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The Journal of Business Leadership (JBL) is a scholarly publication that serves as a platform for academic researchers to share knowledge and research findings on topics related to business and leadership. The journal is indexed in the Library of Congress with online ISSN 2164-4454 and print ISSN 2164-4462.

The JBL aims to foster discussions on theoretical developments and empirical analyses within business and leadership and publish articles that contribute to advancing studies in leadership, business, and entrepreneurship.

The Center for Applied Business Research (CABR) at Austin Peay State University currently publishes and houses the JBL. Initially launched in 1989 by the American National Business Hall of Fame (ANBHF), the JBL primarily featured biographies of ANBHF laureates and encouraged faculty and students to write original articles about these laureates and other historical business figures. However, in 2007, the ANBHF board shifted the journal's focus towards more traditional scholarly articles on business leadership. Since then, it has been included in Cabells' directory and continues to be included in the Cabells' Journalytics database.

The ANBHF distinguished between two series: the original series, which spanned from 1989 to 2006, and the new series, which started in 2008. The old series of articles is available on the ANBHF website: <https://anbhf.org/>. The new series can be found through the Center for Applied Business Research ([CABR](#)) at Austin Peay State University (APSU)—*The Journal of Business Leadership Issues 2008 to Present*. The center coordinates applied research-related activities in the College of Business at APSU, circulating research updates, creating research opportunities, and promoting the CoB research community.

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Dear Readers,

I am delighted to address you as the Editor of *The Journal of Business Leadership*. I extend my warmest greetings and sincere appreciation for your continued support and engagement with our publication. In particular, I would like to thank the peer reviewers who provided thoughtful and timely feedback on journal submissions. *The Journal of Business Leadership* is a double-blind, peer-reviewed journal. Without our peer reviewers, this journal would not be possible.

As readers of *The Journal of Business Leadership*, you are integral members of our community. Your dedication to staying informed about the latest developments in business leadership is commendable. Your feedback and contributions play a vital role in shaping the direction of our journal, and we are deeply grateful for your ongoing involvement.

In this edition, we are privileged to publish diverse articles that address various aspects of business leadership. Each article offers valuable insights and perspectives relevant to leaders across industries and sectors. We are proud to be a platform for sharing knowledge and fostering dialogue among scholars, practitioners, and policymakers.

Looking ahead, we are excited about the opportunities for *The Journal of Business Leadership*. As the business landscape continues to evolve at a rapid pace, the need for effective leadership has never been greater. We are committed to providing timely and relevant content that addresses the pressing challenges facing leaders today and equips you with the tools and strategies needed to succeed in a complex and dynamic environment. If you or your colleagues have any research findings or insights that interest our readership, we encourage you to submit them for consideration. Our editorial team is always eager to review new submissions and to work with authors to ensure the highest quality of scholarship.

As always, we welcome your feedback and suggestions for improving and enhancing our journal to better meet your needs and interests. Whether you have ideas for future topics, recommendations for potential authors, or feedback on specific articles, we value your input and strive to incorporate it into our ongoing efforts to deliver the highest-quality content. In closing, I would like to express my sincere gratitude to each and every one of you for your unwavering support of *The Journal of Business Leadership*. Together, we can continue to push the boundaries of knowledge and practice in business leadership, and I am excited to embark on this journey with you.

Warm regards,

Vikkie McCarthy

Vikkie McCarthy
Editor, *The Journal of Business Leadership*

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Call For Papers

Applied Business and Entrepreneurship Association International (ABEAI)

<http://www.abeai.org>

Twentieth Annual Meeting, November 16-19, 2024



Submission Deadline: September 30, 2024

Submit papers to: abeai@up.edu.

Please indicate your topic area and the area number in your email subject line. Electronic submissions (email attachments in MsWord) of research papers (including detailed abstracts) in all areas of business and economics, as well as the topic areas listed below, are invited for presentation. Proposals for cases, workshops, symposia, colloquia, tutorials on current issues, and other special sessions are also welcome.

Submitted papers undergo a double-blind peer review process. Authors of accepted papers will be notified by email. Accepted papers will be published in the peer-reviewed *Electronic Conference Proceedings*.

The presenting author(s) must register for and attend the conference and present the paper at the time specified in the conference program. Publication of multiple papers by the same author will be subject to extra charges.

All completed papers will be considered for Best Paper Awards in their respective tracks. Student papers will also be considered for award in the Student Papers Track.

Conference best papers are eligible for publication in the *Journal of Business Leadership (JBL)*, (<https://www.apsu.edu/business/applied-research/journal/index.php>). The acceptance may be subject to minor revisions and formatting. All conference presenters are invited to submit their papers to the *JBL* editor. However, only the best papers from the conference are accepted for publication in *JBL* after undergoing minor revisions. *JBL* serves as the official journal of the American National Business Hall of Fame and is indexed by Cabell's. Please see the *JBL* link at <https://sites.up.edu/abeai> for more information.

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LEGAL GUIDANCE FOR LEADERS IN THE AEROSPACE INDUSTRY

Elizabeth R. McVicker, Metropolitan State University of Denver

ABSTRACT

Aerospace continues to garner a leading role in economies, employment, and advanced studies across the United States, from California to Florida (BLS, Industry Week, 2023). Universities prepare students in aerospace engineering programs to learn the science of flight, both for aircraft and spacecraft. As the aerospace industry grows in the private and public sectors, universities and industry leaders assist aerospace professionals in improving their knowledge and honing their leadership skills with continued professional development courses and certificates focused on leadership acuity. Multiple organizations offer continued education programs and certificate programs in this area; however, these courses do not include any risk management training to help a leader prevent legal entanglements, whether on an international basis or a fundamental liability issue. This article will outline a professional development course of studies for aerospace students, undergraduate or graduate, or professionals in the industry. The article will review vital international treaties upon which space exploration has been based since the 1960s and provide an overview of legal concepts, from contracts to negligence to insurance claims, that a leader in the aerospace industry can use to prevent problems and litigation. Leaders in the aerospace industry will also help shape needed changes to the existing regulatory environments, and an understanding of the basics of space law will prepare them for that role.

Keywords: Aerospace Industry, Professional Development, Economics, Regulatory Environments

INTRODUCTION

The aerospace industry plays a leading role in economies, employment, and advanced studies across the United States and the world (BLS, Industry Week, 2023). Engineering programs for aerospace, aeronautical, and astronautical engineering include renowned institutions such as the Massachusetts Institute of Technology, California Institute of Technology, and Stanford University, as well as state universities such as the University of Colorado Boulder and the University of Texas Austin (Industry Week, 2023; USNews, 2023). Smaller universities, both public and private, offer focused studies, undergraduate and graduate, to ambitious aerospace leaders. These include institutions from the Air Force Academy to the Metropolitan State University of Denver and even some community colleges that offer courses and certificate programs in areas related to aeronautical engineering, such as aviation technology (EduRank, 2023; MSU, 2023). The curriculum offered by these institutions of higher education prepares students to learn and practice the science of flight for aircraft and spacecraft (StudyUSA, 2023).

As new leaders in the industry, these ambitious aerospace professionals will work for companies that invest in their continued professional development and leadership acuity. Multiple organizations offer continued education programs and certificate programs in this area; however, a perusal of the offerings from these companies shows that their professional development courses

and resources do not include any risk management training focused on preventing legal entanglements, whether on an international basis or pertaining to a basic liability issue (AIAA, 2023; Aerospace Corporation, 2023; National Institute of Space, 2023). This article will propose an outline of a course of study for aerospace students, undergraduate or graduate, or professionals in the industry as they continue their professional development. The article will review the key international treaties upon which space exploration has been based since the 1960s and present an overview of legal concepts from contracts to negligence to insurance claims that a leader in the aerospace industry can use to prevent problems and litigation so as to spend his or her time focused on exploration and expansion. The article will contemplate the role that leaders in the aerospace industry might play in helping to shape needed changes to the existing regulatory environment.

AEROSPACE INDUSTRY GROWTH: PRIVATE SECTOR INVESTORS AND NATIONAL DEFENSE

The global aerospace market grew from \$261 billion in 2022 to \$278 billion in 2023 (Aerospace Global Market Report, 2023; Business Research, 2023). Rocket launches, asteroid mining, space manufacturing, and even tourism push the global space economy to a prediction of more than \$1 trillion in annual revenue by 2040 (Free Think, 2023). Because the aerospace industry is influenced by technological innovation and global demand for superior aircraft and related services, this growth is anchored in partnerships between private industry and government defense operations and budgets. The U.S. 2023 defense budget of \$773 billion includes money for all aspects of the aerospace industry, including production, maintenance, repair, overhauling, and support for military aircraft and auxiliary equipment such as satellites and radar (U.S. Department of Defense, 2023). The aerospace industry relies on these partnerships for the continued development of data and cutting-edge technologies, such as AI aerospace maintenance and repair, as well as the production of commercial aircraft and out-of-orbit space exploration (Aerospace Global Market Report, 2023).

U.S. and Global Space Industry Endeavors: Leading Corporations and Employers

Commercial enterprises led by some of the world's wealthiest individuals bring images of science-fiction-like rockets and aircraft. Elon Musk's Space X's Falcon 9, Jeff Bezos' Blue Origin reusable New Shephard space Vehicle, Paul Allen's Vulcan Aerospace's Stratolaunch Carrier Aircraft with payload rocket, and Richard Branson's Virgin Galactic's Spaceship Two are enterprises that have captured the imagination of the world as space exploration pushes towards a new 21st century of possibility (SpaceX, 2023; Blue Origin, 2023; Vulcan, 2023; Virgin, 2023). Behind the scenes of these star-studded enterprises, large government-based partnerships with private enterprises are ongoing, anchored in the well-funded defense departments of nations. The U.S. Defense Department and the Federal Aviation Administration, for example, partner with multiple private corporations in the development of prototypes and the manufacture of aircraft, gliders, drones, ultra-light aircraft, private jets, satellites, and space vehicles (Aerospace Global Market Report, 2023; Business Research, 2023). These include the U.S. companies of Raytheon Technologies Corporation, a company with close ties to the U.S. Defense Department since World War II, and Northrup Grumman Corporation, another U.S. company that traces its roots back to the early days of aviation and then to its growth after World War II (Raytheon, 2023; Northrup Grumman, 2023). Other major corporations based in the U.S. include The Boeing Company, General Electric Company, General Dynamics, and Honeywell International, Inc. (Boeing, 2023;

General Electric, 2023; General Dynamics, 2023; Honeywell, 2023). The French-based corporations Airbus Group SE and Safran Group SA build rockets and aircraft for defense and commercial uses (Airbus, 2023; Safran, 2023). Bombardier, Inc., a Canadian based aerospace company, and the British multinational aerospace corporation, Rolls-Royce Holding PLC are other examples of the major multinational corporations in the industry (Bombardier, 2023; Rolls-Royce, 2023). All of these major corporations are growing exponentially, and all depend on the newly minted minds graduating from aerospace engineering programs across the United States and other countries.

These public-private partnerships focus on multiple industries that impact our everyday lives, as well as defense and outer space exploration. These industries include:

- direct-to-home TV and telecommunications such as online access;
- geolocation and navigation that rely on satellites;
- space-pharma where manned missions to the moon and Mars have brought back bacteria for medical research;
- timing services that the world's clocks depend upon;
- additive manufacturing in low-orbit earth, which refers to key technology for enhancing space vehicle designs and enabling affordable missions—the design of components that can withstand extreme temperatures and highly pressured environments;
- space mining of asteroids for metallic resources, from gold to sulfur;
- space entertainment that attracts wealthy individuals looking for new tourism opportunities;
- and Unmanned Aerial Vehicles (UAV) software developed to control drones and other scheduled vehicles in air loft orbit, vehicles such as drones (NASA, 2023).

Leading U.S. State Aerospace Economies

The aerospace industry offers employment to millions of citizens across the United States, from California to Florida, from Washington to Alabama (U.S. Bureau of Labor Statistics, 2023). California and Colorado are number 1 and 2, respectively, in holding the most space contracts in the U.S. for the ventures described above (FAA, 2023; ATKearney, 2019). California continues to host nine percent of the total global Space and Aircraft industry contracts and 21% of the U.S. aerospace market, generating more than \$181 billion of revenue annually, garnering 10.3% of the U.S. defense budget and providing more than 820,000 aerospace-related jobs (California business gov, 2023). California is home to endeavors that include launch services, satellite manufacturing, and engineering for satellite manufacturing and engineering (California business gov, 2023).

Colorado, like California, is a leader in the U.S. space economy, claiming the second-largest aerospace economy in the country (Aerospace CO, 2022). Colorado is the nation's center for military space with four U.S. military commands that serve space-based research and development, acquisitions, and operations: the U.S. Space Command, the U.S. Army Space and Missile Defense Command, the North American Aerospace Defense Command, and the U.S. North Command (Aerospace CO, 2022). In addition, Colorado is home to 1,000 companies and suppliers for the aerospace industry, including nine of the country's top aerospace contractors that include companies such as Ball Aerospace, Gogo Business Aviation, Digital Global, EchoStar, United Launch Alliance, and Sierra Nevada Corporation Space Systems (Built in Colorado, 2023; Elmore, 2023). The Colorado aerospace industry employs more than 240,000 people and generates more than \$5.3 billion in revenue annually (Elmore, 2023). Texas, Florida, Alabama,

Georgia, and Virginia are close behind California and Colorado in the number of jobs and revenue generated by the aerospace industry (U.S. Bureau of Labor Statistics, 2023).

With the continued growth in this dynamic industry and the significant impact on economies across the U.S. and the world, universities and research centers must lead the charge to educate this and the next generations of aerospace talent—from engineers to astronauts to economists to entrepreneurs to policymakers. An overview of some of the top universities dedicated to this endeavor and the rigorous curriculum demanded of their students illustrates how these aerospace workers will be poised to lead not only the industry but also changes in policy vis-a-vis space law and the regulatory environment in which they work.

AEROSPACE CAREERS AND EDUCATION

A plethora of opportunities for a career in aerospace await graduates with degrees in aerospace engineering. These include designing, developing, testing, and manufacturing aircraft, spacecraft, satellites, and missiles. Engineers are involved in developing new technology for use in aviation, defense systems, and space exploration. New aerospace engineers are hired to specialize in aerodynamics, structural design, guidance, navigation, and control of spacecraft and aircraft (AIAA, 2023).

Universities and community colleges across the United States have developed sophisticated programs of study for students pursuing these career opportunities. Engineering programs for aerospace, aeronautical, and astronautical engineering include the Massachusetts Institute of Technology (MIT), California Institute of Technology, Stanford University, the University of Colorado Boulder, the University of Texas Austin, and the Air Force Academy (Industry Week, 2023; USNews, 2023; EduRank, 2023). Metropolitan State University of Denver prepares aerospace students for careers in Colorado, which claims the second largest aerospace industry in the country, as explained above (MSU, 2023; Colorado Space Coalition, 2023). Community colleges offer courses and certificate programs in areas related to aeronautical engineering for students ready to enter the burgeoning workforce in aviation and aerospace (EduRank, 2023; MSU, 2023). The curriculum offered by these institutions of higher education prepares students to learn and practice the science of flight for aircraft and spacecraft (StudyUSA, 2023).

Internships and Private/Public Partnerships between Universities and Industry

The curriculum for a degree in aerospace engineering at these universities is similar in the focus of courses, especially in the junior and senior years. Courses include aero/astro design, applied aerodynamics, spacecraft design, telecommunications, trajectory dynamics, and orbit metallurgy (StudyUSA, 2023). A critical component of the preparation for these aerospace students is the opportunity for students to have internships with aerospace companies, large and small, and with the U.S. federal government. Metropolitan State University of Denver (MSU) provides some examples of the public/private partnerships for these internships (MSU aviation, 2023). Among these internship partnerships include the York Space Systems, which focuses on improving the affordability of spacecraft manufacturing (York Space Systems, 2023); Lockheed Martin, where students study additive manufacturing, creating 3D printers to build space rockets (Lockheed Martin, 2023); EyaSat where students work on satellite development (EyaSat, 2023); Ambient Energy, recently bought by the engineering services firm, Mead & Hunt, where students perfect the sustainable design of aircraft and aerospace design (Mead & Hunt, 2024); and multiple

companies that are part of the U.S. launch service providers, manufacturers and operators of rocket vehicles (ArsTechnica, 2023; MSU aerospace, 2023).

Universities such as MSU have also forged partnerships with the federal government to offer students internships with U.S. agencies such as the National Oceanic and Atmospheric Administration (NOAA, 2023), the National Aeronautics and Space Administration (NASA, 2023), and the U.S. Air Force, which houses the U.S. Space Command (U.S. Air Force, 2023).

Professional Development and Continued Education for Aerospace Employees: A Need for Risk Management Training

Once these aerospace students graduate and become part of the aerospace industry, their studies do not stop. The companies that hire them are engaged in pressing their workforce and leaders to pursue continued education and professional development opportunities. Multiple companies cater to aerospace professionals with a wide array of courses and certificate programs. The focus of these courses builds upon the curricula described above that aerospace students follow in their undergraduate and graduate degrees (AIAA, 2023; Aerospace Corporation, 2023; National Institute of Space, 2023). A perusal of the offerings from these companies shows that their professional development courses and resources do not include any risk management training focused on preventing legal entanglements, whether on an international basis or pertaining to a basic liability issue.

Leaders in the aerospace industry must be ready to respond with alacrity to meet multiple potential risks, not only in the development and launch of satellites and rockets but also in preventing legal entanglements at local and international levels. Aerospace leaders must be ready to prevent and manage liability issues in their industry, from contract claims to tort claims. They need to understand the history of the context of international space treaties and be ready to shape the future of the regulation of the aerospace industry. They will be called upon to provide industry guidance to the U.S. government to craft 21st-century laws to bridge the gaps from the legal framework created in the mid-20th century to accommodate the current explosion of the industry. A course of study that presents the basics of the legal environment of the aerospace business and an overview of international space law aims to provide legal guidance for these aerospace leaders.

LEGAL GUIDANCE FOR AEROSPACE LEADERS

International Space Law

A course of studies that aims to prepare industry leaders with tools to prevent and manage legal issues must provide a historical overview of space law. The foundation of space law is rooted in a series of 20th-century international conventions, beginning with the Outer Space Treaty, signed on January 27, 1967 (UNOOSA, 2023). The Outer Space Treaty was a product of the Cold War when only two nations were in space, and the main concern was nuclear proliferation. Now, almost every nation has a presence in space.

Space law is comprised of international and national laws that govern space-related activities. These laws address matters ranging from the freedom of use and exploration of outer space by all nations to liability for damages caused by space objects to the nuances of government contracts (NOOSA, 2023; Smith, 2018). Space law addresses matters of global concern such as the protection of space and Earth environments, rescue and return of astronauts and space objects, sharing of information about potential hazards in outer space, the prevention of harmful interference from outer space and other nations, and international cooperation (NOOSA, 2023;

Smith, 2018). Domestic space laws, the U.S. being a leader in these efforts, include detailed laws and regulations applicable to the myriad of space activities many nations engage in. Indeed, more than 20 nations have promulgated detailed national space laws and regulations (Jakhu, 2010).

An overview of the major space treaties adopted by the United Nations will include the role of the Committee on the Peaceful Uses of Outer Space (COPUOS). COPUOS was set up by the General Assembly of the U.N. in 1959 to govern the exploration and use of space for the benefit of all humanity: for peace, security, and development (COPUOS, 2019). The Committee was tasked with reviewing international cooperation in peaceful uses of outer space, studying space-related activities that could be undertaken by the U.N., encouraging space research programs, and studying legal problems arising from the exploration of outer space (COPUOS, 2019). The two subcommittees set up under COPUOS continue to meet annually due to the constantly evolving space agenda: the Technical Subcommittee and the Legal Subcommittee (COPUOS, 2019).

U.S. Legal Regime Applicable to Commercial Space Activities

Given that the aerospace industry is highly regulated, a continued education program for aerospace leaders will include an overview of the international context of space law and the legal regime developed in the U.S. The Outer Space Treaty requires that specific nations bear “international responsibility for national activities in space” and that such nations must bear “authorization and continuing supervision” of the activities of non-governmental entities in outer space (Outer Space Treaty, 1967). The U.S. and other nations have responded by passing statutory and regulatory laws that address safety, financial responsibility, licensing, remote sensing of the earth from space, satellite communications, and even space mining. To this date, 22 countries have adopted space laws, and others, such as the United Arab Emirates, have developed their own set of such laws (National Space Law Collection, 2020).

The U.S. has codified multiple laws to this end, beginning with the 1958 National Aeronautics and Space Act (NASA Act, 1958). The NASA Act created the National Aeronautics and Space Administration (NASA) to conduct a U.S. civilian space program with military space activities assigned to the Department of Defense (DoD). Amended multiple times, the NASA Act emphasizes that activities in space should be devoted to peaceful purposes for the benefit of all humankind and encourages the full commercial use of space to the maximum extent possible (NASA, 1958, 2005, 2008, 2010). The 2005 NASA Authorization Act established the International Space Station as a “national laboratory” to emphasize that its use is not limited to NASA-sponsored activities (NASA, 2005).

Some of the more salient U.S. space laws that have been adopted since the NASA Act include the Commercial Space Launch Act of 1984 (CLSA), which applies to the launch and reentry of space objects (CLSA, 2023); the 1992 Land Remote Sensing Policy Act which established a regime for facilitating and regulating commercialization of land remote sensing satellites while returning responsibility to the government (Land Remote Sensing Policy Act, 2023); and the 2015 Commercial Space Launch Competitiveness Act, and the Spurring Private Aerospace Competitiveness and Entrepreneurship (SPACE) Act which makes changes to U.S. commercial space policy including granting property rights to U.S. companies to mine resources from asteroids (SPACE Act, 2015). The Act allows U.S. citizens to “engage in commercial exploration for and commercial recovery of space resources...in accordance with the international obligations of the [U.S.] and subject to authorization and continuing supervision by the Federal Government”; the SPACE Act makes clear that the U.S. does not “assert sovereignty or...exclusive rights or jurisdiction or ownership of any celestial body” (SPACE Act, 2015). The

SPACE Act fosters debate about whether or not the Act violates the non-appropriation clause of the Outer Space Treaty. These are the kinds of legal developments that require the informed participation of leaders in the industry, not only legislators.

The Legal Environment of the Business of the Aerospace Industry and Risk Management

As exotic as the notion of Space Law is, the main culprits that an aerospace company faces daily in terms of risk management and the prevention of legal liability come within the realm of the basics of business law--from contract negotiations to avoiding claims in tort liability—whether negligence claims or intentional tort claims—to the protection of intellectual property, from patents to trademarks. An understanding of the fundamentals of business law and its application to the aerospace industry will prepare aerospace leaders to forge forth with exploration and avoid costly legal battles. This area of the proposed course of study for professional development and continued education is critical and will play a pivotal role in a leader's readiness to manage risk and prevent legal problems.

The presentation of the legal frameworks of enforceable contracts, tort liability, intellectual property, and dispute resolution, which comprise the most commonly applied area of law to space law activities (Smith, 2018), will be structured similarly to a condensed legal environment of business class for undergraduate business students. The course of study will focus on insurance claims, financing, government regulation, and environmental laws. In addition, the course will include training in dispute avoidance and resolution. It will draw from other resources such as the International Chamber of Commerce Financing, which provides essential services to space endeavors similar to financing and insuring other high-risk, high-investment business ventures (ICC, 2023).

INDUSTRY LEADERS' ROLE IN THE AEROSPACE INDUSTRY AND REGULATION

Understanding legal ramifications for risk management and preventing legal liability is only one of the motivations for crafting this proposed course of study. Leaders in the industry play an important role in shaping changes in regulations and legislation aimed at the aerospace industry. The burgeoning commercialization of the aerospace industry calls for the need to amend and advance our space laws nationally and internationally. Likewise, ongoing concerns over threats such as hacking satellite constellations, dazzling (shining disruptive light down from space), and spoofing attacks (a situation in which a person or program successfully masquerades as another by falsifying data to gain an illegitimate advantage) will keep some aerospace leaders up at night or in expensive conversations with legal counsel. The gaps that exist between the expansion of the space industry and our legal framework require well-informed leadership from inside the industry to help shape the shifting legal landscape.

As noted above, the United Nations (U.N.) adopted a resolution outlining how national legislation can comport with the Outer Space Treaty and includes recommendations on national legislation relevant to the peaceful exploration and use of outer space. As Congress and the United Nations look to amend existing treaties and draft new ones to overcome the vagaries of space law, the inside leadership of the industry has an important role. The U.S. statutory provisions and administrative regulations have helped foster the development of commercial space activities in the U.S. As the industry evolves, a need to streamline some of these regulations and expedite the license application procedures seems to become more evident and await Congressional action. A

move in this direction occurred in 2010 with a re-codification of U.S. space laws that enacted a restatement of existing law relating to national and commercial space programs; Title 51, National and Commercial Space Programs, consolidates multiple statutes dealing with space law such that these laws can be found in one place (Title 51, 2010). This is another example of how aerospace professionals can prepare themselves to help Congress modernize our laws.

Some of these “gaps” in the laws and regulations call for urgent discussion and legislative action; for example, there is no U.S. agency with jurisdiction over on-orbit activity; the FAA licenses the launch and return of space vehicles but has no authority over on-orbit activity; there are no judicial decisions on a question of space law in an international court. In addition, concern arises around privacy laws with the abundance of satellites, as well as around property laws and the conflict between laws allowing the mining of celestial bodies and those prohibiting it. Industry professionals must be part of the ongoing development of the regulatory environment.

CONCLUSION

As the space industry continues to develop toward producing and engaging in the projected \$1.5 trillion global revenues of 2040, universities will expand their degree programs to meet the expectations of the organizations involved in the commercialization of space, along with the expectations of the government and its defense goals. The new leaders in the industry will advance their knowledge and expertise to meet the demands of their endeavors. These professionals will engage in professional development studies to develop new technologies and applications that reach beyond our galaxy. They also will play an important role in collaborating with all stakeholders to manage the legal risks faced by the growing industry. A professional development course of studies for aerospace professionals—as well as students, undergraduate or graduate—that provides an overview of our international and national laws as well as a focus on legal issues that arise every day in the industry-- from contracts to negligence to insurance claims—will prepare a leader in the aerospace industry to manage risk and focus on the growth of the industry. This course of study will also help prepare leaders in the aerospace industry to provide a critical voice for the changes needed in the existing regulatory environment. The future of space exploration and commercial space ventures depends upon thoughtful, well-informed, erudite leadership from within the industry.

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WHAT NEXT? AN EXPLORATION OF ENTREPRENEURS' POST-FAILURE CAREER BEHAVIOR

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ABSTRACT

Business failure may be a challenging experience for many entrepreneurs, yet entrepreneurs continue to engage in venture creation and development. The present study integrates Social Cognitive Career Theory (SCCT) with recent theoretical and empirical insights on habitual entrepreneurship to explain and predict how past performance shapes entrepreneurs' subsequent career-related cognitions and behavior. Leveraging a novel cross-national dataset of 2,093 experienced entrepreneurs in Latin America, this study found that compared to experienced entrepreneurs without prior failure, failed entrepreneurs are more likely to start new businesses. The study also found, counter to expectations, that the likelihood of entering paid employment decreases, rather than increases, after a venture failure. The study concludes by considering the implications of these findings and suggesting avenues for future research.

Keywords: Entrepreneurial Failure, Post-Failure Reentry, Habitual Entrepreneurs

INTRODUCTION

Received wisdom suggests most entrepreneurs will experience failure during their careers (Taylor, 1999; Brüderl et al., 1992). Less is known about how a business failure influences an entrepreneur's next career moves (Burton et al., 2016; Koch et al., 2021). Entrepreneurs are motivated to avoid failure to shield themselves from the losses they have or expect to incur (Ucbasaran et al., 2013; McGrath, 1999). Accordingly, rates of entrepreneurial activity may be suppressed due to the widespread fear of failure engendered by the high perceived likelihood and costs of failure (Levie et al., 2011; Cacciotti & Hayton, 2015; Bosma & Schutjens, 2011; Yang & Aldrich, 2012). However, despite having the option to potentially reduce their personal financial risk by pursuing wage employment, entrepreneurs often re-engage in venture creation following a prior failure experience (Baú et al., 2017; Eggers & Song, 2015; Lin & Wang, 2019; Nielsen & Sarasvathy, 2016; Yamakawa et al., 2015). The present study explores the relationship between venture failure and entrepreneurs' subsequent career behavior.

Following a failure, entrepreneurs can seek wage or dependent employment, withdraw from the labor market, or persist with entrepreneurial pursuits (Jenkins & McKelvie, 2017), for example, by starting a new business or continuing to run another business they own when exiting the failed venture. While research notes that organizationally employed former entrepreneurs (OEFEs) are quite common (Baú et al., 2017; Koch et al., 2021), considerably less is known about the performance of their prior venture(s) and its impact on the entrepreneur's career (Hsu et al., 2017). At the same time, studies of habitual entrepreneurs reveal that many entrepreneurs rebound from failure (Fu et al., 2018; Hessels et al., 2018; Simmons et al., 2019). In many cases, little time passes between a prior failure and reentry (Amaral et al., 2011; Jenkins & McKelvie, 2017; Lin & Wang, 2019), and prior failure experience may even help entrepreneurs to perform better in subsequent ventures (Boso et al., 2019; Yamakawa et al., 2015).

The emerging research on post-failure reentry has largely sought to identify its antecedents but, to date, has produced inconclusive findings (Tipu, 2020). To illustrate, Nielsen and Sarasvathy (2016) find that failed entrepreneurs are more likely to reenter than successful entrepreneurs, while Amaral et al. (2011) find entrepreneurs with a positive venturing experience are more likely to reenter than those with a negative venturing experience. Variance in post-failure reentry has generally been explained in terms of differences in human capital (Amaral et al., 2011; Carbonara et al., 2019; Koçak et al., 2010), barriers to and facilitators of learning from failure (Cope, 2011; Mueller & Shepherd, 2016), and in light of individual differences, such as coping and emotional recovery (Shepherd et al., 2016), (causal) attributional style (Williams et al., 2022; Yamakawa et al., 2015), comparative optimism (Ucbasaran et al., 2010), career stage (Baú et al., 2017), and gender (Simmons et al., 2019). While these studies have collectively generated important insights into factors affecting reentry, the opportunity to advance our understanding of how entrepreneurs behaviorally respond to prior failure is offered by integrating frameworks on career self-management into our theorizing.

The present study adopts Social Cognitive Career Theory's (SCCT) career performance/persistence model to explore entrepreneurs' post-failure career behavior. SCCT is a well-established theory that explains three interrelated areas of career development – career interest, choice, and persistence (Lent et al., 1994) – and has recently been integrated into the entrepreneurship literature as an alternative lens into entrepreneurial intentions (Liguori et al., 2018; Liguori et al., 2020) and entry decisions (Lanero et al., 2016; Meoli et al., 2020). SCCT's career persistence model is particularly appropriate because it highlights the role of one's prior personal accomplishments as a learning experience that informs and affects future career-related cognitions, behavior, and performance (Lent et al., 2019). Leveraging a novel dataset of 2,093 experienced entrepreneurs in Latin America, this study finds, compared to experienced entrepreneurs without a prior failure, failed entrepreneurs are more likely to start new businesses and, counterintuitively, that prior failure is associated with a decreased, rather than increased, likelihood of subsequently entering wage employment.

The current study offers two primary contributions to the literature. First, it contributes to research on habitual entrepreneurship and the downside of entrepreneurship by examining the impact of failure on career cognitions (intentions) and behavior (reentry). In so doing, it integrates Social Cognitive Career Theory (SCCT) with findings from the entrepreneurial failure and repeat entrepreneurship literature to identify the approach and avoidance influences of entrepreneurs' cognitions on post-failure reentry. Second, this study contributes to the vocational psychology literature by extending SCCT (Lent et al., 1994) to the entrepreneurship and small business management career domain. The external generalizability of SCCT is extended by testing its career persistence model with working professionals and in a cross-national context.

This paper first introduces the core tenets and propositions of SCCT's career persistence model. It integrates them with findings in the entrepreneurship literature to derive hypotheses of post-failure career behavior. It then proceeds to describe the study design, sample, measurement approach, and report findings. Finally, it concludes with a discussion of the study's implications, limitations, and suggestions for future research.

CONCEPTUAL BACKGROUND

A Social Cognitive Career Theoretic Model of Career Performance/Persistence

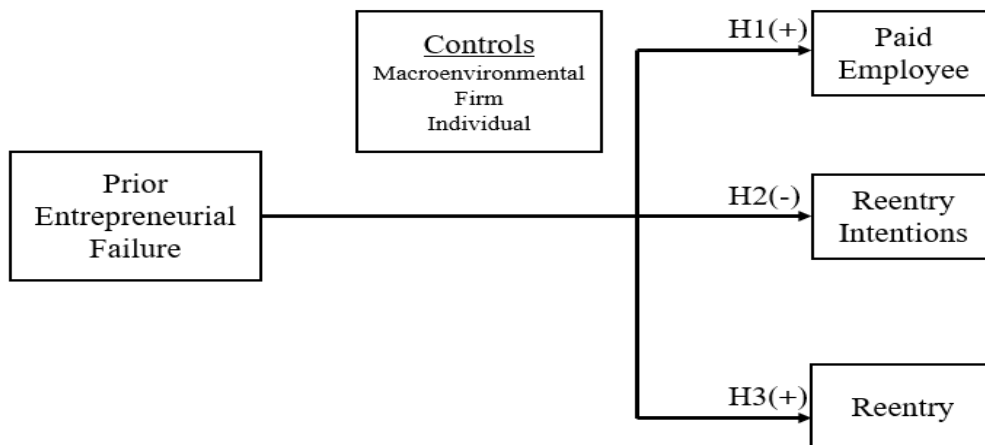
Social Cognitive Career Theory (SCCT) has emerged as a robust theoretical framework initially formulated to explain three fundamental areas of career development – career interest,

choice, and performance/persistence (Lent & Brown, 2019; Liguori et al., 2018). Underlying SCCT’s core propositions is the triadic-reciprocal causal model, which holds that a person’s overt behavior, personal attributes, and contextual factors are bidirectional co-determinants (Lent & Brown, 2019; Lent et al., 1994). Across its models, SCCT highlights the role of social-cognitive variables – learning experiences, self-efficacy, outcome expectations, and goals – in explaining and predicting how agentic career actors’ individual differences, career behavior, and external environmental factors independently and jointly influence one another (Lent et al., 2004).

The present study adopts SCCT’s performance/persistence model (abbreviated hereafter as SCCTPM) for its emphasis on how one’s ability or *past performance within a career domain* affects future persistence and performance within the domain, rendering it highly appropriate for examining entrepreneurs’ post-failure career behavior (Liguori et al., 2020). SCCTPM holds that domain-specific persistence/performance is directly influenced by personal performance accomplishments, including third-party objective performance assessments and self-appraisals of outcomes resulting from past efforts. Career persistence is influenced indirectly by one’s outcome expectations, i.e., beliefs about the consequences of taking action, and domain-specific self-efficacy, i.e., confidence in one’s ability to perform the tasks required to succeed in one’s chosen profession (Lent & Brown, 1996), such as being an entrepreneur.

Attention is focused on the direct relationship between prior failure and reentry. Learning experiences (information sources; Lent et al., 1994) encapsulate how a person’s reinforcement history – the positive, neutral, or negative feedback associated with prior actions – shapes how they filter, interpret, and respond to stimuli. Personal accomplishments are the most influential of the four learning experiences that inform and modify self-efficacy beliefs and outcome expectations, mediating the relationship between prior outcomes and future behavior (Lent & Brown, 2019; Lent et al., 2004). Accordingly, entrepreneurs may regard prior failures as a signal of their innate ability or proficiency in executing fundamental entrepreneurial career tasks (e.g., recognizing opportunities and creating ventures). Consequently, venture failure reduces entrepreneurial self-efficacy (ESE) and the financial and non-pecuniary benefits one expects to attain from entrepreneurial activity. These insights are consistent with findings in the entrepreneurship literature on failure, persistence/resilience, and repeat entrepreneurship to propose a model of entrepreneurs’ post-failure career behavior (see Figure 1).

Figure 1. Conceptual Model of Entrepreneurs' Post-failure Career Behaviors.



Post-failure Career Behaviors

Jenkins and McKelvie (2017) identified post-failure career behaviors in which entrepreneurs engage. A failed entrepreneur may start a new venture, restart the previously failed business, continue managing other firms they already owned at the time the focal venture failed, work as an employee, or withdraw temporarily or permanently from the workforce (e.g., due to unemployment, retirement, or death).

While entrepreneurs' career paths and transitions have received substantial attention, organizationally employed former entrepreneurs (OEFEs) are relatively understudied (Hsu et al., 2017), and therefore, relatively little is known about the antecedents of failed entrepreneurs' decision to return to the workforce. However, OEFEs are quite common. Reporting 26 years of longitudinal career data on 205 German entrepreneurs, Koch et al. (2021) reveal that 57% of career patterns show periods of wage employment following periods of self-employment. In a longitudinal study of 4,761 failed entrepreneurs in Sweden, 75% became employees while 25% subsequently started a new venture; the entrepreneur's career stage, proxied with age, is positively associated with entry into wage employment during mid-career and gender exhibited a moderating effect such that males showed an increased likelihood of paid employment. In contrast, females returned to entrepreneurial activity (Baú et al., 2017).

Venture failure is often associated with financial, social, and psychological costs for the failed entrepreneur (Ucbasaran et al., 2013), making wage employment an attractive career alternative. Wennberg et al. (2010) find that entrepreneurs who take a job while managing their venture reduce the likelihood of a distressed exit. Further, Dennis and Fernald (2001) report that 14% of entrepreneurs experienced a decline in their personal financial situation due to running their business, while Luzzi and Sasson (2016) show that OEFEs enjoy a wage premium compared to employees without entrepreneurial experience. Moreover, social costs of failure, such as stigmatization (Simmons et al., 2014; Sutton & Callahan, 1987), impose additional barriers to reentry by potentially eroding relationships entrepreneurs rely on for post-failure reentry (Amankwah-Amoah et al., 2018). Psychologically, failure induces grief (Shepherd, 2003) and increases an entrepreneur's knowledge of self, including one's personal and professional strengths and weaknesses (Cope, 2011), which may reduce their ESE and the perceived value they can personally extract from venturing. Therefore, we hypothesize:

Hypothesis 1: The likelihood of working as an employee increases for entrepreneurs with prior failure experience.

An intention is a cognitive state that directs a person's attention toward a specific object or path to achieve a goal (Bird, 1988). Within SCCTPM, reentry intentions correspond to performance goals and are described as the determination to engage in a particular activity or effect a specific future outcome (Bandura, 1986). In turn, entrepreneurial reentry intentions reflect one's desire to re-engage in creating and managing a venture following a prior entrepreneurial experience.

How might a prior failure influence an entrepreneur's intention to venture again? SCCT suggests that *ceteris paribus*, reentry intentions will decline after a failure. However, extant research on the performance-intentions relationship has produced mixed results. We will first consider studies in which a positive or non-significant relationship was found and then shift to studies that align more closely with SCCTPM predictions.

Counterintuitively, rather than a failure experience being uniformly associated with reduced intentions, it may be linked to sustained or increased motivation to persist with venture creation. Consider how entrepreneurs may vary in their interpretation of prior failure and how such interpretations impact outcome expectations. Experienced entrepreneurs may conceive of a venture as a single holding within a broader portfolio of entrepreneurial activity (Sarasvathy et al., 2013). Consistent with a portfolio perspective is the expectation that any given venture could fail and a conceptualization of success that is more holistic such that it considers net performance across past, current, and future (expected) holdings. When confronted with failure, the entrepreneur salvages value through learning (Cope, 2011) and, with enriched human capital, later deploys resources to perform better in subsequent ventures (Yamakawa et al., 2015; Tipu, 2020). As reflected in a quote from prominent entrepreneur turned investor Mark Cuban, “it doesn't matter how many times you fail, you only have to be right once” (Zipkin, 2016, p. 1). Applying this “lottery ticket” logic to an entrepreneur’s venture portfolio may substantially reduce or eliminate the demotivating influence of failure.

Differences in self-efficacy levels and causal attributions further suggest a more nuanced relationship between failure and intentions. Hsu et al. (2017) argue that the effect of self-efficacy on intentions is influenced by the difficulty of the task, causal attributions of task performance, and when a complex set of behaviors yields uncertain outcomes. Investigating the effect of negative performance feedback on motivational intensity, experiments show that individuals low in self-efficacy are demotivated by failures, whereas individuals high in self-efficacy and a promotion-focused self-regulatory orientation tend to intensify their efforts following a failure (Idson et al., 2004; Idson & Higgins, 2000; Bandura & Cervone, 1986). Thus, the excitatory influence of negative performance feedback, such as an entrepreneurial failure, on reentry intentions warrants consideration.

Conversely, prior entrepreneurial failure is likely to reduce reentry intentions. SCCTPM suggests a prior failure provides negative performance feedback that induces an entrepreneur to revise downward what they expect to gain from future venturing, i.e., lowered or more conservative outcome expectations, and their perceived ability to execute the tasks required to achieve success, i.e., reduced ESE (Bandura, 1991). Preliminary evidence aligns with SCCTPM predictions. Simmons et al. (2016) conducted a cross-sectional survey and experimental vignette study with 300 experienced entrepreneurs in the U.S. They reported lower serial entrepreneurship intentions for entrepreneurs with a prior distress exit. Other findings suggest a more nuanced relationship between past performance, self-efficacy, and career intentions. Hsu et al. (2017) conducted experimental vignette studies with a sample of undergraduate entrepreneurship students and experienced entrepreneurs. They found that ESE-based explanations dominated the sample of experienced entrepreneurs, and, for this group, poor perceived financial performance of the hypothetical venture had no effect on reentry intentions. They infer that the relationship between ESE and reentry intentions is sensitive to both the extent and nature of prior entrepreneurial experiences. Thus, prior failures may reduce or have no impact on reentry intentions.

