2020 CONFERENCE PROCEEDINGS

NORTHEAST BUSINESS & ECONOMICS ASSOCIATION

Forty-Seventh Annual Conference
November 12-13, 2020

Hosted by

University of New Hampshire
Peter T. Paul College of Business and Economics

A Virtual Conference

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The Peter T. Paul College of Business and Economics delivers high quality undergraduate and graduate business education. It holds AACSB accreditation, a distinction held by less than five percent of the world's business schools. Paul College ranked #67 nationally in the 2020 Poets&Quants list of the best undergraduate business schools. The Online MBA program ranked #40 nationally by U.S. News & World Report.

Paul College is part of the University of New Hampshire, a major research institution providing comprehensive, high-quality undergraduate and graduate programs. Home to about 15,000 students, it is located in the Seacoast region of the state. The ocean is about 15 miles to the east. Boston, with its rich array of cultural resources, is 70 miles to the south. The White Mountain National Forest, offering skiing, hiking, and other mountain-related recreational activities, is 70 miles to the north. The university is categorized as R1 under the Carnegie Classification system and holds land-grant, sea-grant, and space-grant charters.

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University of New Hampshire
Peter T. Paul College of Business and Economics

Northeast Business & Economics Association

Proceedings of the 47th Annual Meeting
November 12-13, 2020

Stephen Ciccone, Editor

Northeast Business & Economics Association

2020 Conference Proceedings

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Dear Colleagues and Friends,

On behalf of the Northeast Business & Economics Association Board Members, I want to thank you for making our 47th annual conference such a successful one. For those who joined our conference for the first time, I hope that you attended many of the sessions and that you found them to be engaging. This year's format has been memorably different than the previous 46 years and we hope also from future conferences beginning in 2021. We did not get to see and be seen, hear and be heard, meet and greet, wine and dine as we would all like. But we came through - thanks to all of you.

As many of you know, this year's Conference Chair, Ahmad Etebari, and Proceedings Editor, Stephen Ciccone, had made extensive plans for a conference on a grand scale in beautiful Portsmouth, New Hampshire. When we had to pivot to a virtual conference, they learned quickly to adapt, serve, and host this virtual conference. I know you'll agree that they both did an excellent job.

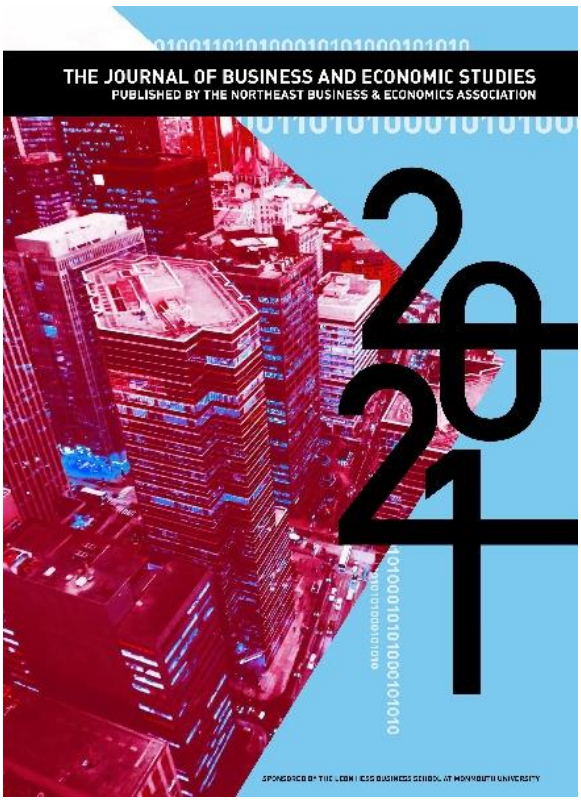
Because of the continued uncertainties related to the pandemic, we have not decided yet the dates and venue of our 2021 NBEA conference. We will inform you as soon as we decide and do hope that you will join us in 2021!

With warm regards,

Amit Mukherjee
President, Northeast Business & Economics Association

Call for Papers

Journal of Business and Economic Studies

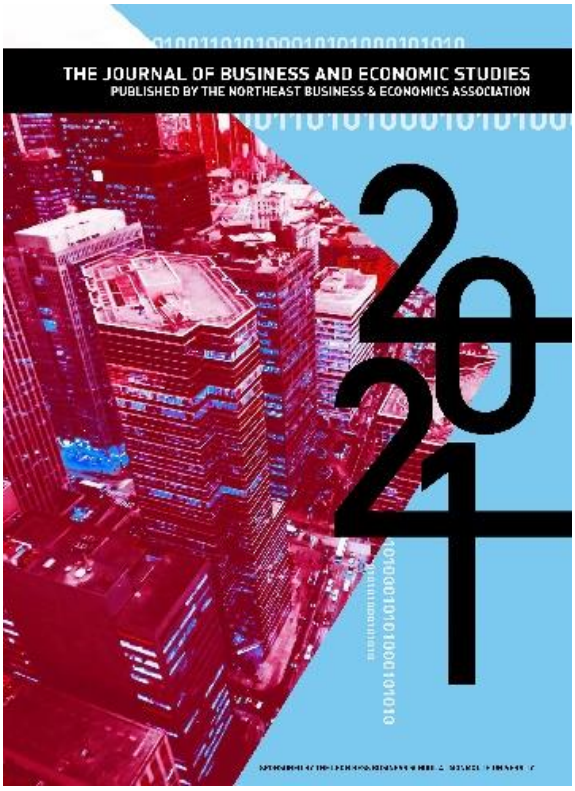


The Journal of Business and Economic Studies (JBES) is the official peer-reviewed journal of the Northeast Business & Economics Association (NBEA). The journal is published online as a Gold Open Access journal.

In October of 2018, the journal returned from a 3-year hiatus of publishing, and we have now released four additional issues, which can all be seen at https://jbes.scholasticahq.com. Submissions are increasing, and we are well positioned to move ahead. Our next issue is due out in a few weeks and we will have another one in April of 2021. We are now reviewing articles for October 2021 and initiating a call for more to consider.

The Journal of Business and Economic Studies seeks high quality papers in ALL AREAS of business. The journal publishes original empirical and theoretical papers, case studies, and book reviews. The journal is listed in Cabell's Directories, AEA's EconLit, Proquest, and EBSCO databases. All submissions are double blind peer reviewed and our target is to have initial reviews done within two months. You can see the editorial board and author instructions at http://jbes.scholasticahq.com.

WE NEED REVIEWERS!!!



We need members of the Northeast Business and Economics Association to step up and help us review articles for the association's journal, JBES. If you are willing to help out, please send an email to Scott Jeffrey (sjeffrey@monmouth.edu), the journal's managing editor, stating your areas of expertise for reviewing.

You may receive up to three requests per year, but always have the option to decline the invitation for whatever reason. Our goal is to turn reviews around within 30 days. Being a reviewer helps us but also helps you develop as a scholar.

THANK YOU FOR CONSIDERING THIS REQUEST!!!

Scott

Special Issue Call for Papers

The Journal of Business and Economics Studies is looking to publish a special issue for "Teaching Cases." If you have a teaching case you would like to submit for publication, please do so. It will undergo our normal review process. Our goal is to publish this in March of 2021.

We want to keep these in reserve to give out with the permission of the author. This will publicize your case and make it more likely that it will be used.

If you want to submit a case, please visit our website at https://jbes.scholasticahq.com/for-authors and click on submit manuscript.

Northeast Business & Economics Association

2020 Conference Proceedings

Papers (Listed Alphabetically by Lead Author)

Machine Learning Modeling Predicting Coronavirus Case Count Using Health Literacy

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ABSTRACT
Health literacy is a discrete form of literacy and becoming an increasingly important aspect for social, economic, and health development. It is already seen as a crucial tool for the prevention of non-communicable disease with investments in education and communication. However, there is not enough knowledge on health literacy's impact on communicable diseases. Today with the rapid development of coronavirus disease 2019 (COVID-19), a communicable disease, there has been a need for people to acquire and apply health information. (Paakkari & Okan, 2020) Health communication intended to educate people has become widely available. However, there is also a lot of misinformation, thus forcing individuals to filter and be health literate.
This investigation created successful models for predicting the number of COVID-19 cases from data regarding the United States Census Bureau, Internal Revenue Service (IRS), Centers of Medicare and Medicaid Services, and National Science Board. The successful execution of these machine learning models builds an association between health literacy and COVID-19, under the assumption that states with high COVID-19 cases associate with areas of lower health literacy. These models can be deployed for further analysis of state health care costs and policy challenges.

Keywords
Health literacy, machine learning, linear regression, logistic regression, random forest, XGBoost, ensemble learning, gradient boost, ordinary least squares regression, socioeconomic, sociodemographic

1 INTRODUCTION

The first use of the phrase "health literacy" occurred in 1974, by Dr. Scott K. Simonds. After its introduction, the term began appearing in academic peer-reviewed literature in the early 1990s and has experienced exponential growth ever since. (Baker, 2006) Indicating a growing internationalization of the field of health literacy.

However, as the field of health literacy has expanded in scope and depth, the term "health literacy" has come to take different meanings and a source of debate. The American Medical Association's Ad Hoc Committee on Health Literacy, defined the term as a constellation of skills, including the ability to perform basic reading and numerical tasks required to function in the healthcare environment such as comprehend prescription bottles, appointment slips, and other essential health related materials. (Baker, 2006)

The Institute of Medicine (IOM) and Network of the National Library of Medicine expanded on this definition of health literacy as a set of individual capacities. Stating that an individual's health literacy is mediated by education, which is affected by culture, language, and the characteristics of health-related settings. (Institute of Medicine (US) Committee on Health Literacy et al., 2004) Thus, depicting health literacy as a shared function of cultural, social, and individual factors.

The first domain within health literacy is individual capacity, which is the set of resources that a person has to effectively understand health information, health care personnel, and the health care systems. Individual capacity has two components: reading fluency and prior knowledge. (Baker, 2006) Reading fluency is the ability to mentally process written materials and form

new knowledge, which measured by The National Adult Literacy Study (NALS) three skills, to read and understand text, locate and use information in documents, and apply arithmetic operations in successfully using numerical information from printed materials. Prior knowledge is composed of vocabulary and conceptual knowledge.

The second domain in health literacy is culture and society, which refer to the shared ideas, meaning, and values of individuals as members of society. (Baker, 2006) This influences how people interact with the health system and helps determine the adequacy of health literacy skills. Culture and society are measured through native language, socioeconomic status, gender, race, and ethnicity.

The third domain in health literacy is the education system, which is measured through the K-12 system, adult education programs, and higher education. (Baker, 2006) K-12 education is charged with the development of literacy and numeracy skills in English, and is the foundation for complex comprehension, that are further applied in higher education. Adult education programs provide opportunities for individuals who drop out of K-12, have completed high school but did not acquire strong skills, did not have full school opportunities, or immigrants who may never had access to education.

The last domain in health literacy is the health care system, which includes all people performing activities such as health-related messages and action plans. (Baker, 2006) There is consistent evidence supporting the notion that health literacy affects the interaction of individuals with health contexts and the health-care system, and may further affect health status and outcomes.

Today the world is seeing an unprecedented pandemic caused by the communicable disease, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), or commonly known as COVID-19. (Coronavirus, 2020) The virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. The elderly and individuals with underlying medical conditions are more likely to develop a serious illness. In efforts to combat this crisis, one of the biggest questions of health literacy has been brought to the public attention. Is health literacy as important for the prevention of communicable disease as it is for non-communicable diseases?

2 MATERIALS AND METHODS

The goal of the research was to develop machine learning models for predicting COVID-19 case count per state according to the socioeconomic and sociodemographic analysis of each state. This goal was achieved through primary exploratory data analysis (EDA) and several machine learning models consisting of linear regression and support vector regression (SVR), ensemble learning models which are random forest, and xgboost.

Machine Learning

Machine learning is defined as computational methods, which use available past information to improve performance or make accurate predictions. Learning corresponds to adjusting the values of these parameters so that the model matches best with the data it sees during training. Based on this training data, the model with the help of its hyperparameters becomes specialized to the particular task that underlies the data. This version of the model becomes the algorithm for that task. (Alpaydin, 2010)

Linear Regression and Support Vector Regression (SVR)

Linear Regression attempts to model the relationship between two variables by fitting a linear equation to the observed data. One variable is considered as the explanatory variable, and the other is considered to be the dependent variable. This does not imply there has to be a cause and effect relationship between the variables, but there is a significant association between the two. (Barron & Kim, 1998)

Support vector machines (SVM) are a set of supervised learning methods used for classification, regression, and outlier detection. For the goal of this project, Support Vector Regression is used. The advantages of SVRs are: effective in high dimensional spaces and where the number of dimensions is greater than the number of samples. SVR models use a subset of training points in the decision function (called support vectors), and different kernel functions can be specified for the decision function. SVRs also depend only on a subset of the training data, because the cost function for building the model does not care about training points that lie beyond the margin. The cost function also ignores samples whose prediction is close to their target. (Steinwart & Christmann, 2008)

Ensemble Learning

Ensemble learning is the process by which multiple models are trained to solve the same problem. Compared to ordinary machine learning approaches which try to learn one hypothesis from training data. (Zhou, 2009) Ensemble methods construct a set of hypotheses and combine them for more accurate analysis. They are primarily used to improve the performance of a model or reduce the likelihood of an unfortunate selection of a poor one.

An ensemble model is constructed in two steps, where the number of base learners are produced and they are combined with majority voting for classification and weighted averaging for regression. (Zhou, 2009) To produce a good ensemble, the base learners should be as accurate as possible and as diverse as possible. This can be completed through the use of various accuracy estimation processes, such as cross-validation.
The main ensemble methods used are boosting, bagging, and stacking algorithms. In boosting, successive trees give extra weight to points incorrectly predicted by earlier predictors. In the end, a weighted vote is taken for prediction. (Zhou, 2009) Bagging trains a number of base learners from a different bootstrap sample, which is obtained by subsampling the training data set. It then combines the subsampling with a majority voting and the most-voted class is predicted.

Random Forest
Random forest adds an additional layer of randomness to bagging. (Liaw & Wiener, 2002) In addition to constructing each tree using a different bootstrap sample of the data, random forests change how the trees are constructed. In a random forest tree, each node is split using the best among a subset of predictors randomly chosen at that node. Although it is somewhat counterintuitive, the method turns out to perform very well compared to other algorithms and is robust against overfitting.

XGBoost
Today xgboost is one of the most widely used learning algorithms in machine learning due to its adaptability, easy to interpret, and high accuracy features. The tree ensemble model consists of a set of classification and regression trees (CART). This is slightly different from decision trees, in which the leaf only contains decision values. In CART, a real score is associated with each of the leaves. A single tree is not strong enough to be used, therefore an ensemble model is used which includes functions as parameters and cannot be optimized using traditional methods in Euclidean space. Instead the model is trained in an additive manner of the objective function, where the model learns from the functions (f_i), each containing the structure of the tree and the leaf scores. (Tianqi & Carlos, 2016)

Data Preprocessing
A dataset can be viewed as a collection of data objects, which are described by a number of features that capture the basic characteristics of an object. In machine learning processes, data preprocessing is the step in which the data objects are transformed or encoded to create a state that the machine can easily parse. Allowing the features of the data to be easily interpreted by the algorithms built.

COVID-19 Case Count
Data was downloaded from New York times COVID-19 case count tracker per state per day. The data table was parsed to collect the total positive coronavirus case count per state as on 16 July, 2020. All of the factors measuring health literacy were merged with this data set to analyze and build machine learning models, understanding how these factors influence the coronavirus case count.

Census Demographic
Data was collected from the U.S. Census Bureau on the socio demographics of each state. Census demographic was measured through age, gender, and ethnicity populations per state. Age was broken into the following groups: less than 5 years, 5 to 9 years, 10 to 14 years, 15 to 19 years, 20 to 24 years, 25 to 34 years, 35 to 44 years, 45 to 54 years, 55 to 59 years, 60 to 64 years, 65 to 74 years, 75 to 84 years, and 85 years and older. Gender was broken into male and female. Lastly ethnicities were grouped into White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, or Hispanic or Latino.

Education
The second aspect analyzed as a part of sociodemographic, was education of each state. This data was collected from the National Science Foundation. Education was measured through analyzing public school expenditure per state GDP, public school expenditure per student enrollment, literacy level, and public school teacher salary. Public school expenditure per state GDP and public school expenditure per student enrolled had the same data in regards to public school expenditure. However, they had different calculations in the ratio columns of per state GDP and per student enrolled. Literacy level encompassed fourth grade math performance score, 4th grade science performance score, 8th grade math performance score, 8th grade science performance score, number of ELL students enrolled, labor force with bachelor's degree, total labor force, total number of doctorate degrees, earned less than a high school diploma, earned a high school diploma, earned some college or associate degree, and earned a bachelor degree.

Health Care Access and Cost
Health literacy also includes the access and affordability of healthcare, which was data collected from Centers for Medicare and Medicaid Services. This factor was measured through health expenditure per state, health expenditure per state capita, and health

insurance enrollments, health insurance cost per state, and health state premium costs. Healthcare expenditure per state and per state capita encompassed the same categories, which were personal health care, hospital services, physician and clinical services, other professional services, home healthcare, drugs and non-durables, durables, other healthcare, and total healthcare. All of the categories were expenses per state. However, in the state capita data frame the data was divided to the capita of the state. Health insurance enrollment, health insurance cost per state, and health insurance cost per enrollee took into account the three main health insurance categories of Medicaid, Medicare, and private health insurance. Lastly health state premium costs included employer sponsored health insurance premium cost (single coverage), employer sponsored health insurance premium cost (family coverage), employee contribution to premium costs (single coverage), employee contribution to premium costs (family coverage), employee contribution to premium costs (combined average), employee deductible costs (single coverage), employee deductible costs (combined average), total potential out-of-pocket costs, and overall health insurance premium costs.

Income

To analyze the socioeconomic factors of health literacy, income was the first factor chosen to be analyzed. This was collected from Internal Revenue Services and the US Census Bureau. The income factor included adjusted gross income, poverty level, and unemployment. Adjusted gross income was divided into top 1%, 5%, 10%, 25%, 50%, and 75% of population per state. Poverty was broken into all ages in poverty (the total number of people under poverty) and the number of people under the small area income and poverty estimate classification per state. The last factor measuring income was the number of people under the following categories, civilian labor force, number unemployed, number employed, and median household income.

Jobs

The last factor in the investigation and another socioeconomic factor of health literacy was analyzing the number of people in each type of job, this data was collected from the National Science Foundation. The categories for job identification were computer mathematical scientists, engineers, life scientists, physical scientists, science engineer workers, social scientists, and technical workers.

Standard Scaler

Feature scaling has a significant impact on machine learning algorithms, especially if the data is skewed giving a bias. Most machine learning algorithms work on the magnitude of the measurement not on the unit. The algorithms use Euclidean distance between data points, therefore the distance of a higher magnitude feature and low magnitude feature would produce undesired results. Data scaling was done by a Z-score algorithm, where the features are scaled according to the mean of zero and standard deviation of 1. Centering and scaling happen independently on each feature by computing the relevant statistics on the samples in the training set. (Misra & Yadav, 2019)

Method

In order to measure health literacy, this investigation took the factors census demographic, education level, health care access and cost, income, and type of jobs. In order to understand the data, simple exploratory data analysis was completed along with correlation analysis. If any missing values were found, they were dropped, as this was mostly due to United States territories being included in the data frame. Correlations and histograms were used to understand if there was a relationship between the data and to check the skewed distribution. In order to understand the data even further, three way correlation was graphed to visually observe how much of an influence each sub-factor had on the COVID-19 case count.

After proper understanding the investigation went into building the machine learning models to predict coronavirus case count per state according to health literacy factor. Linear regression and support vector regression were used to analyze a possible linear relationship. While random forest and xgboost were used to analyze a possible non-linear relationship. To properly train and test the machine learning models, the data was split 75% into train and 25% into test. The train and test data was then split in X and y for collecting the feature data and prediction data. The X_train, X_test, and y_train were all first scaled due to skewness, producing scaled values. The models were used to learn on the scaled train data, then predicted using scaled X_test. The predicted data was then inverse transformed to reverse feature scaling and allow for accurate evaluation of the model. Accuracy of each model was calculated through the use of mean average error, root mean square error, and coefficient of determination. Hyperparameters of ensemble machine learning models were tuned for greater accuracy in predictions.

3 RESULTS

The investigation identified health literacy will be measured through census demographic, education, healthcare access and cost, income, and type of jobs held. All socioeconomic and sociodemographic factors were taken per state and merged for giving a holistic analysis regarding health literacy and its effect on the coronavirus. In this analysis the xgboost machine learning model had the best results in using the factors of health literacy to predict the case count in states across the nation, with a mean average error (MAE) of 11787.828, a root mean square error (RMS) of 24526.679, and a coefficient of determination of 0.898. Showing there is a non-linear relationship between all of the socioeconomic and sociodemographic factors of health literacy and COVID-19 case count per state. (Table 1)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	42784.25724	49551.18520	0.58528
SVR	28924.46130	33125.01769	0.81466
Random Forest	15509.04041	25261.18612	0.89221
XGBoost	**11787.82836**	**24526.67889**	**0.89839**

Table 1: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Health Literacy Information Per State
Further investigation was completed to see the influence of each socioeconomic and sociodemographic factors, which were census demographic, education level, health care access and costs, income, and type of jobs.

Census Demographic
Taking into consideration all data of health literacy under census demographic showed the random forest model as the most accurate with a MAE of 16069.295, RMSE of 29682.196, and a coefficient of determination of 0.851. Showing that there is a linear relationship between census demographic of health literacy and coronavirus case count per state. (Table 2)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	30419.79397	42295.84058	0.69784
SVR	19573.82834	41369.68078	0.71092
Random Forest	**16069.29548**	**29682.19636**	**0.85118**
XGBoost	26056.46980	44507.08463	0.66542

Table 2: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Census Demographic Information Per State

Further analysis was completed into each subcategory of age, gender and ethnicity. Similar machine learning models were built for each measurement of census demographic. The accuracy of those models are shown below.

Age
Age was used as a factor to measure the census demographic aspect of each state. The most accurate model that took all of the groups into consideration was Random Forest. The model gave us a MAE value of 16180.44856, RMS value of 21186.4046, and a R2 score of 0.924. This signified a non-linear relationship between all age groups and COVID-19 case count per state. (Table 3)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	28567.88807	39593.25984	0.73522
SVR	16310.33859	27280.40994	0.87429
Random Forest	**16180.44856**	**21186.40460**	**0.92418**
XGBoost	16849.44376	28044.99481	0.86715

Table 3: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Age Demographic Information Per State

Gender

Gender population was another measurement of census demographic per state. The most accurate model was Support Vector Regression (SVR) with MAE values of 10,209.335, RMS of 13,308.896, and a R2 Score of 0.970. The research therefore was able to observe a linear relationship present between gender population per state and COVID-19 case count. (Table 4)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	12820.87969	15556.22986	0.95912
SVR	**10209.33487**	**13308.89634**	**0.97008**
Random Forest	16063.05345	24454.22158	0.89899
XGBoost	21012.93758	34616.56095	0.79760

Table 4: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Gender Demographic Information Per State

Ethnicity

The last factor measuring census demographics per state were the populations of each ethnicity per state. The support vector regression model was the most accurate when taking into account all sub-factors under ethnicity. It gave error values of 9514.076629 for MAE, 13046.70112 for RMSE, and 0.971 for the R2 Score. Therefore the research was able to observe a linear relationship between ethnicity population per state and COVID-19 case count. (Table 5)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	12558.11371	17841.87347	0.94623
SVR	**9514.07662**	**13046.70112**	**0.97124**
Random Forest	16775.64251	30339.60697	0.84452
XGBoost	23417.88485	39814.84924	0.73224

Table 5: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Ethnicity Demographic Information Per State

Education

The next major factor of health literacy was education. Taking into account this data showed the random forest model was the most accurate with a MAE value of 15799.859, RMS of 20781.516, and a R2 score of 0.927. Showing that there is a non-linear relationship between the education aspect of health literacy and COVID-19 case count per state. (Table 6)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	44959.31632	98824.65656	-0.64957
SVR	21021.19615	37610.14102	0.76108
Random Forest	**13529.27597**	**18536.16600**	**0.94196**
XGBoost	19222.36140	28450.62944	0.86328

Table 6: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Education Demographic Information Per State

Next further analysis was completed on the subfactors of education, which include public school expense per GDP, public school expense per pupil, literacy level, public school teacher salary. The accuracy of machine learning models built under these subcategories are shown below.

Expense Per Gross Domestic Product

One measure of education level was public school expenditure per gross domestic product. Using this data, the linear regression machine learning model was the best with values of 11916.606 for mean average error, 14658.635 for root mean square error, and a value of 0.964 for coefficient of determination. This showed that a linear relationship is present between school expenditure per GDP and positive coronavirus case counts. (Table 7)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	**11916.60606**	**14658.63548**	**0.96370**
SVR	12272.53619	15597.85473	0.95890
Random Forest	11423.90805	15659.24159	0.95858
XGBoost	18230.92522	26692.86094	0.87965

Table 7: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Public Education Expense Per State GDP

Expense Per Pupil

Further analysis on public school expenditure was evaluated per pupil. Predictive analysis showed the best machine learning model as linear regression. Which had error values MAE as 11479.15162, RMSE as 13971.90993 and the R2 score as 0.967. Other non-classification machine learning models were also similarly accurate to the linear regression model. (Table 8)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	**11479.15162**	**13971.90993**	**0.96702**
SVR	14323.71001	19691.75873	0.93450
Random Forest	11162.61617	14815.34039	0.96292
XGBoost	11614.94035	17501.73203	0.94826

Table 8: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Public Education Expense Per Pupil

Literacy Level

Literacy level was the next measurement of education, predictive analysis of this data produced random forest as the most accurate machine learning model. This had error values of 15115.096 for MAE, 20199.510 for RMSE, and 0.931 for the R2 Score. This shows that a nonlinear relationship is observed between the factor literacy level and COVID-19 case count. (Table 9)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	41783.07824	99191.96880	-0.66185
SVR	23771.26850	42465.00174	0.69541
Random Forest	**15115.09625**	**20199.50994**	**0.93108**
XGBoost	17844.93140	26096.26267	0.88497

Table 9: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Literacy Level Per State

Salary

The last factor taken into consideration under the literacy level of health literacy is public school teacher salary per state. There were no further subfactors used for predictive analysis. All machine learning models taking into account public school teacher salaries were not accurate for predicting positive coronavirus case count per state, as all of them had high MAE, RMSE error values, and negative R2 Score. This showed that average public school teacher salary per state is a very inaccurate factor for predictions. Out of the models created, the model with the lowest error values was the support vector regression model, with a MAE value of 46605.197, RMSE value of 80707.048, and a R2 score of -0.100. (Table 10)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	51652.32617	82777.53146	-0.15735
SVR	**46605.19703**	**80707.04799**	**-0.10018**
Random Forest	57139.89721	89688.90415	-0.35868
XGBoost	52994.76563	83962.58166	-0.19072

Table 10: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Public School Teacher Salary Per State

Healthcare Access and Cost

The next health literacy factor taken into investigation was access to healthcare and healthcare costs. The most accurate model reflecting this relationship was xgboost with a MAE value of 12625.2402, RMSE value of 18661.740, and a R2 score of 0.941. This analysis showed there is a non-linear relationship between health care access or costs and coronavirus case count. (Table 11)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	54491.83926	73772.56531	0.08075
SVR	15705.01046	18081.47996	0.94477
Random Forest	15034.41901	20356.55396	0.93000
XGBoost	**12625.24015**	**18661.73958**	**0.94117**

Table 11: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Health Care Access and Costs Information Per State

Additional analysis was completed under healthcare access and cost with the subfactors of health expenditure per state, health expenditure per state capita, health insurance cost per enrollee, health insurance cost per state health insurance enrollment, and health state premium costs. Accuracy of the machine learning models under each subfactor is shown below.

Health Expense Per State

One of the factors measuring health care cost and access is health expense per state. Support vector regression showed to be accurate with a MAE value of 9903.740, RMSE of 12506.680, and a coefficient of determination value of 0.974. This showed great accuracy in our prediction, and the investigation observed a linear relationship between the analyzed variables. (Table 12)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	16513.26326	26895.75056	0.87781
SVR	**9903.739896**	**12506.67990**	**0.97358**
Random Forest	13666.63633	17833.96529	0.94627
XGBoost	19795.01725	29298.39481	0.85501

Table 12: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Health Expenditure Per State

Health Expense Per State Capita

The next factor used to measure hatch care access and cost is health expense per state capita. These machine learning models were not as accurate here, with the support vector regression model being the best model out of the worst. This had a MAE value of 36603.206, RMSE of 66493.775, and a R2 score of 0.253. This does not show an accurate linear relationship as the model is not highly accurate. (Table 13)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	54097.590083	74083.47125	0.07299
SVR	**36603.205936**	**66493.77472**	**0.25320**
Random Forest	52405.184611	72502.98070	0.11212
XGBoost	49905.048502	69473.78532	0.18476

Table 13: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Health Expenditure Per State Capita

Health Insurance Cost Per Enrollee

Another factor used to measure healthcare cost and access was health insurance cost per enrollee. The machine learning model best fit for this data is xgboost which produced a MAE value of 30160.400, RMSE of 43366.240, and a R2 Score of 0.682. This showed that a nonlinear relationship is present between health insurance cost per enrollee and COVID-19 case count per state. (Table 14)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	32027.14108	52311.11576	0.53780
Support Vector Regression (SVR)	39573.08083	69686.75769	0.17975
Random Forest	33978.04576	46303.60068	0.63786
XGBoost	**30160.40039**	**43366.23978**	**0.68235**

Table 14: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Health Insurance Cost Per Enrollee

Health Insurance Cost Per State

As health insurance cost per enrollee was not as accurate as anticipated, the next factor taken into consideration for analysis was health insurance cost per state. As hoped, health insurance cost per state was able to create better models, with the best being random forest. This model had accuracy values of 9927.425 for mean average error, 168284333.877 for mean square error, 12972.4451 for root mean square error, and 0.972 for coefficient of determination. The random forest model confirms that the relationship between health insurance cost per state and coronavirus case count is non-linear. (Table 15)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	14522.06676	22580.79101	0.913876
SVR	11632.82609	16006.74863	0.956723
Random Forest	**9927.425000**	**12972.44517**	**0.97157**
XGBoost	16506.32486	21358.59044	0.92294

Table 15: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Health Insurance Cost Per State

Health Insurance Enrollment

After health insurance cost, health insurance enrollment was also analyzed to better reflect healthcare access and cost. The best machine learning model was support vector regression (SVR) with an accuracy calculation of 14567.155 for mean average error, 24107.362 for root mean square error, and 0.902 for coefficient of determination. This shows a linear relationship is present between health insurance enrollees and the predicted coronavirus case count per state. (Table 16)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	17278.51814	25856.92253	0.88707
SVR	**14567.15457**	**24107.36240**	**0.90183**
Random Forest	18699.93149	25746.97121	0.88803
XGBoost	20824.50276	29116.33866	0.85680

Table 16: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Number of Health Insurance Enrollees Per State

Health State Premium

The last factor used to measure healthcare access and cost is the health state premium paid in each state. Overall this relationship created inaccurate machine learning models. The best model out of the ones created was support vector regression (SVR) which had a MAE value of 47282.651, RMSE value of 77177.133, and R2 Score of -0.006. This showed that there is not a significant relationship between health insurance state premium costs per state and COVID-19 case count per state. (Table 17)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	64092.006829	83578.27810	-0.17985
SVR	**47282.651336**	**77177.13269**	**-0.00604**
Random Forest	59134.487017	83596.15958	-0.18035
XGBoost	58002.167968	82331.01711	-0.14490

Table 17: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Health Insurance State Premium Costs

Income

The next health literacy factor for consideration is Income. The most accurate model reflecting the relationship between Income and coronavirus case count was random forest with a MAE value of 14504.23, RMS value of 20044.31, and a R2 score of 0.941. Therefore the investigation observed a non-linear relationship between income demographics and coronavirus case count. (Table 18)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	17969.43948	23402.94265	0.90749
SVR	10609.00539	14140.49065	0.96622
Random Forest	**14504.23545**	**20044.31515**	**0.93213**
XGBoost	16201.40902	23296.27187	0.90833

Table 18: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Income Demographic Information Per State

Supplemental analysis of income was completed with the help of data collected on adjusted gross income, poverty, and unemployment. Accuracy of machine learning models under each subfactor are shown below.

Adjusted Gross Income

One of the measurements taken into consideration for income was adjusted gross income. The best machine learning model evaluated support vector regression (SVR), with a MAE value of 11286.682, RMSE value of 15816.869, and a R2 Score of 0.958. This showed that there is a linear relationship between adjusted gross income and coronavirus case per state. However, the other machine learning models were also accurate and not much worse than the SVR machine learning model. (Table 19)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	13500.65985	16058.82083	0.95644
SVR	**11286.68164**	**15816.86945**	**0.95774**
Random Forest	12436.70963	18139.52408	0.94442
XGBoost	13424.07096	20501.76201	0.92900

Table 19: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Adjusted Gross Income Information Per State

Poverty

The next factor used to measure income was poverty levels in each state. The best model for analyzing poverty and COVID-19 case count per state was support vector regression. This model had a MAE value of 8094.278, RMSE value of 10369.777, and a R2 Score of 0.982. therefore showing that there is a linear relationship between poverty demographics in each state and coronavirus case count per state. (Table 20)

Model	Mean Average Error	Root Mean Square Error	R2 Score
Linear Regression	13216.40873	18780.181835	0.94042
SVR	**8094.278109**	**10369.776720**	**0.98183**
Random Forest	18137.76185	24878.776330	0.89545
XGBoost	18926.91194	24082.497497	0.90204

Table 20: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Poverty Demographics Per State

Unemployment

The last factor taken into account for income analysis is unemployment level in each state. The best machine learning model present was SVR with a MAE value of 12495.376, a RMSE value of 17941.977, and a R2 Score of 0.946. Therefore, there is a linear relationship between unemployment levels per state and coronavirus case count per state. (Table 21)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	15373.79390	21475.59960	0.92210
SVR	**12495.37611**	**17941.97717**	**0.94562**
Random Forest	16959.22447	24606.85594	0.89772
XGBoost	25275.02872	39992.22253	0.72985

Table 21: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Unemployment Levels Per State

Jobs

The last factor taken into consideration in analyzing health literacy is the population in each type of job held in each state. The most accurate model reflecting the relationship between the type of jobs held and coronavirus was SVR with a MAE value of 21331.564, RMS value of 30853.962, and a R2 score of 0.839. Showing that there is a linear relationship between the population of each job held and coronavirus case count per state. (Table 22)

Model	**Mean Average Error**	**Root Mean Square Error**	**R2 Score**
Linear Regression	19759.07630	37389.22615	-1.0383
SVR	**21331.56395**	**30853.96169**	**0.83920**
Random Forest	24980.64996	41505.05258	0.70903
XGBoost	31011.32486	52906.71107	-0.52721

Table 22: Machine Learning Model Accuracy Predicting COVID-19 Cases Per State Using Population of Each Job Type Per State

4 DISCUSSION

Health literacy is a composite term used to describe the capacities of persons to meet the demands related to health in modern society. Health literacy is crucial for the prevention of non-communicable diseases. However, with the increased chance in pandemics, the next question is how effective health literacy is for communicable diseases such as COVID-19. This research measured health literacy per state and created accurate machine learning models to predict coronavirus cases per state. Therefore showing health literacy can be used to fight the impact of communicable diseases.

Healthcare Cost

People with limited health literacy have reported poorer overall health, and less likely to utilize preventive screenings adherence to medical regimes. Low health literate individuals are also more likely to be hospitalized, causing a huge financial burden. On the contrary, people who gain improved skills to retrieve updated health information may show a greater demand for anything new but also more expensive services. (Parker et al., 2003)

Communicable diseases such as the seasonal influenza have $2.0-$5.8 billion healthcare costs annually from the 2001/2002 - 2008/2009 flu seasons. The type B influenza virus strain accounted for 37% of healthcare costs across all seasons, and as much as 66% in a single season. (Yan et al., 2017) This is a significant cost that is on a trajectory for exponential growth in cost.
With health care costs not decreasing, and seeing a significant presence of low health literacy in America, the xgboost model built in this investigation can be used to analyze the impact of communicable diseases given each state's health literacy demographics. Applications of these models can be seen in the private and public sector.

Private investment in U.S. healthcare has grown significantly over the past decade. In 2018 there were about 800 private equity deals, which had a total value of more than $100 billion. One of the main focuses of private equity firms has been buying and

growing the specialties that generate a disproportionate share of surprise bills: emergency room physicians, hospitals, anesthesiologists, and radiologists. (Gustafsoon et al., 2019) These are all the main areas of the hospital being used to treat communicable diseases, and very prominent during the fight with the coronavirus. States with low health literacy are seeing the highest COVID-19 case counts as citizens of the state are not able to understand and apply their health literacy to keep themselves safe from the virus. These are the states which will have the highest healthcare costs due to increased usage of emergency rooms, radiologists, respiratory therapists, and many more healthcare services.

Similar to private equity firms, the government needs to allocate financial resources to combat public health risks. In order to successfully keep the case and death count low the government has to make sure each citizen has access to affordable health care. Therefore, they can use the machine learning models to analyze which states will be impacted the most by communicable diseases.

Healthcare Policy Challenges

As discussed, problems with health literacy are costly as millions of Americans struggle to read and understand the information needed to function in the healthcare system. Another issue brought by health literacy, is a policy issue at the intersection of health and education.

Many health system beneficiaries cannot calculate their need and affordability of supplemental insurances. As an example, today proposal policies for patients' bills of rights would provide managed care enrollees with access to an external appeals process for disputed claims. Can patients with low health literacy take advantage of this and other rights created under this legislation? (Parker et al., 2003)

Professional medical societies such as American Medical Association have helped to raise awareness by focusing greater attention on health communication and developed guidelines about patients' understanding and the readability of patient materials. In the effort to improve quality, one goal for health policy should be to ensure a health literate America, creating more informed patients who have better outcomes, as they are more concordant with the people who provide health services. (Parker et al., 2003) This will allow individuals to seek care earlier because they recognize warning signs, read and comprehend instructions, understand what their doctors advise, and they are not afraid to ask questions when they do not understand. The hopes to bring awareness can be merged with our model to understand which states have the lowest health literacy. Those states are also the ones to have the highest number of communicable diseases. This will allow organizations and agencies to help state governments navigate public health policy enforcement and understanding when combating communicable diseases such as COVID-19. Specifically this could help effective implementation of mandatory masks and social distancing, sanitation, necessary lockdown, and other guidelines for the public to understand and follow.

Limitations

The concept of health literacy has changed significantly over the last couple of decades. Originally it was defined as literacy through reading, writing, and numeracy skills in the health domain. Today it has evolved into a multidimensional concept that is still evolving. This makes it difficult to accurately measure health literacy consistently and accurately build machine learning models. Although this investigation was able to create accurate models, on average the models still had an error of 8000 to 20000. This could lead to inaccurate investments in the health care system of states, where it is not necessary.

After building, training, testing, and tuning machine learning models, the next step is feature selection, which can reduce computation time, improve learning accuracy, and facilitate a better understanding for the learning model or data. However, with inconsistencies in defining health literacy, there is no knowledge on which factors or sub-factors can be deleted. This has caused the research to include all sub-factors, causing a possibility of noise in the data prediction.

The other issue with analyzing health literacy's effect on communicable disease is size of the data. As this research considered data per state, there were only 50 rows, but numerous columns of data. This is not ideal as splitting the dataset for training and testing the machine learning model is done on the rows. There the model built used 39 states for train data and only 12 states for testing, which is not enough to show valid and confident results.

5 CONCLUSION

Health literacy skills are those people use to realize their potential in health situations. They apply these skills either to make sense of health information and services. Health literacy and clear communication between health professionals and patients are key to improving health and the quality of healthcare. Health literacy has been instrumental in raising awareness regarding non-communicable diseases. However, experts predict communicable diseases and pandemics such as COVID-19 are on the rise. This has raised the question regarding health literacy's effect on communicable and higher transmittable diseases. This importance is becoming exponentially important as technology grows and misinformation is spread. We investigated this

relationship with the use of machine learning models in hopes of successfully predicting the coronavirus case count per state and accurately classifying each state to having above or below the national coronavirus case count average.

Health literacy was defined and measured through census demographics, education levels, health care costs and access, income levels, and types of jobs. Taking into consideration all of the socioeconomic and sociodemographic factors, we were able to successfully predict coronavirus case count per state with a mean average error of 11787.828 for the best machine learning model, xgboost. Census and education level demographics of health literacy showed an accurate random forest machine learning model, with a mean average errors of 16069.295 and 13529.276 respectively. Healthcare access and cost measurements of health literacy showed an accurate xgboost model, with a mean average error of 12625.241. Finally, income level and type of jobs held aspects of health literacy both showed accurate support vector regression models, with mean average errors of 10609.005 and 21331.564 respectively. Therefore there is a relationship present between health literacy and communicable diseases.

In theory these models are accurate to help the private and public sector in making valuable decisions in regards to investment, healthcare costs, and healthcare policy. However, further research needs to be completed in solidifying the definition and factors encompassing health literacy, which can lead to more accurate models and decisions in health literacy.

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How the Cannabis Industry Offers Opportunities for Effective Student Engagement in Business Law

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ABSTRACT
This paper presents a perspective on the emergence and growth of state cannabis legislation as a teaching tool to engage business law students in a pedagogical analysis of the Supremacy Clause of the U.S. Constitution. The focus of this paper is state laws which legalize the recreational use of marijuana and the conflict created with federal law known as the Controlled Substances Act. This conflict raises constitutional law issues that are recognized at the state and federal level.

Keywords
U.S. Constitution, Supremacy Clause, cannabis industry, recreational marijuana

1 INTRODUCTION

The rationale for focusing on the cannabis industry is to highlight the important role the U.S. Constitution plays in the success of a business. The cannabis industry presents a contradiction between federal law and state law. This contradiction is prominent in relation to recreational marijuana and problematic in that our constitution anticipated and addressed such a dilemma. While it will interest students to know that policies and practices ignoring this legal reality have been rewarded with economic growth, and yet significant operational constraints and limitations have been felt by businesses. The opportunity for educators to identify the purpose of a constitutional provision and for students to witness the peril surrounding an industry intent on defying a constitutional provision can prove to have lasting instructional benefit. The content of this paper will be used in class to engage students in a conversation around a powerful and highly relevant constitutional law dimension of business.

2 BACKGROUND

An age-old problem just got harder for post-secondary educators. The start of the new academic year brings a chance to reflect on how we can be better. How do we inspire a classroom inhabited by students with varying degrees of interest in a subject we cannot imagine is uninspiring? If we fall into the trap of minimizing disinterest, convinced it belongs to a few perpetually hard to reach individuals, we could emerge at semester's end with an unacceptable outcome. The goal must be to increase interest levels for all students, including those students who never imagined it possible. Simply asking how to attain this goal is no longer enough. Today we must ask how to attain this goal in light of COVID-19?

This age-old problem got much harder in March 2020. It was then that colleges and universities were forced to shut the door on traditional campus centered learning and open a door to remote learning in an effort to protect lives amid a growing pandemic. Educators had no idea how students would react to the new environment. What COVID-19 showed higher education is that student engagement is essential inside the classroom, no matter what form the classroom takes. One of the best ways to engage students is to make the learning process relevant. For business law students, the cannabis industry offers an opportunity to analyze legal principles in a highly relevant way.

