

What Investors See: Intervening in Corporate-Built Algorithmic Systems

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Abstract

Companies file audited annual reports with regulators for investors to read. Though most companies view these filings as a compliance exercise, in publicly listed companies, these filings have teeth: they are legally binding disclosures to investors about company activities from the preceding year. Computer- and social scientists have recently identified a slew of serious issues regarding the fairness, accountability, transparency, and ethics (FATE) of the algorithmic systems that many publicly listed technology companies build and maintain. In this documents-based analysis, I examine the information available to investors wishing to invest in social media, e-commerce, and other companies that use machine learning algorithms. Data include: “materiality” sections (risks, liabilities) of the investor-facing US-SEC 10-K annual reports for Alphabet/Google from (2018–2021). I inductively coded these and other investor-facing documents, the main tool investors have for holding corporations accountable to investors and to regulators. Social scientists and computer scientists have struggled to analytically engage with the financial investments that undergird the technical systems they scrutinize, sometimes conducting research as if corporate form, financial markets, and investors don’t matter for computing, or for FATE. Investors struggle to conceptualize FATE issues in the corporations they fund, due to corporate financial structures, fiduciary duty, and information barriers. I find that 10-K disclosures delegate responsibilities and risks within the tech industry, without needing to define what the tech industry is. 10-Ks are also a key site in which market participants theorize the relationships between investors and technological production in tech firms.

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I. Introduction

This paper is the first a longer series of case studies on publicly listed consumer technology corporations listed on US and Hong Kong stock exchanges. It develops a documents-based method for tracking changes in framing of risks, ethical issues, and responsibilities of investors and/in technology corporations over time.

II. Related Work

This work builds on research lineages in transnational feminist Human-Computer Interaction (HCI) and adjacent work in anthropology, the sociology of finance, and infrastructure studies. The case study on Alphabet is situated in a long tradition of auditing algorithms, beginning with (Sweeney 2013), who famously audited Google's search algorithms for racist and sexist search results in the early 2010s.

I begin from the starting point that technical production is neither all about the money (or, in more precise terms, financial investment made through global capital markets), nor are financial systems irrelevant to how global technology production operates. There is another paper to be written on the distinctions in intellectual lineages and discourses in academic sub-fields that study: "money" (sociology of money) "markets" (economics, sociology of finance, economic sociology, STS) "the economy" (economics, fiscal economics, anthropology of markets) "economics" (various) "economization" (critical feminist STS) "finance" (business schools) "financialization" (global political economy) , as well as "capital" (various) and "capital markets" (business schools, financial economists, sociology, business history). The same goes for terms like "privatization" (sociology, political science) and "globalization" (various, including anthropology).

i. Financial disclosures in context

In service to getting specific within this morass of terms, I contextualize the 10-K disclosure forms in terms of how investors might read them. The specificity of these financial disclosure documents allows this project an entry-point through which to add to scholarship that **addresses Science and Technology Studies' (STS)** relative omission of financial analysis from technology training, research, design, and development; and probes the co-production of computing materiality and financial materiality. I draw on histories of engineering professionalization and computing, (Hertz 1998; Oldenziel 1999; Andreas 2009; Ensmenger 2010); and economic theory's influence on investments. (Hertz 1998; MacKenzie 2006; Ott 2011; Hong 2017; Weber 2021) I build on classical infrastructure studies methods of infrastructural inversion and (Star 1999; Bowker and Star 1999; Star 2016) with an eye toward the meso-layer of infrastructural connectivity (Edwards 2010). I attend, too, to business histories (Poon 2007; 2016) and financial institutions as sites of cultural knowledge production (Feher 2018; Pardo-Guerra 2019) that may "hack" existing infrastructures to their advantage (Maurer 2001).

ii. Stakes of studying the financial structures of tech corporations

As a finer point, the category 'investor' is not a monolithic one, nor does it refer necessarily to an individual person. For example, an institutional investor (such as a university or a state pension system) typically entrusts its funds to an asset management company (itself a corporation) for the purpose of investing it in the capital markets. In the financial markets as a whole, Institutional investors make up the majority of the transactions in the US and European stock markets, but not, notably, in Mainland China, where retail investors dominate at least 85% of the market, as of 2018

(Hsu et al. 2018). The largest institutional investors in the world have a substantial concentration of assets (Ben-David et al. 2017). While “angel” investors may invest their own personal funds, venture capital firms, like institutional investors, often invest *other investors’ or asset owners’* funds.

For the largest consumer digital technology companies in the world, many of their investors are also founders and C-suite executives with heavy concentration of stock ownership and corporate governance structures that strongly favor their interests. Analytically, we need to ask—whose funds are these that are being invested?¹ When an internet technology corporation invests the funds it controls, as I take up in this paper, ownership depends heavily on the structure and kind of corporation investing those funds at a particular time, in a particular place, and with through particular corporate structure.

