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SEE FAR

EXECUTIVE SUMMARIES

Washington University in St. Louis
Olin Business School

In collaboration with
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To support faculty research in finance and accounting, and facilitate its dissemination by connecting it to students and the business world.

higher purpose

Foster finance and accounting research with higher purpose and help individuals and organizations become purpose-driven.

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To obtain copies of the original research papers summarized here or to recommend your company for a future research project, please contact Amber Lutes, Wells Fargo Advisors Center for Finance and Accounting Research program manager at alutes@wustl.edu or 314-935-4179.

A Message from the Director

I am pleased to continue our magazine, *SEE FAR*. Apart from the obvious attempt to "capitalize" on the WFA-CFAR name, the name also captures the essence of our research: looking to the future rather than concentrating exclusively on current events and thinking, and focusing on big-picture issues that have far-reaching consequences.

All the articles in *SEE FAR* are based on finance and accounting research that has been previously published in an academic journal or as a monograph, or is currently a working paper that will be published in the future. The original papers have been rewritten as executive summaries for *SEE FAR* so that they are accessible to a broad audience, rather than solely to those in academia. This is no small task. Taking a paper originally written for a highly technical academic audience and converting it into something more accessible takes a great deal of skill and hard work, as we discovered while putting together this issue and our past issues. But perhaps that is why the task is so worthwhile. I firmly believe that this will not only help us build a bridge between the research of Olin Business School faculty and those in the world of practice, but also will add to the knowledge people use on a daily basis. The intellectual capital generated by our faculty members' research is quite impressive—Olin consistently ranks among the top 10 schools in terms of our research output. For this reason, it is important that WFA-CFAR research is made available to as many of our stakeholders as possible.

CFAR has articulated a new statement of the higher purpose of the center. This statement is: ***To be a focal point for the support and dissemination of research in finance, accounting, and authentic higher purpose…and change the world through academic research, one idea at a time!*** This statement is focused on the prosocial nature of the center's activities, including the research it promotes. The center helped organize a high-impact conference on organizational and personal higher purpose in November 2019, and will be engaged in activities that build on the insights generated during the conference. An article summarizing the discussions at the conference appears in this issue of *SEE FAR*.

I hope that you enjoy reading the summaries in this issue. I would like to thank my faculty colleagues who participated in helping us create this issue by providing their papers and working with us to convert them into what you will read on the following pages. I look forward to any feedback you have to help us improve this magazine. Please contact WFA-CFAR Program Manager Amber Lutes at **alutes@wustl.edu** with your insights.

Sincerely yours,

Anjan Thakor
John E. Simon Professor of Finance, Director of Doctoral Programs, Director of the WFA Center for Finance and Accounting Research, Olin School of Business, Washington University in St. Louis

Paper: “Financing Innovation: Evidence from the Medical Field”

Author: Andrew Ellul, Indiana University

Date: March 2021

Financing Innovation: Evidence from the Medical Field

ANDREW ELLUL, (Indiana University, CEPR, CSEF and ECGI) Executive Editor,
Review of Corporate Finance Studies

On a December day fifty years ago, the U.S. Federal Government declared a “war” on cancer, prompting significant federal money to be invested in the formation of National Cancer Institute-designated cancer centers. On that day, December 23, 1971, the *National Cancer Act of 1971* was signed into law. While the “war” may not have been won yet, many in the field believe that law was a pivotal moment that led to a new equilibrium and a brighter future. The focus provided by the law, and, more importantly, the funding that came with it were catalysts to the recent spate of major advances in the prevention and treatment of cancer. The public sector has an important role in the medical field. But we should also ask how society can harness financial markets’ abilities when allocating resources and channel them to promote a healthier future for humankind through funding of biopharma research and development (R&D).

While cancer may be headline-grabbing news, there are a large number of medical conditions that, together, generate very high community-wide impacts, besides the heavy individual pain and loss. One may immediately think of Alzheimer’s or Parkinson’s as examples. Actually, there are also around 30 million Americans suffering from over 7,000 rare diseases. Thinking about the toll on the entire humanity gives us a better perspective of the challenge and should convince all of us that we ignore it at our own peril.

What can financial markets do to contribute to a solution? Funding research of scientists engaging in cutting edge research is crucial for the success of life-saving drugs. What is the main challenge? It is the very high probability of failure that drug development faces, making these projects extremely risky from the perspective of investors and corporations. Yet we know that financial markets can be a force for good for our communities through a partnership with scientists “on the ground” finding clues to diseases that cause so much pain.

This was the objective of one session during the ***17th Annual Conference on Corporate Finance and Financial Intermediation*** which the ***Review of Corporate Finance Studies*** co-organized with ***Olin Business School at Washington University in St. Louis*** and its ***Wells Fargo Advisors Center for Finance and Accounting Research.*** We had three research papers presenting cutting-edge research on how to organize funding of medical research and development. The conference also featured a keynote speech by Professor Andrew Lo of MIT on the same subject.

Where is the Problem?

Designing a robust solution must start from one very simple consideration: Why are there so many obstacles for financial capital from finding its way to fund life-changing drugs? Arguably it has to do with the high failure rates of R&D in acquiring regulatory approval and move to the phase where the drug becomes available to the public.

Evidence (see *Table 1*) from all major fields of medicine shows that development of new drugs face an extremely high failure rate, at each of the three Federal Drug Administration (FDA) phases, reaching an overall failure probability of 95% in oncology. Due to lack of funding resulting from these high failure rates, early-phase research in drug development is sometimes referred to the "Valley of Death." It does not need to be like this!

Table 1: Propability of Failing Phase Conditional on Reaching It

Disease Group	Phase 1	Phase 2	Phase 3	NDA/BLA Approval Phase	Overall Probability of Failure
Hematology	27%	43%	25%	16%	74%
Infectious Disease	31%	57%	27%	11%	81%
Opthalmology	15%	55%	42%	23%	83%
Other Disease Groups	33%	60%	30%	12%	84%
Metabolic	39%	55%	29%	22%	85%
Gastroenterology	24%	64%	39%	8%	85%
Allergy	32%	68%	29%	6%	85%
Endocrine	41%	60%	35%	14%	87%
Respiratory	35%	71%	29%	5%	87%
Urology	43%	67%	29%	14%	89%
Autoimmune/Immunology	34%	68%	38%	14%	89%
Neurology	41%	70%	43%	17%	92%
Cardiovascular	41%	76%	45%	16%	74%
Psychiatry	46%	76%	44%	12%	94%
Oncology	37%	75%	60%	18%	95%

The Table shows the average probability of failing each phase of the FDA drug development process, broken down by disease groups. Data from 2006-2015. Results taken from Thomas et al. (2016).

New drug discovery and gaining FDA marketing approval is a very long process, sometimes taking up to 15 years. There are rising costs of clinical trials coupled with a research shift towards biological mechanisms that, while they could be more impactful, are more complex and thus face higher failure risks than in traditional R&D.

These high failure rates, especially in the case of early-stage drug development, lead directly to extremely high risk inherent in these projects. If we were to see each single development project on its own, the project-specific risk (so called idiosyncratic risk) is likely to make the cost of participating prohibitive. This leads straight into the so-called market failure: we have a shared objective (funding medical/biopharma R&D for society's well-being) but we fail to achieve it because no one single investor will be interested (or perhaps able) to participate given this risk. In other words, we need to coordinate our efforts.

Human ingenuity, coupled with the prowess of financial markets, provides various solutions. One could be using a portfolio approach, rather than investing in each of these projects individually. Another could be a marketwide mechanism to provide hedging against the risk of failure. Yet another could be providing the right financial regulatory framework to make supply of capital to fast growing pharmaceutical companies more plentiful.

Portfolios of R&D Programs: The Megafund Approach

Andrew Lo tackled this deep-running problem in his keynote speech and proposed an alternative financing model to fund drug discovery. One solution is through a megafund structure that uses a portfolio approach to pool a large number of biomedical research projects and achieving the diversification of drug development risk. The success of such a fund will not depend on a single project but rather from the multiple "shots on goal." As in every portfolio approach, this structure will work as long as the correlations of success of the different projects, and through the different phases, are low. This structure could be "tranched" and risk of default is redistributed among the many participating investors.

Both equity and debt can be used to raise funding through this structure. For example, debt can be raised through the issue of bonds that are collateralized with the pipeline of drugs and intellectual property. Previous work by Andrew Lo provides (simulation) evidence supporting the claim that such alternative financial arrangement could generate reasonable returns for both equity and bond investors, even when accounting for the projects' dependence between phase transitions. One other investment attraction that should not be underestimated: since R&D projects have limited correlations with market returns, the megafund proposal should attract the interest of investors seeking to diversify away from traditional instruments. This should have a spillover effect: Funding should be more plentiful and thus more biopharma R&D projects can be financed.

Hedging Mechanisms

Another potential market-based solution to address the risk of the regulatory approval process in biopharma innovation is an innovative financial instrument in the form of an FDA Hedge. This financial instrument, that will pay off upon FDA approval failure, will allow risk-sharing between the firms investing in biopharma innovation and FDA development risks with outside investors.

This financing innovation aimed at the funding gap of R&D is proposed in the paper, "Sharing R&D Risk in Healthcare via FDA Hedges," which was presented by Richard Thakor. The argument put forward by the authors is that firms conducting R&D will benefit from exchange-traded FDA hedges, leading to potentially more projects being funded, because some of the risk will be transferred to other parts of capital markets. In other words, society will benefit from risk sharing. Needless to say, for the instrument to take off and be widely used it ought to be simple in its mechanism and practical. The authors rely on the concept of binary options to reach this goal. In such a case, the FDA binary option will pay a fixed dollar amount in the event of the trigger event, i.e. failure of a specific drug in any stage of the FDA approval process.

The FDA Hedge instrument should address the development risk because of two economic explanations. First, the instrument will allow financial investors to better hedge the development risks and thus should increase their supply of capital, both equity and bonds, to drug developers. Second, firms themselves can purchase the FDA hedges, a decision akin to buying insurance against a negative event. Both channels should lead to higher supply of funding.

The authors proceed to investigate the feasibility of such instruments, especially the pricing, using a project-level data of the estimates of the probability of eventual FDA approval for a large number of therapeutics. The authors document gains from trading arising from the FDA Hedge instruments due to the zero-beta property of FDA hedges, bringing together, on one hand, issuers interested in diversified investments and, on the other hand, drug developers aiming to transfer approval risk.

First, what explains the VC's behavior to engage in knowledge transfer across startups given that this could lead to knowledge expropriation? Second, why should a startup be interested in getting funding from a VC with an ownership stake in a competing startup?

What about the feasibility of such instruments? One is glad to read that a form of FDA risk-based instrument already exists in the markets. In fact, the exchange-traded Contingent Valuation Rights, an instrument issued in connection with M&A activity in the pharmaceutical industry, is nothing less than a witness to the market's acceptance of such ideas. Expanding that same idea to cover also drug development risk should be seen as a natural progression towards a market-based solution to solve even larger challenges.