Data from August 2019 indicates the cannabis industry is a growing industry. Thirty-three states, led by California in 1996, the District of Columbia, and several U.S. territories have enacted legislation legalizing medical marijuana (NCSL, 2020). More than a dozen states and U.S. territories, led by Colorado in 2012, have enacted laws legalizing the recreational use of marijuana (NCSL, 2020). These actions carry enormous legal ramifications which have become a tremendous educational opportunity. Legal considerations involving constitutional provisions, banking, employment, contracts, and securities are among the topics to be explored using present day events. The cannabis industry serves as an instructional platform for continued student engagement over the course of the semester as each topic is introduced. It also allows for the reinforcement and application of principles so that students are able to build on material previously studied.

3 CONSTITUTION AND FEDERAL LAW

The most significant area of law the cannabis industry must contend with is the U.S. Constitution. If you accept that most students are without a clear appreciation for the ways in which the U.S. Constitution shapes business operation, the cannabis industry provides an illustration. One look at Article VI, known as the Supremacy Clause, will dispel the notion that the constitution is deserving of respect solely for its longevity (U.S. Const. art VI cl. 2). On the contrary, the constitution's daily impact on cannabis businesses cannot be understated. The Supremacy Clause in Article VI speaks to the working relationship between the federal government and the state government, ultimately giving a nod to federal authority in the event of direct conflict between the two entities (U.S. Const. art VI cl. 2). In the cannabis industry such a direct conflict exists, and the difficulties experienced by businesses caught in this constitutional dilemma is enough to garner attention by both state and federal leaders. The cannabis industry was born out of state laws that legalized marijuana in either a medical or recreational form. These state laws were established against the backdrop of a federal law which identifies marijuana as a Schedule I drug and illegal for any purpose (Controlled Substances Act, 1970). The enforcement of constitutional law principles through federal authority is possible but not threatened at the present time. However, the impact of this supremacy clause issue on the cannabis industry is a constant reminder of the need to seek resolution that establishes harmony between federal law and state law.

4 LEGAL DISTINCTIONS AND ENFORCEMENT DECISIONS

Distinguishing between medical marijuana and recreational marijuana is helpful because medical marijuana laws have been in existence longer, have received greater initial public acceptance, and have survived recent legal scrutiny in some courts.(Mort, 2020) Absent a clear medicinal justification, recreational marijuana is often viewed differently.

When the first recreational marijuana law was enacted in 2012, the U.S. Justice Department, under the Obama administration, sent a communication to the states. So long as the industry did not run afoul of certain priority enforcement areas identified by the U.S. Justice Department in a memorandum from James Cole, then Deputy Attorney General, the federal government allowed states freedom to monitor events internally.(Cole, 2013) In January 2018, then Attorney General Jeff Sessions announced a repeal of the Cole memorandum and promised a "return to the rule of law."(Sessions, 2018) Since that time, Attorney General William Barr has publicly stated in confirmation hearings and in subsequent comments that he would instruct the Justice Department to "operate under a policy of accepting the Cole Memorandum for now" and has signaled an interest in reform "so that federal law is not ignored." (Smith, 2019) At the present time three bills have been introduced in Congress designed to eliminate the conflict between existing federal law and state law.(H.R. 2093, H.R. 3754, S 1028, 2019) Students should take from this an understanding of the power of the U.S. Constitution and the reality that even in an industry capable of boasting millions in revenue, constitutional principles cannot be ignored.

5 PRACTICAL BUSINESS CONSIDERATIONS

Banking

Cannabis businesses face other legal concerns as well. Opening a bank account and transferring funds electronically are fundamental components of any business operation. For cannabis businesses, these privileges have been largely off limits. The banking industry is regulated by federal law and concerns within the industry about opening accounts and accepting deposits from businesses engaged in illegal activity under federal law has been enough to keep banks away. Despite governmental guidance from the Financial Crimes Enforcement Network (FinCEN) issued in February 2014 which was designed to ease the availability of financial services for marijuana businesses compliant with the enforcement priority areas listed in a 2012 memorandum by then Deputy Attorney James Cole, banks remained cautious (U.S. Department of the Treasury, 2014). As a result, many cannabis businesses operated on a cash basis and continue to do so, raising security concerns for owners and employees. The Secure and Fair Enforcement Banking Act 2019, introduced in Congress in April 2019, offers a legislative solution through which federally regulated banks can work with state approved cannabis businesses (H.R. 1595, 2019). Until the bill becomes law, the cash-based nature of these businesses will remain in place as will the associated concerns of those who own and work in these businesses. Raising this point allows educators to reinforce and apply the principles found in the Supremacy Clause, making this provision current and relevant for today's students.

Contracts

Turning to another area, contract law, extends the discussion of constitutional principles. Cannabis businesses are no different from other businesses who rely on contracts as the vehicle through which inventory is supplied, goods are delivered, services are provided, and payment is made. The ability to enforce a contract assures that expectations will be met and enables businesses to plan for the future. As a first step in contract enforcement analysis, the validity of the contract must be established by examining several factors, including a public policy factor which requires that the contract be lawful. Seemingly obvious is the requirement that all contracts have a lawful purpose. Operating a business in the cannabis industry means operating a business in two distinct environments, one in which state law recognizes a legitimate commercial activity and one in which federal law does not. Court decisions and state statutory law add to the contentious landscape. A District Court in Denver, Colorado ruled that cannabis contracts are enforceable as being necessary to avoid "commercial anarchy" (Well, 2019). The ruling is in contrast to the U.S.

Supreme Court's decision in *McMullen v. Hoffman (1899*) which reflects long held opposition to the enforcement of any terms of an illegal contract (Well, 2019). Legislative action in several states including California, Colorado, and Oregon makes it clear that contracts involving medical and recreational marijuana which comply with state regulations are enforceable and lawful regardless of federal law (Cohen, 2020). Here students examine the corrosive nature of such a stark contrast for an industry beholden to two conflicting rules of law. Educators must help students appreciate the need for some form of reconciliation to alleviate on-going business operational uncertainties and the folly of ignoring that contrast.

Employment

Other legal considerations important for business law students further highlight the tumultuous world cannabis businesses inhabit. In the area of employment law, employers have a legal obligation to keep their workplace safe. To minimize the risk of drug related injury, many employers enact zero-tolerance drug policies which lawfully enable employers to engage in random drug testing of employees and impose penalties for failing the test. These penalties can include employment termination. Do employees who use cannabis for medical or recreational purposes pose a risk to the safety of co-workers on the job and if so, can an employer be subject to liability if they implement their stated policy? Questions such as these are worthy of student debate. Although courts have not settled these matters, one important ruling from the Colorado Supreme Court was favorable to the employer. In *Coats v. Dish Network LLC*, employee Brandon Coats tested positive for marijuana use during a random drug test and was fired (Colo. Sup. Court, 2015). The employer's actions were found to be lawful at trial, and on appeal, despite the fact that Mr. Coats used medical marijuana on his personal time and was compliant with all state regulations. This case offers a powerful look at the consequences of actions that contravene federal law and the risk of misplaced reliance on state law.

Securities and Trading

In the area of securities law, the ability of a cannabis business to raise capital by issuing securities on a public exchange is worth exploring. Students represent future business owners and future investors. Cannabis companies lawfully trade on exchanges in Canada where both medical and recreational marijuana are legal substances (Cannabis Act S.C. 2018) Although Canadian cannabis companies trade on U.S. exchanges without penalty, things are more complex for U.S. cannabis companies. According to a recent Forbes.com article the few U.S. based cannabis companies that do trade on U.S. exchanges are indirectly linked to the cannabis industry and not directly involved in "growing, processing, or selling cannabis" (Brochstein, 2020). Still, even this slight level of investment activity associated with the U.S. cannabis industry represents a change from the past according to the article (Brochstein, 2020). From an academic perspective, effective change can only come through governmental action designed to harmonize existing federal and state law as it relates to recreational marijuana. Reinforcement and application of an important legal principle is preserved. A resolution to the cannabis law conflict will be fueled by the power of the U.S. Constitution and may well be embraced by the investing public.

6 CONCLUSION

Efforts to increase student engagement by targeting areas of student interest is a worthwhile endeavor for educators. In the case of the cannabis industry, student interest levels can be tapped throughout the course and allow for a meaningful and lasting learning experience. Educators must strive to provide a learning experience that transcends whatever form the "classroom" takes in today's COVID-19 world and beyond.

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Real Estate and Tax Credits: How Can the Tax Credits be used to Make Affordable Housing More Feasible?

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Keywords
Affordable housing, mortgage interest deduction, low income housing tax credit

ABSTRACT
According to the recent Article: "Separated by Design: How Some of America's Richest Town's Fight Affordable Housing," in southwest Connecticut, the gap between rich and poor is wider than anywhere else in the country. According to the article, due to the denials of zoning variances by the local town boards, the share of housing specifically designated for the low-income residents has decreased since 1990. Moreover, if the low-income housing is built, it is generally built in the poorest neighborhoods. (See Thomas, 2019.)

Specifically, three-quarters of the new units constructed since 2011 were in the state's 10 poorest municipalities, although only 20% of the Connecticut's housing stock is in these communities. Just over 5% of low-housing units were opened in the 10 wealthiest towns. Yet, real estate is a lucrative market that allows great wealth generation. According to the article "Want to Make Millions and Pay No Taxes? Try Real Estate," property developers receive a variety of special tax breaks not available to others. Specifically, U.S. Tax Code is designed to measure profitability of a business venture over time and allowing such a venture to write off losses in one year against income in the next year through net operating loss carryover. (See Clark and Stupples, 2019.)

For most ventures, such losses are limited to loses on their own invested capital and not on borrowed funds. However, real estate developments are an exception to that rule (Clark and Stupples, 2019). This paper will consist of three parts and will examine what tax incentives can be used to induce real estate development ventures to invest in housing subsidies.

Specifically, Part I of this paper will examine mortgage interest deduction changes and how it effects hosing market in the Northeast. Part II of this paper will examine low-income housing tax credit and how it perpetuates urban segregation patterns. Finally, Part III of this paper will study how our present tax laws tend to limit housing choices for lower income populations.

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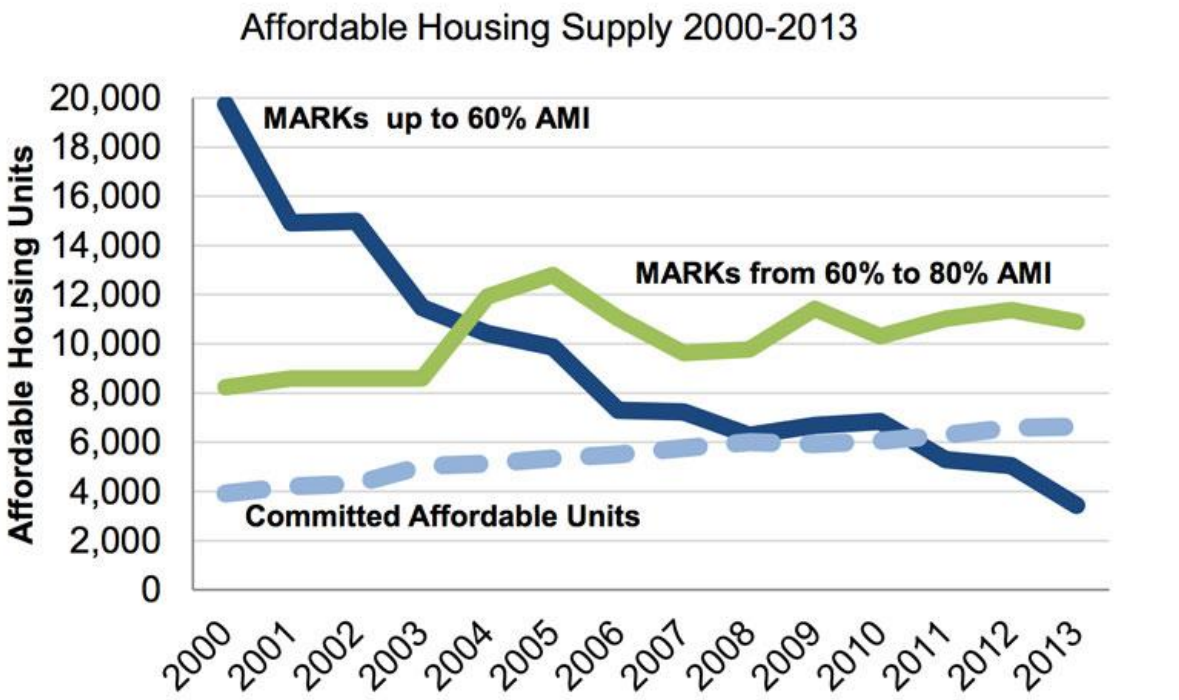

Source: Arlington County Rent and Vacancy Surveys

State	Fair-Market Rent *(2BDRM Apt)*	Hourly Wage/Annual Income Necessary *(to afford 2 BR Apt)*	Est. Avg. Hourly Wage *(of renters)*	# of Full-Time Jobs Needed *(to afford 2 BR)*	Affordable Rent for Avg. *(renter wage)*
1. Hawaii	$1,647	$31.68 / $65,889	$13.61	2.3	$708
2. California	$1,353	$26.02 / $54,127	$17.68	1.5	$920
3. New Jersey	$1,302	$25.04 / $52,081	$16.40	1.5	$853
4. Maryland	$1,291	$24.83 / $51,637	$15.05	1.6	$783
5. NewYork	$1,283	$24.68 / $51,337	$21.45	1.2	$1,115
National AVG.	**$949**	**$18.25 / $37,960**	**$14.15**	**1.3**	**$736**
46. Misissippi	$622	$11.97 / $24,891	$10.03	1.2	$522
47. Kentucky	$616	$11.85 / $24,648	$10.76	1.1	$560
48. S. Dakota	$599	$11.52 / $23,954	$9.61	1.2	$500
49. W. VA	$598	$11.50 / $23,917	$9.88	1.2	$514
50. Arkansas	$593	$11.41 / $23,773	$10.83	1.1	$563

An MBA Capstone Consulting Experience in the Midst of COVID-19

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ABSTRACT
In alignment with Molloy College's commitment to civic engagement, the MBA program requires prospective graduates to complete its Capstone course, which entails providing consulting services to a not-for-profit organization. The course requires students to apply their cross-disciplinary knowledge and skills to solve real problems for their clients. In one short semester, students must form working relationships with fellow project members, develop an understanding of their client's mission and objectives, and propose solutions that address their client's challenging problems. The semester culminates with the delivery of a written proposal, a formal presentation to the client, and a final reflection.

This paper describes the consulting problems faced by a class of Spring 2020 MBA students and the additional challenges they encountered due to the COVID-19 epidemic. It also describes the local organization the students worked with (the I'm Not Done Yet Foundation) and the solutions the students designed to increase awareness of the organization, improve its financial position, and streamline its internal operations.

Keywords
Education, consulting, not-for-profit, marketing, accounting, finance, social responsibility

1 PEDAGOGICAL PHILOSOPHY

Our school's mission is rooted in the Dominican tradition of study, spirituality, service and community, which is exemplified by the students in its MBA program. In addition to traditional MBA courses, students must complete a business ethics course as well as a Capstone course. The program is designed to prepare students to become leaders in their respective fields and conduct business in a socially responsible manner.

The Capstone program was designed by faculty in the spirit of the Bloomberg Philanthropies Mayors Challenge. Teams of students work with not-for-profit organizations that address unmet community needs and provide benefits to society. Each student team develops a proposal for its client that describes the vision of the organization, the research conducted by team members, the recommendations of the team and the steps the client needs to take to fully implement the solutions. This paper summarizes the work and challenges faced by members of one of the Spring 2020 MBA Capstone classes that began the seven-session semester in early March.

2 THE CLIENT AND THE CONSULTING PROBLEMS

Following online introductions, this Spring 2020 MBA Capstone class began the semester divided into two teams: Evolution Marketing Group and Lions Capital Management. One hour into the first class, the students met two of the founders of the I'm Not Done Yet Foundation. The foundation "helps adolescent and young adult (AYA) patients with cancer and other serious, chronic, and long-term illnesses as they transition from pediatrics to adults" (I'm Not Done Yet Foundation, n.d.-a) and was formed by family members following the death of their son and brother, Bobby Menges. Bobby was diagnosed with neuroblastoma at the age of 5 and was diagnosed with cancer twice more before he passed away at the age of 19 in 2017 (The Garden City News, 2017). Bobby lived a life for others, hosting blood drives, raising money for charities and volunteering his time, and was widely recognized for his service (I'm Not Done Yet Foundation, n.d.-b). He was the epitome of inspiration (I'm Not Done Yet Foundation, n.d.-b) and the reason for the foundation's name.

As Bobby transitioned from a child to an adolescent, and then to a student at Duke University, he witnessed a lack of services and support for chronically ill pediatric patients who had been diagnosed at an early age but over time had outgrown the traditional offerings of pediatric departments. Put simply, AYA patients have different needs than pediatric patients (I'm Not Done Yet Foundation, n.d.-b). As such, the foundation raises money for various AYA projects, including AYA cancer research, programs for AYA patients and space for AYA patients separate from pediatric areas, and has had extraordinary success in the local community. However, the Menges family realized that funds were needed for AYA initiatives across the country and turned to the MBA Capstone students at Molloy for help.

Given its limited exposure outside the local area, the foundation asked Evolution Marketing Group to develop a marketing strategy to increase awareness of the organization and engage a diverse group of stakeholders. In addition, the foundation wanted to improve its financial position so it could meet its long-term needs and asked Lions Capital Management to develop a strategy for doing so. During the first class, each team met with one of Bobby's parents to discuss the problems in more detail.

3 THE CONSULTING TEAMS AND SOLUTIONS

Evolution Marketing Group (EM)

Evolution Marketing Group, a team comprised of seven students, was responsible for addressing the foundation's marketing needs. What follows is a summary of the team's work and its major recommendations to help the client increase awareness of its mission and programs.

First, EM developed a website redesign plan for the client. The plan included the development of a new website architecture, layout, and design; the alignment of site content and features with organizational goals; and the production of website operations manuals for SEO functionality, mobile responsiveness, and accessibility for users with disabilities. Implementation of this plan should help the foundation increase engagement by enhancing users' experience and convenience when they visit the website. EM recommended adding a "Donate" call to action button at the top of every page and distinguishing the donation page from the merchandise store to increase on-site revenue generation. Lastly, the plan included the creation of the "Never Done Stories" program, the "AYA Resources" page, and blog categories related to those topics. These additions to the website should help the organization raise awareness about the experiences of individuals in the AYA community and provide them with more resources.

Second, EM devised a community engagement plan. As part of this plan, EM created General Collateral Kits which included business cards, flyers, and posters for the client to use for community outreach and corporate engagement efforts. Also, EM presented the client with a list of various speaking opportunities, ranging from AYA events to charity events to speaking slots on radio shows and podcasts relevant to the AYA community. In addition, EM recommended that the client, given the lack of current AYA cancer or other serious illness podcasts, create its own podcast in an effort to gain recognition as a thought leader.

Third, EM researched and provided information on important media publications and outlets related to AYA cancer. The plan included print media, online media, and influencer marketing components. EM identified free and affordable opportunities the foundation could use to raise awareness about itself and the experiences of those in the AYA community.

Fourth, EM researched several social media management platforms for the foundation to utilize, including Lightful and Later.com. Utilizing these free platforms should make it easier for the foundation to manage all of its social media accounts.

Fifth, EM established a social media blitz plan for the foundation. This included content creation and suggestions to attract more people to their social media outlets. Content information included AYA awareness knowledge, upcoming events, available merchandise, and general foundation updates.

Sixth, EM developed a merchandise marketing plan for the foundation. Prior to the Capstone consulting project, the client's merchandise promotion had played a minor role in the its overall marketing strategy. By following the new merchandise promotion plan, the client could increase brand awareness and recognition, as well as generate additional revenue. The plan included aspects of the social media blitz plan, as well as new merchandise options.

Finally, EM recommended the implementation of a constituent relationship management (CRM) system. The foundation lacked a comprehensive way to manage donor information and engage its stakeholders. The implementation of a CRM system could help the client track leads, automate tasks, and improve the overall efficiency of the organization.

Lions Capital Management (LCM)

Lions Capital Management was a team of six students and was tasked with addressing the I'm Not Done Yet Foundation's financial challenges. What follows is a summary of the work and major recommendations of the team. First, LCM collaborated

with the foundation and Evolution Marketing to source the Salesforce Enterprise Edition CRM system for the foundation, which was eligible to receive complimentary subscriptions due to its nonprofit status (Salesforce.org, n.d.-b). This selection was ideal since it provides robust functionality, is scalable and is complimentary through the "Power of US" program (Salesforce.org, n.d.-a). The team collaborated with the client to apply for this grant. Additionally, LCM committed to providing full administrative support to configure the CRM as well as provide training to the foundation's members for everyday use.

Second, LCM reviewed and reorganized the accounts listed in QuickBooks, as well as adjusted transactions from 2019 through early 2020. LCM renamed accounts to create major categories, created subaccounts that fit each major category, and organized the existing transactions beginning in January 2019. Taking a deep dive into the financials helped clarify the financial health of the foundation and will better support future record keeping. LCM also provided the foundation with a common terminology document as well as a "how to" guide on QuickBooks Online. This will allow the foundation's directors to utilize QuickBooks Online to its fullest potential.

Third, in order to generate sustainable revenue for the foundation's future, LCM created a plan to introduce grants and grant writing to the foundation. LCM provided: (1) a boilerplate document that contains answers to generic questions to common grant questions; (2) names of grants that the foundation is eligible for; and (3) a timeline in which the foundation must apply for the grants and when they are due. Since the foundation's directors had no experience in grant writing, this information would be especially beneficial. In addition, LCM completed two grant applications, one for The Brees Dream Foundation (The Brees Dream Foundation, n.d.) and one for the We Care Fund by Nassau County Bar Association (Nassau County Bar Association, n.d.).

Fourth, LCM developed a strong working relationship with another not-for-profit with interests similar to the foundation. LCM discovered a commonality between both organizations that may ultimately manifest a working partnership. LCM proposed the establishment of a Young Professionals Committee that would act as a peer group and be responsible for planning monthly events (with all proceeds directed to the foundation), all of which would benefit individuals through interactions with their peers.

Finally, LCM provided contact information of local retailers and other organizations who could be interested in selling the foundation's merchandise. Moreover, in addition to sites operated by Amazon, Walmart and Target, LCM identified specialized online platforms, such as Karmaloop, Etsy, and Big Cartel, that could be used to increase sales of merchandise.

4 DISCUSSION

This paper had three primary objectives: (1) introduce the reader to the I'm Not Done Yet Foundation and its important role in providing support to the AYA community, (2) demonstrate how the MBA program provides its graduate students with an immersive Capstone experience that directly benefits society, and (3) describe how the Capstone teams dealt with the obstacles imposed by COVID-19.

Students were asked to reflect on how the semester went, including their understanding of the value of effective communication, the importance of social responsibility, the "lessons learned" and the advice they had for future Capstone students. The feedback from the students indicated they gained a much better appreciation of the organizational differences and challenges of nonprofits.

After just two sessions of face-to-face classroom instruction, the students were told the remaining classes would be conducted online due to the COVID-19 pandemic. Given the design of the course, which included team meetings and practice presentations every week, the move to online interaction and instruction meant the students needed to reorient themselves quickly in order to deliver the final presentations to the client on the date planned. Students also had to manage their own unexpected personal issues related to COVID-19 during this time, including employment, family, and illness.

The lockdown measures implemented due to COVID-19 also significantly hampered the ability of team members to make connections with business owners, community members and leaders of other not-for-profit organizations that may have been interested in working with the I'm Not Done Yet Foundation. In particular, with COVID-19 cases rising quickly in April in the metropolitan New York City area, healthcare providers were unable to allocate time to discuss with students the possibilities of establishing partnerships with the foundation. This required the students to critically evaluate their original project plans and modify them, as necessary, to deliver meaningful recommendations.

In addition, effective online team communication immediately became much more important as the students could no longer rely on the efficiencies of in-person conversations. Moreover, the quick change to the online environment at such an early stage of the group development process increased the importance of team member reliability and accountability. The unprecedented environment also limited intergroup communication, which is expected of teams working for a common client. As a result, both teams needed to review and adjust their project plans mid-semester. One major development from this was an agreement between

EM and LCM to form a joint venture that included four team members. The formation of the joint venture, Evolution Capital, marked another major turning point in the semester and ultimately proved to be very successful.

The importance of adapting to change was a key takeaway from the project. The teams adapted to many unexpected events throughout the duration of the semester, most notably changing collaboration patterns due to social distancing requirements, altering strategies, and forming a joint venture group during the final weeks of a short semester.

Finally, throughout the Capstone experience, members of LCM and EM reflected on concepts that were introduced in other core curriculum MBA courses they had taken. Members applied that acquired knowledge to help them optimize their effectiveness as a team. Moreover, students used their knowledge and skills to adjust their individual project plans, particularly after lockdown measures were implemented due to COVID-19. Some knowledge examples include strategies from marketing management, business ethics, accounting, and project management classes. Specifically, both teams utilized (a) SWOT analysis to determine strategies and objectives necessary to advance the goals of the foundation, (b) principles of business ethics to assess the roles and needs of stakeholders of the foundation, (c) accounting best practices to elucidate financial opportunities, and (d) project management tools, such as Gantt charts, to forecast and track the progress of all project objectives.

5 ACKNOWLEDGEMENTS

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MAINTAINING SUSTAINABLE GROWTH
'THE STRENGTH OF PARTNERSHIPS'

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ABSTRACT
The impact of fruitful partnerships can go a long way to improve society and better the communities in which we live in. Student consulting teams have taken the initiative to conduct field research and establish a wide range of partnerships in order to raise awareness of a local non-profit and continue its mission toward sustainable growth.

This past semester has brought about additional challenges that normally would not be present in order to complete their charge assigned by their client (e.g. non-profit) and do it with finesse. The capstone course is transformational in nature due to the students working with a live non-profit and completing real-world research. If we add to the current learning environment the uncertainties of the global pandemic, we see this transformation of our students amplified due to their unwavering commitment to their client, but also society at large.

This one consulting team's turnkey recommendations really speaks to their perseverance throughout this process and in our current environment. They were able to solidify solid partnerships for this non-profit and push through adversity by coming together as a community for the greater good.

Keywords
Non-profit, partnerships, sustainable partnerships, social responsibility, building community, marketing

1 PEDOGOGICAL PHILOSOPHY

As consulting teams working for a live non-profit, the students have a chance to conduct field research while learning how to collaborate with one another in a civil and productive environment. This process is transformational in it of itself, but when coupled with environmental uncertainty, the students are able to learn even more and to test their limits in a capstone course such as this one. They not only needed to pivot their ideas in support of their assigned non-profit, but pivot the way they collaborate to successfully complete the course and have peace within themselves and one another throughout this entire process. Their efforts were extraordinary and they will become the new model of success among our student body at Molloy College.

The Spring 2020 semester Capstone Class was truly a unique one in that the students kept their poise, tenacity, and their faith to get them through this invaluable course. This paper captures the essence of this semester's triumph while sharing measurable results toward future success. The partnerships that were formed were strategic in that they are not one-time partners for a specific initiative. These new partners can continue to grow with one another to display their social responsibility to their local communities and yet foster relationships surrounded by a local non-profit that speaking to the 'inner good' among people as a whole and bettering society for it. "Goal Consulting, Inc." used the Bloomberg Philanthropies, "Mayor's Challenge" application to guide the consulting experience.

2 THE CONSULTING PROBLEM

The client is the *Ryan Mullen Strive For Five Charitable Foundation.* This non-profit was created in memory of Ryan Mullen. He was an energetic and caring individual that made a real impact on those that surrounded him in such a short period of time. The organization's primary goal is to spread kindness 'because nice matters'. Ryan had many attributes that made him a very

special youth in his local community. Our students were successful telling his story to nearby potential partners to garner long-term relationships while continuing his legacy to reshape the culture of our youth. The Founder of the organization served as the direct client for this fourteen-week capstone project.

The *Ryan Mullen Strive For Five Charitable Foundation* spoke of the need to build and maintain partnerships in order to achieve sustainable growth. This consulting team was able to successfully streamline numerous partnerships while marketing one consistent message, 'because nice matters'. It is not perhaps your usual non-profit where the ask is clear that funding is a necessity to move the organization forward and partnering with donors and promoting volunteerism would help support the organization. The hope of this Foundation is simply to spread kindness and understand that the youth of today as well as tomorrow have their unique issues and if properly addressed, it could positively impact future generations and save lives. This concept is one that the students at Molloy at this stage in their lives can resonate with and it really hit home for the entire class. They feel so fortunate to have had a hand in the immediate growth on the Foundation and are committed toward the future growth of this reputable organization with love, empathy, and kindness at the forefront of their collective efforts.

In order to maintain sustainable growth, the partnerships that were solicited had everything to do with Ryan's life in his local community and then the consulting team thought to expand their reach outside the local community spanning the surrounding boroughs. Imagine this taking place during a global pandemic. It was extraordinary to watch the students persevere and strategically form partnerships with the Massapequa Soccer Shop, where Ryan spent a lot of his time playing soccer since he was a young boy. Having had a relationship with Ryan before he passed, they agreed to a magnificent partnership that would certainly continue his legacy and provide ongoing revenue to the organization.

The second partnership was with Mario's Pizzeria in Melville. This was Ryan and his classmates venue to gather during the day in between classes and in the evenings with close family and friends. The exclusive partnership created here will enable the Foundation to utilize their services when creating future charitable events. This partnership can take shape in many ways by providing raffle baskets, catered food at the charitable event, and by promoting donations on premise to a fallen youth in their own neighborhood.

Another partnership that came out of a prior capstone partner now returning to aid another local non-profit is Spectrum Designs. Spectrum formed their partnership with the Foundation to provide a discount toward the non-profit's merchandise sales. The *Ryan Mullen Strive For Five Charitable Foundation* expressed interest in partnering with a local vendor to provide quality custom merchandise at a reasonable cost.

The fourth partnership was with Angie's Market. Angie's Market is a family-owned market that has agreed to participate in a 'pink bread day' which plays a significant role with the overall branding of the organization. For the next several years, the baker at Angie's Market has committed to baking pink bread and fifty percent of the proceeds will benefit the Foundation. Angie's has also agreed to set up a donation box at their location in memory of Ryan.

The fifth and final partnership was made with Super Foodtown in the Bronx. Super Foodtown has made arrangements to set up a donation box in their Bronx location with flyers describing the Foundation and its mission. This would help increase revenue and raise awareness beyond local lines.

With the primary focus of expanding partnerships, Ryan's legacy will surely live on. His message is especially important today as our society is going through a lot of change and it would be very helpful for adolescent teens and young adults to embrace his message and be the example for future generations.

3 THE RECOMMENDATIONS

- **Massapequa Soccer Shop.**
  The partnership with the soccer shop speaks to one of Ryan's most sacred hobbies. He played locally and abroad. The creation of student scholarships is already being supported by the Foundation and marketing this as well as other aspects of the Foundation in this venue will surely promote additional scholarships to be awarded over time.

- **Mario's Pizzeria.**
  Once Mario's heard of the untimely death of Ryan, they were more than happy to promote the work of the Foundation. This partnership will go a long way for the organization in that it will provide raffle basket items for charitable events, cater the food for future events, and even promote Ryan's legacy at its venue where friends and family hold Ryan dear to their hearts. This is surely a win-win scenario.

- **Angie's Market.**
  This family-owned gourmet grocer caters to their clientele who have enough of discretionary income to make a difference in future years for the Foundation. Angie's understands the need for social responsibility and is making efforts to participate in a 'pink bread day' program to increase brand awareness of this Foundation's cause. Within a week's time frame during the global pandemic, the donation box was able to raise approximately $50 from recurring patrons.

- **Super Foodtown.**
  The foot traffic in this location is heavy and is considered an essential business during the pandemic. Having donation boxes throughout the venue will certainly help with incremental donations over time. This also helps the Foundation to expand its brand in the metro region.

- **Spectrum Designs.**
  The partnership between two non-profits that are local on Long Island coming together to support individuals with developmental disabilities and to spread kindness as well as generosity among our community fits like a glove. The employees of Spectrum Designs are now invested in the Foundation with the creation of merchandise for a reasonable price while the *Ryan Mullen Strive For Five Charitable Foundation* supports employment for individuals with developmental disabilities. This is yet another wonderful partnership that we expect to receive increased recognition in the near future due to their noble efforts.

4 SUMMARY OF DESIRED OUTCOMES

The objective of creating this partnerships is to have these organizations collaborate and help sustain one another not just through this global pandemic, but for the long term with prudent goals in mind. Because these partnerships are strategic in nature, they can ultimately help the Foundation operate more efficiently, therefore, sustaining organizational growth and creating a sense of community for those that resonate with the organization's mission, celebrating Ryan's life.

5 IMPACT ON SOCIETY

There is a need for this solution within our local areas and to help heal our community during these uncertain times. However, our efforts do not stop here.

Goal Consulting, Inc. wishes to make a positive impact across the entire metro area if not further in future years. We see this as just the beginning to a world-wide cultural shift within our society. What excites us most about our ideas and our recommended solutions is continuing Ryan's legacy. We are also helping to shape future generations with a more well-rounded view of how the world could operate. In addition, these new partnerships are targeting heavily populated areas to gain the most recognition for the Foundation. To be a part of something as special as this and to be working with a live non-profit with such an incredible mission is truly rewarding both professionally and personally.

6 ACKNOWLEDGEMENT

We wish to thank our partners at the *Ryan Mullen Strive For Five Charitable Foundation.* This idea of spreading kindness and 'because nice matters' is so relevant in today's society. This idea is universal in that spreading kindness is to receive kindness and the reciprocation during these uncertain times provides a great model for those that wish to become ambassadors of change in our society moving toward a better tomorrow.

7 REFERENCES

Will be supplied upon request.

Young Adults Achieving for Local Non-Profit 'Ambassadors of Social Change'

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ABSTRACT
Molloy College students in conjunction with a local non-profit have joined forces to not only move an organization forward, but to be agents of change toward social good in their local community. The students take their newly learned skill sets and develop a business plan that will allow Board members to implement shortly after their consulting projects are complete. What happens over the course of this project is not only are the students' efforts rewarded by making strides to assist a local non-profit, but their demeanor changes throughout this entire process. The students transform themselves into ambassadors, making the capstone project a rewarding course for all that are involved: the partnering non-profit, those that support the non-profit, the faculty, and the graduating students.

There are three consulting teams that come together to address three separate charges that are pressing for the assigned non-profit. The students need to provide turnkey recommendations to the Board of the non-profit so it may effectively implement their timely ideas.

The new twist to this project is the impact of the national pandemic where the students pivoted beautifully to fulfill their obligations making this so much more of a rewarding project toward social good.

Keywords
Non-profit, esports, cause marketing, social responsibility, marketing

1 PEDOGOGICAL PHILOSOPHY

The faculty at Molloy believe in incorporating the four pillars of Dominican Life into all of their courses across various disciplines. The School was founded on these principles and having them be a part of the capstone course is no different. The pillars speak to one search for truth through study, community, service and spirituality. This is at the heart of this course in that it takes all of the skills developed through their academic journey at Molloy and with this real-world research has the students fully understand its meaning with live field research for a local non-profit. This not only promotes civic engagement, but a true transformation from within for our students.

The Spring 2020 semester Capstone Class proved to be a unique experience for all who were involved: our non-profit partners, their Boards, faculty, and students. This paper captures the essence of this project where students became resilient and their efforts were steadfast toward completing their project during uncertain times. The members of "Achieving For You, Inc." used the Bloomberg Philanthropies, "Mayor's Challenge" application to guide the consulting experience.

2 THE CONSULTING PROBLEM

The client is the *Ryan Mullen Strive For Five Charitable Foundation*. This non-profit was created in memory of a fallen son due to a sudden accident. The organization's primary goal is to teach everyone the importance of coming together as a community, building new friendships, and to practice emotional generosity as Ryan did throughout his life. In order to celebrate his life, family, friends, volunteers, the Board and our students continue to spread Ryan's love for life and generosity in their local communities. Those that the non-profit serves embody the same attributes as Ryan. The Founder of the organization served as the direct client for the student consulting teams.

In summary, the *Ryan Mullen Strive For Five Charitable Foundation* is not necessarily looking to build significant revenue as with other more well-known non-profits. It is looking to spread kindness and provide outlets for young adults to congregate and spread awareness of why 'nice matters' in order to change the overall culture in which we live in for future generations. Since

its inception, this non-profit has been a symbol of change in its surrounding communities. During these uncertain times, this non-profit's message could surely spread nationwide over the next several years.

In order to maintain sustainable growth, the organization continues to work with Molloy students as part of Phase II of this partnership. This process provides timely research opportunities for our students while helping to develop them into tomorrow's stewards in society.

3 THE RECOMMENDATIONS

- **Twitch/Mixer/You Tube Gaming Marathon.**
  We plan to implement this idea with the creation of a gaming marathon on the Twitch platform to help fundraise for the non-profit. It is a livestream that will hopefully cover the cost of other charitable events associated with the non-profit while increasing funding toward student scholarships.

- **Bowling Event.**
  Once we fully research local bowling alleys, we would need to negotiate with management of the chosen venue and the Founder of the non-profit. This event will hopefully become an annual event that will increase in size further building awareness of the organization, spreading kindness, and community.

- **Soccer Tournament.**
  This sport was near and dear to Ryan and to host an annual soccer tournament in his memory would be a great tribute as well as a great outlet to continue his legacy. This too will build brand awareness and provide a great opportunity for students who would like to qualify for one of the scholarships provided by the Foundation.

4 FACTORS THAT COULD DERAIL THE PLAN

There are many risk factors if we were to implement the above-mentioned ideas. One would be if individuals entering the livestream do not decide to donate. Another risk would be the lack of influencers involved. Absence of ample influencers at the marathon such as this along with technical difficulties could derail this reputable idea.

Another issue that may arise is the ideal bowling alley venue not accommodating the event as anticipated. This might lead to minimal donations and the Foundation not being able to offset the costs of this charitable event. If it is not marketed properly, there may be minimal attendees resulting in lost revenue.

Additionally, the soccer tournament may not come to fruition if we are not able to recruit enough teams to run the tournament. In order to combat this issue we would proactively recruit months in advance of the scheduled tournament. There is also a chance that participants can be injured during play. The last risk would be if we do not sell enough of the organization's merchandise at the event to support future fundraising initiatives. Therefore, proper planning is key in order to experience positive results for all of the three aforementioned ideas.

Although these are some prominent risk factors, we believe that our research is sound and that a lot of time has gone into strategizing our efforts toward annual events that will not only help build the brand, but increase revenue and create a better culture promoting social change.

5 SUMMARY OF DESIRED OUTCOMES

Our main objective is to implement a sustainable way for the *Ryan Mullen Strive For Five Charitable Foundation* to fundraise, spread the message of 'because nice matters' and provide ample funding through student scholarships. The timeline to accomplish our three recommendations would be between 1 – 2 years, especially due to our current circumstances. However, once these ideas are set forth, they can be mirrored on an annual basis and perhaps a semi-annual basis (e.g. Twitch marathon) in order to propel the organization to another level over the next couple of years.

6 IMPACT ON SOCIETY

There is a need for this solution nationwide. The overarching idea is to spread societal change for future generations while keeping Ryan's legacy alive. Society will continue to grow socially through the stewardship of those involved with this reputable Foundation. This will ultimately build a strong brand while building community across state lines.

Achieving For You, Inc. wishes to impact the world in a positive way. We are grateful for having the opportunity to partner with the *Ryan Mullen Strive For Five Charitable Foundation* and believe that these newly created partnerships will help sustain the

organization toward future growth. This is not only a rewarding senior project to obtain our degrees, but it is personally gratifying to work alongside the Founder of such a heartfelt non-profit which has truly transformed us individually from within.

7 ACKNOWLEDGEMENTS

We wish to thank our partners at the *Ryan Mullen Strive For Five Charitable Foundation* for allowing us better understand the mission and be part of the solution toward a better tomorrow through research, acts of kindness, and a better community in which we live in.

8 REFERENCES

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Mutual Fund Alpha: Is It Managerial or Emotional?

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ABSTRACT
This paper presents an examination on the impact of investor sentiment on mutual fund alpha. Using the Baker and Wurgler (2006) index, I find that investor sentiment plays an important role in explaining fund alpha, and the outperforming probability of funds rises as investor sentiment rises. Also, benchmark models adjusted by investor sentiment level can better explain the occurrence of fund alpha. This finding is confirmed by the cumulative distribution function (CDF) of the t values of the alpha estimates. Thus, the complete story of mutual fund alpha would be incomplete without incorporating investor sentiment.

Keywords
Fund alpha, investor sentiment, outperforming probability, BW index

1 INTRODUCTION

One issue with the existing benchmark models is that they assume that investors are rational in their decision-making processes. However, the history of the capital market tells us that this assumption is too strong, especially when the market is volatile. Also, the AAII sentiment indexes are based on survey results rather than based on actual economic variables; thus it would be interesting to examine the relationship between fund alpha and a sentiment factor derived from real-life economic indicators.

Since the Baker and Wurgler (2006) index is based on the first principal component of five standardized sentiment proxies, and each of the proxies has first been orthogonalized with respect to a set of six macroeconomic indicators, I examine the effect of this sentiment index on the occurrence of fund alpha, and how sentiment level affects the explanatory power of benchmark models. Besides, I compare the cumulative distribution function (CDF) of alpha estimates' t values to get the whole picture of the relationship between fund alpha and investor sentiment.

2 DATA

I use the CRSP survivorship-bias-free mutual fund database as the data source. The fund sample includes U.S. equity funds only, and the sample period spans from January 2000 to December 2014. All of the equity funds are taken in the sample as long as they have a complete return record every month throughout the entire sample period. In total, I get 523 funds in the fund sample. Since the sample period covers the 2003 tech bubble burst and the 2008 financial crisis, it provides an excellent data source to test the effect of investor sentiment across market states. The Baker and Wurgler (2006) sentiment index is downloaded from the website of Jeffrey Wurgler at New York University.

3 EMPIRICAL FINDINGS

The Outperforming Probability of Funds

In this section, I first estimate the outperforming probability of funds using the CAPM, Fama-French 3-factor model, and Carhart 4-factor model. Although the Fama-French 5-factor model has rarely been used in the industry, I use it in the tests due to its importance in academia. Here, outperforming probability refers to the probability of earning a positive fund alpha that is statistically significant at 5% level. Equation (1) exhibits the structure of the models.

$$R_{p,t} = \alpha_p + \Sigma\beta_p * r_{p,t} + \varepsilon_p \quad (1)$$

where the betas are systematic factors represented by the monthly market excess return, size, style, and momentum. Regarding the Fama-French 5-factor model, the five market factors are the monthly market excess return, size, style, profitability, and investment factors. To capture the effect of the market state, I also divide the sample period into five 3-year subperiods.