Other research suggests an inverse relationship between prior failure and outcome expectations. All else equal, failed entrepreneurs who maintain expectations for future gain will be motivated to reenter to secure those benefits. In a study involving 298 experienced entrepreneurs in Great Britain, mixed findings were reported such that no significant relationship was found between serial entrepreneurs with prior failure and their level of comparative optimism, i.e., the belief they are less likely than others to experience negative outcomes. In contrast, a significant, negative relationship was found between portfolio entrepreneurs with a prior failure and comparative optimism (Ucbasaran et al., 2010). As such, prior failures may lead entrepreneurs to adjust downward

the performance expectations of exploiting a perceived opportunity, thereby reducing reentry intentions.

In sum, despite a robust inverse relationship between past performance and later intentions reported in SCCT-based studies conducted in academic settings (Lent et al., 2019; Lee et al., 2015; Brown et al., 2011; Brown et al., 2008), findings involving samples of entrepreneurs produce less conclusive results. In line with SCCTPM's core assertion that negative performance feedback reduces intentions directly and indirectly via reduced ESE and outcome expectations, we hypothesize:

Hypothesis 2: The likelihood of having intentions to reenter entrepreneurship decreases for entrepreneurs with prior failure experience.

SCCTPM departs from SCCT's interest and choice models by its emphasis on predicting why career actors stay within a career path they have already chosen rather than what leads them to choose one domain (e.g., engineering) versus another (e.g., geology; Lent et al., 1994). SCCTPM has primarily been tested and validated with student samples (Lent et al., 2019; Brown et al., 2008), even with recent adoption in the entrepreneurship literature where attention has focused on forming entrepreneurial intentions or entry into entrepreneurship compared to other career paths (Meoli et al., 2020; Liguori et al., 2020; Pérez-López et al., 2019; Lanero et al., 2016). While SCCTPM posits departure from a career path is more probable in the face of negative performance feedback, working professionals who have improved their understanding of themselves, the nature and demands of venture creation and management, and relationship management (Lattacher & Wdowiak, 2020; Cope, 2011), and who operate in contexts where alternative income generating opportunities are limited, post-failure reentry may occur more often than assumed. Accordingly, we integrate SCCTPM with extant theoretical and empirical findings on habitual entrepreneurship.

Entrepreneurial reentry can be understood as a form of persistence within a career domain, especially if an entrepreneur considers one or more prior venturing experiences to be a failure. Studies on entrepreneurial resilience (Hartmann et al., 2022) and escalation of commitment (Sleesman et al., 2018; McMullen & Kier, 2016), i.e., continuing to invest resources into a potentially failing course of action, largely conclude entrepreneurs frequently persist when faced with adversity or the prospect of firm failure and also note the influence of person-specific variables such as self-efficacy, outcome expectations, hubris, and passion in contributing to persistence (Cardon & Kirk, 2015; Kiani et al., 2023; Hayward et al., 2010). Others observe, in many cases, little time passes between failure and reentry (Lin & Wang, 2019; Amaral et al., 2011), suggesting entrepreneurs can recover quickly or persevere through grief.

Positive and pathological psychology further suggests why entrepreneurs may be more likely to reenter post-failure. As noted above, entrepreneurs differ in their causal attributions of failure (Yamakawa & Cardon, 2015). Entrepreneurs attributing failure to controllable causes (i.e., factors whose degree of impact a person can actively modulate), such as the level of effort expended by the entrepreneur, are more likely to reenter as such factors can be addressed by taking corrective action (Ford, 1985; Stokes & Blackburn, 2002). Moreover, recent inquiries into the dark side of entrepreneurship imply that some individuals suffer from entrepreneurship addiction (Spivack et al., 2014), defined as "excessive or compulsive engagement in entrepreneurial activities that results in a variety of social, emotional, and physiological problems; despite these problems, the entrepreneur is unable to resist the compulsion to engage in entrepreneurial activities" (Spivack & McKelvie, 2018, p. 360). Entrepreneurial addiction is characterized by periods of disengagement from and re-engagement in the underlying behavior as well as increased tolerance over time such that subsequent

engagements are associated with more, rather than less, investment of time, effort, and resources. Thus, entrepreneurs with a compulsion for venture creation may instead “double down” following a failure.

The magnitude of costs entrepreneurs bear in the aftermath of a venture failure may not considerably deter reentry. Studies examining entrepreneurs’ post-exit financial returns suggest a modest negative financial impact on failed entrepreneurs (Harting, 2005). Sampling 783 entrepreneurs who exited a venture within the prior six months, only 29% reported their ventures were not profitable, and of those, only 6% felt their financial situation was currently worse than before they managed the venture (Dennis & Fernald, 2001). Further, Jenkins and McKelvie (2017) found that 34.7% of 256 failed Swedish entrepreneurs whose ventures filed for bankruptcy reentered within six months of filing. Thus, while failed entrepreneurs do incur financial costs associated with failed ventures, these costs do not appear to impact their ability to re-engage in venture creation significantly. Taken together, we hypothesize:

Hypothesis 3: The likelihood of reentering entrepreneurship increases for entrepreneurs with prior entrepreneurial failure.

METHODS

Research Design and Sample Description

The data source for this study is from the Global Failure Index (GFI), a survey conducted by The Failure Institute, a non-governmental organization based in Mexico City, Mexico. Motivated by a vision to broaden how entrepreneurial failure is conceptualized and measured, the GFI collects information from experienced entrepreneurs on 33 factors across four broad categories: 1) characteristics of the entrepreneur, 2) characteristics of the venture, 3) details about the closure of a failed venture, and 4) sources of external support.

Data was collected using a convenience and chain-referral sampling technique. A brief, cross-sectional survey was administered through two web-based platforms, Qualtrics and Survey Monkey. Recruited participants include FUN¹ event presenters and attendees, entrepreneurs affiliated with FUN event host organizations, and respondents who opted in by clicking on a web link to the survey posted on the parent organization’s website and shared by intermediaries and affiliates via two social media platforms, Facebook and Twitter. Responses were obtained from 3,646 entrepreneurs between 2016-2018. Data was retained from 2,093 participants, yielding an effective response rate of 57.4%.

Of the 2,093 experienced entrepreneurs included in the study, 235 (11.3%) became paid employees, 543 (25.9%) expressed intentions to reenter, and 760 (36.3%) engaged in re-entry. The majority of the sample is comprised of adults in the early or middle stages of their career (mean age = 37.82 years; 82.1% of paid employees, 80.3% of those with reentry intentions, and 81.2% of entrepreneurs who reenter are between the ages 26-55), are male (62.5%), have obtained an undergraduate or advanced degree (85%), and were habitual entrepreneurs (77.4%) with at least one entrepreneurial experience prior to their involvement in the focal failed venture.

Traits of the failed venture were recorded. Entrepreneurial teams led the majority of firms (71.9%), and slightly more than half (53.3%) were family-owned businesses. Firms were classified

¹ The parent organization of The Failure Institute manages an international event series called Fuckup Nights (FUN) during which professionals publicly share personal narratives of career-related and personal failures. FUN events are held in urban centers in over 80 countries.

as family businesses if the ratio of familial partners to the total number of partners at closing was greater than or equal to 50%. A wide range of industries were represented, with firms operating in the food, beverage, and tobacco markets (27%) being the most common. Lifestyle small businesses (55%) and technology-based firms (17.4%) were most represented, and a plurality of firms were in the startup phase of development (42.9%). Nearly all firms operated in Latin American countries: Mexico (53.4%), Colombia (22.5%), Chile (15.1%), and Peru (7.2%). Most firms had ten or fewer employees (89.7%), were started with \$10,000 USD or less (74.6%), and had average monthly gross revenue below \$10,000 USD (95.6%).

Measures

Table 1 describes the measures used in the study and how they are operationalized; the dependent and independent variables are summarized below.

| Table 1: Description of Study Variables | |
|--|--|
| Variable | Description |
| Dependent | |
| Employment | Indicator variable equal to 1 if respondents indicated they worked for an organization without any plans to start another business |
| Reentry Intentions | Indicator variable equal to 1 if respondents indicated they worked for an organization but have plans to start another business |
| Reentry Behavior | Indicator variable equal to 1 if respondents indicated they started a new business either a) in the same industry or b) in a different industry than the failed venture. |
| Independent | |
| Prior failure | Indicator variable equal to 1 if respondent claimed they had at least 1 failed venture. |
| Controls (macroenvironment) | |
| Environmental munificence | GEM EFC NES data; operationalized as the average Financing for Entrepreneurs rating, measured on a 5-point Likert scale (1=highly insufficient, 5=highly sufficient), for the five most recent calendar years for which data is available indexed to the country in which the failed venture maintained principal operations. |
| Business climate | GEM EFC NES data; calculated as the average rating on two variables – 1) Governmental Policies and Support, and 2) Taxes and Bureaucracy - each measured on a 5-point Likert scale (1=highly insufficient, 5=highly sufficient), for the five most recent calendar years for which data is available, indexed to the country in which the failed venture operated. |
| Controls (firm) | |
| Family partners | Number of co-owners of the failed venture that are relatives of the failed entrepreneur. |
| Partners at closing | Natural log of the total number of firm owners when the failed venture exited. |
| Industry | Multi-categorical quasi-industry control, i.e., a single variable used to represent industry conditions. Coded into three categories in ascending order reflecting stronger mobility barriers: 1) Trade, e.g., retail, restaurants; 2) Services, e.g., financial services, transportation; 3) Production, e.g., manufacturing, forestry, and agriculture. Trade was the baseline category. |
| Type of business | Categorical variable reflecting strategic orientation of the failed venture. Coded as: 1) social enterprise, 2) high-impact company, 3) technology-based company, 4) traditional company, and 5) other. Other was baseline category. |
| Employees | Natural log of the number of employees of the failed venture. |
| Monthly revenue | Natural log of the average gross monthly sales of the failed venture, adjusted for currency value and inflation. |
| Lifespan | Difference, in years, between the failed venture’s date of closure and start date. |

Global Entrepreneurship Monitor; EFC = Entrepreneurship Framework Conditions; NES = National Expert Survey.

| | |
|------------------------------|--|
| Stage of development | Categorical variable reflecting maturity level of the failed venture at the time of firm exit. Response options include a) start-up, b) growth, c) established, d) expansion, and e) mature. Start-up was baseline category. |
| Startup capital | Natural log of the sum of money used to start the failed venture, adjusted for currency value and inflation. |
| Controls (individual) | |
| Age | Number of years since failed entrepreneur's birth. |
| Sex | Indicator variable coded such that 0 = male and 1 = non-male. |
| College educated | Indicator variable equal to 1 if university and/or graduate school was completed. |
| Entry motives | Number of motives cited for starting the failed venture |

Dependent Variables

Employment. A single item – “What did you do after your business failed?” – with six response options was used to capture respondents’ post-failure career intentions and behavior. Outcomes involving a return to the workforce (wage employment), (temporary) withdrawal from the workforce, and entrepreneurial entry were represented among the response options. Employment was measured using a binary indicator variable which takes the value of 1 if respondents stated they worked for an organization without any plans to start another business and 0 otherwise.

Reentry Intentions. Reentry intentions were measured using a binary indicator variable, which takes the value of 1 if respondents indicated that they worked for an organization but had plans to start another business and 0 otherwise.

Reentry. Of the 6 response options, two indicate post-failure reentry. Reentry was measured as a binary indicator variable, which takes the value of 1 if respondents indicated they started a new business either a) in the same industry or b) in a different industry than the failed venture and 0 otherwise.

Independent Variable

Prior Failure. Prior failure was captured with a binary indicator, which takes the value of 1 if respondents indicated they had at least one venture that failed and 0 otherwise.

RESULTS

Descriptive statistics and correlation coefficients for the study variables can be found in Table 2 in Appendix A. Post-failure employment is significantly correlated with prior failure, $r = -.10$, $p < .01$; reentry intentions, $r = -.021$, $p < .01$ and reentry behavior, $r = -.027$, $p < .01$. Reentry intentions are significantly associated with environmental munificence, $r = .09$, $p < .01$; family partners, $r = -.05$, $p < .05$; type of business, $r = -.05$, $p < .05$; lifespan, $r = -.08$, $p < .01$; and reentry behavior, $r = -.45$, $p < .01$. Post-failure reentry correlates significantly with number of partners at closing, $r = .05$, $p < .05$; type of business, $r = .07$, $p < .01$; number of employees at closing, $r = .07$, $p < .01$; lifespan, $r = .11$, $p < .01$; stage of development, $r = .07$, $p < .01$; startup capital, $r = .08$, $p < .01$; entrepreneur’s age, $r = .10$, $p < .01$; sex, $r = -.09$, $p < .01$; and prior failure, $r = .21$, $p < .01$.

We test our hypotheses with chi-square analysis and by estimating binary logistic regression models. A chi-square test found a significant relationship between prior failure and post-failure career behaviors, $\chi^2(2, N = 1538) = 76.50$, $p = .000$.

Binary logistic regression models were estimated (see Table 3). To facilitate interpretation of results and to compare the magnitude of effects, odds ratios (exponentiated β) are reported (Justo et al., 2015). The baseline model features only the y-intercept and control variables. Paid employment has a significant negative association with environmental munificence (OR = 0.401, p

< .10) and number of partners at closing (OR = 0.590, $p < .05$); employment has a significant positive association with monthly revenue (OR = 1.207, $p < .05$), entrepreneur's age (OR = 1.013, $p < .10$), and sex (OR = 1.487, $p < .05$).

H1 posits an increased likelihood of working as an employee if an entrepreneur has prior failure experience. Model 1 in Table 3 shows that a prior failure (OR = 0.563, $p < .001$) is associated with a reduced probability of engaging in paid employment. Therefore, H1 is not supported.

H2 maintains that entrepreneurs are less likely to express intentions to reenter following a failure. Model 2 in Table 3 shows that a prior failure (OR = 0.762, $p < .05$) is associated with a reduced likelihood of post-failure reentry intentions. Therefore, H2 is supported.

H3 states that entrepreneurs are more likely to reenter if they have a prior failure. Model 3 in Table 3 shows that a prior failure (OR = 2.939, $p < .001$) is associated with an increased likelihood of post-failure reentry. Therefore, H3 is supported.

Table 3
Binary Logistic Regression Analyses Predicting Entrepreneurs' Post-failure Career Outcomes

| <i>Variables</i> | (A) | | (B) | | (C) | |
|------------------------------|-------------|--------------------|--------------------|---------------|------------------|--------------------|
| | Employment | | Reentry Intentions | | Reentry Behavior | |
| | <i>s.e.</i> | <i>Exp(β)</i> | <i>s.e.</i> | <i>Exp(β)</i> | <i>s.e.</i> | <i>Exp(β)</i> |
| Constant | 1.872 | 0.106 | 3.496 | 2.694 | 1.353 | 0.304 |
| Controls (macro) | | | | | | |
| Env Mun | 0.555 | 0.401 [†] | 0.377 | 4.672*** | 0.353 | 0.476* |
| Climate | 0.414 | 1.214 | 0.328 | 0.523* | 0.288 | 1.366 |
| Controls (firm) | | | | | | |
| Family Partners | 0.083 | 1.028 | 0.057 | 0.922 | 0.051 | 1.029 |
| ln_Partners at Closing | 0.247 | 0.590* | 0.162 | 0.909 | 0.145 | 1.221 |
| Industry_Services | 0.183 | 0.888 | 0.129 | 1.042 | 0.122 | 0.936 |
| Industry_Production | 0.251 | 0.896 | 0.179 | 0.953 | 0.162 | 1.023 |
| Type_Traditional | 0.399 | 1.225 | 0.262 | 0.793 | 0.257 | 1.109 |
| Type_Social | 0.442 | 1.266 | 0.299 | 0.652 | 0.288 | 1.221 |
| Type_Growth | 0.457 | 1.159 | 0.311 | 0.525* | 0.290 | 1.638 [†] |
| Type_Technology | 0.439 | 1.137 | 0.286 | 0.715 | 0.277 | 1.345 |
| ln_Employees | 0.100 | 1.009 | 0.072 | 1.009 | 0.064 | 1.126 [†] |
| ln_MonthlyRevenue | 0.094 | 1.207* | 0.310 | 0.744 | 0.082 | 0.989 |
| Lifespan (years) | 0.020 | 0.996 | 0.017 | 0.952** | 0.013 | 1.038** |
| Closing_Growth | 0.214 | 1.122 | 0.148 | 1.078 | 0.140 | 1.188 |
| Closing_Established | 0.226 | 1.234 | 0.169 | 0.883 | 0.156 | 1.041 |
| Closing_Expansion | 0.356 | 0.998 | 0.261 | 0.815 | 0.221 | 1.369 |
| Closing_Mature | 0.262 | 0.940 | 0.185 | 1.090 | 0.172 | 1.227 |
| ln_Startup Capital | 0.029 | 0.967 | 0.022 | 1.037 | 0.020 | 1.008 |
| Controls (individual) | | | | | | |
| Age | 0.008 | 1.013 [†] | 0.006 | 0.995 | 0.005 | 1.004 |
| Sex (0=Male) | 0.164 | 1.487* | 0.121 | 0.819 | 0.113 | 0.721** |
| College Educated | 0.223 | 1.079 | 0.162 | 1.003 | 0.152 | 1.080 |
| Entry Motives | 0.079 | 1.035 | 0.056 | 0.995 | 0.053 | 0.950 |
| Main Effect | | | | | | |
| Prior Failure | 0.167 | 0.563*** | 0.126 | 0.762* | 0.136 | 2.939*** |
| <i>n</i> | | 1,814 | | 1,814 | | 1,814 |
| -2 Log likelihood | | 1,205.671 | | 2,018.721 | | 2,237.320 |
| Model χ^2 | | 40.829* | | 56.891*** | | 154.242*** |

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

DISCUSSION

To answer the research question related to career behaviors entrepreneurs are likely to engage in after a failure experience, the present study is among the first to apply social cognitive career theory to examine entrepreneurs' post-failure persistence. To date, the embryonic research on post-failure outcomes has focused on the antecedents of reentry, with most attention devoted to examining the role of experience in shaping outcomes yet producing mixed results (Tipu, 2020). This study contributes to this stream by examining prior failures' influence on subsequent career behaviors. The main findings are consistent with the literature on entrepreneurial resilience and persistence; failure does not deter entrepreneurs from starting new firms.

The study offers two additional contributions. First, it contributes to the literature on habitual entrepreneurship. By applying SCCTPM, we integrate a social cognitive lens into the transitions entrepreneurs make between paid and self-employment (Koch et al., 2021). SCCTPM offers a particularly valuable perspective due to its triadic reciprocity premise, i.e., the idea that personal traits and cognitions, behavior, and environment are mutually interacting causal factors. Specifically, it demonstrates how past performance impacts one's decision to persist in an entrepreneurial career path while controlling for contextual factors and sampling entrepreneurs in varying national and cultural contexts.

This study also contributes to the vocational psychology literature by extending SCCT to the career domain of new venture creation and small business management. SCCTPM has primarily explored persistence in academia or intentions to transition from aspiring to novice entrepreneurs. This study tests the direct paths between past performance and performance goals (reentry intentions) and performance attainment (reentry) in a sample of experienced entrepreneurs, thereby answering the call to move beyond student samples (Lent et al., 2019). Further, SCCT has largely been tested with U.S. and Western European samples; we explore its external generalizability with a sample of Latin American entrepreneurs.

Counter to expectations, a reduced likelihood of engaging in paid employment is observed. One possible explanation is that local labor markets suffered from a restricted supply of attractive wage employment opportunities, thus necessitating self-employment. An alternative explanation is that failed entrepreneurs' optimism and confidence are less impacted by failure than is often assumed. However, another explanation is that the magnitude of costs imposed by failure are quite tolerable, especially if the entrepreneur did not derive most of their income from the failed venture or the opportunity had limited potential to generate significant wealth. Essentially, the losses were affordable and insufficient to impede persistence in self-employment.

Limitations

Although the results presented offer insights into how prior entrepreneurial performance shapes persistence in self-employment, several limitations should be addressed in future studies. First, survey data was collected with a cross-sectional research design, thereby limiting our ability to make causal inferences and constraining our ability to examine how the intentions-behavior relationship evolves over time more closely. Second, the phrasing and categorizing of post-failure behaviors constrained our ability to disentangle intentions, behavior, and career status as precisely as desired.

Future Research Directions

We encourage researchers to build on the current study by offering suggestions for future research. From a theoretical perspective, future studies may consider a more nuanced approach to conceptualizing past performance. The distinction between failure and non-failure is seldom as straightforward as it might appear. Theorists might consider how SCCT predictions might hold or change if a subjective versus objective approach to career success was adopted. Moreover, researchers could explore the role of context with a sharper lens. Considering variance in business failure, stigma and fear of failure could produce alternative explanations of individual behavior. Lastly, alternative research designs that better equip investigators to make causal inferences should be employed. Longitudinal and experimental designs that track or manipulate dimensions of failure are especially promising.

CONCLUSION

In recent years, scholarly interest in entrepreneurship's negative aspects and outcomes has grown considerably (Shepherd, 2019). EF is central to understanding the dark side (e.g., Williamson et al., 2022), i.e., one's adverse psychological reactions to engaging in the entrepreneurial process, as EF may operate as a cause (e.g., failure-induced grief and depression) and consequence (e.g., burnout preceding failure). Likewise, EF is important for examining the downside (e.g., Shepherd et al., 2016), i.e., capital losses incurred from entrepreneurial activity, as EF likely plays an intricate role in the magnitude and duration of such losses. The present research shows that the dark cloud of failure may indeed have a silver lining and, for entrepreneurs, failure is largely not fatal nor final. They will try again.

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APPENDIX A: TABLE 2

| Table 2 | | | | | | | | | | | | |
|---|-------|--------|--------|--------|--------|-------|--------|--------|-------|-------|--------|--------|
| Descriptive Statistics and Correlations for Control, Main Effect, and Outcome Variables | | | | | | | | | | | | |
| Variable | Mean | s.d. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1. Env Mun | 2.33 | 0.152 | -- | | | | | | | | | |
| 2. Bus Climate | 2.48 | 0.189 | .26** | -- | | | | | | | | |
| 3. Family Partners | 1.04 | 1.075 | .06* | -0.00 | -- | | | | | | | |
| 4. Partners at Closing | 1.13 | 0.651 | -0.03 | -.06** | .25** | -- | | | | | | |
| 5. Industry Group | 1.65 | 0.700 | -.06** | -0.01 | -.07** | .06** | -- | | | | | |
| 6. Type of Business | 1.81 | 1.226 | -.05* | -.08** | -.10** | .13** | .21** | -- | | | | |
| 7. Number of Employees | 6.80 | 37.647 | 0.02 | 0.01 | .14** | .08** | .07** | 0.04 | -- | | | |
| 8. Monthly Revenue | 10.89 | 0.670 | 0.01 | 0.00 | .06** | 0.02 | -0.01 | -0.01 | 0.03 | -- | | |
| 9. Lifespan | 3.27 | 5.113 | 0.03 | -0.02 | .17** | .11** | .05* | .05* | .10** | .23** | -- | |
| 10. Closing Stage | 1.29 | 1.425 | .06** | 0.02 | .07** | 0.01 | -.10** | -.08** | .13** | .07** | .30** | -- |
| 11. Startup Capital | 7.54 | 3.077 | .06** | 0.01 | .15** | .11** | 0.04 | -0.01 | .07** | .32** | .23** | .14** |
| 12. Age | 37.82 | 10.873 | .06* | .10** | .11** | -0.00 | .05* | -0.00 | .10** | .10** | .28** | .16** |
| 13. Sex | 0.37 | 0.484 | -.07** | .14** | .06** | -0.01 | -.09** | -.15** | -.05* | -0.03 | -.06* | 0.01 |
| 14. Education | 0.85 | 0.357 | -.07** | -.07** | -.09** | .08** | .08** | .08** | -.04* | 0.03 | -0.02 | -.14** |
| 15. Entry Motives | 1.59 | 0.982 | 0.01 | -0.01 | -0.03 | 0.04 | 0.00 | .10** | -0.02 | -0.02 | -0.03 | -0.02 |
| 16. Prior Failure | 0.74 | 0.439 | 0.02 | -0.01 | -0.00 | 0.01 | 0.01 | -0.02 | -0.00 | 0.04 | 0.03 | 0.03 |
| 17. Employed | 0.11 | 0.316 | -0.03 | 0.02 | 0.00 | -0.03 | -0.02 | -0.02 | -0.02 | .05* | -0.02 | 0.00 |
| 18. Reentry Intentions | 0.26 | 0.439 | .09** | -0.02 | -.05* | -0.04 | -0.02 | -.05* | -0.03 | -0.04 | -.08** | -0.02 |
| 19. Reentry | 0.36 | 0.481 | -0.03 | -0.01 | 0.04 | .05* | 0.04 | .07** | .07** | 0.01 | .11** | .07** |

| Table 2 (continued) | | | | | | | | | | | | |
|------------------------|-------|--------|--------|--------|--------|-------|-------|--------|--------|--------|----|--|
| Variable | Mean | s.d. | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | |
| 11. Startup Capital | 7.54 | 3.077 | -- | | | | | | | | | |
| 12. Age | 37.82 | 10.873 | .31** | -- | | | | | | | | |
| 13. Sex | 0.37 | 0.484 | -.11** | -.05* | -- | | | | | | | |
| 14. Education | 0.85 | 0.357 | .09** | -0.03 | -.09** | -- | | | | | | |
| 15. Entry Motives | 1.59 | 0.982 | -0.03 | -.10** | -.06** | 0.03 | -- | | | | | |
| 16. Prior Failure | 0.74 | 0.439 | .13** | .16** | -.09** | 0.03 | -0.01 | -- | | | | |
| 17. Employed | 0.11 | 0.316 | -0.01 | 0.03 | .07** | -0.02 | 0.01 | -.10** | -- | | | |
| 18. Reentry Intentions | 0.26 | 0.439 | 0.00 | -.06** | -.05* | 0.00 | -0.01 | -0.03 | -.21** | -- | | |
| 19. Reentry | 0.36 | 0.481 | .08** | .10** | -.09** | 0.04 | -0.02 | .21** | -.27** | -.45** | -- | |

Note: $n = 2,093$ * $p < .05$; ** $p < .01$

| <i>Variables</i> | (A) | | (B) | | (C) | |
|------------------------------|-------------|--------------------|--------------------|---------------|------------------|--------------------|
| | Employment | | Reentry Intentions | | Reentry Behavior | |
| | Model 1 | Model 2 | Model 1 | Model 2 | Model 3 | Model 3 |
| | <i>s.e.</i> | <i>Exp(β)</i> | <i>s.e.</i> | <i>Exp(β)</i> | <i>s.e.</i> | <i>Exp(β)</i> |
| Constant | 1.872 | 0.106 | 3.496 | 2.694 | 1.353 | 0.304 |
| Controls (macro) | | | | | | |
| Env Mun | 0.555 | 0.401 [†] | 0.377 | 4.672*** | 0.353 | 0.476* |
| Climate | 0.414 | 1.214 | 0.328 | 0.523* | 0.288 | 1.366 |
| Controls (firm) | | | | | | |
| Family Partners | 0.083 | 1.028 | 0.057 | 0.922 | 0.051 | 1.029 |
| ln_Partners at Closing | 0.247 | 0.590* | 0.162 | 0.909 | 0.145 | 1.221 |
| Industry_Services | 0.183 | 0.888 | 0.129 | 1.042 | 0.122 | 0.936 |
| Industry_Production | 0.251 | 0.896 | 0.179 | 0.953 | 0.162 | 1.023 |
| Type_Traditional | 0.399 | 1.225 | 0.262 | 0.793 | 0.257 | 1.109 |
| Type_Social | 0.442 | 1.266 | 0.299 | 0.652 | 0.288 | 1.221 |
| Type_Growth | 0.457 | 1.159 | 0.311 | 0.525* | 0.290 | 1.638 [†] |
| Type_Technology | 0.439 | 1.137 | 0.286 | 0.715 | 0.277 | 1.345 |
| ln_Employees | 0.100 | 1.009 | 0.072 | 1.009 | 0.064 | 1.126 [†] |
| ln_MonthlyRevenue | 0.094 | 1.207* | 0.310 | 0.744 | 0.082 | 0.989 |
| Lifespan (years) | 0.020 | 0.996 | 0.017 | 0.952** | 0.013 | 1.038** |
| Closing_Growth | 0.214 | 1.122 | 0.148 | 1.078 | 0.140 | 1.188 |
| Closing_Established | 0.226 | 1.234 | 0.169 | 0.883 | 0.156 | 1.041 |
| Closing_Expansion | 0.356 | 0.998 | 0.261 | 0.815 | 0.221 | 1.369 |
| Closing_Mature | 0.262 | 0.940 | 0.185 | 1.090 | 0.172 | 1.227 |
| ln_Startup Capital | 0.029 | 0.967 | 0.022 | 1.037 | 0.020 | 1.008 |
| Controls (individual) | | | | | | |
| Age | 0.008 | 1.013 [†] | 0.006 | 0.995 | 0.005 | 1.004 |
| Sex (0=Male) | 0.164 | 1.487* | 0.121 | 0.819 | 0.113 | 0.721** |
| College Educated | 0.223 | 1.079 | 0.162 | 1.003 | 0.152 | 1.080 |
| Entry Motives | 0.079 | 1.035 | 0.056 | 0.995 | 0.053 | 0.950 |
| Main Effect | | | | | | |
| Prior Failure | 0.167 | 0.563*** | 0.126 | 0.762* | 0.136 | 2.939*** |
| <i>n</i> | | 1,814 | | 1,814 | | 1,814 |
| -2 Log likelihood | | 1,205.671 | | 2,018.721 | | 2,237.320 |
| Model χ^2 | | 40.829* | | 56.891*** | | 154.242*** |

[†] p < .10; * p < .05; ** p < .01; *** p < .001

An Exploratory Examination of Auditor Liability Cap Disclosures

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ABSTRACT

Over the past two decades, there have been continuous calls for liability reform in global auditing markets. A frequently proposed recommendation is to place a ceiling, or cap, on an audit firm's potential liabilities. Despite this interest in "liability caps," a lack of publicly available data has precluded accounting researchers from studying these agreements. This study investigates a unique sample of United States clients that voluntarily disclose the existence of a liability cap arrangement with their external auditors. Our analysis addresses two research questions. First, are client risk characteristics associated with the existence of an auditor liability cap? We find evidence of additional risk in clients with liability caps. Second, is the existence of an auditor liability cap associated with the price of the audit? Consistent with an insurance hypothesis for audit pricing, we do not find an association between audit fees and clients with liability caps. Together, these findings suggest that the premium typically negotiated for audit engagements with a heightened level of risk is attenuated by the presence of the liability cap.

Keywords: Auditor Liability, Audit Risk, Audit Fees, Auditor Independence, Disclosure

INTRODUCTION

Limiting liability exposure is a critical part of any organization's risk management approach for operating in the global business environment. Liability caps are commonly utilized to shield companies from risk and exposure to excessive claims in contracts spanning many industries, including construction, health care, insurance, and public accounting.

The Advisory Committee on the Auditing Profession studied the condition and future of the auditing profession and expressed concern over rising litigation costs, "mega lawsuits," and pressure on audit firms to settle cases (Levitt & Nicolaisen, 2008). Studies suggest that one solution to help alleviate exposure to excessive claims is to limit an audit firm's liability (Center for Audit Quality, 2008; Lennox & Li, 2012; Louis *et al.*, 2019).

Many countries limit auditor liability in some form. For example, liability caps exist in several European countries, and in the past, the European Commission has recommended that European Union members take measures to limit auditor liability (Buck, 2006; European Union, 2008). In the United States (U.S.), the Private Securities Litigation Reform Act of 1995 (PSLRA) and the related Securities Litigation Uniform Standards Act of 1998 (SLUSA) altered the liability of audit firms from joint and several to proportional liability to reduce attempts to sue the "deep pockets" of the audit firms and their related insurance carriers. Another method to limit audit firm exposure would be to place a cap on the firm's total liability exposure.

Given the importance and contentious nature of auditor litigation, this paper addresses two research questions related to one form of auditor liability reform – auditor liability caps.¹ First, are client risk characteristics associated with auditor liability caps? Second, are audit fees associated with auditor liability caps?

To investigate these questions, we explore 111 U.S. publicly traded companies that publicly disclosed an auditor liability cap with a Big N audit firm during 2005 and 2006.² These liability cap arrangements between a client and its audit firm include alternative resolution dispute procedures, a limitation or exclusion of punitive damages, and agreements to indemnify the auditor. This unique research setting is one where liability caps were given to some public clients before the rules were clarified, and this option may have been completely removed. Note that a current AICPA ethics interpretation suggests that it is an act discreditable to the profession to issue a liability cap to clients who are subject to regulatory requirements that prohibit caps. This AICPA rule became effective on July 31, 2008. Shortly thereafter, a study argued that limiting liability via caps depends on whether or not the company is publicly traded (Lobingier *et al.*, 2009).

Our analyses provide two insights. First, we find that liability cap companies are more likely than non-liability cap companies to operate in high litigation-risk industries and to report internal control weaknesses. This finding indicates that liability cap companies are riskier engagements. It also suggests that firms used liability caps as a risk management tool during this period. Second, we find that, on average, the audit fees of companies with liability caps are not significantly different from companies that do not cap their auditors' liability. Consistent with an insurance hypothesis for audit pricing (e.g., Willenborg, 1999), this finding suggests that, by using liability caps to shield themselves from incremental risk, auditors' fee premium for audits with a heightened level of risk is attenuated.³

This paper responds to the call for more auditor liability-related research (e.g., DeFond and Francis, 2005; Nusbaum, 2007). We contribute to the literature on auditor liability by being one of the first studies to examine auditor liability caps in the U.S. empirically. We also contribute to the auditor risk management literature by investigating how audit firms respond to client risk – limiting their liability to these clients. Furthermore, we extend the audit fee literature by showing that the presence of a liability cap moderates the fee premium typically charged for a high-risk audit.

The paper proceeds as follows. The next section provides a background of auditor liability. Section 3 discusses our research questions. Section 4 introduces the data and describes the research design. Section 5 presents the empirical results, and Section 6 concludes.

¹ Though we refer to these as auditor liability caps, the PCAOB refers to these as “litigation related clauses” while others call these arrangements “limitations of liability” or “liability provisions”.

² We limit our investigation to publicly traded companies to allow the collection of data required for our analysis. In our private conversations with partners of Big N firms, the vast majority of non-public clients have liability caps agreements in their engagement letters. Several partners indicated their firms would not accept a non-public attest engagement without a cap on the client's liability.

³ Admittedly, we cannot say for certain whether the audit fee result is a direct negotiated tradeoff between the auditor and client or a subconscious give and take.

BACKGROUND

Auditor Liability

The tort system is designed to create incentives for auditors to take appropriate actions to minimize the issuance of misleading financial statements and to compensate users (plaintiffs) for their recoverable losses (Palmrose, 2005). Auditors face business risks that include at least three factors: acceptable audit risk, residual litigation risk, and non-litigation risk (Houston *et al.*, 2005). Auditor compensation provides incentives to encourage quality auditing services, provide insurance for investor losses, and motivate firms to bear risks associated with factors that extend beyond the conduct of the audit. Antle (1982) shows that auditors prefer this risk-sharing relationship if the compensation is proportional to the risk accepted. However, Morgan and Stocken (1998) show that setting fees at levels that fully reflect the auditor's business risk is difficult.

Liability Caps

Liability caps on auditors' damages have been suggested as a solution to maintaining U.S. competitiveness in a global market (Committee on Capital Markets Regulation, 2006; Labaton, 2007; Bloomberg & Schumer, 2008).⁴ Moreover, the concerns regarding auditor liability are not constrained to the U.S.⁵ In 2006, the European Union's international market commissioner lobbied for a liability cap for audit firms (Buck, 2006), a view fully supported by the European Commission (European Union, 2008) and recently reiterated by others in favor of liability caps (Trentmann, 2021). Among the shared concerns include having only four firms, the impact on the markets if one firm collapses, and the level of insurance available to the firms.⁶

Arguments for Liability Caps

The report of the Advisory Committee on the Auditing Profession provides a useful discussion of the arguments for and against liability caps. Committee members supporting the implementation of liability caps note that audit firms are often forced to settle cases that lack merit and for which they have a strong defense. The Committee states, "It is not acceptable to leave the health of our economy or the competitiveness of our capital markets to the unfettered discretion of any of dozens of claimants and their counsel" (Levitt & Nicolaisen, 2008).

Arguments against Liability Caps

Those opposing liability caps fear that reducing liability exposure will lead to a reduction in audit quality. However, Louis *et al.* (2019) found that limited liability agreements do not impact financial reporting quality. Moreover, auditors have incentives (provided by professional standards, PCAOB inspections and fines, and SEC enforcement actions) to ensure high-quality auditing services, even if potential losses are moderated via a cap on liability. Furthermore, liability caps could influence the audit process of other parties. These tradeoffs are partially

⁴ Other solutions include providing government insurance for audit firms and strengthening bankruptcy defenses for audit firms.

⁵ Liability caps exist in five EU member countries – Austria, Belgium, Germany, Greece, and Slovenia (Buck, 2006).

⁶ Advocates further note that capital markets need sustainable audit capacity and that increasing liability risks may limit the supply of audit firms from entering markets.

explored in the two research questions. If unmitigated risk leads to increased audit fees, financial statement users and managers are paying a premium to help shield audit firms from risk.

Liability Caps and Auditor Independence

An additional concern with the implementation of liability caps is that they may impede auditor independence. Liability caps exist in a variety of forms, such as indemnification clauses, alternative dispute resolution procedures, and limitations on damages. AICPA ethics rulings state that clauses in engagement letters indemnifying the audit firm do *not* impair independence. However, if an audit firm indemnifies a client, then this would impair independence. Additionally, alternative dispute resolution procedures are *not* considered to impair the auditor's independence. Nevertheless, the commencement of an alternative dispute resolution proceeding could impair independence if it was "sufficiently similar to litigation" (AICPA, 2002).

In 2003, the SEC's Office of the Chief Accountant published interpretations of frequently asked questions on auditor independence, which state "when an accountant and his or her client, directly or through an affiliate, enter into an agreement of indemnity which seeks to provide the accountant immunity from liability for his or her own negligent acts, whether of omission or commission, the accountant is not independent."⁷ This position appears to contradict the AICPA ethics rulings noted previously. Perhaps in response to this apparent conflict, the AICPA issued an additional ethics interpretation, which states that auditors must follow the guidelines of regulatory bodies for publicly traded clients (AICPA, 2008).

RESEARCH QUESTIONS

Liability Caps as a Response to Client Engagement Risk

Prior studies investigate audit firms' responses to client engagement risk. Huss and Jacobs (1991) find that client business risks affect auditors' decisions on whether to accept or continue audit engagements. Johnstone (2000) finds that partners choose client avoidance as a response to client risk, and Johnstone and Bedard's (2003) results indicate that one CPA firm is reluctant to accept risky clients. In their analysis of KRisk, KPMG's proprietary software solution for managing risk in client acceptance and retention decisions, Bell *et al.* (2002) document KPMG's approach to managing audit risk, which includes gathering evidence about clients on several risk factors, converting that evidence into a risk factor score, using the score to determine the appropriate level of partner review, and then using all this information to determine how the firm will respond.

Other research shows that audit firms respond to risk by avoiding risky clients (Krishnan & Krishnan, 1997), reducing the risk of continuing engagements by altering audit procedures (Bedard *et al.*, 2008), or adjusting fees and audit efforts by modifying audit hours and the expertise of the audit team (Bell *et al.*, 2001; Bedard & Johnstone, 2004). Alternatively, firms can accept the risk when an appropriate risk-adjusted rate of return can be achieved.

We first investigate the association between liability caps and perceived audit risk. Liability caps could provide reduced risk on new and continuing engagements by limiting audit firm exposure to subsequent litigation from clients. This leads to our first research question:

⁷ These interpretations are available at <http://www.sec.gov/info/accountants/ocafaquidind121304.htm>.

RQ1: Is there an association between client risk characteristics and companies disclosing auditor liability caps?

Audit Fees in the Presence of Liability Caps

Prior research notes that one auditor's response to risk might be to adjust the fees. Numerous papers have shown that audit fees are associated with audit risk. Early work in this area includes the seminal model of Simunic (1980) and the related work of Simunic and Stein (1996). Both find that auditors have strong incentives to minimize potential litigation risk and incorporate the expected loss from litigation into the audit fee. Maher and Lyon (2005) find that auditors assess and price business risk at the client level, with litigation risk driving higher fees (Taylor & Simon, 1999; Venkataraman *et al.*, 2008). Bell *et al.* (2001) find that auditors' compensation for risk is earned by billing for additional audit hours worked and not by increasing the rate per hour. This implies that firms perform additional procedures in the presence of increased risk.⁸ Bell *et al.* (2001) also note a positive correlation between audit effort, audit fees, and business risk. Choi *et al.* (2008) find that a country's litigation environment is an important factor in determining auditor effort and audit fees. Anantharaman *et al.* (2016) show that litigation risk impacts auditor behavior. Finally, Louis *et al.* (2019) suggest that limited liability agreements lead to lower audit fees.

If audit fees include an insurance component, as suggested by Willenborg (1999), a reduction in the auditor's potential liability could affect them. Owners and managers could expect reduced audit fees in exchange for agreeing to limit their recourse against the audit firm. Similarly, by reducing their potential liability, audit firms might be willing to accept reduced audit fees. This leads to our next research question.

RQ2: Is there an association between audit fees and companies disclosing auditor liability caps?

METHOD

Sample Selection

In order to identify publicly traded clients that entered into liability cap agreements with their auditors, we developed a list of liability cap keywords and phrases from financial press articles.⁹ Common text strings included "alternative dispute resolution procedures," "exclusion of punitive damages," "indemnify and hold harmless," and variations of each of these. We then used the Advanced Search feature within the SEC's EDGAR website to collect a list of firms publicly disclosing a liability cap.¹⁰ Our search spanned four years of company filings,

⁸ A question that has been repeatedly asked, particularly in the medical profession, is whether the current tort system sends too strong a signal, resulting in excessive medical costs to avoid malpractice claims (Studdert *et al.*, 2005). For the auditing market, similar incentives might lead to auditors performing, in effect, a defensive and more costly audit.

⁹ As an example, see Rapoport (2006).

