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Research Statement

My research is motivated by central questions in corporate finance such as governance, investment, leverage, and payout; yet my focus and contributions arise from a deeply interdisciplinary approach. My main research focuses on corporate culture and examines how changes in culture influence corporate performance. To conduct this research, I pioneered the development of quantitative measures of corporate culture that draw on insights from management scholars but use techniques from computational linguistics and machine learning applied to alternative, non-traditional data sources.

My second research area is on emerging technologies and examines how legal and regulatory frameworks influence innovation incentives and value creation. To conduct this research, I have developed an extensive knowledge of corporate law, securities regulations, and intellectual property law to understand how the nuance in legal rules shape innovation. Finally, I have recently begun to combine these two lines of research to examine how emerging technologies are shaping corporate culture and corporate outcomes more broadly.

In my primary research area "Corporate Culture," one of the central tensions I explore is the relationship between formal governance systems and more informal, social systems that combine to influence business outcomes. For example, I study how changes in corporate governance can change the guiding principles (e.g., integrity) that employees follow in a way that affects the firm's financial performance. Historically, finance scholars have simplified away from social elements, despite a general acknowledgement that they are important. Thus, collecting, creating, and combining data sources to measure these previously difficult to measure social forces, creating new causal research designs, and simply documenting key facts and correlations that were previously unknown is an important part of my research contributions.

At present, my *curriculum vitae* lists 10 publications, 3 revision requests, 6 completed working papers, and a few works in progress. My research has received many signals of its influence: with 15 competitive grants and awards; presentations at over 140 invited conferences and seminars (including top business schools, law schools, banks, and policymaking institutions); and over 1000 Google Scholar citations, and more than 26,000 downloads on SSRN. I also actively serve as a reviewer and editor in journal and conference processes. At the same time, I would like to point out that my publication process was significant influenced by having three (great) kids since my initial assistant professor appointment—all of this while my husband had a tenure-track position at Wharton and mine at Duke. Combined with the Covid-19 complications, this is hardly a surprise. Moving forward, I expect the revision requests and my rich pipeline to convert to more top-tier publications soon.

Primary Research Area: Corporate Culture

I often provide expertise on corporate culture for media outlets via interviews and podcasts. Through these experiences, I have learned that it is important to start with the definition of culture. Corporate culture is a pattern of behavior that is *reinforced by systems, people, and events*, and is manifest in many elements, but brings unity to employees' perspectives through the expectations that they have for how they need to behave to fit in and succeed in their corporation. From such a definition, it becomes apparent that examining systems like corporate governance, which may reinforce or work against culture, is critical for understanding the inner workings of firms. The factors that influence corporate culture that I examine in my research are: (i) corporate governance, (ii) technology, and (iii) peer groups.

Focusing on the inner workings and social aspects of corporations is critical: Most people spend the majority of their lives working. In the United States, the volume of transactions that occur inside corporations is roughly equal to that which occur in open markets. Many corporations have thousands of employees who somehow cooperate to produce goods and services. While some corporations generate expansive wealth for their investors, offer innovative solutions to problems, and are persistently more productive, otherwise similar corporations are much less successful. Executives believe these differences are associated with culture. In a large-scale survey of executives that my co-authors and I conducted, we found that corporate culture ranked as the number one long-term value driver for firms.

Specifically, John Graham, Campbell Harvey, Shivaram Rajgopal and I wrote "Corporate Culture: Evidence from the Field" (*Journal of Financial Economics*, 2022), "Corporate Culture: The Interview Evidence" (*Journal of Applied Corporate Finance*, 2022), and "What Do Financial Executives Say about Corporate Culture and Strategy?" (*Management and Business Review*, 2022). These studies examine corporate culture using a detailed survey of 1,348 corporate executives in North America and in-depth interviews of an additional 18 prominent business leaders. This approach provides insights into top executives' views of culture and can be broken into three main blocks: (i) what do executives think corporate culture is, (ii) does culture influence corporate valuations and actions, and (iii) what do executives think works for and against a value-enhancing culture? While surveys are an important tool for getting answers to questions that may be otherwise difficult to capture, surveys can also come with various challenges, so we extensively evaluate common criticisms of surveys and provide evidence that suggests we have a representative sample with responses that are reliable and consistent with external data sources.