This variability in outperforming probability across different periods suggests that market state plays a vital role in funds' outperforming probability, and that model efficiency also varies as market changes. For example, the Fama-French 5-factor model is no longer the most efficient in explaining fund alpha in the fourth subperiod; Instead, it produces the highest outperforming probability. Investor sentiment is affected by market state in the financial markets. Investor sentiment usually gets more elevated in a booming market and lower in a bearish market. From the tech bubble to the 2008 financial crisis, the relationship between market state and investor sentiment has been exhibited clearly, and thus it is necessary to consider the role of investor sentiment on fund alpha.

To examine the effect of investor sentiment on the outperforming probability of funds, I add the Baker and Wurgler (2006) sentiment index to the four benchmark models and follow the same procedure shown in Table 1 to estimate outperforming probability. Equation (2) presents the model setup.

$$R_{p,t} = \alpha_p + \Sigma\beta_p * r_{p,t} + BW_t + \varepsilon_p \quad (2)$$

In Equation (2), BW_t stands for the Baker and Wurgler (2006) sentiment index in month t. The other market factors are the same as those in Equation (1). Adding the Baker and Wurgler (2006) sentiment index (BW) to a benchmark model can significantly reduce the outperforming probability. If the BW index is added to the CAPM, the outperforming probability drops to 1.34%, much lower than the 12.81% using the CAPM alone. If the Fama-French 3-factor and the Carhart 4-factor models are adjusted using the BW index, the outperforming probabilities drop by 3.06% and 3.63%, respectively. This finding clearly indicates that investor sentiment is an important factor in explaining fund alpha. In the subperiods, we can observe an overall similar phenomenon.

Winner Funds and Investor Sentiment

To find out whether investor sentiment matters in fund outperformance, I examine the characteristics of the winner funds, such as the size, style, and fund holdings of the winner funds. I also test the relationship between the winner funds and investor sentiment. Winner funds are funds that earn statistically significant positive alphas based on a benchmark model. Specifically, I group all winner funds together to get an equally weighted fund portfolio. Then, I test whether this portfolio's performance is linked to investor sentiment.

Based on the CAPM, the Fama-French 3-factor model, the Carhart 4-factor model, and the Fama-French 5-factor model, I find that fund performance benefits from more conservative portfolio holdings, whereas the robustness of funds' operating profitability is not essential. Table 3 indicates that this means that the winner funds are mainly large and value-oriented funds. This also means a conservative investment strategy is preferable to an aggressive one. To explore the effect of investor sentiment on fund alpha, I add the BW sentiment index to the four benchmark models and examine the characteristics of the winner funds using the sentiment-adjusted models. The loadings on the sentiment index are much higher than those on the size and momentum factors, suggesting that investor sentiment plays a more important role than the size and style factors. Additionally, the positive loadings on the sentiment index indicate a direct relationship between fund alpha and investor sentiment; this suggests a high chance of beating the market when investor sentiment is high.

In the Fama-French 5-factor model, however, investor sentiment has a loading as low as 0.007 with a t value close to zero. As mentioned earlier, this might be because the BW index and the investment factor are highly correlated with each other. Moreover, it is noteworthy that fund alpha remains statistically significant in all four models, with values of 0.207, 0.161, 0.194, and 0.145, respectively. This finding means that, despite its statistical significance, investor sentiment cannot fully explain the alpha of the winner funds. What might be the key driver behind fund alpha?

Winner Funds and the Sentiment Dummy Variable

I divide the 15-year sample period into quintiles based on the BW sentiment index. Quintile I represents the lowest sentiment period while Quintile V the highest. Then, I create a dummy variable based on the BW index, taking values of 1 to 5 corresponding to the five sentiment levels. Next, I add this dummy variable to the benchmark models using Equation (3).

$$R_{p,t} = \alpha_p + \Sigma\beta_p * r_{p,t} + BWD_t + \varepsilon_p \quad (3)$$

In equation (3), BWDt stands for the dummy variable based on the Baker and Wurgler (2006) sentiment index in month t. The other market factors are the same as those in Equation (1).

The dummy variable BWD is statistically significant with a positive value in all but one of the four models. The loadings on BWD are 0.194, 0.070, 0.097, and -0.051 in the CAPM, Fama-French 3-factor model, Carhart 4-factor model, and Fama-French 5-factor model, respectively. More interestingly, not only does the statistical significance of the fund alpha no longer hold, the

value of fund alpha goes down significantly across all models except the Fama-French 5-factor model. In the other three models, the values of fund alpha are -0.064, 0.067, and 0.054 and the t values become -0.35, 0.60, and 0.48, respectively. This result clearly shows that the level of investor sentiment is the key factor behind the occurrence of fund alpha and that the effect of investor sentiment on alpha is different across different sentiment levels. The sentiment dummy variable is not statistically significant in the Fama-French 5-factor model. As mentioned earlier, this insignificance might be due to the correlation between the investor factor and the dummy variable.

Outperforming Probability and Investor Sentiment

In view of the effect of investor sentiment level on fund alpha, I test the relationship between investment sentiment level and the outperforming probability of funds, or the probability of earning positive alpha. Based on the same four benchmark models, I examine outperforming probability in each of the five sentiment quintiles based on the BW index.

The highest outperforming probability occurs in the highest sentiment level. The outperforming probabilities are 19.12%, 9.18%, 11.85%, and 5.17% for the CAPM, Fama-French 3-factor model, Carhart 4-factor model, and Fama-French 5-factor model, respectively. This finding suggests that the best time to beat the market is when investor sentiment is very bullish. The next best time to earn alpha is in Quintile I, when investor sentiment is very bearish. This find suggests that the best opportunity to outperform the market occurs when investment sentiment is either very bullish or very bearish.

Next, I repeat the same procedure as that in Table 6, except I add the BW sentiment index to the four benchmark models. The purpose of this test is to examine the effect of investor sentiment on outperforming probability at various sentiment levels. If the BW index is factored into the benchmark models, the outperforming probabilities drop significantly. The highest outperforming probability still occurs in the most bullish Quintile V; however, the probabilities decrease to 0.39%, 5.74%, 7.84%, and 2.98% for the four respective sentiment-adjusted models. In Quintile I, the outperforming probabilities are 0%, 0%, 0.19%, and 0.19, respectively. Although the BW sentiment index can explain nearly all the positive alphas earned in a very bearish market, its explanatory power is not as strong when the market is very bullish. Also, we can see that the lowest outperforming probability in Quintile V is 0.39%, which occurs with the adjusted CAPM.

We can infer that investor sentiment is an important factor in earning fund alpha, especially when the sentiment level is high. It is surprising to see that, in Quintile I and Quintile V, the CAPM adjusted by investor sentiment is the best model for explaining fund alpha. This indicates that in high sentiment markets, fund performance is dominated by investor sentiment and that fundamental factors such as size, style, profitability, and investment strategy play limited roles in the alpha-generating process.

Robustness check

In this section, I use the cumulative distribution function (CDF) of alpha's t values to re-examine the major findings in the previous tests. Specifically, whether investor sentiment and the level of investor sentiment matter in earning fund alpha. The advantage of CDF is that it provides a complete distribution of the t values of the alpha estimates based on a market model; thus the overall impact of investor sentiment on funds' outperforming probability can be evaluated.

First, I compare the CDF of alpha's t values between two sets of models. One is the standard benchmark models, and the other is these benchmark models adjusted by investor sentiment. From Figure 2, we can infer that investor sentiment plays a critical role in generating positive fund alphas. Second, investor sentiment level plays an essential role in generating fund alpha, and higher sentiment level leads to a higher chance of beating the market. Third, I repeat the same procedure as that in Figure 3, and the result demonstrates that the sentiment index can better explain outperformance than underperformance.

I believe that investor sentiment captures the emotional portion of the decision-making process. Since the emotional portion is usually not rational, it cannot be explained by the standard benchmark models. As a result, there is a higher probability of earning positive or negative alphas. And investor sentiment is an integral factor that should be integrated into the standard benchmark models.

4 SUMMARY

This paper examines whether investor sentiment affects the occurrence of mutual fund alpha and the relationship between them. I find that investor sentiment has a significant relationship with the occurrence of fund alpha. During the sample period, the winner funds are mainly large and value-oriented, and investor sentiment plays an essential role in fund alpha. The outperforming probability of funds rises as investor sentiment increases. Additionally, the level of sentiment is more important than sentiment itself in explaining funds' outperformance. Fund alpha occurs more frequently in periods with either very high or very low sentiment levels, especially the former. A robustness check using cumulative distribution function (CDF) of the t values of alpha estimates supports this finding. The CDF also shows the Baker and Wurgler (2006) index is not as good as the AAII index in explaining funds' underperforming probability.

Since the standard benchmark models assume that investors are rational, they ignore the emotional side of the investors. This study shows that investor sentiment is indeed a crucial factor in mutual fund alpha, and the best timing to beat the market is when investors are highly optimistic. Thus, the complete story of mutual fund alpha would be incomplete without incorporating investor sentiment.

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Agents of Change – Continuing A Legacy

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ABSTRACT
Students throughout their academic journeys become agents of change when they experience transformational learning. The students at Molloy College in conjunction with local non-profits have partnered to advance society with their field research. While the mission is fascinating for the assigned non-profit, what is truly amazing is how the capstone course shapes our students to become good citizens in our society. There are overarching rewards for all parties involved whether it be the students, faculty, members of the non-profit, and our community at large.

Three consulting teams are created to address the most relatable charges to the assigned non-profit. However, what is truly happening behind the scenes is our students search for truth through their research while positively impacting this organization. If guided successfully, the three consulting teams actually build off of one another's charges creating causational marketing plans that will assist the Board of this non-profit sustain incremental growth over time.

These turnkey recommendations that are presented not only help to build the Foundation where future research could develop, but allows the students to become personally invested in this organization's future. This promotes community and the building blocks of well-rounded young professionals upon graduation of their chosen degrees.

Keywords
Non-profit, building tributes, viral marketing, social responsibility, digital fundraising, marketing

1 PEDOGOGICAL PHILOSOPHY

There is no question that the faculty of Molloy want to have a hand in shaping future generations toward a better tomorrow and help develop good citizens of our community. The beautiful thing about this capstone experience is that we as faculty continue to learn from our students. Watching them transform into young professionals over their academic journeys is truly rewarding for us because they become the sought-out young adults of tomorrow.

The Spring 2020 semester Capstone Class proved to be an extraordinary group of students due to our current circumstances with the global pandemic. This paper captures the essence of this semester's project where the students displayed the utmost commitment to complete their obligations to their client (e.g. non-profit) and complete the course. The members of "Apex Consulting, Inc." used the Bloomberg Philanthropies, "Mayor's Challenge" application to guide the consulting experience.

2 THE CONSULTING PROBLEM

The client is the *Ryan Mullen Strive For Five Charitable Foundation.* This non-profit was created in memory of a youth gone too soon. The organization's primary goal is to teach everyone 'because nice matters' and being good to one another can go a long way and perhaps save lives in the future. Ryan had many attributes that made his story worth telling and our students were successful at doing so with twenty-first century technology and the participation of the Founder of the non-profit along with additional family and friends dear to Ryan. The Founder of the organization served as the direct client for the student consulting teams.

Since inception, the *Ryan Mullen Strive For Five Charitable Foundation* has increased its brand awareness within it local community via more traditional forms of marketing. This capstone consulting firm has managed to spread Ryan's story via digital and causational marketing tactics bringing this non-profit to another level that could potentially expand around the world.

In order to maintain sustainable growth, the students have since committed to work voluntarily to help move the organization and its work forward. Through their research, they have gained a true understanding of who Ryan really was and want to continue to keep Ryan's legacy alive.

3 THE RECOMMENDATIONS

- **St. Anthony's Fundraiser – Hawaiian Night.**
  We plan to implement this idea by selling foundation merchandise and taking photographs for marketing purposes at the St. Antony's High School Hawaiian Night Basketball event. Ryan attended St. Anthony's and to commemorate his life, the School has partnered with the Foundation to award annual scholarships to students who emulate Ryan's characteristics. The reason that Hawaiian Night was agreed upon between the two partners is because Ryan had a love for the beach, water, and was known to wear Hawaiian shirts.

- **Venmo Donation Boards – Celebrating Ryan.**
  While working with the Board of the Foundation we have found that Ryan played soccer (e.g. even abroad) for his entire youth while frequenting the beach and boating on the ocean. We plan on creating three types of Venmo Donation Boards that mirror Ryan's hobbies. These donation boards will be used to increase funding toward student scholarships as well as toward future charitable events. Depending on the demographic we are utilizing several platforms to maximize donations (e.g. FaceBook and Instagram). This process can easily be repeated on a quarterly basis and/or a semi-annual basis toward incremental donations.

- **Online Interviews with Family and Friends.**
  This is where the transformation really took place for the students. The Founder welcomed the students to conduct in-person interviews with close family and friends right before the national pandemic hit our area. They then pivoted by creating these online video interviews to be posted across various social media platforms as well as the Foundation's website. The surge of views, likes, and brand awareness significantly peeked within a few weeks. The client could not be more pleased with how this consulting team rose to the occasion and made Ryan's legacy a reality for all to see and embrace during very uncertain times. The interviews were emotional yet powerful. The analytics behind the message are clear, this would help sustain future growth for the Foundation if additional video content is created over time that provides an emotional appeal as this one did in memory of Ryan.

4 FACTORS THAT COULD DERAIL THE PLAN

There are many risk factors that became apparent with our research, including a global pandemic (later in the semester). Initially, our thought was potential scheduling conflicts associated with the interviews. We realize that people have very busy lives (including us), and it became evident that we needed to schedule in advance to make our idea come to fruition.

Another issue that might have become a reality if not planned accordingly would be the quality of the interviews. Since our consulting team did not know the participants who agreed to be interviewed directly, there was inherent risk in asking the wrong questions and not being able to bring that emotional appeal to the table. In order to mitigate this risk, we researched video content of other non-profits to better understand storytelling and how this marketing tactic would positively impact the organization and its audience.

A third risk that we may encounter is the lack of donations to our Venmo Boards. We have decided to create vertical videos for individuals to post their story prior to the Venmo Board release. This will help the individuals to become familiar with the organization without having to visit the Foundation's website or social media page. There will also be live edits to donations made to promote viewers to increase their donations.

Although these are some prominent risk factors, we were confident that we would pull through and complete our charge, even with the global pandemic. With sound research and a continued commitment among our teammates and our client, we planned to exceed expectations for the greater good.

5 SUMMARY OF DESIRED OUTCOMES

Our main objective is to enhance the overall engagement with the *Ryan Mullen Strive For Five Charitable Foundation* and at the same time continue to generate donations to support student scholarships. The Foundation is built on Ryan's most notable characteristics, all which have been identified throughout our work. Our implementation of these three ideas really exemplifies the Foundation's motto of 'because nice matters' and we believe that Ryan's legacy will continue to live on. It is our hope that the work we have done will have a lasting impact on the Foundation for generations to come.

6 IMPACT ON SOCIETY

There is a need for this solution around the world, especially with recent circumstances. The overarching idea is to spread societal change starting in our own communities and expanding worldwide. Through ongoing stewardship and society building on one

another's generosity and kindness, we can move forward the mission of this reputable organization while changing as individuals for the better.

Apex Consulting, Inc. wishes to make a positive impact. We are grateful for having the opportunity to partner with the *Ryan Mullen Strive For Five Chartiable Foundation* and believe that our collective efforts will be noticed and provide the foundation to incorporate twenty-first century marketing tools to enhance this brand. It is our hope that other non-profits will be able to replicate our efforts toward social good.

7 ACKNOWLEDGEMENTS.
We wish to thank our partners at the *Ryan Mullen Strive For Five Charitable Foundation* for allowing us to get to know Ryan and we will be forever grateful for this rewarding opportunity.

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Will be supplied upon request.

Development and Implementation of a Ballet Learning Seminar at a Senior Living Facility

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ABSTRACT
It is the goal of all senior living facilities to provide optimal care to all their residents, many of whom can live independently and/or need minimal assistance. Those facilities, which strive for excellence, not only ensure that these residents maintain activities of daily living but also provide programs, which stimulate the mind, body and spirit. Indicative of these type of programs is the ballet program run at the Shannondell at Valley Forge Senior Living Facility, which routinely has its residents striving for excellence. The ballet program was developed by the co-founder of a ballet company and pianist. The program, which is based on the Russian Vaganova Ballet Syllabus, has been thriving for 12 years. It is intended to offer mentally and physically competent residents (mean age = 80) mental stimulation along with physical exercise. The class is offered bi-weekly. To prepare for their performance, residents rehearsed for six weeks prior to the performance by spending an extra half hour beyond their regular class time to participate in the intergenerational ballet productions of The Nutcracker (Petipa, M., Ivanov, L. and Tchaikovsky, P.I., 1892). Participating residents' responses to this learning experience were assessed with the Short Form-12 (SF-12) questionnaire; its 12 questions take about 10 minutes to complete. The SF-12 has been validated to assess quality of life (Ware, Kosinski & Keller, 1997) across eight domains of healthy living (physical: 1.general health, 2.physical functioning, 3.role physical, 4.bodily pain and mental: 5.vitality, 6.social functioning, 7.role emotional, 8. mental health). While the SF-12 has been used previously in nursing homes to assess seniors with existing medical conditions (Jenkinson et.al., 1997, Fleishman et.al., 2006, Jackobsson, 2007, Hoeman, 2008, Givens et.al., 2009 and Kiely et.al., 2010), it has not been applied to assess residents, who live independently in a senior living facility and are participating in a ballet program. SF-12 data were collected at the beginning of the program and after the Nutcracker performance from the 26 participating residents (25 females and 1 male between the ages of 72 and 94). Statistical analyses were applied to find participating residents, who had a health score of 100 percent (higher SF-12 scores indicate more favorable results, 100% is the highest possible score for any domain). Results indicated that a ballet program contributes to the long-term well-being of independently living residents in a senior living facility.

Keywords
Stimulation of mind, body, spirit; senior living facilities; ballet

1 ACKNOWLEDGEMENTS
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Rebounding the Event Industry: Moving Past Covid-19

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ABSTRACT
Covid-19 has nearly crippled the hospitality industry with the events segment being one of the hardest hit areas having a "human tagline". Yet, there are glimpses of a prosperous future very different from the one we have known. This paper will discuss the conditions for events to happen in a time of uncertainty and what they will look like within the number of considerations for health and safety. The new normal for events after the coronavirus peak will be challenging and ambiguous. The conditions that need to materialize before events happen will greatly prepare organizations for a more successful and eventful future. As such, organizations and event organizers must identify attractive and alternative event options within CDC guidelines.

Keywords
Events, event design, hospitality industry, Covid-19, social distancing, social gatherings

1 INTRODUCTION

The hospitality, tourism, and travel sectors have been driven by rising consumers' purchasing power, a robust global economy, and digital innovation (Nestor, 2020). According to a report from Deloitte's US Travel and Hospitality Outlook (2019), from 2009 to 2017, US hotel gross bookings grew from $116 billion to $185 billion and airline revenue jumped from $155 billion to $222 billion. Specific to the events industry, the USA provides over 5.9 million jobs. The projected growth for meeting, convention and event planners was expected to increase 11% in the USA between 2016-2026, faster than the average. Annually there has been an upward of 1.9 million events held, with 251 million participants (EventMB, 2019). Events generated more than $1.07 trillion of direct spending and drew 1.5 billion participants globally in 2017 (EventMB, 2019). On average meeting planners spend $48 billion to provide food and beverage services at events (EventMB, 2019). Events generate upward of 300 million room nights annually, representing nearly $50 billion of spending on accommodations (EventMB, 2019). Covid-19 has created a ripple effect that will challenge these growth sectors around the world for years to come.

2 IMPACT OF COVID-19

Covid-19 has been one of, if not the most, debilitating phenomenon that has impacted the hospitality industry with the events segment being one of the hardest hit areas. Traditionally, events have thrived on creating in person experiences and support a variety of organizational and personal engagement activities around the world; the "human tagline". This has ranged from team meetings, retreats, professional and personal development, trade shows, conferences, festivals and concerts, to name a few. Despite the unknown, there are glimpses of a prosperous future but very different from the one we have known as fear and social distance guidelines become the new norm. Accordingly, this means organizations and event planners must facilitate several conditions in order for events to occur with a particular focus on health and safety. There is no doubt this new normal for events will be a challenging one and one that exposes many uncertainties. Yet, preparing and understanding the conditions that need to materialize before events happen will greatly prepare organizations for a more successful and eventful future with the exploration of a variety of flex and hybrid models of event design. Furthermore, this requires precession in nearly all event supportive services such as food and beverage, technology, and accessibility/flexibility of venue site/sizes.

3 COVID-19 REALITIES

There are a number of considerations for health and safety that are piled on top of the usual measures taken to run events which include but are not limited to insurance, social distancing, thermal scanning, sanitation, disinfection, triage and handling of those who show symptoms, and vulnerable population management (Solaris, 2020). Furthermore, these guidelines and state recommendations vary, adding to the complexity and concern of hosting entities. As a result, hosting events increases the level of risk companies will expose themselves and others too. Businesses that decide to move forward with in person events will need to consider insurance coverage options as well as return on investment. Participation in events is anticipated to reduce while overall costs to facilitate events within guidelines is ever increasing. Some of these considerations include force majeure clauses and coverage for cancellation or further postponement, and coverage for attendees that may contract the virus at the event. In

addition, CDC guidelines must be followed with the practice of 'moderate social distancing' as outlined in the Opening Up America Again document on top of state mandates. The positive has been that the CDC guidelines consider virtual events to provide the lowest risk of virus transmission and shifting events to outdoors reduces the risk of transmission. The CDC classifies events into Low Risk, More Risk, Higher Risk and Highest Risk. Outdoor events are considered More Risk. The CDC recommends protections of 6 feet of distance between people of different household, mask wearing and no sharing of objects. This dramatically influences the design of events moving forward, as events by nature rely on several touch points from event registration, to intimate contact activities as part of personal and professional development and enrichment.

4 COVID-19 STRATEGIES

It is difficult to interpret what distancing at events will look like with accuracy long term; but in the most basic sense it includes distancing at least 6 feet (2 meters) from other people, not gathering in groups, and mitigating crowed places and avoiding mass gatherings. The specific number of attendees has also varied by event type, with fewer restrictions on religious and political gatherings which leave many questioning the validity of guidelines. Yet, to enforce CDC guidelines on moderate social distancing, the following considerations must be a focus according to Julius Solaris (2020), the editor of EventManagerBlog.com: (1) Registration. At least 6 feet between attendees queuing will need to be enforced. Retail and grocery story processes give an indication of where we are headed. Directional signage will help to create new flow and order in small spaces with examples of one-way routes and waiting blocks. (2) Signage. Physical signage displaying the correct distance will need to be implemented at registration and along key paths, as well as in common areas such as where F&B will be served. Prepackaged food is a must with restrictions placed on pubic, shared access to water. (3) Room layout. The room layout of the event will need to be redesigned to reflect a distance of 6 feet between chairs and will have to organize a way for people to get to their seats in an orderly fashion that preserves the distance limit. This presents challenges in itself for meetings and events as the size requirements have expediently doubled with limited capacity while ROI remains the same if not less. (4) Self-serving buffets. Self-service will not be an option for a while. Seated dining will be the only alternative with attendees spaced out appropriately, staff wearing protective gear, and sanitation being available. This may skyrocket costs for F&B. Forward-thinking venues may offer cost-effective solutions to provide food and beverage to attendees or meetings may be reformatted to exclude food offerings all together. (5) Social activities. One of the most significant draws to in-person events is the networking and socializing component. It is fair to say that these will be too much of a risk to undertake as they will inevitably translate into a mass gathering. Handshaking, business card exchanging, and marketing collateral giveaways are clear violations of the above rules. Networking sessions will need to be guided and structured. Having 'mixers' or 'drinks' will effectively put event planners under scrutiny and at least in the immediate future have become obsolete. (6) Travel. If attendees are planning to travel to the venue(s) of an event, adherence to distancing guidelines in buses or taxis moving attendees around must be considered. In addition, many states have put quarantine restrictions on those out of state to control the outbreak. (7) Pivot to outdoor events. Outdoor event venues offer a safer alternative to large gatherings indoors. Consumer acceptance of outdoor dining will likely continue post COVID-19. But the harsh reality for most of the US is that winter creates yet another challenge to recover during the colder, rainier months.

5 CONCLUSION

The hospitality industry will recover. The timeline for this recovery, due to the ever-changing conditions of Covid-19 and the significant damage already caused extends way into the future. With the complexity of CDC guidelines, organizations must realize the opportunity to offer hybrid events to try to stay afloat, meaning events will need to consider not only a live option but participation virtually. This new model stresses the importance of high production value in order to keep attendees engaged. Hybrid events will help the industry steadily gain traction as the world waits for a Covid-19 vaccine or other indications that it is truly safe to meet in large groups. Even if the travel ban is lifted, meetings are allowed to take place, physical contact must be limited, until the virus is under control or the fear of risk subsides.

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Leadership in The Covid-Bind: A Phenomenological Study of Experiences of Female Higher Education Administrators

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ABSTRACT
Despite state and federal laws and university policies intended to protect women during maternity leave and other forms of family leave, recent events leave women at higher risk for workplace inequities. Workplace disruptions, including but not limited to Covid-19, have created new complexities in the workplace and at home for women. Prior to these phenomena, the balance between motherhood and work in the academy and the subject of motherhood and balance was rarely discussed within the academy. However, these events have escalated this need to inform university policy to protect women. The purpose of this research was to collect and analyze empirical data through semi-structured questionnaires and follow up interviews regarding the experiences of women in higher education administration during these events. Data collected informs higher education administration and provides insights to appropriate services and responses needed from the university.

Keywords
Covid-19, pandemic, women, high education, double-bind, gender inequality, gender, gender bias

1 INTRODUCTION

Despite state and federal laws and university policies intended to protect women during maternity leave and other forms of family leave, discrepancies between women and men in academic institutions exist. Specifically, researchers have argued that maternity and family-related policies do not fully protect women because of implicit and societal bias (Cossman, 2008; Hill, 2016). To balance being a women and professional responsibilities, female administrators and academics have been found to overcompensate by working more hours than their male counterparts (Hill, 2016). Female faculty members spend a greater proportion of their time on teaching, advising, and service than men in academic institutions, and these activities may detract from research, which often takes precedence in tenure evaluations (Flaherty, 2018). Although studies have been conducted on the balance between motherhood and work in the academy, the subject of motherhood and balance is rarely discussed. For some, the most challenging aspects of performance in higher education is navigating the institutional structures that are (not) in place to support maternity leaves and other types of family leaves making sense of established precedents. Unclear policies (context) and precedents (norms) have worked together to create expectations for how women are to perform. As we find ourselves in a time of pandemic, Covid-19 and racism, these phenomena have and continue to create greater barriers for women and necessitate more awareness. It is critical to understand the full impact of these phenomena as experienced by women in the workplace to inform policy practices in a new age. The purpose of this research was to collect and analyze empirical data through semi-structured questionnaires and interviews regarding the experiences of women in higher education administration.

2 COVID-19 REALITIES

As with Covid-19, its effects on colleges and universities are multifaceted and quite complex. DePietro (2020) states, "In the area of applications and admissions, tuition, student loans or teaching, Covid-19 is making a substantial, and perhaps, lasting impression on colleges and universities." The escalation and devasting impact of Covid-19 has forced unprecedent action by the federal and state government. Not only were campuses required to shift to remote learning almost overnight, but institutions were also suddenly grappling with grave financial challenges as the domestic and global economies face a major recession (Capatides, 2020). These dramatic and instantaneous changes alongside K-12 schools moving to remote learning, required quarantining, and shut down of all non-essential businesses, has left children at home. For many, this has translated into working remotely while balancing the educational needs and requirements of children in households while continuing job responsibilities. At the same time, our nation has experienced an emotional awakening to the racial injustices that surrounds the country. This has added additional complexity, and for many, more roles to balance in the household as well as the workplace—not to forget basic needs for safety. The questions that higher education administrators are now faced with require deliberate and appropriate responses to protect many and continue discourse of women in the academy.

3 METHODS

This study employed a phenomenological research methodology to collect and analyze empirical data through questionnaires and semi-structured interviews. Phenomenology is a qualitative research method focused on the study of an individual's lived experiences. The study sample consisted of female higher education administrators who work in mid-sized liberal arts public universities on the East Coast of the United States. In accordance with snowball sampling, participants recommended other eligible participants to participate in the study (Patton, 1990). Using a purposive snowball sample provided an opportunity to increase rapport and trust between researchers and participants. Questionnaires were conducted in September 2020 and are ongoing. Follow-up interviews are in process to validate questionnaire findings and themes.

4 DATA ANAYLYSIS AND FINDINGS

Preliminary data were analyzed using thematic coding procedures; specially, researchers employed grounded theory procedures of open, axial, and selective coding. Researchers read through the data several times and noted patterns and regularities. Data is still being collected to reach saturation. Thus far, data were coded into category themes including (1) the university, (2) mental health, and (3) personal responsibility. This procedure consisted of a comparison of each new element encountered in the data with those coded previously in terms of emergent categories and subcategories. Data collected indicated a shift in administrative priorities and expectations. Although student safety has always been a priority and concern, the Covid-19 bind has placed greater emphasis on policies and procedures to protect students as well as the entire campus community. There has been a greater sense of "community spirit" to demonstrate high levels of empathy; but it has been met with fear over in person vs virtual requirements of jobs and a balance of personal responsibility. University policy and adherence to state operating conditions have left some feeling safe while others are overwhelmed, scared, skeptical, and physically/mentally challenged to meet the requirements. There is a greater concern and request for flexibility in work expectations and the change within job roles, the requirement of temporary and permeant layoffs, organizational restructuring, furlough demands, and salary/promotion freezes, to list a few. Some administrators indicated feelings of being frustrated and confused and concern that their contributions may or may not be fully implemented because of the circumstances and bureaucratic barriers. The new work environment has required additional work hours. Participants indicated being "up earlier on email and working later" in addition to balancing at home demands of family and children. Meetings have increased exponentially with the perception leaders can just go right from one meeting to another within the virtual platform. If operating within the context of a pandemic was not enough, the institutional climate surrounding a response to systematic racism and equally within university structures is at an all-time high. Once again, institutions and administrators find themselves challenged to be responsive with competing requirements of a new age in academia.

5 CONCLUSION

Preliminary findings provide insight and guidance into the realities of working in 2020. The lived experiences of women provide higher education administrators with deep insight to understand the complexities and requirements for women to work successfully and mitigate more workplace inequalities that have historically marginalized women in the academy. There is greater emphasis placed on senior leaders to recognize that many workers have gone above and beyond, and they are physically, mentally, and emotionally exhausted. A flexible leadership style is needed to successful move forward and navigate a world of constant unknow and changing conditions. This new aged leader must not only understand the needs of an organization during a crisis but must also be willing to "grant others grace" in challenging times. There is a call for action to recognize commitments and contributions of all members of the academy and to lead with a sense of empathy for the benefit of all employees, but especially for those who are operating under significant strain, as they navigate the Covid-bind. This study offered further understanding of experiences of women in administrative positions within higher education. Future research should explore the experiences of women at other levels of the university hierarchy as well as to examine experiences of women in other types of organizations.

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Graduate Business Education in a Virtual World

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ABSTRACT
The COVID-19 health crisis radically altered campus life as we know it in early 2020. The specter of a second wave combined with the possibility of new strains of the virus having a similar effect has forced colleges and universities to prepare for both short and long-term adjustments to the delivery of courses. Most graduate business programs pride themselves on developing a student's ability to adapt in a constantly evolving business environment. In trying to determine which schools may fare well during the current pandemic, a recent study used Bloomberg Businessweek's B-School rankings, placing a particular emphasis on schools with a reputation for innovation and creativity. (Solomon, et al., 2020). This paper will look at both the challenges and opportunities for graduate business programs in this rapidly changing, post-COVID environment.

Keywords
On-line learning, distance learning, COVID-19, business education

1 INTRODUCTION

Business education in the United States dates back to 1881 when the University of Pennsylvania established the Wharton School as the first collegiate business school. In 1900, Dartmouth College's Tuck School was the first to offer a graduate degree, the pre-cursor to the MBA degree (MBA Central, 2020). As the number of schools offering the MBA degree began to grow, the development of part-time MBA and executive programs followed, offering scheduling flexibility for working students and an expanded admissions base for business schools.

On-line Learning

The terms on-line and distance learning are often used interchangeably. Online learning refers to a digital form of learning used in combination with other in-person teaching methods as a way to provide a variety of learning opportunities for students. Distance or remote learning delivers instruction solely online and is not simply a variation of teaching method (Stauffer, 2020). While the former is platform used in delivering the latter, the term on-line learning, particularly recently, has been used when referring to using technology to transmit course materials and assessment outside the classroom to students in remote locations.

The asynchronous on-line format was the first utilized in on-line learning. This method provides students with maximum flexibility. Instructors present class material using presentations, articles, assignments, and assessments that have flexible schedules and deadlines. Group forums are a primary means of encouraging and assessing group discussion and class interactions using the asynchronous format. With the rapid advancements in technology, the synchronous format now allows students and teachers to meet for class remotely in real time, allowing distance learning that most closely resembles the traditional classroom experience (Online Education, 2020). Blended formats combining various combinations of synchronous, asynchronous, and traditional in-person classes give a variety of course instruction formats that can best match the needs of students.

2 COVID-19

In the spring of 2020, colleges moved all traditional, in-person courses to distance/remote/on-line learning due to COVID-19 restrictions. The transition was essential to ensure continuity and prevent the complete abandonment of the spring semester at its midpoint. While both students and instructors invested time and effort to make this abrupt transition as smooth as possible, many considered it to be below the standards of traditional learning. In the wake of this transition to on-line learning in the spring semester, parents and students are complaining about both the cost and the content of the on-line experience vs. the traditional in-person method. A CNBC article cited a OneClass survey showing ninety-three percent of college students believe that tuition should be lowered if classes are held on-line (Hess, 2020).

With the prospect of on-line learning continuing into the fall semester and beyond, colleges stepped up their efforts to adjust to this new paradigm. They are looking to address deficiencies in technological and on-line teaching ability that surfaced during the spring semester. In addition to the effect on a student's academic experience, the pivot to on-line learning has many believing

there is now a major gap in a student's opportunity to achieve a full college experience. This includes the loss of student-student and student-faculty in-person interactions. These help foster student mentoring, working, and social relationships as well as creating the general sense of community achieved by working and living in proximity with professors and peers. This fall semester, only three percent of nearly three thousand colleges are reporting a fully in-person format, with forty-four percent fully or primarily on-line, and the remainder using a hybrid or blended format (Chronicle of Higher Education, 2020).

3 GRADUATE BUSINESS PROGRAMS

Graduate level business programs are not immune to the COVID crisis, having both similar and unique challenges. Even the top tier MBA programs are feeling the heat of losing the traditional, in-person, campus experience. Some of the major reasons why students choose to attend these prestigious – and expensive – programs are the opportunity to engage with colleagues from around the world, join student clubs, and build powerful networks (Zaidy, 2020).

Prior to COVID, however, graduate business education in general had already seen a strong trend toward a wider acceptance of on-line learning. From 2003-2015, graduate degree programs in business/management saw a significant increase in both the percentage of total students taking some on-line classes (an increase from twenty-two to fifty-four percent) and those enrolled in fully on-line programs (ten to thirty-six percent). (National Center for Education Statistics, 2020). With such a strong foothold in on-line learning prior to 2020, graduate business programs were better prepared to weather the effects of the spring transition to fully on-line learning.

Top Tier MBA Programs

In the various rankings of the top MBA programs in the country, you see many of the same institutions on each list. These well-known programs have been in the top tier for some time. The list of the top ranked fully on-line MBA programs looks very different, however, leading to the conclusion that either developing on-line learning requires a different skill set or the top ranked on-line programs began offering an on-line content much earlier, benefitting from a head start. More than likely, it is some combination of both.

Public universities tend to be the forerunners to the on-line MBA degree movement. According the most recent US News and World Report rankings, public universities have led the charge into offering quality on-line MBA degrees, with twelve listed in the top fifteen. Private universities continue to dominate the traditional MBA rankings (twelve of the top fifteen). It is noteworthy that none of the top fifteen traditional programs appears in the top fifteen on-line programs, although that may soon change. (US News and World Report, 2020).

While the Indiana University Kelley School has been offering its top-rated on-line degree program since 1999, Harvard Business School did not join the party until 2014 when it launched a three-course program of business fundamentals taught by some of its well-known MBA professors. Harvard's hesitation in entering the on-line learning game was due in part to "not wanting to either cannibalize or cheapen its existing on-campus MBA program or its executive education offerings" (Byrne, 2014).

Other top tier schools such as Wharton and Stanford are also catching up after a late start, attracting a widening base of potential students with rapidly developing courses attached to their prestigious names. An expansion of the overall footprint of the top tier programs in the MBA world may come at the expense of lower tiered schools. This scramble for positioning in the on-line MBA world has been the top trend for MBA programs at all levels over the past decade. Many have shifted focus, investing heavily in creating or strengthening their on-line format, which, in some cases, offer a significantly lower cost than the traditional format. Some have abandoned their long-standing traditional programs altogether, focusing solely on on-line degree programs. (Ethier, 2020).

4 RECOMMENDATIONS FOR PROGRAMS OUTSIDE THE TOP TIER

While top tier MBA programs are poised to survive and even thrive in the wake of COVID restrictions, those outside the top tier are entering an increasingly competitive environment that may threaten their survival. Based on the examples of current practices and personal experiences, such programs should consider the following:

Spend Effectively

While effective spending is a goal for any organization, the key word for programs outside the top tier is spend. Keeping up with advances in technology, both hardware and software, can be expensive. Whether it is warranted or not, on-line learning programs have long had the stigma of being inferior to their traditional classroom counterparts in the quality of both its content and its instructors. In light of the explosion of spending and the entrance of new participants in the on-line MBA space, programs outside the top tier cannot afford to fall behind the pack.

Competency and Continuity of Instructors

Being an effective classroom teacher does not automatically translate into being an effective on-line teacher. While it is not surprising that effective classroom teachers often are able to adapt well in any environment, the key point is that they must adapt. Delivering a course on-line brings many technological and teaching style challenges. Fortunately, on-line instruction opens the door to a wider pool of potential applicants as experienced on-line instructors are more readily available in the absence of relocation issues. The reputation of many MBA programs, however, is strongly linked to the reputation of its instructors. For top tier programs, well-known, seasoned professors bringing significant industry knowledge into the classroom experience are a draw for enrollment. For schools outside the top tier, as well, it may be worth the time and resources needed to bring their marquee instructors up to speed with on-line learning. Finding a balance between quickly filling expertise voids in a changing environment and maintaining continuity by maximizing the potential of your existing talent is essential.

Structure Opportunities for Social Interactions

While graduate level students overall may be more welcoming to the on-line movement due to its flexibility, MBA programs have always had an inherent importance on personal relationship building in addition to academic mastery. On-line MBA Programs must have with opportunities for students to foster social and professional relationships. For example, group projects, small group discussions in class, virtual office hours, and the using traditional cohort models in which a group of students take several classes together can help serve this purpose. Arranging in-person gatherings, when allowed, while challenging, will greatly enhance the overall business school experience

5 CONCLUSION

The MBA world has changed drastically in the past decade. The widespread acceptance of on-line learning accelerated in 2020 due to the exclusive reliance on the platform during the COVID shutdown. Those programs who use this opportunity to retool based on lessons learned in the spring will best position themselves in this new, virtual environment.

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Cash Distributions to Shareholders, Corporate Governance and the ROIC-WACC Spread

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ABSTRACT
This paper examines how the ROIC/WACC spread impacts cash distribution to shareholders and explores the role agency theory plays regarding such distributions. One would expect that corporations with shareholder friendly governance and compensation in place would be more apt to make cash distributions if the ROIC/WACC spread is negative.

Keywords
Corporate finance, agency theory, corporate governance

1 INTRODUCTION

It is commonly accepted in finance that if a corporation's return on invested capital (ROIC) is greater than its cost of capital, as measured by the weighted average cost of capital (WACC), the corporation should reinvest earnings into the business though retained earnings. In other words, if the corporation incurs a greater capital acquisition cost (as measured by the WACC) compared to its return on deployed capital (as measured by its ROIC), shareholders are better served if the corporation returns capital to shareholders as theory dictates this should lead to increases in shareholder wealth. Alternatively, if the ROIC is greater than the WACC, the corporation should reinvest its cash in the business, either internally or externally via acquisitions. For purposes of this paper, I will refer to this as the "golden rule", i.e., return capital to shareholders if the ROIC < WACC and reinvest in the business of the ROIC > WACC. However, the above proposition assumes that that management is acting in the best interest of shareholders (maximizing shareholder value), i.e., (agency issues are minimal).

A priori, one would expect that a corporation with a strong shareholder friendly governance structure in place would indeed follow this pathway, i.e. reinvest in the business of the ROIC is greater than the WACC and return capital to shareholder of the ROIC is less than the WACC.

This paper explores this issue and tries to address the following questions:

1. Do corporations with a wide ROIC/WACC spread (ROIC-WACC) and strong shareholder governance structures in place reinvest a greater proportion of its earnings?

2. Do corporations with a narrow (or negative) ROIC/WACC spread (ROIC-WACC) and poor shareholder governance structures in place distribute a greater proportion of its earnings?

2 RETURN ON INVESTED CAPITAL (ROIC)

The return on invested capital (ROIC) is defined as follows:

ROIC = NOPAT/Invested Capital, where NOPAT denotes Net Operating Profit after Taxes or Operating Income x (1- tax rate) and Invested Capital equals Total Operating Assets – Total Operating Liabilities.

It should be noted that accounting adjustments need to be made to calculate ROIC. For example, while cash is generally not thought of as an operating asset, many companies do need "working capital cash" vs. "excess cash" to the extent it can be determined. Invested capital also excludes non-operational liabilities, i.e. debt.

3 WACC

The WACC measures the required return on the company's debt and equity, and takes into account the risk of the company's operations and its use of debt. WACCs typically range between 9% and 12% for large-cap companies, although there are many exceptions.

4 THE CORPORATE AGENCY PROBLEM

The corporate agency problem that arises in the modern corporation is a result of the separation of ownership from control; shareholders own, executive management control. There are many instances when shareholder objectives (maximizing value) are not aligned with management objectives, i.e., high compensations, "empire building", etc. This research will construct a governance index based on the structure of the board of directors (inside vs. outside directors), how the board is elected (cumulative vs. straight voting, staggered vs. non-staggered elections), the degree of inside ownership, management compensation structure, concentration of shareholder ownership, etc.

5 MODEL/EMPIRICAL SPECIFICATION

The research regression model specification is shown below:

$$Y_i = b_0 + b_1 X_{1i} + b_2 X_{2i} + e$$

Where:

Y_i = Cash Distributions to Shareholders Rate (total annual cash dividends plus stock buybacks) Divided by Equity Market Capitalization (MKTCAP)

b_0 = Regression Constant

X_{1i} = The ROIC/WACC (ROIC-WACC) Spread for the *ith* Company

X_{2i} = A Shareholder Governance Index (SGI) Denoting Governance Strength

e = *error term*

As noted in the Introduction above, finance theory dictates that if a firm cannot generate returns (as measured by its ROIC) greater than its cost of capital (as measured by its WACC) the company should distribute cash to its shareholder as opposed to reinvesting its cash to grow. Put another way, if the ROIC is less than the WACC, growth would lead to a diminution in shareholder value. One would a priori expect that firms with strong governance structures in place (as measured our Shareholder Governance Index) would follow this "golden rule."