III. Methods

This documents-based study focuses on mimicking the kinds of information these corporations disclose to external investors, since investors do not typically have access to details inside each corporation. The financial disclosures explain a crucial subset of technical details of corporate activities to investors and policymakers.

i. Alphabet/Google as case study

This paper conducts a close reading of financial disclosure documents by Alphabet/Google, which was listed first on the NASDAQ (as Google) in 2004 and was restructured into a holdings company (as Alphabet) in 2015. I began this document analysis on Alphabet/Google’s 10-K forms (2018–2021) with a simple question: where

¹ Thanks go to AnneLee Saxenian for pointing this out to me in an informal conversation in April, 2022.

and how is the technology that Alphabet is building mentioned? How is it discussed? I focused on discussions of Alphabet/Google's technologies in the 10-Ks because the 10-K is an annual legally binding communication between Alphabet and its shareholders, overseen by the US federal agency in charge of enforcing securities trading rules, the US Securities and Exchange Commission (US-SEC). Investors can—and do—sue companies based on information disclosed in 10-Ks. As such, 10-Ks are considered the most reliable sources of information on these companies available to investors because they are required by the SEC to report material matters in the 10-K, and these forms (unlike quarterly earnings reports) must be audited by independent, accredited third-party accounting firms. Defining what is “material” for corporate financial disclosures is a matter of lively and prolonged debate in the academic and legal communities focused on corporate reporting and fiduciary duty. I will review that literature as part of the longer project but have omitted it for this initial case study on Alphabet.

The method I develop here for reading the 10-Ks focuses on shifts in categorization of risks between reporting years. I discovered that these shifts are not visible to machine readers, because many machine readers target changes in blocks of text, rather than changes in organization and headings. The structure and content of 10-Ks matter because 10-Ks are often skimmed by busy investors who might look only at the headings of the RISK FACTORS after focusing on the balance sheets.

In addition to the 10-Ks, I also reviewed all the major attachments, schedules, 8-K filings (“event reports”), 14DEF filings (proxy announcements), and legal settlements appended to the 10-Ks for financial years 2018 – 2021. In later stages of this project, I plan to supplement this analysis with interviews, more 10-Ks, and transcripts of investor meetings and presentations to investors made at major banks, available through proprietary databases such as FactSet. This initial case study on Alphabet will be folded into situational analysis (Clarke 2005) and the larger document study I am

conducting that includes the financial disclosures of Facebook/Meta, Apple, Amazon, and Microsoft (2018-2021), which I will analyze together with the ACM Fairness, Accountability, and Transparency (FAccT) Conference Proceedings (2018—2021).

i. Accessing 10-Ks and other publicly available information

The US-SEC publishes all filings it receives (except those labeled confidential) in a publicly accessible database of PDFs called EDGAR. To organize my search through these 10-Ks and their various attachments, I searched the EDGAR filings through the interface of another database, FactSet.² FactSet organizes the disclosure forms in chronological order and displays transcripts and recordings of quarterly earnings calls, conferences, and presentations to investors, but I focused on financial disclosures for this project. For the Alphabet case study, I made extensive use of a function in FactSet which highlights sections of the disclosure forms that have *changed* one year to the next—revealing where companies have used the same boiler-plate language, and where there have been updates. This change-highlighting function, however, is not perfect (it is machine-generated) and I discovered instances where it missed important changes. Also, since this function does not track changes or omissions in charts and figures, or headings, I double-checked structural changes by toggling between places across the 10-K forms I reviewed. I am considering writing a separate paper on the methods developed for this project.³

² The FactSet database is one of the two major databases (along with Bloomberg) that institutional investors and hedge funds themselves use to make quick searches and in-depth studies of the companies in their portfolios and in their competitors' portfolios. FactSet doesn't have much data on mergers and acquisitions—for future projects that compare the 10-Ks with M&A activity, I would use the database Zephyr. For corporate structures, I prefer D&B Hoovers, other databases that cull business news along with SEC filings.

³ A computer scientist I met recently at a conference on AI for financial applications told me that that she reads 10-Ks, too—for her personal investing interests. She clarified that she didn't really read them, that a machine read them for her, and encouraged me to use a machine reader too. One of the reasons I have chosen to read—at least for this initial case study—by hand without a machines reader is precisely because as a human reader, I notice the position which certain clumps of words or topics are placed in relationship to one another. The following discussion centers on something I noticed in reading the 10-Ks: that sentences

IV. Findings

The 10-Ks I reviewed reorganized categories of risk, and sorted the sub-sections describing different risks into these new categories from 2018-2019. **This major recategorization, I argue, does important boundary work by framing what kinds of risks are—and are not—specific to Alphabet.** I argue that discussion of “competition” and Alphabet’s own investments both serve to focus investors’ attention on certain framings of the promises of Alphabet’s technologies and away from another aspect of its operations: the “ethical, technological, legal, regulatory, and other challenges” (7) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2019a) Google identifies with its products and services. Taken in isolation, the facts that competition, and Alphabet’s investments, are discussed in the first few pages of the main annual disclosure to investors is not surprising. However, the 10-K is not merely a fundraising document—the 10-K is not a pitch deck. It is a legally-binding disclosure of material matters that “a reasonable investor” would want to know about when making investment decisions. (US SEC 1999) Thus, the **10-Ks are a key site in which market participants theorize the relationships between investors and technological production in tech firms.**

