

Abstract

**Outsourcing Voting to AI:**

**Can ChatGPT Personalize Index Funds' Voting Decisions?**

Draft

*Chen Wang*

ChatGPT has risen rapidly to prominence due to its unique features and generalization ability. This article proposes using ChatGPT to assist small investment funds, particularly small passive funds, in making more accurate and informed proxy voting decisions.

Passive funds adopt a low-cost business model. Small passive funds lack financial incentives to make informed proxy voting decisions that align with their shareholders' interests. This article examines the implications of passive funds on corporate governance and the issues associated with outsourcing voting decisions to proxy advisors. The article finds that passive funds underspend on investment stewardship and outsource their voting proxy decisions to proxy advisors, which could lead to biased or erroneous recommendations.

However, by leveraging advanced AI language models such as ChatGPT, small passive funds can improve their proxy voting accuracy and personalization, enabling them to better serve their shareholders and navigate the competitive market.

To test ChatGPT's potential, this article conducted an experiment using its zero-shot GPT-4 model to generate detailed proxy voting guidelines and apply them to a real-world proxy statement. The model successfully identified conflicts of interest in the election of directors and generated comprehensive guidelines with weight for each variable. However, ChatGPT has some limitations, such as token limitations, long-range dependencies, and likely ESG inclination.

To enhance its abilities, ChatGPT can be fine-tuned using high-quality, domain-specific datasets. However, investment funds may face challenges when outsourcing voting decisions to AI, such as data and algorithm biases, cybersecurity and privacy concerns, and regulatory uncertainties.

## Contents

1. Introduction.....	3
2. From Outsourced Voting to Personalized Voting.....	8
2.1 The Rise of Passive Funds and Changing Corporate Governance.....	8
2.2 Outsourcing Proxy Voting Decisions.....	14
3. Outsourcing Voting Decisions to AI.....	24
3.1 Using Zero-Shot ChatGPT Model to Analyze Proxy Statements and Make Voting Recommendations.....	25
3.2 Fine-Tuning ChatGPT with ISS Model.....	31
3.3 Fine-Tuning personalized model for funds with varying focus.....	35
4. Challenges for Outsourcing Voting Decisions to AI.....	37
4.1 Model Fine-Tuning and Iterations.....	37
4.2 Data and Algorithm Biases.....	38
4.3 Cybersecurity and Privacy Concerns.....	39
4.4 Regulatory Challenges.....	40
5. Conclusion and Further Research Agenda.....	41
Appendix 1: ChatGPT-Generated Proxy Voting Guidelines.....	43

## 1. Introduction

ChatGPT was hugely popular in late 2022 and early 2023, and its popularity continues to grow. Launched in November 2022, it reached 100 million users within just two months, becoming the fastest-growing application to achieve that milestone.<sup>1</sup>

ChatGPT is pre-trained using an extensive dataset that includes a diverse range of topics and knowledge up until September 2021.<sup>2</sup> The training of ChatGPT involves a two-step process: pre-training and fine-tuning. In the pre-training phase, the model learns to generate text by predicting the next word in a sentence, given the previous words. This is done using a large corpus of publicly available text from the internet. During the fine-tuning phase, the model is further refined on a more specific dataset. This dataset may include demonstrations of correct behavior and comparisons to rank different responses. This helps the model to adapt its learned knowledge to generate contextually relevant responses and perform specific tasks.<sup>3</sup>

Initially on its launch, ChatGPT was powered by GPT-3.5, a large language model(LLM)<sup>4</sup> which has as many as 175 billion parameters.<sup>5</sup> On March 14, 2023, OpenAI launched GPT4, and stated it is much superior to GPT-3.5. GPT-4 is a multimodal model, which means it can respond to both text and images. Meanwhile, it performs better in reasoning and complex problem solving

---

<sup>1</sup> Krystal Hu, ChatGPT sets record for fastest-growing user base - analyst note, Reuters (Feb. 2, 2023, 7:33 AM PST), <https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/>.

<sup>2</sup> The training dataset for ChatGPT consisted of at least 753.4GB of text data, which is approximately equivalent to 374 billion English words, *see* Alan D. Thompson, *What's in My AI? A Comprehensive Analysis of Datasets Used to Train GPT-1, GPT-2, GPT-3, GPT-NeoX-20B, Megatron-11B, MT-NLG, and Gopher*, LifeArchitect.ai (Mar. 2022), <https://lifearchitect.ai/whats-in-my-ai/>.

<sup>3</sup> For more about ChatGPT's training process and methods, *see* Marco Ramponi, *How ChatGPT Actually Works*, *AssemblyAI* (Dec. 23, 2022), <https://www.assemblyai.com/blog/how-chatgpt-actually-works/>; Molly Ruby, *How ChatGPT Works: The Model Behind The Bot* (Jan. 30, 2023), *Towards Data Science*, <https://towardsdatascience.com/how-chatgpt-works-the-models-behind-the-bot-1ce5fca96286>

<sup>4</sup> A large language model is an AI model used in natural language processing that can process and generate large amounts of text. They are trained on massive datasets of text and can perform a wide range of tasks, such as language translation, text summarization, and question answering.

<sup>5</sup> *See* Long Ouyang et al., *Training Language Models to Follow Instructions with Human Feedback*, arXiv:2203.02155 [cs.CL] (Mar. 4, 2022), <https://arxiv.org/abs/2203.02155>. This paper presents InstructGPT (GPT 3.5).

than GPT-3.5, and produce less factual errors.<sup>6</sup> Now GPT-4 has been embedded in ChatGPT through its plus service, which costs \$20 per month.<sup>7</sup> Meanwhile, GPT-4 API is publicly available, allowing developers to create custom applications and integrate GPT-4 into various platforms, including those tailored for the legal industry.

ChatGPT has demonstrated its versatile capabilities in a variety of fields. It has been utilized for tasks such as drafting emails,<sup>8</sup> assisting professors in creating syllabi and handouts, helping students finish tasks,<sup>9</sup> and providing financial professionals with guidance on selecting stocks.<sup>10</sup> ChatGPT's intelligence is so advanced that some experts predict that highly skilled jobs may be significantly impacted by the introduction and development of ChatGPT.<sup>11</sup>

The legal industry has already adopted the use of AI in various ways. The legal industry has adopted the use of AI in various ways. For example, law firms and lawyers are utilizing AI to review contracts, conduct e-discovery, and perform legal research. Additionally, AI can analyze the behavior of individual lawyers

---

<sup>6</sup> See Will Douglas Heaven, *GPT-4 is bigger and better than ChatGPT—but OpenAI won't say why*, MIT Technology Review (March 14, 2023), <https://www.technologyreview.com/2023/03/14/1069823/gpt-4-is-bigger-and-better-chatgpt-openai/>; OpenAI, *GPT-4 Technical Report*, arXiv:2303.08774 (last revised Mar. 27, 2023), <https://arxiv.org/abs/2303.08774v3>.

<sup>7</sup> But as of April 2023, ChatGPT's UI does not support GPT-4's multimodal features.

<sup>8</sup> See Kif Leswing, *ChatGPT is being used to automatically write emails: Microsoft, Salesforce and TikTok creators are hopping on the trend*, CNBC (updated EST Mar. 8, 2023, 3:51 PM EST), <https://www.cnbc.com/2023/03/08/chatgpt-is-being-used-to-write-emails-big-companies-are-embracing-it.html>.

<sup>9</sup> See Carolyn Chun, *Why some college professors are adopting ChatGPT AI as quickly as students*, CNBC (Apr. 2, 2023, 4:11 PM EDT), <https://www.cnbc.com/2023/04/02/why-college-professors-are-adopting-chatgpt-ai-as-quickly-as-students.html>.

<sup>10</sup> See Cody Willard, *Opinion: ChatGPT and Bard are telling this hedge-fund manager to avoid AI stocks now*, MarketWatch (last updated Apr. 8, 2023, 10:40 AM ET), <https://www.marketwatch.com/story/chatgpt-and-bard-are-telling-this-hedge-fund-manager-to-avoid-ai-stocks-now-71424c5f>.

<sup>11</sup> See Felten, Edward W., Raj, Manav, & Seamans, Robert, *How will Language Modelers like ChatGPT Affect Occupations and Industries?* (March 1, 2023), <https://ssrn.com/abstract=4375268> (finding telemarketers and post-secondary teachers in English, foreign language, and history are among the occupations most exposed ChatGPT); Eloundou, Tyna, Manning, Sam, Mishkin, Pamela, & Rock, Daniel, *GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models* (March 27, 2023), OpenAI, OpenResearch, University of Pennsylvania, <https://arxiv.org/pdf/2303.10130.pdf> (finding that around 80% of the US workforce could have at least 10% of their work tasks affected by the introduction of ChatGPT and ChatGPT-like AIs, while approximately 19% of workers may see at least 50% of their tasks impacted; higher-income jobs may face greater exposure to AI models like ChatGPT).

and judges, and even predict the outcomes of legal cases.<sup>12</sup> However, these AI models typically can only engage in a specific task, and cannot perform tasks outside of their programmed functions. For example, a legal AI model that is designed to review contracts such as Lawgeex<sup>13</sup> is not capable of analyzing judges' decisions, unlike Westlaw's Lex Machina.<sup>14</sup>

One of the main differences between ChatGPT and other existing specialized AI models is its strong generalization ability.<sup>15</sup> This ability refers to ChatGPT's capacity to apply the general knowledge and patterns it has learned during training to various tasks and problems, rather than being limited to specific tasks. ChatGPT's generalization ability enables it to perform multiple applications and tasks, including natural language understanding, question-answering, text generation, machine translation, and more.

In addition, ChatGPT provides fine-tuning, a technique where a pre-trained GPT model is adapted to a specific task or dataset, such as question-answering, language translation, or text classification. Fine-tuning improves performance on the specific task while preserving the model's generalization ability. Thus, it saves users' time and resources by avoiding the need to train an AI model from scratch. Meanwhile, fine-tuning a GPT model can provide ChatGPT with current data, improving its ability to perform specific tasks with an enhanced level of expertise as compared to the general model.

ChatGPT's above-mentioned exceptional intelligence is a result of its internal mechanisms and model. ChatGPT stands for Chat Generative Pre-training Transformer. The term "Transformer" refers to a particular type of neural network

---

<sup>12</sup> See Matthew Stepka, *Law Bots: How AI Is Reshaping the Legal Profession*, Bus. L. Today (Feb. 21, 2022), <https://businesslawtoday.org/2022/02/how-ai-is-reshaping-legal-profession/>.

<sup>13</sup> Lawgeex is designed exclusively to review contracts, see Lawgeex, <https://www.lawgeex.com/platform/>.

<sup>14</sup> Lex Machina, About Lex Machina (last visited Apr. 11, 2023), <https://lexmachina.com/about/> ("Every day, our ...engine scans millions of pages of litigation information to create valuable insights on courts, judges, law firms, lawyers, and parties.")

<sup>15</sup> See Radford, A., Wu, J., Child, R., Luan, D., Amodei, D., & Sutskever, I. (2019). *Language models are unsupervised multitask learners*. OpenAI Blog. <https://openai.com/blog/better-language-models/>

architecture<sup>16</sup> that was first introduced in 2017<sup>17</sup> and is now widely used as the basis for many state-of-the-art natural language processing<sup>18</sup> (NLP) models, including ChatGPT. Transformers are specifically designed to perform sequence-to-sequence tasks<sup>19</sup> with greater efficiency than traditional methods. This is made possible through a mechanism known as self-attention.

Self-attention is a key component of transformer models that enables them to weigh the importance of different words in a given text sequence.<sup>20</sup> By assigning varying weights to different parts of the input, the self-attention mechanism allows the model to capture long-range dependencies<sup>21</sup> and context more effectively than previous architectures. This results in a deeper understanding of the text and the ability to generate more coherent and contextually relevant responses.

Due to ChatGPT's advanced features, such as extensive pre-training on diverse data, strong generalization ability, fine-tuning capabilities, and improved reasoning, the application of AI in the legal industry could experience a significant transformation.

Filing proxy statements is required for corporate issuers when holding shareholder meetings, and proxy voting is a major chance for shareholders to

---

<sup>16</sup> A neural network architecture is a computational model employed in machine learning that draws inspiration from the biological structure and function of the human brain. Neural networks are constructed of multiple interconnected layers of nodes or neurons, which function to process and convert data inputs. The architecture of a neural network denotes the precise configuration and organization of these layers, along with the number of nodes contained in each layer, see Pragati Baheti, *The Essential Guide to Neural Network Architectures*, V7 Labs (Mar. 2, 2023), <https://www.v7labs.com/blog/neural-network-architectures-guide>.

<sup>17</sup> Vaswani et al. (2017), *Attention is all you need*, In *Advances in neural information processing systems* (pp. 5998-6008).

<sup>18</sup> Natural language processing (NLP) is a discipline within artificial intelligence and computational linguistics that aims to enable computers to comprehend, interpret, and produce human language. It involves creating algorithms and models that can process and manipulate significant volumes of natural language data, including but not limited to written text, spoken words, and sign language (a form of visual language that utilizes various hand gestures, facial expressions, and body movements to convey meaning).

<sup>19</sup> Sequence-to-sequence (Seq2Seq) tasks are a class of machine learning problems utilized in natural language processing (NLP). They entail the mapping of an input sequence to an output sequence via an encoder and decoder model. For instance, in machine translation, an input sequence would be a sentence in one language, and the output sequence would be the corresponding sentence in another language.

<sup>20</sup> Vaswani et al, *supra* note 7.

<sup>21</sup> Dependencies refer to the interdependence between the input and output variables of a model. Specifically, the output or prediction of a model is dependent on the input variables, also known as features. Long-range dependencies refer to the relationships between words or phrases that are far apart from each other in a sentence.

exercise their voting power and voices on various issues.<sup>22</sup> This article proposes using ChatGPT to assist small investment funds, especially small passive funds, in making more accurate and informed proxy voting decisions.

Section 2 examines the rise of passive funds in the U.S. and its implications for corporate governance. In recent years, passive funds have gained popularity due to their low-cost and low-fee business model. However, this approach has resulted in passive fund firms underspending on investment stewardship and lacking financial incentives to make personalized proxy voting decisions in the interests and preferences of their shareholders. As a result, many passive funds have relied on proxy advisory firms for voting decisions, leading to a practice known as “robovoting,” where proxies are automatically voted in line with the advisors’ recommendations. Robovoting has resulted in concerns about the quality of proxy advisors’ recommendations and the potential unintended consequences. Large index funds have been able to devote more resources to self-informed voting, but smaller funds have faced a dilemma: outsource their proxy voting decisions to proxy advisors conduct costlier self-informed voting to better serve their shareholders. Recent regulatory initiatives and academic perspectives have emphasized the importance for investment funds to conduct personalized voting that aligns voting decisions with shareholders’ interests and preferences and to achieve better visibility, optics, and reputation in the competitive market.

Section 3 explores an experiment that prompts ChatGPT’s GPT-4 model to generate detailed proxy voting guidelines and weigh each variable. It also tests the model’s accuracy by applying it to a real-world proxy statement. The results show that while ChatGPT can identify potential conflicts of interest in director elections and generate comprehensive voting guidelines, its token constraints and long-range dependencies greatly undermine its capabilities. Additionally, the GPT-4 model of ChatGPT has limitations in mathematical calculations and tends to favor ESG proposals. To improve this, investment funds can fine-tune ChatGPT by incorporating domain-specific data such as ISS guidelines, Voting Analytics data, and market reactions to recommendations, as well as removing outdated or irrelevant information and adjusting weights assigned to different factors. Moreover, Section 3 discusses how investment funds can customize these models to align with their priorities, whether they are focused on financial returns or ESG considerations. Investment funds can iteratively refine their ChatGPT models by incorporating feedback, adding new data sources, and continuously updating their

---

<sup>22</sup> U.S. Securities and Exchange Commission, Spotlight on Proxy Matters (modified June 14, 2017), <https://www.sec.gov/spotlight/proxymatters> (“One of the key rights of shareholders is the right to vote their shares on important matters that affect the companies they own. The proxy voting process is a primary way for shareholders to learn about matters to be decided at companies in which they have invested...”)

models to ensure that their personalized solutions remain accurate, relevant, and effective in supporting their corporate governance evaluation and proxy voting decisions.

Section 4 explores the challenges that investment funds may face when outsourcing voting decisions to AI, particularly ChatGPT. These challenges include the fine-tuning and iterating of the model to optimize its performance for proxy voting decisions, which requires substantial resources, expertise, and tradeoff. Investment funds must also navigate the potential biases that could arise in the model's data and algorithm, such as data bias, method bias, and socio-cultural bias. Cybersecurity and privacy concerns could arise when sensitive data is fed into ChatGPT without proper policies and cybersecurity methods in place to prevent data leaks. Finally, regulatory uncertainties pose a significant challenge for investment funds that want to use ChatGPT for proxy voting decisions. Addressing these challenges is necessary for investment funds to effectively use ChatGPT and other AI tools for corporate governance evaluation and proxy voting decisions.