Role of VCs

Recent empirical evidence shows some new, non-conventional behavior of venture capital funds (VCs) when financing broad R&D efforts (i.e. not only medical): The same VC may provide funding to competing startups, and contribute towards startup performance via resource transfers going from stronger startups to weaker ones. This is nothing short of surprising also because resource transfers across startups seem to be more persistent if startups are engaged in a direct competition between them. The presence of a common VC is likely to lead to higher expropriation of innovation and knowledge, which is a potentially big cost.

These new findings give rise to two important questions. First, what explains the VC's behavior to engage in knowledge transfer across startups given that this could lead to knowledge expropriation? Second, why should a startup be interested in getting funding from a VC with an ownership stake in a competing startup? Merih Sevilir presented the paper, "Financing Competing Innovations: Picking the Winner or Helping the Weaker?" that attempts to answer these questions through a theoretical model.

The paper argues that high competition between startups is the key ingredient to prevent the expropriation of the inherent knowledge, and will induce each of the startups involved to learn from each other's innovative knowledge rather than engage in expropriation. Precisely because expropriation leads to lower payoffs when competition is highest, and VC's rent extraction from the expropriating startup is largest, that it becomes less desirable in situations when competition is highest. In other words, the risk of expropriation is lower precisely when competition is highest because it is in that state that the cost of expropriation is highest.

One interesting insight of the model is that knowledge transfers occur in a one-way direction: From the stronger to the weaker startup. This result suggests a "helping the weaker startup" role for the VC rather than the more traditional "picking the stronger and killing the weaker" role.

Role of Financial Regulation

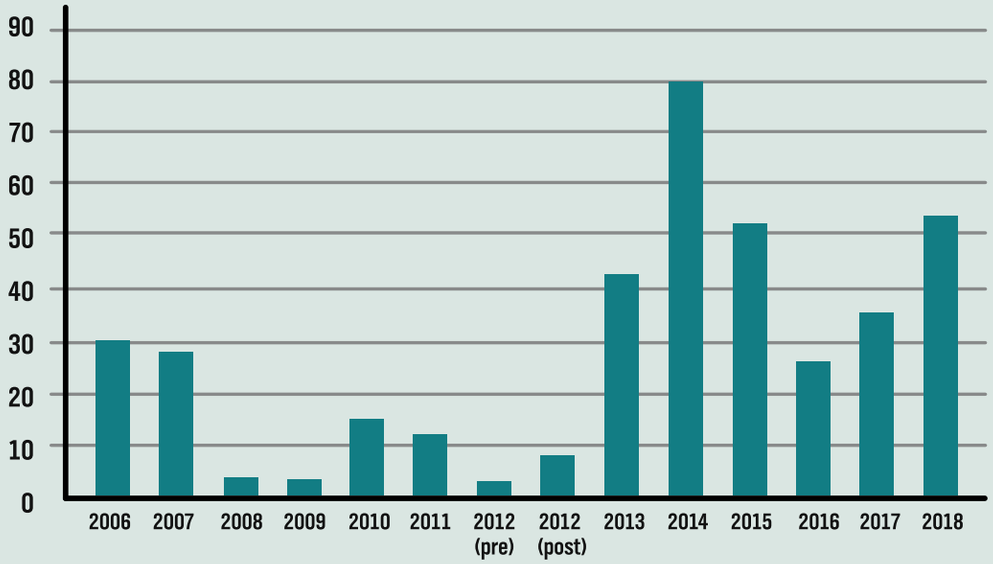
There is also a role for regulation of financial markets to play an important role. Innovation emerging from smaller dynamic companies, the so-called Emerging Growth Companies (EGCs), is the real engine driving transformative aggregate innovation in our society. Biotech startups are at the frontier of scientific innovation, and engender societal benefits by transferring their R&D in a variety of medical conditions into marketable therapeutic applications. Lack of access to financial markets may really slow their development and with it their medical solutions.

It is precisely these companies that need the most funding for their R&D but are hampered by various obstacles. Their cost of capital is very high because they lack a long track record of cash flow generation and are also seen as opaque. Accessing the equity markets through an Initial Public Offering (IPO) is an important milestone in their development but the level of regulatory oversight may be too high for them.

One potential solution is for financial regulatory bodies to recognize the objective challenges the EGCs face when meeting the high regulatory/transparency thresholds. To this end, in 2012, the Jumpstart Our Business Startups (JOBS) Act was enacted by Congress with one objective: encouraging EGCs to access financial markets by easing disclosure and compliance with existing listing rules in the case of EGCs' IPOs.

The paper, "Deregulating Innovation Capital: The Effects of the JOBS Act on Biotech Startups," presented by Joshua White, investigates the impact that such legislation had on various aspects of the business models of biotech startups and their innovation.

Figure 1: Biotech IPOs Per Year, 2006 to 2018



The figure shows the number of biotech IPOs over the period 2006-2018 which is used to straddle perfectly the introduction of JOBS Act. There were 94 biotech IPOs in the pre-JOBS period and 300 biotech IPOs in the post-JOBS period. Evidence obtained from the paper "Deregulating innovation capital: The effects of the JOBS Act on biotech startups," Craig Lewis, and Joshua White (2020).

The first striking result is the immediate and long-term effect that such legislation had on the number of biotech IPOs on U.S. markets. The evidence (shown in *Figure 1*) shows that upon implementing the JOBS Act, the number of such IPOs increased significantly. After years with a limited flow of biotech IPOs, markets experienced a big increase in biotech IPOs: approximately 90% of IPOs after the JOBS Act were carried out by EGCs. This was an important development because better access to markets has been found to spur all types of firm investments, including R&D, eventually leading to large market capitalizations due to future growth opportunities.

The major benefits from lower regulatory costs flow mostly to early stage biotech startups: the analysis shows that biotech companies go public 1.34 years earlier in the development stage of the lead product in their portfolio, an 18% decline when compared to the pre-JOBS period.

This earlier access to financial markets should help these start-ups during their most critical phase: the product development stage is the main driver for biotech IPOs, thus increasing the probability of success and setting the firm on a path of future growth.

The authors find that the lead drug candidate at more than a quarter of post-JOBS Act biotech IPOs are oncology therapeutics and the volume of cancer-related IPOs increased more than five-fold in the same period compared to the pre-JOBS period. Yet, oncology therapeutics are not the only noteworthy outcome. At the same time, the authors also find a significant increase in the biotech IPOs targeting rare diseases after the JOBS Act. The implication from these results is that such R&D, and the eventual transformative drugs that will emerge, would have been harder to achieve without such access to financial markets.

Conclusions

The funding gap of R&D in the biomedical industry is real and engenders negative repercussions on the human condition. Few major reasons explain investors' unwillingness to provide financing for R&D due to well-known risks. What is troublesome is that underinvestment in biopharma R&D causes a potentially large number of life-transformative drugs to not be realized. As a society, the human costs of such failures are prohibitive. Financial markets can provide solutions. Perhaps the signing into law of the National Cancer Act of 1971 still has a valuable lesson for us: the government can provide a framework that will allow proper coordination and facilitation of market-based solutions for the benefit of our societies.

Papers Presented

Craig Lewis, and Joshua White (2020) "Deregulating innovation capital: The effects of the JOBS Act on biotech startups."

Adam Jørring, Andrew W. Lo, Tomas J. Philipson, Manita Singh, and Richard Thakor, (2020) "Sharing R&D Risk in Healthcare via FDA Hedges."

Merih Sevilir, (2020) "Financing Competing Innovations: Picking the Winner or Helping the Weaker?"

Paper: “Organizational Higher and Purpose and Workplace Attitudes: Evidence From the Field”

Authors: Stuart Bunderson and Anjan Thakor, Olin Business School

Date: December 2020

What Does Organizational Higher Purpose Mean for the Workforce?

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The past few years have witnessed an explosion of interest in the topic of organizational higher purpose. At least part of the impetus for this heightened interest comes from Larry’s Fink’s[1] 2018 assertion, in his annual letter to CEOs, that “Society is demanding that companies, both public and private, serve a social purpose. To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society.” In response to this and other recent calls for higher purpose (see the 2019 statement from the Business Roundtable), many companies are scrambling to define and implement a higher purpose and many consulting firms are scrambling to advise them on how and why to do so. In just the past year, *Harvard Business Review* dedicated a special issue to the topic (see “How to Lead with Purpose,” Spring 2020 issue) and the *McKinsey Quarterly* published at least ten different articles examining aspects of organizational higher purpose.

Not surprisingly, enthusiasm for organizational higher purpose has outpaced careful empirical and theoretical research that would support the many claims about the benefits of higher purpose. While past research has provided some theoretical rationale for the benefits of purpose (see Henderson & Van den Steen, 2015) and has provided evidence that purpose can lead to higher performance (see Gartenberg, Prat, & Serafeim, 2019), there is still much to learn about how and when higher purpose benefits firms.

For example, while the benefits of higher purpose are typically assumed to derive from higher employee engagement, we are still learning about the relationship between purpose and various indicators of employee engagement. Moreover, whereas higher purpose is often presumed to articulate prosocial aims (see Bartlett & Ghoshal, 1994), the extent to which the benefits of higher purpose are contingent on prosocial aims, or a particular class of prosocial aims, is not clear.

[1] Larry Fink serves as CEO of BlackRock, the largest investment management firm in the world with $8.67 trillion in assets under management as of January 2021.

We introduced our questions about organizational higher purpose with the following prompt: "A statement of organizational higher purpose captures the higher social or human purpose served by an organization, beyond just the business objectives of the enterprise. That is, a statement of higher purpose makes it clear to all how the business of the organization helps society."

To provide insight into these questions, we conducted a nationwide survey of working adults to learn about their personal and organizational higher purpose. That survey was reported in a working paper[2]. Here we summarize specific survey results from that working paper that speak to the following questions:

1. Do employees who work for purpose-driven organizations differ from other employees in key indicators of employee engagement?

2. If yes, do the observed benefits of higher purpose depend on the specific stakeholders targeted by an organization's higher purpose?

Next we summarize our survey method and key findings. We end with a discussion of the implications of these findings for our understanding of higher purpose.

01 Organizational Higher Purpose and Workforce Attitudes

The sample of respondents for this survey was deliberately designed to capture a broad and representative cross-section of the American working population. We worked with an external polling organization to specifically recruit a balanced sample of respondents in terms of gender, ethnicity, income, and geography. Respondents also varied broadly in terms of education, work experience, managerial experience, and industry. All respondents were currently employed. *Table 1* summarizes key sample demographics. On average, our respondents had a college education, were in managerial positions, were middle-income individuals split almost evenly between being employed by for-profit and other types of organizations, and were roughly representative of the racial composition of the U.S. population.

We introduced our questions about organizational higher purpose with the following prompt: "A statement of organizational higher purpose captures the higher social or human purpose served by an organization, beyond just the business objectives of the enterprise. That is, a statement of higher purpose makes it clear to all how the business of the organization helps society." We then asked the following question: "Does the organization you work for have a statement of higher purpose?" Because organizations differ in how formalized their purpose statements are, we then provided the following response options: *1 = No, 2 = Yes*, but not formally written down, and *3 = Yes*, we have a written purpose statement. Just over half of our respondents (56.5%; n = 576) worked for organizations that had a higher purpose statement, with 21.2% (n = 216) unwritten and 35% (n = 360) written.