In a standard 10-K, ITEM 1A. RISK FACTORS is the first major section after the Overview of the business. This section comes just before the KEY TABLES section that contains financial performance data. After the KEY TABLES, the RISK FACTORS section is the second section, and sometimes the only other section, that an investor might read. As such, the structure of how material issues are discussed in RISK FACTORS is crucial to how busy institutional investors might interpret

containing critiques or concerns which investors or publics have about technologies created by Alphabet/Google are placed in very close proximity to phrases about competition. I was curious about this, and tracked it further in my reading.

Alphabet/Google's 10-Ks.⁴ Further, since this section contains words (as opposed to figures, graphs, or tables), it is also a key section from which *machine readers* pull text from 10-Ks to feed into algorithmic trading systems.

i. Shifting Risk(s)

The structure and content of each part of the RISK FACTORS section allows us to track subtle shifts in Alphabet/Google's categorization of risks, and in the sorting of these risks either closer or farther away from its business operations.⁵ In 2018, RISK FACTORS were divided into three categories: Risks Related to Our Businesses and Industries; Risks Related to Ownership of Stock; and Risks Related to Our Holding Company Reorganization. The Risks Related to Ownership of Stock remains a constant category, with some changes to the sub-sections. I observe that risks related to the holdings company reorganization (completed in 2015) were present in 10-Ks through 2018 but were dropped in 2019. (For full list, see **Appendix: Figure 1.1**)

The name of the "Risks Related to Our Businesses and Industries" category acknowledged that Alphabet owns numerous companies (businesses), and that those businesses are in multiple industries. Note that Alphabet's (and before that, Google's) operations have spanned industries for more than decade—this is not new in 2019, nor in 2015 when Google restructured into the Alphabet holdings company. However, beginning in 2019, **the 10-K broke the old "Risks Related to Our Businesses and Industries" into four new categories**, which have remained through at least 2021. Despite the proliferation of categories, the content of most sub-sections that describe

⁴ Legal actions against Alphabet are mentioned much farther down in the 10-K's notes section and attachments, and thus are read mostly by lawyers and SEC officers, as necessary.

⁵ Machine readers are essential to making automated and semi-automated trades micro-seconds after these disclosures are released. For more detail, see business school literature on machine-readable 10-Ks. After reading ITEM 1A. RISK FACTORS, investors (or their electronic readers) might focus on ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

individual risks stayed the same. **One key exception is discussion of “ethics”, which moved from one sub-section to another, within a category.** (See Competition and Investment section below)

From 2018 to 2019, the old “business and industries” category became four new categories of material risk:

- Risks Specific to Our Company;
- Risks Related to Our Industry;
- Risks Related to Laws and Regulations [and Policies, added in 2021];
- and General Risks;

The “Risks Specific to Our Company” category contains some risks over which Alphabet would appear to have operational control, or at least, be able to allocate budgetary resources to mitigate. These include: risks to its brands; IT failures in its own offices; and IP protection, which Alphabet covers presumably through its budgets for legal costs, public relations, or office maintenance.

Some other risks in the **“Specific to Our Company”** category, however, do not correspond to budgetary allocations in this direct sense—there is no department internal to Google that would be responsible for addressing them, yet they are categorized as “Specific” to the company. These include: “inherent risks” Alphabet carries for its own investments; competition; supply chains; revenue loss; the proliferation of ad blocking technology; and international currency exchange risks. (9-15) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a) These risks seem far beyond the purview of specific departments to address through budgeting, but nonetheless are included in the category of “Specific” to Alphabet/Google. One risk that deserves special mention is “competition” because it is one of the few sub-sections that has content changes after 2018. (Discussed in the next section) The “competition” sub-

section remains filed as specific to Alphabet/Google, though competition seems fitting for the Industry category, rather than specific to Alphabet.

Here, the 10-K does several delicate dances related to disclosure.