Let's explore the different scenarios that can arise employing the above specification. Let's start with a company with a *large* ROIC/Spread and a *strong* governance structure as measured by our Index. Under this scenario we would expect a low Y_i i.e., a low cash distribution rate. Similarly, if the sample company has a strong governance structure and a negative ROIC/WACC spread, we would expect high Yi, or cash distribution rate. Now suppose the subject company has a weak governance structure and a negative ROIC/WACC spread. Here we would expect a low cash distribution rate.

6 DATA

This is an empirical study based on the above model specification. The time parameters of the study period have yet to be determined and will be based on data availability, among other factors.

Data for the dependent variable (cash distributions to shareholders) will be obtained via Bloomberg, Specifically, Bloomberg has a data field entitled "Trailing 12 Month Share Repurchased Amount" (Bloomberg Field: TO271), Regarding dividends, I will employ the Bloomberg Dividends (BDVD) field. Equity market capitalization data will also be derived from Bloomberg, specifically, the Bloomberg equity description (DES) function.

Data for the ROIC/WACC spread will be obtained from Bloomberg's Weighed Average Cost of Capital (WACC) function. This function displays a company's WACC and the ROIC. I will just take the difference. The image below is a screenshot from Bloomberg's WACC function.

Data to compile a Shareholder Governance Index will be constructed from Institutional Shareholder Services (ISS) annual corporate governance quality score. According to ISS, scores range from 1 to 10, with 1 indicating the highest level of governance quality and lowest level of governance risk. ISS analyzes a company's corporate governance risk based on specified factors across four topical categories: Board Structure, Compensation, Shareholder Rights and Audit & Risk Oversight.

7 CONCLUSION

This research tries to explain a company's cash distribution rate (cash distributions to shareholders divided by equity market capitalization) by looking at what the company *should* do with its cash vs. what the company *does* do with its cash. The *should* could be explained by the ROIC/WACC spread and the does may be explained by the strength shareholder governance structures in place.

The Impact of COVID-19 on Different Categories of Age, Race, And Gender in the US

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ABSTRACT
The recent pandemic Coronavirus (COVID-19) disease does not influence everybody similarly. Like the many other countries, it is exposing imbalances in the health system also in the US. Since COVID-19 discovery, the virus has spread globally, causing thousands of deaths, and having an enormous impact on our health systems. The relationship between ethnicity, age, gender, and COVID-19 is questionable. In this research, it has performed distinctive correlation models and machine learning algorithms to evaluate the strength of the relationship of these categories to the COVID-19 cases across all the states of the USA. Comparing the R values and accuracy of the models we have inferred some vital inputs like which is the most vulnerable category that is getting affected. Experiment results lead to interesting facts about the behavior of a widespread coronavirus case across the nation in different age groups, ethnicity, and gender.

Keywords
Coronavirus, vulnerable, multiple linear regression, OLS, Spearman's correlation, association, machine learning

1 INTRODUCTION

Different Coronaviruses cause illness varying from the basic virus-like common cold & flu to progressively severe infections, like Serious Intense Respiratory Disorder (SARS) and the Middle East Respiratory Syndrome (MERS). COVID-19 being the seventh one to affect humans is caused by the SARS-COV-2 virus and is said to have a zoonotic origin (Zhang, 2020). It is known that the reported number of cases in the USA has reached an alarming number of 4 million affected cases and segments of people who are more vulnerable to it. This research tries to shed light on these segments by seeing their correlation with the number of cases in the USA and by finding the highest and lowest factors and comparing them with the help of multiple regression models.

In here, the datasets are divided into three independent factors: age, race, and gender for which our analysis would be focused on 19 states and those spread across the country through which we are delineating the overview of the stats in the USA, where, the analysis for race factor is also performed across all the states of the country. For the factor age, a detailed approach is followed by a gap of 10 years between their groups. The stats of the data in the race factor is segregated as White, Hispanic, Black, American Indian and Alaska Native, Asian, and Native Hawaiian, while "gender" is divided by male and female. The stats used here is the data that was collected from the "Census Bureau" and through Johns Hopkins University on GitHub which were merged to perform correlation and modeling.

Multiple regression models have been designed to predict MAE, MSE, and RMSE for each section of the three independent factors. Mean absolute error is a measure of the errors between paired observations expressing the same phenomenon. Mean squared error measures the average of the squares of the errors that is the average squared difference between the estimated values and the actual values and root mean square error is frequently used to measure the differences between predicted values and observed values by a model. Also, a correlation was found which was the coefficient between the section of factors and the number of cases by Spearman Correlation and resulted in r squared and adjusted r square values from the Ordinary Least Square method.

To begin with, to build and develop Machine Learning models, relevant datasets are to be acquired from known sources. This dataset will be composed of data gathered from multiple and disparate sources which are then combined in a proper format to form a dataset. Dataset formats differ according to use. For instance, a business dataset will not be the same as a clinical dataset. While a business dataset contains significant industry and business information, a clinical dataset will incorporate human services related information. It is also possible to create a dataset by collecting data via different sources viz. Python APIs. Once the dataset is ready, it must be placed in a CSV/HTML/XLSX file format.

2 MATERIALS AND METHODS

The main goal of this research is to identify which category of the demographics (age, ethnicity, and gender) are getting affected and are vulnerable to this communicable disease. This requires a correlation model that identifies the strong correlation measure between the demographic categories and cases. We have used Spearman's correlation model to obtain correlation measures for the data which is acquired from the verified sources to get the best and genuine outcomes from our analysis. The data related to demographics (age, ethnicity, and gender) have been taken from the census bureau.

The data related to the COVID-19 cases for each state have originated from a variety of open sources and was ordered in the first instance through Johns Hopkins University on GitHub. Data is in .CSV format and refreshed day by day which is sourced from this upstream repository maintained by a group at Johns Hopkins University Center for Systems Science and Engineering (CSSE) who have been doing extraordinary work from an early point by collecting data from around the globe.

This dataset includes the number of people infected by COVID-19 across the USA, including people among different races and ethnicity, different age groups, and gender. For the factors age, race, and gender we have a dataset for 19 states, also for the factor race, we have the dataset for 50 states in the USA. Since the data has been gathered from different sources, where it is pre-processed to analyze and retrieve accurate results. As we are using a machine learning model, splitting the dataset into two separate sets – training set and test set is mandated, and to normalize the independent factors of the dataset inside a range, feature scaling is done.

Data Preprocessing

Data preprocessing in Machine Learning is an initial step that helps improve the nature of data to advance the extraction of meaningful insights from the data. Data preprocessing in Machine Learning allude to the procedure of getting ready (cleaning and sorting out) the raw data to make it suitable for building and preparing Machine Learning models. In simple words, data preprocessing in Machine Learning is a data mining method that changes raw data into an understandable and readable format. Regarding making a Machine Learning model, data preprocessing is the initial step denoting the inception of the procedure. Normally, real-world data is inadequate, conflicting, mistaken (contains errors or outliers) and regularly needs explicit trait values/patterns. This is the place data preprocessing enters the situation – it assists with cleaning, design, and arrange the raw data, consequently preparing it to work for Machine Learning models.

The significant steps in data preprocessing in Machine Learning will be explained further in the next upcoming steps.

Identifying And Handling The Missing Values

In data preprocessing, it is significant to recognize and effectively handle the missing values, neglecting to do this, it may reach incorrect and broken determinations and surmise from the data. This will hamper the ML research. Essentially, there are two different ways to deal with missing information.

Dropping A Row Or Column

In this method, it is possible to remove a specific row/column that has a null value for a feature or a row/column where more than 75% of the values are missing. However, this method is not 100% efficient, and it is recommended to use it only when the dataset has adequate samples. It must be ensured that after deleting the data, there remains no addition of bias.

Calculating The Mean

For features having numeric data like age, salary, year this method is more useful. Here, we can calculate the mean, median, or mode of a feature or column or row that contains a missing value and replace the result for the missing value. This technique can add fluctuation to the dataset, and any loss of data can be effectively nullified. Consequently, it yields better outcomes contrasted with the primary strategy (exclusion of rows/columns). Another method of a guess is through the deviation of neighboring values.

Splitting the Dataset
Every dataset of Machine Learning models must be split into two separate sets – training set and test set. The training set denotes the subset of a dataset that is used for training the machine learning model where we are already aware of the output. A test set, on the other hand, is that the subset of the dataset that is used for testing the machine learning model. Machine Learning models use test data to predict outcomes. Usually, the dataset is split into a 70:30 ratio or 80:20 ratio. This suggests that it is possible to take either 70% or 80% of the data for training the model while leaving out the rest 30% or 20% to test the model. The splitting process varies consistent with the form and size of the dataset that is considered (Mirjalili, 2019).

The train_test_split function includes four parameters, the first two are for arrays of data. The test_size function specifies the size of the dimensions of the test set. The test_size may be 0.5, 0.3, or 0.2 – this specifies the dividing ratio between the training and test sets. The last parameter, "random_state" sets the values for a random generator in order the output is usually the same.

Feature Scaling
Feature scaling marks the finish of the data preprocessing in Machine Learning. It is a strategy to normalize the independent factors of a dataset inside a range. At the end of the day, including scaling limits the scope of factors with the goal that you can think about them on regular grounds. The following legitimate advance in our preprocessing pipeline is proportional to our features. Before applying any scaling changes, it is imperative to part our data into a train set and a test set. If we start scaling before, the training (and test) data might end up scaled around a mean value that is not actually the mean of the train or test data and then again go past the entire motive behind why you're scaling in any case (Mirjalili, 2019).

In the dataset, it may be observed that all columns do not have the same scale. In such a scenario, if it is computed by any two values from the columns, one value will dominate the other and deliver incorrect results. Thus, it must be removed from this issue by performing a feature scaling for Machine Learning.

Standardization
Standardization is a change that focuses the data by expelling the mean estimation of each element and afterward scale it by separating (non-consistent) features by their standard deviation. In the wake of standardization data, the mean will be zero and the standard deviation will be one. Standardization can improve the exhibition of models (Mirjalili, 2019). For example, numerous components utilized in the objective function of a learning algorithm (for example, the RBF piece of Support Vector Machines or the l1 and l2 regularized of direct models) expect that all features are based on zero and have a difference in a similar order. On the off chance that an element has a change that is significant degrees bigger than others, it may rule the objective function and make the estimator unfit to gain from other features correctly as expected. Depending on the needs and data, sklearn provides a bunch of scalers: StandardScaler, MinMaxScaler, MaxAbsScaler, and RobustScaler. We have chosen the Standard Scaler for our data.

Standard Scaler
Sklearn, its principle scaler, the StandardScaler, utilizes an exact meaning of standardization to standardize data. It focuses the data by utilizing the following formula, where u is the mean and s is to be a standard deviation.

x_scaled = (x — u) / s (Mirjalili, 2019).

For the dataset, the standardization strategy is being utilized. To do so, StandardScaler class of the sci-kit-learn library is imported by using the following line of code: from sklearn. preprocessing import StandardScaler

The next step is to create the object of StandardScaler class for independent variables. After, it fits and transforms the training dataset using the following code:

```
st_x= StandardScaler()
x_train= st_x.fit_transform(x_train) (Mirjalili, 2019).
```

For the test dataset, it can be directly applied to the transform () function (no need to use the fit_transform () function because it is already done in the training set). The code will be as follows:

x_test= st_x. transform(x_test) (Mirjalili, 2019).

The scaled output values for x_train and x_test for the test dataset will show as:
All the variables in the output are scaled between the values -1 and 1.

3 STATISTICAL MODELS

A statistical model is generally determined as a numerical connection between at least one or more random factors. Insights include data collection, understanding, and approval. Statistical analysis is the procedure of applying several statistical operations to evaluate the data and apply Statistical analysis. Quantitative data include distinct information like studies and observational data. It is likewise called a descriptive analysis. It incorporates different tools to perform statistical data analysis, for example, SAS (Statistical Analysis System), SPSS (Statistical Package for the Social Sciences), Stat soft, and more.

Correlation is one of the most broadly utilized statistical concepts. Correlation is a statistical measure that depicts the relationship between irregular factors. Linear regression models express the relationship between two variables by fitting a line to the observed data and allows to predict a change in a dependent variable as the independent variables change. Ordinary Least Squares is a type of linear least squares method used to find unknown parameters in a linear regression model. All these three models will be explained in detail.

Correlation

Variables within a dataset are often associated with many reasons. We are assuming that every category from age, race, and gender has a strong correlation to the number of reporting COVID-19 cases. It could be helpful while doing data analysis and modeling to understand the relationships between variables. The statistical relationship between the two variables is brought up as their correlation. It's a measure of association between two variables. A positive correlation could be, meaning both variable's move within the same direction, or negative, meaning that when one variable's value increases, the other variables' values decrease. Correlation may be neutral or zero, meaning that there is no relation between the variables (Brownlee, 2020).

- **Positive Correlation:** both variables change in a similar direction.
- **Neutral Correlation:** No relationship within the change of the variables.
- **Negative Correlation:** variables change in opposite directions.

There are different approaches in statistics to search out the association between the variables. The most popular correlation methods are Pearson's correlation and Spearman's correlation which will be explained further below.

Pearson's Correlation

In 1904 Spearman adopted Person's correlation coefficient as a measure of the strength of the relationship between two variables that can't be measured quantitatively (Hauke, 2011). Pearson's relationship coefficient is determined as the covariance of the two factors separated by the result of the standard deviation of each data sample. It is the normalization of the covariance between the two variables to give an interpretable score.

Pearson's correlation coefficient = covariance (X, Y) /(stdy(X) * stdv(Y)) (Brownlee, 2018).

- The use of mean and standard deviation in the calculation suggests the need for the two data samples to have a Gaussian or Gaussian-like distribution (Brownlee, 18).
- The result of the calculation, the correlation coefficient can be interpreted to understand the relationship.

The coefficient restores a value between -1 and 1 that speaks to the furthest reaches of correlation from a full negative correlation to a full positive correlation. An estimation of zero means no correlation. The value must be interpreted, where frequently a number beneath -0.5 or above 0.5 shows a prominent connection, and values underneath those numbers recommend a less outstanding correlation (Schober, 2018). A t-test is accessible to test the null hypothesis that the correlation coefficient is zero. Note that the P-value obtained from the test gives no data on how strongly the 2 factors are connected. With huge datasets, little relationship coefficients can be "statistically significant." Therefore, a statistically huge correlation must not be mistaken for a clinically applicable relationship.

Spearman's Correlation

Spearman's rank correlation is a nonparametric (distribution-free) rank measurement proposed as a proportion of the strength of the relationship between two variables. It is a proportion of a monotone affiliation that is utilized when the dispersion of information makes Pearson's correlation coefficient unwanted or misleading (Hauke, 2011). As with the Pearson correlation coefficient, the scores are between -1 and 1 for consummately adversely associated variables and impeccably emphatically corresponded separately. Rather than computing the coefficient utilizing covariance and standard deviations on the samples themselves, these measurements are determined from the overall rank of values on each sample. This is a typical methodology

utilized in non-parametric statistics, e.g. statistical methods where we do not assume a distribution of the data such as Gaussian (Brownlee, 2020).

Spearman's correlation coefficient = covariance (rank(X), rank(Y)) / (stdv(rank(X)) (Brownlee, 2018).

In uncertain situations of the distribution and possible relationships between two variables, the Spearman correlation coefficient is a good tool to use. Spearman's correlation has given the best results when performed for our analysis. It gave the features that are strongly related to the COVID-19 cases along with the p-value. The p (or likelihood) value obtained from the correlation is a proportion of how likely or plausible it is that any observed connection is because of possibility. P-values run between 0 (0%) and 1 (100%). A p-value near 1 proposes no relationship other than because of possibility and that your null hypothesis assumption is correct. If your p-value is near 0, the observed association is probably not going to be because of possibility and there is an extremely high likelihood that your null hypothesis isn't right. For this situation, you should acknowledge the Alternative (H1) hypothesis that there is an association between the data sets.

The data we have used for correlation analysis were not normalized, hence we have used Spearman's correlation which gave the best results when compared to Pearson's correlation method.

Linear Regression Model

Linear regression is perhaps one of the standards and well-known algorithms in statistics and machine learning. Machine learning, even more explicitly the field of prescient demonstrating, is essentially worried about limiting the mistake of a model or making the most precise expectations conceivable, to the detriment of reasonableness. In applied machine learning, we will obtain, reuse, and make calculations from various fields, including insights and use them towards these ends (Brownlee, 2016).

In that capacity, linear regression was created in the field of statistics and is read as a model for understanding the relationship among input and output numerical variables, however, has been borrowed by machine learning. It is both a statistical algorithm and a machine learning algorithm (Brownlee, 2016). By fitting a linear equation to observed data linear regression aims to model the association between two variables. We consider one variable as explanatory and the other as a dependent variable. An important numerical proportion of the relationship between two factors is the correlation coefficient, which is an incentive between -1 and 1 showing the strength of the relationship of the observed data for the two variables.

Ordinary Least Squares Method (OLS)

OLS is a computationally modest, simple to-clarify quotient of determination value that depends on simple statistics. It is the most used method in Statistical Learning which is also known as the curve fitting method. It is additionally the most seasoned, going back to the eighteenth century and crafted by Carl Friedrich Gauss and Adrien-Marie Legendre. It is additionally one of the simpler and progressively natural methods to comprehend, and it gives a decent premise to learning further developed ideas and strategies. Following that, OLS is an estimator where the estimations of m and c (from the above condition) are picked to limit the whole of the squares of the contrasts between the watched subordinate variable and the anticipated ward variable. That is the reason it's called ordinary least squares. Likewise, it ought to be noticed that when the whole of the squares of the distinctions is least, the misfortune is additionally least—thus, the forecast is better. OLS Regression gives us the outcomes as far as R-value and other statistical terms. Linearity can also be assessed by the least square method (Mukhopadhyay, 2018).

OLS methods give these Statistical outputs in terms of a measure of how the data is fit to the linear regression line using R squared, Adjusted R squared, also few standard error values are interpreted using t-static, F-statistic, and Akaike Information Criterion, Bayesian Information Criterion gives the measure of the quality of the statistical model for the data used.

- **R-squared** is also called the coefficient of determination. It's a statistical proportion of how well the regression line fits the data.
- **Adjusted R-squared** modifies the measurements dependent on the independent variables present.
- The ratio of deviation of the assessed estimation of a boundary from its hypothesized to its standard error is called **t-statistic.**
- **F-statistic** is determined as the proportion of mean squared error of the model and mean squared error of residuals.
- AIC stands for the **Akaike Information Criterion**, which estimates the relative quality of statistical models for a given dataset.
- BIC represents the **Bayesian Information Criterion**, which is utilized as a standard for model choice among a limited arrangement of models. BIC resembles AIC; be that as it may, it includes a higher penalty for models with more parameters.
- The approach has been made for the OLS model in this research to have a better idea of how well the data is the best fit for the linear regression line.

The data from the GitHub and Census bureau had mixed types of data that are categorical and numerical. We have focused on recognizing the correlation between them using Spearman's correlation and OLS model for best linear fit identification.

4 TOOLS

Once the data are gathered, preprocessed, to interpret the results for the analysis python programming language is used. Python is the most widely utilized and the most favored library by Data Scientists around the globe. There are different python packages which we have used for the analysis. The predefined Python libraries can perform explicit data preprocessing occupations. The three core Python libraries used for this data preprocessing in Machine Learning are NumPy, Pandas, Matplotlib, and SciPy as explained below:

- **NumPy** – NumPy is the basic bundle for the logical count in Python. Henceforth, it is utilized for embedding any kind of mathematical operation in the code. Utilizing NumPy, you can likewise include enormous multi-dimensional exhibits and matrices in your code.
- **Pandas** – Pandas is a superb open-source Python library for data manipulation and analysis. It is broadly utilized for bringing in and overseeing datasets. It packs in elite, simple to-utilize data structures and data analysis tools for Python.
- **Matplotlib** – Matplotlib is a Python 2D plotting library that is utilized to plot any sort of charts in Python. It can convey distribution quality figures in various printed copy designs and intelligent situations across platforms (IPython shells, Jupyter notebook, web application servers, and so on.).
- **SciPy** -SciPy is a free and open-source Python library utilized for scientific computing and specialized processing. We have used SciPy to the library for performing the statistical models, to find the correlations.
- We have used NumPy to do various mathematical operations and statistical models on the dataset and also to find the data types of the values in the dataset, which helped us to optimize the code. Pandas is used to read the dataset and perform some manipulations and analysis on the data, it is built on the NumPy. Matplotlib is a mathematical extension to NumPy, it is used to plot charts in a linear regression model to have an idea on the behavior of values in the data. Scipy is used to import spearman and Pearson correlations, the SciPy is built on the NumPy, it also makes use of Matplotlib.

5 RESULTS

To extract the most affected groups amongst Age, Race, and Gender in relation with COVID-19 cases, we have performed Spearman's correlation approach, followed by the Linear Regression model and OLS method.

Effect Of COVID-19 On Different Categories Of Age, Race, And Gender Using Spearman's Correlation

After finding the correlation between the cases and different Age groups, races, and gender by using Spearman's Correlation the following results are obtained.

From the Table 5(a) for 19 states after finding the correlation between cases and different age groups using Spearman's correlation, it has been observed that people of age group between 40-49 years, 50-59 years, and 60-69 are highly affected with the correlation values R (correlation coefficient) of 0.937, 0.935, and 0.933 respectively among different age groups.

Age	Correlation (r)	P-values
0-19 years	0.665	0.0018
20-29 years	0.851	3.88e-06
30-39 years	0.874	1.029e-06
40-49 years	0.937	3.543e-09
50-59 years	0.935	4.446e-09
60-69 years	0.933	5.543e-09
70-79 years	0.840	6.688e-06
80+ years	0.698	0.0008

Table 5(a) Correlation for different age groups for 19 states.

These correlation results for different age groups describe that they show a strong positive correlation with cases by seeing that their r values are greater than 0.8, except for age groups 0-19 and 80+ years as they have below 0.8 while they still show a positive correlation. Also, the p-values are close to zero for all the age groups, with this evidence we accept alternative (H1) hypothesis that there is an association between the age groups and COVID-19 cases.

As shown in the Table 5(b) for 19 states amongst different races, Whites show strong relationship with the number of cases when compared to other groups, with a correlation value of 0.798 and also observed that their p-value is close to zero, so we accept alternative (H1) hypothesis that there is an association between the white race and COVID-19 cases. An inverse correlation among the American Indian and Alaska Native race having a negative value of -0.180.

Race	Correlation (r)	P-value
White	0.798	4.199e-05
Black or an African American	0.561	0.047
Hispanic	0.460	0.125
American Indian and Alaska Native	-0.180	0.4606
Asia	0.088	0.7210

Table 5(b) Correlation for Race for 19 states.

Except for the American Indian and Alaska Native and Asian races, the correlation results for all the races shows a positive correlation whereas, American Indian and Alaska Native shows negative and Asian describe almost neutral correlation.

From Table 5(c) it is also seen that from the correlation of different races with a number of cases across all 50 states, Whites have the highest association with cases than any other groups, with a correlation value of 0.730 and p-value which is close to zero, where we accept alternative (H1) hypothesis that there is an association between the white race and COVID-19 cases. Also, a Negative correlation is observed in the American Indian and Alaska Native and Native Hawaiian and Other Pacific Islander with the r values of -0.008 and -0.113, respectively.

Race	Correlation (r)	P-value
White	0.730	5.949e-09
Black or an African American	0.454	0.00136
Hispanic	0.655	5.777e-07
American Indian and Alaska Native	-0.008	0.9580
Asian	0.216	0.144
Native Hawaiian and Other Pacific Islander	-0.113	0.448

Table 5(c) Correlation for Race for 50 states.

These results indicate that except for inversely correlated races, the rest of them show a positive correlation. Whereas Asians are weakly correlated as they have a lower r value with 0.216.

From Table 5(d), In the factor gender for 19 states, it is seen that the correlation values are almost similar among both genders, while males have slightly higher correlation values with 0.858 when compared with females who have 0.851.

Gender	Correlation (r)	P-value
Male	0.858	2.647e-06
Female	0.851	3.899e-06

Table 5(d) Correlation for Gender for 19 states.

It is also observed that their p-values are close to zero, where we accept the alternative (H1) hypothesis that there is an association between the male, female with COVID-19 cases separately.

Linear Regression Model Using Machine Learning

After evaluating the train test data in the linear regression model, we have obtained the MAE (Mean Absolute Error), MSE (Mean Square Error), and RMSE (Root Mean Square Error) values for each model.

From Table 5(e), for the 19 states among different age groups, it is observed that RMSE values are as low as for the age groups 50-59 years and 40-49 years values with 0.214 and 0.219 respectively and as high as 1.002 for 0-19 years of age group.

Age	MAE	MSE	RMSE
0-19 years	0.872	1.004	1.002
20-29 years	0.466	0.411	0.641
30-39 years	0.489	0.515	0.718
40-49 years	0.147	0.048	0.219
50-59 years	0.185	0.046	0.214
60-69 years	0.326	0.197	0.443
70-79 years	0.477	0.279	0.529

Table 5(e) Error-values of age groups for 19 states.

The RMSE values greater than 0.2 are said to be that the model can relatively predict the data accurately, whereas we have the RMSE values greater than 0.2 for all the age groups which shows that each model for the individual age group has predicted the data accurately.

From Table 5(f) and Table5(g), It is seen in the race among the 19 states and 50 states data Asian & American Indian and Alaska Native are having low RMSE values with 0.514 and 0.819 individually among their categories.

Race	MAE	MSE	RMSE
White	0.643	0.460	0.678
Black or African American	0.560	0.439	0.662
Hispanic	0.610	0.433	0.658
American Indian and Alaska Native	0.556	0.461	0.679
Asian	0.451	0.264	0.514

Table 5(f) Error-values for Race for 19 states.

Race	MAE	MSE	RMSE
White	0.516	0.744	0.862
Black or African American	0.574	0.932	0.967
Hispanic	0.595	0.999	1.000
American Indian and Alaska Native	0.735	0.671	0.819
Asian	0.595	0.929	0.964
Native Hawaiian and Other Pacific Islander	0.716	0.968	0.984

Table 5(g) Error-values for Race for 50 states.

These RMSE results for races of both 19 states and 50 states show that the respective models for each race have predicted the data accurately.

From Table 5(h), for the factor gender in 19 states, we can say that the RMSE value for males is less in the gender with a value of 0.341 when compared to women who are having a value of 0.348.

Gender	MAE	MSE	RMSE
Male	0.207	0.116	0.341
Female	0.174	0.121	0.348

Table 5(h) Error-values for Gender for 19 states.

Which still shows us that the models for both male and female predicted the data accurately.

Outcomes of Statistical Model for Different Categories of Age, Race, And Gender Using Ordinary Least Squared Method
From the Ordinary Least Square (OLS) Method R-squared and adjusted R-squared values were obtained which are unknown parameters in a linear regression model. From Table 5(i), for 19 states among different age groups, it is observed that R-squared values were high for age groups 60-69 years and for the people who are 50-59 years in age with 0.869 and 0.850, respectively.

Age	R-squared	Adjusted R-squared
0-19 years	0.618	0.596
20-29 years	0.681	0.664
30-39 years	0.774	0.761
40-49 years	0.792	0.781
50-59 years	0.850	0.842
60-69 years	0.869	0.862
70-79 years	0.802	0.791
80+ years	0.633	0.612

Table 5(i) R squared, and Adjusted R squared values for age across 19 states.

These R-squared values for different ages indicate that they all are better fit to their models and the age groups having R-squared values greater than 0.8 have a smaller difference between the observed data and the fitted values.

Table 5(j) and Table 5(k) show that in the race among the 19 states and 50 states data, White has the highest R-squared value of 0.937 and 0.882, respectively. Which tells us that they have a smaller difference between the observed data and the fitted values.

Race	R-Squared	Adjusted R-Squared
White	0.937	0.934
Black or African American	0.842	0.833
Hispanic	0.706	0.690
American Indian and Alaska Native	0.257	0.216
Asian	0.531	0.505

Table 5(j) R squared, and Adjusted R-squared values for Race 19 states.

Race	R-Squared	Adjusted R-Squared
White	0.882	0.880
Black or African American	0.581	0.572
Hispanic	0.770	0.765
American Indian and Alaska Native	0.219	0.202
Asian	0.334	0.320
Native Hawaiian and Other Pacific Islander	0.138	0.120

Table 5(k) R squared, and Adjusted R squared values for Race for 50 states.

All the races show a better fit for their respective models but the American Indian and Alaska Native and Native Hawaiian and Other Pacific Islander races have noisy, high-variability data that can have a significant trend having low R-squared values.

From the above results, it can be inferred that the Whites among different races are vulnerable to get affected with COVID-19, age groups of 40-49 years, 50-59 years, and 60-69 years, and male in gender are showing a strong relationship with the COVID-19 cases while using Spearman's Correlation. Since the RMSE values are good for all models, it can be described that the linear regression model is performed better for every model and relatively predicts the data accurately. The R-Squared values which are generated by the OLS method explain that the Whites among different races, age groups of 50-59 years, and 60-69 years are

having a smaller difference between the observed data and the fitted values and hence show a strong association with the COVID-19 cases.

6 DISCUSSION

This research succeeded in implementing the Correlation, linear regression models, and recognized how people of different ethnicity/races, ages, and gender are correlated with the COVID-19 cases from the contemporary data which we have.

Our initial analysis from different research papers has shown that White among the different races, people aged between 18-29 years and 50–64 years across all the age groups are more vulnerable to get infected with COVID-19 (CDC COVID Data Tracker). In the factor, gender males are more likely affected by COVID-19 (Klein, 2020). Whereas, our findings from the correlation and linear regression with the cases and different races have shown that the whites are strongly correlated when compared to any other races with the correlation coefficient of 0.798 which is significant with our initial analysis. For finding the association within the cases and different age groups, we have considered the age groups in 10 years of difference in age. While considering this approach it is observed that the age groups of 40-49 years, 50-59 years, and 60-69 years are having a strong correlation with correlation coefficients of 0.937, 0.935, and 0.933 which show a stronger correlation with cases among the other different age groups, which is also supported by our initial analysis. Finally, considering the correlation between gender and cases, we can understand that they are equally correlated with the cases, but the male population is more associated with the cases than the female population by having correlation coefficients of 0.858 and 0.851 respectively, which is again a significant result with our initial analysis.

A linear regression model is performed using machine learning algorithms to obtain the MAE (Mean Absolute Error), MSE (Mean squared Error), RMSE (Root Mean Squared Error) values. The RMSE value indicates how close the observed data values are to the model's predicted values, RMSE values greater than 0.2 are preferable. From models of the race category, we have seen the highest RMSE values in Hispanic and Black or African American with 1.00 and 0.967 individually, while the remaining races have values greater than 0.8. Considering the different age categories, the RMSE value is high for the 0-19 years age group with 1.002 while for the other groups, it is greater than 0.2 which means that the predicted values are accurate to the observed values. Finally, for gender, the RMSE value for males is 0.341, and females 0.348 which indicates the predicted values as accurate to the observed values.

The OLS (Ordinary least square method) is used to find the unknown parameters in a linear regression model. Where we consider R-squared which is also called a coefficient of determination it is a statistical measure of how well the regression line fits the data and adjusted R-squared adjusts the statistics based on the number of independent variables present. An R-squared value of 1.0 indicates that the data perfectly fit the linear model. Any R-squared value less than 1.0 indicates that at least some variability in the data cannot be accounted for by the model (e.g., an R-squared of 0.5 indicates that 50% of the variability in the outcome data cannot be explained by the model.) (Hamilton, 2015). It is seen that every model in the Age and Gender factors has the R-squared values above 0.6 which indicates that the data are a better fit for their respective models. Whereas for particular age groups of 50-59 years and 60-69 years, high R-squared values are observed, which indicates they are strongly associated with cases and also it is supported by our initial analysis. For the Race category, the R-squared value is as low as 0.257 for the American Indian and the Alaska Native among the 19 states and the races across all states in the US have the R- squared value for the Native Hawaiian and Other Pacific Islander is 0.138 and 0.219 for the American Indian and Alaska Native and below 0.5 for the Asian which shows that even noisy, high-variability data can have significant trends. Despite having low R-squared values, the trend indicates that the predictor variable still provides information about the response even though data points fall further from the regression line. Whereas the Whites are showing a high R- squared value, which means they are highly affected with cases than any other age races and supported by our initial analysis.

In conclusion to this research, it can be inferred that there are divisions of independent variables from age, race, and gender that have a higher chance of contracting with COVID-19. Overlap of these high correlation divisions like age (40-49 years), race (White), and gender (Male) from its variables which can make them more susceptible to COVID-19. Such information can be used to take precautions for these vulnerable groups, which may result in fewer affected cases.

7 FUTURE WORK

To make our findings more accurate we would like to include more states to our analysis whenever the data will be available and also more factors like underlying conditions, obesity, population density, travel history, lockdown restrictions, and other relevant factors so we can predict the correlation between the population and number of cases more accurately.

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Pandemic Pricing Policies: Professional Prerogative or Political Plaything

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ABSTRACT
Pricing a product is considered an important component of the marketing mix that induces consumer behavior. During the 2020 Covid-19 pandemic, price gouging emerged from obscure rarely litigated business law to sensational above the fold headlines. $79.99 hand sanitizer went from a ridiculous pricing decision to an abuse of power and a criminal offense.

This paper will begin with an overview of common pricing strategies and then examine the limits placed on pricing in the form of laws which prohibit price gouging. While many of the jurisdictions which make short term increases in the price of certain goods and services illegal, the laws vary as to the definitions and requirements of the necessary elements of a price gouging violation.

The political reasons for price gouging laws albeit seemingly obvious, will be examined. The safety and consumer protection arguments will be discussed in the context of almost universal opposition by economists of price gouging regulation.

Finally, if price gouging does not protect consumers and if artificial legal parameters of prices actually intrude on healthy appropriate market forces, why do price gouging laws exist in 34 states and in the federal law? What alternatives to price gouging laws would yield a more efficient marketplace and concurrently meet the government's duty to protect consumers and citizens' health and safety during a state of emergency?

Keywords
Price gouging, surge pricing, dynamic pricing

1 PRICING STRATEGY

An overarching decision essential to the success of all businesses is what price to charge for their product. (Kienzler, 2017) A thoughtful strategic pricing decision is critical to the creation of perceived customer value and business profitability. Developing an appropriate pricing strategy is both crucial and highly complex. (Gijsbrechts, 1993) This complex, important business decision, however complex, is exclusively within the purview of the business.

There are several factors both internal and external that influence a business when making pricing decisions. Internal factors, usually under the control of the business may include a set return on investment objective, a cash flow requirement, profit maximization goal, and a market share objective. The external factors often not in the control of the business could include competitor pricing, government regulation, and the prices of complementary goods. (Haron, 2016) As businesses consider these factors and establish a price, it is rare that this decision is constrained by law. Each business has the legal right, with few exceptions, to set a price that is too high or too low and ultimately fails to accomplish their strategic business objectives.[1]

The main goal of any for profit business is profitability. Revenue must be greater than expenses. Since most businesses' revenue is primarily dependent upon what customers pay for the product the pricing strategy is crucial. The most common pricing strategies are penetration pricing, price skimming, value-based pricing, competitive pricing, and cost-plus pricing.

Penetration pricing is usually employed to by businesses willing to absorb losses to gain market share, involves charging a very low price to lure away competitors' customers and later build brand loyalty and allow you to raise prices to a level that yields a profit. (Liu, 2010)

[1] Cigarettes are a notable example. Presently 25 states and the District of Columbia have minimum price laws for cigarettes. Courts have generally held these minimum price laws and similar restrictions are within a state's police powers. See, e.g. Simonetti v State, 132 So.2d 252 (Ala. 1961). However, a few statutes have been held to violate due process or constitute price fixing. See, e.g. Strickland v Rio Stores, Inc. 255 S.E.2d 714 (Ga. 1979) These few reversals have been the exception.

Price skimming is a strategy where a business sets a comparatively high price for a short period of time to skim off customers willing to pay the higher price, usually for a new or improved product. The price is later lowered as demand decreases and competitors introduce a comparable product with similar improvements or innovation. (Zare, 2013)

Value-based pricing sets prices according to some formula that measures the value of the product to the customer. Various strategies and microeconomic models attempt to measure actual, perceived and realized value to arrive at a value-based price. (Hinterhuber, 2004)

Competitive pricing is using the competition's pricing as a benchmark to establish a price. This strategy may be used as an initial low risk entry into a market with a short-term orientation that should be adjusted as the business more effectively data mines product differentiation and relevant consumer behavior. (Ying-Ju Chen, 2018)

Cost-plus pricing is the seller applying a markup percentage to the aggregate cost incurred manufacturing the product. The markup varies industry by industry and is an additional component strategy the business must consider. (Dholakia, 2018)

Each of these approaches to a pricing decision has advantages and disadvantages. While the industry and academic debate may become heated, parochial, and at times financially life altering, rarely is this pricing strategy illegal. The rare exception is when the pricing decision interacts with a state of emergency and the priced product falls within a category of products that the public perceives as too important to leave pricing and thus availability to the unilateral whim of the seller.

2 SURGE PRICING VERSUS GOUGING

Why is surge pricing and dynamic pricing accepted but price gouging is not? Conceptually they are nearly all the same. Economist believe when demand is highest suppliers should charge more/raise the price so that more supply enters the market or demand is discouraged/reduced. The end result for gouging, or these more palatable pricing techniques, is the same. Supply and demand achieve equilibrium at a market price due to shift of the supply/demand curves or an increase/decrease in quanity due a change in price. Economists and management consultants discuss these pricing strategies as a positive for the market without fear that they are providing a guide to gouging.

For example, surge pricing is a way to achieve equilibrium by adjusting the prices for a ride on apps such as Uber or Lyft to match driver to supply. (Dholakia, Government Tech, 2016)When there are periods of excessive demand for a taxi/ride in an area (after a concert, rush hour, rain, etc) prices surge or multiply to draw in more supply of drivers to the location. Rather than having fixed cab fares, or static pricing, the change balances the basic forces of a compeititive market.

Dynamic pricing is slightly different in that the price of a good is constantly pricing to meet the demand. The goal of dynamic pricing is to make " pricing policies palatable, better for consumers, improve consumer welfare and also make the firm better (Veeraraghavan, 2016). As consumers we see this in many transactions. For example, if in March of 2021 you are willing to book a non refundable December 22, flight to Boca Ratton you may only pay $300 but as it gets closer to departure the price will likely go up as consumers who are inelastic and need to be on that flight could pay triple the fair. Business customers who need to meet a client on a certain day at the last minute may not care about price.

Dynamic pricing for airlines and hotels may fluctuate dramatically because of both fixed supply (airlines and hotels cannot add near term supply)and inelasticity of the consumer. Surge pricing is more normally used to boost and reallocate supply/drivers. There is almost no increase in fixed cost for Uber or the drivers.There maybe a modest increase in marginal cost but that is easily met by the increase in marginal revenue.

So far airlines have not been able to add supply quickly to match demand. Airbnb, like Uber/Lyft, seems to be able to draw in supply to an industry that viewed fix supply as key to profitability. For example, in September, New York City hotel demand gushes during Fashion Week and the United Nations opening.Even though the hotel industry knows there will be a flood of demand during this period they can't build an extra hotel tower to meet it which leads to massive price increases/gouging. However, Airbnb can add more capacity by getting potential landlords off the sidelines. Static capacity during peak demand for hotels does not exist to the same degree with Airbnb in the market.

3 LAW OF PRICE GOUGING

If a local pizzeria advertised their slices for $100 each, consumers would laugh, pity the owner's stupidity, or walk 50 feet down the street to the next pizzeria (we live on Long Island) to buy lunch. Filing a complaint with the state Consumer Protection Office would probably not come to mind or be worth their time. However, if instead of one possible dining option the desired product is within the definition of "basic goods and services including medical supplies" (California Penal Code 396) or "essential goods

and services" (Arkansas Code Sec. 4-88-301 2018) and a State of Emergency (e.g. Kentucky, Massachusetts, New Jersey), "Disaster Emergency" (e.g. New York, Rhode Island, Hawaii), or some similar altered legal state due to extraordinary circumstances such as Hurricanes Katrina and Sandy or the current Covid-19 pandemic the public perception, rights of businesses, and role of the government and legal system changes. A pricing decision once only questionable strategically resulting in unprofitability becomes actionable legally resulting in liability.

In New York, the state price gouging statute (N.Y. Gen. Bus. Code Sec. 396-r) was triggered on January 31, 2020, when the U.S. Secretary of Health and Human Services declared a national public health emergency. The declaration of the emergency changed the rights of businesses with regard to unilaterally and without potential legal liability to price certain products.

The New York statute applies to "consumer goods and services vital and necessary for the health, safety, and welfare of consumers." It defines consumer goods and services broadly and covers a broad range of parties in the supply chain. Manufacturers, wholesalers, suppliers, and retailers are all limited by the statute from price gouging. (N.Y. Gen. Bus. Code Sec. 396-r(2))

The statute prohibits parties from pricing the aforementioned consumer goods at an unconscionably excessive price. The New York approach provides the court with factors to consider when determining if the price is unconscionably excessive.

- The amount of the excess in price is unconscionably extreme;
- There was an exercise of unfair leverage or unconscionable means; or
- A combination of:
    - The amount charged represents a gross disparity between the price of the goods or services which were the subject of the transaction and their value measured by the price at which such consumer goods or services were sold or offered for sale by the defendant in the usual course of business immediately prior to the onset of the abnormal disruption of the market; or
    - The amount charged grossly exceeded the price at which the same or similar goods or services were readily obtainable by other consumers in the trade area.

If the accused party can prove the increased price charged was outside of its control the price increase may not constitute a violation. (N.Y. Gen. Bus. Code Sec. 396-r(3)(b)(ii)) Whether the evidence provided by the defendant is sufficient to rebut the evidence of price gouging is left up to the court.

Texas' prohibits price gouging under the state's Deceptive Trade Practices Act. Similar to New York, the courts are given broad discretion to determine what constitutes price gouging. Unlike New York, the Texas statute provides a private cause of action. Individuals may also bring a claim against the business.

The Texas statute prohibits price gouging during a designated disaster period. While the statute does prohibit demanding an exorbitant or excessive price in connection with the sale or lease of fuel, food, medicine, lodging, building materials, construction tools, or another necessity, it does not define exorbitant or excessive. Like the New York statute the courts are left to consider what prices rise to the threshold of illegal activity. (Texas Commerce Code Sec. 17.46(b)(27))

California's anti-price gouging statute is an example of a jurisdiction taking a more quantitative approach. California law prohibits charging excessive and unjustified increases in prices once a state of emergency has been declared. The statute defines an excessive increase as more than 10% above the price charged by that person immediately prior to the proclamation of a state of emergency. (Cal. Penal Code Sec. 396(a))

Price gouging laws vary from state to state and jurisdiction to jurisdiction. While at least 35 states have specific price gouging statutes or are currently considering them, the public outcry during trying periods of financial, emotional, and economic distress cries out for government intervention. This opportunity is strategically not missed by many leaders/politicians even those without state price gouging statutes. Arizona Governor Ducey, and Minnesota Governor Waltz both issued Executive Orders prohibiting price gouging. Delaware Governor Carney and Montana Attorney General Fox issued statements that existing consumer protection laws would be interpreted to prohibit price gouging and be aggressively enforced immediately. Arizona, Minnesota, Delaware, and Montana are four of the states without specific statutes defining and prohibiting price gouging. (Ondeck, 2020).

