAHI is associated and the age of the MAHI representing the number of years since it has received its treaty settlement.

Figure 3 Causal chain for mediation model

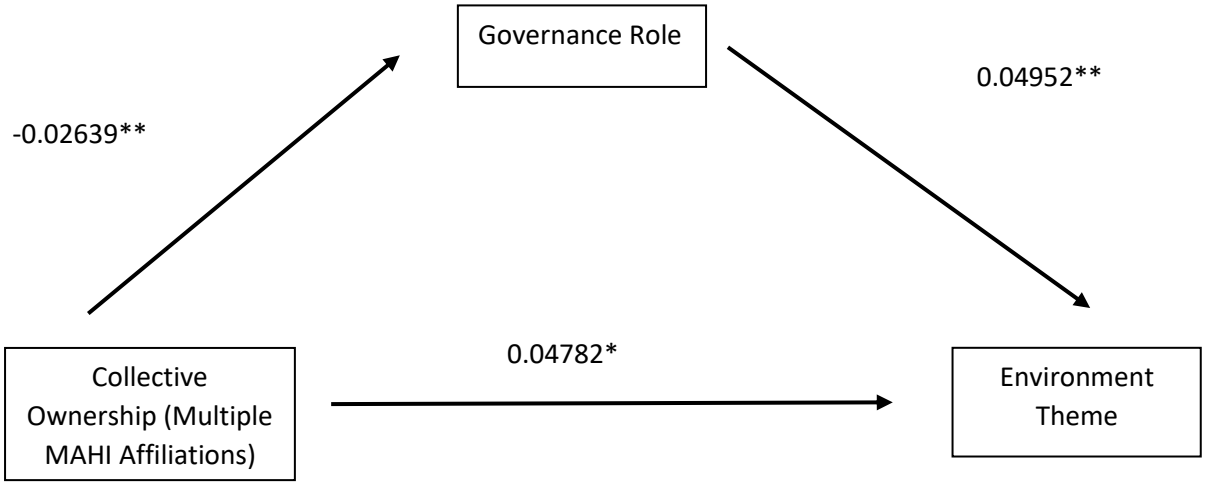

Figure description: This chart shows the mediation model for the impact of governance role on collective ownership and the Environment theme.

TABLE 1 Investment opportunity attributes and levels utilized in discrete choice experiment

Investment Opportunity Attributes	**Levels**
Ability to benefit whānau	Low positive social impact
	High positive social impact
Alignment with kaitiakitanga	Negative environmental impact
	Positive environmental impact
Alignment with mana	Limits indigenous rights
	Increases indigenous rights
Alignment with mauri	Meets no sustainability criteria
	Meets some sustainability criteria
	Meets all sustainability criteria
Return on investment	Below market rate of return
	Average market rate of return
	Above market rate of return

Table description: This table shows the 5 investment opportunity attributes with the first, second and third having 2 levels to choose from and the fourth and fifth having 3 levels, resulting in 72 (2x2x2x3x3) possible combinations.

TABLE 2 Characteristics of Respondents

Individual Characteristics	Value	Number	Percentage
Gender	Female	45	39%
	Male	69	61%
Māori vs. Non-Māori	Māori	101	89%
	Non-Māori	13	11%
Roles in Multiple MAHI	Yes	57	50%
	No	57	50%
Type of Role within MAHI	Governance Role	55	48%
	Employed	47	41%
	Consultant	12	11%
Subsidiary in which role is performed	Trust Board or Governance Body	40	35%
	Commercial Subsidiary	50	44%
	Social or Tribal Development Subsidiary	14	12%
Role within trust board or governance body	Chair	6	5%
	Deputy Chair	6	5%
	Executive Director	6	5%
	Trustee	47	41%
	Director	16	14%
	Pūkenga (Māori knowledge expert)	3	3%
	Other	25	22%
	Consultant	6	5%
Role within commercial subsidiary and social/tribal subsidiary	CEO/CIO/CFO/COO	30	25%
	Manager	5	4%
	Investment/Business Analyst/Accountant	2	2%
	Consultant/Advisor	11	10%
	Investment/Commercial Manager	2	2%
	Board Chair	22	19%
	Board Director	29	25%
	Policy and Strategy Manager	5	4%

	Communications Manager/Coordinator	5	4%
	Environment Manager	5	4%
Involvement in Investment or spending/distribution decisions	Involved in making investment decisions	72	63%
	Not involved in making investment decisions	42	37%

Table description: This table shows the characteristics of the 114 respondents.