¹⁰ An important limitation to our analysis is that companies are not required to disclose the existence of a liability cap. If an auditor liability cap is interpreted as a potential independence issue (as suggested by the SEC and FDIC), then it is likely that companies will disclose any such liability cap. Still, it is possible that we have not captured the full population of disclosures. However, if our control sample contains companies with liability cap agreements, it will work against us finding the relationships we predict. To provide evidence that our independent variables are

beginning on August 1, 2005, and ending on July 31, 2009.¹¹ Note that this includes the time period when the guidance provided by the SEC and the AICPA regarding the influence of liability caps on auditor independence appeared to be different.

This search produced 209 companies that disclosed a liability cap during the years time period from 2002 to 2008. The majority of these companies disclosed the liability cap in their proxy statement. Liability caps also appear in registration statement filings, Form 10-K, and Form 10-Q filings. As we do not have access to clients' engagement letters, we are only able to observe the information about liability caps that is disclosed in their SEC filings. Appendix 1 provides an example.

Table 1 outlines the sample selection process for the liability cap sample and a control sample of non-liability cap companies. Of the 209 companies disclosing liability caps, we removed 57 companies with "indemnify and hold harmless" liability caps, 31 companies outside of 2005 and 2006, 4 companies using a non-Big N auditor, and six companies that did not have all of the data requirements needed to complete the stage 1 and stage 2 regressions.¹² The focus of our study is a final sample of 111 companies with liability cap arrangements.

Table 1: Sample Selection

| | <u>LCAP sample</u>* | <u>Control sample</u>** |
|---|--------------------------------|------------------------------------|
| Initial sample | 209 | 8,147 |
| Less: | | |
| Companies disclosing a liability cap | -- | (209) |
| Companies with 'indemnify and hold harmless' liability caps | (57) | -- |
| Companies with liability caps outside of 2005 and 2006 | (31) | -- |
| Companies with a Non-Big N auditor | (4) | (2,846) |
| Companies with incomplete data for the first stage model | (4) | (577) |
| Companies with incomplete data for the second stage model | (2) | (101) |
| Final sample | 111 | 4,414 |

* This sample was formed by reviewing matches of common liability cap phrases from the Advanced Search feature within the SEC's EDGAR search engine. The date range of our search for company filings spans the four years from August 1, 2005, to July 31, 2009.

** This sample was formed by downloading all *Compustat* firms for 2005 and retaining those companies (i) without a liability cap arrangement, (ii) with a Big N auditor, and (iii) with values for total assets, book value of equity, as well as complete data for the empirical analysis.¹³

uncorrelated with other disclosure decisions, we include size in our analysis as a proxy for the disclosure environment of a firm. Untabulated correlation analysis indicates no significant correlations between size and the other independent variables in our model.

¹¹ We expanded our search to include periods prior to August 2005 and found no additional liability cap disclosures.

¹² In our sample, indemnify and hold harmless liability caps primarily occur when a company seeks to release previously issued financials and contacts the prior auditor to obtain their permission. In these cases, the prior auditor required the company sign an indemnify and hold harmless statement. Since the auditor (in this case) that is getting the liability cap is not the current auditor of record, the audit fee tests are not applicable and requires the removal of these caps for the testing of the regression models.

¹³ We choose 2005 as the reference year for the control sample, as a majority of the liability cap agreements in our sample are effective for this year.

Liability Cap Types

Liability provisions are found in engagement letters between clients and audit firms. The FDIC organizes these provisions into three groups: indemnification clauses, hold harmless clauses, and limitations of remedy clauses (FDIC, 2006). The PCAOB uses a more detailed classification system of eight groups: indemnification, liability limited to fees, limitations based on the time period of the claim, limitations related to the client’s right to assign or transfer the claim, exclusion of punitive damages, agreements on alternative dispute resolution, unsuccessful party to pay adversary’s legal fees, and auditor liability limited to client losses during the period (PCAOB, 2006).

Most liability caps would not directly influence shareholder lawsuits. However, the FDIC notes that some liability caps could indemnify the auditor against claims from third parties. Our sample does not contain any liability caps related to third parties. The liability caps we identified were all agreements between the auditor and the client.

Table 2 presents descriptive data for the liability cap sample. Panel A documents the frequently occurring types of auditor liability caps. Many (99 of the 111) liability cap companies disclose both an alternative dispute resolution (ADR) and a limitation or exclusion of punitive damages.¹⁴ Panel B summarizes the liability cap disclosures by year. The liability cap year (LCAP year) represents the first year of a liability cap agreement between the client and auditor.

Table 2: Descriptive statistics for the LCAP sample

Panel A: Distribution by type of LCAP disclosure

| <u>Type</u> | <u># of Obs</u> | <u>Percentage</u> |
|---|-----------------|-------------------|
| Alternative resolution dispute procedures | 106 | 95.5% |
| Limit or exclude punitive damages | 101 | 91.0% |
| Other provisions | 15 | 13.5% |

Companies frequently disclose more than one type of liability cap, with 99 of the 111 liability cap companies disclosing both alternative resolution dispute procedures and a limitation or exclusion of punitive damages.

Panel B: Distribution by LCAP year

| <u>LCAP year</u> | <u># of Obs</u> | <u>Percentage</u> |
|------------------|-----------------|-------------------|
| 2005 | 83 | 74.8% |
| 2006 | 28 | 25.2% |

LCAP year is the fiscal year of the audit for which a company’s liability cap was effective.

¹⁴ An example of an ADR clause from the FDIC states “By agreeing in advance to submit disputes to mandatory ADR, financial institutions may waive the right to full discovery, limit appellate review, or limit or waive other rights and protections available in ordinary litigation proceedings.” (FDIC, 2006).

Table 2: Descriptive statistics for the LCAP sample (continued)

Panel C: Distribution by size in total asset quintiles

| <u>Quintile¹⁵</u> | <u>Total asset range (in millions)</u> | <u># of Obs</u> | <u>Percentage</u> |
|------------------------------|--|-----------------|-------------------|
| 1 | 0 – 130 | 19 | 17.1% |
| 2 | 130 – 482 | 17 | 15.3% |
| 3 | 482 – 1,384 | 26 | 23.4% |
| 4 | 1,384 – 5,171 | 25 | 22.5% |
| 5 | > 5,171 | 24 | 21.6% |

Panel C sorts the liability cap companies into size quintiles created from the population of 2005 *Compustat* firms. Liability cap companies are fairly evenly distributed across quintiles of total assets. Thus, liability caps are not just used on smaller engagements, which presumably have less bargaining power with their auditors (Casterella *et al.*, 2004).

¹⁵ Break points are determined by sorting the total asset values of all Big N-audited companies in the 2005 *Compustat* database and evenly dividing these companies into five quintiles.

Table 2 (continued)
Descriptive statistics for the LCAP sample

Panel D: Distribution by industry

| <u>Industry</u> | <u>SIC Codes</u> | <u>LCAP sample</u> | | <u>Control sample</u> | |
|------------------------|---------------------------------|--------------------|-------------------|-----------------------|-------------------|
| | | <u># of Obs</u> | <u>Percentage</u> | <u># of Obs</u> | <u>Percentage</u> |
| Chemicals | 2800-2824, 2840-2899 | 1 | 0.9% | 108 | 2.4% |
| Computers | 3570-3579, 3670-3679, 7370-7379 | 23 | 20.7% | 569 | 12.9% |
| Extractive | 1300-1399, 2900-2999 | 2 | 1.8% | 160 | 3.6% |
| Financial/Insurance | 6000-6411 | 20 | 18.0% | 558 | 12.6% |
| Food | 2000-2111 | 1 | 0.9% | 83 | 1.9% |
| Real Estate | 6500-6999 | 5 | 4.5% | 215 | 4.9% |
| Manufacturing | 3000-3569, 3580-3669, 3680-3999 | 11 | 9.9% | 789 | 17.9% |
| Mining/Construction | 1000-1299, 1400-1999 | 3 | 2.7% | 141 | 3.2% |
| Pharmaceuticals | 2830-2836 | 15 | 13.5% | 283 | 6.4% |
| Retail | 5000-5999 | 7 | 6.3% | 373 | 8.5% |
| Services | 7000-7369, 7380-8999 | 12 | 10.8% | 349 | 7.9% |
| Textiles/Print/Publish | 2200-2780 | 2 | 1.8% | 187 | 4.2% |
| Transportation | 4000-4899 | 7 | 6.3% | 342 | 7.7% |
| Utilities | 4900-4999 | 2 | 1.8% | 222 | 5.0% |
| Other | 9000+ | 0 | 0.0% | 35 | 0.8% |

Panel D shows liability cap companies are concentrated in historically higher-risk industries (e.g., computers, financial/insurance, and pharmaceuticals).

Table 2: Descriptive statistics for the LCAP sample (continued)

Panel E: Distribution by stock exchange

| <u>Exchange</u> | <u>LCAP sample</u> | | <u>Control sample</u> | |
|-----------------|--------------------|-------------------|-----------------------|-------------------|
| | <u># of Obs</u> | <u>Percentage</u> | <u># of Obs</u> | <u>Percentage</u> |
| NYSE | 49 | 44.1% | 1,841 | 41.7% |
| NASDAQ | 55 | 49.6% | 1,825 | 41.3% |
| Other | 7 | 6.3% | 748 | 17.0% |

Panel F: Distribution by independent auditor

| <u>Auditor</u> | <u>LCAP sample</u> | | <u>Control sample</u> | |
|------------------------|--------------------|-------------------|-----------------------|-------------------|
| | <u># of Obs</u> | <u>Percentage</u> | <u># of Obs</u> | <u>Percentage</u> |
| Deloitte & Touche | 1 | 0.9% | 1,027 | 23.3% |
| Ernst & Young | 72 | 64.9% | 1,265 | 28.6% |
| KPMG | 35 | 31.5% | 974 | 22.1% |
| PricewaterhouseCoopers | 3 | 2.7% | 1,148 | 26.0% |

Panel E reveals that relative to the control sample, a higher proportion of liability cap companies are listed on the NYSE and NASDAQ exchanges. Finally, Panel F shows that while each of the Big 4 audit firms has entered into liability cap contracts with their clients, two of the firms – Ernst & Young (EY) and KPMG – are involved in almost all of the liability cap agreements and the years in which liability caps are most concentrated (2005 and 2006) followed a period of intense scrutiny and investigation into tax sheltering abuses at EY and KPMG, which may explain their movement to liability cap arrangements.¹⁶ As previously mentioned, another reason for the potential increase in liability caps during this time period is the window of uncertainty between the apparent change in position by the AICPA on liability caps between 2002 and 2008.

Regression Models

To examine our research questions on the relationships between liability caps, firm risk characteristics, and audit fees, we must control for the endogenous relationship between audit fees and the decision to accept a cap on auditor liability. Final decisions regarding the appropriate audit fee arise from negotiations between the auditor and the client and are likely affected by the decision to cap the auditor’s liability.¹⁷ To control for this, we run a two-stage

¹⁶ See related discussion at: <http://www.nysscpa.org/home/2003/0603/4week/article137.htm> (EY) and http://www.usdoj.gov/opa/pr/2005/August/05_ag_433.html (KPMG).

¹⁷ We also perform an untabulated analysis to address selection biases detailed in prior research (e.g., Chaney *et al.*, 2004) with the caveat that current research (Larcker and Rusticus, 2010; Lennox *et al.*, 2012) indicates that self-selection models are often inappropriately relied upon, are difficult to properly design, and are very sensitive to minor changes in model specification and sample selection criteria. Our results indicate that the Heckman coefficient is not significant, indicating a lack of selection bias in our analysis.

regression. The first stage is used to estimate a predicted audit fee. The predicted audit fee is then used in the second stage of the liability cap model.

The empirical specification for the first stage audit fee model is as follows:

$$AF_i = \alpha_0 + \alpha_1 TA_i + \alpha_2 FOREIGN_i + \alpha_3 SEGMENTS_i + \alpha_4 ROA_i + \alpha_5 LOSS_i + \alpha_6 ARINV_i + \alpha_7 LEV_i + \alpha_8 LAG_i + \alpha_9 GCOPIN_i + \alpha_{10} AUDCHG_i + \alpha_{11} DEC_YE_i + \alpha_{12} SPECIAL_i + \alpha_{13} ICW_i + \alpha_{14} RESTATE_i + \text{Industry fixed effects} + \varepsilon_i \quad (1)$$

We rely on the extensive prior literature to develop our audit fee model (e.g., Hay *et al.*, 2006). Definitions for the dependent variable and independent variables in equation 1 are as follows, with each independent variable's expected coefficient sign noted in parentheses:

| | | |
|-------------------------------------|---|---|
| <i>AF</i> | = | Natural logarithm of audit fees (<i>Audit Analytics</i> variable <i>AUDIT_FEES</i>) |
| <i>TA</i> (+) | = | Natural logarithm of total assets (<i>AT</i>) |
| <i>FOREIGN</i> (+) | = | An indicator variable equal to 1 if the company has foreign operations (based on <i>Compustat</i> variable <i>FCA</i>), 0 otherwise |
| <i>SEGMENTS</i> (+) | = | Natural logarithm of the number of operating segments reported in the <i>Compustat</i> Segments database |
| <i>ROA</i> (-) | = | Return on assets, computed as net income (<i>NI</i>) divided by total assets |
| <i>LOSS</i> (+) | = | An indicator variable equal to 1 if a company's net income (<i>NI</i>) is negative, 0 otherwise |
| <i>ARINV</i> (+) | = | The sum of accounts receivable (<i>RECT</i>) and inventory (<i>INVT</i>), scaled by total assets |
| <i>LEV</i> (+) | = | Leverage ratio, computed as total liabilities (<i>LT</i>) divided by total assets |
| <i>LAG</i> (+) | = | Natural logarithm of the number of days between a company's fiscal year-end and the audit report signature date |
| <i>GCOPIN</i> (+) | = | An indicator variable equal to 1 if a company's audit report specifies that the company is a going concern, 0 otherwise |
| <i>AUDCHG</i> (-) | = | An indicator variable equal to 1 if a company changes its independent auditor in the liability cap year or in the year preceding the liability cap year, 0 otherwise |
| <i>DEC_YE</i> (+) | = | An indicator variable equal to 1 if a company's fiscal year-end is December, 0 otherwise |
| <i>SPECIAL</i> (+) | = | An indicator variable equal to 1 if a company reports a value for special items (<i>SPI</i>), 0 otherwise |
| <i>ICW</i> (+) | = | An internal control weakness index score is constructed as the sum of two components. The first component equals 1 for a Section 302 material weakness and 0 otherwise. The second component equals 1 for a Section 404 material weakness, 0 otherwise. |
| <i>RESTATE</i> (+) | = | An indicator variable equal to 1 if a company restates its financial statements, 0 otherwise |
| <i>Industry fixed effects</i> (+/-) | = | Indicator variables for the 15 industries defined in Barth <i>et al.</i> (1998) |

As stated previously, we expect our proxies for client risk characteristics to influence the decision faced by audit firms regarding whether or not to cap their liability. To examine this question, we develop a model in which the dependent variable, *LCAP*, is regressed on the risk variables and control variables. The empirical specification for the second stage liability cap model, which we use to address our two research questions, is as follows:

$$LCAP_i = \alpha_0 + \alpha_1 LIT_RISK_i + \alpha_2 ICW_i + \alpha_3 RESTATE_i + \alpha_4 AUDCHG_i + \alpha_5 TAC_i + \alpha_6 GCON_i + \alpha_7 ROA_i + \alpha_8 LEV_i + \alpha_9 SEGMENTS_i + \alpha_{10} TA_i + \alpha_{11} AF_PRED_i + \varepsilon_i \quad (2)$$

For the variables unique to equation 2, definitions are as follows, with each independent variable's expected coefficient sign noted in parentheses:

| | | |
|----------------------|---|--|
| <i>LCAP</i> | = | An indicator variable equal to 1 if a company discloses a liability cap, 0 otherwise |
| <i>LIT_RISK</i> (+) | = | An indicator variable equal to 1 if a company is in a high litigation industry (SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374, and 8731-8734), 0 otherwise |
| <i>TAC</i> (+/-) | = | Total Accruals, measured as net income (NI) less cash flow from operations (OANCF), scaled by total assets (AT) |
| <i>AF_PRED</i> (+/-) | = | Predicted value of audit fees from Equation 1 |

We expect each of the following risk measures to be positively associated with the presence of a liability cap. These measures include:

Litigation Risk: Francis et al. (1994) identified companies operating in historically high litigation-risk environments. Studies following Francis et al. (1994) created an indicator variable for this group of industries and used it as a proxy for litigation risk (e.g., Geiger et al., 2006; Venkataraman et al., 2008). *LIT_RISK* is an indicator variable used to capture industries with potentially higher risk.

Internal Control Weaknesses: Hogan and Wilkins (2008) suggest that reported internal control deficiencies are related to increased client risk. *As defined previously, ICW captures the risk related to companies with internal control problems.*

Financial Statement Restatements: Prior research indicates that financial statement restatements are associated with increased risk (Palmrose et al., 2004). We create the variable *RESTATE* to capture whether or not a company has restated its financial statements. As noted above, *RESTATE* is coded 1 if the firm reports a financial statement restatement in the liability cap year or the year preceding the liability cap year and 0 otherwise.

Auditor Changes: Morgan and Stocken (1998) show that low-risk companies are less likely to change auditors. We create the variable *AUDCHG* to measure whether or not the company has switched auditors. As noted above, *AUDCHG* is coded 1 if there was an auditor change in the liability cap year or the year preceding the liability cap year and 0 otherwise.

The model also includes control variables for total accruals (*TAC*), going concern opinions (*GCON*), profitability (*ROA*), leverage (*LEV*), complexity (*SEGMENTS*), and size (*TA*). All of these variables are measured as previously defined.

Finally, as discussed earlier, we do not expect an association between liability caps and audit fees. If audit fees include an insurance component, as suggested by Willenborg (1999), and if companies with liability cap agreements are higher risk engagements, this implies that the typical fee premium charged for audits with a heightened level of risk would be attenuated by the reduction in the auditor's potential liability through the existence of a liability cap agreement.

RESULTS

Audit Fee Regression

Table 3 presents descriptive statistics for the audit fee regression. These variables were defined previously. Audit fees are \$2.4 million at the mean and just under \$1.0 million at the median, indicating a distribution with a heavy right tail. Per the convention in the audit fee literature, we use the natural logarithm of audit fees, *AF*, in our empirical tests. Again, the explanatory variables are drawn from the extensive prior literature on the determinants of audit fees (e.g., Hay *et al.*, 2006).

Table 3: Descriptive statistics for the audit fee model

| <u>Variable</u> | <u>Mean</u> | <u>Median</u> | <u>Std Dev</u> |
|-----------------|-------------|---------------|----------------|
| AUDIT_FEES | 2.431 | 0.958 | 5.546 |
| <i>AF</i> | 6.919 | 6.865 | 1.258 |
| <i>TA</i> | 6.736 | 6.653 | 2.140 |
| <i>FOREIGN</i> | 0.281 | 0.000 | 0.450 |
| <i>SEGMENTS</i> | 0.574 | 0.000 | 0.737 |
| <i>ROA</i> | -0.005 | 0.032 | 0.194 |
| <i>LOSS</i> | 0.249 | 0.000 | 0.433 |
| <i>ARINV</i> | 0.251 | 0.197 | 0.212 |
| <i>LEV</i> | 0.559 | 0.549 | 0.294 |
| <i>LAG</i> | 4.253 | 4.234 | 0.375 |
| <i>GCOPIN</i> | 0.082 | 0.000 | 0.274 |
| <i>AUDCHG</i> | 0.072 | 0.000 | 0.258 |
| <i>DEC_YE</i> | 0.752 | 1.000 | 0.432 |
| <i>SPECIAL</i> | 0.596 | 1.000 | 0.491 |
| <i>ICW</i> | 0.205 | 0.000 | 0.553 |
| <i>RESTATE</i> | 0.177 | 0.000 | 0.381 |

The regression results presented in Table 4 from Equation 1 generally are as expected. In particular, size (*TA*), complexity (*SEGMENTS*), the existence of going concern opinions (*GCOPIN*), special items (*SPECIAL*), internal control weaknesses (*ICW*), and restatements (*RESTATE*) are positively related to audit pricing. Profitability (*ROA*) is negatively related to audit pricing. We obtain the predicted value of audit fees, *AF_PRED*, for use in the second stage of liability cap regression.

Table 4: Regression Summary Statistics for the Audit Fee Model

| Variable | Predicted relation | Coefficient | t-statistic |
|-------------------------|---------------------------|--------------------|--------------------|
| Intercept | +/- | 2.752 | 20.38*** |
| <i>TA</i> | + | 0.486 | 76.92*** |
| <i>FOREIGN</i> | + | 0.031 | 1.32* |
| <i>SEGMENTS</i> | + | 0.214 | 14.67*** |
| <i>ROA</i> | - | -0.384 | -5.21*** |
| <i>LOSS</i> | + | -0.035 | -1.12 |
| <i>ARINV</i> | + | -0.079 | -1.41 |
| <i>LEV</i> | + | 0.015 | 0.37 |
| <i>LAG</i> | + | 0.011 | 0.42 |
| <i>GCOPIN</i> | + | 0.123 | 3.15*** |
| <i>AUDCHG</i> | - | 0.020 | 0.53 |
| <i>DEC_YE</i> | + | 0.021 | 0.88 |
| <i>SPECIAL</i> | + | 0.225 | 10.61*** |
| <i>ICW</i> | + | 0.233 | 11.74*** |
| <i>RESTATE</i> | + | 0.070 | 2.41*** |
| Number of observations | | | 4,579 |
| Adjusted R ² | | | 0.72 |

This table reports the regression summary statistics for the first stage audit fee model. This model regresses the natural logarithm of audit fees, *AF*, on a set of variables that have been shown (in prior research) to affect audit fees. All variables are defined in Table 3. *, **, *** indicate statistical significance at a probability of <0.10, <0.05, and <0.01, respectively (one-tailed).

The OLS regression takes the form:

$$AF_i = \alpha_0 + \alpha_1 TA_i + \alpha_2 FOREIGN_i + \alpha_3 SEGMENTS_i + \alpha_4 ROA_i + \alpha_5 LOSS_i + \alpha_6 ARINV_i + \alpha_7 LEV_i + \alpha_8 LAG_i + \alpha_9 GCOPIN_i + \alpha_{10} AUDCHG_i + \alpha_{11} DEC_YE_i + \alpha_{12} SPECIAL_i + \alpha_{13} ICW_i + \alpha_{14} RESTATE_i + \text{Industry fixed effects} + \varepsilon_i$$

Liability Cap Regression

Table 5 below presents descriptive statistics, defined previously, for the liability cap regression. The first set of columns reports the logistic regression variables' mean, median, and standard deviation for companies with auditor liability caps. The second set of columns reports the same statistics for companies without auditor liability caps. To compare the samples, test statistics for the differences in means are reported in the far right column. In terms of our client

risk characteristic proxies, Table 5 reveals that liability cap companies, on average, are more concentrated in high litigation risk industries and report more internal control weaknesses than non-liability cap companies. Surprisingly, Table 5 also shows that liability cap companies report fewer restatements than non-liability cap companies. This is discussed further below. In terms of audit pricing, the predicted value of audit fees for liability cap companies is smaller than the predicted value of audit fees for non-liability cap companies. However, this difference is not statistically significant. However, this univariate analysis does not control for other factors that influence audit fees and the presence of a liability cap. The multivariate analysis that follows controls for these relations as well as the endogeneity in the auditor selection, audit fee, and liability cap decision. Taken as a whole, this univariate analysis provides some preliminary evidence that liability cap companies are riskier than non-liability cap companies.

Table 5: Descriptive statistics for the liability cap model

| Variable | LC AP sample (N=111) | | | Control sample (N=4,414) | | | Diff in means^a |
|-----------------|-----------------------------|--------------------|--------------------|---------------------------------|--------------------|----------------|----------------------------------|
| | Mean | Media n | Std Dev | Mean | Media n | Std Dev | |
| <i>LCAP</i> | 1.000 | 1.000 | 0.000 | 0.000 | 0.000 | 0.000 | – |
| <i>LIT_RISK</i> | 0.369 | 0.000 | 0.485 | 0.279 | 0.000 | 0.425 | 0.090** |
| <i>ICW</i> | 0.261 | 0.000 | 0.628 | 0.204 | 0.000 | 0.536 | 0.057*** |
| <i>RESTATE</i> | 0.090 | 0.000 | 0.288 | 0.180 | 0.000 | 0.368 | –0.090** |
| <i>AUDCHG</i> | 0.054 | 0.000 | 0.227 | 0.072 | 0.000 | 0.259 | –0.018 |
| <i>TAC</i> | –0.048 | –0.037 | 0.098 | –0.051 | –0.036 | 0.097 | 0.003 |
| <i>GCON</i> | 0.036 | 0.000 | 0.187 | 0.083 | 0.000 | 0.275 | –0.047* |
| <i>ROA</i> | –0.014 | 0.031 | 0.194 | –0.004 | 0.029 | 0.198 | –0.010 |
| <i>LEV</i> | 0.512 | 0.526 | 0.278 | 0.556 | 0.540 | 0.298 | –0.044 |
| <i>SEGMENTS</i> | 0.553 | 0.000 | 0.714 | 0.580 | 0.000 | 0.739 | –0.027 |
| <i>TA</i> | 6.880 | 6.798 | 1.934 | 6.622 | 6.796 | 2.168 | 0.258 |
| <i>AF_PRED</i> | 6.935 | 6.888 | 1.044 | 7.070 | 7.063 | 0.904 | –0.135 |

^a Tests for differences in the means between the LCAP and Control samples are based on t-statistics (χ^2 statistics) for continuous variables (proportions).

*, **, *** denotes statistical significance at a probability of <0.10, <0.05, and <0.01, respectively (two-tailed).

RQ1 investigates whether auditor liability caps vary depending on client risk characteristics. Table 6 reports the regression summary statistics from estimating equation 2. This regression analysis controls for possible interrelationships between the characteristics of risk and control variables to isolate their association with the decision to disclose an auditor liability cap. Similar to the univariate results in Table 5, liability cap companies are more likely to be in high litigation-risk industries and report internal control weaknesses. Liability cap companies are less likely to have a financial statement restatement.¹⁸ These results, along with

¹⁸ Neither an unintentional misstatement nor a restatement driven by a change in accounting rules would imply higher engagement risk (Hennes *et al.*, 2008). Other possible explanations include: (i) companies that restated their financial statements are less likely to agree to liability caps, as they do not wish to limit auditor liability going forward; (ii) restatements disclosed prior to the existence of a liability cap might actually reduce engagement risk.

the descriptive results provided in Table 5, identify several risk measures that increase the probability of disclosing a liability cap.

RQ2 investigates whether auditor liability caps impact audit pricing. In Table 6, *AF_PRED* is included to investigate the association between liability caps and audit fees. We find that the audit fees for liability cap companies are not statistically different from the non-liability cap control sample. Notably, the coefficient on *AF_PRED* is insignificant. Consistent with the insurance hypothesis, this finding suggests that an audit firm's ability to reduce litigation exposure through a liability cap attenuates any audit fee premium. Additionally, this finding is especially interesting given that the analysis from RQ1 seems to indicate that liability cap companies demonstrate evidence of increased risk.

Table 6: Regression Summary Statistics for the Liability Cap Model

| <u>Variable</u> | <u>Predicted relation</u> | <u>Coefficient</u> | <u>Wald χ^2</u> |
|-----------------------------|---------------------------|--------------------|---------------------------------|
| Intercept | +/- | -4.091 | 12.29*** |
| <i>LIT_RISK</i> | + | 0.498 | 4.21** |
| <i>ICW</i> | + | 0.500 | 6.99*** |
| <i>RESTATE</i> | + | -1.165 | 9.77*** |
| <i>AUDCHG</i> | + | -0.213 | 0.25 |
| <i>TAC</i> | +/- | 0.856 | 0.53 |
| <i>GCON</i> | +/- | -0.842 | 2.50 |
| <i>ROA</i> | +/- | -0.836 | 1.82 |
| <i>LEV</i> | +/- | -0.023 | 1.03 |
| <i>SEGMENTS</i> | +/- | -0.084 | 0.25 |
| <i>TA</i> | +/- | 0.164 | 1.34 |
| <i>AF_PRED</i> | +/- | -0.090 | 0.09 |
| LCAP observations | | | 111 |
| Control sample observations | | | 4,414 |
| Likelihood ratio | | | 27.51 |

This table reports the regression summary statistics for second stage liability cap model. This model regresses a dichotomous dependent variable, *LCAP*, on a set of risk variables and a set of control variables. All variables are defined in Table 3 or Table 5. *, **, *** indicate statistical significance at a probability of <0.10, <0.05, and <0.01, respectively (one-tailed test where a relation is predicted and a two-tailed test otherwise).

The logistic regression takes the form:

$$\begin{aligned}
 LCAP_i = & \alpha_0 + \alpha_1 LIT_RISK_i + \alpha_2 ICW_i + \alpha_3 RESTATE_i + \alpha_4 AUDCHG_i + \alpha_5 TAC_i + \\
 & \alpha_6 GCON_i + \alpha_7 ROA_i + \alpha_8 LEV_i + \alpha_9 SEGMENTS_i + \alpha_{10} TA_i + \alpha_{11} AF_PRED_i \\
 & + \varepsilon_i
 \end{aligned}$$

Sensitivity Analyses

To determine whether our findings are sensitive to a variety of assumptions and constraints associated with our empirical methods, we replicate our two-stage approach for two additional scenarios. First, because our control sample is concentrated in two audit firms, we re-estimate equations 1 and 2 after clustering the standard errors by audit firm (e.g., Petersen, 2009). The statistical inferences drawn from the primary results reported in Table 6 are unchanged. In particular, the coefficient on *AF_PRED* in equation 2 remains insignificant. Second, because non-audit services could play a role in negotiating an auditor liability cap, we substitute total fees for audit fees in equation 1 and substitute the predicted value for total fees, *TF_PRED*, in equation 2. Similar to the Table 6 result for *AF_PRED*, the coefficient on *TF_PRED* is negative but insignificant.

CONCLUSION

This study is motivated by frequent calls for a statutory cap on auditors' liability. The sample comprises 111 public company clients who voluntarily disclosed a liability cap arrangement with their external auditors. These findings may be useful in informing concerns about current audit firm liability exposure and potential future debates and reforms.

In particular, our analyses reveal two interesting results related to client risk and the pricing of audit services. First, we find that the liability cap companies are more likely to be associated with characteristics of risk than a control sample of audit clients that did not disclose a liability cap. Since liability caps were a way for audit firms to manage their risk, and public companies have potentially taken this option away, we expect firms to respond by implementing other methods to manage client risk and limited liability. Second, consistent with an insurance hypothesis for audit pricing, we do not find a negative relation between liability caps and audit fees. Specifically, liability cap companies do not have statistically significantly lower audit fees in the year of the liability cap agreement compared to a control sample of non-liability cap companies.

We acknowledge that our sample is concentrated in a two-year period where liability caps were voluntarily disclosed by a small number of publicly traded companies. As discussed previously, it is possible that other companies have similar types of arrangements with their auditors and choose not to disclose them; however, this would bias against finding results. Additionally, nearly all of these disclosures are from the clients of two of the Big N firms. Given this research's unique and exploratory nature, our results provide initial evidence on the relationships between liability caps, client risk characteristics, and audit fees. Audit firms are likely still applying liability caps to private companies but may practice other risk management techniques for public companies.

Regulators around the world have expectations of auditor liability and can use it as a tool to shape future auditing practices. Future research might investigate whether liability caps alter the market concentration of auditors, are a precursor to auditor resignations, or have an effect on a company's cost of capital. Further, DeFond and Francis (2005) call for more auditing research using cross-country data. An examination of the effect of disparate liability cap policies across country regimes (mandatory versus voluntary versus no policy) would be a step in this direction.

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Appendix 1: Example of liability cap disclosure

IMCLONE SYSTEMS INC: Excerpt from DEF 14A proxy statement filed August 31, 2006

“KPMG LLP served as the Company’s independent registered public accounting firm for the fiscal year ending December 31, 2005, and has been appointed by the Audit Committee to continue as the Company’s independent registered public accounting firm for the fiscal year ending December 31, 2006.

In connection with the audit of our 2005 and 2006 financial statements, we entered into an engagement letter with KPMG LLP which set forth the terms by which KPMG LLP will perform audit services for the Company. That agreement is subject to alternative dispute resolution procedures and an exclusion of punitive damages.”

LUXURY BRAND MANAGEMENT IN THE WORLD OF EVOLVING TECHNOLOGIES

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ABSTRACT

The dynamics of the luxury sector are unique and quite different from those existing in the fast-moving consumer goods (FMCG) arena. Consequently, the marketing strategies used in the brand management of luxury companies are also distinctive, and brand managers rely on traditional marketing practices only to a limited degree. Luxury has also been slower to embrace online methods due to a perceived potential threat to preserving the values associated with luxury brands. However, as new technologies emerge, organizations – luxury companies included – find themselves facing both new opportunities and challenges. These developments are further magnified by changing demographics, in particular the growing presence of generations Z and Alpha, who have grown up online and will soon become more significant customers with greater buying power. This discussion paper examines the evolving technologies, focusing on the challenges and opportunities presented to luxury companies. Several examples are used to map this scene. Blockchain, NFTs, the metaverse, artificial intelligence, and machine learning are considered. The paper concludes with a brief look at opportunities for future research.

Keywords: Luxury, luxury experiences, NFTs, blockchain, metaverse, VR, AI

INTRODUCTION

The dynamics of the luxury sector are quite distinct and very different from those present in the fast-moving consumer goods (FMCG) area. Consequently, brand managers rely on traditional marketing strategies only to a certain extent. For example, luxury companies and brands have been slower in creating an online presence and delve into e-commerce due to the importance placed on preserving the traditional values so imperative in the sector. Of course, this slow adoption has resulted in some financial losses and lost opportunities for luxury companies, particularly during the Covid-19 pandemic. Recently, there have also been a number of significant technological innovations, such as blockchain and non-fungible tokens (NFTs), machine learning, virtual reality, and artificial intelligence. These innovations provide both challenges and evolving opportunities for all organizations, and luxury companies are exploring the possibilities to engage

with consumers in new ways and at earlier stages.

Demographic trends, particularly the emergence of a growing segment of Gen Z and future potential Alfa customers, are also having a large impact on the luxury industry. These consumers have grown up online, and their digital consumer behavior differs greatly from older, more traditional luxury connoisseurs. This makes understanding them more challenging and even reaching them more difficult as they are not accessible through traditional media channels. In order for luxury brands to engage and keep the interest of these younger segments, they must either refresh their images or develop new opportunities for consumers to engage with the brand – including, for example, the development of digital identities. These new methods need to more closely align with the fluid ways the youth engage in technology yet retain the essence of what it means to be a luxury brand. Thus, enabled by these emerging technologies, the luxury industry is undergoing a historic transformation. Luxury brands have a huge opportunity, as they can play a key role in shaping virtual worlds as they develop. According to Bain & Co. (2022), digital assets and the virtual world (metaverse) will make up 5-10% of the total luxury market by 2030 (Joy, Zhu, Peña, & Brouard, 2022); (D'Arpizio & Levato, 2022).

Therefore, the objective of this discussion paper is to map the scene of evolving technologies, in terms of both the existing and emerging challenges, but also the associated opportunities they may bring to luxury brands. To do so, several examples are used to approach the topic.

BLOCKCHAIN AND NFTs

An NFT, or non-fungible token, is a digital identifier used to certify ownership. It is recorded on the blockchain and cannot be copied, falsified, altered, substituted, subdivided, or destroyed. It exists indefinitely. An NFT can be almost anything digital (e.g., drawings, music, etc.), and its creation is enabled by blockchain technology. This is a system of recording information that makes it nearly impossible to alter, hack, or otherwise cheat the system (Euromoney, 2021). Artists have started using NFTs in the digital environment as it prevents illegal distribution and fraud. Sotheby's, the famous British auction house and one of the world's largest brokers of fine art, luxury, and collectibles, considers non-fungible tokens as a paradigm shift for digital art and other forms of online media. NFTs enable online assets to have verifiable scarcity and ownership while preserving authenticity – all of which increase the value of art in both the physical and digital worlds. These changes empower artists with new realms to explore. Once an artist "knocks out" a unique NFT and a potential collector buys it, usually through an auction, the owner can continue to trade it. The origin of each NFT is always recorded, and collectors can find its authenticity before buying or bidding at auction (Sothebys, 2021). NFTs offer significant opportunities as a new method to attract a younger target audience, particularly given their digital prowess. In fact, by 2030, Morgan Stanley will put the NFT market in the luxury arena to exceed 50 billion USD (Gurzki, 2022).

Consider the following three famous examples of NFTs being sold for millions of dollars. In June 2021, Sotheby's auctioned off NFTs from the famous ten-thousand-CryptoPunk series (e.g., CryptoPunk #7523) for 11.75 million USD. This particular NFT was considered quite unique compared to the others from the same collection, attributed to its ability to demand such an exorbitant price. In another instance, collectors paid 91.8 million USD for an NFT entitled 'The Merge', which was sold in December 2021. The unique aspect of this sale was that, in fact, it was purchased by nearly 29,000 different collectors, who each paid \$575 for some of the NFT's 312,685 units (NFT Evening, 2022). In February 2022, the most expensive CryptoPunk ever (punk #5822, an alien-looking punk sporting a blue bandana) was sold for \$23 million, more than double the amount of the next most expensive punk sold. With the sale of these NFTs for extraordinary prices, this market continues to become ever more relevant (NFTNow, 2023).

The worlds of art and luxury are similar in many ways. They have many shared values, such as scarcity and authenticity. According to Pierre-Emmanuel Angeloglou, Director of Fashion and Leather Goods Strategy at Louis Vuitton, *"Luxury brands and NFTs are based on numerous common concepts that make them compatible: rarity, innovation, sense of belonging and connection to culture"* (BCG & Comité Colbert, 2022). In fact, some luxury brands are already using NFTs. In the summer of 2022, Yves Saint Laurent Beauté, of L'Oréal Group's luxury division, announced its intention to explore this area via the creation of an NFT wallet and custom tokens, which are then associated with a donation to a non-profit organization related to the YSL Beauté community (Ariane, 2022). Louis Vuitton launched NFTs (depicting various historical monuments in its creation) to celebrate its founder's bicentenary (Opensea.io, 2022).

The gaming industry, which already has 3 billion players and continues to have steady growth (Takahashi, 2021), is also connected to the world of luxury. Players in the gaming industry are young and match the upcoming consumer segments currently being courted by the luxury industry, and nearly half of them are female (Bryter, 2020). Players in the online space can outfit themselves with luxury brand fashion items and express their own unique sense of style through their avatars. This provides an opportunity for luxury groups to engage with a target group that is otherwise difficult or impossible to reach through traditional marketing channels.

METAVERSE

In December 2021, Facebook renamed itself Meta with the ambition to *"help bring the metaverse to life"* (Meta, 2021). Meta also announced a \$50 million global investment in responsible research into the development of the metaverse (Bosworth & Clegg, 2021). While there is not yet widespread agreement on how to characterize the metaverse, Meta defines it simply as *"a collection of virtual spaces that you can explore and in which you can create, work, play, learn, shop, and much more together with other people who are not in the same physical space as you"* (Bosworth & Clegg, 2021). McKinsey (2020) identifies it as a space sharing the five following common traits.

1. Immersive environments, often (but not always) using virtual or augmented reality technology;
2. Always "on" exists in real-time;
3. Connects the virtual and physical worlds, as well as multiple platforms;
4. Powered by a fully functional virtual economy, often (but not always) built on cryptocurrencies and digital goods and assets, including non-fungible tokens (NFTs) and
5. Allows people to create a virtual identity, presence, and ability to act virtually, including between interpersonal interactions, make transactions, create their own content, and build their world (Hazan, Kelly, Khan, Spillecke, & Yee, 2022).

Other industry experts characterize the metaverse as a place where today’s youth create online lives and where they can build individual avatars that reflect their personal styles. They can shop, buy property, and conduct all types of online activities. In essence, the metaverse is a place where companies can engage the youth in new and creative ways, i.e., where they have direct access to an elusive target group in a space where they are naturally inclined to be.

The level of investment into the metaverse is significant and rapidly developing. The investment also illustrates how interested organizations are in creating a space with commercial potential, particularly in communications. It is estimated (Hollensen et al., 2022) that the metaverse will revolutionize almost all sectors of society, as well as actually create entirely new industries, marketplaces, and resources. This process will both create and demand new types of skills, professions and whole careers. The financial impact of these developments is estimated to be in the trillions of dollars.

There are several basic building blocks (Hollensen et al., 2022) that enable the metaverse; see Table 1. The first includes consumer-oriented hardware (such as virtual reality headsets, mobile phones, haptic gloves, and enterprise hardware used to operate virtual or augmented reality environments. There are ongoing developments that both increase technical function and focus on greater usability. The second building block is networking, which focuses on bandwidth, network latency, and reliability. Streaming services, such as Netflix, receive video files before they are released to the public to optimize files for the best customer experience.

Table 1: Basic Building Blocks of the Metaverse

| | |
|-------------------|---------------------------------|
| Hardware | Interchange Standards and Tools |
| Networking | Payments |
| Computing | Content, Services, and Assets |
| Virtual Platforms | Consumer and Business Behavior |

Source: Adapted from (Hollensen, Kotler, & Opresnik, 2022)

A third key element is the availability and development of the computing power necessary to complete very technically demanding processes, e.g., motion sensing, computations, or AI. The next building block includes virtual platforms, which enable users to connect to the metaverse. Access is provided through a variety of devices, such as web browsers or VR glasses. This is the aspect that enables simulations and immersive experiences, and while it is often associated with activities such as gaming, it also facilitates economic activities between businesses and consumers. The development of industry standards represents the fifth element needed in order for everyone to work together and facilitate interoperability. This aspect is of key importance in enabling a positive customer experience. Another critical element is that of payment systems, which are likely to be associated with blockchain and virtual currencies. Cryptocurrencies, for example, are becoming more frequently used to facilitate user payments in a variety of ways (e.g., in apps, for transactions, etc.).