We captured the content of each organization's higher purpose statement by inviting

[2] Bunderson, Stuart and Anjan Thakor: *Organizational Higher and Purpose and Workplace Attitudes: Evidence From the Field,* WFA-CFAR Working Paper, Olin School of Business, December 2020.

Table 1: Demographics of Respondents*

Gender	**Distribution:** 48.7% male, 51.3% female [46.8% female in U.S. working population]
Age	**Median:** 35 to 44. **Distribution:** 18 to 24 = 7.4% [10.6%]; 25 to 34 = 21.1% [22.9%]; 35 to 44 = 23.5% [21.8%]; 45 to 54 = 19.1% [20.6%]; 55 to 64 = 23.3% [17.4%]; 65 or older = 5.7% [6.7%]
Race	**Distribution:** 71% White [78%]; 17% Hispanic [17.6%]; 13% Black [12.1%]; 3% Asian [6.4%]; 1% American Indian [No Data]
Education Level	**Median:** Bachelor's degree. **Distribution:** Some High School = 0.7%; High School or Equivalent = 12.0%; Trade School = 2.5%; Some college = 15.6%; Associate's = 11.8%; Bachelor's = 33.9%; Master's = 17.7%; Doctorate = 5.5%
Years of Work Experience	**Median:** 10-15 years. **Distribution:** <5 = 15.4%; 5-10 = 23.1%; 10-15 = 19.6%; 15-20 = 13.2%; >20 = 28.8%
Title	**Distribution:** Intern = 1.5%; Entry Level = 17.2%; Analyst/Associate = 33.0%; Manager = 24.2%; Senior Manager = 6.3%; Director = 5.7%; VP = 1.8%; SVP = 1.2%; C-Level = 2.4%; President or CEO = 2.4%; Owner = 4.5%
Years of Management	**Median:** 5-10 years **Distribution:** None = 27.8%; <5 = 25.5%; 5-10 = 18.5%; 10-15 = 11.2%; 15-20 = 7.9%; >20 = 9.1%
Salary	**Median:** $50,000 to $100,000 **Distribution:** <$25K = 9.0%; $25K to $50K = 30.9%; $50K to $100K = 32.6%; $100K to $200K = 15.1%; >$200K = 7.8%
Organizational Type	**Distribution:** For profit = 49.9%; Non-profit = 8.1%; Government = 10.1%; Health Care = 12.2%; Education = 12.2%
Organization Size	**Median:** 500-999 employees **Distribution:** 1 = 4.1%; 2-9 = 6.9%; 10-24 = 8.5%; 25-99 = 13.6%; 100-499 = 16.2%; 500-999 = 10.9%; 1000-4,999 = 14.2%; 5,000+ = 25.5%

*For gender, age, and race, bracketed numbers are the percentage of each group in the U.S. working population based on 2020 Bureau of Labor Statistics data (https://www.bls.gov/cps/cpsaat03.pdf).

respondents to indicate which stakeholder groups are included in their organization's statement of higher purpose. Options included shareholders, employees, customers, the local community, the broader society, and the environment. Respondents were instructed to check all that applied. *Table 2* summarizes their responses. Because we observed differences between respondents who worked for organizations with written versus unwritten purpose statements, we include data for all respondents in Column A and data for respondents from firms with written purpose statements in Column B. Compared to respondents who worked for organizations with unwritten purpose statements, respondents from written-statement organizations reported a significantly greater emphasis on customers ($p < .05$), the local community ($p < .001$), and the broader society ($p < .001$). One possible explanation for this finding is that organizations that include external stakeholders in their statement of higher purpose may opt to write that statement down so that it can be shared with those external stakeholders, both for external relations and accountability reasons.

Table 2: Elements of Higher Purpose Statements

ELEMENT	ALL RESPONDENTS WITH A PURPOSE STATEMENT (n = 576)	RESPONDENTS FROM FIRMS WITH WRITTEN PURPOSE STATEMENTS (n = 360)
Shareholders	25%	27%
Employees	61%	62%
Customers	57%	60%
Community	46%	54%
Society	27%	32%
Environment	20%	20%

*Numbers represent the percentage of respondents reporting that each element is included as part of their organization's purpose statement.

Past research has suggested that an organization's stakeholders can be divided into (at least) two groups: primary stakeholders and secondary stakeholders (Freeman & Reed, 1983). Primary stakeholders are those stakeholders that engage in economic transactions with an organization, and include shareholders, customers, and employees. Secondary stakeholders do not necessarily engage in economic transactions with an organization but affect and/or are affected by organizational decisions and actions. These include the local community, the broader society, and the environment. Although some have argued that investing in secondary stakeholders yields long-term benefits to an organization in the form of things like good will and a "license to operate" (see Fink, 2018), a commitment to secondary stakeholders is generally viewed as a prosocial decision (see Henderson and Van den Steen, 2015).

As we see in *Table 2*, the higher purpose statements of organizations in which our survey respondents worked were most likely to emphasize two primary stakeholders—employees (61%) and customers (57%). Moreover, 25% of our respondents reported that their organizations included shareholders in its higher purpose. This is consistent with past research suggesting that organizational higher purpose statements are not always about prosocial commitments but may be, and often are, linked to a firm's day-to-day business concerns (see Gartenberg, Pratt and Serafeim (2019), Quinn and Thakor (2018, 2019) and Thakor and Quinn (2020)). At the same time, many of our respondents worked for organizations that did emphasize secondary stakeholders—the local community (46%), the broader society (27%),

Table 3: Respondent attitudes toward their organization's higher purpose, organization, and leadership

SURVEY QUESTION	NO HIGHER PURPOSE	UNWRITTEN HIGHER PURPOSE	WRITTEN HIGHER PURPOSE	STATISTICAL DIFFERENCE: WRITTEN VS. UNWRITTEN	STATISTICAL DIFFERENCE: PURPOSE VS. NO PURPOSE
To what extent is your organization's higher purpose inspiring and meaningful to you personally?	NA	14% said "extremely meaningful"	26% said "extremely meaningful"	$p < .01$	NA
To what extent does your organization's purpose influence the decisions you make as a member of the organization?	NA	17% said "to a great extent"	26% said "to a great extent"	$p < .01$	NA
I am proud to work for my employing organization	19% said "strongly agree"	31% said "strongly agree"	41% said "strongly agree"	$p < .001$	$p < .001$
To what extent do you trust your organization's top leaders to make intelligent and well-informed business decisions?	16% said "to a great extent"	20% said "to a great extent"	26% said "to a great extent"	$p < .01$	$p < .001$
To what extent do you trust your organization to make socially-responsible business decisions?	15% said "to a great extent"	24% said "to a great extent"	29% said "to a great extent"	$p < .001$	$p < .001$

and the environment (20%). This variance in the content of higher purpose statements invites a consideration of whether some elements of purpose are more inspiring and engaging than others.

To explore the question, we asked each respondent to evaluate their feelings about their organization's higher purpose, about their organization, and about their trust in organizational leaders. The specific questions are included in *Table 3* above, along with the percentage of respondents who marked the highest response category. Because we observed significant differences between respondents who worked for organizations with written versus unwritten purpose statements, we include data for both.

The data reported in *Table 3* suggests that organizational higher purpose is associated with greater pride in employees and greater trust in leaders. Moreover, respondents in purpose-driven organizations not only trusted their leaders to make socially-responsible business decisions, they also trusted them to make better-informed business decisions. A commitment to higher purpose on the part of an organization, it would appear, is viewed as a signal of good governance. It is important to note that these effects are consistently stronger for higher purpose statements that are written down.

A written higher purpose statement reflects a more tangible commitment to purpose on the part of the organization, greater clarity on the elements of purpose, and a commitment to communicating and disseminating purpose throughout the organization. It is therefore perhaps not surprising that respondents in organizations with written higher purpose statements were more inspired by their organization's purpose statement and more likely to use that purpose statement in making decisions (see *Table 3*).

Table 4 presents the results of an ordinary least squares regression analysis of the relationship between the different elements of purpose and the respondent attitudes that we explored in *Table 3*. The numbers reported in *Table 4* should be interpreted as the strength and direction (positive or negative) of the relationship between each element of purpose and respondent attitudes, after controlling for the effects of age, race (i.e., majority status), salary, whether the respondent was in a senior leadership position, whether the respondent worked for a non-profit organization, and whether organizational purpose was written down. Some interesting patterns emerged from this analysis. Respondents who reported that their organization included shareholders in its higher purpose, were less inspired by that purpose, were less influence by that purpose in their decision making, felt less pride in their organization, and had less trust in leaders to make business-savvy and socially-responsible business decisions. In contrast, purpose statements that included the environment were more inspiring and influential, and were associated with greater pride in the organization and trust in leadership. None of the other elements of purpose was consistently associated with respondent attitudes, although respondents were prouder to work for organizations that included the local community and broader society in their purpose statements, and trusted leaders to make smarter business decisions when employees were included in purpose statements.

02 Implications for Governance and Shareholder Value Maximization

In sum, we found that employees of purpose-driven organizations felt more pride in their organization and more trust in their leaders, especially when that purpose was written down. We also found, however, that purpose statement that focused on shareholders were less inspiring and influential, and led to lower pride and trust in leadership. There are several possible reasons for this. One is that employees may believe that organizational leaders will focus on shareholder value anyway (due to executive compensation contracts, investor pressures, etc.), and that it is unnecessary to explicitly include it in a higher purpose statement. Second, they may not view shareholder value as a higher purpose of the organization, one that transcends the usual business goals. Third, including shareholder value in a statement of organizational higher purpose may make employees suspicious that the purpose statement is not authentic , and is being merely used as another motivational tool to elicit higher employee effort.

This finding does not necessarily imply that companies should not focus on shareholder value. Having that focus is still a part of good governance. But the finding does indicate that a higher purpose statement has to transcend profit maximization goals. So, as Thakor and Quinn (2020) point out, employees have to believe that decisions are being made at the intersection of business goals (like shareholder value maximization) and a higher purpose that is distinct from those business goals but may still be a part of day-to-day decisions. This provides a new perspective on corporate governance that seems worthy of further research.

Another finding of relevance for corporate governance is that when employees believe that the organization's leaders are embracing a prosocial goal in articulating an authentic higher purpose, they also have greater trust in their business decisions. This may be a perception spillover effect from genuine social responsibility to ethical behavior. That is, employees may believe that leaders who embrace an authentic higher purpose are also more likely to be ethical and hence trust them to make better business decisions. Put a little differently, employees may perceive that the agency problems caused by separation of ownership and control are less severe when the leaders of the organization are more socially responsible—higher purpose engenders trust. Whatever the reason, this finding is also a potentially fruitful area for further theoretical and empirical research.

Table 4: Respondent attitudes as a function of purpose elements.