Firstly, “inherent risks” to Alphabet’s own investments are slotted into Alphabet-specific risks, even though these investments involve other companies across a wide variety of industries, and over which Alphabet has varying degrees of operational control. In categorizing this investment risk as “Specific” to itself, **Alphabet acts here as an investor itself, demonstrating to its own investors that it takes on the risks (“inherent”) to its own investment decisions**—what companies, teams, or customer bases Alphabet plans to “build, borrow, or buy” (Capron and Mitchell 2012). Delicately, however, Alphabet discloses these risks to its own investors—Alphabet’s decisions are material to its investors because if things go very wrong with those investments, this disclosure builds a hedging case that Alphabet can use to defend itself against its own investors. **Disclosing this risk as Alphabet-specific is, paradoxically, an assurance against the actual riskiness of this risk item.**

Secondly, other risks included as **“Specific” to Alphabet/Google** appear to be very far from Alphabet’s operational control—and yet again, are pulled into the orbit of “Specific” risks on the 10-K: supply chain risks, risks of revenue loss, whether users around the world use ad blocking technology, and international currency exchange, international laws, overseas employees risks are listed as “Specific” to Alphabet/Google, rather than industry-wide or “General” risks. Taken together, these risks seem inherently globalized and beyond the control of one specific company—except perhaps to communicate that Alphabet/Google has such a far reach that supply chain risks and international employees’ conditions are labor protections are in fact “Specific” enough to Alphabet to be brought in-house. Alphabet/Google’s

categorization of risks that could well be slotted into Industry-wide or “General” as “Specific” is speaking back to the contextualized relationship between Alphabet and its own investors—as read through the 10-K.

The **“Risks Related to [Alphabet’s] Industry” category** is populated with things like: evolving platforms, data privacy, investments in safety, security, and content review, spam, “problematic content”, and loss of net neutrality. Though RISK FACTORS does not specify what Alphabet’s industry actually is—and takes pains elsewhere in the 10-K to say what industries its competitors are in—there is a lack of specificity here. In terms of risk, Alphabet/Google is now in a single, albeit unspecified Industry. This communicates several ideas to investors simultaneously: that Alphabet competes across industries while being in an Industry of its own; that by being industry-fluid, there is less risk of being regulated as/by the rules that govern a particular industry; that the risks of being (whatever industry Google is in) are borne by an industry collectively—that “evolving platforms”, “data privacy”, safety and content review, and internet public policy—are not specifically *Alphabet’s* problems. The 10-K in fact **defines an industry by delegating responsibilities and risks to that industry, without needing to define it.**

Finally, the **category of “General” risks.** General Risks are likewise inclusive of several unexpected types of risk. Unpredictable macroeconomic trends, Covid-19, deaths of top executives, and stock price volatility seem squarely beyond Alphabet’s operational control. (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a; 2021a; 2022) However, some sub-sections of General Risks seem very specific to Alphabet’s operations, or at least are likely heavily influenced by Alphabet’s practices: taxes and tax liabilities, loss of technical workers to other companies (which seems either like an Industry issue, or an issue specific to Alphabet), and the methodologies by which Alphabet itself establishes the valuations for its acquisitions that do not have comparable or “observable” market prices. (20-21) (Alphabet Inc. (NASDAQ: GOOG,

GOOGL) 2020a) These risks, by the standard I applied earlier of whether Alphabet has a department to address them, could be categorized as “Specific” to Alphabet.

Alphabet also exercises a substantial amount of control over the risks they take when making acquisitions of other companies, yet **acquisitions are filed under General Risk**. Distinctions between “acquisitions” (under General Risk) and “investments” (under Specific risks) is not described. Again, we see distinctions that operate in the context of Alphabet’s communications with investors—and regulators, and, if necessary, legal teams—that make these communications rarified, coded, and yet, “material” in the SEC’s financial-legal sense. The specific risks that are Generalized speak to and create a field beyond the reach and responsibilities—or perhaps beyond *predictability*—of Alphabet’s executives, or Alphabet as a whole.

In the 2019 reorganization of risk, “stock price volatility” was drawn into General Risks, out of its old position in the (still-extant) Risks Related to Ownership of [Alphabet’s] Stock. This Generalized risk category, therefore, has the power to pluck from corporate ownership risks, often narrated as corporate-financial issues, into the same category as issues bemoaned by digital technology companies specifically, such as engineers being poached or enticed away from Alphabet to other companies. This **Generalized category is doing theory work by muddling select financial ownership issues with select technical issues**, etherealizing this laundry list into unknowable Generalized risk, making it into a backdrop or context with which Alphabet can selectively engage, despite the category itself being of Alphabet’s own making, through the 10-Ks.

Alphabet, here, is theorizing about markets—shaping what its purview to investors is, and thus what its role as investor could be, or should be. Pulled back from the claims of near-omniscience through data, or knitting itself into the fabric of daily life

to the point of becoming a verb (“to Google”), these 10-Ks speak to a humble—yet staunchly powerful—working out of what exactly Alphabet/Google should be, and do.

ii. Competition and Investment

In the 2019 reorganization of risks discussed above, most of the content of each sub-section remained the same. There is a notable exception to this: the paragraph that **specifically addresses how ethical and social issues generated by some of Alphabet’s systems could negatively affect revenues and operating results**. In the 2019 10-Ks, within the category of Specific risks, this paragraph moved from the risk item about competition to the risk item related to Alphabet’s own investments.