The survey paper serves as a foundational paper to academics hoping to better understand corporate culture. For example, we document what executives think culture is (distinguishing between stated values and everyday norms), the extent to which culture influences valuation creation (productivity, mergers), ethical choices (compliance, short-termism), and innovation (creativity, risk-taking), and what works against a value-enhancing culture (incentive compensation, investors). The paper also won an award for the Best Paper in Corporate Governance by Investor Responsibility Research Center Institute.

In a solo-authored paper on corporate culture, "A Corporate Culture Channel: How Increased Shareholder Governance Reduces Firm Value," I examine the extent to which changes in shareholder governance alter the corporate culture and ultimately affect firm performance. I evaluate the cumulative effect on firm performance by decomposing the value of the governance changes into those from a corporate culture channel versus a more formal, tangible channel (e.g., plant closings). The results show how corporate culture is an important channel through which governance affects firm value. I develop a causal identification strategy that uses new data to refine the regression discontinuity design based on close-call shareholder votes, allowing me to compare governance changes that just pass vs. those that do not as if the changes occur randomly. Using this approach, I demonstrate that stronger governance significantly changes culture: it increases results-orientation but decreases customer-focus, integrity, and collaboration. Shareholders initially realize financial gains from stronger governance: increases in sales, profitability, and payout occur. Over time, however, intangible assets associated with culture deteriorate, offsetting the gains. These findings support classical multitasking theory where stronger governance incentivizes focus on easy-to-observe benchmarks over harder-to-measure intangibles. A big contribution of this paper was to codify the dimensions of culture highlighted by management scholars using textual analysis of career intelligence websites in a scalable way across firms and time. Since then, numerous studies have built on and cited this aspect. Further, I know that this paper is on the syllabus in the PhD classes at multiple universities.

These results have important implications for both regulators, investors, and researchers. Corporate recidivism rates are very high in the United States. The traditional solution is stronger corporate governance. Yet, as I show corporate governance can crowd out important benefits of corporate culture. These findings are also important for investors and regulators, who too often try to apply one-size-fits-all solutions to corporate governance and monitoring. My results call for a more nuanced approach to governance that evaluates the unique attributes of each corporation. This research received two dissertation awards (WFA Cubist Systems Award, Olin Business School Best Finance Dissertation Award) and the award for the Best Paper in Corporate Governance by Investor Responsibility Research Center Institute. In an important policy extension of this research, "Balancing Governance and Culture to Create Sustainable Value," (*Brookings Institution Governance Studies,* 2016) I examine the heterogeneity in starting culture and show that governance changes at firms that are already results-oriented have no benefits and only negative side effects (e.g., reduced focus on integrity and collaboration). This policy insight led to an invited publication by the bi-partisan Brookings Institute for their Governance Studies series. Both Rebecca Henderson and George Serafeim, award-winning professors at Harvard, contributed to this specialized series.

Because culture is so important, corporate executives reference it frequently in many different forums. Interestingly, there is much less consistency in the statements with different audiences than one might expect. In an expansion of my previous two papers entitled "Communicating Culture Consistently: Evidence from Banks," I quantify this "code-switching" and the extent to which it matters. Using the banking industry as a laboratory, I create a time-series measure of code-switching using corporate websites. For example, when banks tell their investors their corporate values are strongly rooted in integrity but then do not mention truth, honesty, or ethics on the career page, this is labeled as code-switching. I do this for eight common cultural values (big principles) and across different target audiences (customer, employee, investor, and community). I find an inverse relation between the extent of code-switching and value creation. For intuition, I offer a model in which executives optimally pair a combination of incentive pay and narrative (e.g., honest bankers) that may not match between executives and non-executives. This mismatch minimizes costs in low-risk times but amplifies them in high-risk times. Empirically, the code-switching, performance relation is evident during multiple economic downturns (financial crisis and COVID-19 pandemic), potentially offering insight into debates surrounding culture, risk management, and transparency.