PURPOSE ELEMENT	PURPOSE IS INSPIRING	PURPOSE INFLUENCE MY DECISIONS	PROUD TO WORK FOR ORG	TRUST LEADERS TO BE BUSINESS SAVVY	TRUST LEADERS TO BE SOCIALLY RESPONSIBLE
Shareholder	-.41***	-.34**	-.19*	-.17+	-.20*
Employee	.09	.01	.07	.26**	.14
Customer	-.08	.11	.04	.12	.12
Local Community	.22*	.12	.20*	.03	.12
Broader Society	.11	.07	.22*	.16	.19+
Environment	.50***	.54***	.35***	.27*	.49***
Var Explained	.07***	.06***	.07***	.05***	.08***

+ p < .10; * p < .05; ** p < .01; *** p < .001; N =
The following controls were included in all models: age, race, salary, senior leadership position (yes/no), non-profit organization (yes/no), written purpose statement (yes/no)

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For a formal analysis of this issue, see Thakor and Quinn (2020).

Paper: “A Business Case for Non-Tokenistic Gender Diversity”

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Date: March 2021

A Business Case for Non-Tokenistic Gender Diversity

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MOTIVATION AND RESEARCH OBJECTIVES

Board gender-diversification (i.e., the systematic increase in the proportion of board seats occupied by female directors) remains an important subject across the globe. However, the business case for it remains inconclusive. The existing empirical evidence on the impact of board gender diversity on corporate behavior and firms’ financial performance is mixed. Take Norway’s 2006 imposition of a 40% female gender quota on corporate boards as a case in point: Some authors show that the firms affected by the quota undertook fewer workforce reductions, had higher labor costs and employment levels, and had lower short-term profits than comparison firms. Other authors conclude that the constraint imposed by the quota led to a significant drop in the stock prices of the affected firms at the announcement of the law; a large decline in Tobin’s Q over the following years; younger and less experienced boards; increases in leverage and acquisitions; and deteriorations in operating performance. Yet, some authors disagree, arguing that the gender quota had no net negative effect on the affected firms and suggested that the econometrics employed in the previous papers were deficient. The extant results on the relationship between gender and risk preferences also appear mixed, and little is conclusively known about how individual risk preferences manifest in small groups.

My paper[1] provides a novel set of empirical analyses to shed light on this debate. Primarily, I argue that the mixed nature of the empirical evidence on the impact of board gender diversity on corporate behavior and firms’ financial performance derives largely from the difficulty in empirically identifying the way in which different group/board-structures affect the impact of gender diversity on firm performance. I use an approach that avoids these difficulties.

To develop my argument, I consider that a board is a cooperative enterprise in which decisions are often reached via consensus and in which the latter may be sustained with the threat of a vote. I also consider that, in some firms, the CEO may make all the major decisions. Suppose then that a previously homogeneous

male board just became gender-diversified by the introduction of one female director who, perhaps, possesses a strong set of counter-balancing risk preferences. If the female director were token (i.e., not influential) on the board or if the CEO were dictatorial, then the resultant board composition would be no different from the previous, in terms of the effective gender composition. Hence, the risk profile of the board may not necessarily be altered by such an event. Moreover, even if some board gender-balancing were mandated by some legislation, if the CEO was dictatorial and oversaw a largely co-opted board (or if the incumbents resisted the new mandate), then similar results as in the previous case could logically ensue. Worse still, the complications emanating from a potentially difficult change process might exacerbate some negative financial outcomes for the firm, in the short run at least. Nevertheless, to overcome the aforementioned empirical difficulty, I take a three-stage analytical approach to my research design.

Research Design and Results

In the first stage, I use hand-collected data from over 12,000 minutes of the original series of the multiple Emmy Award-winning television game show, ***Cash Cab***, to examine what happens to the risk-taking behavior of small groups (of different gender compositions) when each member can ultimately exert the equivalent of absolute power or influence on the group's willingness to take significant financial risks. To fix ideas, I note that Jianakoplos and Bernasek[2] (1998), using U.S. sample data of household holdings of risky assets, conclude that women are more financially risk-averse than men, while Adams and Funk[3] (2012), using survey data, conclude that women may be more risk-loving. I refrain, ex-ante, from subscribing to either conclusion. I conjecture, however, that if risk-taking tendencies truly vary by gender, on average, and suppose that the group-interaction setting is such that each member of every small group (of various gender compositions) possesses some unidirectional veto power to ultimately shift the collective risk-taking behavior toward less risk-taking, then a pseudo-experimental examination of many of such groups might help resolve this debate. Specifically, I hypothesize that in group settings in which each member equally possesses some unidirectional veto power to ultimately enforce less collective risk-taking, the presence of one individual of the more risk-averse gender type will significantly reduce the group's willingness to take financial risks. However, the converse scenario for the less risk-averse gender type will not be observed, primarily because this veto power cannot be used to enforce greater risk taking.

Since any member of a ***Cash Cab*** group can ultimately exert some absolute power or influence to stop the group from taking significant financial risks, the original series of the game setting, in particular, effectively constitutes an excellent pseudo-laboratory to empirically evaluate the above hypotheses. The game setting can also be compared to the corporate board in several ways: ***Cash Cab*** is fundamentally a cooperative enterprise in which small groups of various sizes work together to earn a cumulative sum, X, and in the end, must reach an often consensus investment decision on whether to distribute and part with their earnings or bet the same in a risky (investment) offer. The elements of the game are also strikingly similar to a simple board investment decision model, and the cumulative winnings under risk are economically significant. However, different from what typically obtains on most corporate boards, but particularly interesting for my empirical analyses at this stage, the game

[1] This research summary outlines the motivation, objectives, research design, key findings, and contributions of my paper titled,"How Many Female Seats on a Board? Group Gender-Diversification, Power, Risk-Taking, and Financial Performance." The paper is part of my Ph.D. thesis. I thank Todd Milbourn, Taylor Begley, Todd Gormley, Xing Huang, Mark Leary, and Anjan Thakor for their kind advice and valuable comments. I also thank Ohad Kadan, Asaf Manela, Radha Gopalan, Phil Dybvig, Jason Donaldson, Janis Skrastins, Jeremy Degenhart, Andrew Knight, Jessica Hatch, Brett Green, Armando Gomes, Guofu Zhou, Jennifer Dlugosz, and Tat Chan for their very useful comments. I am exceedingly grateful to the WFA-CFAR for the 2021 Outstanding Ph.D. Student Paper Award.

[2] Jianakoplos, N.A., Bernasek, A., 1998. "Are women more risk-averse?" *Economic Inquiry* 36, 620–630.

[3] Adams, R.B., Funk, P., 2012. "Beyond the Gass Ceiling: Does Gender Matter?" *Management Science* 58, 219–235.

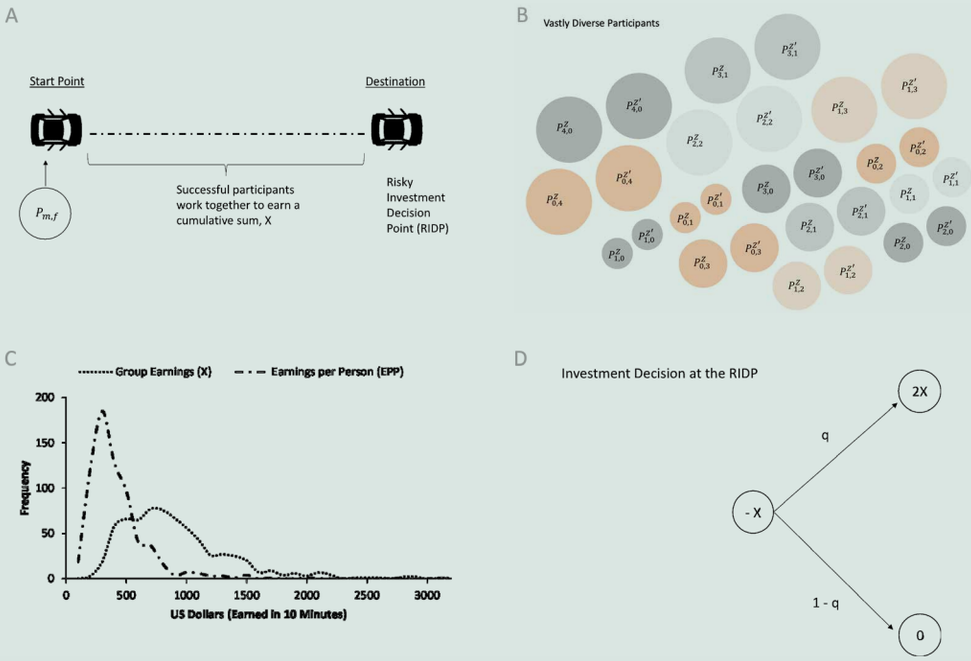
Figure 1: Analytical Stage 1: *Cash Cab* as Pseudo-Laboratory

A) Cash Cab: Unsuspecting passengers $P_{m,f}$ with m males and f females board a taxi to head to a destination. Once in the taxi, they are told that they are in the *Cash Cab*. If they agree to play, they work together answering questions and earn incremental sums of money. If they max out their life lines and/or answer more than 2 questions incorrectly, before arriving to their destination, they lose their cumulative sum, X, and leave the taxi immediately. Else, they keep X and may freely disembark with their earnings. Before they leave, however, they are made a double or loose all offer. I call this point the Risky Investment Decision Point (RIDP). There, each member can stop, but never enforce, the collective risk-taking. The games in my sample occurred in New York and Chicago, two of the largest and most diverse cities in the USA.

B) Diverse Participants and Consolidation of Pure Gender Effects: *Cash Cab* participants are vastly diverse in demographic characteristics such as age, gender, race, status, etc. The symbols Z and Z' represent opposite characteristics (e.g., young v. old; white v. black; and many more). Even though the choice to participate in the game falls short of a random assignment by me as the researcher, the deep diversity of the participants allows me to regroup the participants along progressive shades of gender categories – e.g., Homogenous Male, Majority Male, Gender-Balanced, Majority Female, and Homogenous Female. These pooled groups with similar gender categories but multiple opposite characteristics allow me to compute the average impact for each gender subgroup, by re-enforcing the pure gender effects while averaging out other subgroup characteristics. See my original paper for an elaboration of my identification strategy.

C) Group Earnings (X) and Earnings Per Person (EPP) in the *Cash Cab*: The frequency distributions (below) are based on the 63.1% of the total of 1047 participating groups (in my sample) that successfully arrived at the RIDP and had the chance to bet their cumulative sum, X. The EPP is computed by dividing the cumulative earnings by the group size. Group size varies from 1 to as many as 4 persons. All sums are earned in just about 10 minutes and are economically significant.

D) Risk-Taking at the RIDP: The investment decision at the RIDP of the *Cash Cab* is equivalent to purchasing a lottery that doubles the participants' investment, X, in the success state with a probability q; or pays them nothing in the failure state. Ex-ante, q=0.5 and is declared as such by the game host. This implies also that, ex-ante, the expected value of the lottery is zero. Technically, however, several factors, including gender composition cause the participants to perceive q differently. Again, see my original paper for details on these factors, empirical controls, results, and robustness analyses.



...the homogeneous male groups in the *Cash Cab* take more financial risks because the average male appears more willing to take financial risks at higher individual earnings than the average female.

setting explicitly reinforces a collegial within-group power structure and social dynamics in which every group member's voice, power, and/or influence can be magnified in an egalitarian manner, more so against risk-taking; the immediacy of the outcome of the risky bet is common information; the linkage of outcome to actual decision-makers is direct; the participants are diverse and it is possible to consolidate pure gender effects, after directly controlling for other game factors. See *Figures 1A* to *1D* for some schematic descriptions.