In nearly all of the examples of surge or dynamic pricing both the consumer and supplier feel satisfied. Nonetheless, government sometimes steps in, thwarting the "invisible hand". (Foster, 2020)of economic participants to find this equilibrium. It is not just fines that we see government intervention to thwart gouging during peak periods. There are regulations that inhibit competition. For example, New York City has one of the more aggressive laws that makes it "illegal to have paying guests for less than 30

days--unless, of course, the property is a licensed hotel, bed-and-breakfast, or other similar business. (Fishman, 2020). By not allowing short term rental it takes supply off the market. During Fashion week this will keep existing hotels filled and prices high. But what about during a natural disaster? If parts of Brooklyn were damaged during a hurricane this law would also prevent inviduals from renting out their Mantatten apartments for a few weeks to people who need housing. There are so many similar laws and regulations that Airbnb has pages of its website devoted to the issues (Airbnb, 2020)

During COVID we have not seen price gouging for hotels in part because travel has declined dramatically that occupany is down to under 30%. However, as an example of how regulations can once again impact another busines that uses surge pricing to balance demand is Uber. Riders in the Boston area there are reports that wait times are now of 2-3X greater then before the pandemic.The number of drivers out on the road is down because Massachusetts bans surge pricing for all industries during state of emergencies.Regulations that were put in place to reduce explotation of consumers is instead leading to a reduction in consumer welfare.

4 GOOD POLITICS, BAD ECONOMICS, AND A PROPOSAL

Defending consumers from short term windfall profiteering businesses is a political opportunity and wonderful optic for election season. When voters are, through some unforeseen disaster of no fault of their own, financially disadvantaged, government leaders coming to the rescue of their constituents by prosecuting the businesses and publicly decrying these opportunistic price gougers is public relations gold. Unfortunately, while some people benefit in the short-term from anti-price gouging prosecution, economists argue many other people will be disadvantaged by such a policy. (Dorfman, 2016)

Artificially restricting prices with anti-price gouging statutes or Executive Orders, holds prices lower than it would take to balance supply and demand. While some people will be able to purchase the goods at lower prices because of the artificial legislative restrictions, other people will do without when supply is exhausted. The inability to raise prices will remove the economic incentive for businesses to manufacture and supply additional goods. If the opportunity to charge higher prices legally existed, businesses who ordinarily did not manufacture those goods, sell to that region, or target that market would be motivated to increase the market's aggregate supply.

Economists also argue anti-price gouging laws encourage hoarding. Consumers who happen to purchase the protected good early are motivated by the anticipated shortfall in supply to buy more than they need. This purchasing decision exacerbates the shortage by increasing demand in a market without any motivation to rush to increase supply. (Mohammed, 2013)

A hybrid solution proposed to satisfy politicians desire to be perceived as the defender of consumer/voters and the economists' market impact concern is a combination of price limits and market subsidies. During states of emergency, price gouging laws go into effect, but concurrently suppliers of essential goods are subsidized by government payments, tax credits or other similar financial supplement to incentivize entrepreneurial augmenting needed supply. This hybrid approach will remove the motivation to hoard essential goods. The balance between encouraging timely supply increases and still allowing politicians to have their photo op, will motivate both sides to accomplish their primary goals of profit maximization and constituent appeasement.

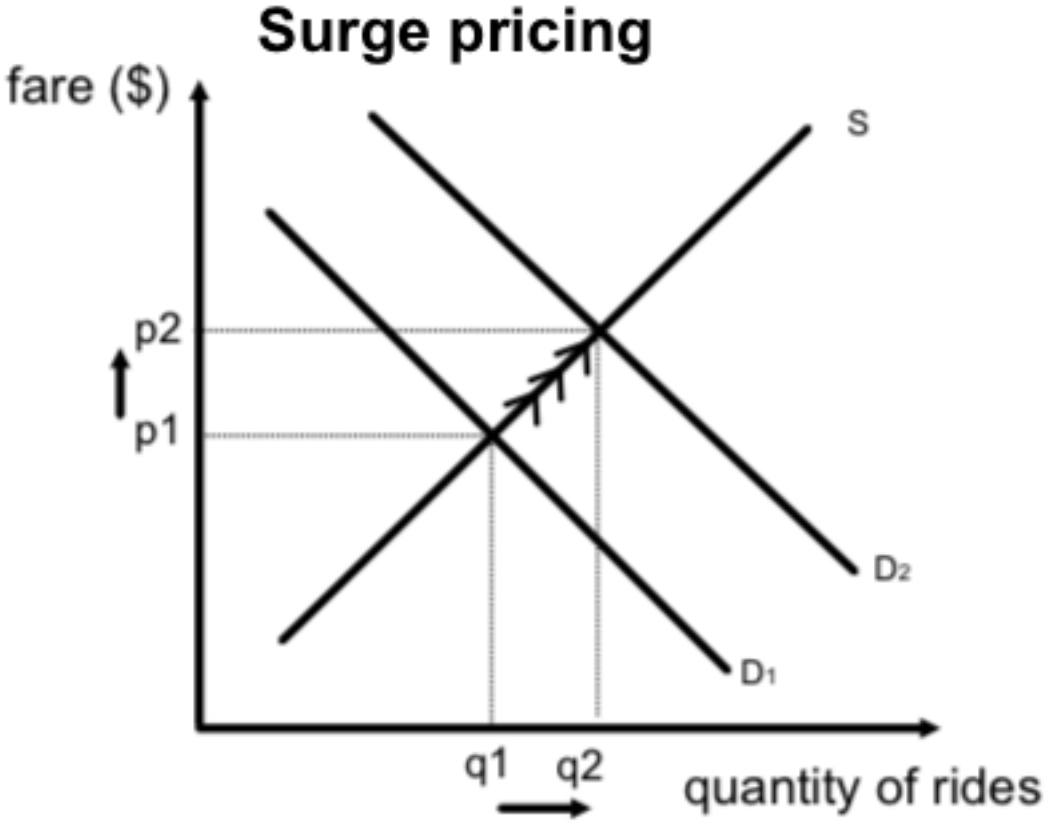

Figure 1:
Source: Tutor2U

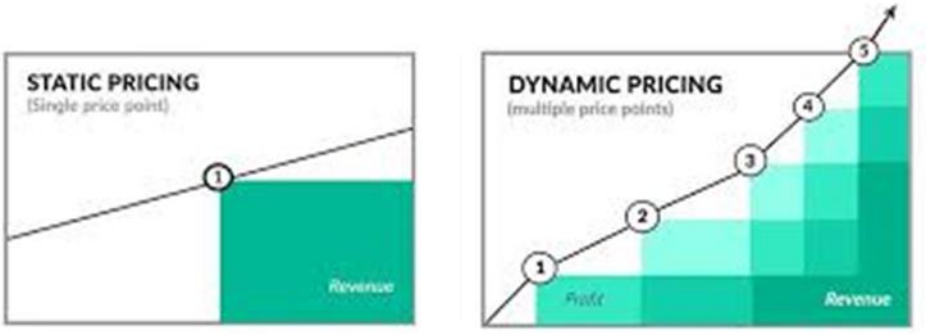

Figure 2:
Source: Towards Data Science

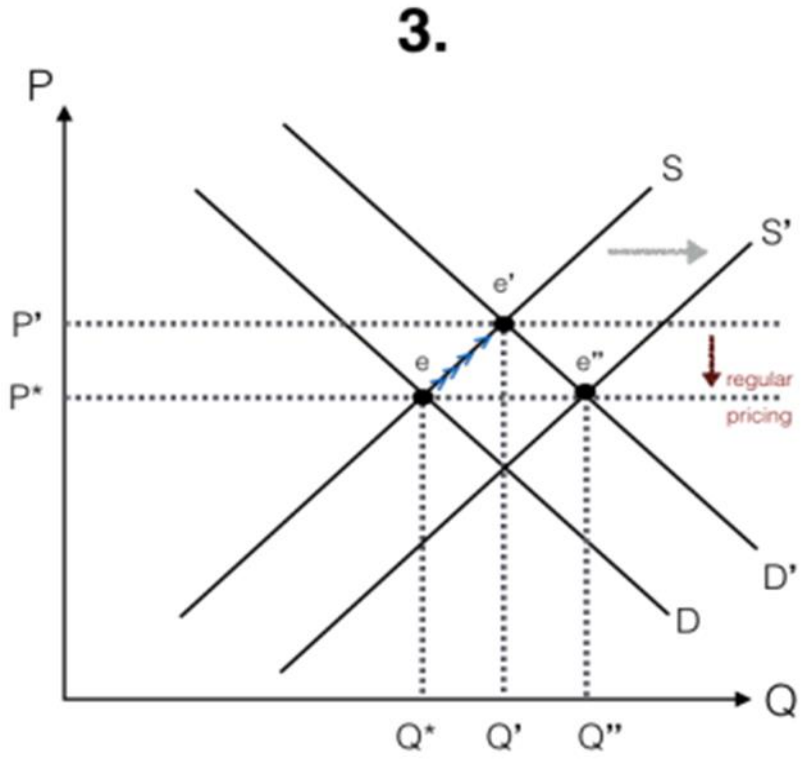

Figure 3:
Source: Wordpress

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Can Earnings Call Sentiment Predict Stock Price Movement?

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ABSTRACT
The quarterly earnings conference call is a popular avenue for corporate disclosure. The extent to which the market incorporates information contained in the sentiment (linguistic tone) of the conference call is still an active area of research. Using a Natural Language Processing technique called Sentiment Analysis, we extract the sentiment contained in earnings conference calls. We then build machine learning models using the extracted sentiment as features, to predict the direction of movement of stock prices post earnings announcement. We find that earnings call sentiment can predict the direction of stock price movement with a high degree of accuracy (73%). We also find that the predictive power of the earnings call sentiment is about the same as the predictive power of the actual EPS and revenue surprise numbers, used as proxies for earnings call content. The predictive power of earnings call sentiment was found to be robust to methodology, as an OLS regression also confirmed our finding that earnings call sentiment is a strong predictor of the percent change in stock price post earnings announcement.

Keywords
Earnings conference calls, sentiment analysis, content analysis

1 INTRODUCTION

Earnings conference calls have increasingly become a medium for dissemination of important relevant information to the market (Frankel, Mayew & Sun, 2010; Kimbrough, 2005). Typical earnings conference calls begin with prepared remarks by the management which is followed by a question answer session with analysts. The conversation between analysts and management is potentially full of rich information that can have an impact on subsequent stock price movement. Core (2001) suggests that it is possible to use techniques such as Natural Language Processing (NLP) to better understand how the linguistic content of the earnings call will impact stock price movement.

Content analysis and textual tone analysis have become increasingly used in corporate disclosure research in recent years. Many studies (e.g. Davis et al., 2008; Demers & Vega, 2008; Henry, 2008) have extracted the tone of the quarterly earnings press releases and related it to stock returns, stock volatility and other firm performance measures. Most of these textual analysis studies find that the linguistic tone of the disclosure is statistically significant, suggesting that relevant information is conveyed by managers in how they use language in their disclosures.

However, very few studies have examined the disclosures embedded in the language of the earnings conference calls. Managers face more constraints when communicating with investors through formal reports such as annual reports, earnings announcements, etc. (Li, 2008). Conference calls may be less subject to these types of restrictions and hence may provide a better setting in which to investigate the relationship between linguistic content and firm performance. In other words, quarterly earnings conference calls, by means of the unscripted question and answer dialogue between management and analysts, provide a richer setting in which one can more fully examine corporate disclosure and its relationship to stock price movement.

Most studies that examine corporate disclosures such as 10-Ks, earnings calls etc. use content analysis to extract tone, and other linguistic features from the disclosures and proceed to determine if there is a statistically significant relationship between the extracted linguistic information and some measure of market performance such as abnormal stock returns. We take a slightly different approach in our study and focus purely on how accurately we can predict stock price movement based on the sentiment extracted from earnings calls, rather than the statistical significance of the relationship between earnings call sentiment and stock price movement after controlling for numerous variables that may have an impact on stock price movement. This is more in line with a pure machine learning approach where prediction and accuracy of prediction are the primary concerns rather than statistical significance. We contend that a machine learning approach is more suited to practice. If one can accurately predict the post earnings call stock price movement based on the sentiment in the earnings call, irrespective of statistical significance, then trading strategies can be constructed to profit from the accurate prediction. An accurate prediction model would be more desirable from an industry and practical application standpoint. Thus, we choose to focus on accuracy of prediction rather than statistical significance. This is not to say that statistical significance of the relationship is not important; we have just chosen to look at the

problem from a different angle than which is common in the literature. In fact, we do perform robustness checks to test the statistical significance of the earnings call sentiment as a predictor of stock price change post earnings announcement by running an ordinary least Squares regression.

To the best of our knowledge ours is among the first studies to take a machine learning based prediction approach to investigating whether earnings call sentiment can predict stock price movement. Thus, we contribute to the meagre literature on earnings call sentiment and its ability to predict stock price movement.

2 METHODS

Data

We obtained earnings call transcripts from Seeking Alpha for 1200 companies traded on the NASDAQ for the period 1/1/2017 to 9/6/2018. Since sentiment analysis is a resource intensive time consuming process, we chose the most recent 18 months of data to keep the size of the data, processing time and computing resources manageable. We had on an average about six quarterly earnings call transcripts per ticker in our data. We had 7520 quarterly earnings call transcripts in our sample with a mean of 304 sentences per transcript. We ended up with a large dataset of over 2 million sentences that we analyzed for sentiment. We also obtained the EPS surprise, revenue surprise, closing price on earnings announcement date, opening price on the next trading day for the 1200 companies from Bloomberg.

Data Preprocessing

The first step in our analysis was to preprocess and prepare the earnings call transcript data for sentiment analysis. We tokenized the earnings call transcript into sentences using the Natural Language Tool Kit (NLTK) library in Python. We then removed punctuations, numbers, stop words, and numerous other words such as welcome, participants, earnings call, etc. that have no impact on sentiment. After this data preprocessing step we were left with just over 2 million sentences.

Sentiment Analysis

We used the lexicon based approach to sentiment analysis, which uses dictionaries of words to identify sentiment in text. The Loughran-McDonald sentiment word lists are curated specifically for the finance domain and have been used extensively in prior literature and hence we have chosen to use the Loughran & McDonald (2011) dictionary in our study. We computed the sum and mean of the positive, negative and uncertain words by ticker and date. This resulted in six independent variables or four features in machine learning parlance.

Variables/Features

The dependent variable in our study is the direction of stock price movement post earnings announcement – a binary variable that denotes a negative price change as a 0 and a positive change as a 1. The main independent variables or the features that were used in our machine learning prediction models were the six sentiment measures described above in the sentiment analysis section. Since stock price movement post earnings announcement is impacted by the earnings call sentiment and the earnings call content we use the EPS surprise and revenue surprise variables as proxies to capture the effect of the call content and control for it in our statistical models.

Prediction Models

The goal of our prediction model was to accurately predict the direction of movement in the stock price based on the sentiment measures extracted from the earnings conference call transcripts. We used three popular classification models – random forest, support vector machines, logistic regression – that have been shown to have good performance. We trained the models using 75% percent of our data and tested them for out of sample accuracy on the remaining 25% of the data. We used a 10 fold cross validation to avoid overfitting.

Robustness Checks

We conducted robustness checks to assess whether our results are robust to change in methodology. The first test we performed was by fitting a simple Ordinary Least Squares (OLS) regression model using the mean sentiment variables as independent variables and EPS, revenue surprise as control variables in the regression. The dependent variable in the regression was the actual price change and not the binary direction variable we used in the classification models.

3 RESULTS

Table 1 shows the results of training various classification models to predict the direction of stock price movement using the earnings call sentiment features. We report the precision, recall and F1 score measures of accuracy. The F1 score is the harmonic mean of precision and recall and reaches its best value at 1 and worst value at 0 and provides a good balanced measure of accuracy taking into account both precision and recall.

Table 1 Classifier performance using sentiment features

Algorithm	Movement	Precision	Recall	F1-Score
Random Forest	Negative	0.75	0.71	0.73
	Positive	0.71	0.75	0.73
	Average	0.73	0.73	0.73
Support Vector Machine	Negative	0.66	0.67	0.67
	Positive	0.65	0.64	0.65
	Average	0.66	0.66	0.66
Logistic Regression	Negative	0.55	0.52	0.55
	Positive	0.54	0.59	0.55
	Average	0.55	0.55	0.55

The Logistic Regression provides a baseline model with an accuracy of around 55%. The Support Vector Machine model with a radial kernel improves on this baseline to achieve an accuracy of 66%. The Random Forest model is the best performing and reaches an accuracy of 73%. Thus, we are able to predict the direction of stock price movement (positive or negative) based on earnings call sentiment with a reasonably high accuracy of 73%.

We investigated what level of prediction accuracy we could attain if we just used the EPS/revenue surprise features in our machine learning models. We found that the prediction accuracy was roughly about the same at 73%. Thus we find that the predictive power of the earnings call sentiment is about the same as the predictive power of the actual EPS and revenue surprise numbers typically used as proxies for earnings call content. We then combined both the earnings call sentiment features and the EPS/revenue surprise features and found the accuracy to increase by 5% to 78%. Thus, using both sets of features does improve the predictive power, but, only marginally.

Table 2 shows the feature importance from the random forest model incorporating both sentiment and market surprise features. The EPS and revenue surprise were the top two and mean sentiments are next. But the weights of the sentiment features are not too far off from the surprise features, indicating that the sentiment features have nearly as much predictive power as the market surprise features.

Table 2 Feature Importance

Variable	Importance
Earnings surprise	0.173
Revenue surprise	0.156
Mean positive sentiment	0.128
Mean uncertain sentiment	0.119
Mean negative sentiment	0.116
Sum positive sentiment	0.106
Sum uncertain sentiment	0.092
Sum negative sentiment	0.090

We now describe the results of our robustness checks. Table 3 shows the results of the OLS regression. We find all the sentiment variables to be statistically significant ($p < 0.01$). The sign of the coefficients of the sentiment variables are also directionally correct with positive sentiment being associated with a positive price change and vice versa. The earnings surprise variable was not significant, while the revenue surprise variable was weakly significant ($p < 0.1$). Thus we find that earnings call sentiment is strongly associated with stock price change post earnings announcement.

Table 3 Robustness Check: OLS Regression

Mean positive sentiment	0.091 (0.0047)***
Mean negative sentiment	-0.123 (0.05)***
Mean uncertain sentiment	-0.007 (0.04)**
Earnings surprise	0.0006 (0.0004)
Revenue surprise	0.0012 (0.0002)*

4 DISCUSSION

The results presented above show that the sentiment extracted from earning calls have significant predictive power in predicting stock price movement post earnings announcement. The earnings call sentiment has similar predictive power as the market surprise (call content) measures. We were surprised by this finding as we were expecting the explicit market surprise measures to have greater predictive power in forecasting the direction of stock price movement. As we expected, combining both the sentiment features and the surprise features did increase our prediction accuracy. The findings were also robust to a change in methodology to a traditional regression analysis. Thus, our findings underscore the importance of the "soft" information contained in earnings conference calls. Our findings are in line with prior research that show that earnings call linguistic tone is a significant predictor of stock performance (Price, Doran, Peterson & Bliss, 2012; Doran, Peterson & Price, 2012; Jiang, Lee, Martin & Zhou, 2019). Thus, we contribute to the meagre literature on the predictive power of sentiment in earnings conference calls by confirming results found in prior literature using a different methodology and more recent data.

Our findings have practical implications. We have demonstrated that just sentiment alone can predict stock price movement with fairly high accuracy. Thus, stock traders and other market participants such as risk managers could utilize the rich sentiment information contained in earnings calls in their stock price forecasts. Trading strategies can also be constructed based on predictions from sentiment models such as ours.

5 CONCLUSION

This study extends the empirical corporate disclosure literature by examining the sentiment (tone) contained in quarterly earnings conference calls and the subsequent market reaction. In particular, we add to the meagre literature analyzing earnings calls sentiment. We employ the widely used Loughran-McDonald dictionary to quantify the sentiment in the earnings calls. We then build machine learning models to predict the direction of stock price movement based on the sentiment in the earnings calls. We find that the sentiment (linguistic tone) in the earnings call can predict stock price movement with a high level of accuracy (73%). We find that earnings call sentiment has the same predictive power as the actual earnings (EPS, revenue) surprise data. Our findings are robust to change in methodology. Thus, we conclude that the rich sentiment information in earnings calls should be exploited in stock price forecasts that are routinely used in trading and risk management.

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Transparency versus Performance in Financial Markets: The Role of CSR Communications

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ABSTRACT
Although companies are exhorted to provide more information to the financial community, it is evident that they choose different paths based upon their strategic emphasis and competitive environments. Our investigation explores the empirical boundary conditions (moderators) under which firms choose to disclose versus withhold information from investors based upon their strategic emphasis. We found significant differences in terms of voluntary information disclosures between firms that consistently delivered positive earnings surprises versus those that delivered negative earnings surprises. We investigated this effect in a more granular fashion by separately examining differences in environmental, social, and governance disclosures between the two pools of firms. We found that in essence, the differences remained consistent – and positive earnings firms were significantly more likely to disclose information about their ESG activities than their counterparts. Interestingly, none of the measures of financial performance were instrumental in distinguishing between the two pools of firms. However, our measures of reach (as measured by the number of) negative news stories lends credence to our findings. From a fund manager's perspective, this finding should raise an immediate red flag-firms that are likely to underperform are likely to be less transparent than overperformers.

Keywords
Transparency, performance, financial markets, corporate social responsibility, earnings surprises, news sentiment analytics

1 CONCEPTUAL BACKGROUND

Firms utilize a variety of methods, formats, and opportunities to disclose information to the investment community. We focus upon companies' voluntary information disclosures as these offer firms with discretionary opportunities to position themselves in financial markets and more importantly, provide investors with the additional transparency they need to make more informed investment decisions. While firms utilize a variety of methods such as earnings calls, blogs, investor conferences, and so forth, to disseminate financial information about the firm's strategy and operations, their efforts to increase transparency are centered around the provision of non-financial information about their CSR and sustainability initiatives. CSR and sustainability initiatives, activities, and accomplishments are now routinely reported to the investment community along the dimensions of ESG (Environmental. Social, and Governance) activities and accomplishments. Investors can also obtain third party ratings about a company's ESG performance from agencies such as MSCI, Thomson Reuters, RobecoSAM, etc. ESG information provides the transparency needed by investors to improve risk assessment and long-term value creation (Kashyap, Mani, Basu and Caiazzo 2017). In addition to these two sources, investors can obtain information about a company's ongoing activities and strategy through newswires. In order to manage and more accurately focus our efforts, we utilized negative news stories about companies in this analysis. Negative news is more salient and has been shown to have a much greater effect on risk assessment than positive news (Dawar and Pillutla 2004). This comprises the third set of information in our analysis.

In this study, we focus upon earnings surprises, that is, the deviation of the firm's announcement of earnings from the market's consensus estimates (Pfarrer, Pollock, and Rindova 2010) for two reasons: 1) earnings surprises can occur for reasons beyond a firm's control (e.g., unexpectedly higher product sales, easing of regulatory requirements, oil spills, hurricane damage to facilities) 2) earnings surprises represent an ideal context to investigate the tradeoffs between transparency and confidentiality in financial markets. However, it is well established that firms often simultaneously engage in CSI (Corporate Social Irresponsibility) and CSR (Herzig and Moon 2013; Kang Germann and Grewal 2016; Lenz et al 2017). Despite the growing emphasis on CSR, stakeholders appear to be more heavily influenced by companies' CSI transgressions than their CSR initiatives (Kang, Germann, and Grewal 2016; Price and Sun 2017).

Earnings surprises catch investors and markets off guard resulting in abnormal (positive and negative) returns immediately after the announcements (Tucker 2007). This reaction is often contingent upon the perceived status of the company in respect to its CSR responsibilities (Kruger 2015). When companies are deemed to be socially responsible, investors often overreact to positive news and underreact to negative news. These anomalies have been explained using prospect theory, which predicts that conservative investors underreact to CSI signals (Barberis, Shleifer, and Vishny 1998). In tandem, halo effects lead investors to favor companies with a good CSR reputation (Walker, Zhang and Yu 2016). However, there is some conflicting evidence in regards to the effects of increased transparency on financial performance. On the one hand, some researchers have found that companies that are more transparent and accountable are more profitable (Eccles et al 2014). On the other, transparency has been associated with an increase in visibility leading to increased sanctions when companies default on their promises (Kruger 2015). Hence, managing CSR communications has become a top priority for managers. Note that managers strive to ensure consistency by building a reputation for delivering stakeholder value. However, when companies consistently deliver negative earnings surprises, there are strong elements of CSI and earnings management that can be inferred from such behaviors.

We began our investigation by focusing on the following questions: 1) How do companies strategically manage CSR communications to ensure a good balance between transparency and confidentiality? 2) What are the effects of increased opacity on company financial performance? CSR communications are instrumental in developing a good CSR reputation. A good CSR reputation has been viewed as a reservoir of goodwill that can buffer companies against CSI spillover effects (Groening and Kanuri 2016; Vanhamme and Grobben 2009; Kim and Woo 2019), which is often referred to as the 'insurance' effect (Kang et al 2017). In support of the insurance effect, Lenz et al (2017) found that CSR offsets the negative effects of negative events, when CSR initiatives are implemented in domains (i.e., environment, social, governance) that are different from their transgressions (e.g., a firm communicates its strong emphasis on diversity, but pays fines for an environmental violation). They attribute this to difficulties experienced by stakeholders associated with retrieving information about company activities in different domains. In addition, Kashmiri et al (2017) found that negative effects are greater for retailers that are similar to a firm that has suffered a data breach. They attribute this to a contagion effect and suggest that communications that dissociate and differentiate bystander firms from the affected firm may help reduce the spillover from negative occurrences and news.

We draw on the extant literature (e.g. Kang, Germann, and Grewal 2016; Jayachandran Kalaignanam, and Eilert 2013; Luo and Bhattacharya 2009) to develop hypotheses about the effect of ESG initiatives on financial performance. We also utilize previous research on voluntary disclosures (e.g., Giannarakis and Sariannidis 2014; Healy, Hutton, and Palepu1999; Lev 1992) to tease out the differences between the effects of ESG on earnings. We observe that investors sanction firms (Hayibor and Collins 2016) when they violate expectations of financial and ESG performance (e.g., failure to protect customer data), or equity (e.g., unfair HR practices), or threaten existing relationships (e.g. eliminate support for legacy products). Investors have been particularly quick to severely punish errant firms (Karpoff, Lee and Martin 2008; Olsen and Klaw 2017). Therefore, effectively managing the spillover effects of negative events and news on financial performance has become a top priority for managers.

Previous studies have found that negative news increases the likelihood of investor sanctions, especially when companies are deemed culpable for undesirable social outcomes (Kolbel, Busch, and Jancso 2017; Lange and Washburn 2012), and can negatively impact a firm's business associates (Kashmiri et al 2017) and MNC subsidiaries of the offending firm (Wang and Li 2019). According to Lenz et al (2017), "CSI's negative effect on firm performance may exceed CSR's positive effect…" This underscores the material and predictive implications of the effects of CSI on financial performance for stakeholders. CSI directly generates financial risk by providing stakeholders with an agenda to coordinate sanctions (Kolbel et al 2017). Increased media coverage of CSI focuses stakeholder attention and coordinates their cognitive responses to CSI occurrences. Building on this line of reasoning, we suggest that CSI invokes fear and uncertainty among stakeholders of increased regulatory scrutiny and fines, penalties, and lawsuits. CSI imposes or raises the specter of additional costs to mitigate externalities. For instance, SEC fines for insider trading and accounting fraud, FTC sanctions for false advertising, and class action lawsuits by consumers, can significantly increase company costs. This manifests in the form of increased risk for companies in capital markets as the magnitude of settlements and future compliance costs is uncertain. As a result, companies may be subject to increased costs of borrowing or fall out of favor with investors seeking stable investments.

CSI also indirectly impacts financial performance as follows. Consumer awareness of CSI is increased by media coverage (e.g., Kolbel et al 2017) and interventions by government agencies. Several government agencies protect consumer interests in the US. For instance, the Consumer Safety Product Commission (CPSC) oversees most consumer products, but food, drugs, and cosmetics are regulated by the Food and Drug Administration, (FDA), while the National Highway Traffic Safety Administration (NHTSA) watches over the automobile industry. The Securities Exchange Commission is specifically charged with protecting the financial interests of investors in US capital markets. Of particular relevance are product harm crises (Chen, Ganesan and Liu 2009; Cleeren, Dekimpe, and van Heerde 2017; Klein and Dawar 2004) and customer data breaches (Kashmiri et al 2017), which affects financial performance as well as a company's reputation and long-term prospects. Companies experience declines in revenue and simultaneously incur significant costs to repair or replace defective products. In addition, the collateral damage to

brand reputation, due to negative halo effects from data breaches, has enduring and adverse implications for financial performance (Kashmiri et al 2017; Park and Sun 2017). CSI awareness in labor markets, hinders employees a company's ability to hire the best talent (Greening and Turban 2000; Jones, Willness, & Madey, 2014). In turn, this detracts from its capability to innovate and create value, thereby reducing its competitive capacity. From the above discussion, these direct and indirect effects underscore the immediate relevance and highly severe impacts of CSI on financial performance.

2 METHODOLOGY

We deploy an empirical approach to determining the level of transparency exhibited by firms. First, we identify companies that have consistently provided (positive +20% or negative -10) earnings surprises from 2013-2016 (16 quarters – see Figures 1 and 2 below). Consistent earnings surprises represent company attempts at earnings management and represent their strategic intent to deliberately withhold information from the investment community. This approach enabled us to identify companies that had consistently pursued an earnings management strategy. Next, we collected Bloomberg Professional's ESG disclosure scores (range: 0-100) that provide information about companies' extra financial activities for these companies. Bloomberg Professional provides disclosure based ESG scores for over 11,000 companies worldwide. ESG scores are awarded based on company filings and other publicly available information as well as a Bloomberg survey. To this data, we append information on their ESG performance using the MSCI database. The MSCI database provides performance-driven (or proprietary) ratings information on firms' environment, social, and governance performance. Finally, we use Nexis to identify all negative news about these companies during the relevant time frame.

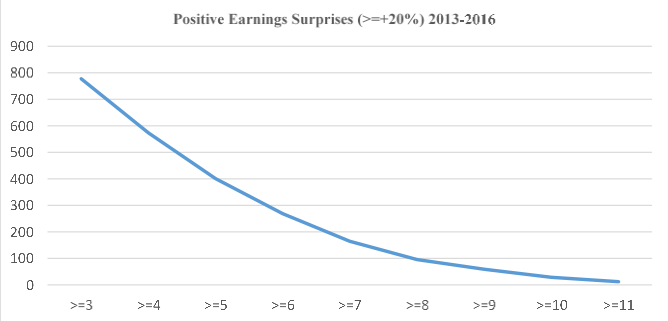

Figure 1: Positive Earnings

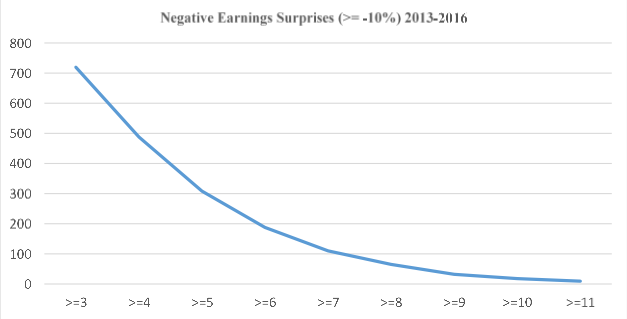

Figure 2: Negative Earnings

A visual inspection of both plots reveals that the inflection points for both positive and negative surprises are at >=6 (i.e., when companies surprise the investor community 37.5%, that is on three or more of eight occasions). Therefore, these companies were selected for further analysis. We began our analysis with a simple comparison of means for the three sets of information identified earlier.

Table 1: Comparison of mean differences in ESG Disclosures between positive and negative earnings surprise firms.

DIFFERENCES IN ESG DISCLOSURES			
	GROUP	Mean	Sig.
2013ESG	0	14.91	0.003**
	1	18.83	
2014ESG	0	14.62	0.000**
	1	19.63	
2015ESG	0	16.13	0.001**
	1	20.81	
2016ESG	0	16.62	0.001**
	1	21.52	
** p < 0.05			

Table 2: Comparison of mean differences in Environmental Disclosures between positive and negative earnings surprise firms.

DIFFERENCES IN ENVIRONMENTAL DISCLOSURES			
	GROUP	Mean	P value
ENV_D2013	0	14.39	0.122
	1	21.66	
ENV_D2014	0	4.40	.011**
	1	9.50	
ENV_D2015	0	4.82	.011**
	1	9.36	
ENV_D2016	0	4.79	.006**
	1	9.65	
* p < 0.1, ** p < 0.05			

Table 1 clearly shows that in the time periods considered for analysis (2013-2016), firms with consistently high positive earnings surprises are far more transparent than firms with negative earnings surprises in terms of their total Environmental, Social, and Governance Scores. To gain further insights, we also compared means across the three dimensions of scores.

Table 2 shows that for years 2014. 2015, and 2016, the differences were in environmental disclosures were significant. In years 2014 and 2016 the differences in means of social disclosure scores were significant (Table 3). For all years 2013-16, the differences in means of governance disclosure scores were significant (Table 4). This clearly suggests that firms with positive earnings surprises are much more transparent than those with negative earnings surprises.

Table 3: Comparison of mean differences in Social Disclosures between positive and negative earnings surprise firms

DIFFERENCES IN SOCIAL DISCLOSURES			
	GROUP	Mean	Sig.
SOC_D2013	0	14.45	0.10*
	1	17.90	
SOC_D2014	0	10.75	0.03**
	1	15.02	
SOC_D2015	0	11.98	0.07*
	1	14.98	
SOC_D2016	0	12.65	0.05*
	1	15.86	
* p < 0.1, ** p < 0.05			

Table 4: Comparison of mean diff. in Governance Disclosures between positive and negative earnings surprise firms (2013-16)

DIFFERENCES IN SGOVERNANCE DISCLOSURES			
	GROUP	Mean	Sig
GOV_D2013	0	50.17	0.002**
	1	52.41	
GOV_D2014	0	46.67	0.000**
	1	52.79	
GOV_D2015	0	47.52	0.000**
	1	53.68	
GOV_D2016	0	48.11	0.000**
	1	54.27	
* p < 0.05, ** p < 0.1			

Next, we turned our attention to ESG performance scores supplied by third-party rating agencies. As the categories of performance are not identical to the disclosure categories, we focused on the overall ratings for all the firms in the sample and standardized the scores for each dimension of ESG (z- scores) to allow for comparisons across industries and categories of ESG performance. The results are shown in tables 5, 6, and 7.

Table 5: Comparison of mean differences in Environmental Performance between positive and negative earnings surprise firms (2013-16)				Table 6: Comparison of mean differences in Social Performance between positive and negative earnings surprise firms (2013-16)			
DIFFERENCES IN ENVIRONMENTAL PERFORMANCE				DIFFERENCES IN SOCIAL PERFORMANCE			
	GROUP	Mean	Sig.		GROUP	Mean	Sig.
Env_S2013	0	2.25	0.603	Soc_S2013	0	3.36	0.745
	1	2.35			1	3.46	
Env_W2013	0	0.00	0.06	Soc_W2013	0	0.13	0.119
	1	0.17			1	0.45	
Env_S2014	0	1.13	0.547	Soc_S2014	0	1.72	0.626
	1	1.24			1	1.86	
Env_W2014	0	0.05	0.669	Soc_W2014	0	0.62	0.586
	1	0.08			1	0.73	
Env_S2015	0	1.22	0.043	Soc_S2015	0	1.97	0.425
	1	1.75			1	2.24	
Env_W2015	0	0.17	0.561	Soc_W2015	0	3.47	0.152
	1	0.13			1	3.12	
Env_S2016	0	2.31	0.665	Soc_S2016	0	2.68	0.300
	1	2.43			1	2.34	
Env_W2016	0	0.21	0.951	Soc_W2016	0	2.10	0.851
	1	0.21			1	2.03	

Table 7: Comparison of mean differences in Governance Performance between positive and negative earnings surprise firms (2013-16)

DIFFERENCES IN GOVERNANCE PERFORMANCE			
	GROUP	Mean	Sig.
Gov_S2013	0	0.19	0.117
	1	0.08	
Gov_W2013	0	0.08	0.451
	1	0.15	
Gov_S2014	0	1.72	0.626
	1	1.86	
Gov_W2014	0	0.03	0.256
	1	0.08	
Gov_S2015	0	0.00	.
	1	0.00	
Gov_W2015	0	0.02	0.620
	1	0.01	
Gov_S2016	0	0.00	.
	1	0.00	
Gov_W2016	0	0.33	0.888
	1	0.32	

Table 8: Comparison of mean differences in the number of negative news stories between positive and negative earnings surprise firms (2013-16)

DIFFERENCES IN # NEGATIVE NEWS STORIES			
	GROUP	Mean	Sig
2013News	0	216.12	0.05*
	1	106.73	
2014News	0	134.02	0.30
	1	106.31	
2015News	0	463.94	0.05*
	1	104.87	
2016News	0	359.98	0.06*
	1	150.54	

* p < 0.1

Finally, we focused on the third information set, that is, the number of negative news stories being disseminated through newswires. As seen from the table below, there are again substantive differences between the two categories of firms in 2013 and 2015 and the difference is marginally significant in 2016.

Table 9: Logistic Regression of Earnings Surprise Status on Information Sets and Financial Metrics (2013)

Variable	B	S.E.	Sig.	Exp(B)	Variable	B	S.E.	Sig.	Exp(B)
INDDUMMY	1.011	.518	0.05*	2.749	2013News	-.001	.001	0.31	.999
ESG2013	.043	.022	0.04*	1.044	NETDEBT4	-.096	.043	0.02*	.908
Env_S2013	.714	.218	0.00**	2.043	DE4	.002	.001	0.04*	1.002
Soc_S2013	-.328	.119	0.01**	.720	ROA4	.136	.046	0.00**	1.145
Gov_S2013	-.579	.265	0.03**	.560	Constant	-.099	.550	0.86	.906

* = p<0.10, ** = p < 0.05

Next, we attempted to isolate the effects of these three sets of information and financial performance metrics such as risk, returns, and Tobin's Q on the propensity of firms to deliver positive and negative earnings surprises. To this end, we estimated a binary logistic model with status (0 = negative earnings surprise and 1 = positive earnings surprise) as the dependent variable and the

three information sets along with financial performance and capital structure measures as the independent variables. Returns data obtained from Bloomberg and the residuals from a three-factor Fama French model Fama and French 1992, 1996) were used to compute idiosyncratic risk (Luo et al 2009) as follows:Riskit= ln[(1-R2it)/ R2it). Where the subscripts i and t refer to the specific firm and year respectively, R2 is the coefficient of determination obtained from rolling regressions of stock returns on three Fama French factors. The results are shown in Table 9 below. We mean-centered the ESG performance ratings and ESG disclosures to reduce collinearity.

As seen above, preliminary results indicate that both information disclosure (ESG2013 < 0.04), and Environmental performance (Env_S2013=-0.69, p < 0.002) are significant in discriminating between positive and negative earnings surprising firms. Interestingly, we also found that companies that had consistent negative earnings surprises were rated more highly than their counterparts with positive earnings surprises. We caution that these are preliminary results based upon findings from a model with data from 2013 only. In the next section, we discuss the implications of our findings.

3 MANAGERIAL IMPLICATIONS

We found significant differences in terms of voluntary information disclosures between firms that consistently delivered positive earnings surprises versus those that delivered negative earnings surprises. We investigated this effect in a more granular fashion by separately examining differences in environmental, social, and governance disclosures between the two pools of firms. We found that in essence, the differences remained consistent – and positive earnings firms were significantly more likely to disclose information about their ESH activities than their counterparts. From a fund manager's perspective, this finding should raise an immediate red flag – firms that are likely to underperform are likely to be less transparent than overperformers.

Interestingly, the objective data in this regard provide a less clear picture. According to third party ratings, the differences between positive surprisers and negative surprisers in terms of their ESG performance were not statistically significant. This finding in itself is extremely revealing. While managers and investors rely on ESG ratings (rather than ESG disclosures provided by companies) to predict financial performance, they may be better served by company disclosures, if they are looking for over- or under-performers. Our measures of reach (as measured by the number of) negative news stories lends more credence to our findings. There were statistical differences between the two pools, with overperformers being subject to far fewer negative news than the underperformers. Data is still being collected on this front and it is too soon to draw any concrete inferences. Additionally, none of the measures of financial performance were instrumental in distinguishing between the two pools of firms. However, we found marked differences in capital structures between the firms. Firms delivering negative earnings surprises were far more heavily leveraged than firms that delivered positive earnings surprises.

4 FUTURE RESEARCH AND CONCLUSION

This research provides interesting and novel insights into the nature of potential relationships between transparency, disclosures, corporate social responsibilities, and earnings surprises. News analytics have a behavioral component as information is reflective of behavior and behavior in financial markets can itself be driven by information, as can be revealed by textual and sentiment analytics (Samuel, 2017; Kretinin et al., 2018; Samuel et al., 2014). Similarly, alternative factors and data sources such as the role of CSR addressing bias against women, internationalization and culture, and use of Twitter data, along with data visualization strategies respectively could be used to gain richer insights (Samuel, et al., 2018, Kretinin, et al., 2019; Samuel et al., 2020; Connor, et al., 2019). In summary, our findings point to an urgent need to increase the value relevance of CSR communications to investors. A socially constructed system of voluntary disclosures can serve as a beacon of hope to investors and hopefully avert market failures. In the end, whether achieved through normative or instrumental means, an efficient market will benefit all market participants.

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Investing in Socially-Minded Young Adults
'Because Nice Matters'

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ABSTRACT
The research herein is part of a fourteen-week research project involving Molloy College students located in Rockville Centre, NY. This project comes from students learning professional skills and much more during the capstone experience. The students worked with a 'live' non-profit located on Long Island and their efforts were to serve for the greater good of society while moving the assigned non-profit forward with its mission. This senior project also promotes civic engagement within their local community with this all-inclusive real-world project.

Hence the students put together turnkey recommendations that would assist the non-profit to implement their findings leading toward social good.

Keywords
Non-profit retreat, college expansion, social responsibility, marketing, not-for-profit

1 PEDOGOGICAL PHILOSOPHY

In preparation of earning their degrees, students need to acquire the proper knowledge that can be applied toward their future professional goals, although they should also be able to demonstrate admirable citizenship. The capstone project helps forge these values through transformative learning. After completion of this course, there is a distinct change in student demeanor and confidence level which promotes continuous learning.

The Fall 2019 semester Capstone Class was divided into three consulting teams where they partnered with a local non-profit with pressing issues. This paper captures the essence of this project where students work as members of a consulting firm named "Rock Consulting, Inc." The team used the Bloomberg Philanthropies, "Mayor's Challenge" application to guide the consulting experience.

2 THE CONSULTING PROBLEM

The client is the *Ryan Mullen Strive For Five Charitable Foundation.* This organization is in its infant stages and is looking to expand over the next several years. This non-profit's mission is to spread kindness because it matters. This non-profit was created in memory of a fallen son via a horrible accident. Those that the non-profit serves are to have the same attributes as Ryan who was a wonderful and kind young man. The Founder of the organization served as the direct client for the student consulting teams.