In 2018, the first item in the then-category Risks Related to Our Businesses and Industries is: "***We face intense competition. If we do not continue to innovate and provide products and services that are useful to users, we may not remain competitive, and our revenues and operating results could be adversely affected.***"⁽⁷⁾ (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2019a) [bold and italics original to the 10-K]. This heading contained an acknowledgement that: "...new products and services, including those that incorporate or utilize artificial intelligence and machine learning, can raise new or exacerbate existing ethical, technological, legal, and other challenges, which may negatively affect our brands and demand for our products and services and adversely affect our revenues and operating results." (7) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2019a)). This is the only place in each of the 10-K documents that specifically mentions the ethical challenges associated with machine learning models.⁶ **The message to investors is that competition is inevitable, and**

⁶ There is also some fantastically vague language by which ethical questions are framed in vague terms—for example, in the data privacy risk section in the Risks Related to Our Businesses & Industries section prior to the reorganization in 2019: " From time to

nobody is safe from it—especially Alphabet. The choice in 2018 to file machine-learning-related ethical issues within the paragraphs about competition (which is framed as an inevitable, yet specific risk) is one way to draw attention away from nebulous ethical concerns. At the same time, this paragraph frames Alphabet as savvy in accepting seeming inevitability of competition and focusing investor attention its theorizing of the markets in which it competes, rather than on the ethical concerns it raises in the competition paragraph. Appending descriptions of ethical concerns to orthodox-canonical descriptions of what a corporation is supposed to be occupied with (competition) discloses ethical risks (nominally satisfying material disclosure requirements) without dwelling on their weight. **The appearance of comprehensive disclosure of risks, therefore, precludes discussion of those risks.** In this case, machine learning models' ethical implications get encased inside the wrapper of competition, without discussing the relationship between the two. Proximity of items in a document without linking is de-analysis, fissure, jumble, aside.

In 2019, the same phenomenon occurred: placing ethics within another risk—but this time, ethics are attached to another term with plenty of canonical market mystique—investing. In 2019, the ethics paragraph was moved from the “competition” risk the last paragraph of the sub-section entitled: ***“Our ongoing investment in new businesses, products, services, and technologies is inherently risky, and could disrupt our current operations and harm our financial condition and operating results.”***(10) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a) [bold and italics original

time, concerns are expressed about whether our products, services, or processes compromise the privacy of users, customers, and others. Concerns about our practices with regard to the collection, use, disclosure, or security of personal information or other data privacy related matters, even if unfounded, could damage our reputation and adversely affect our operating results. Our policies and practices may change over time as users' and customers' expectations regarding privacy and their data changes.”(11) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) : 2019); It was then relegated to the Risks Related to Our Industry (rather than Risks Specific to Our Company): “ Concerns about our practices with regard to the collection, use, disclosure, or security of personal information or other data-privacy-related matters, even if unfounded, could harm our reputation, financial condition, and operating results. Our policies and practices may change over time as expectations regarding privacy and data change.”(13) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a) Legal Matters, *Antitrust Investigations*: “ From time to time we are subject to formal and informal inquiries and investigations on competition matters by regulatory authorities in the United States, Europe, and other jurisdictions...”(83) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2021a) and, boiler plate, on (77) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2022).

to the 10-K]. Under this new heading, the wording changed slightly to include: " In addition, new and evolving products and services, including those that use artificial intelligence and machine learning, raise ethical, technological, legal, regulatory, and other challenges, which may negatively affect our brands and demand for our products and services. Because all of these new ventures are inherently risky, no assurance can be given that such strategies and offerings will be successful and will not harm our reputation, financial condition, and operating results"(10) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a).⁷ **Here, “inherently risky” makes investments and their outcomes seem inevitable.** This fragment of markets orthodoxy (that markets have their own inherent logics) serves to shield and draw attention away from the ethical risks that Alphabet discloses in its 10-Ks. This re-categorization of the discussion of ethical risks into “our ongoing investment” frames ethical risks as normalized within business operations, and signals that their occurrence could be taken by investors as an indicator of an increase in Alphabet’s ongoing investment. Additionally, this re-categorization (from competition to investments) recasts ethical concerns as something to be managed between Alphabet and its investee companies, rather than something with which Alphabet’s own investors should be concerned.

Both “competition” and “investments” are sub-sections in the Specific-to-Alphabet risk category—they did not become General Risks. Ethical issues arising from the machine learning models that underpin Alphabet’s business models seem to be framed as handleable in-house (not by the Industry), and as neither acute enough nor pervasive enough to be considered a Generalized risk.

V. Discussion

⁷ Another subtle shift occurs within this paragraph that has been updated and moved from competition to the discussion of Google’s own investments: the technologies Google produces are now framed as “new and evolving.” I plan to discuss the framings of evolution and revolution in 10-Ks in a future paper.