My empirical analyses of the ***Cash Cab*** pseudo-laboratory data reveal some fascinating results unique to the setting. Starting with the one-person game, I find that an individual female participant is, on average, more risk-averse than an individual male participant. Surprisingly, however, looking at the two-, three- or four-person group participants, I ultimately deduce that, on average, adding just one female to a previously homogeneous male group reduces the group's willingness to take financial risks. If, however, a group (of at least three persons) consists of one female, adding more females does not change the group's risk-taking behavior. The key results drivers are discernible from the basic conditions in the Cash Cab setting. Specifically, once a group earns the cumulative sum $X > 0$, each member of the group can mentally compute his or her earnings per person (EPP). The implicit acknowledgment of the EPP and the requirement for unanimity affords each member the equivalent of a veto power such that groups never purchase the lottery even if only one member expresses a serious reservation (i.e., insistently says no). Moreover, the game host checks to ensure that the group is generally happy to collectively take the risk and that there is no absolute dissent.

In effect, the homogeneous male groups in the ***Cash Cab*** take more financial risks because the average male appears more willing to take financial risks at higher individual earnings than the average female. Also, conditional on one female being in a ***Cash Cab*** group (of at least three persons), adding more females seems, on average, irrelevant for group risk-taking because the first average female in the group (with implicit veto power) converts the group, figuratively, to an average female-centric group in terms of relative group risk preferences. The converse scenario for the addition of one male to, say, a previously homogenous female group is, as hypothesized, not observed in the data because the individual veto in the game setting can only be used to stop, and never to enforce, the collective risk-taking. I provide, in the appendix of my original paper, references to easily observable video data to demonstrate that several alternative explanations or conjectures, other than the key game features such as the implicit individual veto power, are not important for evaluating the collective risk-taking behavior of the ***Cash Cab*** groups.

These findings, together with the unique properties of the ***Cash Cab*** setting, imply that the within-group power and influence distributions impact whether individual tendencies become manifest in small group settings, exactly so for the effect of gender diversity on collective risk-taking. Furthermore, because the individual veto power implicit in the ***Cash Cab*** setting guarantees that no individual participant or subgroup is token, I expand the definition of a token individual or subgroup to include those whose share of the within-group power and influence distributions is unlikely to enable the manifestation of their average characteristics or tendencies (e.g., risk preferences, deliberative mechanisms, etc.) in the ultimate collective outcomes. This definitional expansion is particularly important because Kanter[4] (1977) popularized the idea that proportions, i.e., the relative numbers of socially and culturally different people in a group, are critical in shaping interaction dynamics. She identified four group types based on varying proportional compositions and described "skewed" groups as containing a large preponderance of one type (the numerical "dominants") over another (the rare "tokens"). Nevertheless, my findings in the ***Cash Cab*** pseudo-laboratory suggest that proportions must lead to sufficient power and influence to be meaningful for the eventual evasion of tokenism or the guarantee of an exit from a token status. Put differently, a low-proportion subgroup, or even just one individual, with an enormous share of the within-group power and influence distribution, can be "the dominant," not "the token."

In the second stage, I explicitly consider several testable implications of my findings (in the ***Cash Cab*** pseudo-laboratory) for board gender-diversity, gender-diversification, corporate risk-attitudes, as well as firms' financial performance. Also, I note that CEOs—be they male or female—tend to have large shares of power and influence in firms and on corporate boards. Consequently, I develop three hypotheses, as follows. One, on average, if the CEO of a firm is male and the board is homogenous male, then the addition of one ordinary female director (i.e., a female director whose individual share of the within-board power and influence is low) to the board, in a non-leading role, may not significantly alter the firm's risk profile, all other things equal. Two, if the CEO of the firm is male and its predominantly male board consisted of only one ordinary female director (again, a female director whose individual share of the within-board power and influence is low), then the addition of more such female directors to the board, also in non-leading roles, may significantly reduce the firm's risk profile only if it leads to more aggregate power and influence on the board for these female directors through their collective voting on risk-related issues. Three, if, however, a male CEO of a predominantly male board is swapped with a female CEO (an event that is likely to significantly increase the aggregate share of power and influence in the firm and on the board for the female subgroup of directors), then the risk profile of the firm may be significantly reduced. Moreover, to the extent that these board gender-diversification events lead to non-disruptive reductions in firms' financial risk-profiles, then financial performance may also improve at these firms. These are all conjectures, of course, and the proof of the pudding is in the taste provided by the empirical tests that I perform.

In the third stage, I test these hypotheses using board and financial data (for publicly listed U.S. companies) spanning nearly 20 years. Following the standard practice in the literature, I exclude firms from industries such as banking and utilities because of significant differences in regulatory oversight that can limit the role of the board. I focus not only on the risk indicators that the new directors can, themselves, impact

[4] Kanter, R. M. (1977), "Some Effects on Proportions on Group Life: Skewed Sex Ratios and Responses to Token Women." *American Journal of Sociology,* 82, 965–90.

Table 1: Stage 3: External Validity Test using Pseudo-Natural Experimental Samples from Board/Financial Data

Panels A, B, and C report the difference-in-differences regression results for the *structured* treated and control groups defined (below) for hypotheses 1, 2, and 3, respectively. All boards have at least three (3) directors, pre- and post- event. An ordinary director is a director in a non-leading role on the board. All regressions use a 3-year window pre- and post- event and, as indicated below, include *year, cohort, firm,* and *industry-year* fixed effects. A *year-t* cohort consists of all firms that qualify as either a treated or a control firm in that event year. For each cohort, treated firms must have at least one control firm in the same Fama-French industry and vice-versa.

A) Hypothesis 1: Adding one ordinary female director to a previously homogeneous male board with a male CEO

Treated Firms: No female director on the board for at least three years prior; add one ordinary female director in the event year; and no other major changes to the board.

Control Firms: No female director on the board for at least three years prior; add one ordinary male director in the event year; no female director on the board for at least two more years following the event year; and no other major changes to the board.

B) Hypothesis 2: Adding one or more ordinary female directors to a board with one ordinary female director and a male CEO

Treated Firms: One ordinary female director on the board for at least three years prior; add one or more ordinary female directors in the event year; and no other major changes to the board.

Control Firms: One ordinary female director on the board for at least three years prior; add one or more ordinary male directors in the event year; no other female director on the board for at least two more years; and no other major changes to the board.

C) Hypothesis 3: Swapping a male CEO with a female CEO

Treated Firms: Male CEO for at least three years prior; swap the male CEO with a female CEO in the event year; keep the new female CEO for at least two more years.

Control Firms: Male CEO for at least three years prior; swap the male CEO with another male CEO in the event year; keep the new male CEO for at least two more years.

Data source: ISS Directors Data, Execucomp, Compustat

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Debt/Asset	*Debt/Equity*	*Cash/Asset*	*Vol8Q. Cash/Asset*	*Tangibility*	*Profitability*	*Vol36m. MktAdjRet*
Treated_Post	-0.0092	-0.0432	0.0162	-0.0121	-0.0020	-0.0039	-0.0006
	(0.0115)	(0.0996)	(0.0110)	(0.0176)	(0.0054)	(0.0076)	(0.0025)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.887	0.860	0.855	0.692	0.989	0.864	0.881
N	818	818	818	430	818	818	806

Panel B

Treated_Post	-0.0414	14.9206	0.0102	-0.0364	-0.0017	0.0306	0.0002
	(0.0088)***	(11.9643)	(0.0064)	(0.0140)**	(0.0056)	(0.0061)***	(0.0021)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.930	0.440	0.914	0.716	0.987	0.885	0.885
N	857	857	857	469	857	828	845

Panel C

Treated_Post	0.0117	-6.5164	-0.0033	-0.0021	0.0021	0.0012	-0.0064
	(0.0073)	(4.1805)	(0.0072)	(0.0133)	(0.0042)	(0.0069)	(0.0020)***
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.893	0.359	0.794	0.709	0.981	0.825	0.866
N	4,545	4,545	4,545	1,556	4,545	4,501	4,256

* $p<0.1$; ** $p<0.05$; *** $p<0.01$
Standard errors in parentheses
All regressions include *year*, *cohort*, *firm*, and *industry_year* fixed effects

directly, but also on those that typically capture how the resultant risk profiles of the firms are internalized and/or reflected by the market. For the former, I look at debt/asset, debt/equity, cash/asset, the volatility of quarterly cash/asset computed over the preceding eight quarters, profitability, and asset tangibility. For the latter, I look at the volatility of the market-adjusted stock return computed over the preceding thirty-six months. Market-adjusted stock return is defined as the stock return less the same period return on the CRSP value-weighted portfolio of NYSE/Amex/Nasdaq stocks. See *Table 1* for a collection of the difference-in-differences regression results.

Nevertheless, for a coherent interpretation of the results of each of the tests, I focus not on any risk indicator alone, but on whether the individual changes are collectively consistent with each other. For example, relative reductions in risk factors such as debt/asset, cash/asset, volatility of cash/asset, and the non-reduction/increases in risk factors such as the tangibility of the treated firms might be indicative of relative reductions in the probability of bankruptcy and the expected costs of financial distress in the event of bankruptcy, respectively. Similarly, relative increases (decreases) in profitability might be indicative of relative decreases (increases) in the underlying business risks. In the same vein, relative reductions in the volatility of the market-adjusted return might be indicative of a broad recognition, by the market, that the recent internal financial decisions and actions of the firm have led (or will lead) to a significant reduction in the risk profile of the firm. Overall, the results of the triplet of hypotheses tests provide strong support for the external validity of the sum of my findings.

Contributions to the literature

My original paper contributes to the reconciliation of not only the debate about whether females are, on average, more risk-averse than men, but also the debate about whether gender diversity or the gender-diversification of corporate boards has any impact on corporate behavior or firms' financial performance. This is important because the extant empirical evidence, on the latter in particular, had been mixed—some positive, some neutral, and some seemingly negative. I provide a novel set of empirical analyses and

My original paper contributes to the reconciliation of not only the debate about whether females are, on average, more risk-averse than men, but also the debate about whether gender diversity or the gender-diversification of corporate boards has any impact on corporate behavior or firms' financial performance.

show that the within-group power or influence distributions impact whether gender tendencies manifest in small group settings. Running a difference-in-differences empirical analysis using samples of corporate board/financial data spanning nearly 20 years, I also provide strong external evidence supporting the latter. Notably, in addition to the empirical novelty associated with my findings in the ***Cash Cab*** pseudo-laboratory, my paper is, to the best of my knowledge, the first to systematically examine the marginal effects of adding one or more female directors with differential power or influence status to the corporate board.