In summary, the *Ryan Mullen Strive For Five Charitable Foundation* is looking to spread kindness and provide outlets for young adults to congregate and spread awareness of young adult issues to assist future generations with problematic scenarios. This organization was created to be an agent of change by rallying local family, friends, and creating long lasting partnerships to provide awareness as well as provide scholarship opportunities for students.

In order to maintain sustainable growth, the organization looked to Molloy and its students to address the top three pressing issues in the form of consulting firms to optimize resources while continuing to build the brand.

3 THE RECOMMENDATIONS

- **Plan a Retreat Day.**

We plan to implement our idea by first thoroughly researching the seriousness of head trauma by acquiring a keynote speaker at an annual retreat while incorporating retreat activities and celebrating Ryan's life via his personality traits.

- **Partner with St. Anthony's High School.**

Once we fully gather the information, we must set up recurring meetings with senior administration at St. Anthony's High School (where Ryan attended) to be able to award annual scholarships in memory of Ryan to a graduating senior.

- **College Expansion Plan.**

To mirror similar events held on the Molloy campus at other local colleges that support this non-profit's mission. The idea is to expand the Strive For Five ideology to the college level (not just the high school level) along with providing future fundraising opportunities.

4 FACTORS THAT COULD DERAIL THE PLAN

There are many risk factors if we were to implement this big idea. One of these risk factors would be that industry partners and/or local high schools and colleges might not want to partner with the Foundation. There are so many reputable non-profits, we have to be thoughtful and transparent when pitching our ideas to obtain long-term partnerships.

Another issue that may arise is the liquidity of donations. The availability of funds could also become a potential detriment because the organization is promising to deliver funding and if it cannot, it will reflect poorly. A way to combat this would be to institute charitable events. The Foundation can work alongside the website developers and social media pages to elicit donations from supporters and promote events to inspire volunteers to get involved. Another way to mitigate risk is to not overextend the Foundation.

Additionally, the marketing message may eventually be diluted if the marketing campaign is not continuously surrounded by Ryan's characteristics. Keeping these ideals at the forefront of all of the non-profit's efforts whether it be at charitable events, awarding scholarships, and simply building brand awareness could significantly mitigate prolonged risk.

Although these are some prominent risk factors, it is essential that we make these factors our main priority as charged within our field research. If these initiatives are not properly executed, we will be unable to implement our overarching plan.

5 SUMMARY OF DESIRED OUTCOMES

Our main objective is to implement a sustainable way for the *Ryan Mullen Strive For Five Charitable Foundation* to generate brand awareness with their resonating message of 'because kindness matters' and provide ample funding through student scholarships. The ideal outcomes to be achieved are to promote brand awareness to both high schools and colleges alike as well as produce significant scholarship opportunities for future generations in memory of Ryan.

- **How long do you think it will take to show results?**

The Retreat Day Plan can come to fruition within a 1-2 year time frame. The research can get underway immediately. Volunteers may be solicited, but finding partnering schools may take some time to develop. The hope is to engage the Board of Directors effective immediately to help build volunteerism and to support the event as a whole.

The St. Anthony's Partnership can take up to 6 – 12 months to foster. The reason being, it depends on the time frame in which this scholarship will be offered. After the initial arrangements are made, the Board alongside senior administration at St. Anthony's can continue the relationship to come up with a plan that best fits this type of award on an ongoing basis.

As for the College Expansion, this idea will take approximately 1-6 months to plan events and get in contact with local colleges. It will take closer to the 6 month range when solidifying partnerships with other colleges.

- **How will you manage sustainable efforts?**

All three of the consulting teams need to take the first step regarding the development of these credible ideas, especially since this is new territory for the Foundation. Once turned over to the Board of Directors, it is up to them to get engaged and take the lead on the aforementioned ideas in order to see them come to fruition. They may form subcommittees and through their contacts be able to provide volunteers and/or donations to support the sustainability of the non-profit.

6 IMPACT ON SOCIETY

There is a need for this solution throughout the US. The *Ryan Mullen Strive For Five Charitable Foundation* believes that all of our local communities possess the resources in order to better shape young adults to fulfill fruitful and rewarding lives. Society can grow socially in future years due to the ideas that are being recommended. It is the added brand awareness and the nature of the cause that will help unite everyone within their local communities to build a stronger brand for the greater good.

Rock Consulting, Inc. wishes to impact the world in a positive way. We have grown proud of our recommendations and believe that with the dedication of family, friends, and new partnerships, the Foundation is sure to enhance the lives of young adults around the nation. We are optimistic when it comes to our research efforts. Our ideas will support both social and brand expansion at minimal cost. This is not only rewarding as a capstone project, but it will positively impact others within our local community.

7 ACKNOWLEDGEMENTS

The authors wish to thank our partners at the *Ryan Mullen Strive For Five Charitable Foundation* for allowing us to demonstrate the knowledge and skills developed to positively impact society.

8 REFERENCES

Will be supplied upon request.

Identifying Correlation of Multiple Factors with Mortality Rate of COVID-19 Using Regression Models

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ABSTRACT
The rapid outbreak of the new Coronavirus (COVID-19) pandemic and the spread of the virus worldwide have prompted various investigations about the impact of several factors on the rate of development of this epidemic. Studies have called attention to understand and analyze various parameters that may have influenced the spread of the virus, and in particular, the impact of temperature, humidity, age, population density which has been also emphasized throughout the research. This paper presents the underlying health conditions to evaluate on the association with mortality rate and locate correlation between other variables. Though one can identify several factors, the research has been focused on age, underlying health conditions, temperature and population density as factors and how it could impact mortality once a person gets infected with COVID-19. The methodology used to define the association includes statistical analysis to identify the correlation and dependencies of COVID-19. Several regression models such as Pearson, Kendall, Spearman correlation, Linear Regression have been used along with Polycor regression for association among the variables.

Keywords
Coronavirus, Covid-19, SARS-CoV-2, linear regression; Polycor, Pearson, Kendall, Spearman, correlation, statistical analysis

1 INTRODUCTION

With the COVID-19 spreading so rapidly around the globe, it has now become a matter of international concern. COVID 19, also known as coronavirus, is an infectious disease and is currently an ongoing pandemic (Saxena, 2019). Its effect is observed with the number of cases rising in each country. Its common symptoms include cough, fatigue, high temperatures and shortness of breath. Its transmission between people in close contact is fairly quick through droplets from coughing or sneezing. Touching surfaces exposed to the virus and touching their faces also contributes to the spread (Saxena, 2019). Currently, the number of affected people around the world has been over 4 million and still counting.

The virus was first discovered during early December of 2019 and was believed to have originated from the seafood market in Huanan (Emmie de Wit1). The newly discovered virus is said to be closely related to SARS i.e., Severe Acute Respiratory Syndrome, due to its similarity to effects on the respiratory system. Belonging to the family of RNA viruses, SARS, MERS and COVID-19, the infections from these viruses are usually manifested in the form of Pneumonia, bronchitis or severe respiratory illness and is therefore fatal (Emmie de Wit1). Though comparatively SARS and MERS have a higher fatality rate than COVID 19, considering the rate of spread of the virus, the number of affected cases in COVID-19 is considerably higher. Thus, in spite of having a low mortality rate, the total number of deaths are higher than SARS or MERS.

With the ongoing large number of infected cases around the world, there is a necessity to evaluate and identify the various factors that influence the spread of the virus. Therefore, this study will be pivoted towards understanding the risk populations. It is known that aging has direct association to changes in physiology and tolerance capabilities (Liu Y, 2019). With a large number of older people affected with the virus, it has been observed a considerable number of these cases have resulted in being fatal. Therefore, the study will thereby analyze if age is a considerable factor to determine the severity of the infection and also identify other factors that correlate with the severity.

For the evaluation, following will be data considered on the total cases in each country, the number of people affected, number of deaths and number of recovered cases. From this data, the death/mortality rate, along with recovery rate will be calculated. The mortality rate and recovery rate are usually identified as the percentage of cases with respect to the total cases. But, with many cases still active and without possible outcome of either death/recovery, the rate of Mortality and recovery is calculated as the total number of fatalities and recoveries where available with respect to the total cases of every individual country.

2 METHODOLOGY

Currently, the dataset is obtained from the Centre for Disease Control and World Health Organization for every individual country. The datasets have also been retrieved from worldometer and Kaggle, as they have been integrated from the CDC and WHO and have concise information regarding COVID-19 variables. With a wide range of countries considered for the analysis, the date of the records ranges from January 1st of 2020 to July 14. The provisional data available from CDC is a big data consisting of about 30,000 time series instances. The latest mortality rate, recovery rate has been formulated in worldometer with the data collected from CDC, WHO and individual countries' government provided data. As the datasets are formulated from different sources, it is required for the data to be maintained such that there would be no errors during the analysis. Hence, several data cleaning techniques have been employed as required for the acquired dataset.

Data Pre-Processing

With a wide range of data collected from various sites for analysis, Data pre-processing is the initial necessary step. Data preprocessing is the process of cleaning and preparing the text for further analysis. Online datasets, usually, may contain lots of noise and uninformative parts that could hinder the output during the analysis. In order to keep all the datasets in line for statistical analysis, following data cleaning methods have been employed to get the multiple datasets merged wherever possible to improve the analysis. This would essentially decrease the noise in the datasets and would allow us to obtain more precise outcomes.

Lowercasing

The first pre-processing step which will transform our categorical datasets into lower case (Herrera. F,2014). This avoids having multiple copies of the same words. For example, with mixed cases, while analyzing data based on countries, 'United States' and 'united states' will be taken as two different words. Thereby, with feasibility of missing out records for analysis, it is essential to sync the data to a single case.

Filling Missing Values

The next pre-processing step is to identify the empty or n/a values in the dataset and refill them with 0 value (Herrera. F,2014). In our case, entire missing values are of numeric data types and hence the appropriate comment is to fill the gaps with 0 instead of having them blank. Though one can fill missing values with either mean or median value of the attribute, adopting those methods could hamper the actual association and such set as 0.

Removing Unnecessary Columns

This step would let us remove unusable columns and rows which will not be used from the dataset source. This will help us having the data with right columns and rows and avoid ambiguous content in the dataset (Herrera. F,2014). For example, dropping the 'wind speed' as the variable cannot associate in any of the correlation or statistical analysis.
As mentioned before, below are the factors that correlation with mortality rate and its correlation and different forms of the data have been associated throughout the paper.

- Age

Research articles, thus far, have shown an increased death rate amongst individuals belonging to older age groups across countries (Jordan Rachel E, 2020). It has been seen that older individuals are more susceptible to contracting the COVID-19 infection due their lessened immune response which may also mean they are already dealing with other health conditions apart from the infection.

- *Underlying Health Conditions*

Individuals who have existing health conditions are likely to contract COVID-19 more easily because their immune systems are already weakened by fighting against other diseases in the body (Jordan Rachel E, 2020).The combination of a health condition with the COVID-19 infection can be very fatal in individuals as it becomes very unlikely for them to defend against both simultaneously.

- *Population Density*

At the beginning of the pandemic, there have been reported incidents where densely populated areas have seen a rise in the number of cases and deaths due to COVID-19. Which is why implementations such as travel restrictions, and social distancing have been made, since with high population density the greater proximity and rate of infection amongst the population (Jordan Rachel E, 2020).

- *Temperature*

The SARS-Cov-2 has been seen to act like a seasonal viral infection, such as the flu. Where colder temperatures produce and uptick in the number of cases and warmer temperatures tend to produce a decrease in the number of cases (Jordan Rachel E, 2020). Also, during the colder weather, more individuals tend to experience illnesses such as the common cold where runny noses and coughing is present, which heightens the rate of transmission.

Statistical Models

The procedure to identify the relative factors that contribute to the mortality rate of COVID-19 is validated by its association. Hence, its association is determined by the use of statistical correlation. This approach, by far, is used in data analysis of various sectors and is being applied every day. Statistical analysis is one of the components in data analysis (Cowan G, 1998). It involves scrutinizing the datasets to identify trends and relations among the variables. A generic statistical analysis involves collection of data, its exploratory data analysis, creation of a model to identify the underlying correlations, validating the relation and when needed, employing predictive analysis for future (Cowan G, 1998). The data collected for any statistical analysis can be numeric or categorical. Hence, based on the type of data, different models will be employed to determine the correlations.

Statistical analysis often determines the properties between any given variables. This approach can be defined further as the degree of association of data. In other words, it is the measure of how things are related (Dunn, 2017). In statistics, the association is identified on how linearly data is related i.e., the increase/decrease of a variable when its dependent variable increased (Yule, 1950). Hence, if a variable increase with increase in its dependent variable, it is said to be positively correlated and Negative correlation is a condition where a variable decrease with an increase in the dependent variable. Hence, correlation is a useful way to analyze the association.

Correlation, in statistics, is defined by the Correlation Coefficient, denoted by r^2(Yule, 1950). Its value lies between -1 and 1 and the value identifies the positive or negative correlation of the data. '0' or near 0 denotes that there is no relation among the variables whereas coefficient value nearer to '-1' and '+1' denotes negative and positive correlation respectively (Robert S, 2000) in Figure 1.

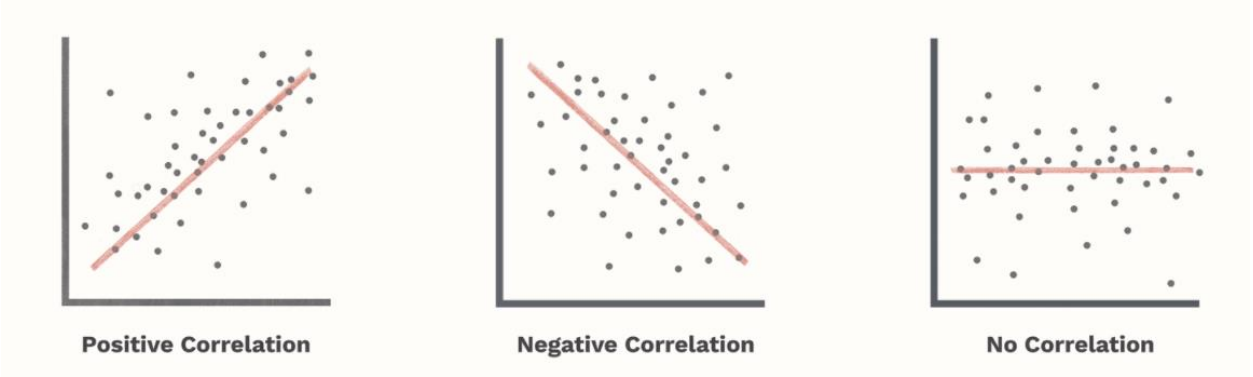

Figure 1. Identification of positive and negative correlations (Cohen, 2013)

There are different methods in statistics to identify relations in a dataset. Though it is usually determined using correlations, other models such as linear regression, t-test, ANOVA, Histograms, etc., are available (Robert S, 2000). In statistics, different types of correlations are available based on the type of data on which the correlation will be determined.

Pearson Correlation

The Pearson Correlation was named after Karl Pearson, founder of the mathematical statistics discipline. It is a basic simple linear correlation, i.e., the relationship between the variables depends on them being constant. It is primarily used with interval data to measure the strength of a correlation, that is represented by the coefficient r2 (Neil J. Salkind, 2003). This shows whether the relationship is positive or negative; represented by numbers valued between +1 and -1. As mentioned before, the closer the

value of r comes to -1.00 or +1.00, the stronger the correlation. The closer the value of r comes to the number 0, the weaker the correlation. For example, if r equaled -.90 or .90 it would indicate a stronger relationship than -.09 or .09.

Spearman Correlation

This correlation method was named after the statistician Charles Edward Spearman and is often used in statistics in place of Pearson correlation, even though it's less conclusive. Many use Spearman's to describe the correlation between categorical data, such as ethnicity or gender, and quantitative data, i.e., numeric data (Neil J. Salkind, 2003). The correlation is further calculated based on hypothesis testing that is subsequently accepted or rejected.

Kendall Correlation

The Kendall Rank Correlation is named for British statistician Maurice Kendall and as the name itself suggests, it is used to analyze the correlation among rank variables. Kendall can be used for statistical analysis when a Spearman's Correlation rejects the null hypothesis (Neil J. Salkind, 2003). Though, it is identified that Kendall correlation coefficient is usually high when the order of the two variables is similarly ranked and low with dissimilar ranking.

Linear Regression

It is defined as a method of modelling relation equations with use of dependent variables with one or more explanatory variables. The relationship is modelled on predictor functions when one of the variables is unknown and is generally used to predict future parameters (Rencher, 2012). One of the most practical uses of linear regression model is to explain variation in the response variable that can be attributed to variation in the explanatory variables, i.e., linear regression analysis can be applied to quantify the strength of the relationship between the response and the explanatory variables. Thus, with the data collected from the Centre for Disease Control (CDC), WHO and Kaggle, it is identified that the dataset consists of a combination of numeric and categorical variables. Hence, our paper will be focusing on identifying the correlations with the use of Pearson correlation and linear regression models.

Tools and Methods

With the obtained data, once the data has been pre-processed, the correlation models have been developed by the use of statistical modelling. Though the models can be defined using several business analytics models such as excel, tableau, etc., with respect to the need of data pre-processing, further analysis has also been done in Python programming and R code.

Scipy

Python consists of a vast array of libraries and modules for various computations. For our paper, Scipy library is being used for scientific and statistical computations. Several required correlation models are available in the stats module of Scipy library. The correlation coefficient is calculated in Scipy as in Figure 2.

$$r = \frac{\sum(x - m_x)(y - m_y)}{\sqrt{\sum(x - m_x)^2 \sum(y - m_y)^2}}$$

Figure 2. The calculation of Correlation in Statistics (SAGE, 2012)

where m_x is the mean of the vector x and m_y is the mean of the vector y.

The Pearson correlation is identified by pearsonr function from Scipy.stats module. Its definition in python is simply denoted by denoting the variables in the form of array denoted by a and b respectively (McKinney.W, 2012). Once the 'stats' module is imported to the program, the Pearson correlation is defined and its output is retrieved as below in Figure 3,

```
>>> stats.pearsonr(a, b)
(0.8660254037844386, 0.011724811003954649)
```

Figure 3. Notation of Pearson correlation function (SAGE, 2012)

It is observed that the function has returned two values, namely the correlation coefficient and the p-value for hypothesis testing. The first value returned is the r^2 coefficient that denotes the association of the variables and p-value is used for statistical methods when you're testing a hypothesis. The coefficient value from the output can be identified in Figure 4.

Pearson's r Value	Correlation Between x and y
equal to 1	perfect positive linear relationship
greater than 0	positive correlation
equal to 0	independent
less than 0	negative correlation
equal to -1	perfect negative linear relationship

Figure 4. Notation of Pearson correlation coefficient values (SAGE, 2012)

Similarly, linear regression is implemented with the help of SciPy library. We obtain a linear function which best approximates the relationship between two arrays, as well as the Pearson correlation coefficient. In addition to its linear correlation functionality, Linear regression model also helps us in identifying the correlation between categorical and numeric constants. Initially, the variables are defined in the form of an array denoted as x and y (McKinney.W, 2012). Then, use scipy.stats.linregress() to perform linear regression for two arrays of the same length. The arguments provided are formatted as arrays and retrieve the output by the use of individual functions on the regression model. Refer to Figure 5 for notations.

```
>>> result = scipy.stats.linregress(x, y)
>>> result.slope
7.4363636363636365
>>> result.intercept
-85.92727272727274
>>> result.rvalue
0.7586402890911869
>>> result.pvalue
0.010964341301680825
>>> result.stderr
2.257878767543913
```

Figure 5. Notation of Linear Regression in Python (McKinney.W, 2012)

From the above functionalities we can identify the correlation coefficient value, p value and standard error, etc. Our regression correlation coefficient is determined by rvalue function and as mentioned, its value denotes either negative, positive or no relation.

Polycor

Similar statistical functionality is defined in r programming to determine the correlation coefficient between the defined variables. Its computation is between two ordinal variables, under the assumption that the ordinal variables dissect continuous latent variables and thus provides the computed polychoric correlation. This function is defined under the Polycor library that is used for correlation computations in R programming. It is a quick two-step methodology generally used for Machine Learning. Its syntax is similar to any of linear correlation function in R and an example is given below.

polychor(x = USClean$Age.group, y = USClean$COVID.19.Deaths, ML = FALSE, control = list(), std.err = FALSE, maxcor=.9999)

3 RESULTS

To perform association analysis of each of the factors, countries have been filtered from the total dataset according to the most recent date of data available and total deaths due to COVID-19 to be greater than 100. These selected countries have provided *Pearson correlations* values of 0.9353205957682248 for *total cases of COVID-19 vs. total deaths of COVID-19,*

0.47723269278018443 for *mortality rate of COVID-19 vs. population density,* and 0.365 for *mortality rate vs. median age in the country*. Therefore, analysis of these particular countries will allow for better broad-spectrum conclusions to be made on associations between COVID-19 and each factor and have been chosen for the core correlation models.

Effects of Age Groups on Death Rate Of COVID-19

Taking into account age groups of *0 -9 years, 10-19 years, 20 -29 years, 30 - 39 years, 40 -49 years, 50 -59 years, 60 -69 years, 70 -79 years and Over 80 years,* age and death rate of COVID-19 have been found to be positively correlated (Table 1). An increase in age has shown a significant increase in the death rate of COVID-19. A *linear regression* model has shown a correlation of r^2= 1.00 between age and COVID-19 death rate in South Korea, Italy, and China. In the United States, a *linear regression* model has also shown a correlation of r^2 = 1.0 between age groups and COVID-19 death rate. *Pearson Correlation* technique implemented on age groups and deaths/death rate is identified to be 0.813143 for China, 0.88317 for Italy, 0.716958 for Spain and 0.65259035 for the United States. A different model has also been used to detect the association between age and death rate for COVID-19 called *Polycor* which is an available correlation library in R studio. This model has produced a correlation value of 0.3923188 for the United States, and 0.7556951 for Italy.

Table 1. The correlation of death rate with varied age groups

Country	Correlation Value	Model Type
China	1.00	Linear Regression
	0.813143	Pearson Correlation
Italy	1.00	Linear Regression
	0.7556951	Polycor
	0.88317	Pearson Correlation
Spain	0.716958	Pearson Correlation
South Korea	1.00	Linear Regression
	0.84059	Pearson Correlation
United States	1.0	Linear Regression
	0.3923188	Polycor
	0.65259035	Pearson Correlation

Effects of Temperature and Humidity on Death Rate of COVID-19 and Rate of Confirmed Cases Of COVID-19

Identifying the association between temperature and humidity through *Pearson* modelling has given a correlation value of -0.499129613. This negative correlation shows an increase in temperature will result in a decrease in humidity. Therefore, humidity has not been taken into consideration in detecting associations between temperature and COVID-19 death rate and rate of confirmed cases, in order to control the confounding variable.

Some countries have shown positive correlations between temperature and death rate of COVID-19 and rate of confirmed cases of COVID-19. While others have shown negative correlations. For association between temperature and death rate of COVID-19 (Table 2) a *Pearson* model has produced correlation values of 0.444410085 for India, -0.112444379 for Australia, -0.04254528 for China, -0.125344918 for Germany, 0.694448372 for Italy, -0.12933255, for the United States, -0.988397401 for Mexico, -0.268639293 for Turkey, -0.612605774 for Egypt, -0.088389672 for France, -0.702249821 for the Philippines, 0.578805429 for Iraq and -0.197863428 for Brazil. A total *Pearson* correlation value of 0.053098481 was found for the association between temperature and death rate of COVID-19 for all the countries mentioned.

For association between temperature and rate of confirmed cases of COVID-19 (Table 3), a *Pearson* model has provided a correlation value of -0.229661 for the countries Iran, Italy, Germany, Spain, and the United States. Two different models have also been used to identify the association between temperature and rate of confirmed cases of COVID-19 for these five countries. One model is a *linear regression*, which has yielded a correlation value of r^2= 0.158, and the other model is *spearman* which has yielded a correlation value of -0.249782.

Table 2. Association between temperature and death rate of COVID-19

Country	Correlation Value	Model Type
Australia	-0.112444379	Pearson
Brazil	-0.197863428	Pearson
China	-0.04254528	Pearson
Egypt	-0.612605774	Pearson
France	-0.088389672	Pearson
Germany	-0.125344918	Pearson
India	0.444410085	Pearson
Iraq	0.578805429	Pearson
Italy	-0.694448372	Pearson
Mexico	-0.988397401	Pearson
Philippines	-0.702249821	Pearson
Turkey	-0.268639293	Pearson
United States	-0.12933255	Pearson
All	0.053098481	Pearson

Table 3. Association between temperature and rate of confirmed cases of COVID-19

Country	Correlation Value	Model Type
Germany		
Iran		
Italy		
Spain		
United States		
	-0.229661	Pearson
All	0.158	Linear Regression
	-0.249782	Spearman

Effects of Underlying Health Conditions and Death Rate Of COVID-19

For identifying the association between underlying health conditions or pre-existing health conditions and death rate of COVID-19, certain conditions have taken into account such as *heart disease, cancer, lung disease, stroke, neurological diseases, diabetes, kidney diseases,* and *obesity* for the United States. For China, the dataset contains health conditions consisting of *cardiovascular disease, chronic respiratory disease, hypertension,* and *cancer.* For Italy, data set consists of health conditions consisting *atrial fibrillation, heart failure, stroke, hypertension, type-2 diabetes, dementia, chronic obstructive pulmonary disease, active cancer in the past 5 years, chronic liver disease, chronic renal disease, dialysis, HIV infection, autoimmune diseases, and obesity.*

For the United States, a *Pearson* model was used to identify associations between underlying health conditions and death rate of COVID-19 along with associations between no underlying health conditions and death rate of COVID-19 (Table 4). The model has produced correlation values of 0.996139847 for individuals with underlying health conditions and a correlation value of -0.033456229 for individuals without any underlying health conditions to the death rate of COVID-19.

For China, a *linear regression* model has produced a correlation of $r^2 = 1.00$ for an association between underlying health conditions and death rate of COVID-19 (Table 5). In Italy, for individuals who did have underlying health conditions a *Pearson* model produced a correlation value of 0.999929 and a *spearman* model produced a correlation value of 0.99 to the death rate of COVID-19 (Table 6).

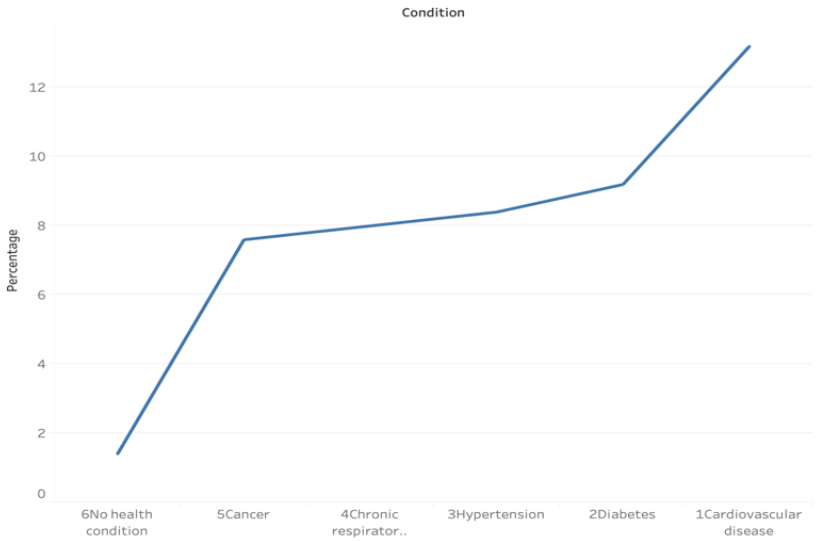

Figure 6. Percentage of fatality among the patients with underlying health conditions in China

Table 4. Correlation between with and without underlying health conditions and death rate of COVID-19 (United States)

Health Condition	Correlation Value	Model Type
Hypertension		
Diabetes		
Kidney disease		
Lung disease		
Coronary Artery Disease		
Obesity		
Stroke		
All	0.996139847	Pearson
No Health Conditions	-0.033456229	Pearson

Table 5. Correlation between underlying health conditions and death rate of COVID-19 (China)

Health Condition	Correlation Value	Model Type
Cardiovascular disease	0.67396873	Pearson
Diabetes	0.1588334	Pearson
Hypertension	0.05580633	Pearson
Chronic respiratory disease	0.00429279	Pearson
Cancer	-0.04722074	Pearson
No Condition	-0.84568051	Pearson
All	1.00	Linear Regression

Table 6. Correlation between underlying health conditions and death rate of COVID-19 (Italy)

Health Condition	Correlation Value	Model Type
Active cancer in past 5 years		
Atrial fibrillation		
Autoimmune diseases		
Chronic liver disease		
Chronic obstructive pulmonary disease		
Chronic renal failure		
Dementia		
Dialysis		
Heart failure		
HIV infection		
Hypertension		
Obesity		
Respiratory failure		
Type-2 diabetes		
All	0.999929	Pearson
	0.99	Spearman

Effects of Population Density on Death Rate of COVID-19

A database that tracks COVID-19 death rate and other characteristics related to COVID-19 of countries around the world has been used whose death rate is greater than 0.00. A correlation between total number of cases of COVID-19 in a population and total number of deaths of COVID-19 in a population was detected (Table 7) using *Pearson, Spearman, and Kendall's* models. The *Pearson* model has given a correlation value of 0.935320595, the *spearman* model has given a correlation value of 0.941949336, and Kendall's model has given a correlation value of 0.800115661. There is a positive correlation between total cases of COVID-19 in a population and total number of deaths of COVID-19 in a population. Therefore, we can analyze the association between population density and death rate of COVID-19.

A *Pearson* model has shown a correlation value of -0.06872055 for associations between population density and death rate of COVID-19. This model has also shown a correlation value of 0.4772326927for associations between cases of COVID-19 per a population of 1 million and death rate of COVID-19 per a population of 1 million.

Table 7. Correlation between total cases of COVID-19 vs. total number of deaths of COVID-19

Associations	Correlation Value	Model Type
Total cases of COVID-19	0.935320595	Pearson
Vs.	0.941949336	Spearman
Total number of deaths of COVID-19	0.800115661	Kendall's

Table 8. Correlation between total cases of COVID-19 vs. total number of deaths of COVID-19

Associations	Correlation Value	Model Type
Population density vs. Death rate of COVID-19	-0.06872055	Pearson
Cases of COVID-19 vs. Death rate of COVID-19 Per population of 1 million	0.4772326927	Pearson

Multi-Correlations

In order to see whether there are associations between multiple factors and the death rate of COVID-19 a *multi-linear regression* model has been used (Rencher, 2012). This model has provided a correlation value of $r^2 = 0.366$ for an association between death rate of COVID-19 and population density along with median age for countries around the world whose death rate is greater than 0.00.

4 DISCUSSION

At the beginning of the study, it has been predicted that associations between age, underlying health conditions, and population density with death rate of COVID-19 would yield positive correlations. Whereas, associations between temperature and humidity with death rate of COVID-19 would yield negative correlations. Our findings have both confirmed and refuted our hypotheses by providing significant results.

When considering the factor *age*, it is observed that age had a very strong correlation to death rate of COVID-19. For the countries analyzed, the correlation results yield mostly an R^2 value of 1.00. When using a different model as well, correlation values came up as 0.7556951 and 0.65259035, telling us that as age increases the death rate of COVID-19 increases as well. Even when considering the median age of countries around the world whose number of deaths are greater than 0.00 and mortality rate of COVID-19, a positive correlation is seen. So, the younger individuals in the population will have a lower death rate than the older individuals in the population. The results coincide with the ones obtained in another study that looked at if children are less prone to COVID-19. In the study, it was found that in China amongst 44,672 cases of COVID-19 present only 0.9% of cases were individuals between the age of 0-10 years, and only 1.2% of individuals were between the age of 10-19 years. They have also analyzed other infectious diseases, such as *severe respiratory distress syndrome (SARS)*, which showed that there was no death rate among individuals below the age of 24 years or children (Lee et al., 2020).

The factor of underlying health conditions has also presented a positive correlation, showing that individuals who already have a pre-existing health condition have an increased death rate of COVID-19, then the individuals who do not have any pre-existing health conditions. For the countries evaluated, we have looked at a wide range of health conditions that deal with the cardiovascular system, respiratory system, nervous system, and endocrine system.

The results have shown strong positive correlations between pre-existing health conditions and death rate of COVID-19, which correlation values of $R^2 = 1.00$ and 0.99. While, having no prior health conditions yielded a negative weak correlation of -0.03 to death rate of COVID-19. Therefore, establishing that having any prior health conditions, not necessarily those related to the respiratory system has an increased death rate than having no health condition. Scientific research has exhibited that the SARS-CoV-2 virus attacks the lungs and damages the walls of the air sacs of the lungs causing it to become very difficult for patients to breathe. However, scientists have found that the immune response from the body and the virus can harm other organs in the body due to a *cytokine storm*, which increases the level of signaling molecules called cytokines in the body and results in an immune response where immune cells invade healthy tissue of other organ systems in the body as there have been many (Wadman et al., 2020). Another study also saw that in patients who have other health conditions COVID-19 triggers a *cytokine release syndrome and a cytokine storm*, and they have a less likely chance of being able to handle the body's response causing the death of the patients (Priyadarsini et al., 2020).

The next factor considered was the population density. From our findings it has been observed that the association between population density and death rate of COVID-19 yields a positive correlation, indicating that the death rate of COVID-19 does increase with a larger population density. The correlation is evaluated total cases of COVID-19 and total number of deaths of COVID-19 present in a population demonstrating that in a population as the number of cases of COVID-19 increases the death rate of COVID-19 increases as well, and we would tend to see a higher number of cases amongst a larger population as observed in the same correlation for populations per million. There are studies that support our outcomes in which they have found that communities in the United States that exhibit a higher population density have an increased death rate and rate of confirmed cases. Their model has displayed a 99.3% variation of death rate associated with geographical disparity (Rajan et al., 2020).

The final factor of temperature has shown mostly a negative correlation with the death rate of COVID-19, where we have deemed humidity as a confounding variable due to its negative correlation with temperature. This confirmed our prediction, that as temperature increases the death rate of COVID-19 will decrease. However, there were three countries: India, Iraq, and the United States that have shown positive correlations between temperature and the death rate of COVID-19, suggesting that even with lower temperatures there is still an increase in the death rate of COVID-19. Other studies, have coincided with our findings as well by showing that an increase of temperature by 1 degree Celsius has resulted in a decrease of 1.19% of the death rate of COVID-19, when looking at the mean temperatures of each region, provide potential conclusions that this may be due to the fact that the SARS-CoV-2 becomes unstable at higher temperatures and also our bodies immune response is weakened in lower temperatures. They have found contradicting evidence as well in another study showing that in China there was a 4.86% increase in the rate of confirmed cases at 3 degrees Celsius, but no correlations were present below that temperature (Wu et.al, 2020).

5 CONCLUSIONS

Based on our findings, primary evidence has been obtained that there are associations between the factors: age, underlying health conditions, population density, and temperature with the death rate of COVID-19. With several correlation/association models in place, it is observed in the paper that Pearson correlation works with the acquired data considering the presence of discrete values. Though certain associations include categorical variables and are difficult to evaluate, the correlation is analyzed by converting the categories to binary segments. Correlation is used to analyze the amount of association between the given variables, it is also ideal to recognize if the association is linear or nonlinear. During these scenarios, Linear regression identifies the required relationship.

During analysis of age correlating with mortality of COVID-19, it is identified that older age groups are at risk of being infected with COVID-19. During the analysis with age in the form of median age, the correlation value was observed to be lower and did not correlate with mortality. It was inferred that the correlation is inaccurate due to the varied infection cases. With lockdown imposition, businesses shut down and unemployment, the exposure to virus may have been limited in certain countries and thus the evaluation is erroneous. Therefore, the analysis has been based on different age groups exposed to the virus. It has been confirmed through the correlation analysis that older age groups are at a higher risk. Considering the association with the temperature, though the correlation exists in few countries, it is highly varied and cannot be confirmed. This could be due to the given time period, as there are not high variations amongst temperature conditions across the world. The association with population density has been identified to have a positive correlation. The inference has been identified that the areas with dense populations have a higher probability of exposure and thus an increase in the mortality rates.
During the analysis of underlying health conditions, the data for each country varied based on the patient's information. Overall data has shown that in patients with cardiovascular disease there has been a high mortality rate, however in the latest data collected from the United States it can be seen that *hypertension* has the highest fatality rate followed by *diabetes* and *cardiovascular disease* with COVID-19 infection.

Understandably, some factors have shown stronger relationships and more stable results throughout the data, while others have shown negative relationships and differing results among the data. Yet, our outcomes have yielded that these particular factors should be considered when dealing with current pandemic. Therefore, one will be able to control the death rate of COVID-19 when taking into consideration the effects of each of these factors.

We have found that there are many considerable limitations to our study due to the fact that COVID-19 is currently still in effect to the population of the world. Thus, the availability of data is restricted, and even with the data present there may be many discrepancies such as underreporting of cases due to technical issues, or not enough testing equipment present for the population. For our study, the latest data i.e., as of July 20, is taken into account when considering these factors which may have yielded adverse results such as in the case of the factor, temperature. Where we observe some countries with positive correlation values because at that date, they are still not experiencing high mean temperatures whereas countries in other regions have significantly higher mean temperatures throughout the year. Lastly, each country is dealing with the effects of COVID-19 in different ways which affects the associations for each of these factors as well and should be taken into consideration. For instance, lockdown

restrictions and social distancing measures are implemented differently in each country which may provide varying correlation values like those seen in population density. There was a negative correlation present, but this may be due to some countries having taken stricter containment measures of SARS-Cov-2 thus limiting human interaction to a very minimal state.

6 FUTURE WORK

In order to enhance the findings in this study and provide more statistically significant evidence to support the associations between each factor and the death rate of COVID-19 there can be other analyses done. The confounding variables should also be taken into consideration such as humidity with temperature, and social distancing with population density. Also, correlations should be tested amongst all of the factors as well as the individual factor correlations with more available data for each country as the pandemic progresses and their situations begin to vary greater with new developments of treatment and preventive care. Here, one can see if these factors play a significant role throughout the progression of COVID-19, or just partially under defined circumstances.

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Rivalry in the Nonprofit Sector: Promotional and Regulatory Competition by Charitable Organizations

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ABSTRACT
Nonprofits are generally assumed to operate under a cooperative model in which collaboration is more likely than competition. Rivalry would only occur between organizations in sectors where marketing to a customer base is part of the business model (e.g. hospitals and universities). In an environment of declining (in real terms) overall contributions and a proliferation of new charities, however, competition is likely to become more prevalent. This paper utilizes a simulation to model the circumstances under which it would make sense for a nonprofit to compete, either through advertising or utilization of the regulatory process. Factors such as the size of the donation pool, the efficacy of promotional campaigns and the organization's overall efficiency (program over total expenses) are incorporated into the model to determine the maximum outlay on advertising that would increase a charities impact. The paper also addresses how larger charities could utilize the regulatory process as a means of preventing competitors from entering the market.

Keywords
Nonprofits, rivalry, simulation model, regulation

1 INTRODUCTION

Nonprofit rivalry is generally expected only when the business model of organizations in a particular sector relies upon a customer base, such as is the case for hospitals and educational institutions. Charities are viewed as cooperative entities, frequently with programs that dovetail with those of other organizations, potentially increasing the availability of a public good. A food bank, for instance, might focus on a specific component of the collection and distribution process, such as acquisition, and rely upon a different organization for delivery. In an era of declining contributions and a rising number of nonprofits, however, competition seems an inevitable outcome. It is now common for larger charities to conduct expansive advertising campaigns in search of donors.

This paper will utilize a simulation to determine the circumstances under which a promotional campaign makes financial sense for a nonprofit. An alternative form of competitive behavior, utilization of the regulatory process, will also be examined. The final section of the paper will examine how payoff matrices can be used to address the question of nonprofit competition.

2 REVIEW OF LITERATURE

Literature on nonprofit competition follows three basic themes: Marketing Strategies and Competition for donations, entry and concentration in the sector, and the role of the regulatory regime under which charities operate. Feigenbaum (1987) examines the relationship between "market structure" in different categories of charitable giving and finds that more concentrated sectors produce lower program outlays (higher promotional expenses). Ritchie and Weinberg (2000) note that competition within the nonprofit sector can be as aggressive as that which characterizes the for-profit world, but that it can also be collegial given the parallel interests of many organizations. The authors postulate that much of the rivalry is a combination of the two, a middle ground they identity as "Alternative Competition". Castaneda, Garen and Thorton (2008) assert that competition among nonprofits reduces both the output of services and the return to managers. Chetkovich and Frumkin (2003) model the trade-off between financials and mission, using nonprofits that have both fee-based and "donative" programs (e.g. The American Red Cross).

Thorton (2006) empirically examines the response of nonprofits to increased competition and concludes that increased rivalry does not raise expenditures on fundraising. The author asserts that internal concerns about "efficiency" (keeping fundraising costs low) dominate over the perceived need to market more aggressively. Subsequent work by Thorton and Belski (2010) notes, however, that the reported financials (as presented in the organization's Form 990) may be manipulated to show lower administrative and fundraising costs, as this is what donors want to see. Barman (2002) models the strategic response of charities

to rising competition, detailing how attempts to differentiate an organization from others working in the same charitable field is the usual response. Pope, Isely and Asamo-Tutu (2009) examine the development of competitive marketing strategies at nonprofits, and how they differ from those used in the for-profit sector. Topaloglu, McDonald and Hunt (2018) argue that competition in the sector has risen dramatically. They apply Resource-Advantage Theory to commercial nonprofits (e.g. hospitals) to demonstrate how organizations can successfully deliver value. Snavely and Tracy (2000) provide a contrast, detailing cooperation among rural charities that enables increased and more effective services.

3 MODEL

Assuming a nonprofit acts so as to maximize the number of people assisted, given the contributions it receives:

$$(1)\quad \text{Max } \Omega_i\,(d_i)$$

Where: Ω_i () is charity i's production function, $\Omega()$ increasing in d
d_i = Donations received by charity i

If we let D equal the total pool of donations available in this category of giving, and if a charity receives a proportion of total donations equal to γ, then its donations are γD. Ignoring fundraising and administrative costs for the moment, this is the most the charity can use for expenses if it is to remain viable in the long-run (it is not running down its accrued assets). If the charity undertakes a promotional campaign aimed at increasing its *share* of the donation pool, contributions increase by a factor of α:

$$(2)\quad (\gamma D)' = \gamma D\,(1 + \alpha)$$

Consequently, the pool of resources available to other organizations will decline. Yet, the promotional campaign is also likely to raise the size of donations overall, benefiting not just charity i, but all charities. If the level of contributions rises by a factor δ, then total donations are now:

$$(3)\quad D' = D\,(1 + \delta)$$

Combining both effects, nonprofit i's donations will increase to:

$$(4)\quad (\gamma D)' = \gamma D\,(1 + \delta)(1 + \alpha)$$

If the cost of the promotional activities is equal to ∞, the funds available for program expenses will equal:

$$(5)\quad \gamma D\,(1 + \delta)(1 + \alpha) - \infty$$

The organization's output will change from $\Omega\,(\gamma D)$ to $\Omega[\gamma D(1 + \alpha)(1 + \delta) - \infty]$. The impact on other nonprofits in this category is unknown. The drop in donations due to the differential promotion of the charity is offset by a rise in total giving, so the overall effect depends on the relative size of α and δ.