While each of the culture papers make important contributions to economic knowledge, they also contribute to foundational work on the measurement of culture. By linking the survey responses to external, observational data, we have built a bridge between traditional and alternative data sources. Importantly, the survey data is positively, correlated with Glassdoor measures of culture that I used in my JMP. Second, we show that what companies advertise on corporate websites is more aspirational and less closely linked to actual culture. A key insight to emerge from this work is that triangulating across the data sources is useful. When executives' actual cultural values and norms were misaligned with the corporate website values, executives indicated that the culture was ineffective and improving it would increase firm value. This has important implications for investors seeking to allocate capital in a way that would improve value.

I extend this measurement idea in a paper entitled, "Decomposing the Value of Corporate Culture." In this paper, I run a horse-race between various supervised and unsupervised machine learning methods to classify 40 different cultural norms for individual employee reviews. Then, using the model of best fit I then apply these techniques to millions of other reviews. Ultimately, this generates a detailed time-series measure of corporate culture. Using this refined measurement approach for employee reviews, I then employ similar machine learning techniques for executive and outsiders' perspectives. Finally, I combine these perspectives to determine both the emotional intensity underlying employees' cultural beliefs and agreement on such beliefs. This allows me to then categorize culture into different types (e.g., an effective, lip service, contested battle, and design-free culture) based on the alignment across sources. For a culture to be effective, both agreement on the cultural values and a high level of intensity about the cultural values must be evident across the sources. Such a definition has parallels to the management literature on strong culture. If however, there appears to be agreement about what cultural values are important but employees lack emotional intensity and, as such, are unwilling to exert effort to live out the values or to sanction others for a failure to uphold the values, this leads to a culture that I classify as "lip service" from leadership. I then document the link between these culture measures and financial metrics.

I also make use of the detailed culture measures in a paper entitled, "Do Diverse Directors Influence DEI Outcomes?" that I wrote with Wei Cai, Ayesha Dey, Joseph Pacelli, and Lin Qui. We examine whether greater board diversity is associated with more diverse workforce hiring, more equitable pay practices, and more inclusive corporate cultures. We document increases in managerial and staff diversity in the years following a diverse director's appointment, consistent with diversity initiatives ``trickling down'' within a firm. We also find that employees perceive improvements in the culture, stronger community-building norms, and approve more of senior management. This research, therefore, extends ideas in my earlier research and the survey paper about the interaction between formal systems (i.e., corporate governance) and informal systems (i.e., culture). It also introduces a novel identification strategy and builds a new repository of diversity data.

Largely because of my body of work on corporate culture, I had the opportunity to write a book chapter on "Corporate Culture" with Gary Gorton and Alexander Zentefis (*Annual Review of Financial Economics,* 2022*)* and I have a second review chapter with Kai Li on "Corporate Culture: A Review and Directions for Future Research" that will appear in a forthcoming Handbook on Financial Decision Making."

While my first set of papers examine how formal systems influence culture, it is also the case that social interactions and varying groups of people can influence cultural norms and day-to-day decision-making. But how far do the group-induced norms extend? Only rank-and-file employees or also executives? Only low stakes, easily reversible decisions or high-stakes, irreversible corporate decisions? To better understand the importance of social identity and peer groups in the corporate setting, I study executives' decisions. In "Dividend Payments as a Response to Peer Influence" (*Journal of Financial Economics*, 2019), I show that there are peer effects in dividend policies. While there is a large literature on peer effects, my paper contributes on both the identification front and offers unique insight into the extent to which investors understand decisions are peer-influenced using dividend announcement returns.

Finally, I have two works-in-progress related to corporate culture. Both of these papers help unite my two research strands by highlighting the extent to which technology is a catalyst for cultural change and the extent to which culture enable a technology-premium for certain firms. First, Colleen Chien and I are working on a project entitled, "Organizational Barriers to Patenting: Evidence from Engineers," where we are conducting a survey of thousands of engineers from leading technology firms to learn which factors are working for and against a diverse, equitable, and inclusive (DEI) innovation process. We start by documenting the stage at which diversity declines in the invention process. Nearly seventy percent of disclosed inventions do not move beyond review boards to an actual patent application, and disclosed inventions from diverse inventors are more likely to fail this process. Diverse engineers link low levels of patenting to information (e.g., lack of familiarity with patent process), identity (e.g., perfectionism and not identifying with inventors), informal systems (e.g., cultural norms that have not adapted to support all inventors), formal systems (e.g., opt-in vs. opt-out harvesting of inventions), and leadership (e.g., lower quality feedback and mentoring).