## 2. From Outsourced Voting to Personalized Voting

### 2.1 The Rise of Passive Funds and Changing Corporate Governance

The rapid growth of passive funds, particularly index funds, is transforming the U.S. stock market structure. These funds have consistently attracted significant capital inflows. By the end of 2021, passive funds owned 16% of the U.S. stock market capitalization, surpassing the 14% ownership of actively managed funds.<sup>23</sup> More stunningly, according to scholarly estimates, passive investors' ownership of the U.S. market reached 37.8% by the end of 2020, further illustrating the substantial presence of passive stock ownership in the U.S. stock market.<sup>24</sup>

Passively managed funds, also known as passive funds, are investment funds that seek to replicate the performance of a specific market index, such as the S&P 500 index. Unlike actively managed funds, which involve active

---

<sup>23</sup> See Steve Johnson, *Passive Fund Ownership of US Stocks Overtakes Active for First Time*, Fin. Times (June 5, 2022), <https://www.ft.com/content/27b5e047-5080-4ebb-b02a-0bf4a3b9bc08>.

<sup>24</sup> Alex Chinco & Marco Sammon, *The Passive-Ownership Share Is Double What You Think It Is* (Dec. 17, 2022), available at <https://www.alexchinco.com/double-what-you-think-it-is.pdf>. This article aggregates the stock ownership of index funds and direct indexers (holders of the iShares Russell 1000 ETF and state pension funds that have positions directly indexed to the Russell 1000) and concludes the 37.8 percentage of passive ownership of the U.S. stock market could be an understatement.



decision-making by fund managers to select securities and create portfolios with a view to beating the market, passive funds do not involve active management. Instead, they track the performance of a specific index and aim to match the index's overall market performance.<sup>25</sup>

Index funds are passive funds that hold a diversified portfolio of stocks or other securities that closely mirror the composition of the underlying index. For example, an equity index fund may track the S&P 500 index, and investors' return would be equal to the performance of the S&P 500 index itself.<sup>26</sup> If an investment fund is traded on an exchange like a stock and can be bought and sold throughout the day, it is called an exchange traded fund (ETF).<sup>27</sup> Most ETFs are index funds.<sup>28</sup>

Vanguard offered the world's first index funds-Vanguard S&P 500 Index Fund. With the intent to raise \$150 million, the fund managed to raise only \$11 million after its initial public offering in December 1975.<sup>29</sup> However, the fund's net assets have now surpassed \$800 billion.<sup>30</sup> The first ETF- SPDR S&P 500 ETF Trust was offered by State Street Global Advisors (SSGA) in January 1993.<sup>31</sup> This

---

<sup>25</sup> See FINRA, *What You Need to Know About the Passive vs. Active Management Debate*, FINRA investor insights (Aug. 15, 2016), <https://www.finra.org/investors/insights/what-you-need-know-about-passive-vs-active-management-debate-rot>. Barclays, *What are active and passive funds?*, Barclays Smart Investor, <https://www.barclays.co.uk/smart-investor/investments-explained/funds-etfs-and-investment-trusts/what-are-active-and-passive-funds/> (last visited Apr. 10, 2023).

<sup>26</sup> See SEC Office of Investor Education and Advocacy, *Investor Bulletin: Index Funds*, SEC (Aug. 6, 2018), [https://www.sec.gov/oiea/investor-alerts-and-bulletins/ib\\_indexfunds](https://www.sec.gov/oiea/investor-alerts-and-bulletins/ib_indexfunds). Please note that some index funds invest in the entire index they track, while others invest in a representative sample of the index. Index fund managers also need to rebalance their portfolios from time to time to ensure that they track the index closely. Rebalancing means index fund managers sell overweight stocks and buy underweight ones.

<sup>27</sup> See Mary Mannion, *ETFs vs. index funds: Which one is better for you?*, J.P. Morgan Wealth Mgmt. (Feb. 15, 2023), <https://www.chase.com/personal/investments/learning-and-insights/article/etfs-vs-index-funds>; Kim Porter, *What's the difference between ETFs and index funds?*, Business Insider (Jul. 12, 2022, 2:31 PM), <https://www.businessinsider.com/personal-finance/etf-vs-index-fund>.

<sup>28</sup> See Vanguard, *ETFs vs. mutual funds: A comparison*, Vanguard Investor Resources & Education, <https://investor.vanguard.com/investor-resources-education/etfs/etf-vs-mutual-fund> (last visited Apr. 10, 2023) ("Most ETFs are index funds...") To be sure, there are also active ETFs, primarily bond ETFs.

<sup>29</sup> See Burton G. Malkiel, 'Trillions' Review: The Rise and Rise of the Index Fund, Wall St. J. (Oct. 20, 2021, 11:53 AM ET), <https://www.wsj.com/articles/trillions-robin-wigglesworth-book-review-john-c-bogle-vanguard-rise-of-the-index-fund-11634745118>.

<sup>30</sup> See Vanguard 500 Index Fund (VOO), Yahoo! Finance, <https://finance.yahoo.com/quote/VOO/> (last visited Apr. 14, 2023).

<sup>31</sup> See Jack Pitcher, *The First ETF Launched 30 Years Ago, Revolutionizing Investing*, Wall St. J. (Jan. 22, 2023, 8:00 AM ET), <https://www.wsj.com/articles/the-first-etf-launched-30-years-ago-revolutionizing-investing-11642430401>

ETF also track the S&P 500 index, and now has over \$ 370 billion in net assets,<sup>32</sup> remaining the biggest ETF in the world.

Passive funds charge far lower fees than active funds. In 2021, the asset-weighted average expense ratio of active equity funds was 0.68%, while that ratio of index equity funds was as low as 0.06%.<sup>33</sup> There are two main reasons why passive funds charge such low fees. First, passive funds typically track an index and do not offer active management like stock picking, which means that they do not require the same level of research and analysis of individual stocks and companies as active funds.<sup>34</sup> Second, passive fund firms often provide index funds tracking the same index.<sup>35</sup> This means that they have to compete with each other for investors, so they keep lowering fees to stay attractive.

There are three biggest ETF managers: BlackRock, Vanguard, and SSGA, collectively dubbed as the “Big Three.” Each of them has trillions of dollars in assets under management (AUM),<sup>36</sup> and dominates the ETF management business.<sup>37</sup> The Big Three possessed a quarter of the ownership of S&P 500 companies in 2019, and such ownership is projected to reach 40% within two decades.<sup>38</sup>

The rise of passive funds has been reshaping the corporate governance landscape. As investment funds are the legal owners of stocks of their portfolio

---

<sup>32</sup> See SPDR S&P 500 ETF Trust (SPY), Yahoo! Finance, <https://finance.yahoo.com/quote/SPY/> (last visited Apr. 14, 2023).

<sup>33</sup> Expense Ratios = the fund’s net operating expenses / the fund’s net assets. See Investment Company Institute, *Mutual Fund Expense Ratios Down Sharply from a Quarter Century Ago*, (Mar. 24, 2022), <https://www.ici.org/news-releases/22-news-trends>. However, according to Morningstar, the asset-weighted average fee ratios of active funds and index funds in 2021 were 0.6% and 0.12%, respectively. But in either estimate, passive funds’ average expense ratio was far lower than that of active funds. See *Morningstar Finds Investors Saved Nearly \$6.9 Billion From Falling Fees in 2021*, Morningstar, Inc. (Jul. 12, 2022), <https://newsroom.morningstar.com/newsroom/news-archive/press-release-details/2022/Morningstar-Finds-Investors-Saved-Nearly-6.9-Billion-From-Falling-Fees-in-2021/default.aspx>.

<sup>34</sup> See Kent Thune, *Index Funds: What They Are & How They Work*, Seeking Alpha (updated Mar. 28, 2023), <https://seekingalpha.com/article/4436649-what-is-an-index-fund#what-is-an-index-fund> (arguing index fund manager does not buy and sell the fund’s investment securities until the index changes, which is infrequent. “Due to the low number of trades, and because there is no need to research and analyze securities, the operational costs of an index fund are extremely low.”)

<sup>35</sup> The world’s three largest ETFs all track the S&P 500 index, see Largest ETFs: *Top 100 ETFs By Assets*, ETFdb (last visited Apr. 10, 2023), <https://etfdb.com/compare/market-cap/>.

<sup>36</sup> See World’s Top Asset Management Firms, ADV Ratings (data as of March 31, 2022), <https://www.advratings.com/top-asset-management-firms>.

<sup>37</sup> See Lucian A. Bebchuk & Scott Hirst, *The Specter of the Giant Three*, 99 B.U. L. Rev. 721 (2019), at 9-11 (finding only 5 of the world’s largest 50 ETFs are not managed by Big Three).

<sup>38</sup> *Id.* at 17-18.

companies, and fund shareholders are beneficiary owners, investment funds are fiduciaries of their shareholders, and should serve their best interests when voting their shares.<sup>39</sup> This fiduciary duty extends to proxy voting. In 2003, the SEC issued a rule that requires fund managers to adopt policies and procedures to ensure that the adviser votes proxies in the best interests of clients.<sup>40</sup> In July 2019, the SEC issued an interpretation further clarified fund managers' fiduciary duties to the investors, including continuing engagements with funds' investors.<sup>41</sup>

With the ascent of institutional investors,<sup>42</sup> especially index funds, the notion of Investment stewardship become well-known. As investment funds are the legal shareholders of their portfolio companies and vote their shares on behalf of fund investors, these investors do not have a direct say in the companies they beneficially own. In response, such funds declare they value investment stewardship.

The notion of investment stewardship refers to engagement with public companies to promote corporate governance practices consistent with encouraging long-term value creation for shareholders in the company. The tools for investment stewardship includes private engagement with management of portfolio companies and proxy voting.<sup>43</sup> Vanguard claims its investment stewardship team “has a clear, consistent, and compelling mandate—to serve as the voice for our investors and promote long-term value creation at the companies in which our funds invest.”<sup>44</sup> BlackRock states, “Investment Stewardship is central

---

<sup>39</sup> See *SEC v. Capital Gains Research Bureau, Inc.*, 375 U.S. 180, 194 (1963) (holding investment advisers have a fiduciary duty to their clients and must act in their clients' best interests.)

<sup>40</sup> U.S. Securities and Exchange Commission, *Proxy Voting by Investment Advisers*, 17 C.F.R. Part 275, Release No. IA-2106, File No. S7-38-02, RIN 3235-A165 (2003), <https://www.sec.gov/rules/final/ia-2106.htm>

<sup>41</sup> See U.S. Securities and Exchange Commission, *Commission Interpretation Regarding Standard of Conduct for Investment Advisers*, 17 C.F.R. Part 276, Release No. IA-5248, File No. S7-07-18, RIN: 3235-AM36 (July 2019).

<sup>42</sup> An institutional investor is a company or organization that invests money on behalf of other people such as asset managers, see James Chen, *Institutional Investor: Who They Are and How They Invest*, Investopedia (updated Nov. 22, 2021), <https://www.investopedia.com/terms/i/institutionalinvestor.asp>.

<sup>43</sup> Barbara Novick, Michelle Edkins, & Tom Clark, *The Investment Stewardship Ecosystem*, BlackRock, Inc. (Jul. 24, 2018), <https://corpgov.law.harvard.edu/2018/07/24/the-investment-stewardship-ecosystem/>.

<sup>44</sup> Vanguard, *Stewardship in Action: A Voice for Investors*, Vanguard (last visited Apr. 11, 2023), <https://corporate.vanguard.com/content/corporatesite/us/en/corp/how-we-advocate/investment-stewardship/stewardship-in-action.html>.

to BlackRock’s fiduciary responsibility to our clients to advance their long-term economic interests.”<sup>45</sup>

However, scholars cast doubt on passive funds’ promise to investment stewardship. Professor Lucian Bebchuk and Alma Cohen have identified two agency problems for institutional investors: under-spending on stewardship and excessive deference to managers of corporations.<sup>46</sup> While these two agency problems are found in both active and index funds, they are more pronounced for index funds. Any resources devoted to by an index fund to increase value of a particular corporation would benefit all index funds tracking the same index, so that the index fund expending all the efforts and resources will not perform better than other index funds.<sup>47</sup>

Agency problems arise from the misalignment of interests between managers and shareholders.<sup>48</sup> Investment fund firms like BlackRock and Vanguard can act opportunistically to maximize the interests of their fund managers at the expense of the index funds they manage.<sup>49</sup> They can do so by extract interests from their shareholders directly, or by economizing on expenses for shareholder services. For instance, BlackRock’s global stewardship team, the largest of the Big Three, is made up of 45 people to cover 85 voting markets. The team’s 20 U.S.-based stewardship managers are responsible for engagement and proxy voting with approximately 4,000 U.S. public companies.<sup>50</sup>

Professor Lucian Bebchuk and Scott Hirst also provide empirical evidence demonstrating agency problems in connection with passive funds.<sup>51</sup> They find serious underinvestment in investment stewardship of the Big Three. BlackRock, Vanguard and SSGA deploy 45, 21 and 12 in for their global stewardship team and devote 0.15%, 0.18% and 0.14% of their annual fees and expenses to

---

<sup>45</sup> BlackRock, *BlackRock Investment Stewardship*, BlackRock (last visited Apr. 11, 2023), <https://www.blackrock.com/corporate/about-us/investment-stewardship>.

<sup>46</sup> See Lucian A. Bebchuk, Alma Cohen, & Scott Hirst, *The Agency Problems of Institutional Investors*, 31 J. Econ. Persp. 89 (2017).

<sup>47</sup> *Id.* at 97-98.

<sup>48</sup> See Mark Anson et al., *Aligning the Interests of Agents and Owners: An Empirical Examination of Executive Compensation*, Ivey Business Journal (May/June 2004), <https://iveybusinessjournal.com/publication/aligning-the-interests-of-agents-and-owners-an-empirical-examination-of-executive-compensation/>.

<sup>49</sup> See Bernard S. Sharfman, *Opportunism in the Shareholder Voting and Engagement of the ‘Big Three’ Investment Advisers to Index Funds*, 48 J. Corp. L., at 7, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3995714](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3995714)

<sup>50</sup> *Id.* at 13.

<sup>51</sup> Lucian A. Bebchuk & Scott Hirst, *Index Funds and the Future of Corporate Governance: Theory, Evidence, and Policy*, 119 Colum. L. Rev. 2029 (2019).

investment stewardship, respectively.<sup>52</sup> If the Big Three allocate their stewardship budget proportionally to each \$10 billion position in U.S. companies, BlackRock, Vanguard and SSGA would allocate \$4,762, \$1,895, and \$2,147 respectively.<sup>53</sup>

Meanwhile, to make informed voting, a stewardship manager has hundreds of pages of materials to read, include the company's annual report and proxy statement, proposals of management and shareholders, and views of the company's board of directors, and third-party analysts' report.<sup>54</sup> This heavy workload makes the Big Three's stewardship expenses look more constrained.

As for engagements with management of portfolio companies, the situation becomes more dire. From 2017 through 2019, the average proportion of portfolio companies with which the Big Three had no engagements were 88.9% for BlackRock, 94.2% for Vanguard, and 94.5% for SSGA.<sup>55</sup>

With such limited resources allocated to stewardship and rare engagements with their portfolio companies, it is highly unlikely that stewardship teams of the Big Three can make informed, well-advised proxy voting for every portfolio company they manage.

As a result of the Big Three's underinvestment in stewardship, they are inertial to effect substantial changes at the firm level and regulatory level. Between 2014 and 2018, approximately 1,500 shareholder proposals were submitted to companies in the Russell 3000 index; however, none of these proposals were submitted by the Big Three.<sup>56</sup> Meanwhile, for the SEC's proposed 80 rule changes during 1995-2019, each of the Big Three submitted comments to less than 10% of all these proposals.<sup>57</sup>

Given the Big Three's significant positions in many companies, market-wide governance reforms, even with small effects on each company, could significantly benefit their portfolios. An important reason why the Big Three are so passive to effect changes in corporate governance could be that the Big Three profit substantially from managing 401(k) plans of many of their portfolio

---

<sup>52</sup> *Id.* at 2078,

<sup>53</sup> *Id.* at 2080.

<sup>54</sup> *Id.* at 2081.

<sup>55</sup> *Id.* at 2086.

<sup>56</sup> *Id.* at 2104. But the authors find the Big Three were active in supporting proposals consistent with their proxy voting guidelines. This finding supports Gilson and Gordon's argument that institutional investors are "rationally reticent" – willing to respond to governance proposals but not to propose them, see Ronald J. Gilson & Jeffrey N. Gordon, *The Agency Costs of Agency Capitalism: Activist Investors and the Revaluation of Governance Rights*, 113 *Colum. L. Rev.* 863 (2013).

<sup>57</sup> Lucian A. Bebchuk & Scott Hirst, *id.* at 2107-2108.

companies. Effecting corporate governance changes in favor of shareholder rights could risk jeopardizing their relationship with corporate management and losing the lucrative business to manage 401(k) plans.<sup>58</sup>

An empirical paper examining large investment funds' voting on UK's FTSE 350 companies also finds that in large investment funds are highly deferential to corporate management, reluctant to challenge board of director's proposal on the corporation's business plan and operation in voting.<sup>59</sup> However, effecting substantial changes in corporate also should garner index funds' support. Absent passive investors' support, activists may not win the battle against incumbent management.<sup>60</sup>

In summary, Index funds' staggering ownership of their portfolio companies and low expense ratio could give rise to mismatch of incentives. Index funds are most likely to be apathetic to improve their portfolio companies' governance, for purposes of keeping low cost, even though an overall increase in corporate integrity would benefit index funds the most.<sup>61</sup> Developing a cost-effective method to analyze the voluminous materials necessary for making informed proxy voting decisions could improve index fund firms' investment stewardship and provide new momentums to improve corporate governance.