TABLE 3 Average Marginal Effects (ME) of collective ownership on ESG preferences

	(1)	ME	(2)	ME	(3)	ME
			Panel A: ME Environment			
TrustBoardSize	0.00964	0.0035659			0.0120*	0.0044304*
	(1.86)	(0.0019172)			(2.56)	(0.0017248)
			0.115*	0.0424085*	0.130*	0.0478195*
$D^{Multiple}$			(2.19)	(0.0193129)	(2.47)	(0.0192599)
AssetSize	0.0507	0.01876	0.0431	0.0159343	0.0569	0.0209859
	(1.25)	(0.0150161)	(1.10)	(0.014505)	(1.51)	(0.013976)
MAHIAge	-0.000426	-0.0001576	-0.00112	-0.0004131	-0.00106	-0.0003917
	(-0.23)	(-0.000694)	(-0.60)	(0.0006829)	(-0.57)	(0.0006818)
$D^{Governance}$	0.0991*	0.0366593*	0.144**	0.0532588**	0.134**	0.0495161**
	(2.45)	(0.0149114)	(2.90)	(0.0182964)	(2.86)	(0.0172152)

$D^{Consultantuse}$	-0.00904	-0.003341	-0.00203	-0.0007502	-0.00538	-0.0019848
	(-0.47)	(-0.0071877)	(-0.11)	(0.0070626)	(-0.29)	(0.0068754)
$D^{SustainabilityManager}$	0.0154	0.0056893	-0.00855	-0.0031597	0.0114	0.0042133
	(0.38)	(0.0149086)	(-0.21)	(-0.0151991)	(0.29)	(0.0147502)
$D^{SustainabilityPerformance}$	-0.00890	-0.0032922	-0.00491	-0.0018154	-0.0260	-0.0096146
	(-0.16)	(-0.0204606)	(-0.09)	(0.0201583)	(-0.47)	(0.020649)
Constant	-0.514***		-0.495***		-0.597***	
	(-4.77)		(-4.81)		(-5.86)	
Pseudo-R^2	0.0021		0.0028		0.0037	
Wald chi^2	10.06		9.70		14.76	
Prob > chi^2	0.1853		0.2061		0.0639	
			Panel B: ME Social			
TrustBoardSize	0.00456	0.0016519			0.00495	0.0017908
	(1.14)	(0.0014512)			(1.21)	(0.0014808)

			0.115*	0.0424085*	0.0206	0.0074736
$D^{Multiple}$			(1.52)	(0.0193129)	(0.48)	(0.015601)
AssetSize	-0.0433	-0.0156817	0.0431	0.0159343	-0.0423	-0.0153334
	(-1.12)	(-0.0139505)	(1.10)	(0.014505)	(-1.09)	(0.0140299)
MAHIAge	-0.00238	-0.0008632	-0.00112	-0.0004131	-0.00249	-0.0009005
	(-1.24)	(-0.0006954)	(-0.60)	(-0.0006829)	(-1.28)	(0.0007001)
$D^{GovernanceRole}$	0.0224	0.008129	0.144**	0.0532588**	0.0280	0.010131
	(0.64)	(0.0127461)	(2.90)	(0.0182964)	(0.95)	(0.0146839)
$D^{Consultantuse}$	0.0171	0. 0061816	-0.00203	-0.0007502	0.0177	0.0064072
	(0.91)	(0.0068209)	(-0.11)	(0.0070626)	(1.97)	(0.006716)
$D^{SustainabilityManager}$	0.0946*	0.0342648*	-0.00855	-0.0031597	0.0940*	0.0340383*
	(2.29)	(0.0149118)	(-0.21)	(-0.0151991)	(2.25)	(0.0151)
$D^{SustainabilityPerformance}$	-0.0232	-0.0084038	-0.00491	-0.0018154	-0.0260	-0.0094294