In order to function effectively, the creation of content, services, and assets is required; this aspect represents all the services and businesses created by brand owners for their customers in the metaverse environment. Brand owners, luxury companies among them, are intensively developing the opportunities in this space. Consumer and business behavior represent the final building block needed and refers to observable changes in behavior (by both customers and organizations) that are directly related to what is happening in the metaverse. For example, generations Z and Alpha learn, socialize, and express themselves in virtual worlds where they can interact with others. The capabilities of virtual worlds will grow, and their accessibility and ease of use will improve (Hollensen, Kotler, & Opresnik, 2022)

Joy et al. (2022) investigated how advanced technologies impact the luxury fashion industry. Then, they posed questions regarding whether young consumers – who live essentially online – will buy more fashion products in the digital world than in the real one. They also examined how the fashion industry can create a strategy for combining digital collections and physical goods. The answers to these questions are not yet known, but many industry experts state that it is typical for younger consumers to have a digital collection rather than a physical one. This type of approach may also open the door to purely virtual brands. One new example is the digital fashion house and platform The Fabricant, which co-creates high-end, couture-quality clothing and accessories for the digital realm. The brand collaborates with various partners, including fashion designers and artists, to create avant-garde virtual collections. Items are showcased in virtual fashion shows, exhibitions, and digital platforms (TheFabricant.com). In another example, Gucci introduced the “Gucci Sneaker Garage,” where clients can virtually try on and customize shoes. Gucci also partnered with a digital artist to create a collection of entirely virtual sneakers featuring unique designs. They were showcased in a virtual exhibition and were available for purchase as NFTs, allowing them to be owned and traded entirely online (Aloian, 2021).

Luxury brands are also exploring opportunities with regard to digital twins, which are exact digital versions of real-world objects such as a couture bag or luxury watch. Examples of companies already using this technology include Breitling, Vacheron Constantin, Burberry, and

Dolce & Gabbana. Some industry experts propose that NFT digital twinning is the future of luxury brands (Xverse, 2023). GME projects that global digital twinning in the fashion and luxury goods market is expected to grow at a CAGR of 10.5 percent between 2023 and 2028 (Global Market Estimates, 2024).

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Artificial intelligence is rapidly developing, so much so that it is literally a moving target. Even in the traditional world of luxury houses, the use of artificial intelligence (AI) is becoming widespread. However, luxury does retain some of its traditional caution regarding the specifics of its implementation. For example, luxury brand managers are more cautious about using AI to communicate with clients. While chatbots are already common in communication with companies like Estée Lauder or Louis Vuitton, unlike in non-luxury sectors, it is always ensured that the client can more easily interact with a human consultant, who is still considered more personal and empathetic. Nevertheless, it is very possible that with the rapid development of AI and machine learning, the fear of low empathy will soon be overcome. One significant benefit of using AI is its ability to offer an extremely high level of personalization, a critical element in luxury brand management (Joy, Zhu, Peña, & Brouard, 2022).

Machine learning has played a key role in the development of BVLGARI's Serpenti Metamorphosis, where BVLGARI (2022) partnered with digital pioneer artist Refik Anadol, who used it to create a multisensory installation for Milan's Piazza Duomo to celebrate the beauty of nature. This installation relied on artificial intelligence algorithms "trained" on the vast number of available images. Algorithms can learn to make accurate predictions, for example, about what combinations and sequences of images will be attractive to a target audience (JLVMH, 2021). Furthermore, the machine learning process automatically improves through repeated experiences. By understanding real-time customer data, such as who buys what, when, at what prices, and in which locations, machine learning can help luxury brands offer highly personalized and relevant recommendations for each customer).

There is enormous potential for AI to dramatically improve customer relationships. Since a personal connection and relationship between lux customers and the brand, including personal interaction between the clients and sales personnel, is a key element to the luxury purchase situation, luxury has long focused on welcoming customers into traditional stores. However, with evolving technologies and the associated e-commerce opportunities, luxury brands need to find new methods to provide personalized online interactions. Solutions are to be found with an omnichannel marketing strategy. This needs to include e-commerce data processing solutions enabled by artificial intelligence. Customers can search in e-shops and elect to complete purchases in person. As the volume of data on sales and consumer preferences continues to grow, AI can use this data to improve the shopping experience further, thereby attracting consumers whose digital behavior is more confident (The Joue, 2021).

One ongoing challenge for the luxury industry is counterfeiting. The counterfeit market is estimated to be worth 81 billion USD by 2026 (The Medium, 2023). Furthermore, with the growing number of luxury brands on the secondary market, there is an increasing need to identify the authenticity of the products. Image recognition technology can potentially reduce the challenges posed by counterfeiting, and artificial intelligence can help luxury brands identify unauthorized sellers on mass e-commerce platforms. In addition, AI can also help authenticate products across the luxury industry; this may be done for example, through biometric certificates and digital twins.

NEW TECHNOLOGIES AND LUXURY BRAND MANAGEMENT

The innovative design of experiences luxury brands provide will be an increasingly important part of luxury marketing. Experiential marketing is about taking the essence of the product and extending it into a set of tangible, physical, and interactive experiences that strengthen the brand's offering. Experiencing a brand may be characterized by customer engagement (measured by the level of interactivity between supplier and customer) and intensity (including aspects of entertainment, education, escape, and aesthetics). Increasing engagement involves interactive co-creation of an experience by both the supplier and customer, rather than simply the former doing it for the latter. Intensity refers to the level of feelings involved relative to the interaction. Together, these contribute to the richness of the overall experience (Atwal & Williams, 2009).

The examples in this paper illustrate approaches of luxury brands to creating new, deep and immersive experiences. NFTs in the luxury world can mean a work of art and build on the tradition of combining luxury and art. Blockchain technology ensures the uniqueness of each NFT, its origin, and its authenticity. In the case of luxury, it can form the basis of a digital art collection and further deepen the relationship between luxury and art. The metaverse enables access to a community of new generations whose virtual involvement opens the door for luxury brands to create virtual events or collections and be involved in the second-life realm. The use of artificial intelligence and machine learning by virtual artists can further engage new target groups. Improving customer service both on- and off-line is also a significant opportunity yet a challenge to implement. This must all be done while carefully preserving the core values of the brands. Moreover, while there are untold opportunities associated with these emerging technologies, there are also reasons to be cautious. For example, one topic to consider is the environmental impact of blockchain technologies, which underpin NFTs, and in particular, the energy needed to validate transactions. Cybersecurity is another cause for concern.

CONCLUSION AND FUTURE RESEARCH

Both the pace and scope of technological development are increasing dramatically. In 2022, the metaverse market was estimated at 65.5 billion USD and is expected to grow to more than 936 billion USD by 2030 (Statista, 2023). Moreover, while giant global corporations are investing billions in shaping what this may look like, how the future will unfold remains to be seen. There are immense opportunities going forward for organizations to explore this space. There will be new and more engaging ways for customers and brands to connect. Customer experiences will become more personalized and have a growing number of touchpoints. Luxury companies have the opportunity to rethink how they traditionally broach technology as well as contribute to how this emerging realm evolves.

New generations of consumers also bring challenges to the luxury sector and the strategies of luxury brands. The differences in their purchasing behavior, the size of new segments, and their technological preferences pose challenges that require consistent preparation and timely implementation. By investing in technology, companies are securing an appeal not only to new generations of customers but also to existing HNWI (high net worth individuals with investable assets above 1 million USD), as a survey of wealth management consultants shows that by the end of 2021, 70% of all HNWI (and 91% under 40) had invested in digital assets (Capgemini Research Institute, 2022). This can support companies' efforts to create diversified digital and physical product offerings.

Areas for future research include investigating opportunities posed by the development of the digital twin concept and the potential it opens for luxury companies. As it is the youth generation that is most at home in this virtual world and who will become an ever more present consumer group, it will also be important to explore the affinity of generations Z and Alpha towards fashion items in the virtual world and how that will contribute to quantification of opportunities. Given the rapid developmental pace of applications using artificial intelligence, there are ongoing opportunities to explore how this may be incorporated into a luxury brand management strategy.

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PEER-TO-PEER LODGING: BURNING HOST QUESTIONS, ANSWERED

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ABSTRACT

This paper analyzes the concerns of experienced peer-to-peer lodging hosts. There is a growing body of knowledge in the published literature that focuses on the variables related to why consumers choose to stay in other people's houses when selecting travel accommodations. However, the published findings on the concerns of lodging hosts are limited. The Peer-to-Peer (P2P) economy continues to increase with the need for property hosts to understand guests' intentions while staying in their properties. The need to extend the literature focused on Airbnb and VRBO host-guest relationships is necessary to better understand the behaviors and trends of guest stays to improve both business for hosts and, ultimately, the guest experience. The results of this paper will provide P2P lodging hosts with valuable information to improve their guests' stays, protect their investments, and drive revenue.

Keywords: Hospitality, Peer-to-Peer (P2P), Airbnb, VRBO

INTRODUCTION

The lodging sector of the hospitality industry is seeing an increase in independently owned and operated lodging accommodations that are becoming an attractive option for travelers. The sharing economy, also known as collaborative consumption (Botsman & Rogers, 2010) or access-based consumption (Bardhi & Eckhardt, 2012), and the peer-to-peer (P2P) economy is finding incredible growth in mobile applications providing marketing capabilities for small, independently owned lodging properties to grow at an unprecedented rate.

Airbnb, a P2P lodging platform, started in the co-founder's apartment in 2007 in San Francisco and quickly grew into an international online booking platform within four years. Airbnb reported in December 2023 that more than 4 million hosts worldwide welcomed over 1.5 billion guests (Airbnb, 2024). Guttentag et al. (2018) define it as a platform on which individuals can rent their spaces as tourist accommodation, involving an entire place or a private room where the host is present. In 1995, Vacation Rentals by Owner (VRBO) was born and is now a global vacation

brand with a unique selection of more than two million whole homes worldwide (VRBO, 2024). VRBO only allows whole homes without the hosts' presence. The growing number of properties available for travelers to select from on the P2P platforms continues to increase, and the need to understand how to attract guests in the P2P economy is critical for independent property owners to be competitive.

While the vision of the Airbnb founders was for travelers to embrace a new way of traveling by connecting to communities "in a unique way" (Airbnb, n.d.), hosts are encouraged to list their extra rooms and properties to make extra income. Attracting guests is one concern of P2P lodging hosts; however, the current study found that hosts also have a variety of other questions regarding the behavior and expectations of guests. The intersection of the host-guest relationship seems to be misaligned, with the individual hosts being left to understand guest expectations and intentions. The role of the host has shifted from a traditional host who helps guests understand and explore the local community to a property manager anxious to ensure every guest experiences a 5-star stay. Published research focused on the host-guest relationship has found several contradictions and has posed more questions.

The authors of the current study are Airbnb and VRBO hosts, which affords them access to other Airbnb hosts' perspectives and a unique perspective of the host-guest relationship. This study explores the role conflict theoretical framework to better understand the shifts in the role of a P2P lodging host. The practical implications of this study may help hosts generate additional revenue while balancing the increased demands of guests, and fulfilling the requirements set forth in the policies and expectations of the P2P accommodation platforms such as Airbnb and VRBO.

LITERATURE REVIEW

In his book *The Theory of the Business*, Peter Drucker (1994) explained that in some situations, "the assumptions on which the organization has been built and is being run no longer fit reality, (p. 95)" He explains that assumptions shape an organization's "behavior, drive the decision-making process, and define what the organization deems as meaningful results" (Drucker, 1994). Airbnb appears to be finding itself in this space as the company continues to show massive growth in the past decade by increasing the number of hosts across the globe that are allowed to own or manage one or more properties. While the original intent of the Airbnb platform was a unique home-sharing experience through a host, the company has not regulated the number or types of properties that hosts are permitted to manage. Cheng and Jin (2019) found little evidence of the intended initially authentic tourist-host interactions. They suggested that the host is now a facilitator rather than a social relationship builder in Airbnb transactions.

A general search of the Airbnb platform results in several property management companies that are now hosts and use Airbnb to market their properties, even hotels. Guests searching for

properties must be aware of the differences in their selections, understanding that commercial properties and individual homestays are mixed into the search results. From a host perspective, the professionally managed properties mixed with the homestays create an unfair advantage. In many cases, property management hosts on the P2P platforms can provide better amenities, locations, number of bedrooms and beds, and bathroom options, all at a lower rate than an individual host. Research has shown that travelers will select commercial properties such as hotels based on location, services, amenities, price, food and beverage, hotel image, security, and hotel marketing (Crnojevac et al., 2010; Dolnicar & Otter, 2003; Liu et al., 2013). Cheng and Jin (2019) found the same true when guests select Airbnb stays. From their review of past guest reviews, four major topics emerged in the reviews: location, amenities, host, and recommendation. Amenities rise to the top of the most common selection criteria in both commercial and P2P properties. To remain competitive and maintain a 5-star rating from past guest stays, individual property hosts must understand what amenities are most important to a guest. Unlike commercial property owners, hosts have limited financial resources to spend on supplies and other amenities that guests may or may not expect when staying in a commercial property.

Cheng and Jin (2019) found that Airbnb guests generally use the same attributes of their accommodations in a hotel as their stay in an Airbnb property. These findings suggest that hosts should have an understanding of hospitality industry service standards and implement the same standards on their property in order to meet the expectations of their guests. It has been found that efforts by hosts to try to implement similar service standards as hotels and communicate by posting signs throughout their properties, providing instructions in house manuals, and communicating house rules in the Airbnb platform for guests to review before booking a property. One example of a provided amenity is black wash towels to remove makeup to keep white bath towels clean. An additional example is asking guests not to flush objects down the toilet. These types of signs are common in hotels, and guests would expect to read them; however, the same signs in a P2P property have been found to be perceived by guests as a negative reflection of the host.

Golf-Papez and Culiberg (2023) explored misbehaviors in the sharing economy and how role expectancy theory relates to the host-guest relationship. Their findings suggested that guest expectations should not only be included in the house rules established by individual hosts but also that a broader communication of the guest expectations should be published on the Airbnb platform so as not to create tension directly between the guest and host.

Xue et al. (2022) support these findings in their examination of “good” guest behavior. They found that Airbnb hosts consider interactions with guests to be more of a business transaction than a way of building relationships with guests. They also suggested that the P2P platforms should develop general codes of conduct for the guests that would begin to co-create proper manners of guests.

RESEARCH QUESTIONS

The current study seeks to answer an array of questions that will ultimately help P2P lodging hosts provide a better experience for their guests. The first question explored is a guest's intended or unintended treatment of their overnight accommodations and the property itself. Are guests inclined to treat a P2P lodging property better or worse than their home? Are the expectations of how they treat the property heightened or lessened than societal expectations of their own home or a traditional hotel?

The second question the researchers are trying to understand in this study is the guest's expectations of the property. Is there an expectation that a P2P property is maintained at or above that of a traditional hotel? Is there an expectation that amenities are above that of one's own home? Where exactly is the bar set?

The hypotheses for this study are:

H1: Guests treat peer-to-peer properties differently than other overnight accommodations.

H2: Guests' expectations of peer-to-peer accommodations are greater than traditional overnight accommodations.

METHODOLOGY

A mixed methods approach was used to obtain the data needed to answer the aforementioned hypotheses. First, a panel of experts was assembled, the Smokey Mountains Area Airbnb Host Community on Facebook. The authors of this study, as Airbnb hosts, have exclusive access to the private Facebook group as a member of the community. This panel of experts brought forward a number of questions that fit into the aforementioned hypotheses. These questions were then condensed into a concise subset of questions that could be asked to a large group of travelers through a crowdsourcing service, CloudResearch's Connect. The authors chose CloudResearch as the platform due to the higher quality ratings of the collected data in previous studies, such as the results from Peer et al. (2021). Crowdsourcing for this study allowed the researchers to use the collective intelligence of a wide range of web users for the labor-intensive task of data collection through an online survey (Moss et al., 2020).

The current study also benefits from the use of the general public as research participants to understand a broader range of the traveling public. The researchers believe that research

participants are valuable contributors to the discovery process and should be compensated for their time and effort. Therefore, the respondents were paid a competitive rate within CloudResearch's Connect platform once they completed the quantitative survey. Three hundred eleven usable responses were collected from participants in this study.

The methodology of this study is unique because the researchers have used current Airbnb hosts and the general traveling public. Many previous studies that focused on Airbnb and the sharing economy obtained data from guest and host reviews published on the Airbnb platform. The current authors chose not to use guest and host reviews due to the low reliability of the reviews as accurate reflections of host-guest relationships.

FINDINGS

It is important to understand the demographics and habits of the sample population studied so that any generalization of findings can be built upon. The largest group of respondents was in the 25-34 years old range, coming in at 32.80%, and the second largest group was the 35-44 years old range, coming in at 28.30%. Therefore, the majority of respondents, over 61%, were between 25 and 44 years of age. The male-to-female ratio was extremely close, with 51.45% of respondents identifying as male and 47.27% identifying as female. 1.28% of respondents identify as binary or would rather not self-identify.

The researchers were also interested in understanding the respondents' frequency of travel. The largest group of respondents indicated that they travel approximately twice annually, 45.98%. The next largest group of respondents indicated traveling monthly, 23.15%. These majorities were followed by 'very rarely' at 14.47%, 'once per year' at 10.93%, and 'more than once per month' at 5.47%.

Respondents were asked to self-identify what was most important regarding any overnight accommodation. Responses indicated the following in order of importance to guests: cost, location, customer reviews/ratings, amenities, convenience of booking, and uniqueness of property. When specifically asked about the most important factors in P2P bookings, these top five remained the same, with number six emerging as communication with hosts.

It is common for hosts to use signage throughout the property to convey property rules and host desires, often to help eliminate property damage. Respondents indicated that 97.75% of guests read the signs, and 97.11% said they abide by them. When asked about paying for property damage, 24.76% of respondents felt that guests should always be charged for damages, 1.93% of respondents felt they should never be charged for damages, 24.76% felt they should be charged only when the damages exceed \$100, and lastly, 48.55% indicated that they should be if they do not follow a sign or house rule causing damage.

Respondents were also asked what amenities make a difference in their booking. Interestingly, having a king bed was ranked the highest by 39.23% of respondents, followed by a hot tub by 28.30% of respondents, and lastly, a bathtub at 11.90%. This question allowed respondents to open it with an open-ended dialogue box, and several responses indicated shower, wifi, and washer/dryer.

A 5-point Likert scale was used to inquire about the importance of previous reviews to a guest when booking. The scale ranged from important to moderately important to not important at all. 59.49% of respondents indicated importance, 19.61% indicated between important and moderately important, with only 16.72% indicating moderately important. Additionally, they were asked how concerned they were about the rating they received as a guest. The average was 70%. This tells us that host reviews matter more than guest reviews, to guests.

A recurring theme of host reviews is how well the P2P property is stocked with consumables such as toilet paper and coffee. Respondents were asked which items should be stocked for the entire length of their stay as opposed to just a 'starter pack.' Responses were as follows: toilet paper (85.81%), garbage bags (77.10%), paper towels (68.06%), kitchen detergents and soaps (66.77%), bath soap/gel (32.58%), coffee/sugar/creamer (30.97%), shampoo/conditioner (30.32%), and 22.58% agreed that a 'starter pack' would be suitable for all of those above.

It is no surprise that guests are expected to do check-out chores, and this is a point of contention amongst P2P guests. However, the researchers set out to explore which expectations are reasonable. The two items that seem most resented are starting a load of laundry and taking off bed linens. 62.89% and 57.39% of respondents, respectively, indicated that they should not have to perform this activity. Other honorable mentions were sweeping the floor and taking out trash, with 52.92% and 29.55% of respondents, respectively, indicating that they should not have to perform this activity.

Lastly, the researchers asked respondents how they consider themselves in the guest/host paradigm. Do they see themselves as a guest in someone else's house or a participant in a business transaction very similar to a hotel? 58.90% of respondents chose the former and, therefore, see themselves as guests in someone else's home.

When considering the original hypotheses of this study, both of the presented hypotheses were confirmed based on the responses of the 311 survey respondents.

H1: Guests treat peer-to-peer properties differently than other overnight accommodations.

H2: Guests have the same or greater expectations of peer-to-peer accommodations than traditional overnight accommodations.

Study findings reveal that guests treat peer-to-peer properties differently and have a heightened expectation of accommodations over traditional overnight accommodations.

IMPLICATIONS OF THIS STUDY

Airbnb, as an organization, has created role ambiguity for hosts. Is the role of a P2P host to provide a welcoming home for guests to stay in or to be a hospitality professional keeping up with industry standards? Airbnb and other P2P platforms have defined what a host should do and have developed specific criteria for the role. The P2P organizations evaluate host performance based on the criteria and provide public recognition for their efforts. As guests continue to use the P2P platforms more consistently for accommodations, guest expectations will continue to increase, and hosts must meet and exceed those expectations. Hosts without the resources or understanding of hospitality industry cleanliness, service, and amenities standards may be frustrated and struggle to attract guests if guest reviews decline. Xue et al. (2022) pointed out in their study of what makes a “good” guest that academics and professionals must understand what the host is experiencing within the P2P platforms by deciphering guest behaviors that lead to host dissatisfaction and higher intention of quitting.

FUTURE RESEARCH AND LIMITATIONS

The limitations of this study are fairly straightforward, and the survey methodology has to deal with three aspects: generalizability, population of respondents, and quality of responses. First, the hope of any study is that the findings can be generalized to a greater population and have a meaningful impact on practitioners across the board. For this study to have results that are generalizable to a greater population, more demographic questions will need to be examined, and the sample size will need to be expanded. Secondly, the population of respondents may be more indicative of individuals with a propensity to earn income through Cloud Research’s Connect than those frequenting P2P accommodations. Lastly, one has to ask, does this population take the surveys seriously or perhaps rush through them for the financial reward, thus skewing the findings? Future research in this area expanding guest behavior questions to the traveling public would benefit practitioners. Questions that would compare and contrast guest behaviors at hotels, motels, and other commercial properties to understand how they differ would be interesting to explore. The authors would like to expand this research in the future by expanding the panel of experts that developed the questions and by segmenting respondent groups regionally to see if there are differences in regional populations.

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OVERALL EQUIPMENT EFFECTIVENESS (OEE) IN MICRO-SURGICAL DEVICE MANUFACTURING

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ABSTRACT

In the micro-surgical device manufacturing industry, well-maintained machines, detailed process instructions, and standard reference tools can ensure maximum utilization through good product quality, efficient time, and minimum cost. This study investigates a series of micro-surgical device manufacturing processes to propose an advanced strategic operational plan based on a real-time data analytics concept called Overall Equipment Effectiveness (OEE) to improve overall maintenance along with better machine performance and product quality. This new framework was developed within a micro-surgical device company. Still, the firm desires to keep its identity and some other aspects of its processes and products confidential, so with their blessing and support, this article will cover the aspects of OEE applied to their situation. The data shown and evaluated in this paper is representative and accurate to the improvements achieved. The problem-solving tools used in the past were implemented on individual machines, equipment, processes, operators, etc. This holistic and novel approach makes sure that the OEE is conducted across all the machines in the processes, not on each machine or process separately.

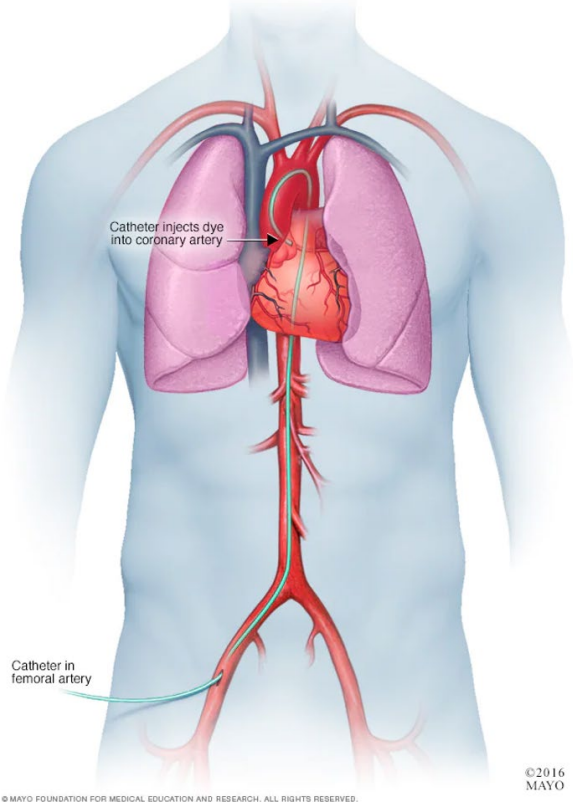
The main contributing elements that lower OEE are reworks, downtime, rejection rate, and unbalanced cycle times. Each element has two sub-elements that combine to form the six big losses. However, a unified approach like the OEE was never utilized. So, a new framework was designed based on the OEE model using an amalgamation of problem-solving tools to overcome the identified problems and reduce the contribution of the three big losses. This advanced model of OEE provides a complete guide to decrease the share of big losses to improve the value of OEE. The proposed model includes problem-solving tools and a conventional OEE model for a complete framework. After the successful implementation of the proposed model, a significant reduction in the value of three big losses was observed, ultimately improving the value of OEE factors for the machines by 48%.

Keywords: Micro-Surgical Devices Industry, Overall Equipment Effectiveness (OEE), Problem-Solving Tools

INTRODUCTION

Micro-surgical devices are vital parts of the health service industry. Some micro-surgical devices that are a part of this research study are catheters, guidewires, and stents. For critical conditions such as cardiac treatments, devices like guidewires help doctors navigate the blood vessels to reach the heart to diagnose or treat certain heart conditions such as clogged arteries or irregular heartbeats. The guidewire is a guide that catheters can rapidly follow for easier delivery to the treatment site. These micro-surgical assemblies consist of a long, thin tube that can be fitted with a variety of different tips (including micro stents) to serve a range of functions (Keehan & Gergely, 2023, Catheter and Specialty Needle Alloys, TE Connectivity Corporation). Figure one is a schematic diagram of a catheter inserted into a blood vessel through the upper thigh, neck, or arm to reach the heart for the cardiac catheterization procedure.

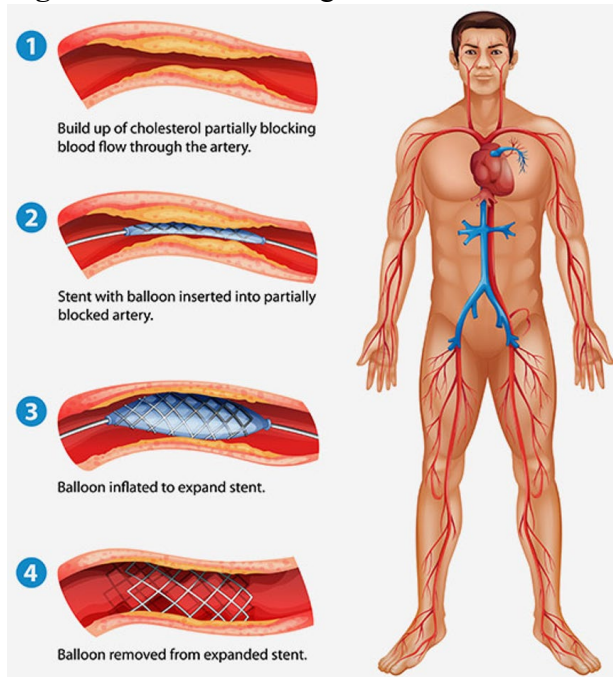
Figure 1: Diagram of a cardiac catheterization surgical procedure using a micro-catheter



Source: *Overview of Coronary Angiogram, 12/2021*

Similarly, figure two illustrates how a micro stent opened the human artery through a balloon inflation procedure to remove the cholesterol buildup and improve the blood flow through the artery.

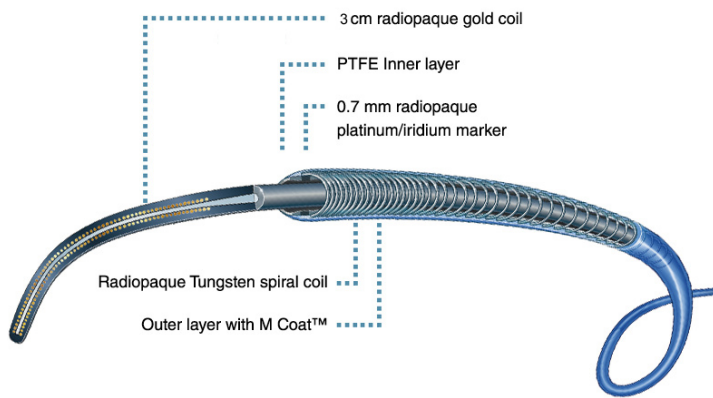
Figure 2: Schematic diagram of cardiac catheterization surgical procedure using micro-stent



Source: *Percutaneous Coronary Intervention*, 01/2022

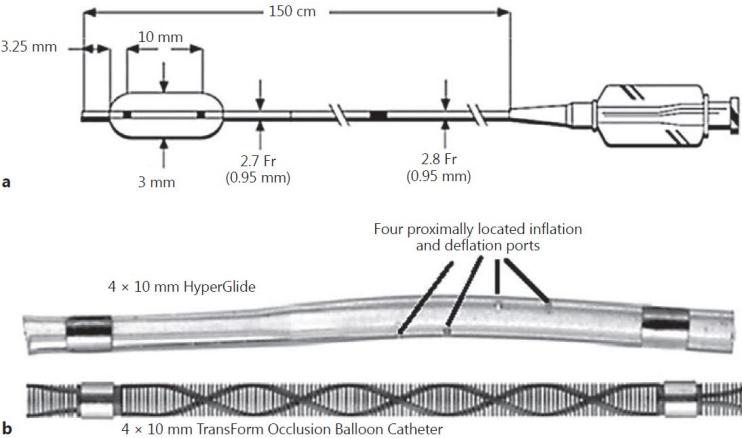
These micro-surgical assemblies consist of a long, thin tube that can be fitted with various tips to serve a range of functions. Figure 3 (Terumo et al. Corporation) shows a cross-sectional assembly view of the Progreat Micro Catheter System. Several internal layers of micro components are coaxially aligned and centrally secured together to form an assembly. Each component is made of specialized medical-grade precious alloys, which play a key role during surgical procedures. Figure 4 (Taqi et al., 2017) shows a typical device diagram of a TransForm Occlusion Balloon Catheter with a catheter length of 150 cm and a HyperGlide microtube, which gets inserted into an artery to reach the right access point inside the human body to the surgical procedures. Note how truly thin these catheters are (about 0.8 mm on average).

Figure 3: Progreat Micro Catheter System



Source: [Progreat™ Micro Catheter System \(terumo-europe.com\)](http://terumo-europe.com)

Figure 4: TransForm Occlusion Balloon Catheter and HyperGlide (Taqi et al., 2017).



Due to their microscopic feature sizes, longer lengths, and high precision requirements, the manufacturing and assembly for these micro-surgical devices face many significant challenges, such as tight specification requirements, micro-machining, micro-soldering, micro-adhesion, micro-grinding, strictly enforced regulations, and the unique challenges faced whenever a new device is introduced for manufacturing. These challenges pose many issues during high volume manufacturing of the devices (e.g., high scrap rate, high rework rate, slower process times, longer cycle times, frequent but prolonged inspection times, micro-machining leading to errors during processing, highly manual processing, etc.). (Almeida & Ruben, 2017; Ciurana, 2015; Araya, 2011; Azizi, 2015; Darwish et al., 2014). The learning curve for the technicians who build these devices is steep. Figure 5, on the next page below (Keehan & Gergely, 2023), shows a few pictures of a typical micro-surgical manufacturing line in a clean room environment. A series of manufacturing, inspection, assembly, and packaging operations can be seen in these pictures. High usage of microscopes and magnifying glasses is required due to the microscopic nature of the parts being manufactured.

Figure 5: Micro-surgical Device Manufacturing Lines



Source: [med-catheter-needle-alloy-wp-en.pdf](#)

Given the competitive forces in today's medical micro-surgical device market, completion of the product development cycle on time, with maximized efficiencies, high yield rates, and low machine downtime, is critical (Andritoi, 2020; Halpern, 1991; Tsacle & Aly, 1996; Ales, 1996; Eungard & Matzen, 2004; Solar et al., 2007; Lee & Kang, 2020).

Productivity and quality effectiveness are required to strengthen the organization's competitiveness in the global market, which ultimately fulfills the customer's dire, life-or-death requirements. Consequently, operational excellence is required to achieve superior quality and productivity levels. Effective and efficient manufacturing strategies combined with continuous improvement, scrap/rework reduction, and machine maintenance planning combined with modern real-time data analytics solutions help manufacturing organizations achieve world-class manufacturing performance. Therefore, to achieve superior quality and high productivity, a holistic manufacturing approach is required, which combines the overall effectiveness of the entire manufacturing cell through the critical analysis of the current processes, real-time data analytics solutions, and continuous improvement methodology.

Overall Equipment Effectiveness (OEE) is a modern concept that relies on real-time data analytics while minimizing the six major losses in a manufacturing cell. OEE is a measure of how well a manufacturing operation (equipment, time, and material) is being used compared to its full potential during the periods it is expected to run. It measures manufacturing processes' uptime, availability, and quality (Ramzan et al., 2022; Raju et al., 2022).

The Overall Equipment Effectiveness system consists of three main parts: Availability Rate (A), Performance Rate (P), and Quality Rate (Q). It is used to track the performance of any process that must meet a standard level of quality while producing the products at a planned rate. Table 1 shows the OEE Factors, loss classifications, and their computations.

OEE is the only metric that goes beyond the individual standard efficiency metrics like first-pass yield, scrap rate, throughput rate, and change over time. It is a powerful real-time indicator of an organization's overall effectiveness in managing its resources. (Corrales et al., 2020).

PROBLEM STATEMENT

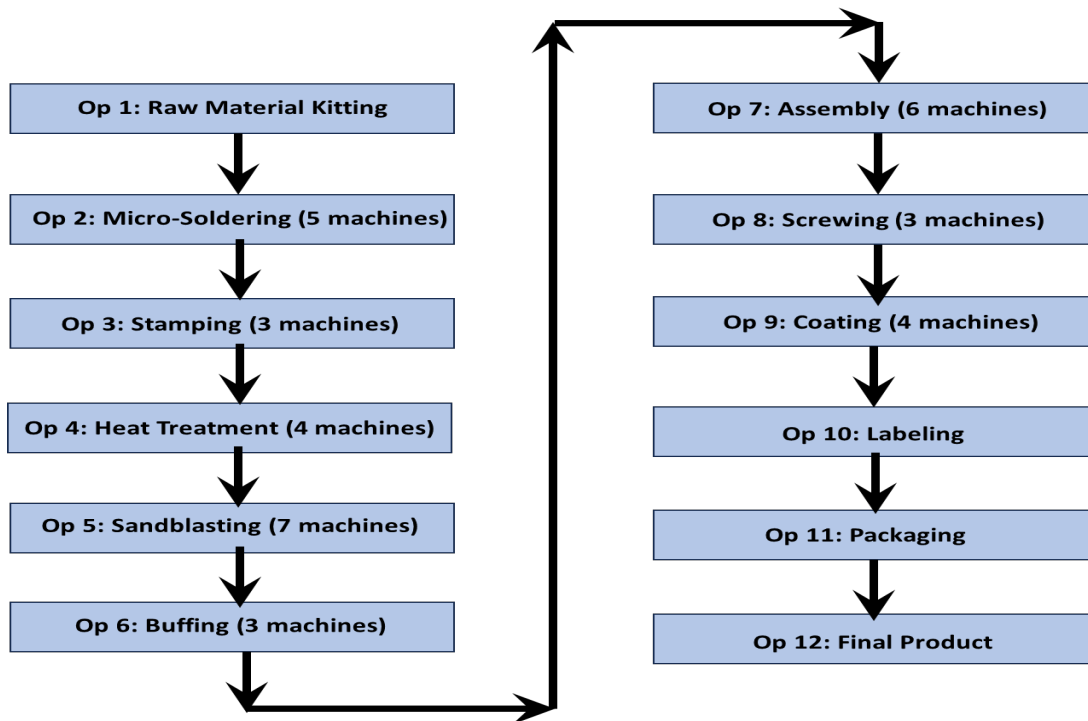
All the operations involved in micro-surgical device manufacturing are shown in Figure 6 below (Araya, 2011). In the first operation, all the required raw materials are kitted in the right quantities, verified, and made available for the next process. The next operation, micro-soldering, is a critical process where three surgical elements are soldered together at every 50 mm using a braze material. The operator accesses the soldering spot using a microscope. Standard procedures are well-defined. It is a highly skilled process because the solder spot, solder size, and braze amount play a significant role in the quality of any soldered joint. Mis-aligned soldering, solder tip abrasion, and filament burnout are the frequent issues caused during this operation but are identified in later operations. Operation 3 is stamping, where a micro-sized protective sheet (made of precious specialized metal alloy used for medical applications) is pressed and formed on top of the three soldered joints. Operation 4 is heat-treatment of the soldered joint at 80°C for 10 minutes to achieve uniformity and eliminate residual stresses caused by soldering and stamping. The extra

solder material is removed using an alumina grit sandblasting process in operation 5. Operation 6 is touch-up grinding, also called surface buffing, to improve the surface finish of the soldered joint. Parts are thoroughly inspected after every process using high-magnification microscopes (10x, 50x, and 100x are used as required). All the excessive solder material and sandblasting-related surface roughness are cleaned after the buffing process. Thus exposing many defects or rework issues caused during the micro-soldering and stamping processes.

During the assembly operation, the micro-surgical guidewire is aligned and assembled within a flexible protective tube, followed by securing the end pieces using micro-screws (operation 8) to maintain the alignment. Operation 9 is to immerse the protective tube assembly into a specialized coating solution for 90 sec, then remove and place it in a heating chamber for coated layer formation and uniform drying. Then, the parts undergo a series of final inspections and strength testing before applying a unique identifier label on each device. Once the quality check is completed, each device is packaged, air-sealed into a specialized packaging material, and sent to the Quality Assurance Department for final release to the customers.

In this complete process (See Figure 6), operations 2 through 6 are the most critical processes where most of the issues occur (like defective micro-soldering, minor misalignments, rework, stoppages, machine breakdown, re-setup, machine adjustment, idle time, etc.). In this research, the micro-surgical device manufacturing section is focused on identifying the root causes and developing and implementing a corrective action plan for operations 2 through 6.

Figure 6: Micro-surgical Device Manufacturing Operations (Araya, 2015)



The calculated value of Overall Equipment Effectiveness (OEE) is the product of its three factors: availability (A), performance rate (P), and quality rate (Q). The value of each factor further depends on pairing two significant losses combined and simplifying them to make 3 OEE factors of the six big losses (See Table 1). These losses include equipment failure, setup and adjustment, reduced speed, idling, and minor stoppages, defects and rework, and reduced yield losses. When the contribution of these losses increases, the overall value of OEE is reduced significantly, indicating the frequent breakdown of micro-soldering equipment, inspection for wear and changeover of solder tip, setup, changeover adjustment loss of time and product quality, increased processing time of parts, idle time for the remaining equipment.

Table 1: OEE Factors, Loss Classifications and Computations (Azizi, 2015)

| OEE Factors | Six Big Loss Category | Computation of OEE |
|-------------------------|---------------------------|---|
| Availability Rate (A) % | Equipment Failure | A = Operating Time / Loading Time |
| | Setup and Adjustment | |
| Performance Rate (P) % | Idling and Minor Stoppage | P = Net Operating Time / Operating Time |
| | Reduced Speed | |
| Quality Rate (Q) % | Defects and Rework | Q = (Processed Quantity - Defect Quantity) / Processed Quantity |
| | Reduced Yield | |

In such a scenario, these operations become problematic and require a thorough evaluation using a continuous improvement program. Therefore, it is desired to define the framework for the reduction of these losses through an effective Kaizen program and Failure Mode and Effects Analysis (FMEA) focused on root cause analysis at critical operations, thorough evaluation and rating of the severity, occurrence, and detection of the root causes, corrective actions planning and its implementation in the entire micro-surgical manufacturing cell.

METHODOLOGY

To develop and implement the proposed plan, the adopted methodology has been divided into two phases: 1) Understanding the Current State and 2) Developing and Implementing a Future State Plan. The first phase is focused on understanding the current state of each operation step, identification of the critical issues and problem analysis, and then identifying root causes using FMEA methodology to quantify the causes using severity, occurrence, and detection indexes to calculate the Risk Priority Numbers (RPN) in order to prioritize the most severe causes. A standard Risk Priority Number (RPN) scale is shown in Table 2 below (Melanson & Nadeau, 2019). This prioritization was followed by a systematic corrective action plan, setting up future state goals for each OEE factor, a detailed implementation action plan, and a follow-up action tracking to validate the corrective actions. A follow-up FMEA analysis was conducted after six months of implementing the corrective actions, using the same criteria and factors for the same operations.

Table 2: Risk Priority Number (RPN) Scale (Melanson & Nadeau, 2019)

| Risk Priority Numbers (RPN) | Description |
|-----------------------------|--------------|
| 225 and higher | Intolerable |
| 175 à 224 | Unacceptable |
| 125 à 174 | Permissible |
| 50 à 124 | Acceptable |
| 5 à 49 | Negligible |

The details of problem analysis, root cause analysis, and corrective action plan are shown in Table 3. The baseline OEE data for the three factors and their respective big losses were tracked in real-time using a custom-developed production data tracking system. Twenty months of OEE % data was calculated and tracked to identify the current state OEE (52%) for the existing manufacturing operations calculated using the real production lots and their actual processing times.