## 2.2 Outsourcing Proxy Voting Decisions

Proxy voting is often associated with investment stewardship.<sup>62</sup> Vanguard<sup>63</sup> and BlackRock<sup>64</sup> both stress proxy voting is a key component of

---

<sup>58</sup> See Lucian A. Bebchuk and Scott Hirst, Big Three Power, and Why it Matters, 102 B.U. L. Rev. 1547 (2022), at 1589.

<sup>59</sup> See Suren Gomtsian, *Different Visions of Stewardship: Understanding Interactions between Large Investment Managers and Activist Shareholders*, 22 J. Corp. L. Stud. 151 (2022), doi: 10.1080/14735970.2021.1991090. The author finds that institutional investors' stewardship focuses on amending corporations' article of incorporations, bylaws, and corporate governance guidelines, and ESG matters such as prompting sustainability.

<sup>60</sup> *Id.* (finding activist shareholders fail to mobilize institutional investors beyond ESG and general corporate governance matters. Institutional investors are unlikely to vote in line with activist shareholders on proxy contests, changing composition of incumbent boards, and business-related matters.)

<sup>61</sup> Leo E. Strine, Jr., The Delaware Way: How We Do Corporate Law and Some of the New Challenges We (and Europe) Face, 30 Del. J. Corp. L. 673 (2005), at 689, available at <https://www.wlrk.com/webdocs/wlrknew/AttorneyPubs/WLRK.27004.05.pdf>

<sup>62</sup> Barbara Novick, Michelle Edkins, & Tom Clark, *supra* note 43.

<sup>63</sup> Vanguard, *supra* note 44 (“Vanguard funds’ voice and vote are the most important levers we have ... We evaluate proposals and vote proxies on behalf of each of our funds at public company shareholder meetings around the world.”)

<sup>64</sup> BlackRock, *supra* note 45 (stating BlackRock does investment stewardship “ through engaging with the companies our clients are invested in, voting proxies for those clients who have given us authority...”)

investment stewardship. As proxy voting is central to index funds' investment stewardship, it is worth studying more carefully.

As noted earlier, a key feature of passive funds' business model is low-fee low-cost. Even the Big Three have devoted limited resources to investment stewardship. Thus, to keep the fees and costs low, they may lack financial incentives to cast personalized votes like actively managed funds.<sup>65</sup> Meanwhile, devoting resources to improving the value of a single company in their portfolio barely influences the overall performance of the index that the index fund tracks.<sup>66</sup> If the costs of conducting thorough research and making informed voting decisions cannot be outweighed by the benefits, passive funds may not elect to devote resources to these activities.<sup>67</sup>

Additionally, passive funds often lack the expertise required to analyze all their portfolio companies and make specific voting decisions. This is because passive funds' portfolios are widely distributed across various industries, making it difficult to maintain a deep understanding of each company's unique characteristics.<sup>68</sup>

As a result, passive fund managers may have limited incentives in analyzing unique characteristics of individual securities within an index and may not allocate resources to gather security-specific information relevant to each security. Instead, they may rely on the efforts of active investors to obtain and utilize such information, effectively free riding on active managers' efforts.<sup>69</sup>

As index funds lack resources, personnel, expertise, and financial incentives to make personalized decisions on corporate governance matters of their portfolio companies, a possible choice for them is to rely on proxy advisory firms to vote proxies. This gives rise to a practice called "robovoting", which

---

<sup>65</sup> See Giovanni Strampelli, *Are Passive Index Funds Active Owners: Corporate Governance Consequences of Passive Investing*, 55 San Diego L. Rev. 803 (2018) (finding "Anecdotal and empirical evidence provides limited conclusions but suggests passive investors tend to adopt a low-cost investment strategy to reduce costs associated with engagement with investee companies, thereby keeping their fees low").

<sup>66</sup> Dorothy S. Lund, *The Case Against Passive Shareholder Voting*, 43 J. Corp. L. 493 (2017), at 119. *see also* Iliev, P., & Lowry, M. (2015). Are mutual funds active voters? *The Review of Financial Studies*, 28(2), 446-485 (finding funds rationally assess the net benefits of voting and only devote the necessary resources to make an informed vote when the net benefits are sufficiently large.)

<sup>67</sup> *See* Iliev, P., & Lowry, M. (2015). Are mutual funds active voters? *The Review of Financial Studies*, 28(2), 446-485 (finding funds rationally assess the net benefits of voting and only devote the necessary resources to make an informed vote when the net benefits are sufficiently large.)

<sup>68</sup> *Id.* at 119-120.

<sup>69</sup> Vladyslav Sushko & Grant Turner, *The Implications of Passive Investing for Securities Markets*, BIS Quarterly Review, Mar. 2018, 113-131, at 119.

means fund managers automatically vote in line with recommendations of Institutional Shareholder Services (ISS) and Glass Lewis, the two major proxy advisory firms, rather than deliberately evaluating proposals presented to them before voting.<sup>70</sup> In 2020, 114 institutional investors, collectively managing more than \$5 trillion in assets, voted in line with recommendations of proxy advisory firms 99.5% of the time.<sup>71</sup>

ISS and Glass Lewis together account for more than 90% of the proxy advisory business, with ISS's market share exceeding 60%.<sup>72</sup> They provide proxy advisory services to clients by recommending voting "for" to approve a proposal put forward by the board or shareholder, or "against/withhold" to disprove or express concerns on a proposal. They issue annual proxy voting guidelines to announce their stance and recommendations on each issue on ballot. ISS drafts its guidelines by a survey of institutional issuers and corporations, roundtable discussions, and comments from corporate governance stakeholders.<sup>73</sup>

Small and mid-sized institutional investors particularly rely on proxy advisory firms' services. A recent study by Chong Shu finds that funds providing index products are 6% percent more likely to robovote than non-indexers.<sup>74</sup> Shu also finds that larger funds are less inclined to robovote with ISS recommendations.<sup>75</sup> In conclusion, Shu finds practices of robovoting have "become increasingly prevalent among ISS customers, especially the ones with smaller assets and that sell index funds."<sup>76</sup> This finding suggests that passive index funds, especially those with small assets and cost-sensitive business models, are more likely to outsource their proxy voting decisions to advisory firms due to

---

<sup>70</sup> Paul Rose, *Robovoting and Proxy Vote Disclosure*, at 1, <https://ssrn.com/abstract=3486322>

<sup>71</sup> Paul Rose, *Proxy Advisors and Market Power: A Review of Institutional Investor Robovoting*, Ohio State Legal Studies Research Paper No. 631, Manhattan Institute (Apr. 22, 2021), Figure 1 at 10, available at SSRN: <https://ssrn.com/abstract=3851233>.

<sup>72</sup> See Kevin Chuah, Isobel Mitchell, and Lily Tomson, *Another Link in the Chain: Uncovering the Role of Proxy Advisors*, ShareAction (Aug. 2019), at 5, <https://cdn2.assets-servd.host/shareaction-api/production/resources/reports/Another-Link-in-the-Chain-Uncovering-the-Role-of-Proxy-Advisors.pdf>.

<sup>73</sup> See James Copland, David F. Larcker & Brian Tayan, *The Big Thumb on the Scale: An Overview of the Proxy Advisory Industry* (May 31, 2018), Stanford University Graduate School of Business Research Paper No. 18-27, at 3, <https://ssrn.com/abstract=3188174>

<sup>74</sup> Chong Shu, *The Proxy Advisory Industry: Influencing and Being Influenced*, USC Marshall School of Business Research Paper (Oct. 26, 2022), at 16, <https://ssrn.com/abstract=3614314>

<sup>75</sup> *Id.*

<sup>76</sup> *Id.* at 3, 15, 23. Shu finds that "fraction of ISS customers who almost entirely follow its recommendations grew from 4 percent in 2007 to 21 percent in 2017, at which time over 40% of small funds (and over 50% of small index funds) robovoted." at 3. Shu defines small funds as those whose total net assts are at the first 1/3 quantile of all funds surveyed. at 48.



their inability or unwillingness to maintain extensive in-house corporate governance teams.<sup>77</sup>

Apart from small institutional investors, even huge institutional investors with independent voting guidelines could vote overwhelmingly in line with proxy advisory firms. For instance, Vanguard, a major asset manager that has more than \$7 trillion in AUM,<sup>78</sup> and has proxy voting guideline in place,<sup>79</sup> still vote in line with recommendations of proxy advisory firms.<sup>80</sup> Vanguard voted in line with ISS 94% and Glass Lewis 86% of the time on almost 800,000 proposals in 2019 and 2020.<sup>81</sup> As 79% or \$5.7 trillion of Vanguard's AUM are index assets, Vanguard's proxy voting practices substantiate Shu's claim that index fund firms are inclined to defer to recommendations of proxy advisory firms. This deference applies to huge players like Vanguard as well as small index fund firms, though there are differences in percentage of voting in alignment with proxy advisory firms' recommendations between these two types of fund firms in different sizes.

Due to the high demand for proxy voting by institutional investors, proxy advisory firms may not be able to provide tailored recommendations to all investors.<sup>82</sup> Limited resources of proxy advisors could result in varying quality of their recommendations. When ISS is busy, the quality of its proxy advice is

---

<sup>77</sup> See Rose, *Proxy Advisors and Market Power: A Review of Institutional Investor Robovoting*, supra note , at 9. See also Iliev, P., & Lowry, M., supra note 71 (finding smaller passive funds are more likely to vote in line with proxy advisors' recommendations, as the costs of doing self-informed voting outweigh the benefits.)

<sup>78</sup> Vanguard, *Vanguard in a Nutshell* (2023), at 2, <https://www.fr.vanguard/content/dam/intl/europe/documents/en/vanguard-in-a-nutshell-cu-en.pdf> (last visited Apr. 9, 2023).

<sup>79</sup> See e.g., Vanguard, *Proxy Voting Policy for U.S. Portfolio Companies* (Effective February 1, 2023), [https://corporate.vanguard.com/content/dam/corp/advocate/investment-stewardship/pdf/policies-and-reports/us\\_proxy\\_voting\\_2023.pdf](https://corporate.vanguard.com/content/dam/corp/advocate/investment-stewardship/pdf/policies-and-reports/us_proxy_voting_2023.pdf) (last visited Apr. 9, 2023).

<sup>80</sup> Vanguard uses services from both ISS and Glass Lewis. See Vanguard, *Investment Stewardship: About Our Program*, [https://corporate.vanguard.com/content/dam/corp/advocate/investment-stewardship/pdf/perspectives-and-commentary/IS\\_about\\_our\\_program\\_092021\\_online.pdf](https://corporate.vanguard.com/content/dam/corp/advocate/investment-stewardship/pdf/perspectives-and-commentary/IS_about_our_program_092021_online.pdf) (last visited Apr. 9, 2023) (“we consult a wide variety of third-party research providers, such as Institutional Shareholder Services, Glass Lewis, and Equilar.”)

<sup>81</sup> Rose, *Proxy Advisors and Market Power: A Review of Institutional Investor Robovoting*, supra note 71, at 12.

<sup>82</sup> Per as ISS's website, “ISS’ 3,000 employees operate worldwide across 25 global locations in 15 countries. Its approximately 3,400 clients include many of the world’s leading institutional investors who rely on ISS’ objective and impartial offerings, as well as public companies focused on ESG and governance risk mitigation as a shareholder value enhancing measure.” See ISS, *About ISS*, <https://www.issgovernance.com/about/about-iss/> (last visited Apr. 9, 2023). Put differently, on average, each ISS employee is serving 1.1 of the company’s clients.

patchy.<sup>83</sup> Even worse, ISS's recommendations could make significant factual and analytical errors, or use one-size-fits-all standard to make recommendations irrespective of state law or firm-specific facts.<sup>84</sup>

Meanwhile, the supply-demand disequilibrium of proxy advice could also cause proxy advisors' recommendations to be biased. In situations where there is high demand for proxy advice and where funds with profit-maximization objectives are unwilling to pay for high-quality advice, the recommendations of advisory firms will be closely aligned with preferences of socially responsible investors, even if they only represent a small percentage of total investors.<sup>85</sup> A possible explanation to these two firms' such inclination is that they both provide ESG consulting services.<sup>86</sup> They can benefit from advocating for ESG in proxy advising and ESG consulting.<sup>87</sup>

This phenomenon is particularly evident in the case of ISS. ISS recommendations hold significant influence over passive funds' proxy voting decisions, potentially directing them towards socially responsible objectives and resulting in a divergence from the voting outcomes that would have been attained

---

<sup>83</sup> See Ana M. Albuquerque, Mary Ellen Carter & Susanna Gallani, *Are ISS Recommendations Informative? Evidence from Assessments of Compensation Practices*, available at SSRN: <https://ssrn.com/abstract=3590216> (finding ISS recommendations are associated with future industry-adjusted accounting performance, but only for non-December fiscal year-end firms, suggesting that ISS activities may be value-added to shareholders if they are not exposed to high levels of workload compression.)

<sup>84</sup> See Frank M. Placenti, *Are Proxy Advisors Really a Problem?*, Squire Patton Boggs (US) LLP, Harvard Law School Forum on Corporate Governance and Financial Regulation (Nov. 7, 2018), <https://corpgov.law.harvard.edu/2018/11/29/the-realities-of-robo-voting/>. The authored analyzed supplemental proxy filings reporting errors in recommendations of ISS and Glass Lewis, and found during the 2016, 2017 and partial 2018 proxy seasons, 94 different companies made 119 filings and reported 139 significant problems these two firms' recommendation reports. Of all the errors filed, 39 were factual errors, 51 analytical errors, and 49 were serious disputes, which means ISS used one-size-fit-all standard to make recommendations, including support shareholder proposals in violation of state law governing the companies.

<sup>85</sup> See John G. Matsusaka & Chong Shu, *A Theory of Proxy Advice when Investors Have Social Goals*, USC Marshall School of Business Research Paper (Apr. 6, 2021), at 32, <https://ssrn.com/abstract=3547880>

<sup>86</sup> See Institutional Shareholder Services, ISS ESG Solutions, <https://www.issgovernance.com/esg/> (last visited April 13, 2023); see also Glass, Lewis & Co., *Glass Lewis Launches ESG Scores and Data to Give Investors Insights Needed for Informed Voting and Engagement Decisions* (Feb. 7, 2022), <https://www.glasslewis.com/press-release-esg-profile/>.

<sup>87</sup> See Bryan Junus, *How Robo-Voting Affects ESG Initiatives For Financial Companies*, Financial Advisor Magazine (Oct. 4, 2022), <https://www.fa-mag.com/news/how-robovoting-affects-esg-initiatives-for-financial-companies-69985.html> (claiming ISS and Glass Lewis have apparent conflict of interest because they "both advocate for ESG services and profit from ESG activities, while also advising shareholders how to vote on ESG proxy measures".)

through passive funds' self-informed voting, i.e., passive fund managers read and research the proxy materials beforehand and vote on their own.<sup>88</sup>

Meanwhile, ISS and Glass Lewis can exert strong influence on proxy voting results. While a comprehensive study finds that while only 55% of institutional investors indicate proxy advisory firms help them make more informed voting decisions, the actual voting outcomes suggest otherwise.<sup>89</sup> Institutional investors are significantly likely to vote in alignment with proxy advisory firms' recommendations on various governance issues, particularly on matters such as say-on-pay proposals and proxy contests for corporate control. In 2017, ISS's negative recommendations could decrease institutional investors' votes in support of proxy contests by 73%, say-on-pay proposals by 27.7%, elections of directors by 18.3%, and employee equity compensation plans by 17.4%.<sup>90</sup>

Another research also confirms negative ISS recommendations can decrease the votes in favor of say-on-pay proposals<sup>91</sup> by about 25%. Such influence is particularly strong in companies with substantial institutional ownership, where such ownership is widely dispersed and held by institutions with small stakes or high turnover.<sup>92</sup> Put differently, small institutional investors are more likely to rely on ISS to vote proxies instead of performing independent research on matter on ballots.<sup>93</sup>

Then Vice Chancellor of Delaware Court of Chancery Leo Strine vividly described the importance of ISS's recommendations for institutional investors'

---

<sup>88</sup> See John G. Matsusaka & Chong Shu, *Does Proxy Advice Allow Funds to Cast Informed Votes?*, USC Marshall School of Business Research Paper Sponsored by iORB, No. Forthcoming, <https://ssrn.com/abstract=3866041>. The article also finds that Glass Lewis's recommendations do not favor social goals and align more closely with the voting outcomes when funds read the proxy materials and cast their votes on their own.

<sup>89</sup> See James Copland, David F. Lareker & Brian Tayan, *supra* note 73, at 4.

<sup>90</sup> *Id.* at 4 and exhibit 1. An equity compensation plan is an employee benefit plan that provides employees with equity ownership in the company through the granting of equity-based awards, such as stock options, restricted stock units, or performance-based shares. Under Section 442 of the Internal Revenue Code (26 C.F.R. § 1.422) and Rule 16b-3 of the Exchange Act (17 C.F.R. § 240.16b-3), an equity compensation plan shall obtain shareholder approval.

<sup>91</sup> Section 14A(a)(1) of the Exchange Act (15 U.S.C. § 78n-1(a)(1)) mandates that all public companies provide their shareholders with an opportunity to vote on a non-binding basis, at least once every three years, on the compensation of named executive officers. Rule 14a-21(a) of the Exchange Act (17 CFR § 240.14a-21), also known as the "Say-on-Pay" rule, requires public companies to include in their proxy statements a separate shareholder advisory vote on executive compensation at least once every three years.

<sup>92</sup> See Nadya Malenko & Yao Shen, *The Role of Proxy Advisory Firms: Evidence from a Regression-Discontinuity Design*, 29 Rev. Fin. Stud. 3394 (2016).