This case study unpacks how **10-K filings contain and produce theorizing**—in charts, figures, attachments, and text—**about the responsibilities of investors and tech companies for the ethical implications of their operations and practices.**

The threads I've traced here are not merely examples of a large corporation evading responsibility for the ethical implications of the machine learning models it develops. Rather, the fragmented categorizations of risks, and the shifting location of ethical issues as discussed within those risk categorizations, must be read within its specific context: the 10-K filings and attachments, investors use to make decisions about investing in a large technology company.

As such, the 10-Ks of large digital technology companies like Alphabet are particularly **rich sites for theory-building** because these 10-Ks build theory over time with investors and technology companies as reporting entities. Alphabet is such a large company by market capitalization (not to mention amounts of data stored) that it competes with its own investors for opportunities to invest in yet other companies. By re-filing ethical issues in machine learning systems into Alphabet's own investments, which it describes as "inherently risky", Alphabet's 10-K accomplishes two tasks at once:

Firstly, it **detaches ethical issues from discussion of competition with other firms that compete with Alphabet for investors' funds.** Alphabet's top institutional investors invest in multiple large tech companies that compete with Alphabet. If Alphabet is routinely classified by investors as part of a portfolio of the same type of company, they might start comparing Alphabet to its peers on ethics issues, in addition to other metrics. If, on the other hand, Alphabet is not competing/comparing with its tech company peers on ethical issues, investors need not inquire further beyond high-level explanations provided in the 10-K.

Secondly, by re-categorizing ethical issues as part of the “inherently risky” business of Alphabet using its own investment money (though, given Alphabet’s corporate ownership structure, Alphabet spends its founders’ money and top institutional investors’ funds) **the 10-Ks reframe Alphabet itself as a responsible investor**—cognizant of the risks, willing to take the hit if something goes wrong (including in terms of ethics) with the results of its investments. In other words, Alphabet can appear to investors as a good market participant that puts its own (or, shareholders’) funds on the line, and its managers as prudent stewards that are *themselves* aware of risks. By disclosing risks to investors, Alphabet comes to be seen as a more responsible investor. Simultaneously, however, since these risks are included in the 10-K, they are also, de facto, disclosures to Alphabet’s own investors, signaling that the investors must also be prepared to write off the losses which might be incurred to them in case something goes wrong with Alphabet’s own investments.

An added layer: 10-Ks are designed to communicate to investors, some of whom are Alphabet’s direct competitors for investment opportunities in other companies. The subject of **competing both for and with investors** is the possible subject of a future paper. By tracing the patterns of issues Alphabet assigns to itself, its industry, and “General” risks, we see how the structures of these documents do industry and firm-defining work, as well as positioning in terms of investors, investees, and how markets supposedly work.

Challenging the assumption that 10-Ks written merely to appease investors, this case study shows **Alphabet as financial actor that invests and competes with its own investors**, rather than as a passive or preoccupied recipient of capital. Tracing how this and other companies’ investment portfolios (which contain other kinds of corporations, not just other tech corporations) change over time may allow us to reclassify these corporations as financial-technical investment vehicles. However,

rather than minimizing these companies' characteristics as merely or only financial institutions by another name, I have found that technology corporations become more situated, and more contextual over time, through their strategic use of financial disclosures like the 10-Ks and through their corporate governance structures.

VI. Conclusion

Alphabet/Google's 10-Ks communicate to investors using a mash-up of different categorizations and ways of segmenting the holding company's business. I focus on the world's largest consumer technology corporations because they are both investors and investees, and because these companies have an added, interesting, complication of sometimes competing with their own investors for opportunities to invest in other companies. In 10-Ks, Alphabet/Google focuses on how it *makes* money (for investors), but my analytical interest is how they *spend* money—where Alphabet/Google 'invests' both internally and externally. I speculate that in 10-Ks, large tech corporations like Alphabet/Google don't want to focus on their investments as *investors* because that would put investors in (overt) competition with Google for investments. **Google wants to be a catch-all for investments, but also competes with its investors for opportunities to invest in other companies, and in other areas of the financial markets such as hedging, derivatives, currency markets, etc.** These multi-layered investor-investee relationships form a key element in discerning lines of accountability for the systems these consumer technology corporations build and maintain.

This early-stage project will continue to explore these themes by branching out into other documents, databases, and using interviews and eventually participant-observation.