My findings further contribute to the discussions on the potential barriers to reaping the maximum benefits of gender diversity in corporate boards and some effective strategies for sustainable progress. On the one hand, using interview data, Creary, et al.[5] (2019) highlight that collegial and egalitarian boards are more likely to accept and integrate differences of opinion and that members of these boards believe that both their expertise and willingness to learn are recognized and incorporated into the board's work. Interestingly, such collegial culture in which diversity on the board is surmised to thrive is a crucial feature of my main empirical setting (i.e., the ***Cash Cab*** pseudo-laboratory, wherein an egalitarian culture is guaranteed by the individual veto power or the high individual share of the within-group power and influence distribution, implicit in the game setting). On the other hand, Rhode and Packel[6] (2014) outlined "tokenism/critical mass" as one "barrier/solution" pair. Tokenism refers to the broader argument about whether the appointment of only one or two female or minority directors will significantly improve board decision-making. Kanter[7] (1977) finds that token members often encounter "social isolation, heightened visibility … and pressure to adopt stereotyped roles." Kramer et al.[8] (2006) argue that "critical mass" is necessary to fully realize the benefits of diversity on corporate boards. My results, however, suggest that "critical mass" must lead to sufficient power and influence within-group or within-board, to be meaningful for the eventual evasion of tokenism or guarantee of an exit from a token status. In other words, a low-proportion subgroup, or even just one individual, with an enormous share of the within-group power and influence distribution, can be "the dominant," not "the token" member of the group.

My research is related to the subset of literature in economics that uses T.V. game shows and natural experiments to study risk aversion and decision making under uncertainty. I focus on the effect of gender composition on risk-taking and financial performance and include both the cumulative earnings and group size variables as controls. My paper is also related to the literature that uses experiments to examine risky decisions. I confirm and then extend the previous findings that a team's risk-taking behavior may not increase with the team's size by explicitly showing that, on average, risk aversion does not necessarily increase with the number of women in a group. While some of the previous empirical results from a similar line of the literature suggest that women are generally more financially risk-averse than men, others suggest that women may be more risk-loving. My findings provide evidence in support of the former.

My research is also related to the literature that examines how board composition affects corporate choices. For instance, by using data on publicly traded U.S. firms, I confirm previous research findings that predominantly private European firms run by female CEOs have lower leverage and less volatile earnings. I also extend

[5] Creary, S. J., McDonnel, M-H., Ghai, S., and Scruggs, J., 2019. When and Why Diversity Improves Your Board's Performance, Harvard Business Review (online)

[6] Rhode, D., Packel, A.K., 2014. Diversity on Corporate Boards: How Much Difference Does Difference Make? 39 Delaware Journal of Corporate Law 377.

[7] Kanter, R. M., 1977. Some Effects on Proportions on Group Life: Skewed Sex Ratios and Responses to Token Women. American Journal of Sociology 82, 965–90.

[8] Kramer, V.W., Konrad, A.M., Erkut, S., Hooper, M.J., 2007. Critical Mass on Corporate Boards : Why Three or More Women Enhance Governance. Governance 0–3.

these findings by providing a novel collection of systematic empirical evidence to show that the average gender effect on collective risk-taking becomes unobscured when the within-board social dynamics (or power and influence distributions) are egalitarian.

Conclusion

To recap, using hand-collected data from over 12,000 minutes of the multiple Emmy Award-winning television game show, ***Cash Cab***, my research shows that on average, the presence (or addition) of one influential female in (or to) a small previously homogeneous male group significantly reduces the group's willingness to take financial risks. If, however, a group (of at least three persons) consists of one such female, adding more females does not significantly alter the group's risk-taking behavior. These results and the key features of the ***Cash Cab*** setting suggest that the within-group power/influence distributions impact whether gender tendencies manifest in small groups. Using difference-in-differences estimation on U.S. board and financial data spanning nearly 20 years, my paper also provides strong external evidence supporting the latter. Overall, my research findings appear to effectively reconcile the mixed extant empirical evidence on the impact of board gender diversity on firms' financial performance and are instructive for ongoing discussions on board-gender-diversification.

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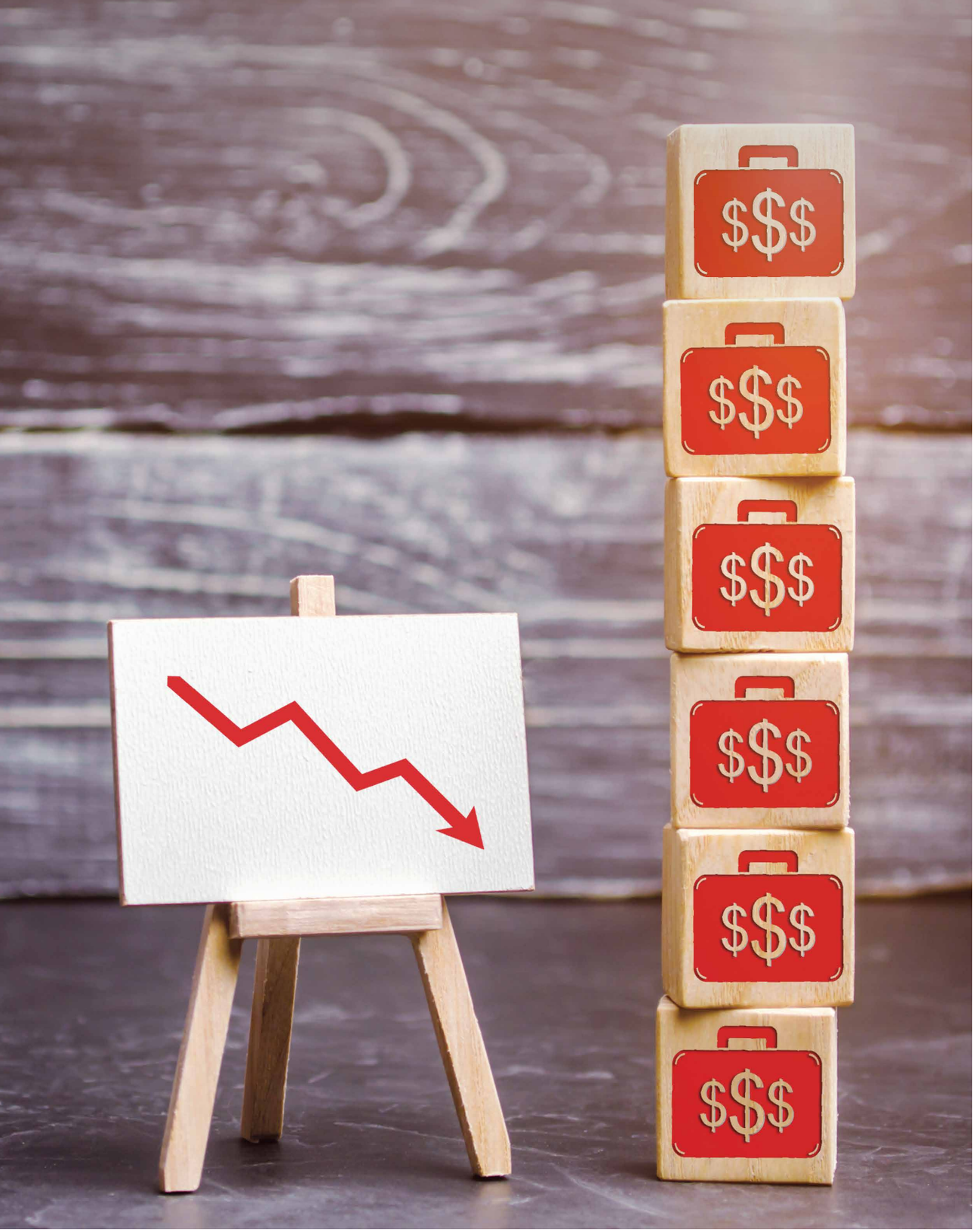


Paper: "Idiosyncratic Income Risk, Precautionary Saving, and Asset Prices"

Author: Maarten Meeuwis, Olin Business School Date: March 2021

Date: March 2021

Idiosyncratic Income Risk, Precautionary Saving, and Asset Prices

MAARTEN MEEUWIS, Olin School of Business, Washington University in St. Louis

For most households, labor earnings are the main source of total yearly income. Since future wage earnings are uncertain, labor income is risky. Households face risks in their wage earnings that come from both the overall state of the economy and their personal employment situations. Most of the risk in labor income is household specific: some people earn an amount similar to the year before, others make a promotion and get a raise, and yet others lose their job and see a decline in their income. Household-specific risk is called idiosyncratic risk. These personal events such as job displacement can have large effects on not just present income but also on expected future income. Moreover, it is hard to insure against income risk, even if the risk is idiosyncratic. Exposure to idiosyncratic risks can therefore drastically change the consumption and saving decisions of risk-averse households.

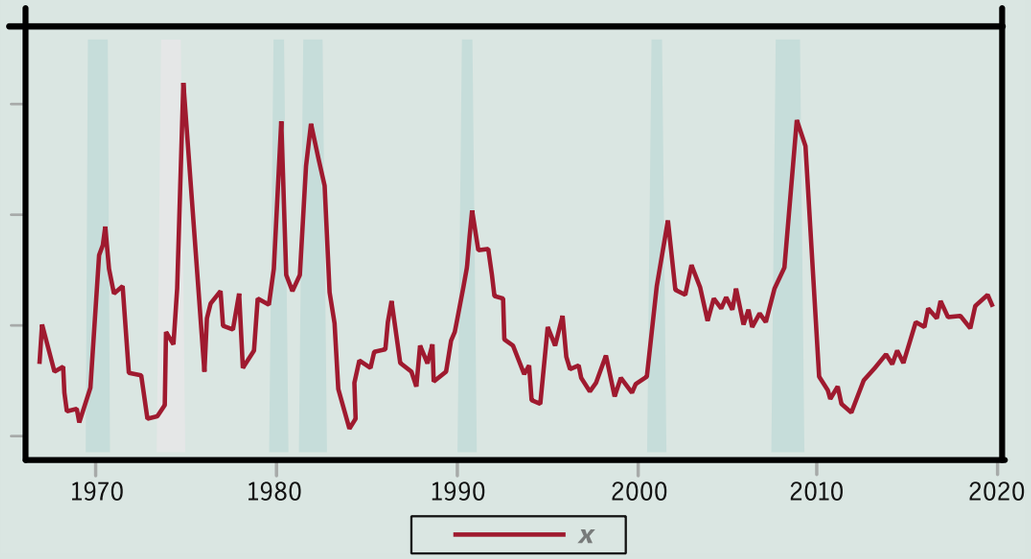
In my research[1], I study the implications of time-varying income risk on financial markets. To do so, I propose a theoretical model of the economy in which idiosyncratic income risk drives fluctuations in aggregate production, employment, inflation, and asset prices. In the model, elevated income risk depresses current expenditures, as households have an increased desire to save and build up a cushion against possible future shocks. Consistent with the predictions of the theoretical model, I find that income tail risk, which changes over time, can explain significant differences in the mean and volatility of stock returns across firms and over the business cycle. That is, the bottom-line conclusion of the research is that labor income risk can explain why risk and expected stock returns are larger for some firms than for others and can also be used to forecast future stock returns.

Data on Labor Income Risk

Recent studies using detailed administrative data on the labor income of millions of U.S. workers show that the distribution of income growth rates across households is wide and varies over time. In particular, during recessions, the probability of suffering a severely negative long-term income shock spikes. In other words, individuals face the prospect of prolonged lower income during recessions. This probability is reflected in the skewness of the income growth distribution. The skewness measures negative

[1] Meeuwis, Maarten, 2021, "Idiosyncratic Income Risk, Precautionary Saving, and Asset Prices," working paper, Washington University in St. Louis, MO.