<sup>93</sup> *Id.* at 3397.

voting decisions: “[P]owerful CEOs come on bended knee to Rockville, Maryland, where ISS resides, to persuade the managers of ISS of the merits of their views about issues like proposed mergers, executive compensation, and poison pills. They do so because the CEOs recognize that some institutional investors will simply follow ISS’s advice rather than do any thinking of their own.”<sup>94</sup>

Real-world evidence has demonstrated that index funds, regardless of their sizes, are predominantly inclined to rely on recommendations of proxy advisory firms to vote their shares. Particularly, small passive funds are more likely to be affected by and vote in line with ISS recommendations, i.e., robovoting. The evidence at least in part contradicts a theoretical proposition that passive funds would make self-informed voting and be active on corporate governance matters.<sup>95</sup>

But proxy advisors’ recommendations could be biased, and not necessarily serve the best interests of small passive funds and their shareholders. Robovoting could cause unintended consequences for small passive funds and their shareholders.<sup>96</sup> This is particularly true for ISS recommendations.

All in all, small funds may face a dilemma: either outsourcing their proxy voting decisions to proxy advisors to save costs but risking uncertain service quality and potential economic consequences; or conducting self-informed voting at higher costs to improve the quality of their voting decisions and better serve their shareholders.

### 2.3 The Transition to Personalized Voting

We have discussed empirical evidence that both small and large passive funds underspend on investment stewardship and rely on proxy advisors’ recommendations, but there are notable distinctions between them. Because of economies of scale, large passive funds, especially the Big Three, can internalize

---

<sup>94</sup> Leo E. Strine, Jr., *supra* note 61, at 688.

<sup>95</sup> See Jill E. Fisch, Assaf Hamdani & Steven Davidoff Solomon, *The New Titans of Wall Street: A Theoretical Framework for Passive Investors*, 168 U. Pa. L. Rev. 17 (2020) (claiming “passive funds need to exercise their governance rights in an informed manner to promote firm value. Passive investors must do this by relying on voice, rather than exit” and finding passive investors have shown an increased interest in corporate engagements, “particularly market-wide initiatives such as improving corporate governance.”)

<sup>96</sup> See David F. Larcker, Allan L. McCall & Gaizka Ormazabal, *Outsourcing Shareholder Voting to Proxy Advisory Firms*, 58 J.L. & Econ. 173 (2015) (confirming that proxy advisory firms’ recommendations have a substantive impact on say-on-pay voting outcomes, and finding outsourcing of voting to proxy advisory firms may have the unintended economic consequence of inducing boards of directors to make compensation decisions that decrease shareholder value, i.e., causing the companies’ stock prices to fall.)

costs associated with investment stewardship more easily than their small counterparts. Consequently, the Big Three do more independent research on proxy statements than small funds and do not automatically vote in line with proxy advisory firms like ISS or Glass Lewis.<sup>97</sup>

Large index funds' efforts to increase a specific corporation's value within the index can benefit the index as a whole, and in turn, all index funds tracking the index. Despite small funds' freeriding, large funds' devotion of resources for self-informed voting and exceptional voting performance signals to investors that the funds are resourced, engaged, and focused on long-term value.<sup>98</sup> Such signaling could further reinforce the strength of large funds,<sup>99</sup> and help them make more inroads into smaller funds' edge.

Market competition could be a driving force for small funds to adopt self-informed proxy voting similar to their larger competitors. In addition, regulatory, academic, and practical trends also pressure small funds to make personalized voting instead of robovoting.

In November 2022, the SEC adopted rules that amended Form N-PX, imposing enhanced reporting duties on institutional investors with respect to their proxy voting.<sup>100</sup> The Form N-PX is required to be filed annually by every registered management investment company<sup>101</sup> to report their most recent 12-month proxy voting records.<sup>102</sup> The amended Form N-PX requires registrants report the votes report on the form consistent with a list of categories outlined in the amended form. Among all the 14 categories that registrants are required to

---

<sup>97</sup> See Alon Brav, Andrey Malenko & Nadya Malenko, Corporate Governance Implications of the Growth in Indexing (March 2023), Eur. Corp. Governance Inst. - Fin. Working Paper No. 849/2022, available at SSRN: <https://ssrn.com/abstract=4222402>

<sup>98</sup> See Brian L. Connelly et al., Signaling Theory: A Review and Assessment, 37 J. Mgmt. 39 (2011), at 43 (doi: 10.1177/0149206310388419) (reviewing signaling theory, and finding firms by continually paying interests and dividends to signal they are of good-quality, and such signaling influence outsiders' perception of the firms' quality).

<sup>99</sup> Better reputation could lead to better business opportunities, see PG Shu et al., *The Reputation Effect of Venture Capital*, 36 Rev. Quant. Fin. & Acc. 533 (2011) (finding for VC-backed IPOs, reputable VC-backed firms outperform mediocre VC-backed ones).

<sup>100</sup> U.S. Securities and Exchange Commission, *Enhanced Reporting of Proxy Votes by Registered Management Investment Companies; Reporting of Executive Compensation Votes by Institutional Investment Managers*, Release Nos. 33-11131; 34-96206; IC-34745; File No. S7-11-21, RIN 3235-AK67.

<sup>101</sup> Section 4 and Section 5 of the Investment Company Act (15 U.S. Code § 80a-4 & 80a-5) defines an investment company. A Registered Management Investment Company (RMIC) is a type of investment company that pools money from many investors and invests those funds in a diversified portfolio of securities. RMICs are regulated by the SEC under the Investment Company Act, and they must register with the SEC to offer their shares to the public.

<sup>102</sup> 17 C.F.R. § 270.30b1-4.

report, director elections, corporate governance, environmental or climate and compensation are noteworthy.<sup>103</sup> Meanwhile, investment companies' votes should be disclosed quantitatively, which means the number of shares voted and how those shares were voted (e.g., for or against proposal or abstain) should be disclosed. If the votes were cast in multiple manners (e.g., both for and against), funds will be required to disclose the number of votes in each manner.<sup>104</sup>

The SEC stated that these enhanced disclosure requirements on funds' voting practices will help investors identify votes of interest and compare voting records.<sup>105</sup> Consequently, investors could identify more easily how funds voting on each issue and select funds more representative of their investment preferences and ideas. This regulatory change could pressure investment funds to vote proxies in a more personalized way than simply robovoting.

Academics have also come up with solutions to make investment funds' proxy voting in more alignment of their shareholders' interests and preferences. For instance, Professor Jill Fisch proposes that institutional investors should act like elected representatives. They cast their votes independently but before voting they should consult with and seek input from their shareholders.<sup>106</sup>

But there are also arguments opposing small funds making personalized, self-informed voting. For instance, Professor Gordon contends that firm-specific engagement is undesirable for both passive funds and investors. For funds, serious engagement is costly and contravenes with their low-cost business model, and passive funds will not benefit from these engagements as they cannot overweight or underweight specific stocks in their portfolios. Meanwhile, passive funds' portfolios are formed without any firm-specific research.<sup>107</sup> For investors, as portfolios of index funds are so diversified—diversified to an entire index—that firm-specific risks would be diversified away.<sup>108</sup> He argues that only systemic risks, especially climate risks, financial and social stability risks would

---

<sup>103</sup> Item 1(g) Form N-PX, 17 CFR § 274.129 (amended Dec. 2022). All these 14 categories are: director elections; Section 14A say-on-pay votes; audited-related; investment company matters; shareholder rights and defenses; extraordinary transactions; capital structure; compensation; corporate governance; environmental or climate; human rights or human capital/workforce; diversity, equity and inclusion; other social issues; other.

<sup>104</sup> *Id.*

<sup>105</sup> U.S. SEC Adopts Rules to Enhance Proxy Voting Disclosure by Registered Investment Funds and Require Disclosure of "Say-on-Pay" Votes for Institutional Investment Managers, Press Release No. 2022-198 (Nov. 2, 2022), available at <https://www.sec.gov/news/press-release/2022-198>.

<sup>106</sup> See Jill E. Fisch & Jeff Schwartz, *Corporate Democracy and the Intermediary Voting Dilemma*, Texas L. Rev., Forthcoming, <https://ssrn.com/abstract=4360428>.

<sup>107</sup> Jeffrey N. Gordon, *Systemic Stewardship*, 47 J. Corp. L. 627 (2022), at 643.

<sup>108</sup> *Id.*

significantly affect index funds' risk-adjusted returns.<sup>109</sup> In conclusion, he suggests that passive funds' engagements should focus on mitigating market-wide systemic risks, instead of firm-specific risks. He names this investment stewardship as "systemic stewardship".<sup>110</sup>

Professor Kahan and Rock put forward arguments about why systemic stewardship could fall short.<sup>111</sup> A particularly persuasive argument they state is that systemic stewardship implicates a tradeoff for fund managers between a firm's value and their portfolio's value.<sup>112</sup> Under current corporate law, fiduciaries owe fiduciary duties to serve the best interests of all their shareholders, including small shareholders.<sup>113</sup> Meanwhile, index fund managers typically manage a wide variety of different portfolios for different clients, each of whom is owed fiduciary duties. The "tradeoff" strategy that would benefit some portfolios at the expense of other portfolios would conflict with these fiduciary duties as well as with the core multi-client multi-portfolio business model.<sup>114</sup>

This argument holds true for funds within a fund family. The systemic stewardship posits all investors within a fund family have identical interests and preferences. But this is not the case in the real world. For instance, Vanguard provides 82 ETFs, including Vanguard Energy ETF and Vanguard ESG U.S. Stock ETF.<sup>115</sup> If Vanguard adopts a unitary voting position to require energy companies dramatically reduce emissions and banks stop financing new fossil fuel projects,<sup>116</sup> investors in Vanguard ESG ETF could benefit and those in Vanguard Energy ETF could be financially hit. However, legally, Vanguard acts as a fiduciary for investors in both ETFs, who may have differing interests when Vanguard are voting proxies.

But systemic stewardship falls even shorter across fund families. Systemic stewardship posits index funds have identical interests and preferences, too. They should vote in the same manners that address climate change and other systemic risks, However, if small funds do so, they would risk being more marginalized. Index funds are essentially providing similar products that track an index (or a

---

<sup>109</sup> *Id.* 652-658.

<sup>110</sup> *Id.* 658-666.

<sup>111</sup> See Marcel Kahan & Edward B. Rock, *Systemic Stewardship with Tradeoffs*, NYU Law and Economics Research Paper No. 22-01, available at SSRN: <https://ssrn.com/abstract=3974697>

<sup>112</sup> *Id.* at 5.

<sup>113</sup> *Id.* at 15-17.

<sup>114</sup> *Id.* 21-23.

<sup>115</sup> See Vanguard, Discover Vanguard ETFs, <https://investor.vanguard.com/investment-products/list/etfs> (last visited Apr. 14, 2023).

<sup>116</sup> See Saijel Kishan, *Big Banks Told to Phase Out Financing of New Fossil-Fuel Projects*, Bloomberg (Jan. 24, 2023, 7:00 AM PST), <https://www.bloomberg.com/news/articles/2023-01-24/wall-street-faces-calls-from-investors-to-cut-fossil-fuel-financing?sref=CMlh25pt>

commodity) and cannot offer unique features, leading to a concentration of capital among those who can make the fees as lowest as possible, illustrated by ETFs' falling expense ratio.<sup>117</sup> Small players and new entrants should be very innovative to grab market share from the towering Big Three.<sup>118</sup> Personalized voting is a type of strategy that can signal to investors that the fund is attentive to shareholder interests and perspectives, boosting the reputation of index funds that provide personalized voting.<sup>119</sup> This is particularly important for small funds to differentiate themselves in a crowded market of similar investment products.

The market force, regulatory initiatives, and academic perspectives all champion that investment funds should make personalized voting to align their voting decisions with their shareholders' interests. Personalized voting is not only crucial for funds within a fund family so that fund managers can fulfill their fiduciary duties to all shareholders, but also for small fund firms to align their proxy voting with their shareholders' interests and preferences, and to achieve better visibility, optics, and reputation in the competitive market.

### 3. Outsourcing Voting Decisions to AI

Numerous evidence has demonstrated that passive funds, especially small passive funds, have been outsourcing their proxy voting to proxy advisory firms, or robovoting. However, as the limitations of robovoting become apparent and small funds face growing pressure to make personalized, well-informed voting decisions, using AI models could be a potential solution. However, training a specialized LLM from scratch can be time-consuming and costly. As an example, it is estimated that training Bloomberg's finance LLM model, BloombergGPT, required 53 days and cost over \$2.7 million.<sup>120</sup> In comparison, fine-tuning

---

<sup>117</sup> See Investment Company Institute and Morningstar, *supra* note 33.

<sup>118</sup> See Katherine Greifeld, *Big Three's Grip on \$6.7 Trillion ETF Market Slips for a Sixth Year*, Bloomberg (Dec. 14, 2022, 10:25 AM PST) (reporting that firms launching new ETFs are racing to provide innovative products such as single-stock ETFs and maturity-specific bond funds).

<sup>119</sup> See Hsuan-Chi Chen & Christine W. Lai, *Reputation stretching in mutual fund starts*, 34 J. Banking & Fin. 193 (2010) (finding new equity funds launched by reputable fund managers who exhibiting one-year performance persistence can attract capital inflows and perform better in the short run). Even activist shareholders need to grab attention and build reputation, see Travis L. Johnson & Nathan Swem, *Reputation and Investor Activism: A Structural Approach*, 139 J. Fin. Econ. 29 (2021) (finding reputation-building incentives explain 20% of activist investors' campaign initiations and 19% of their proxy fights).

<sup>120</sup> See Jamiel Sheikh, *The ChatGPT of Finance Is Here, Bloomberg Is Combining AI And Fintech*, Forbes (Apr. 5, 2023, 01:36 PM EDT), <https://www.forbes.com/sites/jamiel/sheikh/2023/04/05/the-chatgpt-of-finance-is-here-bloomberg-is-combining-ai-and-fintech/?sh=76dac93e3081>.



ChatGPT is a cost-effective option, as it is already pre-trained and can be customized to suit specific needs.<sup>121</sup>

### 3.1 Using Zero-Shot ChatGPT Model to Analyze Proxy Statements and Make Voting Recommendations

Before beginning the experiment and discussion of using ChatGPT to make proxy voting recommendations, it is useful to understand the regulations surrounding proxy statements.

Under Section 14(a) of the Exchange Act,<sup>122</sup> reporting companies must provide shareholders with proxy materials and file proxy statements with the SEC before holding shareholder meetings. The SEC has created Schedule 14A<sup>123</sup> to specify the information that must be included in a proxy statement, including details about matters to be voted on and information about the company's management, board of directors and the company's financial performance.

In November 2021, the SEC issued "universal proxy rules" that require reporting companies to use universal proxy cards in contested director elections.<sup>124</sup> A universal proxy card is a single proxy card that lists all the director nominees from both the management and dissident shareholders. Dissident shareholders can use the universal proxy card if they solicit at least 67% of voting shares and meet certain procedures contained in Rule 14a-19.<sup>125</sup> Under the old rules, shareholders could only vote for the director nominees of the company or the dissident shareholder. The new rules give shareholders more choice and allow them to vote for director nominees they believe are best qualified, regardless of who nominated them.

A reporting company typically files Form DEF 14A for annual meetings, mergers or contested elections for directors.<sup>126</sup> Meanwhile, shareholders of

---

<sup>121</sup> See OpenAI, Pricing, OpenAI (last visited Apr. 11, 2023), <https://openai.com/pricing/>. Fine-tuning ChatGPT using the priciest model costs \$0.0300 per 1,000 tokens to train and \$0.1200 per 1,000 tokens to generate answers. This means that it costs users \$40 to train the model with 1 million English words of data, and \$160 to generate 1 million English words (1,000 tokens roughly equal 750 English words).

<sup>122</sup> 15 U.S. Code § 78n(a)

<sup>123</sup> 17 C.F.R. § 240.14a-101

<sup>124</sup> U.S. Securities and Exchange Commission, *Universal Proxy*, 17 C.F.R. pt. 240, Release No. 34-93596, IC-34419, File No. S7-24-16, RIN 3235-AL84 (Nov. 17, 2021).