Table 3: Root Cause Analysis and (Before) Failure Modes and Effect Analysis (FMEA)

| Seq. | Operation | Root Causes | OEE Factor Affected | Severity | Occurance | Detection | Risk Priority Number (RPN) |
|------|-----------------|---|-----------------------------------|----------|-----------|-----------|----------------------------|
| Op 2 | Micro-Soldering | 1) No details provided about the 3 elements that are soldered. | Availability and Performance Rate | 8 | 7 | 10 | 560 |
| | | 2) No details about the amount of solder braze to be used per joint. | Availability and Performance Rate | 3 | 8 | 6 | 144 |
| | | 3) No details for solder tip cooldown time. | Availability | 5 | 9 | 9 | 405 |
| | | 4) No details about solder distance per elements. | Performance Rate | 10 | 3 | 8 | 240 |
| | | 5) No defined life for solder tip. No defined life for heating element. | Availability | 10 | 4 | 8 | 320 |
| Op 3 | Stamping | 1) Micro-alignment issues. | Performance Rate | 9 | 2 | 8 | 144 |
| | | 2) 8% rework: protective cover is removed and new cover is applied. Significant amount of time is lost in rework. | Performance Rate | 7 | 3 | 7 | 147 |
| | | 3) 2% scrapping of corewire due to cracking damage caused during rework. | Quality Rate | 10 | 2 | 7 | 140 |
| Op 4 | Heat Treatment | | | | | | |
| Op 5 | Sand-blasting | 1) Uneven material removal due to unpredictable nozzle wear. Leading to re-blasting. | Performance Rate | 9 | 4 | 5 | 180 |
| | | 2) Surface pitting of stamped alloy cover causing rejects. | Quality Rate | 10 | 2 | 8 | 160 |
| | | 3) Frequent machine stoppage to inspect the and replace nozzle. | Availability | 10 | 5 | 4 | 200 |

In the past, several separate problem-solving tools and continuous improvement methodologies like lean manufacturing (focused on a continuous flow of product at a specific task time), Six Sigma (focused on the quality aspect of manufacturing), total productive maintenance (TPM) (focused on effective maintenance approach), operator training improvement, etc. were utilized by the manufacturing company. However, a holistic concept like Overall Equipment Effectiveness (OEE) was never utilized. Problem-solving tools helped identify localized solutions at every step, but the overall system was never continuously analyzed for efficiency and effectiveness (real-time and daily analysis). After researching and understanding the merits of this modern data analytics solution, Overall Equipment Effectiveness (OEE) methodology. The team decided to utilize the OEE methodology to understand the impact of the six major losses and their impact on the three factors that define OEE. As defined in the company's Quality Policy and Continuous Improvement Department, the operations and process data for every production lot have already been collected for the past two years. We decided to utilize the recent 20 months of data to develop the baseline average OEE %, which was 52%

Failure Modes and Effects Analysis (FMEA)

FMEA sessions were conducted for five days in collaboration with the Operations, Quality, Engineering, and Continuous Improvement Departments. All the critical operations were identified after initial brainstorming and production data analysis. This is followed by a thorough step-by-step root cause identification, identifying the OEE factors affected by each cause and identifying the severity, occurrence, and detection indexes to calculate the Risk Priority Numbers (RPN) for each root cause. The list of root causes and FMEA analysis is shown in Table 2. This was followed by a thorough corrective plan development and implementation timelines for all the highly rated root causes. It took us about three months to implement the actions completely. A follow-up FMEA analysis was conducted after six months of implementing the corrective actions, using the same criteria and factors for the same operations. Table four shows the corrective action plan, results of the follow-up FMEA, and the improved RPNs.

Table 4: Corrective Action Plan, Follow-up FMEA and improved RPNs

| Seq. | Operation | Root Causes | Corrective Action Plan | Severity | Occurrence | Detection | Risk Priority Number (RPN) |
|------|-----------------|---|---|----------|------------|-----------|----------------------------|
| Op 2 | Micro-Soldering | 1) No details provided about the 3 elements that are soldered. | 1) Detailed instructions & training modules created. Team Leaders and Operator training provided. | 2 | 2 | 10 | 40 |
| | | 2) No details about the amount of solder braze to be used per joint. | 1) Detailed instructions & training modules created. Team Leaders and Operator training provided. | 3 | 3 | 5 | 45 |
| | | 3) No details for solder tip cooldown time. | 1) Daily Total Productive Maintenance (TPM) schedule was implemented. Clearly defined 180 seconds of solder tip cooling time. | 1 | 3 | 3 | 9 |
| | | 4) No details about solder distance per elements. | 1) Process analysis performed, corrugated & marked metal stripe provided to correctly located the solder distance for the 3 loctions. | 1 | 2 | 8 | 16 |
| | | 5) No defined life for solder tip. No defined life for heating element. | 1) Process analysis performed, effective life of heating element identified as 3-days identified. A 3-day changeover plan implemented. | 3 | 2 | 4 | 24 |
| Op 3 | Stamping | 1) Micro-alignment issues. | 1) Process analysis performed, corrugated & marked metal stripe provided to correctly located the solder distance for the 3 loctions. | 1 | 2 | 7 | 14 |
| | | 2) 8% rework: protective cover is removed and new cover is applied. Significant amount of time is lost in rework. | 1) This issue was significantly reduced due to above action. | 2 | 2 | 6 | 24 |
| | | 3) 2% scrapping of corewire due to cracking damage caused during rework. | 1) This issue was significantly reduced due to above action. | 2 | 2 | 6 | 24 |
| Op 4 | Heat Treatment | | | | | | |
| Op 5 | Sand-blasting | 1) Uneven material removal due to unpredictable nozzle wear. Leading to re-blasting. | 1) New, harder and long-lasting nozzle material was identified after research. 2) Twice/day Total Productive Maintenance (TPM) schedule was implemented. Clearly defined the nozzle life & changeover schedule. | 3 | 4 | 5 | 60 |
| | | 2) Surface pitting of stamped alloy cover causing rejects. | High magnification microscopes with larger field of view was implemented during sandblasting. Experimental design was conducted to optimize uniform material removal. This reduced the surface pitting issue significantly. | 3 | 2 | 8 | 48 |
| | | 3) Frequent machine stoppage to inspect the and replace nozzle. | New and harder nozzle material and TPM schedule resolved this issue. | 4 | 3 | 4 | 48 |

Similarly, the production lots and operations data were collected in a real-time system to perform the comparative analysis, and the improved OEE % values were tracked and compared monthly. Table 5 shows the 20 months of baseline OEE data highlighted in yellow and the follow-up eight months of improved OEE data highlighted in green after the corrective actions were implemented and sustained.

Table 5: Monthly Data: Overall Equipment Effectiveness (OEE)

| | Month-Year | Availability (A) % | Performance (P) % | Quality (Q) % | OEE (A*P*Q) % |
|---------------|------------|--------------------|-------------------|---------------|---------------|
| Before | Jan-21 | 66.2 | 81.2 | 93.8 | 50% |
| | Feb-21 | 69.8 | 70.2 | 95.4 | 47% |
| | Mar-21 | 72.4 | 75.2 | 98.3 | 54% |
| | Apr-21 | 73.6 | 76.7 | 96 | 54% |
| | May-21 | 68.9 | 72.6 | 98.9 | 49% |
| | Jun-21 | 62.6 | 72 | 98.9 | 45% |
| | Jul-21 | 72.4 | 79.9 | 97.8 | 57% |
| | Aug-21 | 72.8 | 81.7 | 98.2 | 58% |
| | Sep-21 | 68.7 | 72.5 | 98.7 | 49% |
| | Oct-21 | 71.3 | 74.1 | 98.3 | 52% |
| | Nov-21 | 64.2 | 74.4 | 98.9 | 47% |
| | Dec-21 | 69.8 | 71.5 | 98.5 | 49% |
| | Jan-22 | 73.8 | 75.3 | 96.8 | 54% |
| | Feb-22 | 66.6 | 74.6 | 94 | 47% |
| | Mar-22 | 69.5 | 81.4 | 94.4 | 53% |
| | Apr-22 | 70.7 | 73.4 | 95.8 | 50% |
| | May-22 | 65.7 | 77.8 | 96.3 | 49% |
| | Jun-22 | 69.3 | 80.8 | 94.9 | 53% |
| | Jul-22 | 73.8 | 85.4 | 95 | 60% |
| Aug-22 | 71.1 | 83.3 | 94.5 | 56% | |
| After | Sep-22 | 79.2 | 95.2 | 99.8 | 75% |
| | Oct-22 | 75 | 85.7 | 98.1 | 63% |
| | Nov-22 | 83.9 | 90.5 | 99.5 | 76% |
| | Dec-22 | 82.9 | 93.9 | 99.7 | 78% |
| | Jan-23 | 85.1 | 95.5 | 98.8 | 80% |
| | Feb-23 | 87.1 | 95.8 | 99.5 | 83% |
| | Mar-23 | 91.3 | 86.9 | 98.7 | 78% |
| | Apr-23 | 93.3 | 92.1 | 99.3 | 85% |

RESULTS AND DISCUSSIONS

Table 6 below shows the average improvement in Overall Equipment Effectiveness (OEE) and its three factors. These results have proved that equipment failure, setup and adjustment, idle time, minor stoppages, reduced speed, rework, defects, and reduced yield issues are *interdependent*. The Availability (A) and Performance Rate (P) data showed the highest improvement of 22% and 20%, respectively. The Quality Rate (Q) improved by 3%.

The first significant finding that affected the OEE % (RPN = 560) was that the standard soldering instructions did not contain any technical details and visual references for applying the molten solder material on the micro-joint. Every trained operator had a high amount of variation between their soldering method. They often relied on the over-application of solder material, assuming it would be sandblasted and buffed in later operations. However, these variations and the over-application of molten solder caused many quality issues within the parts, which were not identified immediately within the process. The corrective actions improved the RPN from 560 to 40. This is considered a significant improvement, and the results have been sustained after eight months of implementation.

The second significant finding was that the combination of frequent micro-wear of the soldering micro-tip due to its micro-thickness (RPN = 320) and repetitive heating and cooling was causing a high volume of rework and defects issues (RPN = 405). Not allowing the micro-tip to cool down completely was accelerating the wear of the tip. This lightly worn micro-tip was assumed to be a good-for-use tip, but it was affecting the micro-solder quality, equipment availability, and repeated rework of parts. The introduction of the Total Productive Maintenance (TPM) schedule improved the RPN from 405 to 9. Additionally, the results have been sustained after eight months of implementation.

The third most important finding was the degradation of the thin solder heating element within the equipment over a relatively short period of time. Thus, increasing the solder melting time and defective solder quality, leading to high soldering rework quantity. The 3-day changeover schedule of the heating element improved the RPN from 320 to 24.

The complete list of RPN improvements after the corrective action implementation for all the major root causes is shown in Tables Three and Four (above).

STATISTICAL ANALYSIS: F-TEST TWO SAMPLES (BEFORE AND AFTER OEE) FOR VARIANCES

All the quantitative analyses and results in Tables 3 to 6 are based on accurate data collected and practical significance. To validate these results, a Statistical Analysis: F-Test for Two Samples (Before and After) for all three factors and OEE was performed using the data from Table 5. Tables 7 to 10 show that the P-value for Availability Rate (0.015), Performance Rate (0.040), Quality Rate (0.002), and OEE (0.042) for the before and after scenarios are statistically significant at a 5% significance level. The inference derived from the actual data matches the statistical analysis.

Table 6: Improvement in OEE % and its 3 Factors

| OEE Factors | Average % | | |
|-------------------------|-----------|-------|-------------|
| | Before | After | Improvement |
| Availability Rate (A) % | 69.66 | 84.72 | 22% |
| Performance Rate (P) % | 76.7 | 91.95 | 20% |
| Quality Rate (Q) % | 96.67 | 99.18 | 3% |
| OEE (A*P*Q) % = | 52% | 77% | 48% |

Table 7: Availability Rate: Two-Sample F-Test for Variances

| | Before | After |
|---------------------|--------|-------|
| Mean % | 69.66 | 84.72 |
| Variance | 10.5 | 36.0 |
| Observations | 20 | 8 |
| Df | 19 | 7 |
| F | 0.291 | |
| P(F<=f) one-tail | 0.015 | |
| F Critical one-tail | 0.393 | |

Table 8: Performance Rate: Two-Sample F-Test for Variances

| | Before | After |
|---------------------|--------|-------|
| Mean % | 76.70 | 91.95 |
| Variance | 19.6 | 15.5 |
| Observations | 20 | 8 |
| Df | 19 | 7 |
| F | 1.264 | |
| P(F<=f) one-tail | 0.040 | |
| F Critical one-tail | 3.455 | |

Table 9: Quality Rate: Two-Sample F-Test for Variance

| | Before | After |
|---------------------|--------|-------|
| Mean % | 96.67 | 99.18 |
| Variance | 3.4 | 0.3 |
| Observations | 20 | 8 |
| Df | 19 | 7 |
| F | 9.984 | |
| P(F<=f) one-tail | 0.002 | |
| F Critical one-tail | 3.455 | |

Table 10: OEE: Two-Sample F-Test for Variances

| | Before | After |
|---------------------|--------|-------|
| Mean % | 52 | 77 |
| Variance | 17 | 45 |
| Observations | 20 | 8 |
| Df | 19 | 7 |
| F | 0.374 | |
| P(F<=f) one-tail | 0.042 | |
| F Critical one-tail | 0.393 | |

CONCLUSIONS

The objective of this study was to utilize one of the modern data analytics solutions named Overall Equipment Effectiveness (OEE), which is a holistic approach that is comprised of 3 important factors: Equipment Availability Rate (A), Equipment Performance Rate (P), and Product Quality Rate (Q). The three factors are a simplified function of the six significant losses. A standard method was developed and utilized to calculate the baseline OEE. Using the baseline OEE, a thorough Failure Modes and Effect Analysis (FMEA) was performed to systematically identify and evaluate the root causes leading to the major losses. Based on the findings, a detailed corrective action plan was developed, and proposed actions were implemented. A follow-up FMEA was conducted after six months using the same criteria and a significant improvement in OEE was observed.

Some key improvements are listed below:

1. Availability rate increased by 22% due to reduced Equipment Failure and Setup and Adjustment losses.

2. Performance rate increased by 20% due to a reduction in Idle Time, Minor Stoppage loss, and reduced speed of operation.
3. Quality rate increased by 3% due to a reduction in the Quality Defects and Rework loss. A 3% improvement may seem small, but the increase was from 96.67% to 99.18, and, like the other improvements, that is significant.
4. The OEE rate increased 48% due to availability, performance, and quality improvements.

The general form of the OEE model, along with its sub-factors, is already defined and implemented in various manufacturing industries. However, this study aimed to propose an advanced form of OEE combined with Root Cause Analysis (RCA), Failure Modes and Effects Analysis (FMEA), and Corrective Action Implementation to show significant improvement in a major manufacturing company producing microsurgical devices.

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RETURN TO OFFICE POLICIES: CONSIDERATIONS, CONCERNS, AND RECOMMENDATIONS

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ABSTRACT

The year 2024 has ushered in the return to office (RTO) era, with a growing number of companies wanting employees to work in-person at least a few days a week. Unsurprisingly, employees have been resistant, as many have come to value the flexibility that remote/hybrid work arrangements offer. This paper discusses the factors driving the RTO push, why RTO may not be the solution to these issues, and the reasons employees are pushing back. It addresses challenges leaders should anticipate in their RTO efforts as well as considerations and recommendations to address these issues.

Keywords: Flexibility, Hybrid, Remote Work, Return-To-Office

INTRODUCTION

The COVID-19 pandemic caused an unprecedented shift to remote work. While likely intended as a temporary arrangement, it caused fundamental changes in what employees value, especially flexibility. As pandemic-related restrictions lifted, many companies continued to offer flexible arrangements regarding when and where work was performed, ushering in what seemed to be a “new normal” regarding full-time remote or hybrid work (Brodersen & McVicker, 2022; Thayer et al., 2023).

The pendulum has recently begun to swing back: many organizations are requesting or requiring their employees to return to the office at least a few days per week (Kawamoto, 2023b). These include high-profile companies such as Amazon, Apple, Disney, Google, IBM, Meta, Starbucks, Tesla, and Twitter (Lebowitz et al., 2023). Even Zoom, the champion of remote work technology, has requested that employees within a 50-mile radius of a company location return to the office at least twice a week, starting in August and September of 2023 (Goldberg, 2023).

Unsurprisingly, close to 73% of organizations report difficulties in encouraging employees to return to the office (Starnier, 2023), and 90% intend to implement return-to-office (RTO) policies by the end of 2024 (Crist, 2023). In some cases, the approach has been one of force: employees are threatened with poor performance reviews or termination if they do not comply (Kawamoto, 2023b). In June 2022, for example, Elon Musk mandated Tesla employees return to the office full time, issuing the ultimatum, “If you don’t show up, we will assume you have resigned” (Lebowitz et al., 2023). After acquiring Twitter, he issued a similar warning to employees: “..if you can show up at an office and you do not show up at the office, resignation accepted – end of story” (Pena, 2022). In May 2023, over 20,000 employees at Amazon signed a petition protesting its return to

office policy, with over 1,800 staging an in-person and virtual walkout. In response, Amazon tightened its policy, announcing in August 2023 that employees come to the office at least three days a week or resign without severance pay (Kawamoto, 2023b).

Other companies are adopting a gentler, more proactive approach. JC Penney, for example, developed their return-to-office plans in collaboration with its employees. Rather than requiring a set number of dates per week, teams are empowered to come together when it makes the most sense (Kawamoto, 2023c). Salesforce, a cloud-based software company, encouraged workers to come in by offering a \$10 charitable donation in the name of employees who came into the office during a 10-day period (Goldberg, 2023).

Today's organizations must work to strike a balance between the desires of company leaders to get workers back in the office and the desires of employees to maintain flexibility with respect to where work is performed. This paper will address key considerations associated with return-to-office policies. It will provide an overview of the factors that have led to an increased push to get employees to spend more time in the office, as well as the factors leading to resistance from employees. It will provide specific examples of strategies companies have implemented in these efforts – from the punitive to the proactive – to outline a set of considerations and recommendations when it comes to designing these policies.

THE PUSH AND PUSHBACK OF RTO MANDATES

The Push: Why Leaders Want RTO

According to a 2022 survey by the Chief Executive, 60% of companies who had adopted remote/hybrid work reported satisfaction with their model, and less than 1% had plans to return to in-person work (Nolen, 2023). This begs the question as to why companies are increasingly, and often suddenly, reversing course. A recent survey conducted by the Society for Human Resource Management found that, of companies who have implemented RTO policies, the driving factors include “a need for in-person collaboration and teamwork” (75%), “workplace culture and engagement considerations” (69%), “leadership preferences” (65%), a “desire to restore a sense of normalcy and routine (54%) and “employee productivity concerns” (41%; Agovino, 2023).

Many leaders say they struggle with coordination and communication issues in remote/hybrid environments and feel these arrangements stifle cooperation, innovation, and creativity (Nolen, 2023; DiDomenico, 2023). Supervisors report a lack of confidence in their ability to manage remote workers and skepticism that remote workers are as productive and motivated as their in-office counterparts (Parker et al., 2020). It, therefore, comes as little surprise that supervisors believe in-person work is crucial with respect to effectively observing performance, providing feedback, and developing/mentoring employees (see DiDomenico, 2023; Nolen, 2023; Tsipursky, 2023). There is also a belief among senior leaders that remote work is detrimental to organizational culture and employee engagement (Nolen, 2023). Indeed, a need to retain/strengthen culture is a frequent rallying cry of CEOs when announcing their RTO plans (DiDomenico, 2023). Finally, many leaders were never fully on board with remote/hybrid work arrangements to begin with and prefer their employees to work on-site (Society for Human Resource Management, 2021).

The Problem: Mandated RTO Won't Fix These Issues

RTO mandates, in and of themselves, are unlikely to address these issues. For one, the push is based largely on leader perceptions and opinions rather than evidence (Zitron, 2023). According to a 2023 survey conducted by the Chief Executive, only 5% of organizations reported a drop in performance with remote or hybrid arrangements (Nolen, 2023). Thus far, there is little evidence that RTO mandates have had a positive impact on overall company performance (Gourani, 2024). This suggests that the challenges leaders face are likely not a function of *where* work is performed but *how* work is managed. Often, the supervisors' approach to managing remote workers impacts productivity rather than the nature of the work itself (Goldberg, 2023b). Rather than assume traditional "office-centric" practices will translate to remote settings, leaders need to be willing and able to adapt their approaches to communication and collaboration, leverage technology effectively, and provide employees with the resources they need to succeed in these environments (Tsipursky, 2023). Similarly, it is naïve for leaders to assume that RTO policies will improve organizational culture or worker engagement, especially if a punitive component is involved. Extolling the benefits of in-office work for promoting community, connection, and teamwork, yet threatening employees with termination or poor performance reviews for non-compliance sends a terrible mixed message. In fact, companies that have implemented RTO mandates found a significant decline in overall employee satisfaction (Ding & Ma, 2024).

The Pushback: Why Employees are Resisting RTO

Employees forced to work away from their "preferred location" report lower engagement, higher levels of burnout, and increased intent to quit (Wigert & Agrawal, 2022). It therefore comes as little surprise that workers have been less than enthusiastic when asked, or forced, to return to the office. The sudden, unexpected, and often immediate nature of some RTO mandates has caught employees off guard as they seem to backtrack from previously implied or stated policies for remote work. Often, workers are not given a voice in policy design or provided with compelling evidence for the need for in-person work. Thus, there is a perception that these mandates reflect a lack of trust and prioritize the desires of senior leaders over the needs and concerns of employees (Liu, 2023). Valued benefits, such as flexibility and work-life balance, are being revoked, and workers are left to scramble to adapt to new arrangements, such as the costs and time associated with commutes, relocation, and re-navigating family/child-care agreements. Finally, there are issues of equity and fairness, as many senior leaders mandating RTO are not held to the same accountability standards as lower-level employees (Zitron, 2023). Salesforce CEO Marc Benioff, for example, has said, "I've always been a remote worker...I don't work well in an office. It just doesn't work with my personality." However, the company recently implemented return-to-office mandates for its non-remote employees. According to Benioff, "They need to mix in-person and remote together" (Gendron, 2023).

RETHINKING RTO: STRATEGIES AND CONSIDERATIONS TO GET IT RIGHT

Encouraging employees to return to the office does not have to be an uphill battle. Employee resistance to RTO is not about a lack of desire to return - 68% of employees prefer working in a hybrid arrangement vs. full-time remote work (28%; McKendrick, 2022), and many

employees value the connections and informal interactions in an office setting. A 2023 survey conducted by the Society for Human Resource Management found that 72% of employees who are called back to the office found their RTO experience to be a positive one, reporting improvements in collaboration, engagement, satisfaction, and performance (Agovino, 2023). Best practices for rethinking the return to office include the following:

Determine the REAL Reasons for RTO

As previously mentioned, many of the reasons companies implement RTO policies are rooted in leader perceptions rather than evidence. In fact, 80% of early adopters of RTO say they would have taken a different approach had they relied on employee data to help inform their planning (Envoy, 2023). Thus, leaders need to figure out the underlying motives behind their RTO policies and determine whether having employees back in the office is, indeed, the best way to achieve these goals. This first involves questioning assumptions and perceptions about the effectiveness of remote vs. in-office work (Tsipursky, 2023). A “belief” that in-office work is necessary to build collaboration, teamwork, culture, or engagement is not a valid reason to implement RTO policies, especially if little effort has been made to foster these in remote or hybrid settings. This also involves collecting the necessary data to justify a need for in-office work and ensure that RTO policies effectively achieve the desired outcomes.

Create a Compelling Reason to Return

“Because we said so” is not an effective motivator. In designing RTO policies, focus on factors that encourage employees, not punish them. Some companies have implemented incentives to encourage employees back to the office, such as onsite meals, social events, gym memberships, charitable donations, and subsidizing costs for commuting, parking, and child/family care. However, there is a limit to their effectiveness. Incentives alone are not a convincing reason to justify RTO, especially if they fail to fulfill key employee needs and desires. Senior leaders must put forth the effort needed to create an environment that makes people *want* to come to work rather than crossing their fingers that in-office work will be the panacea to fix organizational culture. By facilitating conversations with employees about the reasons for in-office work, leaders can create an environment that promotes opportunities to truly capitalize on the benefits of in-person interaction (Davis, 2023).

Encourage Employee Involvement

A key difference between RTO policies that are resisted vs. embraced by employees is quite simple: employee involvement in the process. Encouraging collaboration in RTO policies will reap far greater benefits than forcing compliance to leader-driven mandates. Organizations should consider potential “pain points” that may result from RTO. It is important to consider the impact these policies or mandates might have on trust, culture, and engagement, as well as employee concerns about the hard and soft costs of being asked to return to the office, such as commutes, dependent care, productivity, etc. Once these are made clear, find a way to address them or find a compromise.

JC Penney, for example, relied on employee input and cross-functional employee teams to develop their RTO policies (Kawamoto, 2023c). They found that the key employee needs were flexibility in scheduling and pay. To address these concerns, they developed a mobile app where

employees could view and change their schedules and access some of their earned wages before the end of the pay period. Since these changes, they have seen improvements in retention and an increase in new applicants. Ernst & Young, after facing employee backlash to their RTO announcement, surveyed employees to determine the roots of their reluctance to return (Smith, 2023). Key employee concerns involved the cost of commuting and dependent/pet care, so the company offered an \$800 annual reimbursement to offset these costs. Since then, they have seen a 150% increase in in-office attendance across locations.

CONCLUSION

The RTO debate is unlikely to end soon. However, having more productive and useful discussions about the value of having employees in the office is possible. By considering the real reasons for the push and emphasizing data over preferences, leaders will better understand whether RTO is necessary and, if so, how it should best be implemented. By giving employees a voice in the process, companies will be better able to create an environment where people want to return and ensure a smoother transition. A return to the office should not be a tug-of-war between leaders and employees. The most successful approaches are rooted in collaboration.

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CAN ENTREPRENEURIAL MARKETING PROVIDE AN ECONOMIC MOAT FOR SMALL AND EMERGING FIRMS?

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ABSTRACT

This study explores the economic moat concept, which has become increasingly relevant to modern-day businesses seeking a sustainable competitive advantage. Drawing upon Porter's Five Forces Model, we investigate the potential for economic moats in small companies and emerging entrepreneurial firms. By analyzing examples of narrow economic moats in small firms, we provide insights into the strategies that may help these firms build and maintain a competitive advantage in their respective markets. Our findings suggest that entrepreneurial firms can leverage various sources of competitive advantages, such as customer loyalty, low-cost structures, and network effects, to create narrow economic moats that protect against competitive threats.

Case studies of Andy's Hobby Headquarters and Laura Farms illustrate how small firms can successfully cultivate narrow economic moats aligned with Porter's Forces. Andy's strategic evolution from a local hobby shop to a national and international destination, coupled with a strong online presence and community engagement, demonstrates how management actions can foster customer loyalty and differentiation. Similarly, Laura Farms leverages social media to project company values and create emotional ties with viewers, establishing a narrow economic moat.

This paper offers practical insights for entrepreneurs and small business owners seeking long-term success in today's highly competitive business environment. Finally, it concludes that deliberate management strategies, particularly in marketing, can facilitate the development of economic moats within competitive environments and substitution pressures. By adjusting traditional definitions of economic moats to accommodate the rapid pace of entrepreneurship, it advocates for further research into the relationship between economic moats and sustained profitability among entrepreneurial ventures.

Keywords: Entrepreneurship, Economic Moats, Strategic Management, Entrepreneurial Marketing, Porter's Five Forces

INTRODUCTION

The economic moat had its roots in medieval times when castles were protected from attack by surrounding themselves with deep, wide moats. In the modern business world, the economic moat has taken on a new meaning, referring to companies' competitive advantages that protect them from their rivals. The economic moat is a valuable concept for entrepreneurs and small business owners, as it can help them identify and leverage their strengths to gain a sustainable competitive advantage.

This paper explores the concept of economic moats. It pairs it with Porter's Five Forces Model to identify possible and obtainable economic moats at a scale feasible for emerging

entrepreneurial firms and small businesses. By analyzing the various factors contributing to creating an economic moat, we provide practical guidance for small business owners seeking to build and maintain a competitive advantage in their respective markets.

The paper is organized as follows. We begin by defining the economic moat concept and tracing its evolution from medieval times to the modern business world. We then provide an overview of Porter's Five Forces Model and explain how it can be used to identify and analyze the various sources of competitive advantage. Next, we examine examples of small firms that have developed narrow economic moats and identify the strategies that have helped them succeed. Finally, we summarize our findings and provide practical insights for small business owners and entrepreneurs looking to build a sustainable competitive advantage.

BACKGROUND

Warren Buffet introduced the economic moat concept during the Berkshire Hathaway shareholders' letter in 1999. During the session, Warren explained that Berkshire Hathaway looked for business opportunities that provided a stout economic castle surrounded by a broad and enduring moat. Buffet's concept gained traction and has been formalized by Morningstar, an investment research firm. A moat is essential because of competition. The competition inherent to all viable and healthy economic markets will cause all industries to experience returns on investment that regress to the mean (Stiger, 1963). Morningstar (2022) defines an economic moat as a sustainable competitive barrier that protects for ten or twenty years. A ten-year moat is defined as narrow, and a twenty-year moat is defined as wide. Such a barrier will enable a firm to earn an above-average return on investment and thus allow the firm to avoid regression to the mean experienced by non-moat companies in the industry. Boyd (2005) confirmed that Morningstar's firms accorded moats outperformed firms within the same industry that did not have identified moats. An economic moat, narrow or wide, is a collection of management actions that result in above-average earnings. The variation in share prices does not reflect the presence or absence of an economic moat. Morningstar further refines the moat concept by identifying four types of economic moats these are (1) high customer switching costs, (2) economies of scale, (3) intangible assets, and (4) network effects (2022, Morningstar Glossary). Customer switching costs were examined, and a typology was developed by Burnham, Frels, and Mahajan (2003). They identified three types of switching costs: (1) procedural switching costs, (2) financial switching costs, and (3) relational switching costs. Economies of scale as an entry barrier are defined by von Weizacker (1980) as costs paid by firms seeking entry into an industry but not paid by firms already in the industry. Intangible assets are the result of actions taken by a firm's management. They are idiosyncratic and firm-specific (Gambetti et al., 2017). Corporate identity, brand, and reputation are primary sources of intangible assets. Metcalfe's law explains the concept of network effects (Metcalfe, 1995). Robert Metcalfe explains that networks increase in value proportionately to the number of members in the network. The total value of a network is $N*(N-1)$. Lin and Camara (2020) offer an excellent discussion of network effects. Their discussion of the network effect as a competitive edge is fascinating to this study. They posit that network effects or externalities have become a key factor informing firms' strategies.

Michael Porter (2008) identifies and describes five forces shaping the competitive environment in the industry. These forces are (1) the rivalry that exists among the existing competitors, (2) the bargaining power of the customers or buyers, (3) the ease or threat of

substitute products or services, (4) the bargaining power of suppliers, and (5) the ease of entry into the industry. Taking the latter first, we examine each of these forces in turn.

Porter is not the first to discuss barriers to entry as it is first mentioned by Wallace (1936, p. 83) in the Papers and Proceedings of the forty-eighth meeting of the American Economic Association. During this meeting, he called for an in-depth investigation into the concept of barriers to entry. Bain (1956, p. 3) defines a barrier to entry as an advantage established sellers have in an industry that new entrants still need to gain. The barrier's strength is indicated by the amount existing firms can raise prices beyond competitive levels without attracting the attention of new firms, who will then attempt to enter the industry. Carlton & Perloff, 1994 provide a more recent definition) define a barrier to entry as anything preventing entrepreneurs from creating a new firm in a market.

The second of the five forces is the bargaining power of suppliers. Suppliers can exert power by setting prices and limiting the quantities and quality of the products they offer (Luttgens & Diener, 2016). Porter (2008) indicates that powerful suppliers can capture more value for themselves by (1) limiting quantities, (2) charging higher prices, or (3) shifting costs to industry firms. He says that this ability enables powerful suppliers to extract profitability from firms in an industry, especially if they cannot pass costs on to their customers.

How easily can the industry's products or services be substituted? Porter (2008) explains that the threat of substitutes, defined as products or services that perform the same function as the firm's product or service but in a different way, is always present. When the threat is significant, the industry's profit potential is limited due to price ceilings. Porter further indicates that substitutability is considered high under the following conditions: (1) the switching cost to the buyer is low, and (2) the potential substitute can provide a price-performance trade-off that the buyer finds attractive.

The power of buyers can be displayed in three ways: (1) they can force down prices, (2) they can demand better product or service quality, and (3) they can play the participants in an industry against each other (Porter, 2008). Buyers can be considered powerful if (1) they are few, (2) they buy standardized or undifferentiated products, (3) switching costs are minimal, or (4) backward integration is possible. Buyer power can also be reflected in price sensitivity relative to the product or service (Porter, 2008). Buyers will be price sensitive if (1) the purchase is a significant portion of its budget, (2) buyers earn low profits, (3) the product does not affect the buyer's product or service quality, (3) the product does not have a significant impact on the buyer's other costs. The last of Porter's five forces to be discussed is rivalry among firms. Michael Porter (2008) indicates that rivalry among firms within an industry can take several forms. The greater the rivalry among the industries' firms, the more the industry's profitability is limited. Profit potential within the industry is derived from the intensity and basis of competition between firms. Porter (2008) says that competitive passion is greatest if many firms are competing in the industry or if the competing firms are roughly the same size. The basis of competition can be very destructive within the industry if the rivalry becomes based on price.

ECONOMIC MOATS FOR THE ENTREPRENEUR

Economic moats have two essential characteristics for the fledgling or small business endeavor; (1) they are rare, and (2) they provide significant protection from competitors. According to Morningstar (2022), 345 equity firms have wide moats. A search of all equities listed by Morningstar (2022) indicates a total of 25,243, confirming the rarity of a wide

economic moat. The world of the entrepreneur is defined by rare. Good to great ideas are rare, financial resources are rare, time is rare, and talent is rare. The entrepreneur is familiar with working within the confines of rare. However, the protection a moat can offer is of more interest to the fledgling business owner than its rarity. Almost any new business enters a maelstrom of competition and finds itself in a fight for life that many will lose. According to the United States Small Business Association (SBA) (2012), approximately two-thirds of small firms with employees last two years. The SBA further reports that one-half will survive for five years. The first years are considered the most volatile, and survival rates become steady after the five-year mark. The Small Business Association also reports that the survival paths for small firms are fine with the economy's overall condition. Survival paths are also similar across industries. The protection offered by an economic moat might provide a comfort zone that would enable the fledgling firm to develop, refine, and implement systems that will allow it to maintain its competitive advantage, stay afloat in the sea of competition, and continue harvesting value and having above-average returns.

Porter's Five Forces (2008) provide a scaffold or framework for a firm to develop and build its strategy for continuing success. We look for possible fits between the components of the Five Forces and the components of the economic moat model. Entrepreneurial marketing can provide the momentum needed to construct and maintain an economic moat for a small firm. Each of the five forces will be examined relative to finding a fit with one or more of the components of an economic moat. The question then asked is if entrepreneurial marketing can build that specific component.

Rivalry Between Firms

The rivalry between small firms in a specific industry ranges from non-existent to intense and cutthroat. Small and emergent firms experience this rivalry primarily in a constant battle to acquire and retain customers. This battle will be won by firms that can structure their entrepreneurial marketing efforts to position the firm in the customers' minds as the go-to solution for the problem they seek to solve (Ries & Trout, 2000). Large and established firms generally have abundant cash available for marketing, but small and emerging firms do not have so much. The entrepreneurial firm will require superlative efforts in developing and implementing a marketing campaign that takes advantage of the firm's intangible assets, which provide an economic moat. The firm's identity, brand, and reputation must be developed and presented to customers such that the firm eclipses the competition in the customers' minds. An entrepreneurial marketing campaign that provides continuing effort to maintain a brand, identity, and reputation can result in an economic moat for a small or emerging firm that protects from intense competition within an industry space.

Bargaining Power of Buyers

Entrepreneurial firms will find it challenging to construct a viable economic moat within the context of the second force, buyer power. Buyers can impact a firm by forcing prices lower, demanding more excellent quality service, and playing the firms within an industry space against one another. Influential customers have a more remarkable ability to manipulate these three components. Significant customers are defined by being few, buying standardized products, and suffering minimal switching costs if changing suppliers. However tricky as it seems, there are opportunities to construct an economic moat within the context of the bargaining power of buyers. An astute entrepreneurial marketing effort can convince the buyer that switching to

another supplier will be prohibitive, primarily if that cost can be conceptualized as no longer being part of an elite network or losing special privileges derived from such things as loyalty programs. Depending on the industry space, some small firms could provide lower prices to buyers through exceptional management. Marketing efforts targeted at price awareness could build an economic moat based on economies of scale that resulted from management actions.

Bargaining Power of Suppliers

Most small businesses depend upon suppliers to provide the materials necessary to execute their business model. With few exceptions, entrepreneurial and emerging firms will not give the volume of orders required in terms of units or dollars to leverage any advantage from suppliers that could result in an economic moat for the aspiring entrepreneurial firm. The economic moat that is most applicable in this situation would be developed on the concept of economies of scale.

Ease of Substitution

A small firm can create an economic moat when the customer has difficulty finding a substitute for the provided product or service. The problem in substitution could be manifested in availability, quality, or pricing. This situation could arise in niche markets beneath the notice of larger firms or perceived as needing more economic value to the large or competing firms to warrant market entry. Economic moats will likely be constructed on intangible assets, network effects, and high customer switching costs.

Ease of Entry

Some industries or business areas are easy to enter. They may not require a significant capital investment and seem attractive to entrepreneurs who view the lack of barriers as an opportunity to create a business. Entrepreneurs operating in this space should know how easily competitors can enter the area. An economic moat in this space could provide protection unavailable to competitors. This space's most probable economic moats will be constructed around high switching costs and intangible assets.

DISCUSSION AND CONCLUSIONS

This paper reviews the established topics of Porter's Five Forces and Economic Moats and extends them to entrepreneurship. This investigation aims to find areas within Porter's Five Forces that align with the four types of economic moat—the aspiring entrepreneur environment in which above-average returns on investment can be earned. The researchers have identified economic moats that align with individual Porter Forces. Table 1 below provides a concise overview of this paper's conclusions.

Table 1. The Juxtaposition of Porter Forces & Possible Narrow Economic Moat

| Porter Force | Economic Moat Possible |
|------------------------------------|--|
| Rivalry Among Existing Competitors | Network Effects, High Switching Cost, & Intangible Assets |
| Bargaining Power of Buyers | None Identified |
| Ease of Substitutions | Intangible Assets, High Switching Costs, & Network Effects |
| Bargaining Power of Suppliers | None Identified |
| Ease of Entry into the Business | None Identified |

Unsurprisingly, the Porter Forces most amiable to developing economic moats are Rivalry Among Existing Competitors and Ease of Substitution. The researchers say that these two forces are most active for entrepreneurial ventures and the most conducive to building an economic moat with limited resources. Both identified Porter’s Forces use the same economic moat components. The economic moats that can be developed around these two Porter Forces are Intangible Assets, High Customer Switching Costs, and Network Effects.

Intangible Assets are specific to the company and result from management actions (Gambetti et al., 2017). Company reputation, corporate brand, and corporate identity are common intangible assets. Admiration of reputation, identification, respect for the brand, and alignment with corporate identity are well within the development realm for the average emerging entrepreneur’s marketing efforts. The latter intangible assets would enable customers to develop loyalty to a company, resulting in an economic moat. This economic moat will be able to function within Porter’s Forces of Rivalry Among Existing Competitors and Ease of Substitution. Small and emerging firms should consider an economic moat based on high customer switching costs. Management should consider actions that would give customers valid reasons not to switch to another provider. The incentive to remain with the current provider should be that the value gained by the switch is less than that maintained by staying the course with the existing supplier. This value could be emotional or economic. This economic moat is most applicable within the Porter Force of Rivalry among Existing Competitors and Ease of Substitution.

The researchers suggest that the Morningstar definitions (2022) be modified relative to time by adjusting for the fast pace of change within an entrepreneurial ecosystem rather than defining a narrow economic moat as one that can be sustained for three years rather than the ten years above for narrow and seven years for a wide economic moat instead of the previously defined twenty years. These new definitions allow for the ever-changing and quick deployment of innovations within entrepreneurial ecosystems. Further research is indicated by locating entrepreneurial companies exhibiting characteristics that define narrow and wide economic moats and determining if the economic moats enable the firms to post earnings above the industry's average.

Case Studies: Entrepreneurial Examples

The researchers have chosen two small firms with narrow economic moats: (1) Andy’s Hobby Headquarters and (2) Laura Farms. Given their business performance, it is safe to say that these two businesses maintain narrow economic moats. The respective moats are found in the Porter Forces expected. The discussed firms possess narrow economic moats in competition and ease of substitution.

Andy's Hobby Headquarters has been a retail hobby shop in Glendale, AZ, for the past 15 years. This small business specializes in plastic model kits and the supplies needed to assemble them to a high standard. The retail hobby industry has moved from the general hobby shop of the 1950s and 1960s to more niche-oriented shops specializing in one or two broad hobby areas. Many shops have also incorporated websites and provide online product ordering. The shops all sell the same or similar products. Competition is commonly perceived to be on price. However, a few shops, such as Andy's Hobby Headquarters, have moved beyond price competition and have taken management actions to develop a narrow economic moat. Andy's has evolved over the past few years from a small hobby shop serving a limited regional market to a shop serving as a pilgrimage destination for national and international customers, and now, it has a substantial online presence. Andy has developed a company in the minds of modelers, and he has become a "go-to" online location for kits and supplies. Andy's management actions have taken him from a small local retail shop to an organization with a retail store and online ordering location in the United States and Europe. It is easy for customers to feel that they are essential to Andy, which causes loyalty to develop in the organization. Weekly build videos and industry updates keep Andy's Hobby Headquarters in the minds of his followers and customers.

Additionally, Andy's Hobby Headquarters sponsors two YouTube channels with large followings. Andy stands out among the competition due to his management decisions. His company capitalizes on his brand and the modeling values he presents to the public. His YouTube channels have created a loyal following of modelers who benefit from belonging to the media. A customer may shop around for better prices, but none of the similar businesses offer the experience that Andy's Hobby Headquarters does.

Laura Farms uses internet channels to give followers a unique perspective and the vicarious experience of large-scale farming in Nebraska, USA. Laura Farms reportedly earned more than \$200,000 annually from her internet presence. Laura Farms depends upon intangible assets to be successful on YouTube and other social media. Laura Farms projects a wholesome image that appeals to many. The social media presence and productions are excellent, but Laura Farms gives more than technical goodness. Viewers will feel like they are part of the family and share their struggles and triumphs, but most importantly, viewers will think that Laura Farms shares the same values as they do. Laura Farms has built a narrow economic moat through the projection of company values and by making it emotionally expensive to leave for another viewing experience.