This model assumes that the nonprofit under consideration does not engage in cooperative activities with its "competitors" (as in Snavely and Tracy (2000)) that leverage the effectiveness of programs, but instead provides parallel services. If charities are co-dependent, then competitive actions on the part of an organization are likely counterproductive.

Establishing the magnitude of donations actually spent on programs entails defining the cost structure of the nonprofit. If donations are initially γD, as above, then some proportion of the donations, λ, is spent on administrative and other costs prior to devoting them to programs. If γD are the initial (pre-promotional) donations received by a charity, the program expenses are:

$$(6)\quad \gamma D\,(1 - \lambda)$$

and post-promotional expenditures (with λ remaining fixed) are:

$$(7)\quad \gamma D\,(1 - \lambda)\,(1 + \delta)(1 + \alpha) - \infty$$

with the output of the charity being $\Omega[\gamma D\,(1 - \lambda)\,(1 + \delta)(1 + \alpha) - \infty]$.

Boundary Condition

If the output of services is the goal (rather than simply revenue), the nonprofit will conduct the promotional campaign if:

$$\gamma D\,(1-\lambda)\,(1+\delta)(1+\alpha) - \infty > \gamma D\,(1-\lambda)$$

Which will occur if:

$$(8)\quad \gamma D\,(1-\lambda)\,[(1+\delta)(1+\alpha) - 1] > \infty$$

which simply states that the promotion will make sense if the net addition to program expenses exceeds the cost of the campaign.

4 RESULTS

Figure 1 details a range of realistic values for the variables in Equation 8. Under these assumptions, a total of 2400 outcomes are produced. Table 3 presents the results of the simulation. A scant 0.4% of the observations are less than $50,000, indicating that significant promotional activities would only be ruled out in markets that are small and with little chance of increasing either total giving or the share accrued to a particular nonprofit. The most prevalent outcomes are represented by the ranges $100,000-200,000 and $200,000-300,000, which together represent over 37% of the total sample. Organizations with net returns in this range could spend up to that amount on a promotional campaign and break even. This "density" of outcomes continues to the $500,000-600,000 range (ten percent of the outcomes) and then rapidly tapers down. Outcomes at the tail end of the distribution in Table 3 would represent larger nonprofits, in markets with large donation pools, coupled with a high impact on both total giving and the proportion of giving going to the organization as a result its promotional campaign. Although a small minority of the outcomes in the sample, the nonprofits represented would benefit substantially from a marketing initiative.

5 THE ALTERNATIVE PATH – UTILIZATION OF THE REGULATORY FRAMEWORK

Nonprofits that want to engage in competitive practices to either grow in size or "hold off" smaller competitors can conceivably utilize the regulatory environment rather than advertising. At present, nonprofits face few regulations (mostly reporting requirements) and that lack of oversight and control significantly reduces operating costs. The only exception is California's Nonprofit Integrity Act, which mirrors some of the provisions of Sarbanes-Oxley. A stricter regime would impose costs on smaller charities (e.g. an annual independent audit) that many would find impossibly burdensome. A payoff matrix approach is utilized to demonstrate the conditions under which tighter regulations would lead to fewer nonprofits and a less competitive environment for established institutions.

6 CONCLUSIONS

Assessing the extent and role of competition in the nonprofit sector is a relatively new thread within the more general literature on behavior in the charitable sector. In general, not-for-profits were viewed as cooperative organizations, potentially sharing resources and goals, rather than rivalrous entities that can act in ways usually reserved for corporations. In an environment where the number of nonprofits is rising, and the level of donations stagnant, competition is a not unexpected outcome. The analysis presented herein has examined two forms of rivalry, increased advertising expenditures as a means of capturing a greater proportion of donated funds, and utilization of a more strident regulatory environment as a competitive tool by larger organizations. One could analyze these two scenarios by utilizing empirical data on promotional activities by nonprofits (advertising expenditures). These figures are somewhat suspect, however, as they are self-reported. In addition, one would have to delineate the market of each organization under consideration; an artificial process, as many nonprofits are continually in the process of expanding their geographic reach. Finally, these figures represent what organizations *are* doing, not what they optimally should be doing. Instead, a simulation was used to demonstrate the viability of promotional activities across a wide range of parameters. Simple game models were then used to further reinforce the notions that not only can advertising can be a dominant strategy, but that utilization of the regulatory environment as a competitive tool is plausible.

Although prior research has noted the propensity for charitable organizations to contest available resources through fundraising, this is the first attempt to analyze how utilization of the regulatory environment might benefit larger nonprofits. Further research might address other potential forms rivalry, such as direct competition over available governmental and foundational funding. What will eventually emerge is a characterization of the nonprofit sector that is significantly more competitive than is generally assumed, with competition taking a form far different from that which exemplifies for-profit firms. Recognizing that rivalry is part of the essential nature of charities will lead to new avenues of research on optimal behavior in the sector.

Figure 1
Simulation, Variable Definitions and Ranges of Values

Variable	Definition	Range of Values
γ	Charity's proportion of donation pool	0.4-0.8 (by 0.1)
λ	Amount spent on fundraising and administration	.05-0.3 (by 0.05)
δ	Rise in total giving (increased size of pool)	.05-0.2 (by 0.05)
α	Increase in charity's share of pool	0.2-0.5 (by 0.1)
D	Size of pool of donatable funds	200,00-2,000,000 (by 200,000)

Table 1
Distribution of Returns, in Dollars, Simulation

Range	Observations	Range	Observations
<50,000	10 (0.4%)	500,000-600,000	239 (10.0%)
50-100,000	153 (6.3%)	600,000-700,000	161 (6.7%)
100,000-200,000	441 (18.3%)	700,000-800,000	110 (4.6%)
200,000-300,000	457 (18.8%)	800,000-900,000	65 (2.7%)
300,000-400,000	373 (15.5%)	900,000-1,000,000	43 (1.79%)
400,000-500,000	295 (12.3%)	>1,000,000	53 (2.2%)

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Higher Education Underperformance, *Pre*Covid19!

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ABSTRACT
Higher Education is facing severe market challenges and threats to its survival. The challenges that higher education leaders and stakeholders are facing are being both masked and exasperated by the 2020 Pandemic. Understanding the reasons for underperformance *before* the 2020 Pandemic, is essential. Recognition of the pre-pandemic challenges may prevent college and university leaders from pretending that these challenges did not previously exist. The challenge in facing reality is that much of the influences emerge from public doubt in the value of higher education. This paper and presentation focuses on the influences that both feed public doubt and the negative outcomes that have resulted. This paper and presentation will also suggest where our leaders may need to place their focus, with the intentional goal of changing public doubt into public confidence. We must restore the belief that a college education is essential to the success of the individual as well as to the fabric of a democracy.

Keywords
Higher education performance, national rankings, pandemic, financial crisis

1 INTRODUCTION

The challenges that higher education leaders and stakeholders are facing are being both masked and exasperated by the 2020 Pandemic. Will we become accustomed to hearing that it was the 2020 Cove19 Pandemic that put Higher Education in such danger? Understanding the reasons for under-performance *prior* to the 2020 Pandemic, will prevent us from *pretending* that higher education was healthy and stable. Acknowledging the pre-pandemic issues and influences may prevent us from *pretending* that they did not exist at all!

In the March 6th, 2020 Chronicle of Higher Education, *prior* to the shutdown of face-to-face education across the United States, it was shared that 10% of colleges faced severe market risk; 30% faced some market risk. Couple this with the Department of Justice's Civil Lawsuit and the subsequent suspension of the National Association of College Admission Counselor (NACAC) ethics standards and higher-education begins to feel like the wild-west. Just like there is no ONE best way to lead, there is no magic bullet to resolving the danger and challenges that higher education faces. Understanding and acceptance is the first step. First we must **recognize** the influences upon higher education performance. Cutting expenses *alone* is neither sustainable for any college or university, nor healthy for the students. The challenges prior to Covid19, that will continue, start with **Public Doubt**.

2 INFLUENCES FEEDING PUBLIC DOUBT IN HIGHER EDUCATION

There is questionable confidence in the value of a college-education. The path of a college graduate is unclear. The student debt crisis has severely fed the doubt that a college education is worth the cost.

Value of a Credentialed College Degree

Evidence reflects that earning a college-degree will significantly improve the economic future of an individual (Source: Georgetown University), yet, public doubt rises. The perception is ***not*** fading, that "Americans worry that college costs too much, wonder what students are learning, and questions the value of a degree" (The Trends Report, 2019, Chronicle of Higher Education).

STEM is Everything

Really? Business Education, knowledge and skills, are foundational to every field and discipline. Whether you will be leading the MOMA, the Brooklyn Public Library, or PepsiCo, business acumen is valued. The expanding belief that business education is not valued and the only guaranteed path is within science, technology, engineering or math, fails to recognize that business knowledge and skills are not limiting, but empowering, for so many industries and fields.

College and Career Readiness Standards (CCRS)
NYS defines its own standards as to the readiness of high school students for college or career. The results are poor. Though the high school graduation rate has been rising since 2011, the skills have not. For many, the high school diploma reflects *attendance* rather than college and career *readiness*. Further, the results reflect significant diversity among Asian, White, Hispanic and Black students. When students get to college, un-prepared, further cost is folded into the high-education system.

Student Debt Crisis
Americans owe over $1.64 trillion in student loan debt, spread among close to 45 million borrowers. It was suggested that up to 40% of borrowers may default on student loans by 2023. "Students who attend for-profit institutions take on more educational debt and are more likely to default" (Armona, Luis, Rajashri Chakrabati, and Michael F. Lovenheim, 2017, 2020, Student Debt and Default: The Role of For-Profit Colleges. Federal Reserve Bank of New York, Staff Reports, Staff Report No. 811, April 2017, Revised February 2020).

3 WHERE DOES THIS PUBLIC DOUBT LEAD HIGHER EDUCATION?
What are the outcomes and influences of public doubt that are changing the regulatory and social culture of higher education?

Education Secretary Betsy DeVos
Public doubt feeds Education Secretary DeVos' support for a model that may allow more federal funds to flow toward for *non*-accredited, work-force preparation institutions, which can negatively influence the view of the traditional degree-based credential. Though I do not think it is imminent, this rhetoric can cause an emotional negative reaction, especially for private schools. Aligned with this rhetoric is that an education *solely* benefit the individual, rather than contributing to an *educated society*. So, an individualistic view suggests, "Why should my taxes pay for someone else's education", so *they* can get rich (Eric Kelderm, 12.18.2018).

Federal Government Negatively Influences How Higher Education Operates
The pre-pandemic travel ban was further exasperated by the 2020 pandemic, redirecting international students away from US Schools. Then, the federal government's influence on higher education was more explicitly demonstrated when the Department of Justice brought a civil lawsuit against the National Association for College Admissions Counseling (NACAC) to remove three long-standing practices that maintained order for students and colleges. The NACAC code of ethics provided a gamebook for all colleges and universities that prevented students from being aggressively pursued right up to the day school starts each semester. Colleges now have a lower level of confidence in planning its enrollment and preparing for each semester. The NACAC standards gave colleges confidence in planning enrollment, within a realistic range, based on high school graduation rates and shifting demographics; these factors are knowable. Even before the severe and added burden of the 2020 Pandemic, the May 1st commitment date for students had been made less meaningful. Now, sales strategies, which were categorized as unethical, are now mainstreaming.

Free Education For All Model
Public doubt has reinforced the rallying call behind the ***Free Education for All*** model. The Excelsior Scholarship gained national attention for tuition-free education for the State University of New York (SUNY) and City University of New York (CUNY) institutions. The original narrative predicted that close to 1 million students would qualify. The complexity of ***qualification***, which included, but is not limited to full-time credit load and last dollar funding support, and ***administration*** issues, such as requiring students that they must live and work in New York state to *pay back* the value of the scholarship, created a different reality. Relevant for many is that the Excelsior Scholarship shut-out the private institutions. More than 40% of New York residents initially enroll in private New York colleges and universities, which award more degrees that SUNY and CUNY combined. Yet, Excelsior departed from the long-standing promotion of diverse educational options. This creates a confusion as to the role that private, mission-driven institutions, play in the lives of its students and the professions for which it creates new knowledge. A belief can emerge that the *paper credential* is more important than the *educational journey and student transformation*.

What Does This Mean?
The challenges of falling enrollments, public doubt, student debt, the rise of the mega-universities, and the loss of government support, are inter-related. As we consider strategies to address these threats, we must recognize that *everyone* is facing the *same* threats. Any college's competitors will respond to the elimination of the NACAC standards and begin to pursue other college's committed students, after the May 1st commitment date. Also colleges will start to claw back students who had applied in the prior year, to suggest, with a financial incentive, that a student begins his or her sophomore year at a different college. Every college needs to retain every current students *while* developing new markets.

4 STRATEGIES TO REPOSITION THE NARRATIVE AROUND THE ROLE OF HIGHER EDUCATION

As educators and scholars, we understand that the trend, unchanged, will continue. Collectively as the higher education industry, as well as individually as stakeholders within a college or university, we must change the narrative around the role of education in society. The strategies must be substantive and lasting.

ME-TOO in All We All DO

The Me-too movement was a back-lash from years of pent-up abuse and a lack of recognition and response. Now it has been released, and a litigious culture has risen. Sensitivity to student perceptions need to be increased. Higher education leaders and faculty need to continuously train themselves to understand the evolving reality of *harassments*, from trigger warnings on syllabi, to learning how to manage challenging conversations in the classroom with sensitivity. Along with becoming more sensitive educators, we may also prevent lawsuits that can eat away at already stressed resources in both time and money. Also, campus reports are viewed by parents and used to choose a school. A loco Parentis view makes us responsible beyond the classroom for students; we need to continuously learn what that means. Professors' generosity in offering help to students who are struggling would, a few year ago, earn that professor 'popular professor award,' where today, the same offer to help, may be perceived by a student as too intimate, making a student uncomfortable. Faculty-established recommendations and practices need to be established to reduce any misunderstanding that can damage a professor's reputation.

Articulation of the Value of the Educational Journey

Academic leaders and faculty need to actively bust the myth that gaining a customized world-class education, is not the goal, but rather simply finding the least expensive and most convenient path to getting a degree conferred. Students that were on a path toward private education may feel a need to go to a SUNY or CUNY school and pursue the Excelsior scholarship option. Yet, public systems are *also* under economic pressure and may not be able to give the student an individualized path, due to the pressure to increase class size and cut expenses.

A parallel perception is that that private colleges teach *liberal* and *extremist* philosophies, rather than sticking to an assigned narrow role of getting the students jobs. The role of education is to expose the student to provocative ideas, expand their critical thinking skills, broaden their global viewpoints, and give them what they need to be supporters of a democracy, as well as be on a powerful path to their desired profession. Every stakeholder in higher-education must advocated that an **educated populace** is needed for a healthy democracy. Students and their parents need to see the tangible outcomes of this educational journey and the financial investment.

Articulation of The Role of Higher Education as a Not-For-Profit System That Serves Society

Higher education stakeholders need to build a narrative and a culture with the belief that education is for *both* the individual and the society. The belief must be strengthened that the student can follow his or her dreams, but also become a positive and prepared contributor to our society. This includes understanding economics, the value of law, the role of government, the philosophy of society, the social contract, and the value of socially-minded business. Business education should focus not solely on profit-taking, but on sustainable economic growth, job creation, and contributing to a society where individuals can benefit from the sweat of their own brows. Higher education stakeholders must support a shared belief that education is good for America, not just for the individual. Students must leave college knowing that education is a privilege and with privilege comes responsibility to create opportunity for others.

5 STRATEGIES TO ATTRACT AND RETAIN STUDENTS

The market is changing. The Mega-university offers a degree at a low cost with high convenience. Attracting students is one aspect of higher education positioning within the market, but equally important is retaining students. With the elimination of the long-standing NACAC standards, colleges can aggressively recruit students without restraint. Also, student retention is a major component of national rankings. These strategies are relevant to both attracting and retaining students:

Job Preparation

Though we are preparing the student for a productive personal and professional life, the economic pressure of today's world, requires higher education to be committed to career readiness. Consider…

- Starting business internships the summer after freshman year. Students learn what they *hate* and they gain incremental confidence, before the critical junior year, while building their resumes. Application of gained knowledge is important for the student as he or she moves through the educational journey.
- Establish an expectation that finance students, and even accounting students, sit for the Level 1 CFA exam, *before* graduation. Nuggets of the business curriculum, relevant to level 1 CFA, should be identified so students focus on those

topics within: quantitative reasoning, economics, accounting, corporate finance, and into the upper level courses. A mini-finance capstone can be a CFA prep course in the senior year before the student sits for the exam.

- Establish the expectation that students will take a project management course and will sit for the Certified Associate in Project Management (CAPM) exam. This credential will strengthen both the college's reputation as delivering the strongest market-prepared candidates, and the student's chances to shine.
- Design registered dual-degree programs that *cross* disciplines (where it makes sense) with the intent of promoting the liberal arts undergraduate programs and linking them to the graduate business degrees. "Study your passion, as you prepare for your profession." Dual-degrees give parents the confidence that their children will leave college with two degrees and a secure future.
- Be acutely aware of the institution's default rate. This data is collected by the Department of Education; it is also reported in the IPEDS. Default rate indicates the ability of the student to leave school, get a job, and repay his or her student loans. A high default rate is an indicator that the students are not securing the level of employment that will allow the repayment. The ROI of student debt is employability. Higher education leadership must have clarity as to the student's ability to be employable at the end of the educational journey.

It Is Not Just About Getting the First Job

Any worthy and reputable institution of Higher Education should never be about *solely* getting a job; it is about world-class market-valued preparation, not only for the first job, but an education that will serve the student throughout his or her life. A strategic consideration is to *promote* the life-time commitment to the graduate, especially if he or she is derailed mid-career and needs *more* than a college-level career center.

Negotiate a relationship with an executive-level outplacement and coaching organization, so when an unexpected downturn takes place, the alumna can turn toward the institution that conferred the degree; the student should always feel connected.

Flexibility in Time, Space, and Speed

The past has shown that in times of recession that individuals turn to education as an answer. So, the strategy should be to significantly increase flexibility in *time*, *space*, and *speed*. Higher education must expand the pathways for the students.

- Promote 7-week immersion semesters for graduate education. A 7-week model, especially integrating online, is attractive to working professionals, who cannot commit to 14 weeks. Also the student's schedule can wrap around demanding work seasons, such as exists for accountants.
- Design an accelerated undergraduate degree that integrates online coursework through the winter and summer semesters, allowing a motivated student to earn the bachelor's degree in a predictable 3 years. A dual-degree option allows both bachelors and graduate degrees to be earned within 4 years.
- Build and promote a program that serves mid-career and senior leaders who never completed their undergraduate degree. Offer a highly flexible and professional environment for mid-career men and women. Design for-credit certificates that can be accumulated to build toward the Bachelors, allowing the adult learner to update the resume incrementally, as the undergraduate degree is being earned. Design these for-credit certificates so that they qualify for federal financial aid and are employment aligned; this evidence will be require under the Gainful Employment rule.
- Increase registered online degrees to serve the international market.
- Increase corporate partnerships with work-site course delivery that integrates online delivery with a tuition discount.

Faculty and Advisors are the Secret Sauce

Students may not *choose* a school because of any one professor; but, once the student arrives, the relationships formed with professors, are powerful. The *National Survey of Student Engagement (NSSE)* reflects, what we all know: student want advisement quality over quantity, and *not* just about course selection. The mentorship of a professor, can keep a student at a school. Without this bond, the student can be seduced away. Retention is tied to the faculty and what they bring to the student's life. Also, for students at risk – it is the faculty who will see the red-flags first.

Squash the Student's Doubt That the Knowledge Gained is Not Valuable

Public Doubt is fed by the perception that *"I'm learning something that I will never use.*" The NSSE found that students want the confidence to apply new knowledge. Moving assessment out of the '*have to do'* column, into the '*happens naturally'* column, comes from a culture of assessment that makes our programs better. Ensure that students understand the learning outcomes and how the knowledge *stacks*, so when the journey is complete, the student can DO what the college promised, and be able to enter the profession, hitting the ground running. Experiential learning is already part of many college cultures, so flip the classroom

so that the professor's talent is used to help the student APPLY the knowledge. Competitions and student showcases, are all program level assessments. They provide the student confidence that he or she can apply the learned knowledge.

High Impact Practices Matter

All this flexibility will increase the diversity of students, but it does not lessen our promise of providing a full-college experience. The NSSE cites the high impact practices, so add more discipline-related high impact practices. The Annual Euroweek student research competition is an opportunity to combine: 'researching with faculty,' 'going abroad,' a 'field experience' a 'learning community,' and a 'capstone-like experience.' Every year business students from around the world form teams: two students from three countries, to conduct original research that has a meaningful economic/socially-minded business focus. Then, the students travel to meet their co-authors, and create a presentation – and then compete. Students are completely transformed. And in 2020 it was done virtually.

I also recommend a meaningful relationship with the Northeast Business & Economics Association. Students are welcome to present with their faculty. Again, students respond with high-emotional gratitude, and consider this experience transformative.

6 REPLACING PUBLIC DOUBT WITH CONFIDENCE

Awareness of the influences that have been creating a loss of confidence in the value of higher education, is the first step. *Acknowledging* the legitimacy of these concerns is the next step. Groupthink can lead the higher education community to collectively resist *accountability*, which will not serve higher education's long-term stability and survival. A sincere acknowledgment that higher education is accountable for its own long-term success must precede a commitment to strategies that will provide a predictable path to a college graduate. The student needs to have confidence that the cost of higher education is a valued investment, which will positively change the trajectory of the student's professional and personal life.

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The Sustainable Closet

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ABSTRACT
The technology that created the boom in online shopping has turned the local thrift store into a mainstream phenomenon. Customers of the future will look for ways to recycle, resell or upcycle, and will be drawn to the incredible value of buying secondhand, with millennials and Gen Z adopting second hand faster than other age groups. This will have a significant positive impact on global sustainability, as the fashion industry produces 10% of all carbon emissions, is the second-largest consumer of the world's water supply, and pollutes oceans with microplastics. The clothing industry follows oil as the second largest industrial polluter. In the US, consumer trends indicate that shoppers who don't want to be seen in the same outfit twice have resulted consumers' buying 60% more clothing today than they did 15 years ago, but keep the items only half as long. In Europe, clothing resale has brought the conversation of ethical buying back into the spotlight. Globally, the fashion resale and rental market is exploding, growing 21 times faster than the retail market over the past three years. The objective of this study is to better understand consumer attitudes and behaviors with regard to the apparel resale economy.

Keywords
Secondhand, resale, sustainable, online shopping, recycle

1 INTRODUCTION

The concept of "resale" is largely associated with the retail industry. In today's vast technological world, the idea of sharing apparel has become extremely prevalent because there are countless platforms and websites at consumer's disposals. Depending on where in the world you live, the resale platforms available to you will vary. In the United States, the most well-known of clothing resale platform is thredUp. Referred to as the "largest online consignment and thrift store," thredUp has been paving the way for collaborative consumption in the retail industry for some time. ThredUp gives consumers the opportunity to acquire brand-name clothing and accessories at a bargain price. ThredUp guarantees customers that every piece of clothing and/or accessory is 100% authentic and "in such good shape anyone could mistake them as new" (thredUp, 2019). At a time in which so many people are consumed with materialistic status and keeping up with the trends, the idea of collaborative consumption is a no-brainer. Consumers can shop for brands anywhere, from Gucci to Burberry, and Ann Taylor to Lululemon Athletica. The rise of resale can be attributed to many factors including the desire for sustainability and the ability to meet the demands of the "Instagram Generation", as the market uniquely meets consumers' preference for variety, value and sustainability (Saunders, 2019).

2 LITERATURE REVIEW

Academic research on the phenomenon of collaborative consumption (CC) has recently flourished with the growth of the digital sharing economy. New technology-driven business models have made 'sharing' resources much easier (Barnes & Mattsson, 2017) by combining the basic components of e-commerce with social networking. A search in Google Scholar for Collaborative Consumption results in over 2 million articles. A more focused search on Collaborative Consumption of apparel resulted in more than 18,500 results. The research objective for this study focuses on the drivers of the secondhand economy in apparel, so that the literature concentrated on prior research on consumer motivations for CC.

Resale has been a growing part of the apparel industry for a long time. The resale or sharing economy is defined as "people coordinating the acquisition and distribution of a resource for a fee or other compensation, which may include, trading, bartering, or swapping activities, where giving and receiving and may include nonmonetary exchange" (Park & Armstrong, 2017, p. 466). Based on the literature, we see four major reasons why more people are engaging in resale. These include, sustainability, enjoyment, reputation, and economic benefits.

First, studies show that engaging in apparel sharing can have positive effects on the environment as well as conserve natural resources. When you purchase an item from a resale platform, you are reusing clothing that someone else was done with as opposed to buying new clothes. This reduces the need to produce more clothing which saves resources. According to the

literature, "a sustainable marketplace that "optimizes the environmental, social, and economic consequences of consumption in order to meet the needs of both current and future generations" (Hamari, Sjöklint, Ukkonen, 2016, p. 2051). This may influence the attitudes of the people participating in resale because the importance of *environmental sustainability* to so many people today.

The next important reason for collaborative consumption is *enjoyment*. The enjoyment factor in resale, comes mainly from social networking. Enjoyment has been regarded as an important factor also in other sharing-related activities, such as information system use, and information sharing on the Internet" (Hamari et al., 2016, p. 2052). Social networking is the largest part of enjoyment in resale because being able to post and share what you are wearing is becoming more and more important to people and resale allows people to always have something different to share online.

Our third reason for the growth of the resale economy is *reputation*. Reputation, similar to enjoyment, is a reason that stems largely from the ability to connect with people online. "Gaining reputation among like-minded people has been shown to motivate sharing in online communities and open-source projects" (Hamari et al., 2016, p. 2052). We posit that reputation (image) and enjoyment will be the main drivers of the resale economy in the United States because of the desire for fast-fashion and a rotating wardrobe. With the growth of social media, people do not want to be seen wearing the same thing twice because that may hurt their reputation on social media. If people maintain a positive reputation on social media, that will increase their enjoyment of the resale industry. Finally, the fourth major reason for the growth of the resale economy is the *economic benefit* that it brings people, where CC offers "utility maximizing behavior wherein the consumer replaces exclusive ownership of goods with lower-cost options" (Hamari et al., 2016, p. 2052.) offer their goods at a greatly discounted price since they are used which saves consumers money.

3 METHODOLOGY

A survey was developed in Qualtrics, a leading survey management platform, and was administered by email from April 1s - April 20, 2020. A total of 100 interviews were completed among undergraduate students at a college located in the northeast United States. Based on the study objectives, a key component of this research was to evaluate attitudes towards collaborative apparel consumption, and identify those attitudes that correlate with behavior. A list of ten statements was developed to measure attitudes based on the literature review. Hamari et al. (2016) operationalized four categories of apparel resale and rental motivations: sustainability, enjoyment, reputation and economic benefits. The attitude scale for this study has been developed using the highest factor loadings for the items operationalized in these four constructs, reducing the number of items from 27 to ten statements.

We first asked if they were aware of the resale and rental economy. After that, we wanted to know if they were aware of any of the sites that participate in the apparel resale. A list was provided in the survey that included the popular sites in the US. These included Poshmark, The Real Real, ThredUp, Depop, eBay, ASOS Marketplace, Tradesy, Vinted, Etsy, and Vestiaire Collective. Respondents also had the opportunity to add "others" to their responses. To understand their motivation and the behavior, respondents were asked to indicate how strongly they agreed with each of the ten statements, using a 7-point Likert scale.

4 RESULTS

4.1 Scale Reliability

A 7-point Likert scale was used to measure attitudes towards collaborative apparel consumption. The reliability score is a measure of the internal consistency, which is reported using Cronbach's alpha coefficient α. The Cronbach's alpha for ten attitudinal variables pooled into a single aggregate measure was calculated as $\alpha = .905$, indicating that the scale items are a reliable and consistent measure of attitudes towards collaborative apparel consumption. Most items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The one exception to this was the statement, "Participating in collaborative consumption improves my image within the community", which would slightly increase the alpha to $\alpha = 0.913$ if deleted. All variables (attitudes) were strongly correlated with purchase intent.

4.2 Attitudes towards Collaborative Consumption

More than 70% were aware of resale fashion platforms on an unaided basis. Awareness for specific brands was highest for eBay, followed by Etsy and Poshmark. Respondents were asked for their level of agreement with ten attitudinal statements developed from the previous research. Strongest agreement was expressed for the following four statements:

- Collaborative consumption is environmentally friendly
- Participating in collaborative consumption has financial benefits
- Participating in collaborative consumption is a good thing
- Sharing goods & services through collaborative consumption makes sense

4.3 Regression Analysis

A regression analysis was conducted to examine the relationship between CC attitudes and 1) future intent to engage in apparel CC (for those who have never engaged in CC), and 2) intent to do more apparel CC for those respondents that have engaged in this behavior.

For the first regression analysis, the ten attitudinal items had a significant impact on purchase interest, $\Delta R2 = .38$, $\Delta F (10, 155) = 9.53$, $p < 001$. Only two of the ten statements had a significant impact on purchase interest. These were "CC is environmentally friendly" and "CC would be interesting".

For the second regression analysis, the full model of ten attitudinal items had a significant impact on purchase interest, $\Delta R2 = .38$, $\Delta F (10, 80) = 6.40$, $p < 001$. Only one of the ten statements had a significant impact on purchase interest on its own. This was "CC would be interesting". Interestingly, the statement "CC would be interesting" was associated with higher levels of purchase intent, but was not among the statements that people agreed with most strongly.

5 DISCUSSION

According to the literature, from the consumer behavior's point of view, the younger generations are paying growing attention to these issues (Gazzola, Pavione, Pezzetti and Grechi, 2020). The survey results highlight the growing attention that the younger generations today are paying to sustainability and circular economy, which indicates that for the fashion market, these factors are becoming a strategic element and a source of long-lasting competitive advantage. These trends point to the opportunity to explore emerging new business models that result in strategic direction, and can add to the marketing and management literature. Despite previous researchers' efforts to examine consumer motivations for apparel CC, the answers may be specific to country and culture. This study contributes to literature in two important ways. First, by testing previous theory generated from qualitative research. Second, by distinguishing two modes of CAC including online renting and resale. In this way we can provide a more holistic picture for the phenomenon of apparel CC.

6 LIMITATIONS OF STUDY & FUTURE RESEARCH DIRECTION

The major limitation of this study is that it was conducted using a convenience sample. Surveys were emailed to colleagues, associates and fellow students at one college located in the northeast United States. As such, there is likely to be bias in the sample. However, it allowed us to ask very specific questions about the sites that were the most used, the behaviour characteristics, etc. Another bias, which may be the one with the more consequences, is that we shared it ourselves. This implies that we shared it with people that are in the same economic class, age range, and in the same thinking process in general. The majority of the people that answered the survey were close enough to us so that we could reach them, and we only have the opinion of people, which in our case, were already aware of the resale economy. Future research should build on the methodology employed here across a wider demographic and geographic sample of the population.

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He, She, We: Gender Impacts in Teamwork

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ABSTRACT
It is well known that organizational teams are highly valued in work settings (Marquis, 2019; Sachiko & Takeda, 2014). Some research has shown gender differences such as "team collaboration is greatly improved by the presence of women in the group" (Baer & Woolley, 2011; Hoogendoorn, Oosterbeek & VanPraag, 2013). Other studies support mixed gender teams as advantageous (Apesteguia, Azmat & Iriberri, 2012; Sachiko & Takeda, 2014). This paper will review the perceptions of gender contributions in teams from the literature and report on a study of current business students in a liberal arts university. Some comparisons are made to the author's 2017 survey on gender effects in team projects in the same school.

Keywords
Assessment, gender, performance, team

1 INTRODUCTION

Many organizations are transitioning from hierarchal structures to team-based management according to a 2019 study by Deloitte of nearly 10,000 respondents in 119 countries (Volani, Schwartz, Indranil, Hauptman, Van Durme, Denny, & Bersin, 2019). Most or almost all work done in teams was reported by 31% of the respondents and significant improvement in performance from transitioning to team-based models was described by 53% and minimal improvement by 21% (Volani, et al., 2019). In the meta-analytic review by Joshi and Roh (2009), the context was assessed as more of a moderator than gender or other diversities. A study of 83 teams in eight organizations (Kearney, Gerbert & Voelpel, 2009) purported that cognition as a personality trait was the influential effect in team-work rather than gender. Whatever the composition, teams are used extensively and increasingly including management teams, project teams, parallel teams, and virtual teams.

2 PAST TEAM GENDER STUDIES

Fenwick and Neal's (2001) study of gender differences using a business simulation found a positive relation to performance due to more co-operative, interactive and people-oriented workstyles. Though very few all men groups ranked first or second, mixed groups' high performance was attributed to the combination of women and men's competitive and analytical decision-making style. A contrasting analysis was made by an assessment of three years' worth of data from the L'Oréal E-Strat Challenge of 37,914 participants from 1,500 global universities with women numbering 12,759 undergraduates and 3,934 graduates and men numbering 14,525 undergraduates and 6,697 graduates [37,915 one not included in assessment]. Apesteguia, Azmat and Iriberri (2012) reported that decision-making teams of three women performed worse than mixed teams or all men teams.

Mixed teams also had beneficial ratings in self- and peer-assessments of 192 groups of 3-7 students, the median number of 5 students in 100 groups, reported "enhanced collaboration" in gender-balanced groups (Sachiko & Takeda, 2014). In another study using peer-assessments (Tucker, 2014), 1523 students in four degree programs of two universities made 18,814 ratings with women assessed higher than men though not significantly. However, there was a significant difference in the generosity of ratings by men rather than women. Tucker (2014) ventured this could be due to men compensating for deficient teamwork skills through greater magnanimity.

In a L'Oréal study, the authors, (Apesteguia, Azmat & Iriberri, 2012) postulated that poor ranking of all-female teams could be due to selection processes such as low ability or shy women choosing all-women teams affecting reduced skills and interactions.

3 STUDENT TEAM GENDER STUDY

A survey of undergraduate business students rated the effectiveness of team projects by gender. An instrument in Survey monkey was e-mailed to students through class rosters for anonymous responses. Most business courses require some form of team collaboration for short or full semester projects. The results were compared to a 2017 assessment by the author of 23 women and 20 men. For example, in that survey women were rated as better performers in 5 of 6 categories: work done - men 30.2%, women 69.8%; attention to grammar/writing - men 27.9%, women 72.1%; concern for due date - men 23.7%, women 76.7%; correct formatting - men 25.6%, women 74.4; and team conscientiousness - men 39.5%, women 60.5%. Only focus on relevant research was ranked higher for men at 51.2% and 48.8% for women (see Table 1).

Table 1: Performance Ranking (2017)

Better Performance	Men N=20	Women N=23
work done	30.2%	69.8%
attention to grammar/writing	27.9%	72.1%
concern for due date	23.3%	76.7%
focus on relevant research	51.2%	48.8%
correct formatting	25.6%	74.4%
team conscientiousness	39.5%	60.5%

4 RESULTS

Students from Spring 2020 Management of Human Resources class completed the online survey. There were 13 male and 13 female responses. To the question "In general, which gender would you rank as the better performer in any of your class work/projects?" the better performance of women was again rated higher, even higher than 2017, to men (see Table 2).

Table 2: Performance Ranking (2020)

Better Performance	Men N=13	Women N=13
work done	15.4%	84.6%
attention to grammar/writing	11.5%	88.5%
concern for due date	11.5%	88.5%
focus on relevant research	26.9%	73.1%
correct formatting	15.4%	84.6%
team conscientiousness	23.1%	76.9%

There was a female comment that "men sometimes add more creative content and a more relaxed work environment which helps the team,"

The questions of the Spring 2020 students are compared to the those of Fall 2017. The work of women ranked high for exceptionally helpful in both studies, but more considered the work only moderately helpful in 2020 than they did in 2017 (see Table 3).

Table 3: How would you assess the work of women in any class/work projects? Spring 202 N=26 Fall 2017 N=43

	Not Very Helpful		no label		Moderately Helpful		no label		Exceptionally Helpful	
	2020	2017	2020	2017	2020	2017	2020	2017	2020	2017
work done	0.0%	0.0%	0.0%	0.0%	19.2%	2.3%	15.4%	32.6%	65.4%	65.1%
attention to grammar/writing	0.0%	0.0%	0.0%	0.0%	11.5%	4.7%	26.9%	27.9%	61.5%	61.5%
concern for due date	0.0%	0.0%	0.0%	0.0%	19.2%	2.3%	19.2%	34.9%	61.5%	62.8%
focus on relevant research	0.0%	0.0%	0.0%	0.0%	11.5%	7.0%	23.1%	30.2%	65.4%	62.8%
correct formatting	0.0%	0.0%	0.0%	0.0%	11.5%	2.3%	19.2%	41.9%	69.2%	55.8%
team conscientiousness	0.0%	0.0%	0.0%	0.0%	11.5%	4.7%	19.2%	34.9%	69.2%	60.5%

The impression of men's contribution exceptional helpfulness to team efforts regarding due date, research, formatting and conscientiousness increased. However, men's attention to grammar/writing and work done decreased in exceptionally helpful categories (see Table 4).

Table 4: How would you assess the work of men in any class/work projects? Spring 2020 N=26 Fall 2017 N=43

	Not Very Helpful		no label		Moderately Helpful		no label		Exceptionally Helpful	
	2020	2017	2020	2017	2020	2017	2020	2017	2020	2017
work done	3.9%	0.0%	0.0%	0.0%	34.6%	20.1%	23.1%	30.3%	38.5%	48.8%
attention to grammar/writing	3.9%	0.0%	3.9%	0.0%	26.9%	23.3%	23.1%	32.6%	42.3%	44.2%
concern for due date	3.9%	0.0%	3.9%	0.0%	42.3%	18.6%	11.4%	44.2%	38.5%	37.2%
focus on relevant research	3.9%	3.9%	0.0%	0.0%	30.8%	13.9%	15.4%	34.9%	50.0%	46.5%
correct formatting	3.9%	3.9%	0.0%	0.0%	30.8%	13.9%	15.4%	39.5%	50.0%	41.9%
team conscientiousness	0.0%	3.9%	0.0%	0.0%	34.6%	18.6%	11.5%	30.2%	53.9%	46.5%

5 LIMITATIONS

The study of 26 human resource management students is a small focused group and is not representative of different majors, geographic areas or cultures. The literature yields studies of larger numbers but are also limited. More research on the success and satisfaction of mixed teams compared to same gender teams could be illuminating. Also, the current study did not include only virtual teamwork which has increased with home workers because of the pandemic (Roddy, 2020) and more global locations of workers (Sahin, 2020).

6 CONCLUSIONS

The increased score for women's improved performance in a team correlated with a study of 245 participants of virtual teams Comprised of 43% female and 57% male, higher level of perceived team performance was reported by 77% of women compared to 55% of the men participants. "Men want clear objectives and women valued communications." (Boiney, 2001).

In a study of 699 people in groups of two to five that was not designed to focus on any gender effect, it was found that "the tendency to cooperate effectively is linked to the number of women in a group." (Woolley, et al., 2010). The effectiveness of the team was not dependent on the intelligence of the members rather than the social sensitivity and hence the collective intelligence of the group. The study authors purported that it is" possible to improve the intelligence of a group by changing the members of a group, teaching them better ways of interacting or giving them better electronic collaboration tools."

For this study, the work of women was ranked higher than men and this perception of better performance by women increased from Fall of 2017 to Spring of 2020. The composition of teams for successful projects is a critical factor and it will be challenging to assess the effective dynamics of teams for in person and online work.

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Liberal Learning in an Undergraduate Business Program: Curriculum Review and Revision

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Keywords
Focus® 2, self-efficacy, career decision making, business curriculum

1 INTRODUCTION

According to Chew and McInnis-Bowers (2004), "the benefits of constructing programs of study that effectively prepare the liberally educated business professional have been well recognized and discussed for over a century. In 1890, Charles William Elliot, president of Harvard, commented that the object of a good education for business people would require development of "accuracy in observation, quickness and certainty in seizing upon the main points of a new subject, and discrimination in separating the trivial from the important in great masses of facts," and that "liberal education develops a sense of right, duty and honor." The skills developed through liberal arts learning develop communication and values in students, both essential to successful careers in business.

The purpose of this initiative is to revise select assignments in select courses in the undergraduate business program to intentionally infuse liberal arts learning opportunities into the curriculum. The competencies most associated with liberal learning have not traditionally been incorporated in business program learning outcomes. Further, business courses have not generally incorporated pedagogies, learning activities, and assessments intentionally directed toward helping students develop these competencies. With the help of an implementation grant we set out to make changes to five courses in the undergraduate business program. We convened a group of ten faculty from across the institution and created a plan to utilize the interdisciplinary relationships between faculty to inform undergraduate business teaching and learning, specifically curriculum development, pedagogy, faculty development, and resource sharing for student liberal arts learning. We entered the process believing that enhancing the learning experiences of our business students through the purposeful incorporation of liberal learning experiences will improve their ability to think critically, to learn broadly, to reflect, and to be self-aware global citizens.

After identifying faculty, we determined that we needed to understand what faculty (including adjunct instructors) teaching in the business program understood about liberal learning outcomes in the business curriculum. We utilized an electronic survey to gather the information. The survey results indicated that the faculty believes that the curriculum does lead to the achievement of its liberal learning outcomes; however, there is room for a more intentional focus on the assignments and pedagogies used to meet these broad liberal learning outcomes. The survey results indicate the need for the revision of several of the courses throughout the curriculum from introductory level courses through the capstone. Importantly, the survey did not account for developmental learning as the students move through the curriculum. For example, a basic level of analytical thinking should be measured in a 100 level course, but a deeper level of analytical thinking and application should be measured in the 300 and 400 level coursework.

Specifically, the survey revealed that outcomes related to multiple framing and reflective exploration of meaning are not adequately supported in the curriculum. Multiple framing was reported as an outcome in only 60% of the courses and unanimously identified in the survey in only 13% of the courses. Similarly, the reflective exploration of meaning was supported as an outcome in 73% of the curriculum, and unanimously identified as an outcome in 26% of the curriculum. This finding was supported in a follow-up question in the survey in which 43% of the respondents noted that multiple framing is not supported in the curriculum, and 30% reported that the reflective exploration of meaning is not supported. It is important to note that respondents agreed that analytical thinking and practical reasoning are supported in the curriculum at 70% for each type of outcome, with 30% strongly agreeing. A small percentage of the respondents strongly disagreed that the program meets the oral

and writing communication outcomes and disagreed that it meets the critical and creative problem solving, utilization of technology, and understanding of global influences outcomes. These responses suggest that there is room for improvement in meeting these outcomes in the curriculum.

With regard to particular types of assignments and course materials that are used to support the learning outcomes in the program, the text, lecture, guest speakers, case studies, videos, reflection, problems, and class discussions were noted as current learning tools. These responses suggest that outcomes might be better met through a further infusion of liberal arts content and pedagogy.

The survey concluded with an open-ended response option. One respondent felt that there has been a noticeable decline in writing skills among the students in the program in the courses the instructor taught. We acknowledge that writing is not an explicit liberal learning outcome; however, the survey supports more opportunities to infuse writing assignments into the curriculum.