<sup>125</sup> 17 C.F.R. § 240.14a-19

<sup>126</sup> See Lexis Securities Mosaic, *SEC Forms Guide* (last visited Apr. 11, 2023), <https://www.lexissecuritiesmosaic.com/resourcecenter/SEC%20Forms%20Guide.pdf>.

reporting companies can submit their proposals for inclusion on the companies' proxy statements pursuant to Rule 14a-8.<sup>127</sup>

Prompts are crucial in guiding the response generation of ChatGPT for specific tasks and inquiries. In essence, a prompt is a concise text fragment that furnishes context and instructions for ChatGPT to generate a response. The length and complexity of a prompt may vary depending on the task's nature, ranging from a single sentence to several paragraphs. This article uses prompts requiring ChatGPT to act as if it is a corporate governance expert with various experience in providing proxy advice.<sup>128</sup>

Initially, ChatGPT's GPT-4 model is prompted to provide its opinion on generating proxy recommendations, including the factors that should be considered and their corresponding weightage. In response, ChatGPT states that it evaluates each issue and assigns appropriate weights to them, with the goal of promoting effective corporate governance and enhancing long-term shareholder value. Additionally, ChatGPT is asked to construct a regression model based on the variables and weights it provides. The model is as follows:

$$\text{Governance Score} = \beta_0 + 0.2 * \text{Board Composition} + 0.2 * \text{Executive Compensation} + 0.15 * \text{Shareholder Rights} + 0.15 * \text{ESG Factors} + 0.1 * \text{Proxy Access} + 0.05 * \text{Auditor Independence} + 0.1 * \text{M\&A Proposals} + 0.05 * \text{Shareholder Proposals}$$

The model is intended to evaluate and score a corporation's overall corporate governance like ISS's Governance QualityScore service,<sup>129</sup> rather than providing specific recommendations. Through further prompts, ChatGPT provides a breakdown and weightage for each independent variable in the regression model mentioned earlier. For example, with respect to board composition, the following regression model is generated:

$$\text{Board Composition} = \beta_0 + 0.3 * \text{Board Independence} + 0.3 * \text{Diversity} + 0.25 * \text{Skills and Expertise} + 0.05 * \text{Board Size} + 0.05 * \text{Director Tenure} + 0.05 * \text{Committee Structure}$$

A more detailed version of the model includes a breakdown of each dependent variable:

---

<sup>127</sup> 17 C.F.R. § 240.14a-8

<sup>128</sup> The prompts used in this article draw inspiration from Alejandro Lopez-Lira & Yuehua Tang, *Can ChatGPT Forecast Stock Price Movements? Return Predictability and Large Language Models*, SSRN (Apr. 6, 2023), 7-9, <https://ssrn.com/abstract=4412788>

<sup>129</sup> See ISS Governance, Governance QualityScore, ISS ESG, <https://www.issgovernance.com/esg/ratings/governance-qualityscore/>.

$$\text{Board Composition} = \beta_0 + 0.3 * (0.5 * \text{Independent Directors} + 0.3 * \text{Independent Committees} + 0.2 * \text{Independent Board Chair or Lead Director}) + 0.3 * (0.4 * \text{Gender Diversity} + 0.4 * \text{Ethnic Diversity} + 0.2 * \text{Other Forms of Diversity}) + 0.25 * (0.2 * \text{Financial Expertise} + 0.2 * \text{Industry Expertise} + 0.2 * \text{Technology Expertise} + 0.2 * \text{Legal and Regulatory Expertise} + 0.2 * \text{Strategic Planning Expertise}) + 0.05 * (1.0 * \text{Number of Directors}) + 0.05 * (0.5 * \text{Average Tenure} + 0.5 * \text{Tenure Diversity}) + 0.05 * (0.5 * \text{Committee Composition} + 0.5 * \text{Committee Performance})$$

This breakdown provides a more granular evaluation of a company's board composition. As we can see from the model, ChatGPT breaks down board composition into board independence, diversity, skills and expertise, board size, director tenure and committee structure. Furthermore, ChatGPT breaks down board independence into independent directors (the proportion of independent directors on the board), independent committee (requiring critical board committees-audit, compensation, and nominating to be composed mainly or entirely of independent directors) and independent board chair or lead director. After identifying the factors, ChatGPT also assigns weight to each variable, reflecting how ChatGPT weighs the relative importance of each variable in the overall model.<sup>130</sup>

#### [Appendix 1: ChatGPT-Generated Proxy Voting Guidelines]

Investment funds must exercise caution if they wish to build models or request ChatGPT to build models based on guidelines written and weights assigned by ChatGPT. This is because the variables may include both numeric and categorical variables.<sup>131</sup> For instance, ChatGPT assigns a weight of 15% to shareholder rights, with 40% allocated to voting rights and 25% to anti-takeover provisions.<sup>132</sup> The sub-variables of voting rights and anti-takeover provisions, such as the one-share, one-vote principle, supermajority vote requirements, poison pills, and staggered board, are all categorical and should be constructed as dummy variables<sup>133</sup> during modelling. The coefficients for supermajority vote requirements, poison pills, staggered board, and other anti-takeover provisions should be negative to reflect their negative impact on shareholder rights. After a

---

<sup>130</sup> Please note, the test may not be reproduced as the results are randomly generated.

<sup>131</sup> A categorical variable is a type of variable used in statistics that represents data in categories or groups. It takes on a limited number of values belonging to a specific category or group and is often represented by labels or names.

<sup>132</sup> See appendix 1.

<sup>133</sup> A dummy variable is a binary variable used in statistical models to represent the presence or absence of a categorical feature. It is coded as either 0 or 1, and is commonly used in regression analysis to model the effect of a categorical predictor on the dependent variable.

sequence of prompts, ChatGPT-generated regression model for shareholder rights with dissection of voting rights and anti-takeover provisions is:

$$\text{ShareholderRights} = 0.4 * (0.7 * \text{OneShareOneVote\_dummy} - 0.3 * \text{SupermajorityVoteRequirements\_dummy}) + 0.25 * (-0.4 * \text{PoisonPills\_dummy} - 0.4 * \text{StaggeredBoard\_dummy} - 0.2 * \text{OtherAntiTakeoverMeasures\_dummy}) + 0.2 * \text{ShareholderEngagement} + 0.1 * \text{ShareholderVotingMechanisms} + 0.05 * \text{BoardAccountability}^{134}$$

In the above experiment, ChatGPT's GPT-4 model generated positive coefficients for anti-takeover-related variables without human intervention.<sup>135</sup> This indicates that ChatGPT requires human oversight to ensure accurate modeling. Additionally, the experiment confirms that even the most advanced GPT model is not proficient in mathematical computations, as ChatGPT made errors when calculating coefficients for dissected variables (but this miscalculation could also result from long-range dependencies).<sup>136</sup>

In addition to the complex modelling process, the functional limitations of using zero-shot ChatGPT models, including the most advanced GPT-4, to generate the above models are also apparent. ChatGPT's token limits restrict users to inputting limited words at a time. Moreover, the problem of long-range dependencies remains significant, as ChatGPT can forget the weights assigned to each variable in previous dialogues that occurred thousands of words ago. As a result, ChatGPT must be prompted again with the weights it has assigned.

The experiment goes one step further by testing whether ChatGPT can generate proxy voting recommendations based on the regression model it has produced. In this experiment, ChatGPT is prompted to provide recommendations on whether shareholders should vote for or withhold/against proposals included on a proxy card.

---

<sup>134</sup> For all the dummy variables, 1 denotes if the company has such a provision in place, 0 denotes otherwise.

<sup>135</sup> Moreover, ChatGPT initially failed to identify categorical variables. However, after being prompted to construct dummies for such variables, it was able to recognize eight categorical variables. Nevertheless, some of these variables were not entirely categorical in nature.

<sup>136</sup> This could arise from the inherent limitations of LLM models, *see* Ben Dickson, *Can you trust ChatGPT and other LLMs in math?*, TechTalks (Mar. 6, 2023), <https://bdtechtalks.com/2023/03/06/chatgpt-llm-mathematics/>. A possible solution is to invoke plugins of professional math software such as MATLAB in ChatGPT (*see* OpenAI, ChatGPT plugins, <https://openai.com/blog/chatgpt-plugins>).

As the training data for ChatGPT was due in late 2021, a proxy statement filed in March 2022 by Bank of America<sup>137</sup> is used for the experimentation. There are three proposals on the BOA's DEF 14. The first is a proposal for election of directors. ChatGPT recommends shareholders vote for all the nominees nominated by BOA, in line with the recommendation of BOA's board. ChatGPT has concluded that the board displays a robust level of diversity,<sup>138</sup> and each board nominee demonstrates exceptional expertise and experience. However, ChatGPT points out that the independence of a nominee, Frank P. Bramble, could be comprised as two of his companies were acquired by BOA.<sup>139</sup>

BOA's board recommended voting against Proposal 5, which requests a civil rights audit, Proposal 6, which proposes stopping BOA from financing new fossil fuel supplies, and Proposal 7, which requests BOA to disclose charitable donations.<sup>140</sup> However, ChatGPT recommends that shareholders vote for these proposals. ChatGPT's disagreement with BOA's board on ESG matters indicates that, at least in this experiment, ChatGPT places significant value on ESG ideas.

However, in this experiment, the limitations of tokens and the problem of long-range dependencies once again impede a more detailed analysis. Proposal 2 regarding executive compensation is lengthy and contains various tables and charts that ChatGPT is currently unable to recognize. As a result, the experiment fails to produce a conclusive recommendation from ChatGPT.

In conclusion, the zero-shot ChatGPT model, especially GPT-4, is a useful tool for writing long and detailed proxy voting guidelines, as well as detecting potential conflicts of interest that could compromise the independence of a director nominee. However, its ability to serve as a reliable proxy advisor is limited by token constraints and the challenge of long-range dependencies.

To enable ChatGPT to read PDFs and overcome the limitations on token input, one possible solution is to extract the text from the PDFs and split it into smaller chunks. Users can utilize Python libraries such as PyPDF2, pdfrw, or pdfplumber to extract text from PDF files or use non-programming PDF-to-text tools. Next, users should divide the text into meaningful sections such as

---

<sup>137</sup> See Bank of America Corporation, DEF 14A, SEC EDGAR (filed Mar. 7, 2022), [https://www.sec.gov/Archives/edgar/data/70858/000119312522067335/d222593ddef14a.htm#not22593\\_2](https://www.sec.gov/Archives/edgar/data/70858/000119312522067335/d222593ddef14a.htm#not22593_2).

<sup>138</sup> ChatGPT observed that the board nominees exhibit diversity in terms of gender and race, with five women and individuals from diverse backgrounds, and the tenure of each nominee varies. Meanwhile, ChatGPT's analysis does not consider the age of each nominee.

<sup>139</sup> *Id.* at 14 "Mr. Bramble...having held leadership positions at two financial services companies acquired by our company (MBNA Corporation, acquired in 2006, and MNC Financial Inc., acquired in 1993)."

<sup>140</sup> *Id.* at 87-99.

paragraphs or sections to ensure that the context is preserved.<sup>141</sup> Once the text has been chunked, the ChatGPT model can be run repeatedly on each text chunk until all the chunks have been processed. Finally, the outputs can be combined into a single, coherent response. This process is also necessary for fine-tuning ChatGPT models.

Investment funds can request modifications to ChatGPT’s corporate governance evaluation and proxy recommendation guidelines, as well as corresponding models. These changes may include adding or deleting variables and adjusting the weights assigned to each variable. However, investment funds should continually monitor the process and provide responses, feedback, and performance reviews of the recommendations generated by the zero-shot ChatGPT model. Otherwise, the results may not be accurate, reliable, or in line with industry standards.

While the zero-shot ChatGPT model can be helpful, it might not offer professional-level proxy voting advice. Like lawyers, ChatGPT requires specialized training with domain-specific data to comprehend the rationale and methodologies involved in delivering high-quality proxy voting advice. Therefore, it is essential to fine-tune ChatGPT for a more specialized and personalized approach, ensuring its reliability in providing proxy voting advice.

We conducted a non-controlled experiment in which we fine-tuned the GPT-3.5 text-davinci-003 model using BOA’s 2022 proxy statement and proxy voting guidelines generated by the zero-shot ChatGPT’s GPT-4 model (Appendix 1) as datasets. After fine-tuning, we prompted the fine-tuned text-davinci-003 model to assume the role of an experienced corporate governance expert and to make recommendations for or against all proposals in BOA’s proxy statement, disregarding any suggestions from the board and relying solely on voting guidelines. The recommendations generated by the fine-tuned model are as follows:

Table 1: Recommendations of BOA Board, Zero-Shot GPT-4 and Fine-Tuned Davinci-3<sup>142</sup>

Proposal	Subject Matter	BOA Board	Zero-Shot GPT-4	Fine-Tuned Davinci-3
1	Electing directors	For	For	For

<sup>141</sup> See Dhanashree, *How to Extract Text from PDF Using Python?*, Nanonets (Mar. 7, 2023), <https://nanonets.com/blog/extract-text-from-pdf-file-using-python/>.

<sup>142</sup> The subject matter of each proposal was also summarized by the fine-tuned text-davinci-3.

2	Approving executive compensation	For	/	For
3	Ratifying appointment of independent registered public accounting	For	For	For
4	Ratifying Delaware Exclusive Forum Provision in Bylaws	For	For	For
5	Shareholder proposal requesting civil rights and nondiscrimination audit	Against	For	For
6	Shareholder proposal requesting adoption of policy to cease financing new fossil fuel supplies	Against	For	Against
7	Shareholder proposal requesting report on charitable donations	Against	For	For

When asked why the fine-tuned model recommended voting against proposal 6, the model responded, “Proposal 6 is a shareholder proposal requesting adoption of a policy to cease financing new fossil fuel supplies. Voting against this proposal is a way to express opposition to the use of fossil fuels and to support the transition to renewable energy sources.” The fine-tuned model accurately summarized the content of proposal 6, but its recommendation contradicted its stated purpose. This outcome highlights some cognitive limitations of GPT-3.5, as the zero-shot GPT-4 model did not make such an error.

Simultaneously, it also indicates that the GPT-4 generated voting proxy guidelines favor ESG, as the fine-tuned model, instructed to override BOA board’s opinions and make recommendations based solely on GPT-4 generated guidelines, endorsed all three shareholder proposals promoting ESG matters.

It should be noted that since the fine-tuned model is based on GPT-3.5, it does not fully demonstrate the capabilities of GPT-4, making the results not directly comparable. Additionally, due to the limited scope of the fine-tuning datasets, the results may exhibit bias.

### 3.2 Fine-Tuning ChatGPT with ISS Model

Given the significance of ISS in providing guidance to institutional investors on voting proxies, it would be helpful to begin by creating a voting model based on ISS’s proxy voting guidelines. These guidelines are updated and

released on an annual basis, and the latest proxy voting guidelines for U.S. incorporated companies was published in December 2022, effective for Meetings on or after February 1, 2023.<sup>143</sup>

These guidelines display ISS's framework for making recommendations. The guidelines classify proxy voting issues into seven categories, including board of directors, audit-related, shareholder rights and defenses, capital and structuring, compensation, and social and environmental issues.<sup>144</sup> Each category consists of numerous subcategories. For instance, with respect to the board of directors, ISS guidelines consider composition, responsiveness, accountability, and other issues, including the size of the board, term limits, and retirement age of directors.<sup>145</sup> The guidelines provide general recommendations for each issue. For complicated issues, the guidelines list specific facts and circumstances worth considering when shareholders cast their votes. Overall, the guidelines are very concrete and specific. However, the complexity of the guidelines could make it difficult for funds to follow them without thorough understanding and analysis.

Although ISS's proxy voting guidelines are publicly available, the voting recommendation model it uses is proprietary, and the specific parameters and coefficients used to evaluate the weight of each issue are not disclosed to the public. In fact, ISS's process for updating its voting guidelines has been criticized for its lack of transparency and representativeness.<sup>146</sup>

But ISS's recommendations can be accessed on ISS Voting Analytics database. The database contains two sets of voting records: Company Vote Results, which covers proxy voting results for Russell 3000 companies; and Fund Vote Results, which covers the voting records of individual funds within the top 100 mutual fund families, extracted from Form N-PX filings.<sup>147</sup> For detailed information, the database provides the identities of companies, descriptions of

---

<sup>143</sup> Institutional Investor Services, *United States Proxy Voting Guidelines*, (published Dec. 13, 2022), <https://www.issgovernance.com/file/policy/active/americas/US-Voting-Guidelines.pdf?v=1>.

<sup>144</sup> *Id.*

<sup>145</sup> *Id.* at 9-23.

<sup>146</sup> See David F. Larcker, Allan L. McCall, and Brian Tayan, *And Then a Miracle Happens!: How Do Proxy Advisory Firms Develop Their Voting Recommendations?*, Rock Center for Corporate Governance at Stanford University Closer Look Series: Topics, Issues and Controversies in Corporate Governance and Leadership No. CGRP-31 (Feb. 25, 2013), <https://ssrn.com/abstract=2224329> (arguing that too few participants are involved in the ISS data collection process, and that the composition of the respondent pool is not well disclosed. Additionally, ISS's survey design contains errors that are "likely to confuse and/or bias respondents.")

<sup>147</sup> Voting Analytics Data, Harvard Business School Baker Library (last visited Apr. 11, 2023), <https://www.library.hbs.edu/find/databases/voting-analytics-data>.



ballot items, shareholder meeting dates, management and ISS recommendations, and the number of “for” and “withhold/against” votes, among other items.<sup>148</sup>

We can assess the effectiveness of the ISS model by observing market reactions to ISS recommendations. We can evaluate how the market reacts to ISS recommendations by looking at changes in stock prices after a company’s proposals have been voted on.<sup>149</sup> If proposals are voted in line with ISS recommendations and the company’s stock price rises afterward, or if proposals are voted in opposition to ISS recommendations and the company’s price goes down afterward, we can conclude that the ISS model is effective as the market reacts positively to ISS recommendations. Conversely, if proposals are voted in line with ISS recommendations but the company’s stock price goes down, or if proposals are voted in opposition to ISS recommendations but the company’s stock price rises, the ISS model may decrease the company’s value as the market reacts negatively to ISS recommendations.<sup>150</sup>

It is noteworthy that market reactions to ISS recommendations can be influenced by various factors other than the recommendations themselves, such as general market conditions, macroeconomic indicators, or company-specific news. In order to obtain a more accurate and precise evaluation of the market reactions to ISS recommendations, investment funds may consider employing difference-in-difference (DiD) regression to control for compounding factors.<sup>151</sup>

---

<sup>148</sup> Tao Li, *Outsourcing Corporate Governance: Conflicts of Interest Within the Proxy Advisory Industry*, 64 *Manag. Sci.* 2951 (2018), at 2956, <https://doi.org/10.1287/mnsc.2016.2652>.