	(-0.48)	(0.0176375)	(-0.09)	(0.0201583)	(-0.52)	(0.0180317)
Constant	-0.469***		-0.495***		-0.482***	
	(-5.13)		(-4.81)		(-5.21)	
Pseudo-R^2	0.0015		0.0028		0.0015	
Wald chi^2	10.53		9.70		10.53	
Prob > chi^2	0.1606		0.2061		0.2297	
Panel C: ME Governance						
TrustBoardSize	-0.00858	-0.0030322			-0.0100	-0.0035451
	(-1.13)	(-0.0026611)			(-1.34)	(-0.0026288)
$D^{Multiple}$			-0.0615	-0.0217498	-0.0743	-0.0262476
			(-0.93)	(-0.0234731)	(-1.12)	(-0.0234724)
$D^{AssetSize}$	-0.0711	-0.0251221	-0.0638	-0.0225447	-0.0754	-0.0266244
	(-1.38)	(-0.0181222)	(-1.19)	(-0.0188468)	(-1.46)	(-0.0181686)
MAHIAge	0.000353	0.0001247	0.000758	(0.000268)	0.000741	0.0002616
	(0.16)	(0.0007671)	(0.34)	(0.0007948)	(0.33)	(0.0007974)

$D^{GovernanceRole}$	-0.102	-0.0360457	-0.130*	-0.0459112*	-0.122	-0.0432546
	(-1.84)	(-0.0196138)	(-2.01)	(0.0228958)	(-1.95)	(-0.0222439)
$D^{Consultantuse}$	-0.0428	-0.0151122	-0.0480	-0.0169607	-0.0452	-0.015953
	(-1.31)	(-0.0116527)	(-1.47)	(0.0115863)	(-1.38)	(-0.0116547)
$D^{SustainabilityManager}$	-0.0608	-0.021483	-0.0423	-0.014967	-0.0583	-0.0205833
	(-1.10)	(-0.0195701)	(-0.75)	(-0.0200113)	(-1.04)	(-0.0197997)
$D^{SustainabilityPerformance}$	0.00724	0.0025598	0.000584	0.0002064	0.0179	0.0063168
	(0.08)	(0.0316075)	(0.01)	(0.0304722)	(0.20)	(0.0316427)
Constant	-0.217		-0.254		-0.168	
	(-1.29)		(-1.42)		(-0.99)	
Pseudo-R2	0.0031		0.0030		0.0037	
Wald chi^2	10.33		9.02		10.95	
Prob > chi^2	0.1707		0.2511		0.2047	
N	114		114		114	

Table description: Fractional probit regression results (for various specifications of Equation 1) with ω_{ESGj} is respondent j's allocation of 100 points between Environmental, Social and Governance themes; $TrustBoardSize_j$ is the number of tribal members elected to the trust board of the MAHI with which respondent j is associated; $D^{Multiple}{}_j$ represents a binary variable which is equal to 1 when respondent j is associated with more than one MAHI and 0 otherwise; $D^{AssetSize}{}_j$ is a dummy variable which is 1 for MAHI with assets >30 and 0 otherwise. MAHIAge is number of years since the MAHI has received its treaty settlement; $D^{GovernanceRole}{}_j$ represents a binary variable which is equal to 1 when respondent j has a governance role and 0 otherwise; ; $D^{ConsultantUse}{}_j$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated makes use of consultants and 0 otherwise; $D^{SustainabilityManager}{}_j$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated employs a sustainability manager and 0 otherwise; $D^{Sustainabilityperformance}{}_j$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated measures and reports on its sustainability performance and 0 otherwise. *t* statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 4 Impact of collective ownership on the relative importance of the financial return investment attribute

w_{IOA}	(1)	ME	(2)	ME	(3)	ME
TrustBoardSize	-0.00468 (-0.68)	-0.0012561 (-0.0018562)			-0.00175 (-0.26)	-0.0004682 (-0.0017775)
$D^{Multiple}$			0.163** (2.79)	0.0436761** (0.0154682)	0.161** (2.73)	0.0431062** (0.0156113)
AssetSize	-0.0849 (-1.28)	-0.0227766 (0.0178295)	-0.0778 (-1.17)	-0.0208003 (0.0178096)	-0.0797 (-1.19)	-0.0213197 (-0.0179858)
MAHIAge	-0.00245 (-0.80)	-0.000656 (-0.0008207)	-0.00332 (-1.10)	-0.0008871 (-0.0008126)	-0.00332 (-1.10)	-0.0008882 (-0.0008131)