Figure 1: Idiosyncratic Labor Income Risk Spikes in Recession



tail risk, the risk of individual "disasters," in the distribution and is highly negative during adverse economic times. This means that the likelihood of really bad income outcomes increases significantly during recessions, and implies that workers face additional risks in their individual outcomes in times of economic distress.

To quantify the amount of idiosyncratic risk in labor income that working households face, I estimate the parameters of a flexible process that can fit the empirical distribution of labor income growth. The key component in this process is a variable that I call x_t that captures the magnitude of tail risk in income that households are subject to in quarter t. *Figure 1* plots the estimated path for x_t. In line with the countercyclical nature of uncertainty in individual labor income that is observed in the data, measured income risk fluctuates substantially over time and peaks during recessions.

Asset Pricing Model

To study the implications of income risk on the economy and on asset markets in particular, I solve a theoretical model of the economy in which the measured income risk process x_t is a key input. The model features firms that produce consumption goods in the economy, and households that consume the goods that are produced by the firms. The model is solved such that supply and demand are equal to each other in all markets. The model builds on a New-Keynesian macroeconomic framework: since prices and wages are sticky and only sluggishly adjust to economic news, low aggregate demand results in low output levels and therefore depresses economic activity and aggregate consumption by households.

The model features two types of households: investors and consumers. Investors buy shares of stock in the firms that produce output in the economy and therefore determine the equity valuations of these firms. These valuations depend on the cash flows of the firms as well as the discount rates that compensate for systematic risks. Consumers, the other type of households, earn labor income by working for the firms and decide how much of their income to consume today and how much to save for tomorrow in a nominal risk-free saving account. Importantly, these consumers face individual shocks to their labor income that cannot be (completely) insured. As in the data, the distribution of these individual shocks varies over time, according to the tail risk process x_t.

The key effect in the model is that income risk determines how much of their net worth households are willing to consume today versus save for the future. When income risk rises, households are increasingly worried about the possibility of future layoffs and other events that will reduce future earnings. To take care of their basic consumption needs in those scenarios, households will try to reduce present consumption in favor of saving more. Thus, faced with additional risks, consumers will build up additional funds for a rainy day. This effect is called a precautionary saving motive.

Due to the precautionary saving channel, firms in the model—which produce goods for household consumption—face reduced demand for consumption goods when income risk is high. As a result, firms produce less output and make lower profits in those states. This means that firm earnings are sensitive to changes in the income tail risk faced by individuals, and firm valuations fluctuate with changes in the idiosyncratic income risk of individuals over time. This risk creates volatility in equity returns that matches the volatility of stock markets in the data. Since changing income risk affects stock market wealth and is a systematic risk factor to shareholders, this risk exposure is compensated by a significant risk premium in equity returns: higher risk translates into a higher expected return on risky stocks.

The model also implies that not all firms are affected equally by fluctuations in income risk. Some firms produce goods with inelastic demand that are consumed in stable amounts, while other firms produce goods with elastic demand for which consumption can easily be cut back or expanded depending on the available budget and alternatives. Firms with more elastic demand are more exposed to fluctuations in the amount of idiosyncratic income risk and have more volatile cash flows and returns, and therefore have higher average returns. In the empirical analysis that follows, I test these model implications on asset prices and find that the data support the main predictions of the model.

Empirical Findings

Portfolio analysis: The model predicts that exposure to demand shocks is priced in equity markets. Differences in the distribution of firm returns arise from heterogeneity in demand elasticities. **That is, different firms have different demand elasticities for their products and this leads to differences in their stock returns.** To test for systematic differences in returns across firms, a common approach in the asset pricing literature is to sort firms in portfolios and thereby reduce the noise in individual firm returns. A direct measure of demand elasticities is not available, but we can use the fact that the demand for durable goods (e.g., cars, computers, and furniture) is more affected by macroeconomic shocks to aggregate demand than the demand for nondurable goods and services (e.g., food, utilities, and health care). Motivated by this fact, I use the return difference between firms that produce durable goods and firms that produce nondurables or services, the Durables Minus Nondurables and Services (DMNS) portfolio return, as a traded proxy for demand shocks. I sort firms in quintile portfolios based on their exposure to the DMNS factor.

Figure 2: Distribution of Portfolio Returns

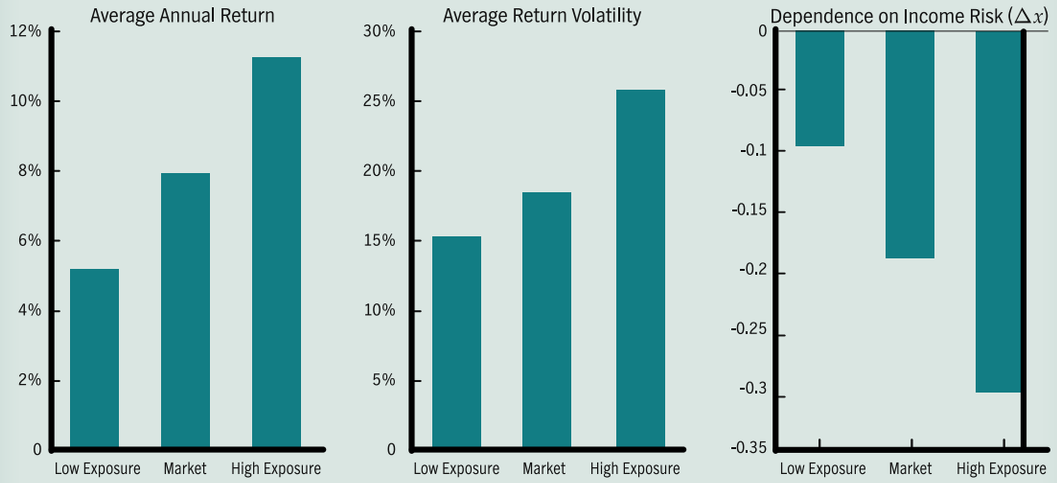
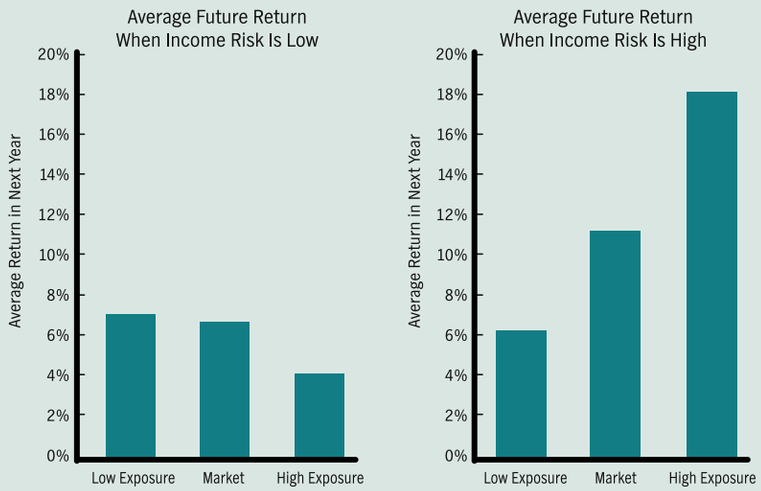


Figure 3: Income Risk Predicts Future Equity Returns



The left graph of *Figure 2* shows that firms with a high exposure to the DMNS factor earn a premium of six percentage points per year compared to firms with a low exposure. This difference in average returns is statistically significant. Correspondingly, the middle graph of *Figure 2* shows that firms with a high DMNS exposure have more volatile stock returns. In other tests, I also find that firms with a high DMNS exposure have lower price markups over marginal costs and have stock returns that are more responsive to changes in monetary policy surprises, as predicted by the model.

Risk premia: The portfolio analysis shows significant differences in equity returns across firms. In the model, differences in firm returns are due to variation in the exposure to idiosyncratic income risk shocks. When idiosyncratic income risk rises, high-exposure firms have low returns because of a reduction in consumption, while low-exposure firms are relatively unaffected. Since high-elasticity firms are more affected by demand shocks, there is a cross-sectional risk premium for high-elasticity firms relative to low-elasticity firms. This difference in average returns is a compensation for the systematic risk coming from changes in idiosyncratic income tail risk.

Consistent with this proposed channel, the right plot of *Figure 2* shows that firms with a high DMNS exposure have returns that are highly negatively associated with fluctuations in idiosyncratic income risk in the data, while firms with a low DMNS exposure have returns that are only mildly exposed to changes in income risk. I use analytically rigorous asset pricing tests to estimate the risk premium that is associated with changes in income risk. These tests confirm that exposure to idiosyncratic tail risk is compensated by a significant risk premium and that this exposure explains differences in expected returns across firms. Highlighting the special role of income tail risk, I find that other macroeconomic indicators do not yield the same results.

Linking stock prices back to their fundamentals, I also find that high-exposure firms have cash flow growth that is negatively correlated with changes in income risk, while there is no such relation for low-exposure firms.

Time-varying risk and returns: Another key result coming out of the model is that future asset returns are predictable by the current level of income tail risk in the economy. When income risk rises, households are increasingly worried about the possibility of future income losses and the precautionary motive becomes disproportionately stronger. Any further increases in risk then lead to stark reductions in current consumption levels and increases in the desire to save as a precaution for potential future financial hardship. A consequence of this effect is that the risk in financial markets varies over time. In recessions, the volatility of future returns is amplified and expected returns go up. As a result, asset prices are more volatile than cash flows, and the level of idiosyncratic income risk predicts future equity returns. When current income risk is high, average market returns over the next year are significantly higher. This prediction is supported by the data.

Importantly, I find that predictability varies substantially across portfolios. Firms with more elastic demand are more exposed to changes in income tail risk and therefore have a bigger increase in the risk premium when the level of tail risk in labor income rises. *Figure 3* plots the average one-year ahead return on different portfolios when income risk is low and when income risk is high. We see that predictability increases with the DMNS exposure of the portfolios: high-exposure firms have returns that are highly predictable by measured income tail risk, while low-exposure firms do not have predictable returns. In a model of risk and returns, expected returns only go up when risk goes up. Indeed, I find that the future volatility of high-exposure stocks rises with income tail risk, while there are no such effects for low-exposure stocks.

Closing Thoughts

A growing literature in financial economics focuses on the role of demand factors in explaining stock market patterns. In a New-Keynesian framework where changes in aggregate demand have effects on real economic outcomes, demand factors can help explain puzzling facts about financial markets, such as why average returns on equity seem to be higher than what our economic models predict, why stock markets are so volatile, and why stocks are highly responsive to monetary policy announcements, many of which seem to lack the surprise element to justify movements of such large magnitudes. Consistent with this framework, previous studies have shown that across stocks, exposure to demand shocks is compensated with a risk premium. These patterns raise the question of what drives changes in household demand that move asset prices.