<sup>149</sup> A widely used database to track changes in stock prices of US companies is CRSP US Stock Databases (<https://www.crsp.org/products/research-products/crsp-us-stock-databases>).

<sup>150</sup> To gauge market reactions to ISS recommendations, see David F. Larcker, Allan L. McCall & Gaizka Ormazabal, *supra* note 96, at 192-195. The authors use average daily adjusted return for the 30 days before and the 30 days after a company’s 8-K filing date to measure market reactions. Form 8-K is known as a “current report” and it is the report that companies must file with the SEC to announce major events that shareholders should know about (U.S. Securities and Exchange Commission, Form 8-K: Current Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934)

<sup>151</sup> DiD regression compares the changes in outcomes for a treatment group (e.g., companies that received ISS recommendations) to changes in outcomes for a control group (e.g., companies that did not receive ISS recommendations) over time. By comparing these changes, DiD regression helps to isolate the causal effect of the treatment (ISS recommendations) on the outcome variable (market reactions) while accounting for other factors that might affect the outcome. For a general survey of DiD, see Michael Lechner, *The Estimation of Causal Effects by Difference-in-Difference Methods*, 4 *Foundations and Trends(R) in Econometrics* 165 (2011); for applying DiD with Python, see Matheus Facure, *The Difference-in-Differences Saga*, Causal Inference for The Brave and True (2022), <https://matheusfacure.github.io/python-causality-handbook/24-The-Diff-in-Diff-Saga.html#the-difference-in-differences-saga>

After parsing ISS proxy voting guidelines, processing and normalizing available ISS Voting Analytics data, matching ISS recommendations to corresponding proposals and final voting results, and calculating the market reactions to each ISS recommendation, the next step is to fine-tune the ChatGPT model to create a personalized model based on ISS principles and methodologies and the market reactions to ISS recommendations.

It is noteworthy that the dataset should be divided into separate training and validation sets for model fine-tuning and evaluation. A commonly used practice is to allocate 80% of the data for training and 20% for validation.<sup>152</sup>

After fine-tuning ChatGPT, investment funds can use the personalized model to generate voting recommendations for proposals in both the validation set and real-world proxy voting. Additionally, the model can be used to assess companies' corporate governance after incorporating more relevant data, such as financial information and media news.

Investment funds can evaluate the performance of their resulting models by calculating relevant performance metrics such as accuracy, F1-score,<sup>153</sup> or mean absolute error.<sup>154</sup> If they find the recommendations generated unsatisfactory, investment funds can provide feedback to iterate the fine-tuned model. This can involve adding new data sources, removing irrelevant or outdated data, or adjusting the weighting of different data sources to better align with the investment funds' preferences.<sup>155</sup> After rounds of fine-tuning and iteration, the

---

<sup>152</sup> See Ajitesh Kumar, Machine Learning – Training, Validation & Test Data Set, Vitalflux.com (June 13, 2021), <https://vitalflux.com/machine-learning-training-validation-test-data-set/>.

<sup>153</sup> The F1 score is a performance metric used to evaluate the accuracy of a model's predictions. It considers both precision and recall, which measure the model's ability to make accurate positive predictions and correctly identify all positive instances, respectively. The F1 score is the harmonic mean of precision and recall and ranges from 0 to 1, with higher values indicating better performance. See C. J. Van Rijsbergen, *A Statistical Interpretation of Term Specificity and Its Application in Retrieval*, 22 *Journal of Documentation* 11 (1979).

<sup>154</sup> The Mean Absolute Error (MAE) is a performance metric that measures the average difference between predicted and actual values of a dataset. It is commonly used in regression analysis to evaluate the accuracy of a model's ability to predict continuous values. MAE is helpful when the magnitude of the error is significant, and the errors are not expected to cancel each other out. For performance evaluation of general and fine-tuned ChatGPT models, see e.g., Anne Lundgaard Hansen & Sophia Kazinnik, *Can ChatGPT Decipher FedSpeak?*, SSRN (Mar. 24, 2023), <https://ssrn.com/abstract=4399406>, at 7-8.

<sup>155</sup> Investment funds can improve the performance of their fine-tuned GPT models by adjusting the weighting of data sources used in the model training process. They can increase the weight of important data sources, such as executive compensation or board diversity, and decrease the weight of less relevant or reliable sources, like social media or news articles. Techniques like adjusting the learning rate, regularization term, or loss functions can be used for this purpose. The

model will become increasingly accurate and useful for making voting recommendations.

This article does not aim to serve as a manual for fine-tuning ChatGPT. Instead, it presents a framework that offers an idea of building a personalized model for generating voting recommendations for small investment funds by fine-tuning ChatGPT.<sup>156</sup> Appendix 3 contains ChatGPT-generated codes for fine-tuning ChatGPT.

Meanwhile, Glass Lewis provides proxy voting guidelines<sup>157</sup> and a Proxy Paper® service<sup>158</sup> similar to ISS Voting Analytics. Moreover, Glass Lewis is more ESG-neutral than ISS.<sup>159</sup> Therefore, investment funds that focus less on ESG can consider using Glass Lewis's proxy voting principles and proxy voting recommendations as training data instead of ISS's.

### 3.3 Fine-Tuning personalized model for funds with varying focus

Sections 3.1 and 3.2 have discussed building and modifying corporate governance scoring and voting recommendation models using ChatGPT, and fine-tuning these models with specific datasets. This subsection focuses on the process of fine-tuning ChatGPT to create personalized corporate governance evaluation and proxy recommendation models that align with the varying priorities of different investment funds.

For funds prioritizing financial returns, the fine-tuning process could emphasize factors that directly contribute to these objectives, such as portfolio companies' financial performance, business strategies, management's expertise,

---

learning rate determines the size of model updates during training, while the regularization term prevents overfitting. The loss function measures the difference between predicted and true outputs and guides model optimization during training. Choosing appropriate values for these parameters is crucial for optimal model performance.

<sup>156</sup> For instruction of fine-tuning ChatGPT, see OpenAI, *Fine-Tuning Language Models*, OpenAI Platform Documentation (last visited Apr. 11, 2023), <https://platform.openai.com/docs/guides/fine-tuning/fine-tuning>; Arjun Sha, *How to Train an AI Chatbot With Custom Knowledge Base Using ChatGPT API*, Beebom (last updated Apr. 7, 2023), <https://beebom.com/how-train-ai-chatbot-custom-knowledge-base-chatgpt-api> (providing a step-by-step guide for starting from scratch to fine-tune ChatGPT, including installing Python and necessary libraries. However, this particular fine-tuning process focuses on creating a bot for searching the training data. If a user wants to leverage all the model's capabilities, the code should be modified as needed).

<sup>157</sup> Glass, Lewis & Co., 2023 Policy Guidelines United States, Glass Lewis & Co. (Nov. 2022), <https://www.glasslewis.com/wp-content/uploads/2022/11/US-Voting-Guidelines-2023-GL.pdf>.

<sup>158</sup> Glass, Lewis & Co., Proxy Research - Proxy Paper®, Glass Lewis & Co. (last visited Apr. 11, 2023), <https://www.glasslewis.com/proxy-research-3/>.

<sup>159</sup> See Chong Shu, *The Proxy Advisory Industry: Influencing and Being Influenced*, *supra* note 74, at online Appendix Page 15, Figure 6, showing Glass Lewis has consistently presented a less socially conscious ideology than ISS.

and risk management.<sup>160</sup> Funds can provide proprietary data on these factors and retrain the model on this curated dataset to tailor ChatGPT accordingly.

Funds that are environmentally and social conscious can fine-tune ChatGPT by emphasizing environmental, social, and governance factors. This may involve prioritizing factors such as climate-related issues, ethical business practices such as compliance with labor laws, and board diversity.<sup>161</sup> These funds can provide data related to real world ESG metrics more than just ESG scores,<sup>162</sup> industry-specific benchmarks, and relevant regulations<sup>163</sup> to retrain ChatGPT and generate customized recommendations that reflect their ESG priorities.

Both profit-focused and ESG-inclined funds can benefit from incorporating proprietary data and reputable public data sources, such as the Wall Street Journal or FactSet, in the fine-tuning process. This data may include fund-specific investment guidelines, internal research and analysis of portfolio companies, historical voting records and engagement efforts, sector-specific insights, and best practices.

Investment funds should periodically update their ChatGPT models to account for changing market conditions, regulations, and stakeholder expectations. This may involve adjusting weights assigned to different factors or retraining the model with updated proprietary and public data. By continuously refining the model, funds can ensure that their personalized corporate governance evaluation and proxy recommendation models remain effective and relevant.

---

<sup>160</sup> See Söhnke M. Bartram, Corporate Risk Management as a Lever for Shareholder Value Creation, 9 J. Risk Fin. 541 (2008), <https://doi.org/10.1111/1468-0416.00038> (demonstrating risk management on the firm level represents a means to increase firm value to the benefit of the shareholders.)

<sup>161</sup> See Syeda Humayra Abedin et al., *Environmental Performance and Corporate Governance: Evidence from Japan*, 15 Sustainability 3273 (2023), <https://doi.org/10.3390/su15043273> (finding a separate environmental management committee, a more diverse board, and a greater level of board independence improve the environmental performance of a firm); Valentina Lagasio & Nicola Cucari, *Corporate Governance and Environmental Social Governance Disclosure: A Meta-Analytical Review*, 27 Corp. Soc. Responsibility & Envtl. Mgmt. 1148 (2019), <https://doi.org/10.1002/csr.1716> (finding board independence, board size, and women directorship visibly enhance corporations' ESG disclosure.)

<sup>162</sup> See Aruna Raghunandan & Shivaram Rajgopal, *Do ESG Funds Make Stakeholder-Friendly Investments?*, 27 Rev. Accounting Stud. 822 (2022), <https://doi.org/10.1007/s11142-022-09693-1> (finding ESG scores are correlated with the quantity of voluntary ESG-related disclosures but not with firms' compliance records or actual levels of carbon emissions.)

<sup>163</sup> See e.g., U.S. Securities and Exchange Commission, Press Release No. 2022-46, *SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors* (Mar. 21, 2022), <https://www.sec.gov/news/press-release/2022-46>.

In conclusion, ChatGPT exhibits potential in generating proxy voting guidelines and identifying potential conflicts of interest; however, its effectiveness as a proxy advisor is impeded by token constraints and long-range dependencies. To address these challenges, investment funds might consider fine-tuning ChatGPT using specialized datasets, such as ISS, Glass Lewis, or their proprietary proxy voting guidelines, along with market reactions and high-quality public and private data. This process enables the development of tailored models capable of producing more accurate and reliable corporate governance scoring and proxy voting recommendations for smaller funds. To ensure the ongoing relevance and precision of fine-tuned models, it is essential to consistently monitor, evaluate, and iterate on them.

#### 4. Challenges for Outsourcing Voting Decisions to AI

AI continues to advance rapidly, so are its associated challenges. These challenges include model fine-tuning and iterations, data and algorithm biases, cybersecurity and privacy concerns,<sup>164</sup> and regulatory uncertainties. Addressing these issues is crucial for investment funds intending to optimize the use of ChatGPT-like AI models for corporate governance evaluation and proxy voting decisions, ensuring accuracy, fairness, and compliance with evolving regulations.

##### 4.1 Model Fine-Tuning and Iterations

The initial challenge investment funds may encounter when fine-tuning ChatGPT for proxy voting decisions lies in the complexities of iterating and refining the model.

The fine-tuning process entails several stages, including collecting specialized data relevant to the fund's objectives, cleaning and preprocessing the data to ensure its quality, and conducting iterative training sessions to optimize the model's performance.<sup>165</sup> This process can be both demanding and time-consuming, as funds must devote substantial resources to data gathering, invest in technical expertise to manage the fine-tuning process, and allocate time to monitor and evaluate the model's performance.

Furthermore, funds need to consider the trade-offs between training time and model accuracy. On the one hand, longer training times can lead to better

---

<sup>164</sup> See Matthias Holweg, *Rupert Younger, & Yuni Wen, The Reputational Risks of AI*, Berkeley Haas Center for Mgmt. Res. (Jan. 24, 2022), <https://cmr.berkeley.edu/2022/01/the-reputational-risks-of-ai/> (finding privacy violations and algorithmic bias are the most prevalent of AI failures).

<sup>165</sup> See Arslan Mirza, *How to Build Your Own Custom ChatGPT Bot*, GitConnected (Mar. 28, 2023), <https://levelup.gitconnected.com/how-to-build-your-own-custom-chatgpt-bot-cf4af959adcc>.

accuracy, as the model has more time to learn and identify patterns<sup>166</sup> in the data. On the other hand, longer training times can also be more costly in terms of time and resources. Investment funds also need to determine the optimal combination of input data and model parameters to achieve the desired results. Too much data that is not relevant to the fund's objectives can add many noises into whole datasets, making it harder for the model to identify patterns and extract meaningful insights. While too few relevant data points can lead to inaccurate or incomplete results. Similarly, adjusting model parameters too much or too little can impact model accuracy and performance.

In summary, the intricacies of modeling iterations present significant challenges for investment funds looking to fine-tune ChatGPT for proxy voting decisions, requiring collaboration of skillful data scientists, financial experts, and programmers.

#### 4.2 Data and Algorithm Biases

AI models can exhibit different types of biases, such as data bias, method bias, and societal bias.<sup>167</sup> Data bias can arise from sample inadequacy, sample selection bias, out-group homogeneity bias, and an algorithm's inability to anticipate counterfactual data. Sample selection bias occurs when the training data used to develop an AI model is not representative of the population it is intended to serve, which can lead to inaccurate predictions. Out-group homogeneity bias is the tendency to perceive individuals from groups other than one's own as more similar to each other, which can result in incorrect assumptions or decisions. The size and popularity of the training dataset could also cause biases.<sup>168</sup>

Method bias includes confusing correlation with causation, overgeneralization, and confirmation bias in hypothesis formulation and validation. Confirmation bias refers to the tendency to favor information that confirms pre-existing beliefs or hypotheses while undervaluing or disregarding information that contradicts them.<sup>169</sup> Socio-cultural bias embedded in datasets can lead to discriminatory outcomes for disadvantaged populations.<sup>170</sup>

These biases can affect the impartiality and accuracy of proxy voting recommendations generated by ChatGPT. Particularly, machine learning-driven

---

<sup>166</sup> A pattern is a sequence of events or features that repeat or are recognizable. In the context of machine learning, patterns are used to identify relationships between data points and make predictions based on those relationships.

<sup>167</sup> See Shahriar Akter et al., *Algorithmic bias in data-driven innovation in the age of AI*, 60 Int'l J. Info. Mgmt. 102387 (2021).

<sup>168</sup> *Id.* at 5-6.

<sup>169</sup> *Id.* at 6-7.

<sup>170</sup> *Id.* at 7.

AI models are often considered black boxes, as their complex algorithms and large amounts of data can make it difficult for users to interpret decisions made by the AI models.<sup>171</sup> If ChatGPT's training data and algorithms contain biases, the recommendations it makes could be inherently biased and partial.

GPT-3.5's prototype -GPT-3 has showed gender,<sup>172</sup> race and religion biases.<sup>173</sup> As the experiment in Section 3.1 has displayed, ChatGPT's zero-shot GPT-4 model has a propensity in favor of ESG causes. And GPT-4 is accused to be to be politically left under the natural semblance.<sup>174</sup> But it seems it shows no gender or race bias in making recommendations of director nominees. But one experiment does be a very small size of sample, more experiments are needed to test whether ChatGPT is biased.

### 4.3 Cybersecurity and Privacy Concerns

In addition to biases in training data and models' algorithms, cybersecurity and privacy concerns could also result in investment funds being cautious on using ChatGPT to make proxy voting decisions.

Data leaks taking place in electronic Giant Samsung shows the privacy concerns in using ChatGPT dealing with sensitive data. Samsung Semiconductor allowed its employees to use ChatGPT for coding, note-taking, and inquiring questions, but failed to inform them about what data can and cannot be submitted to it. As a result, highly sensitive data related to internal business practices, source codes, and top-secret methods were unknowingly submitted to ChatGPT on three separate occasions. This data could potentially be leaked to other users as ChatGPT records all conversations and learns from them. In response, Samsung has announced plans to develop its own internal ChatGPT-like AI service to

---

<sup>171</sup> See Yavar Bathaee, *The Artificial Intelligence Black Box and the Failure of Intent and Causation*, 31 Harv. J.L. & Tech. 351 (2018), at 901-906.

<sup>172</sup> See Lucy Li & David Bamman, *Gender and Representation Bias in GPT-3 Generated Stories*, in Proceedings of the Third Workshop on Narrative Understanding 48 (2021), <https://aclanthology.org/2021.nuse-1.5> (finding GPT-3 generated stories have female characters more likely to be associated with family and appearance, and less powerful than masculine characters); Tom B. Brown et al. (2020) *Language Models are Few-Shot Learners*. arXiv preprint arXiv:2005.14165, version 4, last revised 22 Jul 2020 (finding 83% of 388 occupations tested were more likely to be associated with a male identifier., especially occupations signaling higher-education or requiring physical labor).

<sup>173</sup> See Tom B. Brown et al, *id*, finding ChatGPT-generated descriptions have racial and religious stereotypes.