Small and emerging firms can develop narrow economic moats, as seen in the example of Andy's Hobby Headquarters and Laura Farms. However, it should be noted that creating a moat should be a deliberate management act and part of the company's strategic plan. Entrepreneurial marketing can enable the development of economic moats in competitive churn and rivalry and ease of substitution.

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GLOBAL PERSPECTIVES ON WATER MANAGEMENT: AN OVERVIEW OF ACTION STEPS FROM THE UNITED NATIONS TO LOCAL COMMUNITIES

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ABSTRACT

Water scarcity is a worldwide reality; people across the globe now experience the impacts of an excess of water demand over available supply every day. Pressure on water is rising, and action is urgent (UN HLP, 2018, UN SDG Summit 2023, 2023). The United Nations (UN) and the United Nations Educational Scientific & Cultural Organization (UNESCO) have been focused on water scarcity since 1977, when they created an Action Plan on “Community Water Supply,” declaring that everyone has the right to access drinking water to meet their basic needs (UN, 2018). Since then, the UN has declared the decade of 2018-2028 as a “Decade for Action” on “Water for Sustainable Development (UN, 2018).” The recommendations from this international body of 193 member countries call for all stakeholders to be involved in creating responses to the challenges of water scarcity—not only governments and international organizations but universities, private organizations, farmers, and all citizens. Concomitantly, the World Economic Forum is working to foment public-private partnerships around the world to close the gap between water demand and water supply. This article presents an overview of some of the “action steps” being taken by these organizations, as well as some examples from universities to local organizations with ties to agriculture and water use.

INTRODUCTION

Four billion people—almost one-half of the world’s population—experience severe water scarcity for at least one month each year (UNICEF, Water Scarcity, 2023). Over two billion people live in countries where water supply is inadequate (UNICEF, Water Scarcity, 2023). Half of the world’s population could live in areas facing water scarcity by 2025 (UNICEF, Water Scarcity, 2023). While municipal, industry, and recreational demands tackle challenges of water scarcity, agriculture is the leading consumer of water worldwide, accounting for 70 percent of global water withdrawal (UNFAO, 2023). Food and water form the core of the United Nation’s (UN) 2030 Agenda for Sustainable Development (UN SDGS, 2023). The UN articulated 17 Sustainable Development Goals (SDGs) that focus on ending poverty, improving health and education, and spurring economic growth (UN SDGS, 2023). Goal Number Six aims to “ensure availability and sustainable management of water...for all (UN SDGS, 2023).”

The action steps that the UN has taken to bring this goal to reality include its policies and strategies in the following programs: the UN Food and Agriculture Organization (FAO), the UN Global Framework on Water Scarcity in Agriculture (WASAG), and UNESCO’s World Water Assessment Program (WWAP). These programs and the policies adopted by the United Nations General Assembly as well as the UN High-Level Panel on Water Outcomes have opened doors to

universities, private sector organizations involved in agriculture and water development, students, and national and local governments to turn the vision of water-related SDGs of the 2030 Agenda into reality through global, national and local partnerships.

The World Economic Forum (WEF) has embraced the call to action to achieve the UN's SDGs focused on water by creating partnerships with over 1,000 entities to “unlock innovative solutions for a sustainable future” and protect the global water cycle (WEF, 2023). The WEF champions the collaboration of public-private partnerships (PPPs) to close the gap between water demand and supply worldwide (WEF, 2023).

Efforts and accomplishments of three water study programs at universities in Colorado, Nebraska, and Italy, along with programs focused on water management in key agricultural sectors in these areas and around the world—including both local government and private companies—illustrate accomplishments that align with the UN's “International Decade for Action—Water for Sustainable Development” as well as with the WEF's focus on PPPs. In Denver, Colorado, the One World One Water Center for Water Studies at the Metropolitan State University of Denver (OWOW) has provided opportunities for students to study in Italy as well as in the oldest irrigated parts of Colorado (OWOW, 2023). OWOW has partnered with the Colorado Department of Agriculture to help foment studies on soil health and water management, as well as reaching across the Atlantic to form partnerships with the Università per Stranieri di Perugia in Perugia, Italy, and with one of the largest irrigation companies in Italy the Canal Emiliano Romagnolo (CER) that has rolled out programs for local Italian farmers to find solutions to the water scarcity that has hit Italy severely in the past few years (CER, 2023). These collaborations foster opportunities at the UN, at UNESCO, and with irrigation companies and local farming research efforts in both Italy and Colorado (USP, 2023; OWOW, 2023). Concomitantly, the University of Nebraska, located in a state where one in four jobs is related to agriculture, embraces its role as not only a local and national source of water research but an international one as well (DWF, 2023). At the heart of these accomplishments is an optimism based on the energetic leaps into new water management practices from students, researchers, farmers, and policy leaders at the local, national, and international levels.

All of these efforts aimed at improved water management on a local and global scale resonate with “water ethics” that emphasize human dignity, collaboration, the common good, and stewardship. This article provides an overview of these goals and some examples of achievements that have responded to the UN's call to action to meet the world's water scarcity challenges.

GLOBAL ACTIONS: UNITED NATIONS AND WORLD ECONOMIC FORUM'S RESPONSES TO WATER SCARCITY, FOOD, AND AGRICULTURE

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, sets out 17 Sustainable Development Goals (SDGs) and issues an urgent call for action by all countries to come together in a global partnership to end poverty, reduce inequality, spur economic growth, confront climate change, and preserve our oceans, waterways, and forests (UN SDGs, 2023). Goal Number Six of the 17 SDGs focuses on water and aims to “ensure availability and sustainable management of water (UN SDG, 2023).” SDG6, the ‘Water SDG,’

calls for progress around water supply, sanitation, water quality, water efficiency, scarcity, integrated water resources management, water, and the environment, increased international cooperation, and involvement of communities in the management of water and sanitation. Water is the common currency that links nearly every SDG (UN HLP, 2018).

Although SDG 6 is the most recent and most urgent call for action on water scarcity around the world, the UN has been concerned with water-related issues around the world for many years. In 1977, the Mar del Plata conference in Argentina agreed to endorse a plan called the “Community Water Supply,” which declared that all people everywhere on earth have the right to “access drinking water in the quantities and quality equal to their basic needs (UN SDG, 2023).” After almost forty years, in December 2016, the UN General Assembly unanimously adopted the resolution declaring the decade of 2018-2028 as the “International Decade for Action—Water for Sustainable Development to support the water-related targets tied to SDG 6 (UN SDG, 2023). The UN now has focused its resources on turning its goals articulated in SDG 6--“ensuring the availability and sustainable management of water resources”--into reality by fostering global, national, and local partnerships (UN SDG, 2023, UN SDG Summit 2023, 2023).

UN Secretary General’s Action Plan, the UN High-Level Panel on Water Outcomes, the 2023 SDG Summit

In 2018, the UN Secretary-General, António Guterre, and the President of the World Bank Group, Jim Yong Kim, issued a declaration and an outline for an “Action Plan” that emphasizes the SDG 6 goals. The Plan begins with the declaration that water is “critical for sustainable development, the eradication of poverty and hunger and is indispensable for human development, health, and well-being (UN Secretary-General, 2018).” The Secretary-General and World Bank Group President’s declaration and plan build on the agreements reached during the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015-2030, and the 2015 Paris Agreement (UN Secretary-General, 2018). They also note the role of the World Economic Forum (WEF) and how the WEF has contributed to the “action steps” needed worldwide to respond to the water crisis.

The activities listed in the “Action Plan” are broad in their scope, with the specifics of achievements and undertakings dependent on “Member State activities” and scientific and academic engagement with a focus on communication, sharing of technology and water data, and continued coordination of “policy support, capacity building and improved access to reliable water data to effectively model and plan for the future (UN Secretary of State, 2018).”

Alongside the “Action Plan” issued by the UN Secretary-General and the World Bank Group President, the “High-Level Panel on Water” (HLPW), a group of 11 Heads of State and Government, with one Special Advisor, released a document summarizing the key initiatives aimed at realizing the goals of SDG 6. The document is entitled “Making every drop count: UN High-Level Panel on Water Outcome Document,” released on March 14, 2018 (UN HLP, 2018).”

The Panel's recommendations are broad and call on "all stakeholders to be involved in crafting responses to these challenges, and to build on the work already underway (UN HLP, 2018)." The Plan looks to Member States and governments to facilitate cooperation "across national boundaries" but also galvanizes individual citizens, private organizations as well and international non-governmental organizations to "meet these challenges (UN HLP, 2018)." The HLPW observes that if nothing is done to meet the challenges of water scarcity, the world faces a 40% shortfall in water availability by 2030 (UN HLP, 2018). The "foundations for action" outlined by the Panel are as follows:

1. "Understand Water," which means all stakeholders must commit to making evidence-based decisions about water and cooperate to strengthen water data, such as through the HLPW World Water Data Initiative;
2. "Value Water," which means "to sustainably, efficiently, and inclusively allocate and manage water resources and deliver and price water services accordingly";
3. "Manage Water," which means to "implement integrated approaches to water management at local, national, and transboundary levels, strengthen water governance, and ensure gender equality and social inclusion." (UN HLP, 2018).

These recommendations not only encourage promoting partnerships and encouraging innovations in water management but also in increasing financial support. The UN's SDG6 also highlights the role of agriculture, which uses almost 70% of the globe's water, as well as how water scarcity threatens the ability of the world's communities to feed its people. Several UN organizations and committees have undertaken significant work on the nexus between water, agriculture, and food. The UN, the World Bank, and the World Economic Forum push forward with pragmatic achievements in forging partnerships to harness financial resources and foster collaboration among government agencies, corporations, and NGOs (UN FAO, WASAG, WEF, 2023). The UN Secretary-General, António Guterre, convened a 2023 Summit in New York in September 2023 to "provide a renewed impetus and accelerated actions for reaching the SDGs (UN 2023 SDG Summit, 2023)." The summit highlighted the increased crises that the world faces and the critical need for a unified response from all stakeholders.

United Nations Food and Agricultural Organization (UNFAO) and United Nations' Global Framework on Water Scarcity in Agriculture (UNWASAG)

Agriculture uses almost 70% of the world's freshwater withdrawals (Global Agriculture, 2023). The United Nations Food and Agricultural Organization (UNFAO) is a specialty agency of the UN that leads international efforts to defeat hunger. The goal of FAO is to help people around the globe find food security and access to high-quality food. The 195 members work collaboratively on the goals of the FAO—193 countries and the European Union (UNFAO, 2023). In partnership with the UNFAO, the Global Framework for Action to Cope with Water Scarcity in Agriculture (WASAG) brings together key players across the globe and from different sectors

to tackle the collective challenge of using water better in agriculture to ensure food security for everyone around the world. The UNFAO formed the partnership with WASAG, which fosters collaboration among government agencies, international organizations, research institutions, advocacy groups, and professional/membership organizations for the development and deployment of policies, strategies, and programs that assist in the development of water resources management to meet the challenges of drought and food security (UNWASAG, 2023).

The world must produce an estimated 60 percent more food by 2050 to ensure global food security (UNWASAG, 2023). Water is key to food production from the fields to the supply chain. Therefore, sustainable use of water in agriculture is pivotal for achieving the objectives articulated in the SDGs as well as assuring the viability of the livelihoods of hundreds of millions of smallholder farmers and rural communities worldwide. Farmers play an essential role in any process of change in agriculture; the UN depends on the actions and policies developed through WASAG to provide incentives to farmers to empower them to “conserve biodiversity, protect ecosystems and minimize environmental impacts (UNWASAG, 2023). These policies and incentives extend to irrigation organizations to respond to the needs of farmers by “ensuring the reliable delivery of sufficient water, increasing the transparency of irrigation management, and achieving efficiency and equity in access to water (UNWASAG, 2023).” WASAG provides access to investments in infrastructure for the modernization of irrigation systems while assisting in the facilitation of technical capacities of farmers and water managers (UNWASAG, 2023). A WASAG working group focused on finance has identified financial mechanisms to support new approaches to provide financial assistance for the investments for modernizing the world’s farming infrastructure (UN Finance, 2023).

United Nations Educational Scientific & Cultural Organization’s World Water Assessment Program (UNESCO’s WWAP)

UNESCO established the World Water Assessment Programme (WWAP) in 2000 in response to a call from the UN Commission on Sustainable Development (CSD) to produce a UN system-wide periodic global overview of the status, use, and management of freshwater resources. (UNESCO, 2023). Its overall objective is “to meet the growing requirements of UN Member States and the international community for a wider range of policy-relevant, timely and reliable information in various fields of water resources developments and management, in particular through the production of the United Nations World Water Development Report (UN WWDR).” WWAP issues World Water Development Reports and undertakes activities on a local, regional, and international level to equip water managers with knowledge, tools, and skills to develop and implement sustainable water policies (UNESCO WWAP, 2023). The Government of Italy funds UNESCO WWAP and has since 2017 (UNESCO WWAP, 2023). This relationship has fomented local programs from academic research to new policies in farming and irrigation systems, as discussed later in this article (UNESCO WWAP, 2023).

UNICEF and Water Scarcity

Another UN organization focused on water scarcity and actions to produce technologies to increase access to safe water is UNICEF, the UN Children’s Fund (UNICEF, 2023). UNICEF focuses on:

1. identifying new water resources with technologies such as remote sensing, geophysical surveys, and field investigations;
2. improving the efficiency of water resources by providing support for the rehabilitation of urban water distribution networks and promoting wastewater reuse for agriculture to protect groundwater;
3. planning for urban scarcity by identifying available resources to reduce the risk of cities running out of water;
4. expanding technologies to ensure climate resilience, which includes the use of deeper groundwater reserves by using solar-powered networks, the use of small-scale retention structures to manage aquifer recharge, and rainwater harvesting where possible;
5. promoting an understanding of the value of water and the importance of its protection by working with schools and local communities;
6. and developing technical guidance, manuals, and online training programs to improve water access (UNICEF, 2023).

World Economic Forum: Achieving SDGs requires public-private collaboration

The United Nations, however, is not working alone in the world’s efforts to close the gap between water demand and supply. With the stark realization that the world is not on track to achieve SDG No. 6 on water and that a 40% gap between global water supply and demand looms by 2030, the World Economic Forum (WEF) initiated the 2030 Water Resources Group (2030 WRG) at its annual meeting in 2008 (WEF 2030 WRG, 2023). More than 1,000 partners from the private sector, government, and local communities work together to facilitate financing for water-related programs for agricultural water efficiency, urban and industrial water management, wastewater treatment, and improved farming techniques for large and small farmers (WEF 2030 WRG, 2023). The 2030 WRG oversees a multi-donor trust fund hosted by the World Bank Group (WEF 2030 WRG, 2023). To date, the 2030 WRG has provided over \$893 million to finance these kinds of projects (WEF 2030 WRG, 2023).

The WEF fosters public-private partnerships (PPPs) to help find investors and users in both upstream and downstream communities in order to “shift the paradigm” of the underinvestment in the water infrastructure around the world (Mazzucato, 2023). The WEF estimates that a tripling of investments is needed to ensure universal access to water to help meet the water objectives articulated in SDG 6 (Mazzucato, 2023). The WEF has identified key areas for investments that include smart technologies that combine data and communication technologies such as smart sensors and meters that can improve water systems’ efficiency as well as innovations for detecting leakage in water delivery systems, agriculture, recycling of industrial

wastewater and water-efficient energy systems (Mazzucato, 2023). One example of the financial assistance coming from WEF is the financing of some programs of the US space agency NASA in solving water problems around the world. NASA is currently using satellites to monitor water resources and track changes in water quality and is developing new technologies to desalinate seawater and extract water from the air (WEF, 2023). The WEF holds hope for the implementation of the optimistic goals that were prioritized at the UN's SDG 2023 Summit (Mazzucato, 2023). Despite the stumbling of the actions toward realizing the achievements of SDG 6 on water, a plethora of successful examples illustrate how local universities, farmers, irrigation companies, and local communities have rallied to meet the water scarcity challenges of the 21st century.

LOCAL RESPONSES AND EXAMPLES OF PUBLIC-PRIVATE COLLABORATION

Examples of how local research and educational institutions, water irrigators, and farmers have embraced the invitations from the UN and the WEF to meet the challenges presented by the world's water scarcity crisis illustrate that this world and its people can, indeed, find answers to the problems articulated in SDG 6 on water. From Colorado to Nebraska, from Italy to Brazil, teachers, students, political leaders, and farmers are answering the call to revolutionize water management policies and practices.

University Partnerships: Steps towards achieving SDG No. 6:

Surprisingly, there are few universities that offer water studies programs outside of environmental and atmospheric studies programs. The One World One Water Center (OWOW) is one of them, and it is a collaboration between the Metropolitan State University of Denver and Denver Botanic Gardens. The OWOW Center's mission is to "prepare an educated, empowered, solution-oriented Colorado citizenry to protect and preserve our precious water resources (OWOW, 2023). In partnership with Denver Botanic Gardens, OWOW is able to expand the "reach and breadth of educational programs on water and environmental issues; attract funding for joint research in these areas; and raise awareness of water and the environment through collaborative water stewardship (OWOW, 2023)."

OWOW formed a partnership with the Università per Stranieri di Perugia (UNISTRAPG) in the Umbrian town of Perugia, Italy, located two hours from Rome and the meeting place of the 2018 UNESCO/UN's conference on the use of data technology in water management (OWOW, 2023). UNISTRAPG established the Water Resources Research and Documentation Center (WARREDOC) in 1985 and worked to develop research, advanced training, and scientific communication focused on water, environment, and disaster risk management (UNISTRAPG WARREDOC, 2023). The partnership between OWOW and UNISTRAPG has led to study-abroad programs for students and professionals from Colorado and Italy. This partnership allowed OWOW to develop a partnership with UNESCO's World Water Assessment Programme (WWAP), which focuses on "equipping water managers and key decision-makers with information, data, tools and skills" to develop effective policies to respond to the food,

water, energy nexus critical to feeding the world (UNESCO WWAP, OWOW, 2023). In 2018, OWOW, UNISTRAPG, and UNESCO hosted a forum focused on UNESCO's efforts in developing technologies to respond to the food and water nexus (OWOW, 2023). Another workshop held in Rome in 2022 brought together professionals from local communities - the "custodians of world change and a key asset to resilience in managing water crisis"—and how communities in Colorado and Italy are responding to the water crises, especially how local agriculture endeavors, from irrigators to farmers, in these two different, yet similar, places in the world are involved in changes towards a sustainable water future (OWOW, 2023). The workshop "Water Extremes: Building Sustainable and Resilient Communities" included presenters that offered an inter-continental debate on shared drought and flood events and included a delegation from Colorado, a state that includes high mountains, arid plains, and an important agricultural sector for the United States, as well as water management leaders from Italy (OWOW, UNISTRAPG WARREDOC, 2023). The workshop focused on how these diverse areas could benefit from each other's experiences in water management and natural hazard mitigation (Italy (OWOW, UNISTRAPG WARREDOC, 2023). From the Governor of Colorado to the managers of the largest irrigation organization in Italy to delegates from UNESCO to representatives from the U.S. Department of Agriculture, as well as directors of the two university water studies programs, the workshop resulted in additional partnerships envisioned by the UN and WEF to forge forth towards meeting the goals of SDG 6.

The partnership between OWOW and UNISTRAPG has been a catalyst for OWOW to join the UN FAO's Global Framework on Water Scarcity in Agriculture, where it has combined resources of the Metropolitan State University of Denver and the Denver Botanic Gardens to develop and improve best practices in water-efficient urban agriculture and food access, extending its research to developing-world applications (OWOW, UN FAO, 2023). The partnerships between these two universities also led to an agreement with Canal Emiliano Romagnolo (CER), one of Italy's largest irrigation canals and water management districts that supplies water throughout the northern Italian, Emilia-Romagna region for agriculture, industry, and potable uses (OWOW, CER, 2023). The agreement opens opportunities for professional and student exchanges. CER is an 83-mile canal that supplies water to more than 84,000 farms. It has also developed an IT/web-based system that farmers can use for more efficient water management (CER). This system helps farmers optimize their use of water resources for sustainable agriculture production, especially in dry years (CER). OWOW forged a similar agreement with the Colorado Department of Agriculture, which has also implemented a similarly-based IT water management program (Ag Colorado, 2023).

OWOW and the Colorado Department of Agriculture

OWOW, the Denver Botanic Gardens, and the Colorado Department of Agriculture have joined hands to implement new processes for water-efficient urban agriculture through soil management (OWOW, 2023). Like Canal Emiliano Romagnolo, the Colorado Department of Agriculture has launched projects for local farmers and ranchers to help evaluate their current production system and identify areas for improved management to increase soil health, water quality, and water availability (Ag Colorado, 2023). The Colorado STAR Plus program encourages

farmers to commit to practices that have been proven to improve soil health, water quality, and water availability (Ag Colorado, STAR, 2023). The STAR Plus program provides financial and technical assistance to producers as they implement new practices; the state government and federal grants provide stimulus funding to provide equipment grants and training; this program and the relationship with OWOW illustrate the policy ambitions first articulated by the UN FAO.

The University of Nebraska Daugherty Water for Food Global Institute (DWFI)

The state of Nebraska in the Great Plains of the North American continent has been one of the most important agricultural producers in the world for over a century. A well-endowed foundation, the Robert B. Daugherty Foundation, chose the University of Nebraska, known for its advanced research on agriculture and the environment, to house the Daugherty Water for Food Global Institute (DWFI) to “address the global challenge of achieving food security with less stress on water resources through water management in agriculture and food systems (UN DWFI, 2023).” In step with the international ambitions of the UN FAO and SDG 6, the DWFI leverages the University of Nebraska’s expertise to forge partnerships across the state, nation, and globe (UN DWFI, 2023). DWFI collaborates with other universities, businesses, non-governmental organizations, and government agencies worldwide to foster future water and food security (UN DWFI, 2023).

Recent examples include working with Rwanda in Africa to develop a business ecosystem for smallholder irrigation. Out of Rwanda’s more than 1.5 million acres of irrigable land, only 10% is currently irrigated (UN DWFI, FY 2022 Annual Report, 2022). A more developed irrigation system would enable farmers to take advantage of three growing systems instead of only one. However, this depends upon access to irrigation pumps and other equipment that farmers can share (UN DWFI, FY 2022 Annual Report, 2022). DWFI completed maps and analyses for the Rwanda farmers to jumpstart these efforts. In line with the goals of the UN FAO, DWFI researches ways to help growers worldwide achieve food production goals while taking on and overcoming environmental challenges (UN DWFI, FY 2022 Annual Report, 2022).

Another example of an international partnership fostered by the University of Nebraska’s DWFI is a water management partnership with Brazil and the country’s and world’s largest agricultural producer, the state of Mato Grosso (UN DWFI, FY 2022 Annual Report, 2022). The government of Mato Grosso, Brazil, signed a technical collaboration agreement with the UN’s DWFI to map its water resources and identify and monitor them. The cooperation between DWFI and Mato Grosso is focused on creating a plan to improve the sustainable use of water for irrigation of crops, maintenance of pastures, and increasing family farming (UN DWFI, FY 2022 Annual Report, 2022). Because Mato Grosso depends on the Urucua Aquifer, similar to how Nebraska depends on the High Plains Ogalla Aquifer, DWFI, through its partnerships with Mato Grosso as well as other Brazilian water management entities, continues to pursue its mission to achieve food security worldwide with less pressure on scarce water resources (UN DWFI, FY 2022 Annual Report, 2022).

Some of the technological advances that DWFI has developed recently include the development of the *Parallel 41 Flux Network*, which is a series of towers across the central plains of the U.S. that determine the movement of water vapor and other gasses in cropped fields (UN DWFI FY 2022 Annual Report, 2022). This data helps growers more precisely apply the amount of irrigation water that crops need. It is also being used to compile data from satellites and NASA projects funded by the WEF, all in pursuit of realizing SDG 6 on water. DWFI developed a free website portal to view and download global daily Evapotranspiration (ET) spatial datasets (UN DWFI FY 2022 Annual Report, 2022). DWFI also worked with the U.S. Department of Agriculture’s Agricultural Research Service to develop these ET spatial datasets—another example of global water management efforts.

The *Dashboard for Agricultural Water Use and Nutrient Management* (DAWN) project is another example of a partnership between a government policy-maker—the U.S. Department of Agriculture and the National Institute of Food and Agriculture—and a university, University of Nebraska, and local community stakeholders—farmers and ranchers—aims to provide farmers with a predictive tool to sustain food crop production (UN DWFI FY 2022 Annual Report, 2022). DAWN incorporates modeling based on the ET Modeling using the NASA satellites to help farmers maintain a soil water balance in the root zone to predict irrigation needs (UN DWFI FY 2022 Annual Report, 2022).

WATER ETHICS: AN OPTIMISM FOR THE FUTURE CONCLUDING THOUGHTS

The “Water ethics” principle motivates global efforts for sustainable water management in this 21st century. As the world faces a crisis over water scarcity and food availability, the “Principles of Water Ethics” resonate with the missions and actions of communities around the world (Jennings et al., 2016). The “Principles of Water Ethics” enumerates three main principles that reverberate through all of the above-described accomplishments and undertakings:

- Human Dignity: There is no life without water;
- Solidarity: There must be up and downstream collaboration and
- Common good: The improper management of water means that human potential is diminished for all.

The call to all stakeholders implicit in the above-described efforts from the United Nations and the World Economic Forum, as well as the multiple examples of national, regional, and local partnerships between universities, NGOs, and private sectors, illustrate how communities across the globe embrace the reality that we all have a role in the stewardship of our resources and land. We are all charged with finding an ethical balance in using, changing, and preserving our water resources.

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FACULTY PERSPECTIVES ON DISCRIMINATION IN A COLLEGE OF BUSINESS

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ABSTRACT

Diversity and inclusion are core values of the Association to Advance Collegiate Schools of Business (AACSB) accreditation standards. Using survey data collected from faculty members within the College of Business at a 4-year U.S. university, this study assesses faculty perceptions regarding discrimination within the college. We define discrimination based on 12 categories: Age, Sex, Learning Disabilities, Physical Disabilities, Country of Origin, Gender, Religion, Sexual Orientation, Ethnicity/Race, Political Views, Physical Characteristics, and Status. The findings show that most faculty believe that the college leadership understands discrimination. However, several faculty members indicated they have witnessed or experienced discrimination in the college setting. Those who experienced discrimination felt that the situation was not handled appropriately. Unlike prior studies focusing on students, this study focuses on faculty perceptions and experiences regarding discrimination within a college with similar demographics to the average business school. Our findings can help guide future university policies regarding recommendations to educate stakeholders, address issues related to discrimination, and improve reporting channels.

Keywords: Business College, Racial Discrimination, Employment Discrimination, Sex Discrimination, Faculty Perception, Workplace Bias, Higher Education, Microaggressions.

INTRODUCTION

Over the last six decades, the US population has become more diverse, but some companies have not yet updated their policies and practices to reflect those societal changes. Similar challenges can be found in academia. In institutions of higher learning, faculty diversity has not increased at the same rate as student diversity (Beer et al., 2022; Rawls, 2020; Rawls et al., 2021).

Additionally, even though affirmative action and other anti-discrimination policies have been implemented in the US more than 60 years ago, discrimination continues to impact underrepresented faculty members in higher education (Trower & Chait, 2002; Turner & Myers, 2000; Rawls, 2020; Rawls et al., 2021; Beer et al., 2022). A recent study on faculty of color (Settles et al., 2021) defined a construct, “epistemic exclusion,” as a way of devaluing the scholarship of faculty of color in which the devaluation has negative consequences on the hiring, retention, and advancement of faculty of color. Studies also showed that discrimination and microaggressions impact women's recruitment and retention (Harnois & Ifatunji, 2011). Within academia, faculty of

color face discrimination from students through biased evaluations of pedagogy and teaching practices (Settles et al., 2021).

This work seeks to understand better the challenges related to discrimination that may impede faculty diversity. This study explores faculty members' perceptions and experiences of discrimination within a higher education institution. Specifically, we investigate whether faculty members think the leadership within their institution understands discrimination and explore faculty members' experiences with discrimination within the college setting, including reporting and resolution.

To conduct our investigation, we surveyed faculty in a College of Business at a large public university with high student diversity but low faculty diversity. Notably, the distribution of faculty demographics in this business college is similar to the average business school demographics distribution given in the Association to Advance Collegiate Schools of Business (AACSB) Business School Data Guide (AACSB, 2020). According to AACSB, most full-time faculty at business schools are White (63.3%), Asian Americans, or Pacific Islanders (17.7%), while Black or African American (3.9%) and Hispanic or Latinx (2.8%) faculty are in the minority.

The study contributes to the literature about DEI by focusing on a college of business with faculty demographics similar to the average business school. Further, this study focuses on faculty members' views, while most others address students' opinions. Our findings indicate that most faculty believe that college leadership understands the most categories of discrimination. However, faculty also believe that a fair percentage of professors have experienced discrimination against themselves or have witnessed discrimination against their peers. Those who have experienced discrimination did not feel that their complaints were handled adequately or promptly. These findings are disheartening, given that numerous studies have concluded that the negative effect of discrimination is well understood by the college leadership (Finkelstein et al., 2000; Brochu & Esses, 2011).

In the following sections, we provide a literature review, present research questions, and define discrimination as we used it in the present study. We share the research methodology and then conclude with a discussion of the findings, limitations of the research, and recommendations for future work.

LITERATURE REVIEW

Review of Discrimination

Prior research has presented evidence of discrimination and workplace bias taking place in traditional workplaces as well as in higher education. The consequences of prejudices against the various members of a college have also been widely documented. Studies show that students' satisfaction decreases when experiencing stereotyping, racial tensions, and unequal treatment from faculty and peers (Suarez-Balcazar et al., 2003). Studies also show that when dissatisfied students leave the institutions, a decline in the diversity of the student body damages the campus climate and faculty members' work environment (Hurtado & Ruiz, 2015).

Studies focusing on faculty experience indicated that when the diversity of faculty decreases, the incidences of racial discrimination increase. (Zambrana et al., 2017). Studies also point to the inequity between male and female faculty members. Females earn less, are promoted less often, and are challenged more often in the classrooms than their male colleagues (Crothers et al., 2010). In research universities, faculty of color are less likely to be hired than faculty from other ethnic groups (Stout et al., 2018). In these universities, the faculty of color's research is less

respected (Christine, 2006). These issues impact the recruitment and retention of women and faculty of color.

Studies have generated compelling evidence of discrimination against faculty members based on gender and race/ethnicity. Discrimination, however, covers more than gender and race/ethnicity. Discrimination happens when people are treated less favorably than others in a similar situation. People may be discriminated against because of their age, disability, ethnicity, country of origin, political belief, race, religion, sex or gender, sexual orientation, language, culture, physical characteristics, status, or other grounds. Discrimination, which is often the result of prejudices people hold, makes people powerless, impedes them from becoming active citizens, restricts them from developing their skills, and, in many situations, from accessing work, health services, education, or accommodation (Finlay & Dunn, 2019).

This research focuses on 12 categories of discrimination derived from the current legislation and the literature. Specifically, the US Equal Employment Opportunity Commission (EEOC) regulates what is and is not acceptable workplace practices by enforcing laws that protect employees. These laws include the Americans with Disabilities Act (ADA), Age Discrimination in Employment Act (ADEA), Title VII of the Civil Rights Act of 1964 (Title VII), and Title II of The Genetic Information Nondiscrimination Act of 2008 (GINA). The current legislation leads to selecting the following discrimination categories: Age, Sex, Learning Disabilities, Physical Disabilities, Country of Origin, Gender, Religion, Sexual Orientation, and Ethnicity/Race. To those categories, we add Political Views, Physical Characteristics, and Status.

The category “Political Views” is mentioned in the legislation and in the literature. California (CA) Labor Code 1101 prohibits employers from acting against employees for political affiliations as long as these affiliations do not negatively impact job performance. Studies have also established that in the US, the academy is overwhelmingly liberal. Faculty members’ political preferences have resulted in discriminatory practices, especially against conservative faculty members (Gross, 2007). “Lookism” also leads to discrimination (Patacchini et al., 2015; Desir, 2010). Because of “Lookism” people are evaluated based on their looks rather than their performance. For instance, people are treated differently when they are lighter (Hunter, 2007) or thinner (Patacchini et al., 2015). To account for this form of discrimination, “Physical Characteristics” is added in our study as a discrimination category. Lastly, since studies have shown that high-status groups have more prestige and power than others (Cuddy et al., 2008), “Status” is added as the last discrimination category.

These 12 discrimination categories are used to examine four research questions. The first research question explores faculty members’ perceptions of the college leadership’s understanding of the various categories of discrimination. The second and third research questions evaluate whether faculty members have witnessed discrimination against students, staff, or faculty and whether they have personally experienced discrimination. The last research question focuses on faculty members’ experience reporting and resolving discrimination.

Understanding Discrimination

To succeed in creating a campus free of discrimination, we need leaders who understand what needs to be done. Actions start with a clear understanding of discrimination, its meaning, and how it impacts the campus community. Successfully eliminating discrimination also implies that the campus community trusts that the leadership understands discrimination and has the desire and willingness to take action. This leads to our first research question: “Do faculty members think that the college leadership understands the various discrimination categories?”

Because of their position, leaders have an essential role in institutional racism. They establish organizational culture and influence the beliefs and values of their organization's members (Bolden, 2004). Chairpersons and deans influence the culture of universities, and that culture is crucial to faculty performance and, thus, to the overall success of higher education institutions and citizen education (Gappa et al., 2007).

Faculty are demanding a diverse and inclusive environment free of pervasive discrimination practices. Empirical evidence from numerous studies establishes that students have better grades and graduate faster in a diverse, equitable, and inclusive environment (Milem, 2003). Studies show that in a culturally inclusive and equitable environment, everybody feels safer and experiences less abuse, less harassment, or less unfair criticism (Van Fleet & Griffin, 2006). Studies also show that a disconnect between faculty members' values and the institution's culture leads to dissatisfaction and attrition (Pololi et al., 2012). Rothblum (1988) explained that the absence of a supportive environment causes women's attrition. Senge (2003) correlated job satisfaction with a cohesive purpose, a shared vision, and teamwork. A company leader plays a more significant role in creating a healthy organizational culture than any type of training session, mandatory or otherwise. When employees believe the company's leader supports diversity, it is more likely that they will follow suit (Downey et al., 2015).

Witnessing Incidents of Discrimination

The second research question addresses faculty members' experience witnessing incidents of discrimination in the academic environment. The survey question was: "Within the last 24 months, have you witnessed any incidents of discrimination in the college towards our (1) Students, (2) Staff, and (3) Faculty." A follow-up section of the question probed on the frequency of witnessing such discrimination.

Witnessing discrimination against members of one's own group is related to poor health and well-being (Paradies et al., 2015). Studies also show that individuals with a high internal motivation to eliminate prejudices are negatively impacted when they witness prejudices against another group (Schmader et al., 2012). In a study of college students, prejudices against gay people led to fear, despair, drug use, as well as negative relationships with teachers. Although women and sexual minorities reported more frequent direct experiences of harassment, discrimination impacts all of us regardless of gender or sexual orientation (Silverschanz et al., 2008)

Observing racial prejudice toward patients or other students has also been linked to increased depression symptoms in all students, albeit the impact was most prominent in Asian students (Hardeman et al., 2016). In the workplace, those who have observed discrimination towards others, referred to as ambient sexual harassment, suffer several negative consequences (Glomb et al., 1997; Miner-Rubino & Cortina, 2004).

Experience of Discrimination

Our third research question focuses on faculty members' experience with discrimination. Our research question asks: "How often do faculty members recollect experiencing discrimination?"

One of the primary challenges with discrimination is often the subtleness in which it occurs, which is why discrimination cases are sometimes dismissed (Leap, 1995). Although the burden of proof often falls on the plaintiffs, research shows that discrimination based on ethnicity, race, and country of origin continues to inflict harm to many people. There are a plethora of studies reporting cases of discrimination against African Americans, Hispanics, and women (Pager and Shepherd,

2008). Recent research has found an increase in Asian American prejudice as a result of the COVID-19 virus, which originated in Wuhan, China (Clissold et al., 2020). Note that the virus is new, but discrimination against Asians and Asian Americans is not (Lai & Babcock, 2013; McMurtry et al., 2019).

Discrimination based on age and physical characteristics remains pervasive. Several studies reported that age discrimination occurs because older workers are perceived to be resistant to training, averse to new technologies, and less adaptable than younger workers (Finkelstein et al., 2000). Physical characteristics, particularly obesity, remain the most frequent type of discrimination. Brochu and Esses (2011) pointed out that weight discrimination is one of the rare permissible forms of discrimination in the USA.

Prejudices towards members of some religious groups and toward the LGBTQ+ community are widespread. Heterosexuals have always regarded homosexuals as inferior, owing to the "symbolic threats" that homosexuals are said to bring (Warriner et al., 2013). Lesbians, bisexuals, and transgender people encounter persecution because they challenge standard gender roles (Nagoshi et al., 2008).

People with disabilities and their families face discrimination, isolation, and social exclusion. Nokrek et al. (2013) and Nuwagaba et al. (2012) reported that they often lack access to formal education and that challenging interactions with government agencies are not unusual.

Finally, research suggests widespread bias among unorthodox and low-status or power groups (Bergh et al., 2016; Duckitt & Sibley, 2017; Weidlich, 2021). Unfortunately, someone who is prejudiced toward ethnic minorities may also be biased against religious and sexual minorities and may display negative attitudes about women and the elderly (Cohrs et al., 2012).

Discrimination: Reporting and Resolution

Our last research question focuses on reporting and resolving discrimination. Specifically: "Do faculty members who have experienced discrimination also report it?" and (among those who have experienced and reported discrimination) "How was the complaint handled?"

One of the challenges with reporting discrimination is the nature in which it occurs, i.e., whether overt or more subtle. Studies have shown that subtle incidents of discrimination often go undetected, which makes it more difficult to recognize and report (Cundiff. et al., 2018). The position of the person being accused often plays an important role in determining how the accusation is being handled and if any disciplinary actions will take place. In a study on academic pediatrics, both men and women endorsed fear of reporting their struggle because of retaliation and futility (Rosenberg et al., 2022).

Elphick, Minhas, and Shaw (2020) stated that "at least 70% of victims of prejudice fail to disclose the cases." According to the authors, victims have expressed concern that reporting problems may result in retaliation. In instances where retaliation is prohibited, "covert retaliation" can occur in forms like vindictive comments, subtle criticisms in promotion-, grant-, or peer-review, alienation of the accuser, and minimization of professional opportunities (Rosenberg et al., 2022). When incidents are reported but disregarded or dismissed, faculty members who report the incidents feel degraded.

METHODS

To evaluate the research questions presented above and better understand the views of College of Business full-time faculty regarding discrimination, an online survey was created using

the Qualtrics platform. The survey questions are based on the literature review presented above as well as various surveys administered by other institutions, i.e., Bloomsburg University Diversity Survey, Erasmus, University of Texas, San Antonio Diversity Survey, University of Michigan Diversity Survey, Dickinson College Diversity Survey, Diversity Survey Report and South Carolina University Survey.

The survey started with a brief description of the study, assurances that it could be completed within 15 minutes, and guarantees that the respondents would not be identified. When the idea of creating a survey was shared with colleagues, several faculty members insisted that they would not participate if they were not guaranteed anonymity to avoid the consequences of being candid.

The survey instrument includes the four research questions discussed above. The first question asks about the faculty's understanding of discrimination based on the 12 categories described in the previous section. The second question asks whether faculty have witnessed any discrimination incidents towards faculty, staff, or students. The next question addresses the faculty's experience with the 12 discrimination categories. The fourth question focuses on faculty members' experience with reporting and resolving discrimination incidents. The survey ends by asking respondents to indicate their gender and their academic rank (tenured vs. non-tenured). These last questions were optional since demographic information might easily identify some faculty.

Cronbach's alpha coefficient was also calculated for the Likert questions to assess internal consistency. Cronbach's alpha estimates the internal consistency or average correlation of items in the instrument by determining how all items relate to all other items and the total instrument (Gay et al., 2006). Cronbach's alpha was .832, where coefficients above .70 are acceptable and above 0.80 are preferred (Cortina, 1993).

Table 1 summarizes the survey questions. As shown in the table, respondents were presented with a "prefer not to answer" response option so that faculty who did not want to answer a specific question could participate. As Fernandez and Randall (1991) reported, adding this type of response option increases participation and response rate.

RESULTS

Description of respondents

The final sample includes 50 faculty members, which represents 61% of the eligible population. In most cases, faculty answered all questions; however, we did not discard surveys for which a few questions were incomplete. This allowed faculty to participate where they felt comfortable and skip some questions while maintaining the survey's integrity.

Recall that when the survey was presented to faculty, most of them stated that they would not participate unless anonymity was guaranteed. Faculty indicated that they sought anonymity to avoid the repercussions of being open about the college administration's views. The demographic questions about gender and rank were optional and added at the end of the survey. For these optional questions, 27 faculty members (54%) indicated their gender. Among these respondents, 48% are females, 44% males and 7.4% other. A total of 23 faculty members (46%) specified their tenure status: 60% are non-tenured, and 40% are tenured.

Table 1: Survey Questions

| Category | Question | Options |
|---|--|---|
| Understanding Discrimination | In your opinion, the leadership (Chair and above) understands that discrimination covers: (1) Age, (2) Sex, (3) Learning Disabilities, (4) Physical Disabilities, (5) Country of Origin, (6) Gender, (7) Religion, (8) Political Views, (9) Sexual Orientation, (10) Ethnicity/ Race, (11) Physical Characteristics, and (12) Social Status. | Yes No Unsure Prefer not to answer |
| Witnessing Incidents of Discrimination | Within the last 24 months, have you witnessed any incidents of discrimination in the college towards our (1) Students, (2) Staff, and (3) Faculty? | Yes, >5 times Yes, 1-4 times No Unsure Prefer not to answer |
| Experience of Discrimination | Within the last 24 months, have you personally experienced discrimination in the college regarding: (1) Age, (2) Sex, (3) Learning Disabilities, (4) Physical Disabilities, (5) Country of Origin (6) Gender, (7) Religion, (8) Political Views, (9) Sexual Orientation, (10) Ethnicity Race, (11) Physical Characteristics, and (12) Social Status | Yes No Unsure Prefer not to answer |
| Discrimination: Reporting and Resolution* | If yes, did you report it? If yes, has the situation been handled appropriately? If yes, was it handled promptly? (Respondents who answered” yes” to the previous question were asked about reporting and resolving discrimination.) | |
| Demographics (optional) | Gender? Academic rank? | Male or Female Tenure or Untenured |

Findings

In the tables that follow, we report the distribution of responses and the Chi-square computed to evaluate the potential differences in responses based on gender and academic rank (tenured vs. non-tenured). Findings are summarized in 4 sections to parallel the four survey questions discussed above.