My research proposes that risk in household labor income, which varies over time, is an important source of demand fluctuations. Uninsured income tail risks affect the aggregate demand for consumption goods through a precautionary saving motive that changes over time: when the probability of future losses in wage earnings increases, households need to cut back consumption and save more for a rainy day. A decline in present consumption leads to depressed firm profits. Comparing across firms, firms that face more elastic demand are more exposed to fluctuations in idiosyncratic tail risk. This risk exposure is compensated by a significant and countercyclical risk premium in equity markets. These predictions of this model of the economy are supported by empirical evidence on stock market returns.

The Washington University Corporate Finance Conference: An Essay by Mark Leary

As stated earlier in this publication, the mission of the WFA-CFAR is "to support faculty research in finance and accounting, and facilitate its dissemination by connecting it to students and the business world." For the past 17 years, one of the ways the center has supported this mission is through sponsoring our annual Conference on Corporate Finance. Each fall, we host on our St. Louis campus a gathering of leading scholars from top business schools around the country and internationally, to present and discuss the latest research in corporate finance and financial intermediation. From humble beginnings in 2004, the conference has grown in both size and reputation and is now considered one of the leading small conferences in corporate finance. A professor from a leading European school who attended for the first time in 2019 wrote, "This was a terrific conference….I thought it was really a great program and full of high quality participants. While I have presented [our] paper a few times, the comments were by far the best I have received at any conference." While the conference typically has one or two invited speakers on specific topics, most of the presented papers are chosen on the basis of a rigorous and highly competitive selection process involving reviewers from many other schools. Throughout the years, we have also introduced a variety of innovative elements to the conference in order to maximize engagement, attract new participants, and enhance the value of the event. This article briefly describes the structure and content of the conference and how it supports each element of the CFAR mission.

Facilitating dissemination of research: The heart of the conference each year are the sessions of selected academic research papers. Each spring, we solicit submissions of new, unpublished research papers from around the world. While the conference has a focus on corporate finance, we encourage submissions on broad topics within that field in order to learn from, rather than constrain, the direction of research. Over the last five years, we have received an average of over 150 submissions per year. We intentionally keep the conference program small. (Unlike other conferences that run parallel sessions, we value keeping everyone in the same room to maximize the sharing of ideas.) As a result, the acceptance rate over the past five years has been quite low – just 6% of the submitted papers on average are accepted to the program. This makes it one of the most selective conferences in our field and gives us a great opportunity to select a high quality program. Many of the papers that are presented are eventually published in leading finance and economics journals.

Following each author's presentation, an invited discussant provides a commentary on the work. This gives us an opportunity to learn from leading scholars in each specialty and provides a spring-board for the subsequent question and answer time. These conversations often spill over into coffee breaks and meals. Conference participants often remark that one of the things they value about our conference is the extended time afforded to informal discussion, which more effectively serves the goal of disseminating novel research.

Supporting faculty research: In addition to the sessions of submitted papers, in recent years the conference has featured a special session where we hear from senior scholars on a topic of particular interest for contemporary research, paired with a session of invited working papers on related topics. Examples have included sessions on research in corporate culture (2016), the use of historical data in corporate finance research (2017), the role of institutional investors in corporate governance (2018), covenants and collateral in debt contracting (2019) and financing innovation (2020). One benefit of these sessions is being able to enhance the profile of the conference by including in the program well known scholars, such as Patrick Bolton (Columbia), Laura Starks (UT Austin), Paola Sapienza (Northwestern University), and Andrew Lo (MIT), among others. A greater advantage is being able to hear the perspectives of these leading researchers on the development of these areas, their own work in them, and fruitful directions for future research.

Another innovation we introduced to the conference a number of years ago that helps support faculty research is a session of short presentations of new ideas. This session gives participants, including some of our own faculty members, the opportunity to get feedback on early research ideas that they are still developing. Each participant is given just five minutes to communicate the essence of their idea, followed by five minutes to gather as many questions and comments from the audience that they can—think "shark tank," but for academic researchers and in a supportive environment! These quick pitches often spark further conversations around dinner and serve both the goals of disseminating research and supporting our faculty's work.

Connecting to students: Having a world-class conference on our own campus not only benefits our faculty, but is a great resource for our PhD and DBA students. Hosting this conference gives our students the opportunity to learn about current research and to make connections with faculty from other institutions even before they hit the job market. For students nearing graduation, it is also a great opportunity to advertise their own research to an audience outside of Olin. One way we have facilitated this is by having students in the final year of their PhD program set up posters describing their dissertation research during conference breaks and/or the cocktail hour prior to the conference dinner. This gives them an opportunity not only to practice "selling" their ideas to the broader profession, but also to receive feedback on their research. In some years, we have opened this opportunity up to PhD students from outside of Washington University as well, which gives us an opportunity to make connections with some of the leading students entering the profession.

Connecting to the business world: While the conference primarily attracts an academic audience, we also strive to incorporate bridges to the business world and provide opportunities for academics and practitioners to learn from one another. Over the years, this has taken different forms. In the years following the last financial crisis, we incorporated panel discussions on regulatory issues facing the banking industry, including the implementation of Dodd Frank and bank capital requirements. We heard voices from both the regulator perspective, such as Julie Stackhouse of the St. Louis Fed, and the industry side, such as Sanjiv Das, at the time with Citi Mortgage. We have also hosted several panels of corporate CFOs and directors to dialogue on the connections between academic views and their perspectives on financing, investment and governance decisions. Other times, we have featured notable keynote speakers from industry or government, including John F.W. Rogers, Executive Vice President of Goldman Sachs, who spoke at the 2016 conference on the importance of corporate culture, and Jim Bullard, CEO of the St. Louis Fed (and CFAR board member), who spoke on the outlook for the economy and monetary policy to conference participants in 2012.

Having just completed our 17th annual (and first virtual!) conference this past November, its reputation is strong. The conference provides positive exposure for the Olin School and brings benefits to our own faculty and students as well as the broader research community. Of course, none of it would be possible without the financial support of the WFA-CFAR as well as the participation of many advisory board members and friends of the center over the years. We look forward to many more!

As an illustration, the program for the last conference (October 2020) is provided on the next two pages. Given that this was our first conference done in a remote Zoom format due to the Covid pandemic, we felt it was a good idea to have a special session on the intersection between Health Care and Finance, in addition to our usual collection of other high-quality papers on a variety of topics in corporate finance. In another article in this issue, Professor Andrew Ellul of Indiana University (who chaired this special session) provides a discussion of the papers presented in this special session as well as the keynote speech given by Professor Andrew Lo of MIT.

CFAR CORPORATE FINANCE CONFERENCE 2020 PROGRAM

FRIDAY, OCTOBER 30, 2020

SESSION 1: REGULATION

Session Chair: Mark Leary, *Washington University in St. Louis*

9:00 AM – 10:10 AM CST

"INTERNAL MODELS, MAKE BELIEVE PRICES, AND BOND MARKET CORNERING"
(Ishita Sen and Varun Sharma)
Presenter: Ishita Sen, *Harvard Business School*
Discussant: Amiyatosh Purnanandam, *University of Michigan*

"A FUZZY BUNCHING ESTIMATOR OF REGULATORY COSTS"
(Kairong Xiao and Adrien Alvero)
Presenter: Kairong Xiao, *Columbia University*
Discussant: Ramona Dagostino, *University of Rochester*

— BREAK 10:10 AM–10:30 AM CST —

SESSION 2: BANKING AND CONSUMER BEHAVIOR

Session Chair: Jason Donaldson, *Washington University in St. Louis*

10:30 AM – 11:40 AM CST

"DYNAMIC BANKING AND THE VALUE OF DEPOSITS"
(Ye Li, Patrick Bolton, Neng Wang and Jinqiang Yang)
Presenter: Ye Li, *Ohio State*
Discussant: Alexi Savov, *New York University*

"CONSUMER RESPONSE TO CORPORATE POLITICAL STATEMENTS: EVIDENCE FROM GEOLOCATION DATA"
(Marcus Painter)
Presenter: Marcus Painter, *St. Louis University*
Discussant: Pat Akey, *University of Toronto*

— BREAK 11:40 AM–1:15 PM CST —

SESSION 3: "FINANCING INNOVATIONS" (JOINT WITH REVIEW OF CORPORATE FINANCE STUDIES)

Session Chair: Andrew Ellul, *Executive Editor, RCFS (Indiana University)*

1:15 PM – 3:00 PM CST

"FINANCING COMPETING INNOVATIONS: PICKING THE WINNER OR HELPING THE WEAKER?"
Presenter: Merih Sevilir, *Indiana University*
Discussant: : Victoria Vanasco, *CREi*

"SHARING R&D RISK IN HEALTHCARE VIA FDA HEDGES"
(Richard Thakor, Adam Jørring, Andrew W. Lo, Tomas J. Philipson and Manita Singh)
Presenter: Richard Thakor, *University of Minnesota*
Discussant: Bart Hamilton, *Washington University in St. Louis*

"DEREGULATING INNOVATION CAPITAL: THE EFFECTS OF THE JOBS ACT ON BIOTECH STARTUPS"
(Craig Lewis and Joshua White)
Presenter: Josh White, *Vanderbilt University*
Discussant: Richard Thakor, *University of Minnesota*

Andrew Lo, MIT

SATURDAY, OCTOBER 31, 2020

9:00 AM – 9:45 AM CST

Keynote Address: FINANCIAL INNOVATION AND MEDICINE
Andrew Lo, *Massachusetts Institute of Technology*
Session Chair: Anjan Thakor, *Washington University in St. Louis*

— BREAK 9:45 AM–10:00 AM CST —

SESSION 4: MONETARY POLICY AND CORPORATE BORROWING

Session Chair: Anjan Thakor, *Washington University in St. Louis*

10:00 AM – 11:10 AM CST

"TRADE CREDIT AND THE TRANSMISSION OF UNCONVENTIONAL MONETARY POLICY"
(Manuel Adelino, Miguel Ferreira, Mariassunta Giannetti and Pedro Pires)
Presenter: Manuel Adelino, *Duke University*
Discussant: Mitchell Petersen, *Northwestern University*

"BLOCKING BLOCK-FORMATION: EVIDENCE FROM PRIVATE LOAN CONTRACTS"
(David De Angelis, Brian Akins, and Rustam Zufarov)
Presenter: David De Angelis, *Rice University*
Discussant: Mitchell Berlin, *Federal Reserve Bank of Philadelphia*

— BREAK 11:10 AM–11:30 AM CST —

SESSION 5: FINANCIAL DISTRESS

Session Chair: Armando Gomes, *Washington University in St. Louis*

11:30 AM – 12:40 PM CST

"PRIVATE EQUITY AND FINANCIAL STABILITY: EVIDENCE FROM FAILED BANK RESOLUTION IN THE CRISIS"
(Song Ma, Emily Johnston-Ross and Manju Puri)
Presenter: Song Ma, *Yale University*
Discussant: Edith Hotchkiss, *Boston College*

"DISSECTING BANKRUPTCY FRICTIONS"
(Winston Dou, Lucian Taylor, Wei Wang and Wenyu Wang)
Presenter: Winston Dou, *University of Pennsylvania*
Discussant: Samuel Antill, *Harvard Business School*

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Professor of Practice in Finance
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Washington University in St. Louis
Olin Business School

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Professor of Practice in Finance and Academic Director
of the Corporate Finance & Investments Platform

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Finance Faculty

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