<sup>174</sup> See David Rozado, *The Political Biases of GPT-4: Things Are Not Always What They Seem*, David Rozado (Mar. 14, 2023), <https://davidrozado.substack.com/p/the-political-biases-of-gpt-4>.

protect potential data breaches, but until then, it has limited ChatGPT questions to 1024 bytes.<sup>175</sup>

The process of interacting with and fine-tuning ChatGPT involves feeding it sensitive data. However, if there are no policies and cybersecurity methods in place to prevent data leaks, investment funds with proprietary data may be hesitant to use ChatGPT for making proxy voting decisions.

#### 4.4 Regulatory Challenges

The regulatory environment for AI models like ChatGPT is uncertain, which presents challenges for investment funds that want to use it for proxy voting decisions.

On March 31, 2023, the Italian Data Protection Authority temporarily banned the use of ChatGPT in Italy, citing privacy concerns.<sup>176</sup> Then on April 12, 2023, the Italian Data Protection Authority provided a list of conditions for OpenAI to satisfy until April 30, 2023, if OpenAI wants to restore the ChatGPT service in Italy. Of all the conditions, OpenAI must post information on its website about how and why it processes the personal information of both users and non-users, as well as provide the option to correct or delete that data.<sup>177</sup>

Investment funds who want to rely on ChatGPT to perform corporate governance and proxy voting analysis could face challenges due to regulatory uncertainties. If ChatGPT can be temporarily taken down at the request of regulators, then it would be difficult for investment funds to rely on ChatGPT for essential job responsibilities,

In April 2023, the Cyberspace Administration of China (CAC) proposed rules that regulate generative AI,<sup>178</sup> setting extensive limitations on the contents of AI models like ChatGPT can generate. To be sure, OpenAI does not offer

---

<sup>175</sup> See Jai Vijayan, *Samsung Engineers Feed Sensitive Data to ChatGPT, Sparking Workplace AI Warnings*, Dark Reading (Apr. 11, 2023), <https://www.darkreading.com/vulnerabilities-threats/samsung-engineers-sensitive-data-chatgpt-warnings-ai-use-workplace>.

<sup>176</sup> See Frances D'Emilio & Matt O'Brien, *Italy temporarily blocks ChatGPT over privacy concerns*, AP News (Mar. 31, 2023), <https://apnews.com/article/chatgpt-ai-data-privacy-italy-66634e4d9ade3c0eb63edab62915066f>.

<sup>177</sup> AP News, *ChatGPT could return to Italy if OpenAI complies with rules*, AP News (Apr. 12, 2023), <https://apnews.com/article/chatgpt-openai-data-privacy-italy-c0764f0e77273c429564fdb0c475a707>

<sup>178</sup> Generative AI refers to a category of AI algorithms that generate new outputs based on the data they have been trained on (ChatGPT is a generative AI), see Nick Routley, *What is generative AI? An AI explains*, World Econ. Forum (Feb. 6, 2023), <https://www.weforum.org/agenda/2023/02/generative-ai-explain-algorithms-work/>.



ChatGPT in China. While the U.S. is also considering regulating AI as concerns of abusing AI mounts.<sup>179</sup>

Excessive regulation of ChatGPT and similar AI tools could potentially disrupt their functionality, limit their creativity, and hinder their ability to generate accurate and comprehensive corporate governance reports and proxy voting recommendations.

## 5. Conclusion and Further Research Agenda

Asset Management giants like Vanguard have already been utilizing AI to “create customized financial plans that help clients meet their short-term and long-term financial goals.”<sup>180</sup> Likewise, leveraging large language AI models such as ChatGPT to assist small institutional investors in making personalized proxy voting decisions also shows promise. By fine-tuning ChatGPT, its ability of generalization can be enhanced by training with curated datasets. Thus, investment funds can employ customized ChatGPT to make self-informed and personalized proxy voting more in line with their shareholders’ interests and preferences. However, there are potential challenges that should be considered in future research.

Further research is needed to examine the feasibility of this approach, including the costs for small funds to fine-tune a ChatGPT model to personalize their voting practices. The cost of hiring experts to fine-tune the model, as well as the cost of acquiring high-quality data, could be a significant obstacle for small funds. Therefore, cost-benefit analyses should be conducted to determine if the benefits outweigh the costs.

Additionally, the performance of the fine-tuned models needs to be evaluated. While the experiment in Section 3 showed the potential of ChatGPT’s GPT-4 model to generate detailed proxy voting guidelines, there were also limitations such as token limitations and long-range dependencies. Fine-tuning the model with high-quality, domain-specific datasets could improve its performance and reduce these limitations. After GPT-4 API becomes widely available, future research should proceed with a fine-tuned ChatGPT model to examine its performance based on the experiment design in Sections 3.1 and 3.2. This will

---

<sup>179</sup> See Ryan Tracy, *Biden Administration Weighs Possible Rules for AI Tools Like ChatGPT*, *Wall St. J.* (Apr. 11, 2023, 2:55 PM ET), <https://www.wsj.com/articles/biden-administration-weighs-possible-rules-for-ai-tools-like-chatgpt-46f8257b>.

<sup>180</sup> See Blake Schmidt & Amanda Albright, *AI Is Coming for Wealth Management. Here’s What That Means*, *Bloomberg* (Apr. 21, 2023), <https://www.bloomberg.com/news/articles/2023-04-21/vanguard-fidelity-experts-explain-how-ai-is-changing-wealth-management?sref=CMih25pt>.

help to determine the effectiveness of the model in real-world scenarios and provide insights into its potential limitations and areas for improvement.

Further research should also focus on identifying and addressing potential biases and ethical considerations that may arise from using AI in proxy voting. AI models trained on biased data could lead to biased voting decisions, which would negatively impact shareholders' interests. Additionally, regulators should develop guidelines and regulations that promote the ethical and responsible use of AI in proxy voting while safeguarding shareholders' privacy. By addressing these concerns, small institutional investors can leverage AI, such as ChatGPT, as a powerful tool to make personalized proxy voting decisions and navigate the competitive investment market.

## Appendix 1: ChatGPT-Generated Proxy Voting Guidelines

Introduction: This document has been generated by the GPT-4 model of ChatGPT. The prompts required ChatGPT to act as an experienced corporate governance expert who has provided multiple proxy recommendations on various issues. The prompts have been deleted to make this document more like actual guidelines. The following is the framework of ChatGPT's proxy voting guidelines, with weights assigned to each issue.

### 1. Key aspects of corporate governance

ChatGPT: As a corporate governance expert with proxy voting recommendation experience, I can provide guidance on various aspects of shareholder voting, board composition, executive compensation, and other governance-related matters. Proxy voting is an essential mechanism for shareholders to exercise their voting rights without physically attending annual or special meetings. Here are a few key aspects to consider when making proxy voting recommendations:

Board composition: Evaluate the board's diversity, independence, and expertise. A well-balanced board with a mix of skills, backgrounds, and experience levels can contribute to effective decision-making and oversight.

Executive compensation: Assess whether the company's executive compensation plans align with long-term shareholder interests and are tied to performance metrics. Excessive pay packages that are not linked to performance can lead to misalignment between management and shareholder interests.

Shareholder rights: Analyze the company's governance structure and the rights provided to shareholders. For example, consider whether the company has a dual-class share structure, which can concentrate voting power in the hands of a few individuals, or if the company has adopted a poison pill strategy that makes it difficult for shareholders to effect change.

Environmental, social, and governance (ESG) factors: Assess the company's commitment to ESG principles and whether it has implemented policies and practices to address material ESG risks. This includes considering climate change, labor practices, and corporate social responsibility, among other factors.

Proxy access: Evaluate the company's provisions for proxy access, which allows shareholders to nominate directors to the board. Proxy access can help promote board diversity and increase shareholder influence on board composition.

Auditor independence: Assess the independence of the company's external auditors and their ability to provide a fair and accurate assessment of the company's financial position.

Mergers and acquisitions (M&A): Evaluate the strategic rationale behind any proposed M&A activity and its potential impact on shareholder value. Consider factors such as deal terms, potential synergies, and integration risks.

Shareholder proposals: Carefully review shareholder proposals on various governance, compensation, and ESG matters. Consider the merits of each proposal and how it aligns with the long-term interests of shareholders.

In summary, proxy voting recommendations should be based on a comprehensive analysis of the company's governance practices, executive compensation, shareholder rights, ESG factors, and any other relevant issues. The goal is to promote long-term shareholder value and ensure that management is accountable to shareholders.

## **2. General Model for Evaluating Proxy Proposals**

ChatGPT: Yes, I can provide a general model for offering proxy voting advice. This model outlines key steps and considerations when analyzing and making recommendations on various proxy voting matters. Keep in mind that this is a general framework, and specific situations may require additional analysis or focus on unique issues.

Gather relevant information: Collect necessary data on the company's governance practices, financial performance, ESG policies, and other relevant factors. Sources may include the company's proxy statement, annual report, sustainability report, and third-party research or assessments.

Assess board composition: Evaluate the board's overall composition, focusing on diversity, independence, and expertise. Identify any gaps in skills or experience and consider whether the company's director nomination process is robust and transparent.

Evaluate executive compensation: Analyze the company's executive compensation plans, ensuring they are tied to performance metrics and aligned with long-term shareholder interests. Consider the use of equity-based incentives, peer benchmarking, and any potential risks of excessive pay.

Review shareholder rights: Examine the company's governance structure and the rights provided to shareholders. Identify any potential red flags, such as a dual-class share structure, staggered board, or anti-takeover provisions.

Analyze ESG factors: Assess the company's commitment to ESG principles and its ability to manage material ESG risks. Review the company's policies, practices, and disclosures related to environmental, social, and governance matters.

Evaluate proxy access provisions: Determine whether the company has adopted proxy access provisions that allow shareholders to nominate directors to the board. Consider the eligibility requirements and potential impact on board diversity and shareholder influence.

Assess auditor independence: Evaluate the independence and performance of the company's external auditors, ensuring they can provide an accurate and unbiased assessment of the company's financial position.

Examine M&A proposals: If applicable, analyze any proposed mergers or acquisitions for their strategic rationale and potential impact on shareholder value. Consider deal terms, synergies, and integration risks.

Review shareholder proposals: Carefully assess shareholder proposals related to governance, compensation, and ESG issues. Weigh the merits of each proposal and its alignment with the long-term interests of shareholders.

Develop recommendations: Based on the analysis, formulate proxy voting recommendations on director elections, executive compensation plans, shareholder proposals, and other relevant matters. Clearly articulate the rationale behind each recommendation and how it serves the best interests of shareholders.

Communicate and engage: Share proxy voting recommendations with clients or stakeholders and be prepared to discuss the underlying analysis. Engage with company management, if necessary, to address concerns or seek additional information.

By following this general model, you can provide well-informed and objective proxy voting advice that promotes long-term shareholder value and effective corporate governance.

### **3. Weighting in proxy voting recommendations**

ChatGPT: The weighting in a proxy voting recommendation model may vary depending on the specific priorities and preferences of the individual or organization using the model. However, I can provide a general example of how different factors might be weighted when making proxy voting recommendations:

Board composition: 20%

Executive compensation: 20%

Shareholder rights: 15%

ESG factors: 15%

Proxy access: 10%

Auditor independence: 5%

M&A proposals: 10%

Shareholder proposals: 5%

In this example, board composition and executive compensation are given the highest weight, reflecting their significance in ensuring effective corporate governance and alignment of management interests with shareholders. Shareholder rights and ESG factors are also important considerations, each receiving a 15% weight.

Proxy access, M&A proposals, and shareholder proposals are assigned a moderate weight, while auditor independence is given a lower weight, as it generally has a more indirect impact on shareholder value.

It's essential to note that these weights are only an example and can be adjusted based on the preferences, priorities, and objectives of the individual or organization using the model. Also, the model should be flexible enough to account for unique circumstances or issues that may arise in specific cases, requiring additional emphasis or analysis.

#### **4. Reasons for Weighting**

ChatGPT: The weights provided in the example are based on a general understanding of the relative importance of each issue in promoting effective corporate governance and long-term shareholder value. The rationale for each weight is explained below:

**Board composition (20%):** A well-balanced and diverse board with the right mix of skills, backgrounds, and experience is crucial for effective decision-making and oversight. As a result, board composition is given significant weight, reflecting its importance in driving corporate performance and strategy.

**Executive compensation (20%):** Aligning executive compensation with company performance and long-term shareholder interests is vital to incentivize management to make decisions that benefit shareholders. This factor is given substantial weight as it directly influences the behavior of company leadership.

**Shareholder rights (15%):** Shareholders' ability to influence company decisions and hold management accountable is an essential aspect of corporate governance. This factor is assigned a moderate weight, reflecting the need to ensure that shareholders have the necessary rights and tools to protect their interests.

**ESG factors (15%):** Companies that effectively manage ESG risks and opportunities are more likely to create long-term value for shareholders. By assigning a moderate weight to ESG factors, the model acknowledges the growing importance of sustainability and responsible corporate practices in today's business environment.

**Proxy access (10%):** Proxy access provisions empower shareholders to nominate directors to the board, enhancing board diversity and shareholder influence. This factor is given a moderate weight, recognizing its role in promoting effective board composition and governance.

**Auditor independence (5%):** Independent and unbiased external audits are crucial for ensuring accurate financial reporting and investor confidence. This factor is given a lower weight, as it has a more indirect impact on shareholder value and governance, but it still plays a crucial role in maintaining transparency and trust.

**M&A proposals (10%):** Mergers and acquisitions can significantly impact shareholder value, either positively or negatively. This factor is assigned a moderate weight to emphasize the importance of carefully evaluating proposed deals and their potential effects on long-term shareholder interests.

**Shareholder proposals (5%):** Shareholder proposals can address various governance, compensation, and ESG issues. While each proposal's impact on

shareholder value might vary, this factor is given a lower weight, acknowledging that these proposals can sometimes lead to improvements in corporate practices and policies.

It's important to reiterate that these weights are just an example, and organizations or individuals may choose to assign different weights based on their priorities and objectives. The model should be adaptable and flexible to accommodate unique circumstances and preferences.

## 5. Board Composition

ChatGPT: When evaluating board composition, various factors contribute to an effective and well-functioning board. While the specific weights may vary depending on an organization or individual's priorities, I can provide an example of some critical considerations and their potential weights:

**Board independence (30%):** A significant portion of the board should consist of independent directors, free from material relationships with the company or its management. This ensures objective decision-making and effective oversight.

**Diversity (30%):** Board diversity, including gender, ethnicity, age, and background, leads to a broader range of perspectives and better decision-making. Diverse boards are more likely to avoid groupthink and have better problem-solving capabilities.

**Skills and expertise (25%):** Board members should possess a mix of skills and expertise relevant to the company's industry, operations, and strategic goals. This includes financial, technological, legal, and industry-specific knowledge, among others.

**Board size (5%):** An optimal board size enables effective decision-making without becoming unwieldy. Boards that are too large may suffer from slow decision-making, while those that are too small may lack the necessary diversity of skills and experience.

**Director tenure (5%):** A balanced mix of long-serving and newer directors ensures both institutional knowledge and fresh perspectives. Excessively long director tenures can contribute to entrenchment, while a board composed mainly of new directors may lack the necessary experience.

**Committee structure (5%):** Board committees, such as audit, compensation, and nominating committees, should be appropriately structured



and staffed with qualified and independent directors. This allows for efficient delegation of responsibilities and effective oversight.

These weights are meant to serve as an example and may be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the particular company and industry context.

1. Board independence (30%): Board independence ensures objectivity and reduces conflicts of interest. Key factors to consider and their potential weights include:

a. Independent directors (50%): The proportion of independent directors on the board.

b. Independent committees (30%): Ensure critical board committees (audit, compensation, and nominating) are composed mainly or entirely of independent directors.

c. Independent board chair or lead director (20%): Presence of an independent board chair or lead director to facilitate objective oversight.

2. Diversity (30%): A diverse board brings various perspectives, experiences, and skills to the table. Key diversity factors and their potential weights include:

a. Gender diversity (40%): Representation of women on the board.

b. Ethnic diversity (40%): Representation of different ethnicities on the board.

c. Other forms of diversity (20%): This includes age, background, and professional experience.

3. Skills and expertise (25%): A well-rounded board possesses the skills and expertise necessary to guide the company effectively. Key areas of expertise and their potential weights include:

a. Financial expertise (20%): Directors with financial knowledge, such as a background in accounting or finance.

b. Industry expertise (20%): Directors with experience in the company's industry or sector.

c. Technology expertise (20%): Directors with experience in technology, digital transformation, or cybersecurity, as relevant to the company.

d. Legal and regulatory expertise (20%): Directors with knowledge of legal and regulatory matters that impact the company.

e. Strategic planning expertise (20%): Directors with experience in strategy, mergers and acquisitions, or other relevant areas.

4. Board size (5%): The optimal board size should balance efficiency and diversity. Consider the following weight:

a. Number of directors (100%): Assess the total number of directors on the board and determine if it's an appropriate size given the company's scale and complexity.

5. Director tenure (5%): A mix of long-serving and newer directors ensures both continuity and fresh perspectives. Key factors to consider and their potential weights include:

a. Average tenure (50%): Assess the average tenure of directors on the board.

b. Tenure diversity (50%): Evaluate the distribution of director tenures to ensure a mix of long-serving and newer directors.

6. Committee structure (5%): Board committees should be well-structured and staffed with qualified directors. Key factors to consider and their potential weights include:

a. Committee composition (50%): Assess the composition of key committees (audit, compensation, and nominating) to ensure they are staffed with appropriate expertise.

b. Committee performance (50%): Evaluate the effectiveness of each committee in fulfilling its responsibilities and objectives.