In the second paper, Christos Makridis, Michal Zator, and I are working on a project entitled "AI-augmented Culture and Leadership" which involved an already launched randomized control trial with a large public company examining the extent to which technology may influence culture. The novel technology transforms granular data on employees' actions into productivity scores, which they then apply machine-learning methods to in order to give managers and employees insights into how to improve their productivity. The AI insights are delivered via short messages. We worked with the company to curate over 1000 messages based on employee actions aimed at improving performance. Some of the messages emphasize culture whereas other emphasize rules that are more formal. We then randomize across the groups the rules-based vs. culture-based messages and will have access to the same granular employee data to understand the precise reaction to the messages. We also conducted baseline survey of workers and will conduct a second one at the completion of the experiment about the culture. This paper should have meaningful impact across disciplines as it will help clarify the extent to which technology is a catalyst for cultural change, and help quantify the value creation associated with improving culture.

Secondary Research Area: The Law and Economics of Emerging Technology

Corporations and financial intermediaries are undergoing one of the most dramatic shifts in technology since the industrial revolution. Artificial intelligence (AI), blockchain, and the decentralization of power that they are helping to shepherd in are likely to require meaningful modifications to regulatory frameworks. My research in this area examines how legal and regulatory frameworks affect innovation incentives and value creation.

In "Artificial Intelligence and High-Skilled Work: Evidence from Analysts," Roni Michaely and I examine the relationship between AI and incumbent workers traditionally tasked with prediction work by focusing on sell-side equity analysts. By focusing on a single profession, we can thoroughly characterize how the composition of analysts changes over time, how tasks are rebundled, the characteristics of the analysts that thrive in this environment, how product quality changes and the economic channel driving any quality changes, and finally, how compensation may change. An important contribution of our study is to show that analysts are displaced by technology and then disaggregate how they are displaced. A key finding from our study in support of the intuitive idea that AI cannot replace social skills is that those endowed with greater social skills are less likely to be displaced during this technological disruption. To answer the AI skills question, we first needed to understand how competition from FinTechs was changing the competitive landscape for financial analysis. In a companion paper, "FinTechs and the Market for Financial Analysis" (*Journal of Financial and Quantitative Analysis*, 2021) we characterize the extensive variety of FinTechs in the space, and then, we show how these FinTechs change the information discovery process. Importantly, we also provide evidence that the services offered by these FinTechs, like AI-based signals from alternative data, are linked to improvements in informational efficiency.

In another work that is both focused on innovation incentives but also complementary to my JMP entitled "Common Venture Capital Investment and Startup Growth," (Resubmitted to *Review of Financial Studies*) Ofer Eldar, Kate Waldock, and I revisit the tension between formal systems and informal, social dynamics in the context of entrepreneurial startups. Specifically, we ask if changes in corporate governance -- the weakening of directors' fiduciary duties through the adoption of corporate opportunity waivers, generally perceived to be weak corporate governance -- actually contributes to better startup performance by enabling greater information sharing and mentoring of entrepreneurs by VC investors with common industry investments. We find evidence to suggest that weaker governance benefits startups through this social channel. We extend the insights from this paper in "Common Ownership and Entrepreneurship" (*AEA Papers & Proceedings*, 2021), in which, we suggest that even if public-firm common ownership reduces public-firm competition and raises prices in the short term, it may also create opportunities for entry of innovative high-growth start-ups.

I have two papers examining how legal changes can explain innovations in corporate financial policy. In "Who Benefits from Bond Market Modernization?," David Musto and I examine the trade-off between legal changes that enabled quick primary offerings in the corporate bond market and bond covenants; we highlight how contract uniformity emerges as time for due diligence decreases. In "Optimal Leverage and the Role of Institutional Investors" (R&R at *Review of Finance*), Roni Michaely and I document how the strengthening of fiduciary duties for certain types of institutional investors is associated with firm's moving their leverage toward optimal.