Understanding Discrimination

Table 2 presents the responses to the question of whether faculty perceive that college leadership understands discrimination. For each of the 12 discrimination categories discussed

above, the table displays the numbers and percentages of respondents answering “yes,” “no,” or “unsure.” The table also displays the Chi-squares calculated to determine whether the cross-tabulation results are statistically significant when comparing genders and ranks.

| In your opinion, the leadership understands that discrimination covers: | Yes | No | Unsure | Chi-square by gender | Chi-square by rank |
|---|----------------|---------------|----------------|-----------------------|--------------------|
| | % | % | % | % | % |
| Age (N=43) | 67.4 (n=29) | 18.6 (n=8) | 14.0 (n=6) | 1.980 P = .371 | .924 P = .630 |
| Sex (N=43) | 76.7 (n=33) | 11.6 (n=5) | 11.6 (n=5) | 1.846 P = .397 | 1.944 P = .378 |
| Learning Disabilities (n=43) | 72.1 (n=31) | 9.3 (n=4) | 18.6 (n=8) | 1.899 P = .387 | 2.852 P = .240 |
| Physical Disabilities (n=43) | 79.1 (n=34) | 9.3 (n=4) | 11.6 (n=5) | 2.901 P = .234 | 1.658 P = .198 |
| Country of Origin (n=43) | 62.8 (n=27) | 11.6 (n=5) | 25.6 (n=11) | 5.874 P = .053* | .924 P = .630 |
| Gender (n=43) | 69.8 (n=30) | 9.3 (n=4) | 20.9 (n=9) | 2.906 P = .234 | .984 P = .612 |
| Religion (n=43) | 67.4 (n=29) | 7.0 (n=3) | 25.6 (n=11) | 4.920 P = .085* | .103 P = .950 |
| Political Views (n=43) | 53.5 (n=23) | 11.6 (n=5) | 34.9 (n=15) | P = 4.436 P = .109 | 1.264 P = .532 |
| Sexual Orientation (n=43) | 72.1 (n=31) | 9.3 (n=4) | 18.6 (n=8) | P = 1.376 P = .503 | .103 .950 |
| Ethnicity/Race (n=43) | 76.7 (n=33) | 11.6 (n=5) | 11.6 (n=5) | 1.271 P = .530 | .810 .667 |
| Physical Characteristics (n=43) | 60.5 (n=26) | 16.3 (n=7) | 23.3 (n=10) | 4.920 P = .085* | .924 p = .630 |
| Social Status (n=43) | 51.2 (n=22) | 7.0 (n=3) | 41.9 (n=18) | 2.637 P = .267 | .243 P = .886 |

Most faculty members perceive that the leadership understands discrimination when it pertains to sex (76.7%), learning disabilities (72.1%), physical disabilities (79.1%), sexual orientation (72.1%), and ethnicity/race (76.7%). The highest percentages of faculty who believe that the leadership does not understand discrimination are for the categories of age (18.6%) and physical characteristics (16.3%). The highest percentages of people unsure about the leadership's understanding of discrimination pertain to political views (34.9%) and social status (41.9%). Although none of the Chi-square values are statistically significant at 5%, three of the Chi-squares by gender are significant at the 10% level: country of origin (Chi-square 5.874, p=.053), religion (Chi-square 4.920, p=.085), and physical characteristics (Chi-square 4.920, p=.085). More women

than men report being unsure about the leadership understanding of these categories of discrimination.

Witnessing Incidents of Discrimination

Faculty members’ responses to the question of whether they have witnessed any incidents of discrimination towards students, staff, and faculty members are depicted in Table 3. The table presents the numbers and the percentages of respondents reporting having witnessed discrimination “more than five times,” “between 1 and 4 times,” or “not at all” within the last 24 months. The table also includes numbers and percentages of those who are “unsure” and the Chi-squares.

| Within the last 24 months, have you witnessed any incidents of discrimination towards | Yes, >5 times | Yes, 1-4 times | No | Unsure | Chi-square by gender | Chi-square by rank |
|---|---------------|----------------|-------------|------------|----------------------|--------------------|
| | % | % | % | % | % | % |
| Students (n=43) | 2.3 (n=1) | 11.6 (n=5) | 72.1 (n=31) | 14.0 (n=6) | 1.343 P=.511 | 3.729 P=.292 |
| Staff (n=41) | 7.3 (n=3) | 4.9 (n=2) | 78.0 (n=32) | 9.8 (n=4) | 2.965 P=.397 | 4.304 P=.230 |
| Faculty members (n=42) | 14.3 (n=6) | 19.0 (n=8) | 54.8 (n=23) | 11.9 (n=5) | 3.766 P=.288 | .998 P=.802 |

Relatively few faculty respondents reported witnessing discrimination towards students or staff. Fourteen percent of respondents reported observing instances of discrimination targeting their faculty peers at least five times within the last 24 months. Nineteen percent mentioned seeing incidences of discrimination toward their peers between 1 and 4 times within the last 24 months, and 11.9% were not sure whether they had witnessed discrimination or not. None of the Chi-square values are statistically significant at 5% or 10%

Experience of Discrimination

Table 4 summarizes responses to the questions about experiencing discrimination. The table is organized similarly to Table 2. For all the discrimination categories analyzed, the percentages of people who have not personally experienced discrimination in college remain higher than 69%. The highest percentages of “yes” responses pertain to the categories of ethnicity/race (20.9%) and gender (11.4%). The highest percentages of respondents selecting “unsure” are for the categories sex (11.6%), gender (18.2%), and political views (11.4%).

The Chi-square values comparing male and female responses are significant at the 5% level for the discrimination category “gender” (Chi-square = 7.287, p=.026), with all males responding that they have not experienced gender discrimination, vs. only 53.8% of female respondents experiencing no gender discrimination. Instead, 15.4% of females say they have experienced it, and 30.8% are “unsure.” Chi-square analyses by faculty rank (tenured vs. non-tenured) were only significant at the 10% level for the categories: religion (Chi-square = 5.018, p=.081) and political views (Chi-square = 5.018, p=.081). Virtually all the non-tenured faculty did not experience

discrimination based on those categories, whereas some tenured faculty admitted that either they had experienced the discrimination or were unsure.

Table 4: Experience of Discrimination

This table reports the distribution of responses for participants who selected either “yes,” “no,” or “unsure.” A “prefer not to answer” option was provided to allow faculty to participate where they felt comfortable and skip some questions while maintaining the integrity of the survey. For each category three participants selected prefer not to answer. * indicates statistically significant differences at *10%, **5% and ***1%

| Within the last 24 months, have you personally experienced discrimination in the college regarding | Yes | No | Unsure | Chi-square by gender | Chi-square by rank |
|--|------------|-------------|------------|----------------------|--------------------|
| | % | % | % | % | % |
| Age (n=42) | 7.1 (n=3) | 88.1 (n=37) | 4.8 (n=2) | 1.846 P = .397 | .646 P = .421 |
| Sex (n=43) | 7.0 (n=3) | 81.4 (n=35) | 11.6 (n=5) | 4.062 P=.131 | 2.154 P=.341 |
| Learning Disabilities (n=43) | 0.0 (n=0) | 97.7 (n=42) | 2.3 (n=1) | --- | --- |
| Physical Disabilities (n=43) | 0.0 (n=0) | 95.3 (n=41) | 4.7 (n=2) | .883 P=.347 | --- |
| Country of Origin (n=42) | 7.1 (n=3) | 83.3 (n=35) | 9.5 (n=4) | 1.846 P=.397 | 3.105 P=.212 |
| Gender (n=44) | 11.4 (n=5) | 70.5 (n=31) | 18.2 (n=8) | 7.287* P=.026 | 2.208 P=.331 |
| Religion (n=43) | 4.7 (n=2) | 88.4 (n=38) | 7.0 (n=3) | .962 P=.618 | 5.018* P=.081 |
| Political Views (n=44) | 6.8 (n=3) | 81.8 (n=36) | 11.4 (n=5) | 2.011 P=.366 | 5.018* P=.081 |
| Sexual Orientation (n=44) | 4.5 (n=2) | 90.0 (n=40) | 4.5 (n=2) | 2.007 P=.367 | 1.513 P=.219 |
| Ethnicity/Race (n=43) | 20.9 (n=9) | 69.8 (n=30) | 9.3 (n=4) | 2.386 P=.303 | .282 P=.868 |
| Physical Characteristics (n=42) | 4.8 (n=2) | 85.7 (n=36) | 9.5 (n=4) | 1.043 P=.307 | 1.513 P=.219 |
| Social Status (n=43) | 4.7 (n=2) | 86.0 (n=37) | 9.3 (n=4) | 2.007 P=.367 | 2.144 P=.342 |

Discrimination: Reporting and Resolution

The last set of questions centers on the issue of reporting discrimination and how, according to respondents, the issues reported were resolved. Among those who answered that they had experienced discrimination (n=20), 15% (n=3) indicated they reported the problem. For respondents who have experienced and reported discrimination, 33% (n =1) felt that the situation was partially handled appropriately, and 66.6% (n=2) felt that it was not. Also, all three of these respondents felt that the situation was not handled in a timely manner.

CONCLUSION

We surveyed College of Business faculty members using twelve discrimination categories to gather their views about the leadership's understanding of discrimination and their experience

witnessing and being discriminated against. For those respondents who indicated that they had been discriminated against, we also elicited their views about reporting the incidents and how their claims were handled.

Our survey was distributed to all faculty members in the college. Fifty faculty members, representing 61% of the eligible population, took the survey. These respondents indicated that the college leadership understands discrimination based on sex, learning disabilities, physical disabilities, sexual orientation, and ethnicity/race. According to these respondents, discrimination based on age and physical characteristics is not well understood by the college leadership. Since the pervasive impact of discrimination because of age and physical characteristics has been identified by others, department chairpersons and other administrators' understanding of discrimination based on those categories should be improved (Finkelstein et al., 2000; Brochu & Esses, 2011).

Our findings also reveal that a sizable proportion of professors have watched and experienced prejudice against themselves or their peers. Among those who reported experiencing discrimination, the highest percentages are for the categories of ethnicity/race and gender. Finally, those who have reported discrimination found that their claim was either not handled or only partially handled adequately. None felt that the report was handled promptly.

LIMITATIONS AND FUTURE RESEARCH

Evaluating discrimination is problematic because it usually occurs subtly, meaning that individuals have trouble assigning a motivation to a behavior. Thus, an individual may know that he or she was mistreated, such as being excluded from a group activity or other more subtle forms of microaggressions, and consequently report the instance. However, he or she may not want or be able to label that exclusion as 'discrimination.'

Also, our sample size remains limited despite its similarity with the average business school, and the demographic questions were voluntary to preserve the anonymity of respondents, further limiting the gender and rank comparisons. Finally, faculty responses are self-reported and may be prone to recollection biases. If enough data had been available, comparisons between minority faculty and their non-minority colleagues across departments, disciplines, and types of institutions (public vs. private) could have been performed. Studies show that minority faculty members are typically less satisfied than non-minority faculty (Bender & Heywood, 2009; Rosser, 2005). Future studies are required considering these findings. A qualitative analysis could help acquire a better understanding of the faculty's viewpoint.

In summary, we hope our findings will be helpful to other higher education institutions that may consider analyzing their faculty members' opinions. Discrimination affects people's well-being and their feeling of having control over their actions and their consequences. Exposure to discrimination can lead to low self-esteem, fear, stress, and poor health.

As far as we know, faculty members' perceptions of the impact and magnitude of discrimination based on what the US Equal Employment Opportunity Commission (EEOC) regulates have not been evaluated in institutions of higher learning. Eliminating discrimination implies that our institutions develop and examine strategies to address the problem. Our institutions should also devote resources to educating members on the harmful impact of stereotyping. All stakeholders must be trained to recognize discrimination, and channels to report instances of discrimination must be in place.

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MODALITY DEMAND TRENDS POST COVID19 IN A PUBLIC UNIVERSITY: A DEEPER DIVE INTO GENDER, MARITAL STATUS, AND OTHER DRIVERS OF CLASS SELECTION

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ABSTRACT

In the first phase of the study, we investigated the effect that COVID-19 has had on student demand for six educational modalities used in the Woodbury School of Business (WSB) at Utah Valley University (UVU) in Orem, Utah. Those modalities are Face-to-Face, Hybrid, Independent Study, Internship, Live Interactive Video, and Online.

The two hypotheses evaluated were whether the change to primarily online would revert to the pre-COVID-19 ratios of live and online and second that students were choosing online over live for rational reasons despite their preference for live courses. The first hypothesis was rejected, as students generally continued to choose online at a significantly higher rate, and no pronounced move back to face-to-face classes occurred. The second hypothesis was indicated but not proven due to a lack of relevant data at the time of the study's first phase. So, enrollment for Online and Flextime dramatically increased after COVID-19, while Face-to-Face and evening classes experienced huge drops.

The study's second phase extends this research and shows that gender does not affect course choice. Further, students select online for pragmatic and logical reasons, including how age, employment, marital status, and perceived free time play into those class choices. Indeed, in practice, students enroll more often in online course sections due to the practicalities of their complicated lives. This second hypothesis is indicated and statistically proven in the second phase.

Keywords: COVID-19, Course Modality, Age Group, Work Status, Employment, Marital Status

INTRODUCTION

First Phase of the Study

COVID-19 caused massive disruptions at all levels of education, and higher education, in particular, was severely challenged by the disease. Many institutions struggled to continue college courses during the pandemic. Courses that required students to be in close proximity, such as dance, sports, and theater, were shut down at many universities worldwide. Courses where distancing and online delivery options were available were able to continue. However, in these courses, there were many challenges with adjusting for sick students, live streaming, faculty adaptability, and isolation, to mention a few.

The first phase of this bifold study looked at recent modality data to see how much the COVID-19 pandemic changed student demand patterns in how they chose courses and if there was any evidence in the data to suggest that those changes would be long-term, even permanent. Because the Woodbury School of Business (WSB) is the largest school of business in Utah, with about 5,000 students, the data should be representative and applicable to similar colleges worldwide.

It was posited that the changes forced by the COVID-19 event would have happened eventually (first hypothesis). So, the so-called “new normal” would not revert to the old delivery methods, especially live course sections. So far, this hypothesis has held.

The second hypothesis was that students select online courses for pragmatic and logical reasons. Although students say they prefer live courses, in practice, they enroll more often in online course sections due to the practicalities of their complicated lives. In a paper published by the authors (El-Saidi et al., 2023), the course modality data from the WSB was evaluated from the summer semester of 2017 through the fall of 2021 to show the patterns that developed in the WSB during that time period, especially those due to the pandemic. The second hypothesis was indicated but not proven due to a lack of relevant data at the time of the study. So, enrollment for Online and Flextime dramatically increased after COVID, while Face-to-Face and evening classes experienced huge drops.

Second Phase of the Study

For further investigation, a survey was designed and administered to WSB students during the Summer and Fall of 2022. The survey included questions about the number of classes taken per modality, students' preferences, and why they chose a specific modality when signing up for a class. The survey also investigated demographic factors such as student age group, gender, marital status, and employment status and how these factors affected students' preferences toward teaching modalities.

First, the hypothesis to be investigated in this paper is that those four specific factors affect student course modality preferences. Second, in practice, students enroll more often in online course sections due to the practicalities of their complicated lives. Interestingly, the added data for the second phase of our bifold study statistically proves the second hypothesis of the first phase and provides the reasons for those trends.

DESCRIPTION OF THE RESEARCH PROBLEM

Student demand patterns for courses taught in the WSB have changed drastically since the beginning of the COVID-19 pandemic. The once predictable student demand patterns, where online was growing slowly and steadily from year to year, were moved in a matter of weeks to primarily online and live streaming formats, starting part way into the fall semester 2019 at UVU. Up to that fateful event, most department chairs within the WSB tried to follow student demand for specific modalities in their scheduling of courses, although some of the changes that occurred in the three years before Covid were due to the desire to move to promising hybrid modalities that provided more flexibility, and also to take advantages of the “flipped classroom,” (El-Saidi et al., 2023; The Derek Bok Center for Teaching and Learning, 2022).

Some departments and programs in the WSB, such as accounting, economics, and entrepreneurship, resisted moving to online formats after the restrictions of the pandemic were lifted. The thinking for some professors has been that some courses and even disciplines require

live interaction with students to be effective. However, even within the WSB, professors have shown that challenging applied quantitative courses like business calculus and operations management can be taught effectively, and the test scores of online students exceeded the test scores of students in live sections (Adams et al., 2006). Online courses can have selection bias and thus can attract better than average students. However, the old belief that quantitative courses cannot be taught effectively online is just not true.

The issue of whether specific business curricula require live formats to be effective is not the problem or focus of this research effort. Still, the rapid move to online due to pandemic issues has increased the friction over live versus online modalities. The real and pressing issue for the WSB is how to get a better feel for student demand patterns in the future so that the WSB and the university can better anticipate student needs. Students are presently choosing online over live formats, even in courses that are traditionally seen as more adapted to live instruction by educators. That includes, but is not limited to, Business Calculus, Business Statistics, and Data Analytics. The authors believe this information will be necessary to many colleges and universities, even those with different missions and student populations. The results will also give a window into how well students are adapting and accepting online modalities.

It is worth mentioning that elite universities started moving toward offering free online classes to large audiences, and this added weight to the position that online education is not only here to stay but also will be a major player within higher education (Windes & Lesht, 2014). Offering online classes by such institutions may reduce concerns about “quality” in online courses, at least at public institutions.

RESEARCH BACKGROUND

The idea for the first phase of the study started in the fall of 2019 when UVU mandated that all classes be moved to delivery in online or live-streamed formats. As the restrictions began to lift by the spring of 2021, online sections were still filling first, and the anticipated return to more traditional live modalities has not occurred as much as was anticipated by administration or schedulers. That reality, though not totally unexpected, is a major shift away from traditional live formats and has enormous policy implications, such as classroom space on campus, technology needs, etc.

Utah Valley University invested about \$1 million to deliver live courses using live streaming as the pandemic worsened in the fall of 2019 and then continued well into 2020 while trying to create social distancing or moving to totally online modalities. In order to continue live sections, provide social distancing and contact tracing, students were divided up into roughly equal-sized cohorts and then required to attend half or less (some large sections were divided into three groups. Students in these sections were expected to attend one-third of the time) of the live sections and attend the other class periods by live streaming. For a time, students had to sit in the same seat every time they attended a live class, and this also helped in contact tracing should COVID-19 cases appear in students.

The situation rapidly became political. After several iterations in 2020, the Legislature for the State of Utah (House Bill 294, 2021) weighed into this modality issue. Senate Bill 107 (2021a) mandated that “All schools (K-12) are required to have four days of in-person instruction, no soft closures allowed, (and) Test to Stay process is implemented when the following occurs: ... etc.” Other restrictions applied, which were part of House Bill 294 that came out on April 10, 2021 (Senate Bill 107, 2021b), but for the subject of modalities, the Legislature of Utah mandated live

instruction for at least “4 days” a week for K-12 and considered similar mandates for higher education (Senate Bill 107, 2021a). Senate Bill 107 (2021a) also mandated that “for the fall semester in 2021, an institution of higher education shall offer a number of in-person courses that are at least 75% of the number of in-person courses that the institution of higher education offered for the analogous semester that began immediately on or after August 1, 2019 (and) for spring semester in 2022, an institution of higher education shall offer a number of in-person courses that is at least 75% of the number of in-person courses that the institution of higher education offered at the beginning of the analogous semester that began on or immediately after January 1, 2020” (Senate Bill 107, 2021a). Therefore, UVU was mandated to schedule 75% of its live course sections from fall 2019 into fall 2021. Though more stable now (spring 2023), the situation continues to be dynamic, so it is possible that with further outbreaks, specific modalities for higher education in Utah could be mandated. Thus, there is an urgent need to forecast student demand for specific modalities moving forward.

BRIEF TEACHING MODALITY LITERATURE REVIEW

An in-depth Modality Review was summarized in a paper by El-Saidi et al. (2023). The key findings in that literature review are summarized as follows. First, while universities are seeking to increase enrollments and online enrollments have more than quadrupled, many instructors are often unprepared, in many ways, to transition to online learning (Trammell & LaForge, 2017). COVID-19 has made online learning commonplace for students, and if universities seek to increase enrollments, online options are essential.

Second, studies of best practices in face-to-face and online teaching and how to combine those were done by Singh et al. (2021). In that study, a variety of approaches for bridging the gaps in weaknesses of live and online pedagogies was presented (Singh et al., 2021). Singh (2021) quoted the findings of Sim et al. (2020) (who) determined from their study that most former live students were highly optimistic and showed increased enthusiasm regarding online learning.

Third, Martinez et al. (2020) looked at the struggles of transitioning a master’s level student population from live to online in an engineering school. The Martinez et al. study (2020) also strengthened the argument “...that ‘anytime and anywhere’ learning approaches, together with support material and student’s monitoring, improve(s)...students’ learning process.” Moreover, “that both blended and online methodologies can improve grades and reduce dropout ratio in higher education.” Additional findings for Hernandez University (UMH), Spain, were that using their new learning approaches increased student enrollments, grades, perception of course quality, and satisfaction. At the same time, the geographic origin of students has also improved.

Fourth, a study by Julien and Dookwah (2020) showed that “Face-to-face learning (F2F) is (was considered) essential for Mathematics and is necessary for human interaction. Students also revealed that while they appreciated both forms of learning, most of them noted that teaching Mathematics ought to be conducted F2F. The UVU experience so far supports and strengthens this finding. Still, Julien and Dookwah (2020) also noted that “...some students felt that Online learning (ONL) was extremely convenient and comfortable, and they experienced minimum stress in completing exercises. This finding was also claimed by Croxton (2014). “Online learning greatly appeals to many students because it offers flexibility in participation, ease of access, and convenience...” (Julien & Dookwah, 2020, p. 1). This same study also found that ONL was more

economical for students, with lower expenditures "...on transportation, meals, and printing assignments (Julien & Dookwah, 2020) and even in tuition, in some cases. The three main recommendations from the Julien and Dookwah (2020) study were that "(s)tudents ought to be given more opportunities to study (online), be provided with social opportunities during (online) (and) a blended form of instruction should be given for Mathematics courses."

Finally, it is worth mentioning that "(f)aculty at private institutions (tend) to perceive teaching online as optional, with no sense of urgency on the part of the administration to teach online" (Windes & Lesht, 2014). However, if those intuitions saw "peer schools" migrating online, they then saw it as a "competitive necessity" to do the same (Windes & Lesht, 2014). "The recent moves by elite universities to offer free online classes to large audiences is adding weight to the position that online education is not only here to stay, but also will be a major player within higher education, (Windes & Lesht, 2014)." This same research also seemed to indicate that the act of "teaching online itself may reduce concerns about quality" in online courses, at least at public institutions (Windes & Lesht, 2014). But the most telling finding in the Windes and Lesht (2014) study was that the "single motivating force to encourage online teaching" is "student demand." This finding is consistent with Allen and Seamans's report (2008), which found that the most important motivational factor for teaching online was flexibility in meeting students' needs. Our current paper addresses this important finding in great detail.

METHODOLOGY

Assumptions and Limitations

Modalities and schedules are quite complicated, so the data gathered had to be simplified, and some decisions about how to count specific courses were made. First, the data were simplified for live sections and separated into *morning, afternoon, evening, and Saturday* sections. For online sections, appropriate decisions were made about how to count those that were *synchronous* (students and instructors engage with each other and the course material at the same time but from different locations) versus *asynchronous* (students and instructors engage with the course material at different times and from different locations). The first, synchronous sections, were counted as online, and the sections were counted as online.

First Phase of the Study: Data Characteristics and Conclusions

Teaching Modalities Classification Data

The percentages of total students attending spring, summer, and fall semesters at UVU did not change much from Fall 2019 to Fall 2021; however, student enrollments over the same period decreased by about 5.2 percent. The Fall semester stayed at about the same overall percentage; spring increased by over one percent, and summer decreased by over one percent (El-Saidi et al., 2023). None of those percentages are of note but are available in the data set analyzed by the authors. However, the comparison of the teaching and time classification modalities shows some significant changes.

Time-of-Day Classification Data

Noticeable changes in student demand patterns become apparent when looking at the day and time of day. First, the already low number of enrollments in Saturday classes decreased by

almost 81 percent, and Saturday enrollments (i.e., classes) disappeared entirely in the summer and fall of 2021. Second and more noticeable, the other four time frame percentages of total enrollments changed as follows from 2019 to 2021:

- Morning classes changed from 26% to 16.59%, a 36% drop,
- Afternoon classes changed from 17.78% to 12.28%, a 31% drop,
- Evening classes changed from 23.9% to 14.92%, a 37.6% drop, and
- Flextime classes changed from 31.53% to 56.06%, an increase of 77.8%.

Flextime and online/asynchronous exploded, but that was to be expected. The University mandated online courses in the spring of 2020 and began opening more live courses by the fall of 2020. A feeling permeated through UVU, perhaps from upper administration, that once the COVID-19 pandemic subsided significantly and classroom restrictions, etc., eased, students would readily return to their preferred live courses. That migration back to face-to-face did not happen from spring 2021 to fall 2021. In a closer look at the data, the few courses that saw any significant migration back to the live modality were the 2000-level courses, primarily quantitative. As of the writing of this paper in early spring of 2023, the enrollment in new semesters continues to show that online sections of courses are still the ones that fill first.

Synopsis of the first phase of the study

The initial time frame for this study was from the Summer of 2016 through the Fall of 2021. A student survey was conducted and given to many students on several required courses. Modalities and schedules are quite complicated, so the data gathered in the first stage of this study had to be reformatted, and some decisions about how to count certain courses were made. For example, the data were simplified for live sections and classified into *morning, afternoon, evening, and Saturday* sections. For online sections, appropriate decisions were made about how to count those that were *synchronous* versus *asynchronous*. In the end, the six modalities studied were Face-to-Face, Hybrid, Independent Study, Internship, Live Interactive Video, and Online (El-Saidi et al., 2023).

Conclusions of the first phase of the study

Our statistical analysis (El-Saidi et al., 2023) of both teaching and time-of-day classification modalities of 2019 (before COVID) were statistically significant compared to those of 2021 (after COVID) at the 5% significance level. While enrollment for Online and Flextime has dramatically increased after COVID, the Face-to-Face and evening classes experienced a considerable drop. When the authors looked at which classes had increases in live enrollments in the fall of 2021, it was only in the 2000-level courses, such as Business Calculus. In the upper division courses, the migration to more online continues. The second hypothesis is that although students say that they prefer live courses, in practice, they enroll more often in online course sections due to the practicalities of their complicated lives. This hypothesis was only indicated but not proven in this first phase of the study.

Second Phase of the Study: Extended Survey Analysis

The second phase of the study extends the research in the first phase. It shows that students select online classes for pragmatic and logical reasons, including how age, employment status, marital status, and perceived free time play an important role in those class choices. Further, to our surprise, the extended survey analysis shows that gender does not affect course choice. Indeed, in practice, students enroll more often in online course sections due to the practicalities of their

complicated lives. The four factors, work status, marital status, age, and gender, are discussed in detail next.

Work Status: Summary and Conclusions

Work status is classified as full-time employment, part-time employment, or unemployed. Tables 1 through 7 show how a student’s work status affects the number of classes taken and class count percentages and how it changes the students’ course modality preference.

Table 1: Work Status and Class Count Percentage

| Number of Classes Taken and Class Count Percentage | | | | | | | |
|--|-------|--------|--------|--------|--------|-------|-----------|
| Work Status | 1 | 2 | 3 | 4 | 5 | 6 | Row Total |
| Full-Time | 1.74% | 9.46% | 9.27% | 14.67% | 12.36% | 2.70% | 50.20% |
| Part-Time | 0.97% | 3.67% | 3.67% | 9.65% | 16.60% | 6.18% | 40.74% |
| Unemployed | 0.39% | 0.77% | 0.00% | 3.09% | 3.86% | 0.97% | 9.08% |
| Column Total | 3.10% | 13.90% | 12.94% | 27.41% | 33.82% | 9.85% | 100.00% |

The three categories of work status are analyzed in more depth regarding students’ course type choice and the reasoning for choosing online over face-to-face classes. The results are reported in Tables 2 through 7 below and accompanied by a brief discussion.

Table 2: Full-Time Employed Students’ Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 3.69 | 2.89 | 0.60 | 0.10 | 0.10 | 260 |
| # of Classes Reported | 959 | 751 | 156 | 27 | 25 | |
| % of Classes Load | 100% | 78.31% | 16.26% | 2.82% | 2.61% | |

Out of the 518 students who participated in the survey, there were 260 full-time employed students. As shown in Table 2, students who are full-time employed prefer Online courses (78.31%) over face-to-face (16.26%), while Hybrid and Livestream captured 2.82% and 2.61%, respectively. The last three percentages of Face-to-Face, Hybrid, and Livestream may be attributed to the difficulty of fitting these modalities within a tight work schedule. Full-time students also prefer fewer classes (average of 3.69), as shown in Table 2, compared to part-time (average of 4.37) and unemployed (average of 4.34), as shown in Tables 3 and 4, respectively. Further, the average number of courses full-time employed students take is 3.69, of which 2.89 are online, 0.60 are Face-to-Face (F2F), and 0.10 are hybrid and livestream each.

Table 3: Part-Time Employed Students’ Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 4.37 | 2.23 | 1.71 | 0.29 | 0.15 | 211 |
| # of Classes Reported | 922 | 470 | 360 | 61 | 31 | |
| % of Classes Load | 100% | 51% | 39% | 7% | 3% | |

Of the 518 students who participated in the survey, 211 were part-time employed students.

Those students take fewer online courses (2.23 versus 2.89) and notably more face-to-face courses (1.71 versus 0.60) than full-time employed students; see Tables 2 and 3. Hybrid and livestream remain unpopular choices among part-time employed students. This reality may be attributed to the ability to adapt a part-time work schedule to a university course load.

Table 4: Unemployed Students’ Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 4.34 | 2.13 | 1.62 | 0.40 | 0.19 | 47 |
| # of Classes Reported | 204 | 100 | 76 | 19 | 9 | |
| % of Classes Load | 100% | 49% | 37.3% | 9.3% | 4.4% | |

Out of the 518 students who participated in the survey, there were only 47 unemployed students. Those students are very similar to part-time employed students. The average class count is 4.34 vs 4.37, with 2.13 being online and 1.62 being in-person; see Tables 3 and 4. This particular finding is quite puzzling. Why is it that part-time employed students are taking essentially the same class load as unemployed students? Investigating why unemployed students take slightly fewer classes (on average) than part-time employed students may be warranted. Again, hybrid and livestream remain unpopular among the three employment categories.

Tables 1 through 4 show that hybrid and livestream remain unpopular among the three work categories and capture very low percentages. Therefore, our discussion below is restricted to Online and face-to-face classes that capture at least 84% of the classes. Tables 5 through 7 displayed below shed light on work status and the various reasons for choosing Online and face-to-face course modalities.

Table 5: Full-Time Employed Students’ Reasoning for Choosing Online versus Face-to-Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 4.8% | Preferred Instructor | 14.8% |
| Time Fit Schedule | 54.7% | Time Fit Schedule | 22.6% |
| Preferred Modality | 17.4% | Preferred Modality | 25.2% |
| Only Time Offered | 7.7% | Only Time Offered | 26.10% |
| To be With a Friend | 0.3% | To be With a Friend | 2.6% |
| Other | 15.1% | Other | 8.7% |

Table 6: Part-Time Employed Students’ Reasoning for Choosing Online versus Face-to-Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 12.0% | Preferred Instructor | 13.2% |
| Time Fit Schedule | 41.2% | Time Fit Schedule | 27.2% |
| Preferred Modality | 8.6% | Preferred Modality | 42.7% |
| Only Time Offered | 26.2% | Only Time Offered | 11.7% |
| To be With a Friend | 0.8% | To be With a Friend | 1.90% |
| Other | 11.2% | Other | 3.3% |

Table 7: Unemployed Students’ Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 12.50% | Preferred Instructor | 18.36% |
| Time Fit Schedule | 41.66% | Time Fit Schedule | 14.29% |
| Preferred Modality | 4.17% | Preferred Modality | 38.78% |
| Only Time Offered | 29.17% | Only Time Offered | 10.20% |
| To be With a Friend | 0.00% | To be With a Friend | 0.00% |
| Other | 12.50% | Other | 18.37% |

As employment takes up more of a student’s daily schedule (moving from unemployed toward full-time employment), the flexibility of time to fit schedule associated with Online courses becomes more favorable. Meanwhile, the preference for face-to-face courses becomes a lower priority as employment increases.

Work Status and Course Modality Choice: Overall Condensed Summary

In short, *Full Time Students*, on average, have the following characteristics:

- Take fewer courses overall (3.69),
- Take more online courses (2.89)
- Take far fewer Face to Face courses (0.6)

Meanwhile, *Part Time Students* are behaving as follows:

- Take more courses overall (4.37)
- Take fewer online courses (2.23) compared to full-time students (2.89)
- Take more Face-to-Face courses (1.71) compared to full-time students (0.60)

The *Unemployed Students* are acting as follows:

- Take a similar number of courses compared to part-time (4.34 versus 4.37)
- Take marginally fewer online courses compared to part-time (2.13 versus 2.23)
- Take marginally fewer Face to Face courses compared to part-time (1.62 versus 1.71)

Finally, one may conclude that modality type and reason for choosing a specific modality are most influenced by full-time employment. As time spent working increases, the time when a course is available matters more, favoring online classes due to their flexibility. As work-time decreases, preference toward a modality (notably, Face to Face) matters proportionally more.

Marital Status: Summary and Conclusions

Marital status is classified as single, married, single parents, and married parents. Tables 8 through 16 show how a student’s marital status affects the number of classes taken and class count percentages and how it changes the students’ course modality preference. Out of the 518 students who participated in the survey, there were 247 single students, 204 married students, 39 single parents students, and 28 married parents students.

Table 8: Marital Status and Class Count Percentage

| Number of Classes Taken and Class Count Percentage | | | | | | | |
|--|-------|-------|--------|--------|--------|-------|-----------|
| Marital Status | 1 | 2 | 3 | 4 | 5 | 6 | Row Total |
| Single | 0.77% | 4.83% | 5.41% | 12.55% | 17.95% | 6.19% | 47.7% |
| Married | 2.12% | 5.41% | 5.21% | 11.78% | 11.78% | 3.09% | 39.4% |
| Single Parents | 0.19% | 2.12% | 1.54% | 1.54% | 1.93% | 0.19% | 7.5% |
| Married Parents | 0.00% | 1.54% | 0.77% | 1.54% | 1.16% | 0.39% | 5.4% |
| Column Total | 3.08% | 13.9% | 12.93% | 27.41% | 32.82% | 9.86% | 100.0% |

Table 9: Single Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 4.27 | 2.31 | 1.56 | 0.27 | 0.13 | 247 |
| # of Classes Reported | 1055 | 571 | 385 | 67 | 32 | |
| % of Classes Load | 100% | 54.12% | 36.49% | 6.35% | 3.03% | |

Table 10: Married Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 3.89 | 2.86 | 0.81 | 0.11 | 0.11 | 204 |
| # of Classes Reported | 793 | 583 | 165 | 23 | 22 | |
| % of Classes Load | 100% | 73.52% | 20.81% | 2.9% | 2.77% | |

Single students take *more* classes on average (4.27 versus 3.89) and *more* Face-to-Face classes (1.56 versus 0.81; almost twice as much) than married students. As shown in Tables 11 and 12, married parents take *more classes* on average (3.64 versus 3.46) and *prefer online* courses (3.14 versus 2.03) compared to single parents. On the other hand, married parents, on average, take much fewer face-to-face classes than single parents (0.32 versus 0.85).

Table 11: Single Parents Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 3.46 | 2.03 | 0.85 | 0.36 | 0.23 | 39 |
| # of Classes Reported | 135 | 79 | 33 | 14 | 9 | |
| % of Classes Load | 100% | 58.52% | 24.44% | 10.37% | 6.67% | |

Single parents take, on average, the *fewest courses of any marital demographic* (3.46) and *favor the online modality over face-to-face* (2.03 versus 0.85).

Table 12: Married Parents Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average#. | 3.64 | 3.14 | 0.32 | 0.11 | 0.07 | 28 |
| # of Classes Reported | 102 | 88 | 9 | 3 | 2 | |
| % of Classes Load | 100% | 86.28% | 8.82% | 2.94% | 1.96% | |

Married parents *prefer online* courses by a large margin compared to any other modality in their group and, on average, have the highest number of online classes among any marital demographic (3.14). Tables 13 through 16 displayed below illustrate how marital status affects the various reasons for choosing Online and Face to Face course modalities.

Table 13: Single Students' Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 7.9% | Preferred Instructor | 13.7% |
| Time Fit Schedule | 43.4% | Time Fit Schedule | 25.6% |
| Preferred Modality | 13.3% | Preferred Modality | 39.7% |
| Only Time Offered | 22.2% | Only Time Offered | 13.3% |
| To be With a Friend | 0.7% | To be With a Friend | 2.6% |
| Other | 12.5% | Other | 5.1% |

Table 14: Married Students' Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 9.3% | Preferred Instructor | 15.9% |
| Time Fit Schedule | 52.1% | Time Fit Schedule | 24.3% |
| Preferred Modality | 12.7% | Preferred Modality | 34.6% |
| Only Time Offered | 12.4% | Only Time Offered | 19.6% |
| To be With a Friend | 0.4% | To be With a Friend | 0.0% |
| Other | 13.1% | Other | 5.6% |

Table 15: Single Parent Students' Reasoning for Choosing Online versus Face-to-Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 10.0% | Preferred Instructor | 14.8% |
| Time Fit Schedule | 50.0% | Time Fit Schedule | 18.6% |
| Preferred Modality | 12.5% | Preferred Modality | 25.9% |
| Only Time Offered | 7.5% | Only Time Offered | 22.2% |
| To be With a Friend | 0.0% | To be With a Friend | 3.7% |
| Other | 20.0% | Other | 14.8% |

Table 16: Married Parent Students' Reasoning for Choosing Online versus Face-to-Face

| Online | Percentage |
|----------------------|------------|
| Preferred Instructor | 2.7% |
| Time Fit Schedule | 59.5% |
| Preferred Modality | 10.8% |
| Only Time Offered | 13.5% |
| To be With a Friend | 0.0% |
| Other | 13.5% |

| Face to Face | Percentage |
|----------------------|------------|
| Preferred Instructor | 11.1% |
| Time Fit Schedule | 0.0% |
| Preferred Modality | 22.2% |
| Only Time Offered | 22.2% |
| To be With a Friend | 0.0% |
| Other | 44.5% |

Marital Status and Course Modality Choice: Overall Condensed Summary

Reasons for course modality selection among various marital status groups are overwhelmingly consistent.

- All marital status categories select online courses for their schedule convenience by a large margin over Face-to-face (almost twice as much and even higher).
- All marital status categories select Face-to-Face courses as they learn best from this modality.
- The number of married parents is low for Face-to-Face courses, with a sample size of 28. However, there is no reason to doubt that a similar pattern of reasoning emerges.
- For students with more time and fewer responsibilities (not in relationships or parental roles), the preference toward Face-to-Face modalities is consistent.
- For students with less inferred time and more responsibilities, the necessity of a course that fits a schedule is consistent with their modality choices.
- Single parents take the fewest courses of any marital demographic, on average 3.46, favoring the online modality and generally taking far fewer face-to-face courses.
- Married parents prefer online courses by a large margin compared to any other modality.

Age: Summary and Conclusions

Table 17 shows that the highest percentage of students taking courses based on the administered survey clusters around the 21-24 age bracket, taking 4-5 classes. Notably absent is the 18–20-year-old bracket, which may result from the majority religion in Utah since the Church of Jesus Christ of Latter-Day Saints is sending young women and men (aged 18-19) on service missions for one to two years. It would be valuable to compare this data versus data from an out-of-state institution, where that may not be the norm. Tables 17 through 22 below illustrate how age affects the number of cases taken and the class count percentage.

Table 17: Age and Class Count Percentage

| Number of Classes Taken and Class Count Percentage | | | | | | | |
|--|-------|--------|--------|--------|--------|-------|-----------|
| Age Group | 1 | 2 | 3 | 4 | 5 | 6 | Row Total |
| 18- | 0.00% | 0.00% | 0.00% | 0.19% | 0.00% | 0.00% | 0.19% |
| 18-20 | 0.39% | 0.19% | 1.54% | 2.70% | 6.95% | 1.93% | 13.70% |
| 21-24 | 1.35% | 5.21% | 5.98% | 14.48% | 17.57% | 7.34% | 51.93% |
| 25-29 | 0.77% | 3.47% | 2.12% | 5.41% | 5.98% | 0.39% | 18.14% |
| 30-34 | 0.00% | 1.35% | 1.54% | 2.90% | 1.35% | 0.19% | 7.33% |
| 35+ | 0.58% | 3.67% | 1.74% | 1.35% | 0.77% | 0.00% | 8.11% |
| No Response | 0.00% | 0.00% | 0.00% | 0.39% | 0.19% | 0.00% | 0.58% |
| Column Total | 3.09% | 13.90% | 12.93% | 27.41% | 32.82% | 9.85% | 100.00% |

Table 18: Age Group 18-20 Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 4.56 | 2.44 | 1.79 | 0.24 | 0.10 | 71 |
| # of Classes Reported | 324 | 173 | 127 | 17 | 7 | |
| % of Classes Load | 100% | 53.40% | 39.20% | 5.24% | 2.16% | |

Students in the 18-20 age bracket take 4.56 classes on average, which is higher than any other age group, and they prefer online classes to other modalities in their age group.