Please note that these weights are only examples and can be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the company and industry context.

## **6. Executive compensation**

ChatGPT: When evaluating executive compensation, various factors contribute to determining whether the compensation packages align with long-term shareholder interests and company performance. The specific weights may vary depending on an organization or individual's priorities. However, I can provide an example of some critical considerations and their potential weights:

1. Pay-for-performance alignment (40%): Assess whether executive compensation is tied to company performance and encourages long-term value creation. Key factors to consider and their potential weights include:

a. Performance metrics (50%): Evaluate the use of short-term and long-term performance metrics that are relevant to the company's strategy and industry.

b. Performance targets (30%): Assess whether the performance targets are challenging yet achievable, encouraging executives to strive for continuous improvement.

c. Performance period (20%): Consider the time horizon of performance measurement and whether it encourages long-term decision-making.

2. Compensation structure (30%): Examine the balance between fixed and variable pay components, ensuring that the compensation structure incentivizes executives without encouraging excessive risk-taking. Key factors to consider and their potential weights include:

a. Base salary (30%): Evaluate the appropriateness of the base salary, considering the executive's role, experience, and industry benchmarks.

b. Short-term incentives (30%): Assess the design and weight of annual bonuses or other short-term incentives, ensuring they are tied to relevant performance metrics.

c. Long-term incentives (40%): Evaluate the structure and weight of long-term incentives, such as stock options, restricted stock units, or performance shares, to ensure they promote long-term value creation.

3. Compensation benchmarking (15%): Determine whether executive pay is appropriate compared to industry peers or other relevant benchmarks. Key factors to consider and their potential weights include:

a. Peer group selection (60%): Assess the appropriateness of the peer group used for benchmarking, considering factors such as company size, industry, and geography.

b. Benchmarking methodology (40%): Evaluate the methodology used for benchmarking, ensuring that it provides a fair and accurate comparison of executive pay levels.

3. Compensation governance (10%): Assess the role of the board and the compensation committee in overseeing executive compensation. Key factors to consider and their potential weights include:

a. Compensation committee independence (50%): Ensure that the compensation committee is composed mainly or entirely of independent directors.

b. Compensation committee expertise (50%): Evaluate the qualifications and experience of the compensation committee members in the area of executive compensation.

4. Clawbacks and risk mitigation (5%): Consider the presence of provisions to mitigate risk and protect shareholder value in case of misconduct or financial restatements. Key factors to consider and their potential weights include:

a. Clawback provisions (50%): Assess whether the company has implemented clawback provisions that allow the recovery of incentive-based compensation in case of misconduct or restatements.

b. Risk management (50%): Evaluate the company's approach to managing risks related to executive compensation, such as the presence of stock ownership guidelines or holding periods.

Please note that these weights are only examples and can be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the company and industry context.

## **7. Shareholder rights (15%)**

ChatGPT: When evaluating shareholder rights, various factors contribute to determining whether a company's governance structure promotes accountability and enables shareholders to influence key decisions. The specific weights may vary depending on an organization or individual's priorities. However, I can provide an example of some critical considerations and their potential weights:

1. Voting rights (40%): Assess whether voting rights are fairly distributed among shareholders and if they can effectively influence key decisions. Key factors to consider and their potential weights include:
  - a. One-share, one-vote principle (70%): Evaluate whether the company adheres to the one-share, one-vote principle, ensuring that each share of common stock has equal voting rights.
  - b. Supermajority vote requirements (30%): Assess the presence of supermajority vote requirements for significant decisions, which may hinder shareholder influence by requiring an unusually high level of support.
2. Anti-takeover provisions (25%): Examine whether the company has implemented measures that could entrench management and deter potential takeover bids. Key factors to consider and their potential weights include:
  - a. Poison pills (40%): Evaluate whether the company has adopted a shareholder rights plan or “poison pill” that could dilute the ownership of a potential acquirer.
  - b. Staggered board (40%): Assess whether the company has a staggered board structure, in which only a portion of directors stand for election each year, making it more challenging to replace a majority of the board.
  - c. Other anti-takeover measures (20%): Examine the presence of other anti-takeover provisions, such as golden parachutes, exclusive forum provisions, or limitations on shareholders’ ability to call special meetings.
3. Shareholder engagement (20%): Determine whether the company facilitates open communication and engagement with shareholders. Key factors to consider and their potential weights include:
  - a. Shareholder proposals (50%): Assess the company’s responsiveness to shareholder proposals and whether it addresses shareholder concerns.
  - b. Shareholder communication (50%): Evaluate the company’s efforts to communicate with shareholders, such as investor presentations, conference calls, or dedicated investor relations resources.
4. Shareholder voting mechanisms (10%): Assess whether the company provides shareholders with accessible and convenient voting mechanisms. Key factors to consider and their potential weights include:

- a. Proxy access (50%): Evaluate whether the company has adopted proxy access provisions, allowing shareholders to nominate directors on the company's proxy statement.<sup>181</sup>
  - b. Electronic voting (50%): Assess whether the company facilitates electronic proxy voting, making it more convenient for shareholders to cast their votes.
- 5. Board accountability (5%): Examine the company's commitment to board accountability and responsiveness to shareholder concerns. Key factors to consider and their potential weights include:
  - a. Director election thresholds (50%): Evaluate the company's director election standards, such as whether it requires a majority vote for uncontested director elections.
  - b. Board evaluation (50%): Assess the company's process for evaluating board performance, including the use of third-party assessments or other best practices.

Please note that these weights are only examples and can be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the company and industry context.

## 8. ESG factors (15%)

ChatGPT: Evaluating Environmental, Social, and Governance (ESG) factors is an essential aspect of assessing a company's sustainability and ethical practices. These factors can have a significant impact on a company's reputation, risk management, and long-term performance. Here is a breakdown of the ESG factors and potential weights for each category:

- 1. Environmental (40%): Assess the company's efforts to minimize its environmental footprint, manage environmental risks, and promote

---

<sup>181</sup> In November 2021, the SEC issued universal proxy rules that require reporting companies to include board nominees of dissident shareholders on the proxy cards distributed by the companies. This is applicable if the dissident shareholders solicit at least 67% of voting shares and fulfill the procedural requirements specified in the rules and the companies' bylaws (*see supra* Section 3.1, paragraph 3). However, the bylaws of reporting companies may have a lower threshold for dissident shareholders to use the universal proxy card. This emphasizes the importance of training ChatGPT with current data.

sustainable practices. Key factors to consider and their potential weights include:

- a. Climate change and greenhouse gas emissions (30%): Evaluate the company's efforts to reduce greenhouse gas emissions and mitigate the risks associated with climate change.
  - b. Resource management (25%): Assess the company's initiatives to use resources efficiently, including energy, water, and raw materials.
  - c. Waste and pollution management (25%): Examine the company's efforts to minimize waste generation and prevent pollution, including hazardous waste and air emissions.
  - d. Biodiversity and land use (20%): Evaluate the company's impact on biodiversity and its approach to land use, including responsible sourcing of raw materials and habitat conservation.
2. Social (35%): Examine the company's commitment to social responsibility, including its treatment of employees, suppliers, customers, and communities. Key factors to consider and their potential weights include:
    - a. Labor and human rights (40%): Assess the company's labor practices, such as fair wages, working conditions, and adherence to human rights standards.
    - b. Employee health and safety (20%): Evaluate the company's efforts to ensure a safe and healthy work environment for its employees.
    - c. Diversity and inclusion (20%): Examine the company's commitment to promoting diversity and inclusion at all levels, including its workforce, management, and board.
    - d. Community engagement (20%): Assess the company's efforts to support the communities in which it operates, including charitable contributions, local hiring, and community development initiatives.
  3. Governance (25%): Assess the company's governance practices and commitment to ethical business conduct. Key factors to consider and their potential weights include:
    - a. Board structure and composition (30%): Evaluate the company's board independence, diversity, and expertise, as well as the effectiveness of board committees.

b. Executive compensation (20%): Assess whether executive compensation is aligned with company performance and long-term shareholder interests.

c. Shareholder rights (20%): Examine the company's commitment to protecting shareholder rights and facilitating shareholder influence on key decisions.

d. Ethics and compliance (30%): Evaluate the company's efforts to promote ethical business conduct and maintain robust compliance programs, including anti-bribery, anti-corruption, and data privacy policies.

Please note that these weights are only examples and can be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the company and industry context.

#### 9. Proxy access: (10%)

ChatGPT: Proxy access is an important aspect of shareholder rights, allowing shareholders to nominate director candidates on the company's proxy statement. A detailed breakdown of proxy access considerations and their potential weights includes:

1. Ownership threshold (40%): Assess the minimum ownership percentage required for shareholders to nominate directors. Lower thresholds make it easier for shareholders to exercise their proxy access rights. Key factors to consider and their potential weights include:
  - a. Percentage of outstanding shares (60%): Evaluate the required percentage of outstanding shares that shareholders must own to nominate directors.
  - b. Holding period (40%): Assess the length of time shareholders must hold the required shares before being eligible to nominate directors.
2. Nomination limits (30%): Examine the limits on the number of director nominees that shareholders can submit. Fewer restrictions allow for greater shareholder influence. Key factors to consider and their potential weights include:
  - a. Maximum number of nominees (50%): Evaluate the maximum number of director nominees that shareholders can propose.



- b. Percentage of board seats (50%): Assess the maximum percentage of board seats that can be filled by shareholder-nominated directors.
- 3. Disclosure requirements (20%): Assess the information that shareholders must provide when submitting director nominations. Transparent and reasonable disclosure requirements promote a fair nomination process. Key factors to consider and their potential weights include:
  - a. Background information (50%): Evaluate the required background information on nominees, such as professional experience, qualifications, and potential conflicts of interest.
  - b. Ownership information (50%): Assess the required disclosure of the nominating shareholder's ownership stake, including the duration of ownership and any material relationships with the company.
- 4. Nomination process (10%): Examine the procedural aspects of submitting director nominations, including the timing and format of submissions. A user-friendly nomination process encourages shareholder participation. Key factors to consider and their potential weights include:
  - a. Submission window (50%): Assess the timeframe during which shareholders can submit director nominations, ensuring that it provides sufficient opportunity for shareholder participation.
  - b. Submission format (50%): Evaluate the format and channels through which shareholders can submit nominations, such as electronic submissions or physical mail.

Please note that these weights are only examples and can be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the company and industry context.

#### 10. Auditor independence ( 5%)

ChatGPT: Auditor independence is critical to ensure the credibility and reliability of a company's financial statements. A detailed breakdown of auditor independence considerations and their potential weights includes:

1. Non-audit services (40%): Assess the extent to which the auditor provides non-audit services to the company, which may compromise their independence. Key factors to consider and their potential weights include:
  - a. Non-audit service fees (70%): Evaluate the proportion of non-audit service fees relative to total fees paid to the auditor, with a higher proportion potentially indicating a conflict of interest.
  - b. Types of non-audit services (30%): Assess the nature of non-audit services provided, with a focus on services that could create a conflict of interest, such as consulting, tax advisory, or internal audit services.
2. Audit firm rotation (30%): Examine the length of time the audit firm has been serving the company, as a long tenure may raise concerns about independence. Key factors to consider and their potential weights include:
  - a. Audit firm tenure (60%): Evaluate the number of years the audit firm has been engaged by the company, with longer tenures potentially indicating a lack of independence.
  - b. Mandatory rotation policies (40%): Assess whether the company has implemented policies requiring mandatory audit firm rotation after a certain period, which can help maintain auditor independence.
3. Audit partner rotation (20%): Assess the rotation of key audit partners to ensure that fresh perspectives are brought to the audit process. Key factors to consider and their potential weights include:
  - a. Lead audit partner tenure (60%): Evaluate the number of years the lead audit partner has been assigned to the company, with shorter tenures being preferable to maintain independence.
  - b. Mandatory partner rotation policies (40%): Assess whether the audit firm has implemented policies requiring mandatory rotation of key audit partners, such as the lead audit partner or the partner responsible for reviewing the audit.
4. Audit committee oversight (10%): Examine the role of the company's audit committee in overseeing the auditor's work and ensuring their independence. Key factors to consider and their potential weights include:
  - a. Audit committee independence (50%): Evaluate the independence of the audit committee members, ensuring that they are free from any conflicts of interest.

- b. Audit committee expertise (50%): Assess the financial expertise of the audit committee members, as this can contribute to effective oversight of the auditor's work.

Please note that these weights are only examples and can be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the company and industry context.

#### 11. M&A proposals (10%)

ChatGPT: When evaluating Mergers and Acquisitions (M&A) proposals, various factors contribute to determining whether the proposed transaction aligns with shareholder interests and has the potential to create long-term value. The specific weights may vary depending on an organization or individual's priorities. However, I can provide an example of some critical considerations and their potential weights:

1. Strategic rationale (35%): Assess the strategic reasons behind the proposed transaction and how it aligns with the company's long-term goals. Key factors to consider and their potential weights include:
  - a. Business synergies (50%): Evaluate the potential synergies from the proposed transaction, such as cost savings, revenue enhancements, or technology integration.
  - b. Market expansion (25%): Examine the potential for the proposed transaction to provide access to new markets, customers, or distribution channels.
  - c. Diversification (25%): Assess whether the proposed transaction would result in a more diversified business portfolio, reducing the company's exposure to risks associated with a single industry or product line.
2. Financial impact (30%): Examine the financial implications of the proposed transaction and its potential to create shareholder value. Key factors to consider and their potential weights include:
  - a. Purchase price (40%): Evaluate the reasonableness of the purchase price, considering factors such as valuation multiples, premiums paid, and industry benchmarks.

- b. Financing structure (30%): Assess the proposed financing structure, including the use of cash, stock, or debt, and the potential impact on the company's capital structure and credit rating.
  - c. Earnings accretion/dilution (30%): Examine the potential impact of the proposed transaction on the company's earnings per share, considering whether it is expected to be accretive or dilutive.
- 3. Integration risks (20%): Assess the potential risks associated with integrating the target company into the acquirer's operations. Key factors to consider and their potential weights include:
- 4.
  - a. Cultural fit (40%): Evaluate the compatibility of the target company's culture and values with those of the acquirer, which can impact the success of the integration process.
  - b. Operational challenges (40%): Assess the complexity of integrating the target company's operations, including IT systems, supply chains, or manufacturing processes.
  - c. Retention of key talent (20%): Examine the potential for the proposed transaction to result in the loss of key employees from the target company, which could hinder the integration process and the realization of synergies.
- 5. Governance and management (15%): Examine the potential impact of the proposed transaction on the company's governance structure and management team. Key factors to consider and their potential weights include:
  - a. Board composition (50%): Evaluate any changes to the board composition resulting from the proposed transaction, including the addition of new directors from the target company.
  - b. Management integration (50%): Assess the potential impact of the proposed transaction on the company's management team, including any changes to key executive roles or reporting structures.

Please note that these weights are only examples and can be adjusted based on the specific priorities and preferences of the individual or organization using the model. The relative importance of each factor may also vary depending on the company and industry context.

## 12. Shareholder proposals (5%)

ChatGPT: Shareholder proposals are an important mechanism through which shareholders can influence a company's policies, practices, and governance. When evaluating shareholder proposals, several factors contribute to determining whether the proposal is in the best interest of the company and its shareholders. The specific weights may vary depending on an organization or individual's priorities. However, I can provide an example of some critical considerations and their potential weights:

1. Relevance to the company (30%): Assess whether the proposal is directly related to the company's operations, strategy, or governance. Key factors to consider and their potential weights include:
  - a. Alignment with business strategy (50%): Evaluate whether the proposal addresses an issue that is relevant to the company's strategy, operations, or industry.
  - b. Materiality (50%): Examine whether the proposal addresses a material issue that could have a significant impact on the company's financial performance, reputation, or risk profile.
2. Potential impact on shareholders (25%): Assess the potential impact of the proposal on shareholder value, both in the short and long term. Key factors to consider and their potential weights include:
  - a. Financial implications (50%): Evaluate the potential financial implications of the proposal, such as costs, benefits, or risks associated with its implementation.
  - b. Long-term value creation (50%): Assess whether the proposal is likely to contribute to the company's long-term value creation, considering factors such as growth prospects, risk management, and competitive positioning.
3. Alignment with best practices (20%): Examine whether the proposal is aligned with best practices and industry standards. Key factors to consider and their potential weights include:
  - a. Governance standards (50%): Evaluate whether the proposal adheres to widely accepted governance standards, such as those related to board composition, executive compensation, or shareholder rights.
  - b. ESG guidelines (50%): Assess whether the proposal aligns with environmental, social, and governance (ESG) guidelines or recommendations, such as those from industry associations or regulatory bodies.

4. Feasibility and implementation (15%): Assess the feasibility of implementing the proposal and the potential challenges associated with its execution. Key factors to consider and their potential weights include:
  - a. Complexity (50%): Evaluate the complexity of implementing the proposal, considering factors such as operational challenges, resource requirements, or regulatory hurdles.
  - b. Management's ability to execute (50%): Assess the company's management team's ability and track record in executing similar initiatives or managing comparable challenges.
5. Support from other shareholders (10%): Examine the level of support for the proposal from other shareholders, which can provide an indication of its merit and the likelihood of its approval. Key factors to consider and their potential weights include:
  - a. Shareholder voting history (50%): Assess the voting history on similar proposals at the company or within its industry, as a proxy for the level of support among other shareholders.
  - b. Proxy advisor recommendations (50%): Evaluate the recommendations of proxy advisory firms on the proposal, as these firms often influence institutional investors' voting decisions.