$D^{GovernanceRole}$	-0.0178	-0.0047695	0.0238	0.0063641	0.0252	0.0067411
	(-0.28)	(-0.0170165)	(0.36)	(0.0177612)	(0.38)	(0.0176642)
$D^{Consultantuse}$	-0.00435	-0.0011657	0.000140	0.0000374	0.000638	0.0001707
	(-0.14)	(-0.0082995)	(0.00)	(0.0078257)	(0.02)	(0.007942)
$D^{SustainabilityManager}$	-0.0588	-0.0157632	-0.0620	-0.0165947	-0.0649	-0.017354
	(-0.81)	(-0.0193931)	(-0.86)	(-0.0191995)	(-0.90)	(-0.0192312)
$D^{SustainabilityPerformance}$	0.0417	0.0111851	0.0170	0.0045531	0.0202	0.0053937
	(0.61)	(0.0184572)	(0.25)	(0.0180956)	(0.30)	(0.0179492)
Pseudo-R^2	0.0031		0.0043		0.0043	
Constant	-0.748***		-0.866***		-0.851***	
	(-5.56)		(-6.34)		(-5.80)	
N	114		114		114	

Table description: Fractional probit regression results (for various specifications of Equation 2) with w_{IOA} as dependent variable. w_{IOA} is the relative importance respondents assigned to 5 attributes (social responsibility, environmental performance ability to enhance indigenous rights, sustainability performance and return on investment in relation to the market rate of return) in making tradeoffs between investment opportunities in the discrete choice experiment. $TrustBoardSize_j$ is the number of tribal members elected to the trust board of the MAHI with which respondent j is associated; $D^{Multiple}{}_j$ represents a binary variable which is equal to 1 when respondent j is associated with more than one MAHI and 0 otherwise; $D^{AssetSize}{}_j$ is a dummy variable which is 1 for MAHI with assets >30 and 0 otherwise. MAHIAge is number of years since the MAHI has received its treaty settlement; $D^{GovernanceRole}{}_j$ represents a binary variable which is equal to 1 when respondent j has a governance role and 0 otherwise; ; $D^{ConsultantUse}{}_j$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated makes use of consultants and 0 otherwise; $D^{SustainabilityManager}{}_j$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated employs a sustainability manager and 0 otherwise; $D^{Sustainabilityperformance}{}_j$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated measures and reports on its sustainability performance and 0 otherwise. *t* statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 5 The mediating impact of governance role