Table 19: Age Group 21-24 Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 4.23 | 2.58 | 1.30 | 0.20 | 0.14 | 269 |
| # of Classes Reported | 1137 | 693 | 351 | 55 | 38 | |
| % of Classes Load | 100% | 60.95% | 30.87% | 4.84% | 3.34% | |

Students aged 21-24 take an average of 4.23 classes and prefer online classes to other modalities in their age group.

Table 20: Age Group 25-29 Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 3.74 | 2.97 | 0.49 | 0.19 | 0.10 | 94 |
| # of Classes Reported | 352 | 279 | 46 | 18 | 9 | |
| % of Classes Load | 100% | 79.26% | 13.07% | 5.11% | 2.56% | |

Students aged 25-29 take an average of 3.74 classes and prefer online classes to other modalities in their age group. In fact, they take an average of 2.97 classes online, which is higher than any other age group.

Table 21: Age Group 30-34 Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 3.66 | 2.50 | 0.84 | 0.08 | 0.24 | 38 |
| # of Classes Reported | 139 | 95 | 32 | 3 | 9 | |
| % of Classes Load | 100% | 68.35% | 23.02% | 2.16% | 6.47% | |

Students aged 30-34 take an average of 3.66 classes and prefer online classes to other modalities in their group.

Table 22: Age Group 35+ Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 2.76 | 1.74 | 0.76 | 0.26 | 0.00 | 42 |
| # of Classes Reported | 116 | 73 | 32 | 11 | 0 | |
| % of Classes Load | 100% | 62.93% | 27.59% | 9.48% | 0% | |

Students aged 35 or older take an average of 2.76 courses, which is the lowest compared to other age groups. As students age, the number of classes taken across all modalities decreases. Tables 23 through 27 displayed below illustrate how age affects the various reasons for choosing Online and face-to-face course modalities.

Table 23: Age group 18-20 Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 9.4% | Preferred Instructor | 17.1% |
| Time Fit Schedule | 42.7% | Time Fit Schedule | 28.0% |
| Preferred Modality | 5.2% | Preferred Modality | 39.0% |
| Only Time Offered | 25.0% | Only Time Offered | 7.3% |
| To be With a Friend | 1.0% | To be With a Friend | 3.7% |
| Other | 16.7% | Other | 4.9% |

Table 24: Age group 21-24 Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 6.6% | Preferred Instructor | 14.5% |
| Time Fit Schedule | 46.7% | Time Fit Schedule | 26.1% |
| Preferred Modality | 14.1% | Preferred Modality | 40.6% |
| Only Time Offered | 18.8% | Only Time Offered | 13.5% |
| To be With a Friend | 0.3% | To be With a Friend | 0.5% |
| Other | 13.5% | Other | 4.8% |

Table 25: Age group 25-29 Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 9.7% | Preferred Instructor | 14.7% |
| Time Fit Schedule | 58.3% | Time Fit Schedule | 17.6% |
| Preferred Modality | 11.7% | Preferred Modality | 26.5% |
| Only Time Offered | 7.8% | Only Time Offered | 29.4% |
| To be With a Friend | 0.0% | To be With a Friend | 2.9% |
| Other | 12.6% | Other | 8.8% |

Table 26: Age group 30-34 Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 7.1% | Preferred Instructor | 5.0% |
| Time Fit Schedule | 59.5% | Time Fit Schedule | 20.0% |
| Preferred Modality | 11.9% | Preferred Modality | 40.0% |
| Only Time Offered | 11.9% | Only Time Offered | 20.0% |
| To be With a Friend | 2.4% | To be With a Friend | 0.0% |
| Other | 7.1% | Other | 15.0% |

Table 27: Age Group 35+ Reasoning for Choosing Online versus Face-to-Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 12.9% | Preferred Instructor | 5.0% |
| Time Fit Schedule | 48.39% | Time Fit Schedule | 15.0% |
| Preferred Modality | 22.58% | Preferred Modality | 20.0% |
| Only Time Offered | 6.45% | Only Time Offered | 45.0% |
| To be With a Friend | 0.00% | To be With a Friend | 5.0% |
| Other | 9.68% | Other | 10% |

Age and

Course

Modality Choice: Overall Condensed Summary

- As students age, the number of courses they take across all modalities decreases.
- On average, students in the 18-20 age bracket take 4.56 classes, the 21-24 age group takes 4.23, the 25-29 age group takes 3.74, the 30-34 age bracket takes 3.66, and the 35+ age group takes 2.76.
- The online course count generally increases as a student ages, while the face-to-face course count generally decreases.
- Additionally, older students tend to be further into a relationship (or parenthood). How age and marital status affect course modality preference and selection count are highly similar.

Gender: Summary and Conclusions

Out of the 518 students who participated in the survey, 318 were males, 194 were females, and six didn't reveal their gender as either male or female. Tables 28 through 32 illustrate how a student's gender affects the number of classes taken and changes their course preference.

Table 28: Gender and Class Count Percentage

| Number of Classes Taken and Class Count Percentage | | | | | | | |
|--|-------|-------|-------|--------|--------|--------|-----------|
| Student Gender | 1 | 2 | 3 | 4 | 5 | 6 | Row Total |
| Male | 0.39% | 5.14% | 5.82% | 15.14% | 25.72% | 9.61% | 61.82% |
| Female | 0.39% | 1.75% | 3.93% | 11.84% | 15.04% | 5.23% | 38.18% |
| Column Total | 0.78% | 6.89% | 9.75% | 26.98% | 40.76% | 14.84% | 100.0% |

Table 29: Male Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 4.01 | 2.56 | 1.12 | 0.20 | 0.13 | 318 |
| # of Classes Reported | 1274 | 814 | 357 | 63 | 40 | |
| % of Classes Load | 100% | 63.89% | 28.02% | 4.95% | 3.14% | |

Table 30: Female Students' Course Modality Choice

| | Classes | Online | Face to Face | Hybrid | Livestream | Sample Size |
|-----------------------|---------|--------|--------------|--------|------------|-------------|
| Average # | 4.06 | 2.57 | 1.15 | 0.22 | 0.12 | 194 |
| # of Classes Reported | 787 | 499 | 223 | 42 | 23 | |
| % of Classes Load | 100% | 63.41% | 28.34% | 5.33% | 2.92% | |

Table 31: Male Students' Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 8.4% | Preferred Instructor | 15.2% |
| Time Fit Schedule | 51.0% | Time Fit Schedule | 21.0% |
| Preferred Modality | 13.0% | Preferred Modality | 39.3% |
| Only Time Offered | 15.2% | Only Time Offered | 14.7% |
| To be With a Friend | 0.6% | To be With a Friend | 1.8% |
| Other | 11.8% | Other | 8.0% |

Table 32: Female Students' Reasoning for Choosing Online versus Face to Face

| Online | Percentage | Face to Face | Percentage |
|----------------------|------------|----------------------|------------|
| Preferred Instructor | 7.8% | Preferred Instructor | 12.5% |
| Time Fit Schedule | 44.8% | Time Fit Schedule | 28.5% |
| Preferred Modality | 12.1% | Preferred Modality | 34.0% |
| Only Time Offered | 19.4% | Only Time Offered | 18.8% |
| To be With a Friend | 0.4% | To be With a Friend | 1.4% |
| Other | 15.5% | Other | 4.8% |

Gender and Course Modality Choice: Overall Condensed Summary

- No statistically significant differences are found at the 5% level of significance between male and female students in terms of reasoning for selecting a particular modality.
- It may be inferred that gender has little to no bearing on why a student chooses a particular modality.
- Online courses are overwhelmingly chosen for scheduling reasons, while face-to-face courses are chosen primarily because of personal preference for that modality.
- Females, on average, take slightly more classes than males (4.06 versus 4.01), but that difference is not statistically significant at the 5% significance level.

Conclusions of the second phase of the study

A few key takeaways from the study's second phase are as follows. Overwhelmingly, online classes are selected to fit a schedule based on availability. Face-to-face courses are chosen

as a preferred teaching modality. Gender has little to no influence on why a student chooses a particular modality. Age, Marital status, and Employment status have notable impacts on the average number of classes taken by students and the learning modalities a student prefers and chooses. Students who are older, married, single parent or married parent, or have a full-time work schedule (less inferred free time or a busier schedule) tend to take more online classes, though reasoning for those choices remains the same.

The third finding on the effect of Age, Marital status, and Employment indicates several other insights. First, the perceived amount of “free time” a student has within their schedule is the primary factor in what class type students take. Students will prefer face-to-face classes if time or schedule is not a concern. As time or schedule tightens, online classes take a larger share. Hybrid or Livestream classes, as they still have a schedule requirement, tend to be used more by students with more open schedules. Ultimately, as students’ lives progress, online classes will increase proportionally to the rate at which face-to-face classes decrease.

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THE METAVERSE: A PATH FOR ENTREPRENEURIAL OPPORTUNITIES IN AN ENTREPRENEURIAL MINDSET CAMPUS

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ABSTRACT

With its potential to foster an entrepreneurial mindset, the metaverse holds immense promise for wealth creation within specific socio-economic contexts. Data from the Brookings Institute and the Nationwide Retirement Institute Consumer Survey highlight the need for further support to bridge the wealth gap for Black Americans. In this paper, we delve into the metaverse paradigm, explore its expansive possibilities, and provide guidance for aspiring student entrepreneurs at historically Black colleges and universities (HBCUs) to capitalize on its lucrative opportunities. In recent years, the burgeoning digital landscape of the metaverse has emerged as a breeding ground for student entrepreneurs, especially those at HBCUs. The metaverse acts as a transformative space, empowering students with an entrepreneurial spirit and a knack for digital technologies to create, trade, access, and enjoy a vast array of digital commodities, services, and entertainment that might be prohibitively expensive or entirely inaccessible in the real world. This paper aims to shed light on how the metaverse can stimulate entrepreneurship and contribute to narrowing the wealth gap for Black Americans.

Keywords: Metaverse, Entrepreneurial Mindset, Historically Black Colleges and Universities, Wealth Gap, Digital Landscape.

INTRODUCTION

The concept of human interaction within digital, computerized environments boasts a historical presence that spans more than 40 years (Collins, 2008). The evolution of computer technology and software development has paved the way for the emergence of the metaverse—a 3D, global, virtual reality environment. The term “metaverse” was first coined by Neal Stephenson in his 1992 science fiction novel *Snow Crash*, in which Stephenson described a persistent, immersive, 3D virtual environment that facilitates a range of activities from business to entertainment and is accessible to any user worldwide who has computer access (Collins, 2008).

The metaverse is in an early stage of creation, expansion, and rising popularity. Advancements in artificial intelligence (AI) enablers (e.g., machine learning, deep learning, and animation) are expected to contribute further to the development of a limitless world of human commerce and interaction. The metaverse presents an opportunity for budding student entrepreneurs to explore and think creatively within and beyond conventional norms.

In fact, nascent student entrepreneurs are often encouraged not merely to think outside the box but also to recognize that there is no box at all; the entire world is within their grasp, free from

restrictions, and every possibility is open to them. This mindset is especially advantageous for students of historically Black colleges and universities (HBCUs) trying to bridge the wealth gap. The metaverse promises to significantly enhance accessibility, diversity, and equality, thereby fostering an entrepreneurial mindset among these students.

Kauffman Compilation Report (2016) revealed that African Americans exhibit lower rates of entrepreneurial mindset development compared to other racial groups. This underlines the importance of financial understanding, knowledge, skills, and aptitude in bridging the wealth gap. In the report, it was suggested that businesses should facilitate increased exposure to entrepreneurial-oriented activities for students.

At present, several American business firms are spearheading the development of the metaverse. Prominent among these are Roblox Corp., Nvidia Corp., Unity Software, Inc., Advanced Micro Devices, Inc., Amazon.com, and Meta Platforms, Inc. (formerly Facebook). These companies, along with a host of researchers, scientists, and entrepreneurs, are anticipated to establish a metaverse that serves as a global platform for both emerging and established entrepreneurs to interact, trade, and share experiences. This process is expected to create a plethora of economic opportunities for innovative entrepreneurial firms, encompassing minority-owned, family-owned, and women-owned businesses.

However, the potential benefits of the metaverse hinge on the entrepreneurs' capacity to identify, evaluate, and leverage the forthcoming opportunities (Pomsuwan & Akkara, 2014; Lussier et al., 2016; Muhammad Muneeb et al., 2020). This statement highlights the importance of fostering an entrepreneurial mindset. One might posit that, during periods of economic prosperity, metaverse innovations might tend to surge. Innovation in the United States is a major source of investment, job creation, and national income. For example, the U.S. Chamber of Commerce Foundation (2024) reported that innovation contributes to approximately 50% of the United States's gross domestic product (GDP). From an economic standpoint, student engagement in the metaverse is likely to escalate with increased demand for goods, services, leisure, and virtual reality experiences that can boost national income.

Table 1 shows the GDP per capita for a selection of countries. These nations are anticipated to engage in the metaverse in various roles, including innovators, sellers, and buyers.

Table 1: GDP of Selected Countries, 2020 (U.S. dollars)

| COUNTRY | GDP | COUNTRY | GDP | COUNTRY | GDP |
|---------------|--------|-----------|--------|-----------------|--------|
| Switzerland | 87,097 | Sweden | 52,259 | Canada | 43,258 |
| Ireland | 85,268 | Australia | 51,812 | New Zealand | 41,478 |
| Norway | 67,390 | Finland | 48,773 | United Kingdom | 40,285 |
| United States | 63,544 | Austria | 48,328 | Japan | 39,539 |
| Denmark | 61,063 | Hong Kong | 46,324 | France | 39,030 |
| Singapore | 59,798 | Germany | 46,208 | Korea, Republic | 31,489 |
| Iceland | 59,270 | Belgium | 44,594 | - | - |
| Netherlands | 52,397 | Israel | 43,611 | - | - |

Source: The World Bank, <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

Entrepreneurs play a pivotal role in this dynamic, integrating their business ventures into the metaverse. These enterprises frequently launch innovative goods and services, highlighting features such as quality, convenience, reliability, and uniqueness. As previously noted, the entrepreneur's role spans venture creation, innovation, investment, and the identification and exploitation of opportunities (van Praag & Versloot, 2006; Boutillier, 2020; Masango & Lassalle, 2020). Nonetheless, the metaverse's potential surpasses mere entrepreneurial endeavors. It also

encompasses opportunities in software development, cloud infrastructure, and a plethora of other services.

U.S. ENTREPRENEURIAL SPIRIT AND THE METAVERSE

In contrast to many other nations, the United States has witnessed a substantial increase in the establishment of entrepreneurial firms. As illustrated in Table 2, the creation of new business ventures surged from 834,000 establishments in 2011 to 1,107,000 in 2021, representing an impressive 33% increase. This remarkable growth underscores the robust entrepreneurial spirit prevalent within American society. Over this period, the average annual business formation in the country amounted to a staggering 950,000 establishments.

Table 2: Birth of Private Establishment in the United States, 2011-2020 (Thousands)

| YEAR/MONTH | ESTABLISHMENTS | SUB-TOTAL | YEAR/MONTH | ESTABLISHMENTS | SUB-TOTAL | | | |
|--|--------------------------|--|--|--|--------------------------|-------|--|-------|
| 2011 March June September December | 204 210 206 214 | 834 | 2016 March June September December | 236 241 238 238 | 953 | | | |
| 2012 March June September December | 236 217 210 218 | | 2017 March June September December | 242 241 243 245 | | 971 | | |
| 2013 March June September December | 205 222 219 215 | | | 2018 March June September December | | | 248 265 251 249 | 1,013 |
| 2014 March June September December | 220 221 225 224 | | | | | | 2019 March June September December | |
| 2015 March June September December | 233 234 243 247 | 2020 March June September December | | | 316 227 277 287 | | | |
| Total | | | | | | 9,503 | | |

Source: Bureau of Labor Statistics, <https://www.bls.gov/news.release/cewbd.t08.htm>

However, it is crucial to acknowledge that a majority (approximately 85%) of these newly formed businesses tend to disappear within 3-4 years of their inception. The reasons behind these failures are diverse, encompassing factors such as insufficient capital, lack of a clear vision, mismanagement of resources, and even entering the wrong market. Despite these challenges, the country's resilient entrepreneurial spirit is anticipated to drive the expansion and development of the metaverse.

The propensity towards entrepreneurial activity in the United States can be attributed to a multifaceted range of factors, including:

- The free-market nature of the American economy: This fosters an environment conducive to innovation and risk-taking, which enables individuals to pursue their entrepreneurial dreams.
- The United States' political stability and adherence to the rule of law: This crucial element provides a predictable and secure environment where businesses can operate and thrive.
- The consistent growth and strength of the American economy: These factors offer a fertile ground for entrepreneurial ventures to flourish.
- The readily available resources such as capital, skills, technology, and infrastructure: These essential components underpin the success of entrepreneurial endeavors.
- Government support for business firms: This factor includes initiatives aimed at facilitating access to funding, providing training programs, and simplifying administrative procedures.

The combination of these factors has created a fertile ground for entrepreneurship in the United States, propelling the Nation to the forefront of global economic activity. As the country continues to foster this vibrant entrepreneurial spirit, its citizens can expect to reap the rewards of innovation, economic growth, and job creation.

THE METAVERSE

Although constantly evolving and championed by various sources, the metaverse remains a challenging concept to grasp and define fully. For instance, Thornhill (2021) heralded the metaverse as the "next big thing" in the digital realm, while *The Economist* (2021) envisioned it as a boundless successor to the Internet, a three-dimensional immersive world, poised to replace our current flat online experience. Snider and Molina (2021) further unpack the concept, highlighting how the metaverse blends various technological elements, including virtual reality, augmented reality, and video, to create a digital universe where users "live." Elliott (2021) added another dimension, viewing the metaverse as a limitless digital realm where anything imaginable can exist. Elliott further predicted that the metaverse would eventually become a seamless extension of our senses, allowing us to integrate digital elements into the physical world or fully immerse ourselves in 3D environments at will.

Belie et al. (2011) proposed that this immersive potential makes the metaverse particularly suitable for educational purposes. They advocated for using avatar-based, 3D virtual worlds as teaching platforms while citing the interactivity and rich experiences that this technology offers. In conclusion, although the metaverse remains a work in progress, its potential to reshape our digital interactions and experiences is undeniable. As technology continues to develop, the metaverse promises to blur the lines between the physical and digital, offering endless possibilities for connection, creativity, and learning.

BUSINESS OPPORTUNITIES

The development, upkeep, and growth of the metaverse presents an expansive range of opportunities for entrepreneurs and other stakeholders. Because of its inherent nature and functionalities, the metaverse is anticipated to foster a continuous flow of global interactions and transactions. Khoo (2021) identified the key components of the metaverse as follows:

- Infrastructure: This encompasses hardware items such as Virtual Reality headsets, operating systems, and cloud computing.
- Software: This includes tools for content creation and development platforms.
- Semiconductor industry: This covers the hardware and software components that drive the metaverse experience.

As a digital counterpart of the natural world, the metaverse will encompass a variety of activities, including creation, training, work, and collaboration. It will also facilitate the exchange of goods and services (e.g., cryptocurrencies, smart glasses, headsets, contact lenses, games, clothing, automobiles, and toys).

IDEA GENERATION FOR THE METAVERSE

Black entrepreneurs and other entrepreneurs must contemplate the metaverse, its development, and its prospects to identify potential opportunities for exploitation. Ideas, the lifeblood of entrepreneurship, innovation, and venture creation, are not born in a vacuum but rooted in events, problems, experiences, obsessions, emotions, or other ideas.

One strategy for generating new ideas involves dedicating free time to brainstorming business concepts. An effective method is the “outside-in” approach, where one considers replicating something existing, like a T-shirt, with minimal effort and expense. The subsequent step is to ponder how to make it unique or distinct from existing offerings in the market. Of course, this work necessitates market research, consultations with others such as family members, and an investigation into the cost of production.

Another approach for generating new business ideas is the “inside-out” method. This method typically leads to invention and innovation by focusing on ideas to solve consumer or societal problems or to invent entirely new products.

Many scholars have discussed the issue of idea generation, and they offered insightful suggestions. Notably, Pareras (2021) emphasized the crucial distinction between opportunities and ideas for entrepreneurs. Pareras suggested that entrepreneurs should focus on the following key aspects:

- Ensuring the business idea solves a real and existing need.
- Evaluating the scope and attractiveness of the opportunity.
- Understanding the efforts required to capitalize on the opportunity.
- Learning the anticipated return on investment for the opportunity.
- Initiating strategic action plans for success.

Griffiths-Hemans and Grover (2006) discussed the idea fruition process, outlining three stages:

1. Idea creation: generating new concepts and solutions.
2. Idea concretization: developing and refining the best ideas.
3. Idea commitment: securing resources and support for implementation.

Michalko (2003) emphasized that creative individuals challenge assumptions, explore diverse approaches, and view issues from multiple perspectives. Heinonen et al. (2011) highlighted the importance of individual creativity in crafting business ideas and incorporating creative thinking throughout venture planning. Witell et al. (2011) investigated how customer-generated ideas can be used to enhance product quality. Finally, De Bono (1985) proposed that new ideas offer individuals the following benefits:

- New ways of doing things: finding more efficient or effective methods.
- New ways of looking at things: gaining different perspectives and understanding.
- New ways of presenting things: communicating ideas in novel and engaging ways.
- New ideas about ideas: becoming more adept at generating and refining concepts.

The American economy is currently grappling with significant income inequality, which has prompted discussions about academic programs that could address this gap. Entrepreneurship has been recognized as a potential solution to close the racial wealth gap, as Howard (2019) noted. However, individuals of color continue to exhibit lower rates of entrepreneurship, as the Ewing Marion Kauffman Foundation (2016) reported, emphasizing the urgency of addressing this disparity.

HBCUs play a vital role in shaping the next generation of leaders by fostering entrepreneurial thinking across diverse disciplines. These institutions provide guided support, structure, and processes to assist students in launching successful businesses. Moreover, HBCUs have a rich history of outreach and success within the African American community, positioning them well to create impactful change.

According to the Higher Education Act of 1965 (as amended), an HBCU is defined as any historically black college or university that was established prior to 1964, whose principal mission was, and is, the education of Black Americans, and that is accredited by a nationally recognized accrediting agency or association determined by the Secretary [of Education] to be a reliable authority as to the quality of training offered or is, according to such an agency or association, making reasonable progress toward accreditation. (Source: <https://www.govinfo.gov/content/pkg/COMPS-765/pdf/COMPS-765.pdf>)

HBCUs offer students of all races the opportunity to develop their entrepreneurial skills and talents. For over a century, these institutions have been instrumental in educating and empowering African Americans. They have equipped generations of men and women with the knowledge and tools to bridge the wealth gap and positively affect their communities.

The economic downturn caused by the global pandemic has led many HBCUs to incorporate an entrepreneurial mindset into their curricula. This shift has been driven by the experiences of many young people in underserved communities, who have witnessed their parents' layoffs and their peers struggle to establish traditional careers. As a result, entrepreneurship education has moved from the periphery to the center of higher education, including HBCUs.

Previously, conventional 9-to-5 jobs offered a sense of security. However, this perception has diminished. Entrepreneurship, which was once considered relatively risky, now holds greater appeal. Students increasingly focus on their individual talents and "personal brands" as the foundation for a more secure future rather than relying solely on corporate paychecks.

HBCUs now bear the responsibility of developing an entrepreneurial-minded curriculum. This curriculum is aimed to empower students to thrive in their communities and to operate effectively and efficiently within the larger economy. It is designed to prepare students for success, regardless of the path they choose, whether their path is a conventional 9-to-5 job or an entrepreneurial journey. Ultimately, these efforts are aimed to bridge the racial wealth gap and to create a more equitable future.

The curriculum at HBCUs is designed with an entrepreneurial mindset. Its primary goals are (a) to equip students with the necessary skills and knowledge to achieve their educational objectives, (b) to acquire relevant credentials, and (c) to gain valuable work experience. The

program emphasizes experiential learning and co-curricular activities, teaching students the skills required to start, manage, and lead a business, regardless of their academic discipline. This holistic approach aims to cultivate a workforce that meets the needs of the business community and society at large.

In addition to preparing students to become capable employees at established organizations, the program also empowers them with the knowledge and skills to become successful entrepreneurs. By fostering an entrepreneurial mindset, students are prepared to create market-demanded products and services, automatically creating jobs and stimulating economic growth.

The entrepreneurial skills acquired at HBCUs provide students with the fundamental knowledge needed to launch, fund, market, and operate successfully sustainable, socially conscious, and commercially competitive businesses in the real world. These skills go beyond mere academic knowledge; they empower students with the confidence and ingenuity to translate their ideas into tangible successes.

The HBCU campus provides students with invaluable resources that support and enhance their workforce development and readiness. This robust support system nurtures their innovative potential, regardless of their chosen field of study.

DISCUSSION

The business landscape has undergone significant transformations since the 1980s, with the integration of technology playing a pivotal role in both business and higher education. This transformation has been largely driven by trade that encompasses domestic and international exchange of goods and services and income growth.

The rapid advancements in technology witnessed in recent years have been facilitated by several key factors, including supportive government policies, entrepreneurial endeavors (particularly within higher education institutions), and public acceptance. Economists anticipate that this rapid evolution will accelerate further in the coming years, fueled by economic prosperity, anticipated breakthroughs in innovation and invention, and the emergence of the metaverse.

With its immersive virtual reality capabilities, the metaverse presents a unique opportunity to inspire budding student entrepreneurs, particularly those attending HBCUs. Many of these students often grapple with stereotypes as they strive to make a positive impact on their communities. The metaverse can provide them a platform to bridge the wealth gap and reshape the domestic and international business landscape.

The increased application of technology in trade has led to the emergence of electronic commerce (e-commerce), which, in turn, paved the way for the rise of e-entrepreneurs and, more recently, metaverse entrepreneurs (m-entrepreneurs). Kollmann (2006) defined e-entrepreneurship as the act of establishing new companies within the networked economy. Both m-entrepreneurs and e-entrepreneurs are more technology-oriented businesspeople compared to traditional entrepreneurs. However, the motivating factors for all types of entrepreneurs generally involve seeking, recognizing, and capitalizing on economic opportunities by creating business ventures. M-entrepreneurs, in particular, are metaverse-focused opportunity explorers—individuals who view the digital world as their domain for entrepreneurial activity. The main attributes of m-entrepreneurs and e-entrepreneurs can be summarized as follows:

- They establish technology-based virtual ventures rather than brick-and-mortar entities.
- They are more willing to test new ideas, technologies, and business models compared to other entrepreneurs.
- They thrive on innovations.
- They are more inclined towards risk-taking, as Web-based ventures are usually riskier than brick-and-mortar ventures.
- They are less likely to face entry barriers compared to traditional business ventures because they are more adept at creating their own market niche.
- They are likely to be more globally oriented than other entrepreneurs because of the nature of their ventures.

M-entrepreneurial firms, as virtual entities, can be distinguished from traditional entrepreneurial firms in numerous ways. These distinctions include differences in business models, technology infrastructure, organizational culture, and modes of communication. An entrepreneurial mindset fostered on HBCU campuses will provide students with access to essential resources—knowledge, skills, and aptitude—needed to support and enhance the development and readiness of student m-entrepreneurs. This support is crucial as students engage in creating innovative m-entrepreneurial ideas, regardless of the discipline they pursue.

When planning a business venture, m-entrepreneurs must identify a product or service they wish to offer. This choice is typically influenced by the m-entrepreneur's skills, experience, education, and resource availability. Furthermore, like other successful businesses, m-entrepreneurial firms thrive on both intangible and tangible assets (e.g., knowledge, patents, technology, and trademarks).

The campus of HBCUs with a strong entrepreneurial mindset requires nurturing, enhancement, and expansion to benefit students. This mindset is essential because students are the catalysts for growth and the competitive edge necessary for success. It is noteworthy that entrepreneurial firms are inherently designed to grow. However, such growth should not be left to chance; it must be managed strategically. There are multiple strategies for managing growth effectively. Viewing a university campus as a business venture, Krogh and Cusumano (2006) proposed three distinct strategies:

- Scaling, which involves creating a vision for the venture;
- Duplication, which refers to business expansion; and
- Graduation, which essentially means business diversification.

CONCLUSION

The metaverse, a fusion of technologies, talents, systems, and strategies, offers a myriad of economic opportunities for aspiring entrepreneurs, especially those from marginalized communities. In this paper, we suggested that the successful exploitation of these opportunities necessitates their recognition, analysis, and careful selection. We also emphasized the need for entrepreneurs to develop a specific vision, mindset, and skill set. The metaverse extends beyond software development and technical aspects, offering exciting opportunities in various fields such as virtual wellness, telemedicine, gaming, marketplace experiences, workplace interactions, and education and training. This emerging frontier has the potential to revolutionize these fields, paving the way for innovative solutions and enhanced experiences.

Web-based micro-entrepreneurial firms employing innovative business models and resources across diverse economic sectors will primarily shape the metaverse. The entrepreneurial

spirit is a topic of intense discussion among stakeholders because of its substantial contributions to employment, investment, and technological advancement. As the metaverse illustrates, visionary leaders often anticipate and capitalize on emerging opportunities born from technological progress, economic development, and other environmental shifts.

The rapid emergence of the metaverse promises to unveil new avenues for micro-entrepreneurs, business firms, and others. This new avenue is further underscored by Meta Platforms, Inc.'s (formerly Facebook; 2021) announcement of its intention to create 10,000 new positions that will be dedicated to developing its metaverse. A micro-entrepreneurially inclined HBCU campus's growth will likely hinge on its ability to learn and adapt by accumulating knowledge of the market, industry, technology, and competition. However, the highly dynamic and rapidly developing nature of the metaverse's surrounding environment presents a challenge for HBCU leaders. They are currently focused on strategies for revenue generation and student retention; therefore, prioritizing the development of a micro-entrepreneurial campus might not be at the top of their agenda.

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Author's Guide

The JBL publishes original empirical, conceptual, and case study manuscripts. All manuscripts submitted for publication shall not be under review with another publisher while being considered by the JBL. Submissions must be saved as a .doc file and sent electronically via e-mail to the editor with the subject JBL Manuscript Submission.

Only MS Word documents will be accepted for review. Do not send pdf files. Manuscripts should be between 4000 and a maximum of 8000 words, including an abstract (150-300 words approx.), keywords, appendices, references, figures, and tables. Tables must be placed where you want them to appear in the manuscript. Papers are to be prepared in English and edited to avoid grammatical and typographical errors. The manuscript must be in APA format, single-spaced with 1-inch (2.54 cm) margins around Times New Roman 12-point font with the exception of the title, which must be 16-point and authors 14-point, both bold. The paper should begin with a title, author's information (12-point font), and the word "abstract" (10-point font, bold and capitalized), each of which must be centered. Alignment of the paper body must be "justify".

The first page of the manuscript is a separate *Title Page* with author names and affiliations. The Manuscript title appears on the first line or lines, followed by the author's information with each author and the author's affiliation on one line. The author's information line should contain the author's first name, last name, and institutional affiliation. No other identifying information about the author(s) should appear in the manuscript except on the *Title Page*.

The second page of the manuscript will begin with the *Abstract*, followed by *Key Words* (5-8), and then the body of the manuscript. Leave one blank line between the word abstract and the abstract itself. Leave two blank lines between keywords and the body of the manuscript. There must be a blank line between paragraphs, with the first line of each paragraph indented (0.5 inches). Please do not use columns. References need to be consistent and in APA format. Every sub-heading should be bold and capitalized.

The journal uses a double-blind peer review process. Submissions must include a separate page for the paper's title, author(s) name(s), and e-mail address of the contact person for the paper. See the example paper for more.

SAMPLE PAPER FOR *THE JOURNAL OF BUSINESS LEADERSHIP* OR PROCEEDINGS PUBLICATION

Jane Smith, University of Abcdef

ABSTRACT

Each paper (except case studies) must start with an abstract. The abstract should be approximately 150-300 words long and summarize the topic and findings of the paper. It should also be italicized and formatted in the same manner as the rest of the document (see instructions below).

When you complete your manuscript, we will ask you to submit it as an MS Word file (.doc or .docx). Please work with us to make the document look great! Follow these directions carefully, resulting in a highly professional appearance.

Keywords: Include Three to Five Keywords

INTRODUCTION

The following sections of this document will give insight into using it as a template to create a nice-looking paper. However, you do not need to use this file as a template if you are mindful of how you format your document. The aim is to make your document look “camera ready” so that we do not need to make any modifications. For your convenience, here is a summary of the key elements.

- The page size for the document should be set to 8.5 by 11 inches.
- The margins should be set at one inch all around.
- The document must be single-spaced.
- Turn on Widow/Orphan control and avoid headings to break over a page.
- Do not use headers or footers.
- The font should be Times New Roman, 12-point font (with the size exceptions mentioned below for quotes, tables, and references).
- The document must use full justification throughout (except the headings that need to be centered).
- Each paragraph should begin with a left tab or first-line indent of one-half inch (typically the default tab option).
- There should not be any extra blank lines between paragraphs unless a section of text needs to stand out from the other paragraphs.
- Title of the paper must be in ALL CAPITAL LETTERS, bolded, centered, and in 18-point font.
- The Authors' names and affiliations should be in 14-point font, bolded, and centered. Please do not use honorifics for author names (e.g., Ph.D., Dr., etc.).
- The document's main headings should be in ALL CAPITAL LETTERS, bolded and centered in the default 12-point font. Subheadings should be in Initial Capital Letters,

bolded and left-justified. Pay attention not to orphan a heading from the text that follows at the bottom of a page. More information on headings can be found in the sections below.

- If the paper contains hypotheses, lists, formulae, tables, figures, or footnotes, please read those sections below for more information.
- References should be APA style in 10-point font, single-spaced between references, with hanging indents.
- It is important to make your document look consistent with this document before it is submitted for publication.

FORMULAE

Below, we have inserted some meaningless formulae to serve as an example. In this example, we offset the equation by one-half inch and set a left tab on the ruler bar at the margin to handle the display of the equation number. You change the tab type on the ruler bar by clicking the little icon at the far left edge. The tab type will change, and then you can click on a location within the ruler bar to insert the newly defined tab.

$$x \lim_{x \rightarrow \infty} \left(-b \pm \sqrt{b^2 - 4ac} \right) \frac{\sqrt{\quad}}{2a} \quad (1)$$
$$\sum_{i=1}^n X_i = \frac{1}{n}$$

When you have certain formulaic characters that are italicized letters (i.e., *r*, *z*, etc.) that you would like to include in the body of a paragraph, it is best to use the letter rather than a formula box. Formula boxes in the body of paragraphs can alter the line spacing, which we would like to avoid, if possible.

TABLES

We encourage you to submit your tables just as you want them to appear. With that in mind, we have a few requests to maintain consistency from one paper to the next. We would like the table contents to be in 10-point font (or smaller if the table size calls for it) and centered on the page. Tables should NOT exceed the width of the one-inch margins of the document. Please include the title **inside** the table's borders, as shown below. The table title should be centered, bolded, and in the same size font as the rest.

Left justify, center, or right justify columns in your table to make your material more readable, as you desire. Please note that an auto-indent setting in your “Normal” tab will affect the contents of your table. To correct this, highlight the table, open the “Paragraph” box in the “Home” tab, and remove the first line indent instruction. Also, please place the tables where you would like them to appear in the document's body. If the table breaks a page, move text material from above or below to keep the table on one page. If the table cannot fit on one page, set the title and descriptive rows to “repeat” on the following page.

Table 1: DESCRIPTION OF STUDY

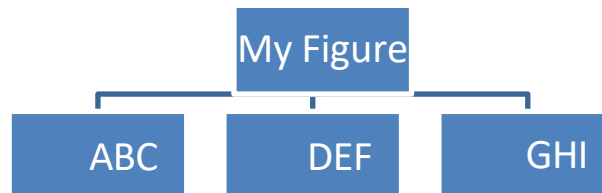
| COMPANY | NAME | DATE |
|---------|---------|-----------|
| ABC | A Name | 1/1/2010 |
| DEF | B Corp. | 1/2/2009 |
| GHI | C. Name | 5/5/2008 |
| WXY | D. Inc. | 7/21/2007 |

If your table is highly complex or large, you can try to get it to work by sizing down the font to 9 points or even 8 points. Do NOT exceed 8 points, as reading your table will be extremely difficult. If you cannot get your table to work on the page, you must create it as a JPG and shrink it to fit.

FIGURES

Your figures should always be centered and have a title for reference purposes. Remember to use Times New Roman as the font when you create figures, and think about how they will look in the journal. Generally, figures should not exceed 6 inches in width. Put the figures where you want them to appear and format them the way you want them to look in the final document.

Figure 1: Title



If you have highly complex figures or trouble placing them in the manuscript, you may need to consider engaging us to process them. You can contact us for a price quote for any aspect of the formatting process.

GUIDELINES FOR CASES

Prepare cases as described above with these exceptions. First, instead of an abstract, begin the case with a “Case Description” and a “Case Synopsis,” both in italics, as illustrated below. Technical information is in the Description, while the Synopsis should gain the reader's interest. The body of the case should follow the synopsis, separated by a heading. Prepare the “Instructors’ Note,” described more fully below, using these instructions as well. Never forget that the Note is more important than the case, at least from the perspective of accrediting agencies for your university!

CASE DESCRIPTION

The primary subject of this case concerns (describe the most important topic, i.e., entrepreneurship/conflict management/ethics/etc.). The secondary issues examined include (list as many as the case contains, just like for the primary subject). The case has a difficulty level.

Of (choose one of the following: one, appropriate for freshman-level courses; two, appropriate for sophomore-level courses; three, appropriate for junior-level courses; four, appropriate for senior-level courses; five, appropriate for first-year graduate level; six, appropriate for second-year graduate level; seven, appropriate for doctoral level). The case is designed to be taught in (indicate how many) class hours and is expected to require (indicate how many) hours of outside preparation by students.

CASE SYNOPSIS

This section presents a brief overview of the case (a maximum of 300 words). Be creative. This section will be the primary selling point of your case. Potential case users are more apt to choose adoption cases that catch their fancy.

The Case Description and Case Synopsis are not used when the case is assigned to students. Their purpose is to inform instructors and prospective users of the case.

CASE BODY

The body of the case will follow the description and synopsis and should be formatted according to the preceding instructions. Avoid using photographs or extensive exhibits, making reading the case more difficult. The general rule of thumb is that if looking at this exhibit is not important to the decision point of the case, then omit it.

Please do NOT include assignment questions in the body of the case. These should be in the Instructors' Notes. Leaving them in the case body will prejudice student readers, who will seize on the assignments and ignore much of the case's content.

INSTRUCTORS' NOTES

Instructors' Notes are an important part of the referee process and must be included with all cases submitted for review or publication. Notes should be prepared in accordance with these publication guidelines and as a separate manuscript and file because the case notes are published in a different issue from the case.

Prepare Instructors' Notes for use by instructors unfamiliar with the case issues. The note should allow the instructor to teach the case without additional research. Begin the note with a **REPEAT** of the Case Description and Case Synopsis. Follow the Case Synopsis with Recommendations for Teaching Approaches. Specific questions, assignments, or teaching methodologies should follow. Be sure to **INCLUDE ANSWERS** for all questions or assignments. Please do not include the questions and assignments in the case; include them in the Instructor's Note instead. This gives instructors more flexibility in what to assign. Epilogues, if appropriate, should close the note. If your case is from library research, include the references for all material used in a **REFERENCES** section.

REFERENCES

References should be completed using APA style. They must be single-spaced, left justified, and completed in Times New Roman 12-point font.

PUBLICATION POLICIES AND PROCEDURES

Review Process

All journal submissions undergo the double-blind peer review process by members of the Editorial Review Board and volunteer reviewers. The review process is as follows:

1. The journal Editor will review papers for appropriateness and use a plagiarism verification tool to ensure the work has not been plagiarized.
2. The Editor will send the manuscript to two reviewers without disclosing the identities of the authors or second reviewer.
3. The review results are confidentially delivered to the Editor, who then reviews the feedback to ensure the comments are relevant and non-discriminatory. The reviewer's comments are sent to the author(s) with the editor's decision regarding publication.
4. The reviewer's feedback and the Editor's decision are sent to the authors. Submissions are either Accepted, Accepted with Minor Revisions, Accepted with Major Revisions, or Rejected for publication.
5. Author(s) receiving an acceptance with revisions determination are instructed to revise and resubmit the article.
6. Revised papers are returned to the Editor, who returns the revisions to the original reviewers.
7. Feedback from the second round of reviews is processed in the same manner. In some cases, author(s) are given a second opportunity to revise and resubmit papers if they are not found acceptable after the first revision.
8. If accepted for publication, the author(s) are notified by the Editor and provided with instructions on the submittal process.

Accepted Journal Article Requirements

The submission must be formatted according to the sample paper for *The Journal of Business Leadership*. Accepted submissions not formatted according to the guidelines will be sent back to the corresponding author for formatting updates.

Ethics Policy

The Journal of Business Leadership's publication ethics policy follows the Committee on Publication Ethics (COPE) Best Practice Guidelines for Journal Editors, Reviewers, and Authors. The JBL attests that journals remain transparent and neutral to regions and religions and will not discriminate based on age, gender, race, or physically challenged people. The journal strictly abides by the review for publication ethics as recommended by the COPE and remains transparent in acknowledging the source while publishing the information collaboratively.

Authors verify: Submitted manuscripts are the original work of the author(s) and that all contributing authors are listed and given credit. Manuscripts have not been published nor are under consideration by another journal concurrently. All sources of data used in the development of the manuscript are properly cited.

Reviewers verify: Manuscripts are reviewed based on the intellectual content of the paper without regard to gender, race, ethnicity, religion, citizenry, or political values of the author(s). Conflicts of interest during the review process must be communicated to the Editor. Manuscript information is kept confidential. Any concerns regarding the review of a manuscript are communicated to the Editor.

Editors verify: Manuscripts are evaluated in fairness based on the intellectual content of the paper without regard to gender, race, ethnicity, religion, citizenry, or political values of authors. Conflicts of interest pertaining to submitted manuscripts must be disclosed. Manuscript information is confidential. Publication decisions of submitted manuscripts are based on the reviewer's evaluation of the manuscript, policies of the journal editorial board, and legal restraint acting against plagiarism, libel, and copyright infringement rest with the Editorial Board.

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