In "Patent Value and Citations: Creative Destruction or Strategic Disruption?," (R&R at *RAND Journal of Economics)* David Abrams, Ufuk Akcigit and I evaluate how incentives created through the legal rules for intellectual property awards relate to value creation and often used proxies for innovative value. Specifically, we use novel revenue data for tens of thousands of patents held by non-practicing entities (NPEs), we find that the relationship between citations and value forms an inverted-U, with fewer citations at the high end of value than in the middle. We explain the inverted-U with a model of innovation that has productive and strategic patents. The strategic patents exploit the claims writing process for innovation: they offer little actual innovation and so are cited infrequently but they are extremely valuable to producers as the language used in the claims block follow-on innovation.

I have two works-in-progress that explore how regulation affects innovation incentives in the FinTech space. First, in "Regulating Emerging Technology: Evidence from Digital Assets," Daniel Rock and I assess empirically whether regulatory enforcement in a nascent technology helps or hurts the market in that new technology. We frame our analysis in a model that reveals a concave relation between regulatory enforcement and technological progress. In a second paper entitled "Control and Influence in Decentralized Autonomous Organizations" Ian Appel and I examine emerging patterns in governance at DAOs by quantifying one aspect of control -- influence over the improvement process. These projects have received research grants from Wells Fargo and Ripple's University Blockchain Initiative.

Finally, in "Social Change through Financial Innovation: Evidence from Donor-advised Funds," (*Review of Corporate Finance Studies*, 2022) I compare DAFs, an investment account registered as a public charity, with other legal structures for charitable giving and highlight the economic features that allow DAFs to be correlated with improved efficiency. A major part of this project involved compiling the first data on DAFs and simply explaining their economic rationale as most policymakers complain that they are a tax loophole for the rich. In contrast, I highlight how their flexibility enables the integration of FinTech tools which in turn help match donors to high quality charities that serve populations in the areas of greatest inequality. This research and amazing data helps to open up a new set of promising follow-on research questions. For example, estimates of the causal effect of how technology is changing the nature of philanthropy and fundraising (and even perhaps the culture of philanthropic nonprofits).

Summary of Research Impact: Past, Present, and Future

Since starting as an assistant professor, I have grown as a scholar and colleague during my time at Duke, UC-Berkeley, and Santa Clara University. I have produced 10 publications, 3 revision requests, over 1000 citations, 6 additional completed working papers, and several new works-in-progress. Given the strength of my pipeline and the resilience I have shown to adapt in spite of personal hardships (having a newborn and two toddlers at home at the start of the pandemic), I expect the rich pipeline to convert to top-tier publications soon and that I have a well-defined road ahead. I believe that my research on corporate culture has the potential to have a significant impact on the field of finance and economics. The positive signals of the importance of my research include prestigious awards in the areas of corporate governance: twice winning the award for the Best Paper in Corporate Governance (in 2015 and 2020) by the Investor Responsibility Research Center (IRRC). Further, I have been awarded the WFA's Cubist Systematic Strategies Award for Outstanding Research, the Best Finance Dissertation Award by the Olin Business School, and the Thomas Edison Innovation Award by George Mason University. I have also received external grant funding from KPMG, INQUIRE, the Paris-Dauphine FinTech Award, Wells Fargo, Ripple, HKU-SCF FinTech Academy, and the Institute for Humane Studies.

Lastly, I think an important part of research is actively disseminating to the research community. My research has been presented at the National Bureau of Economic Research (NBER) nine times and I have given more than 140 conference and seminar presentations. My seminar invites included most of the top U.S. business schools (e.g., Harvard Business School 3x, MIT, Columbia, Wharton, NYU, Northwestern, Yale, and UCLA 2x) and top U.S. law schools (e.g., NYU, University of Chicago, UC Berkeley, and Penn). I am also keenly aware of the importance of sharing research with practitioners and have presented my work for UBS, Bank of America, Wells Fargo, Blackrock, Q Group, INQUIRE, the Federal Reserve Board, the Federal Reserve Bank of New York, U.S. Treasury Department, and the Brookings Institution. Finally, my unique interdisciplinary expertise is also recognized by my peers, I was invited to be the "Evidence" co-editor for Cambridge's Elements in Law, Economics, and Politics. I also actively serve on conference program committees, as a chairperson, and as a referee for papers in finance, law and economics.