VII. Future Directions

i. Accounting for Techno-Promise

This paper focused on Alphabet/Google's definitions and re-categorizations of material RISK. To find other places where technical practices and investors' interests intersect, I also conducted systematic analysis on the segmentation and reporting on revenues and operating expenses, but less so on another key source of information about corporate investments in technical production—"Other Income (Expense), net", which includes non-marketable investments (divided into non-marketable debt and non-marketable securities). Alphabet/Google's 10-Ks contain minimal reporting for these items. The firm's categorizations of "operating" activities, "investing" activities, and "financing" activities in their consolidated financial statements point to further places to explore Alphabet/Google's reporting as an investor in other companies, one of the prime foci of this longer research project.⁸ Revenues and Costs/Expenses matter in studying the financial reporting of large tech corporations because it is these two figures (Revenues and Costs/Expenses) that largely determine the companies reported income upon which it is taxed. Along with Revenues and Costs/Expenditures, I looked for accounting traces of technical production in the R&D expenditures reporting, all the subjects of another possible future paper.⁹

⁸ **"Operating activities" make money for Alphabet by** "Our largest source of cash provided by our operations are advertising revenues generated by Google properties and Google Network Members' properties. Additionally, we generate cash through sales of apps, in-app purchases, digital content products, and hardware; and licensing and service fees, including fees received for Google Cloud offerings and subscription-based products. Our primary uses of cash from our operating activities include payments to our Google Network Members and distribution partners, and payments for content acquisition costs. In addition, uses of cash from operating activities include compensation and related costs, hardware inventory costs, other general corporate expenditures, and income taxes." (40) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a, 201) **"Investing activities"** generate profits for Alphabet via "maturities and sales of our investments in marketable and non-marketable securities. Cash used in investing activities consists primarily of purchases of property and equipment, which primarily includes our investments in land and buildings for data centers and offices and information technology infrastructure to provide capacity for the growth of our businesses; purchases of marketable and non-marketable securities; and payments for acquisitions."(39-40) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a, 201) **"Financing activities"** make money for Alphabet through the "issuance of debt and proceeds from sale of interest in consolidated entities. Cash used in financing activities consists primarily of net payments related to stock-based award activities, repurchases of capital stock, and repayments of debt."(41) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a, 201)

⁹ In 2018, Research and Development expenses included the compensation (including stock-based compensation or SBC) and "facilities-related costs for engineering and technical employees responsible for R&D of our existing and new products and services; depreciation expenses; equipment-related expenses; and professional services fees primarily related to consulting and outsourcing services" (33) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2019a), and the report left the other (non-technical) employees' salaries working on R&D out of the calculus. No specifics were reported on the content or nature of the consulting projects, or the kinds of labor outsourced, and for what (presumably R&D-related) purposes. In 2019, the contents of R&D's expenses remained the same, but specificity was added to the margin notes that named specific projects (and investments) that might make the R&D budget fluctuate : "continued investment in ads, Android, Chrome, Google Cloud, Google Play, hardware, machine learning, Other Bets, and Search."(36) (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020a, 201) These specific projects are a mix of a: device (Android), web browser (Chrome), infrastructural investment (Cloud) , application store (Play), and much more amorphous categories (hardware), an entire computing discipline (machine learning), non-primary business revenues (Other Bets), and primary revenue streams (Search). This is not specificity in the sense of giving investors (or regulators) the details sufficient to

ii. Talking to the Banks

Another way to access how these accounting and budgetary categories are back-translated to external investors, I may compare these sparse 10-K disclosures with the transcripts of conversations with major financial institutions at internet technology conferences convened by Alphabet/Google's major external investors such as JP Morgan, Goldman Sachs, UBS, Deutsche Bank, Citibank, the Royal Bank of Canada, to name a few that held formal internet technology conferences at which Alphabet presented in the 2018-2021 period. Analyzing transcriptions of these specific tech-related investment calls between Google and its major financial investors in the context of conference about technology is one possible expansion of the current project.

iii. Corporate Governance

I also plan to explore proxy votes and settlements. I find it shocking that most (if not all) of the proxy votes went in the direction that the Board of Directors recommended.¹⁰ This includes voting down major proposals by shareholders to issue reports on sustainability metrics, gender and racial pay equity, whistleblowing, and human/civil rights, as well as proposals about equal shareholder voting, etc.

iv. Corporate 'Personhood'

evaluate the types of R&D spending, their proportions, or even the projects contained in something like "hardware" or "machine learning". Rather, the development of lists of projects offers a different type of specificity, one that is, again, speaking to the highlight reels of techno-promise captured in the first pages of the 10-K: the summaries designed to communicate "the power of _____" whatever the latest technological wave Alphabet communicates to shareholders that it is (or has already been) riding. More on this in another possible future paper.

¹⁰ In 2019, board recommended voting no on the following proxy proposals, none of which passed: a human rights oversight committee, a report on sustainability metrics, report on takedown requests, regarding the nomination of human rights and/or civil rights expert to the board, a report on whistleblower policies and practices, a report on gender/racial pay equity, proposal regarding majority vote for election of directors, non-binding vote on amendment of bylaws, a report on arbitration of employment-related claims, and proposal regarding equal shareholder voting. (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2020b) In 2021, the following proxies were voted down: stockholder proposal regarding equal shareholder voting; A stockholder proposal regarding the nomination of human rights and/or civil rights expert to the board; A stockholder proposal regarding a report on sustainability metrics.; A stockholder proposal regarding a report on takedown requests.; A stockholder proposal regarding a report on whistleblower policies and practices; stockholder proposal regarding a report on charitable contributions; A stockholder proposal regarding a report on risks related to anticompetitive practices; A stockholder proposal regarding a transition to a public benefit corporation. ALL REJECTED at stockholder meeting: (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2021b) Even though they did file a sustainability report with the SEC – it's not considered material!