	$D^{GovernanceRole}$	$D^{GovernanceRole}$	ME	Environment	ME	Financial Return	ME	Environment	ME	Financial Return	ME
TrustBoardSize	0.0823			0.0136**	0.00504**	-0.00146	-0.0014598	0.0120*	0.0044304*	-0.00175	-0.0004682
	(1.56)			(2.62)	(0.001923)	(-0.22)	(0.0066926)	(2.56)	(0.0017248)	(-0.26)	(-0.0017775)
$D^{Multiple}$		-1.267**	-0.263945**	0.0945*	0.03495**	0.155**	0.154725**	0.130*	0.04782*	0.161**	0.043106**
		(-2.95)	(-0.076045)	(1.98)	(0.01765)	(2.80)	(0.0551751)	(2.47)	(0.019259)	(2.73)	(0.015611)
AssetSize	-0.307	-0.441	-0.0919334	0.0463	0.0171224	-0.0813	-0.0813425	0.0569	0.0209859	-0.0797	-0.0213197
	(-0.72)	(-1.00)	(-0.0901588)	(1.17)	(0.0147059)	(-1.25)	(0.0651155)	(1.51)	(0.013976)	(-1.19)	(-0.0179858)
MAHIAge	-0.00226	0.00416	0.0008661	-0.000962	-0.0003557	-0.00329	-0.0032907	-0.00106	-0.0003917	-0.00332	-0.0008882
	(-0.12)	(0.21)	(0.0042041)	(-0.50)	(0.0007116)	(-1.08)	(0.0030363)	(-0.57)	(0.0006818)	(-1.10)	(-0.0008131)
$D^{GovernanceRole}$								0.134**	0.0495161**	0.0252	0.0067411
								(2.86)	(0.0172152)	(0.38)	(0.0176642)
$D^{Consultantuse}$	0.197	0.163	0.0339701	-0.000924	-0.0003416	0.00167	0.001671	-0.00538	-0.0019848	0.000638	0.0001707
	(0.86)	(0.69)	(0.0486618)	(-0.05)	(-0.007250)	(0.05)	(0.0306255)	(-0.29)	(0.0068754)	(0.02)	(0.007942)
$D^{SustainabilityManager}$	0.715	0.655	0.1363477	0.0327	0.0120907	-0.0613	-0.0613391	0.0114	0.0042133	-0.0649	-0.017354
	(1.54)	(1.39)	(0.0949906)	(0.76)	(0.015836)	(-0.91)	(0.0672128)	(0.29)	(0.0147502)	(-0.90)	(-0.0192312)
$D^{SustainabilityPerformance}$	-1.110*	-0.825	-0.1718351	-0.0532	-0.0196807	0.0148	0.014831	-0.0260	-0.0096146	0.0202	0.0053937
	(-2.37)	(-1.74)	(0.0941864)	(-0.89)	(-0.022194)	(0.22)	(0.0664596)	(-0.47)	(0.020649)	(0.30)	(0.0179492)
Pseudo-R^2	0.0644	0.1083		0.0020		0.0042		0.0037		0.0043	
Constant	-0.747	0.405		-0.532***		-0.839***		-0.597***		-0.851***	
	(-0.78)	(0.46)		(-5.09)		(-6.34)		(-5.86)		(-5.80)	
N	114	114		114		114		114		114	

Table description: Logistics regression results (for Equations 3) with $D^{GovernanceRole}$ as dependent variable. $TrustBoardSize_j$ is the number of tribal members elected to the trust board of the MAHI with which respondent j is associated; $D^{Multiple}{}_j$ represents a binary variable which is equal to 1 when respondent j is associated with more than one MAHI and 0 otherwise; $D^{AssetSize}{}_j$ is a dummy variable which is 1 for MAHI with assets >30 and 0 otherwise. MAHIAge is number of years since the MAHI has received its treaty settlement; $D^{GovernanceRole}{}_j$ represents a binary variable which is equal to 1 when respondent j has a governance role and 0 otherwise; ; $D^{ConsultantUse}{}_j$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated

makes use of consultants and 0 otherwise; $D^{SustainabilityManager}{}_{j}$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated employs a sustainability manager and 0 otherwise; $D^{Sustainabilityperformance}{}_{j}$ represents a binary variable which is equal to 1 when the MAHI with which respondent j is associated measures and reports on its sustainability performance and 0 otherwise. *t* statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 6 Selection bias test

	Māori vs Non-Māori		
Question for which selection matters	(1) Māori	(2) Non-Māori	(3) Diff
What is the level of importance you attach to Māori values in the investment decision making process?	6.2	6.5	-0.3

Table description: This table shows the mean response of Māori and Non-Māori respondents to the question, "What is the level of importance you attach to Māori values in the investment decision making process?". The mean difference reported in column (3) was insignificant in a nonparametric Mann-Whitney U Test of the null hypothesis that the two distributions are equal.

Table 7 External validity test

MAHI	**Investment Portfolio Allocation Provided in Survey**	**Investment Portfolio Allocation in 2022 Annual Report**
#1	Managed funds-5%, Fixed income and cash-3%, direct investments/private equity-52%, natural resources (farm, forests, fishing quota)- 40%	Equity-8%, Property, Tourism-54%, Seafood, Farming, Forestry-38%
#2	Managed funds-10%, Fixed income and cash-10%, direct investments/private equity-65%, natural resources (farm, forests, fishing quota)- 15%	Real Estate- 10%, Natural Resources- 20%, Infrastructure and private equity- 60%, global shares- 10%
#3	Direct investments/private equity – 100%	Real estate-100%
#4	Managed funds-20%, Fixed income and cash-0%, direct investments/private equity-	Managed Funds-19%, Cash and Cash Equivalent-4%, Direct investments-8%, Fisheries and

	10%, natural resources (farm, forests, fishing quota)- 70%	Forestry-59%, other investments- 10%

Table description: This table shows the comparison of investment portfolio allocation provided by survey respondents with actual allocations provided in the annual reports.