Google puts its origin story into many of the attachments to the 10-K, particularly in press releases and sometimes in the 10-Ks themselves. From the 2019 press release announcing Sundar Pichai coming on as Alphabet CEO:

"Our second founders' letter began: *"Google was born in 1998. If it were a person, it would have started elementary school late last summer (around August 19), and today it would have just about finished the first grade...* Today, in 2019, if the company was a person, it would be a young adult of 21 and it would be time to leave the roost. While it has been a tremendous privilege to be deeply involved in the day-to-day management of the company for so long, we believe it's time to assume the role of proud parents—offering advice and love, but not daily nagging!" (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2019b) These striking fantasies of males giving birth, of family, of 'natural' life of children (corporations), of growing up, and of personhood seem intricately linked with investors and what their roles are purported to be throughout the development of a company, particularly one with as large a financial presence as Alphabet/Google. I would be keen to explore these themes in conversation with feminist technoscience scholarship on embodiment and technical (re)production.

v. Bets and Gambles

More origin stories from the same press release: "We are deeply humbled to have seen a small research project develop into a source of knowledge and empowerment for billions—a bet we made as two Stanford students that led to a multitude of other technology bets. We could not have imagined, back in 1998 when we moved our servers from a dorm room to a garage, the journey that would follow."(Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2019b) I would be interested to follow the discourse of betting, chance, and research leading to 'bets', gambles, etc. and discussion of Alphabet separating Google's operations into : Google, and "Other Bets".

The press release continues:

"With Alphabet now well-established, and Google and the Other Bets operating effectively as independent companies, it's the natural time to simplify our management structure. We've never been ones to hold on to management roles when we think there's a better way to run the company. And Alphabet and Google no longer need two CEOs and a President. Going forward, Sundar will be the CEO of both Google and Alphabet. He will be the executive responsible and accountable for leading Google, and managing Alphabet's investment in our portfolio of Other Bets." (Alphabet Inc. (NASDAQ: GOOG, GOOGL) 2019b)

It strikes me that the holding company structure is anything but natural, and the management structure is vastly **more** complicated now that Alphabet is a holding company. This set of practices and framings related to a 'portfolio'—originally from the VC tech investor scene—is now shaping how technology companies themselves are managing their own internal company structures. This supports my observation that technology companies are technology investors, and past a certain size, compete with their own investors for deals, bids, and new companies in which to invest.

**V. Appendix: Figure 1.1: RISK FACTORS in Alphabet/Google's 10-K,
reorganized from 2018 to 2019-2021**

2018		2019, 2020, 2021		
Risks Related to Our Businesses* and Industries*	1 competition **	Risks Specific to Our Company	24 ad blockers	
	2 loss of partners [deleted after 2018]		1 competition inherent risk of Alphabet's investments **	
	3 regulatory		4 revenue loss	
	4 inherent risk of Alphabet's investments		14 IP protection	
	5 evolving platforms		16 brand risk	
	6 revenue loss		17 supply chains	
	7 unpredictable operations results		19 IT failures international operations currency, laws, employees	
	8 new and existing laws		20	
	9 lawsuits/investigations/litigation			
	10 liability for sources/content			
	11 data privacy	Risks Related to Our Industry*	5 evolving platforms	
	12 international data privacy laws		11 data privacy investments in safety, security, content review spam, content violations (changed to "problematic content")	
	13 IP claims against Alphabet		18	
	14 IP protection		23 loss of net neutrality	
	15 inherent risk of Alphabet's acquisitions	Risks Related to Laws and Regulations [and Policies, 2021]	3 regulatory	
	16 brand risk		8 new and existing laws	
	17 supply chains		9 lawsuits/investigations/litigation	
	18 spam, content violations		10 liability for sources/content	
	19 IT failures		12 international data privacy laws	
	20 international operations currency, laws, employees	13 IP claims against Alphabet	Risks Related to Ownership of Our Stock	B repurchasing
	21 loss of executives			C stock ownership concentration
	22 loss of technical workers			D discouraging takeover
	23 loss of net neutrality	Risks Related to Ownership of Our Stock	General* Risks	unpredictable operations (+ geopolitical, macroeconomic risks)
	24 ad blockers			7 inherent risk of Alphabet's acquisitions
	25 Investment valuations [deleted after 2018]			15
	26 taxes			21 loss of executives
Risks Related to Ownership of Our Stock	A stock price volatility		22 loss of technical workers	
	B repurchasing		28* valuation methodologies	
	C stock ownership concentration		**	
	D discouraging takeover		26 taxes	
Holding Co. Reorganization	i Dependency subsidiaries' operations [deleted after 2018]		A stock price volatility	

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