TABLE 8 Placebo test for alternative potential drivers

	(1)	**(2)**	**(3)**
	Panel A: Environment		
Location	0.000935		-0.000398
	(0.09)		(-0.04)
Frequency in use of Consultants		0.0166	0.0168
		(0.86)	(0.83)
D^{Gender}	0.00878	0.00995	0.00998
	(0.21)	(0.24)	(0.24)
$D^{GovernanceRole}$	-0.132*	-0.131*	-0.131*
	(-2.27)	(-2.21)	(-2.24)
$D^{ConsultantRole}$	-0.198*	-0.200*	-0.199*
	(-2.36)	(-2.47)	(-2.40)
$D^{Multiple}$	0.0980*	0.0995*	0.0998*
	(2.22)	(2.11)	(2.25)
$D^{Decisions}$	0.122	0.138	0.137

	(1.44)	(1.69)	(1.67)
Pseudo-R2	0.0037	0.0038	0.0038
Panel B: Social			
Location	-0.00856		-0.0115
	(-1.15)		(-1.54)
		0.0312	0.0374
Frequency in use of Consultants		(1.56)	(1.88)
D^{Gender}	-0.0387	-0.0369	-0.0360
	(-0.97)	(-0.91)	(-0.90)
$D^{GovernanceRole}$	-0.0432	-0.0394	-0.0415
	(-0.89)	(-0.81)	(-0.85)
$D^{ConsultantRole}$	-0.0659	-0.0823	-0.0685
	(-0.85)	(-1.05)	(-0.92)
$D^{Multiple}$	0.0173	0.0117	0.0218
	(0.42)	(0.29)	(0.54)
$D^{Decisions}$	0.0503	0.0900	0.0846
	(0.63)	(1.13)	(1.05)
Pseudo-R2	0.0012	0.0014	0.0016
Panel C: Governance			
Location	0.00391		0.00829
	(0.29)		(0.59)

		-0.0502	-0.0547
Frequency in use of Consultants		(-1.59)	(-1.68)
D^{Gender}	-0.0456	-0.0489	-0.0493
	(-0.75)	(-0.79)	(-0.81)
$D^{GovernanceRole}$	0.0930	0.0894	0.0910
	(1.26)	(1.21)	(1.23)
$D^{ConsultantRole}$	0.229	0.242	0.232
	(1.67)	(1.79)	(1.76)
$D^{Multiple}$	-0.0579	-0.0577	-0.0647
	(-0.93)	(-0.92)	(-1.04)
$D^{Decisions}$	0.0354	-0.0186	-0.0152
	(0.34)	(-0.20)	(-0.16)
Pseudo-R2	0.0030	0.0038	0.0039
N	114	114	114

Table description: Placebo test results (for various specifications of Equations 1,2 and 3) with ω_{ESG} as dependent variable. ω_{ESG} is the proportion allocated to E, S and G themes by respondents. $D^{Māori}$ and MCV Score have been replaced by location and frequency in the use of consultants as the main independent variables, D^{Gender} is a dummy variable which takes the value of 1 if a respondent is male and 0 otherwise, , $D^{GovernanceRole}$ and $D^{ConsultantRole}$ are variable which indicates if a respondent is a consultant or trustee, a consultant or trustee while $D^{Multiple}$ is a dummy variable which takes the value of 1 if a respondent has a role with more than one MAHI and 0 otherwise. Subsidiary indicates whether a respondent is associated with the governance body, the social subsidiary, or the commercial subsidiary. $D^{Decisions}$ is also a dummy variable which is 1 if respondents are involved in making investment decision and 0 otherwise. t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.