As an additional check on the liberal arts experiences of our business students, we examined the transcripts of business graduates of the last five years (2013-2018). Almost 70% of those students took at least one liberal arts class beyond what was required for General Education or recommended for their major (Ethics in Business). Although that figure looks promising, the great majority of those graduates took only one of those "extra" classes. Moreover, each of those extra classes was an entity unto itself, making no reference to the application of its content or methodologies to topics in business. Experience has shown repeatedly that students need guidance and practice if they are to integrate their learning in disparate disciplines both before and after they have earned their degrees.

The work to revise the five identified courses began Summer 18 and will conclude Spring 21. To date the courses that have been revised and their descriptions are as follows:

BUS100 - Introduction to Business: Domestic & Global Dimensions
The Introduction to Business course provides a fundamental working knowledge of the varied aspects of business and prepares students for future studies in more specialized topics within the subject area. Students will increase their awareness of the overall environment and function of business as well as observe its contributions to society. This course also covers communication, technology, globalization, and business ethics.

BUS200 - Principles of Management & Management Skills
This course is an introduction to the principles of management including planning, organizing, leading, and controlling. The course combines the traditional management process approach with contemporary systems and behavioral approaches. Awareness of the major skill areas of effective management to include communication, motivation, and innovation are addressed.

BUS215 - Principles of Marketing & Consumer Behavior
Principles of Marketing and Consumer Behavior introduces the basic concepts and tools of modern marketing practice and appreciate the importance of marketing decisions dealing with product, price, distribution and promotion. The course will emphasize the interplay between these marketing decisions and environmental forces (competitive, economic, technological, socio-cultural, and legal-regulatory). The course will also provide the student with an understanding of consumer behavior, market research, market segmentation and positioning.

BUS350 - Small Business Planning & Management
This course emphasizes the fundamentals of starting a new business venture from development to planning, market analysis, initial financing, organizing, and managing. Topics include form of ownership, location, distribution channel and supplier chain to cash flow, operations and marketing. Introduction to the nonprofit sector and community is presented. Management issues specific to nonprofits including mission, volunteerism and financial management will be explored. The principle of wealth creation and contribution to society will be dominant throughout.

BUS490- Senior Capstone Seminar
This capstone experience assesses the students' mastery of the Business Administration curriculum and the core competencies expected of all business professionals. Through class meetings and individual or team dialog, students will craft individualized projects that will allow them to analyze the complex multidimensional business problems.

2 METHODS/MEASURES

This effort is a reflection of practice. The efforts of the faculty were supported through a grant that provided a small stipend for participation. The Director of the Undergraduate Business Program was recruited to lead the efforts for the duration of the grant. Five courses in the undergraduate business program were identified for intervention. The five faculty who worked collaboratively to secure the funding were joined by five additional faculty from liberal arts programs at the College, along with the institution's

Director of Assessment. While meeting several times over the course of the academic year, course learning outcomes were reviewed and the liberal arts faculty provided options for assignments that infused liberal arts learning into existing assignments or, in some cases, suggested new assignments.

Measuring the success of the course revisions will be ongoing. Ultimately, stronger communication skills, richer understanding of business problems and processes, and greater internship and employment opportunities for graduates will demonstrate the success of this effort.

3 PROCEDURE

Over the course of three years, a group of faculty that represented the business program and liberal arts programs including Psychology, English, Art, World Languages, and History met regularly to discuss the business course learning outcomes and assignments. Suggestions were made to revise assignments and add new assignments to five of the courses to ensure course learning outcomes were met while intentionally infusing liberal arts learning assignments into the courses. The effort to revise five courses will take three years and include piloting of each of the revised courses to allow for further revision of assignments if necessary.

4 RESULTS

As of Spring 2020 four courses have been revised and piloted. Introduction to Business: Domestic & Global Dimensions, Principles of Management & Management Skills, Principles of Marketing & Consumer Behavior and Small Business Management. The revised assignments include scaffolded levels of reflection, writing, experiential activities and exposure to various literature and readings. The assignments include such things as:

- Career Research & Survey Analysis Reflection
- Campus Art Gallery visitation and Reflection
- Restaurant development, creation, and plan
- Word Choice/Leadership Gallery
- Happiness Advantage – reading and Reflection
- Art Gallery (assignment #2) – paired Art student experience; application of Marking Mix
- Marketing Persona Analysis-photography target market discussion analysis
- Marketing Plan- creation, development, and presentation
- Small Business - Values, Philosophy and Business Model exercise and reflection
- Small Business - Location and Sustainability Reflection

Preliminary analysis of course evaluations, assignments, and discussions in the revised classes reveal overall student satisfaction with the content as well as greater comfort with assignments that require them to apply what they have learned, for example writing a marketing as well as a business plan and working in groups. The addition of increased reflective writing in these courses have also preliminarily been evaluated as positive by the students.

5 DISCUSSION

According to DS (2018), "Put simply, business majors seem to be graduating with some of the technical skills they'll need to secure jobs, but without having made the gains in writing or critical-thinking skills they'll require to succeed over the course of their careers, or to adapt as their technical skills become outdated and the nature of the opportunities they have shifts over time" (para. 7). The student characteristics we are seeking to develop are also supported by employers for what Gardner and Estry (n.d.) call T-Shaped Professionals. T-Shaped Professionals "integrates depth, defined in terms of disciplinary knowledge and the ability to understand how individuals with that knowledge function and interact to accomplish a desired outcome within or across a system(s), and breadth, defined as the professional abilities that allow someone with profound disciplinary knowledge to interact meaningfully with others who possess different disciplinary knowledge in order to affect an outcome that might not otherwise be possible" (p.2). Liberal arts learning helps students develop essential skills that will help them analyze information, identify trends, communicate effectively and encourage imagination in the workplace. Developing the highly sought-after T-Shaped Professional requires adjustments to curriculums and assignments including "innovative and intentional use of technology, space, and context to design learning experiences that can be integrated to chronicle a learner's development into a T" (p.2). The new learning experiences designed to support and obtain the learning outcomes of the undergraduate business course contribute to the development of the student into T-Shaped Professionals.

The path to the labor market is particularly important for Saint Elizabeth University as we serve a proportion of underprepared students. According to a New York Times report (2017) the University serves some of the poorest students among select private institutions and the North Eastern Athletic Conference; approximately 12% of the students report family incomes of less than

$20,000 annually. However, the University is among the highest performers in moving graduates up two or more income quintiles in the NEAC, in New Jersey, and among our peer institutions making the University 57th out of 578 selective private colleges; and, the University is 238th out of 578 selective private colleges that move poor students to rich adults (NYT, 2017). With regard to economic benefits, Gillie and Isenhour (2003) noted higher incomes for students who engaged in informed and considered career decisions as well as lower rates and shorter periods of unemployment, lower costs to employers associated with employee turnover, lower health care costs, lower incarceration and criminal justice costs, and increased worker productivity (p. 1). The value added to educational, social, and economic outcomes benefit the student, the institution, and society.

A better understanding of self and the confidence gained via the multi-modal approach to engagement in liberal arts learning will support business students through their program of study and help them develop into the T-Shaped professionals sought by employers.

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Bridging the Gap in the Technology Commercialization Process

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ABSTRACT
Cogeneration merges the production of usable heat and electricity into a single process that helps to reduce carbon emissions, energy waste and energy costs. Until now, this source of sustainable energy has been used mostly in the industrial sector, the consumer market is unknown. One type of cogeneration system, the Stirling engine, is a heat engine that is operated by a cyclic compression and expansion of air or other gas at different temperatures. This cogeneration system is capable of charging a smartphone's battery using the heat of everyday objects like a hot cup or a radiator, or a human hand.

There are two main goals of this project; 1) is to design and build a small prototype using the Stirling engine technology to generate electricity; and 2) to conduct a market test to assess the appeal of the Stirling sustainable charger among consumers. Online surveys will be employed to conduct research to evaluate overall purchase interest in this new technology. The information to be collected will include demographic and attitudinal characteristics that can be used to help build consumer profiles, and identify which profiles correlate with higher levels of purchase interest for the Stirling sustainable charger. This research will be used to help position the Stirling charge, and to identify key target segments for the marketing of this product.

Keywords
Cogeneration, sustainable charger, Stirling engine, consumer marketing

1 INTRODUCTION

The Stirling Engine is a future technology advancement that when put forth shows how far the world has come to creating energy in a multitude of ways. The Stirling engine will not only be a transcendent tech, but will be able to show vast improvement in the economic market when delivered to the right audience. In many walks of the earth, the Stirling engine is the technology consumers have been waiting for in order to charge their cellular device or other essential technology on-the-go. The Stirling engine introduces a new way to do this through a hot or cold beverage. While the size of the product is larger than others, it poses a unique way of recharging your tech in a more enjoyable way. The Stirling engine could be the future for many countries who don't have access to other certain technology tools available to them. The research we have provided shows the potential of the Stirling engine being able to be marketable to a larger audience and why the need for it is now.

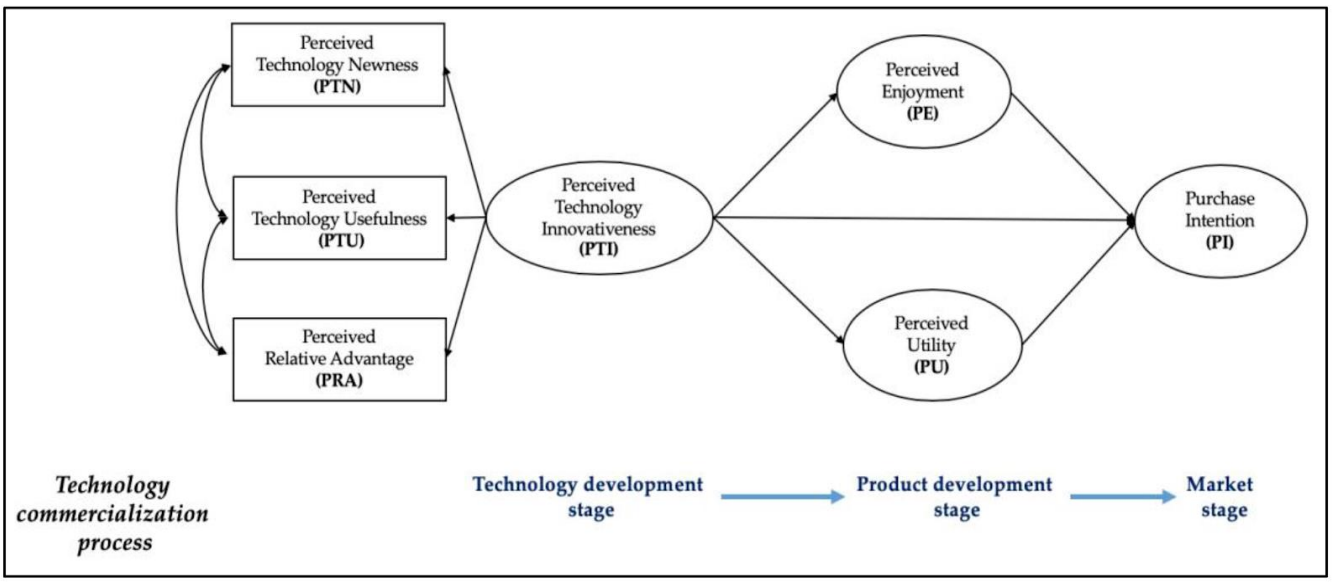
2 LITERATURE REVIEW

According to the article *Bridging the Gap in the Technology Commercialization Process: Using a Three-Stage Technology–Product–Market Model* (Kim, Park, Sawng, and Park, 2019). There should be a lot of research and development in order for the technology you are introducing to not fail as it launches for consumers to purchase. The Stirling engine motor is an innovative and transcendent technology that introduces a new way of charging your dead phone or tablet. But new technology is frightening and certain technology has to be introduced at the right time in order for consumers to accept the product into current day society. The Stirling engine motor is integral for many consumers to understand the type of power it takes to recharge their technology from 0% to 100%. With this article it thoroughly explains why the developmental process of getting the right research goes a long way for a new product like the Stirling engine to sell, especially to the right target market. The market demand for new ways to recharge phones is currently a necessity for many people who phone dies extremely fast. This creates an opportunity for the Stirling.

Table 1. Variable indicators.

Variable	Indicator
Perceived Technology Newness (PTN)	This technology is new This technology is different This technology is unique This technology is original
Perceived Technology Usefulness (PTU)	Using this technology is useful Using this technology improves performance Using this technology increases productivity
Perceived Relative Advantage (PRA)	This technology is higher quality than the competition This technology solves problems I had with existing technology
Perceived Technology Innovativeness (PTI)	How innovative is this technology? This is an innovative technology
Perceived Enjoyment (PE)	Using this product is exciting Using this product is fun This product is enjoyable
Perceived Utility (PU)	This product is effective This product is helpful This product is practical
Purchase Intention (PI)	I need this product I want to purchase this product

What the article continues to say moving forward is how we might perceive certain technology that is introduced to us. Is the technology we are introducing new? Is it useful? Does it give us a relative advantage? And if it answers any of those questions with a positive yes, then it would be perceived to be innovative according to the *Three-Stage Technology-Product-Market-Model* (Kim et al., 2019). Furthermore, with that model, would it be perceived as an enjoyment or utility? And continuing on that trend if the answer was a yes, would it then be enough for a consumer to have the right perception of the product to purchase the intended product (Purchase Intention - PI). Those three steps explained above are considered the technology developmental stage, product developmental stage, and the market stage. All three stages the Stirling engine must go through in order to see the success rate increase of a product with this type of innovation to become trending to a consumer.



Throughout the article we are taken to the vantage point of the consumer thought process and perceive look at the product rather than the developer's perspective. Though the developer of the product will come to the conclusion of why wouldn't you purchase the product, the consumer may see a few reasons why they wouldn't, so therefore explaining how the research and development process of reaching the right consumer base will be important to gauge how the product will actually be perceived in the marketplace.

Through the study we see that a competitive advantage can be gained through this type of three step model. Though it may not lead to quick emergence of the product leading the tech world, the model can help the product avoid market failure if taken the right steps. The Stirling engine has a lot of promise and can achieve great advancements in the tech industry if handled by the right company and introduced in a proper manner. Consumers want to buy products that will change their daily lives and that will make their lives easier in the long run. Can the Stirling engine do that for our current day society?

3 METHODOLOGY

A survey was developed in Qualtrics, a leading survey management platform, and was distributed via email in the US, Belgium and Netherlands. The research was conducted from April 14 - April 21, 2020. A total of 120 surveys were completed. Based on the study objective, a key component of this research was to evaluate attitudes towards the environment, and correlate them with planned behavior (purchase intent). Based on the literature (Chen & Chai, 2010) a list of six statements was developed to measure attitudes using a 7-point Likert scale. Another objective was to collect reactions and perceptions to the Stirling battery. A list of ten attitude statements was developed, also based on the literature review (Kim, Park, Sawng & Park, 2019).

An a priori power analysis was conducted to determine the required sample size for regression analysis of the total sample of respondents using GPower (Faul, Erdfelder, Buchner, & Lang, 2009). For the regression analysis, the power analysis indicated that 89 participants would be needed to detect a small to moderate effect size ($f2 = .15$) with a power of .95, and an alpha level of $\alpha = .05$ for one tested predictor and ten total predictors. As such, these analyses suggest that the sample size ($N = 110$), was sufficient for statistical analyses.

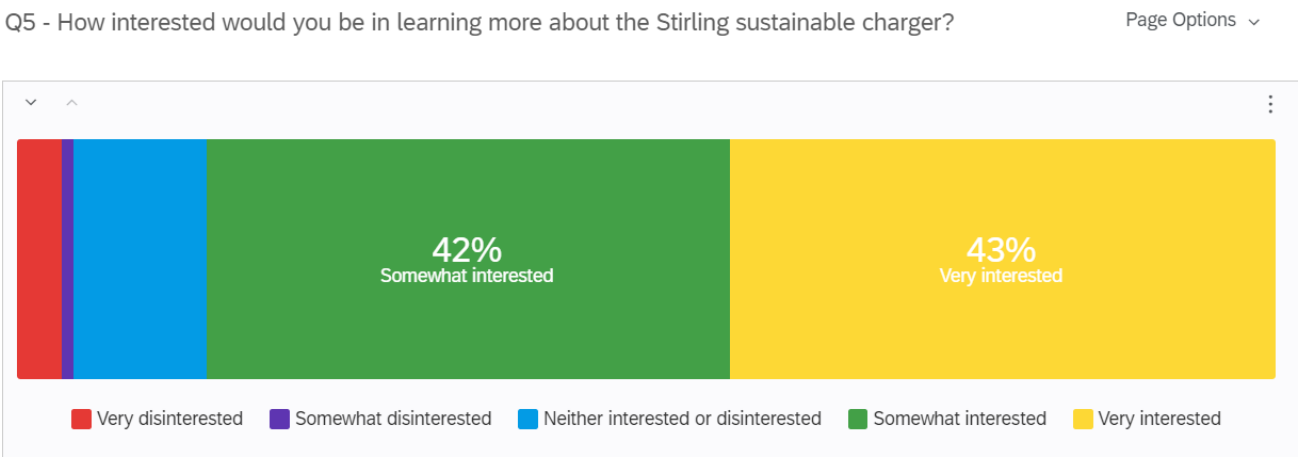
4 RESULTS

Scale Reliability

A seven point Likert scale was also used to measure respondent attitudes towards the environment. The reliability score is a measure of the internal consistency, which is reported using Cronbach's alpha coefficient α. The Cronbach's alpha for the six attitudinal variables pooled into a single aggregate measure was calculated as $\alpha = .808$, indicating that the scale items are a reliable and consistent measure of attitudes towards collaborative apparel consumption. All six items were worthy of retention, resulting in a decrease in the alpha if deleted.

Key Questions

The beginning of our survey captured the key characteristics of our respondents. A statement explaining benefits of cogeneration and a picture of what the Stirling engine charger would look like were introduced. After participants were shown the statement and picture, they were asked "How interested would you be in learning more about the Stirling sustainable charger?" A majority of respondents answered somewhat interested (47) and very interested (49). These two choices accounted for 85% of our sample. Only 5 respondents showed negative attitudes towards the product with 1% somewhat disinterested and 4% very disinterested.



Since the Stirling engine charger is based on using "lost heat" from radiators or drinks, it was important to gauge our samples viewpoint on environmental issues. Respondents were given a scale to rate the importance of the statements listed below, where 1 indicated strongly disagree and 7 indicated strongly agree. The statement " Everyone is responsible for protecting the environment" was very popular as 68% of respondents strongly agreed. 74% of respondents strongly agreed with the statement "The deterioration of the environment is a serious problem." Both results showed a strong interest from our sample in environmental issues.

After the environmental statements, we asked the respondents "How interested would you be in buying the Stirling sustainable charger if it was available to you today?" 22% were neither interested nor disinterested, 46% were somewhat interested and 17% were very interested. Respondents were not willing to commit fully to purchasing the charger. We then asked why they answered that way. Many did not find it to be practical and failed to see the need for the product when they already have an efficient way of charging their mobile devices. They were not given enough information regarding potential cost or how long the charge would last.

Regression Analysis

A regression analysis was conducted to examine the relationship between environmental attitudes and Stirling charger purchase interest. Overall, the six attitudinal items had a significant impact on purchase interest, $\Delta R^2 = .25$, $\Delta F\ (1, 84) = 4.58$, $p <$ 000. Four of the six statements had a significant impact on purchase interest, while two of the statements did not. These were "Everyone is responsible for protecting the environment" and "Everyone should recycle".

Demographics

Our audience demographic was 53% male, 54% aged 18-24, and 35% earned less than $20,000 in the previous year. To learn more about our audience, we asked targeted questions such as their highest degree of achieved education as well as their preferred devices to use while shopping online. There was an even spread for education achieved with 36% holding a bachelor's degree, 23% holding a master's degree and 20% holding a high school diploma. When shopping on the internet, 45% of respondents prefer to use a laptop, 41% prefer a smart phone and only 10% prefer to use a desktop computer. This diverse group of respondents ensured there would be no bias in the answers we received.

5 DISCUSSION

This research makes a contribution to both theory and practice by creating a framework in which R&D activities can be aligned with the marketplace with the objective of commercializing new technologies. While innovation through R&D is important for economic growth, inventions must be successfully transferred to the market in order to create value. Few studies have emphasized that it is necessary to understand the market at the R&D stage in order to reduce risk of failure. Furthermore, consumers do not always want new or innovative technologies since they require a lot of changes in existing behaviors. This study extends the "three-stage technology–product–market model" (Kim, 2019) by testing a new technology with potential environmental positioning, across three different countries. We also demonstrate how positioning strategies and marketing communications can be enhanced by understanding consumer motivations. Directions for future research include replicating this study for testing new technologies in expanded markets.

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Investigating the Relationship between Background and Risk: Immigrant vs. Native-born CEOs

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ABSTRACT
This research explores the spectrum of risk tolerance in CEOs from different backgrounds from companies within the Standard and Poor's 500 Index. This study uncovers a difference is risk taking tendencies between immigrant and native-born CEOs, impacting the reported financials and investments made by the firms. Exploring the behavioral differences of individuals in a business setting can help diversify the CEO pool and increase the collaboration to play on the strengths of individuals. Risk-taking is defined as the calculated steps taken by a firm, represented by its CEO, to increase financial gains and market capitalization. By using data provided by company financial statements, metrics such as research and development, leverage, and options volatility are used as proxies for risk. This research uncovers that immigrant CEOs are less associated with risk taking behavior compared to their native-born counterparts. The purpose of this paper is to add to the prior research conducted reviewing the impact of behavioral traits on financial decision making.

Keywords
Immigrants, risk, heritage, research and development

1 INTRODUCTION

Entrepreneurship is an immigrant's game. Ranging from small, mom-and-pop shop businesses to large multi-national corporations, immigrants make up a large portion of the businesses owned in the United States. Immigrants, in comparison to their native-born counterparts, are twice as likely to become entrepreneurs and start a new business venture (Fairlie et al, 2015). From the new businesses created, immigrant-owned businesses have a history of withstanding the first five years of business, the average time it takes for a startup to fail (Kerr and Kerr, 2016). When companies pass the first five years of operation, they are more likely to succeed. The success of businesses owned by immigrants prompted further research to determine if immigrant-led companies in the Standard and Poor's 500 (S&P 500), a stock market index of United States based stocks, outperform companies with native-born CEOs.

Research regarding immigrant and native-born populations are plentiful, however, there is limited information regarding risk-taking within these two groups where the backgrounds of the Chief Executive Officers (CEO) is the main point of consideration. This research seeks to add on to the literature that exists consisting of impacts of one's background. This is done by investigating the effect family background has on their willingness to take risks in a large organization, such as those in the S&P 500. In this study, the term immigrant encompasses both first- and second-generation individuals. This is due to the cultural influence of the first-generation immigrant group having a great impact on the second-generation.

2 LITERATURE REVIEW

Immigration and Background

Immigrant populations are known for being highly entrepreneurial. Business ownership in the United States is higher among foreign-born individual than native-born, thus a larger number of immigrants are self-employed and running businesses in comparison to their native counterparts (Farlie et al, 2015). One of the key aspects of understanding the reason why immigrant populations act in the manners they do is to explore their background. Different populations rank at different levels on cultural dimensions. In a study related to the banking industry, two dimensions of interest were group versus self-interest and uncertain futures (Nguyen et al, 2018). In times of high competition, bank performance is positively related to uncertainty avoidance and negatively related to individualism. The relationship between the actions of the CEO and the performance of the firm indicate implications from the CEO's background and culture. Some cultures are highly risk-averse, whereas others are not. In times of movement and instability, CEOs from second and third generation backgrounds are likely to be better and more effective leaders, however, in times of stability, CEOs who are fourth generation or greater tend to be better leaders. As generations stride from

the initial migrated group, cultural impacts on the groups dissipate. Knowledge of how groups react in high-pressure environments is an indicator of their ability to control situations and not come out of it with a loss. Understanding what cultures deem important and how that can translate in their entrepreneurial ventures and in business settings is key in predicting the future of a company led by certain individuals.

CEO Characteristics

Two of the strongest characteristics shared by CEOs are work ethic and integrity (Kaplan et al, 2008). This indicates when an individual is considered for the position as CEO, they are viewed as individuals who have strong integrity and are hard workers. Behaviors desired in CEO candidates include decision making, engagement, adaptability, and reliability (Botelho et al, 2017). Decision making is a key in the role as a CEO; having to make judgment calls under time constraints and continue with the decision, even if it is the incorrect one, leads to higher overall performance. This relates to the concept of risk-taking and how certain populations may be more risk-averse than others. As stated in the section above, second and third generation CEOs tend to do better in times of instability, displaying tendencies to make decisions under high pressure and following through to mitigate loss. Engagement is directly related to the favorability of the CEO and how others view their decisions. This is crucial in gaining support and respect from stockholders. Ease of adaptability in short- and long-term plans allow for more flexibility and profits for the company. The more adaptable the CEO and company, the longer it will stay in business as it is not resisting changes occurring in the market or industry. Lastly, reliability is one of the most important factors. Focused on delivering results in a steady stream, CEOs who are dependable do better as they are supported by stockholders and employees in the company for following through with commitments made. Not all the behaviors are required of a CEO, as changes may be necessary depending on the industry, however, the opportunity for growth and prosperity grows exponentially as more behaviors are present (Botelho et al, 2017). The prominent characteristics and behaviors of CEOs mirror the active components of the immigrant entrepreneur identity and background.

Firm Capital Structure

Capital structure, the way firms finance their operations and debts using different funds, affects the bottom line of the business (Brigham et al, 2017). There are different theories as to which method of structuring a firm is best. The pecking order theory is based on the idea of there being three main ways to fund a firm: debt retained earnings, and equity, each with differing levels of risk depending on the point of view (investor versus firm) (Frank et al, 2003). This is due to adverse selection, knowledge of information that another party is unaware of (Brigham et al, 2017). This theory is used to predict the profitability of a firm based on the leverage. Companies with less leverage, less debt in comparison to assets, are said to be more profitable as they have less to pay off decreasing their liability and increasing their assets and equity (Frank et al, 2003). This theory is used to understand the thought process of management and their reactions to fluctuations in the environment.

Research and Development

Investments in research and development (R&D) are instrumental in the progress of a company. R&D is important in all industries; however, its impacts are seen at a greater height in technological fields. Immigrants are over-represented in organizations like the National Academy for Science and Engineering and among founders of biotechnology companies approaching initial public offerings (IPO) (Hunt et al, 2010). A method of measuring innovation and change is through patents. For example, immigrant college students are twice as likely to contribute to patenting ideas than their native counterparts. However, when comparing student groups in the sciences, immigrant students are shy of matching native-born students in patent releases. Overall, the patents created by immigrant populations help the economy of the host country, the United States in this case, by creating their innovative idea and keeping profits within the country (Hunt et al, 2010).

Investments in R&D reflect the CEOs willingness to take risk in situations where there is a lack of incentive system. Risk aversion is a personal and cultural trait which influences how individuals react when faced with uncertainty. Someone who is less likely to take risks is highly risk averse, whereas someone who is willing to take risks ranks low on risk aversion (Abdel-Khalik, 2014). R&D is a large financial commitment. The National Science Foundation (NSF) published in 2018 a statistic that showed that $375 billion dollars were spent on R&D in the business sector (NSF 18-312). When large sums of money are to be invested, the process must be thought out and the decision weighed. If the R&D is unsuccessful a large loss is taken by the company and the image of the CEO, but if the step is not taken there is a chance of losing a competitive edge in the industry, especially in a high growth sector such as technology or healthcare.

3 DATA AND METHODOLOGY

This research used data from the S&P 500 index starting in 2010 to 2018 to gather CEO names. Once a list of CEOs was gathered, each individual name was researched on the internet to find information regarding the CEOs background and family history. Within this sample, immigrant CEOs and native-born CEOs were determined and categorized appropriately. Female CEOs were not included in this study to mitigate a variability factor. The number of female CEOs was no significant enough to have a large

impact on the findings of this research. Once the information regarding CEO background was completed, the data was matched with financial figures from CompuStat, using Wharton Data Services.

The main variables of interest pulled from the data were R&D, leverage, and option volatility. These variables were then put with other controlled variables to see the impact on immigrant status. R&D is used to represent investment in research as a way to expand and further the company. Leverage, or debt-to-equity, is a risk measure because it relates to the amplitude of the decisions made by the firm. Lastly, option volatility is used because it utilizes the option pricing model and is a direct measure of risk.

To analyze the data, three variations of the Ordinary Least Squares (OLS) Model were run per each risk variable. This was done to view the impact of control variables and fixed effects on the dependent variable (risk measure).

1. Risk Variable= Immigrant Status
2. Risk Variable=Immigrant Status + Control Variables
3. Risk Variable=Immigrant Status+ Control Variable+ Fixed Effects

4 RESULTS

CEOs from immigrant backgrounds show a general aversity to risk taking. When looking at R&D alone, without any fixed effects in place, R&D has a positive association with immigrant CEOs, however, when controlled for industry fixed effects, the relationship flips resulting in a negative association. This means immigrant CEOs are not associated with high levels of R&D spending and investments when compared to their native counterparts. In the case of leverage, or the debt-to equity ratio, without controlling variables in place, immigrant CEOs are associated with lower levels of leverage, indicating lower risk. Once control and fixed effects are placed, the significance of the results diminish. Similarly, when analyzing options volatility, immigrant CEOs are not associated with volatile earnings of their stock, instead, having a smoother trend in earnings and prices. The options volatility variable also plays as a proxy for growth in the study, indicating firms with immigrant CEOs will have less growth compared to their native counterparts. However, once the control and fixed effect variables are included in the analysis the significance dissipates. Overall, the results of this study indicate immigrant CEOs are less likely to take risks compared to their native-born counterparts.

5 CONCLUSION

Entrepreneurship, at its root, focuses on sustainability of a company through its financials. Small businesses show trends in which immigrant owners take more risks comparability than native-born business owners. However, these trends do not follow through into large companies, where immigrant CEOs take less risk. Conclusions can then be drawn showing a relationship between risk tolerance and impact of those risks. For CEOs of larger companies, there is more to gain, but also more to lose. So, more steps are taken to get to a final decision, vetting out the other possibilities, minimizing the losses. For immigrants, the research shows there are less investments in risker aspects of business, like R&D, and they carry smaller debt-to-equity ratios.

The classification of R&D may have an impact on the findings, as reporting regulations change frequently on what amounts can be expensed or capitalized and the regulations related to outsourcing R&D. The level of debt-to-equity a firm has can impact on the firm's stability and how much buying power the company has. However, there are different ways to finance besides using exclusively debt, such as equity financing. As the risk becomes greater for immigrant CEOs, research shows there is more consideration that goes into handling risky situations, thus decreasing the risk tolerance of immigrant CEOs compared to their native-born counterparts.

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Taking the Plunge:
A Case Study of Private Investments and Decision-Making

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ABSTRACT
Trust is an important part of doing business. The ability to trust someone to manage investment capital is not taken lightly. One of the advantages in publicly traded markets is the avoidance of liquidity risk. The capital markets continue to attract fresh capital as investors can liquidate quickly, however, private businesses can offer competitive returns, if not greater ones but often times require a locking up period much like a certificate of deposit. This paper suggests that investors aren't as concerned with liquidity risk since classic decision-making suggests that new investors are risk aggressive when losing as they hope for their principle to return. On the other hand, investors will forgo the liquidity risk if the returns are promising. Using this theory, an investment advisor decided to explore the results of investing in three privately held businesses based on trust.

Keywords
Trust, decision making, private investments

1 INTRODUCTION

The current pandemic has investors and workers concerned. With elevated volatility, decision-making is more difficult and losses can be easily realized. The ability to have a conviction bias on the overall capital markets along with double-digit unemployment rates has many avoiding public markets altogether and others adding more. As more and more jobs hang in the balance, people are skeptical on investing in the capital markets but admit that risk-free returns are not keeping up with inflation. An alternative to doing so involves investing in private markets. The private markets typically yield more attractive gains with some floor for protection of investor funds. However, these investment vehicles typically lack information and many times transparency but the returns are meant to compensate for this (Giuzio et al, 2018). Another concern is the liquidity risk as most private firms seek to make use of capital for longer periods of time and thus, investors cannot easily access their funds once deployed. Furthermore, in many countries, the lack of a regulatory agency makes it difficult for investors in private deals to recoup any losses (Yap, 2016). Here in the US, investors have the luxury of an infrastructure that can handle investigations and possible recovery.

In this paper, three private deals are explored and the factors behind the decision-making to invest in each one. The outcomes are not always fruitful but lessons can be learned and risks can be accepted.

2 BACKGROUND

Private deals can still be done with a handshake and some paperwork for record keeping however, the trust factor is paramount in order for a deal to move forward. In hard money lending, the risks are reduced through having the borrower put up a significant portion of the asset backed funds (Lambie-Hanson et al, 2015). For example, a developer may ask for funds at a significantly higher rate but is instructed that 20-30% of the project be funded by the developer or externally. If the venture fails, the lenders will have recourse to the asset(s) involved and might choose to use them or resell them. However, in many cases, hard money lenders and venture capital firms are funded by accredited investors who can afford to take on the higher risks. Those who are not accredited have recently been able to fund private ventures and projects through the use of crowd sourcing. Furthermore, investors receive lower frequency of new information and need to understand and accept the higher risk associated with these types of investments (Iturbe-Ormaetxe, et al, 2019). Unfortunately, these investors lack the experience and in many cases, lack the ability to withstand significant losses, which is an obstacle to investing in these private markets.

Expected Value

To make the decision to enter in a private deal, expected value can be cautiously used (Boncompte, 2018). The lack of information transparency makes it a challenge to invest in private debt with a borrower. Furthermore, in such deals, the expected value is almost always negative as the capital is being completely exposed. In the above example, the expected value may seem negative for the hard money lenders, but there is legal recourse for action within the US. Since many of the deals are asset backed, the

lender has access to the asset in the event of default – receiving at a significant discount. The likelihood of default may still be significant, however, the return to the lender in the form of funds returned plus profit or the asset handed overcompensates for the likelihood of losing the funds. Thus, the expected value changes from negative to positive. This is difficult to figure out in new ventures that do not have hard assets that are being used as collateral.

Information & Illusion of Control

Confidence in decision-making is attributed to the amount of accurate information one reviews. In trading or investing in the capital markets, questions of "did I invest at the right time" or "should I have invested more" tend to rise. On the other hand, due to the infrequency of private deals, investors do not have the luxury of timing as seen in the public markets. When losing in a publicly traded security or commodity, one can employ "dollar cost averaging" to add to their position at a lower price thereby reducing their break-even price. The logic behind this somewhat irrational behavior is to attempt to avoid any losses. The illusion of controlling the outcome of a heavily traded security or commodity surfaces as many do not wish to admit a loss (Stephens & Ohtsuka, 2014).

In the private markets, investors rarely add more to their losing positions as this is attributed to the manager of the investment; someone who is external to them. In this case, the ability to control the situation by exiting is almost impossible. The confidence in the decision to invest here is not as high as in the public markets. This is due to the lack of information available. While some private firms do get independently audited or verified results to investors, this is not mandatory and thus limits an investor's access to information. Thus, the confidence level of investors in a new project is shaky at best as there is not enough information and the two are highly correlated (Lei et al, 2020).

Trust

When dealing with someone new, most investors rely on the information from those whom they value for input. These people can provide investors with experiences, ratings, and sometimes, results. The trust that they place in their information sources is critical in private deals as the ability to locate accurate information on someone is often times difficult (Taghavi et al, 2020).

While gathering information from other trustworthy sources is important, this is only the first part. The biggest hurdle is whether or not to trust the borrower for the new project and invest in the new venture. Most successful investors return to the same person/firm for new investments as the risk factor is lowered by the positive experience. Of course, past performance is no indication of future earnings however; a relationship has now been established. Relationships matter in decision-making as the added piece of information of being successful is another data point. In unsuccessful ventures, cutting one's losses and moving on saves time and stress on dwelling on losses. Although, many will want to try and recoup their losses by devoting more resources (Kahnemann & Tversky, 1979**),** the rational answer is to move on to greener pastures.

3 PROJECTS AND OUTCOMES

In order to gauge investor behavior in private deals, a fiduciary was asked to interview clients that were involved in 3 deals. The first one involved equity, the second one involved debt, and the third involved a combination of debt and equity. The clients were asked about their decision to enter the investment and the reasons, would they reinvest with the same person, and why or why not?

Car rentals

In this new venture, an app was already established for renting personal cars. A group of investors were approached by two entrepreneurs to invest in purchasing vehicles to be rented out. The group of investors was to be a part of the equity side with precautions. Asset backed ventures are typically less risky since they are backed by collateral (Afshar, 2013). The point person had discussed all the terms in profit sharing, how to protect the capital invested, and how to liquidate investor capital. A total of 30 investors participated at a minimum investment of $10,000 each up to $25,000 for approximately $350,000.

There were three options in profit sharing. For the highest level of investment, an investor would receive 50% of their share of the profits. For the lowest level, an investor would receive 25% of the profits, and anyone in between who had invested in increments of $5000 above the minimum would receive 40% of the profits. The lock up period was for 1 year. The information that investors had on the two entrepreneurs was based on ratings of others whom had done business with them, an attorney that had represented one of the entrepreneurs, and the viability of the business plan. Based on the findings, the decision to invest in this venture was made.

About 4 months after the funds were invested; one of the entrepreneurs was indicted for a felony crime associated with fraud. The entrepreneurs did not disclose this and one of the investors discovered this and brought to the attention of the other investors. Immediately, the other entrepreneur stepped in to reassure investors that he was in charge of the venture and that the other entrepreneur was only in charge of compliance issues. Still, 2 investors asked to be liquidated after the one year lock-up had

elapsed. The indicted entrepreneur was convicted of the felony and was incarcerated for 6 months at which his partner abandoned any association with the venture and the now convicted felon. The investors were reassured by the convicted felon that their funds would be returned after the vehicles were liquidated. Needless to say, the assets were never liquidated and if they were, investor capital was not returned.

To illustrate the irrational behavior of investors, many asked to speak with both entrepreneurs to demand their funds be returned. Unfortunately, promises were made and 3 years later, only 15% of the funds have been returned. However, of the 30 investors that have lost their funds, 15 continue to reach out in hopes of having their funds returned. When asked, their responses are consistent with common behavior of loss aversion in that they continue to spend more resources to break even (Lindsay, 2019). In fact, these same 15 were ready to deploy more resources in hopes of a better outcome even though there has been infrequent information offered. When asking the other 15 investors why they haven't pursued other avenues, their responses were consistent with taking a guaranteed loss and moving on. In fact, of these 15 investors, 10 mentioned that there is no greater loss and if the other 15 want to pursue getting the funds returned, then they won't impede their efforts. Only 1 person from each group wanted to warn the public and press charges for fraud.

Real Estate Debt

This next investment involved providing funds to a developer of real estate that was looking for investors to be paid 15% in simple interest on a loan for a home to be rehabilitated and sold. The amount of funds required was $100,000 and the lock-up period was for one year at which either the capital was returned or the title would be handed over to the fiduciary that represented the investors. The information that was readily available included a home that was valued at twice the loan in its current state, a contact who had and continues to successfully do business with the developer, an asset that was local and could be checked on at random times, and a developer who had disclosed to us that he was a convicted felon and had served time for an unrelated crime.

The fiduciary reached out to 10 investors, of which 7 participated. In asking the 3 that chose not to participate, there concerns were the same in that they were concerned with the developer's felony record. The 7 that did were asked their reasons for proceeding. To begin, all 7 were confident that since a fiduciary was involved and a direct contact had had success in the past, their funds were relatively safe. 4 of them felt that since the title was held at a lawyer's office and the mortgage registered with the county clerk's office, the risks were reduced. 5 of them felt that since this was a property that couldn't be moved, it made it "real". 6 of them invested since the project and the parties involved were local to them.

The results of this deal were successful. Among the terms of the contract, investors would receive a minimum of 6 months worth of simple interest and the project was completed in 5 months at which funds were returned. Since it was local, the fiduciary was able to walk on the property and enter the house in order to keep investors updated with the progress of the project. After this project was finished, 4 of the investors returned for a second successful project.

Commercial Property

The last investment dealt with a mixture of debt and equity. A developer of commercial real estate would offer investors 5% in simple interest for a period of 2 years, return the investor capital afterwards in full before award the investor equity. The idea behind this is to borrow at a relatively low rate compared to a traditional commercial loan while compensating investors at a decent rate as it is difficult for investors to have a secured backing at 5%.

The information that was available to the fiduciary is that one of his friends had invested a significant amount of his personal funds with this developer. The fiduciary and his friend had known the developer for over 7 years. The developer provided contracts for all investors along with certificates of ownership in the project that was being developed.

Since the developer was offering 1% equity per share having each investor come up with 1% of the "after rehab value" of the property. The developer had set aside $100,000 of the project to be funded by the fiduciary and his friend. The fiduciary asked 2 potential investors for $25,000 each as the remaining $50,000 was already funded.

The friend, was already anchored in the rates offered by banks for CDs and understood the risk was higher in a private deal but the reward was at least double. The other 2 investors were asked and only 1 decided to invest. When asked why he chose to invest, the investor understood the risks, trusted the fiduciary's past experience and the developer's integrity in the past. The other investor felt that the opportunity cost associated with tying capital for 2 years was too long for a low return. So, the fiduciary financed the remaining $25,000.

The result of this project was that within 2 years, the funds were returned and immediately thereafter, the project was sold for 40% more than the estimated value at the time of investment. Each investor was rewarded with their share of the profit. In this case, the return was the highest of the 3 investment vehicles.

From the three investors in this group, all three redeployed their funds with this developer and continue to receive 5% plus an equity stake in the next project.

4 DISCUSSION

In order for one to have confidence in a decision to invest in a private venture, there were a number of factors that led to trust. Of the 40 investors interviewed (some were in multiple deals), the consistent factor for investing was based on someone within the group knowing someone who had experience with the project developer or entrepreneur and had successfully invested in that project before. In trusting someone with investment capital, the factors that led up to trust included an established relationship, a vetting process, a track record, and most importantly, someone close who has done well in the past.

For the failed the venture, the vetting process was performed and the entrepreneurs had a track record based on their accountants and attorneys verifications. However, trust hadn't been established with any of the investors. No one had entered any venture with the two entrepreneurs directly. Nor, did any of the 30 investors have direct contact with either of the two entrepreneurs prior to this venture. The decision to invest was made strictly on others vouching for them.

Learning from the mistakes of the first project, the 2nd project was less risky. The developer was vetted, had a positive track record, and someone close to the investors had successfully done business with him. In this case, the trust in the individual investor who had successfully invested in the past was critical as the risk to someone whom the investors trusted was greater than the risk to the new investors. The loss of goodwill and reputation would be detrimental to the existing investor as his integrity would have been questioned with the new group of investors, all of whom knew him well. Other factors also contributed to this success mainly the fact that this project was done locally and having someone be physically present providing updates also contributed towards the trust factor and an increase in confidence in the decision to continue investing with this developer.

The final investment opportunity was the least risky of the three. The fiduciary and the developer had known each other for a considerable amount of time. Furthermore, the fiduciary's friend had invested a significant amount of funds in the past with the developer. Although the investments are not local to the fiduciary, the established track record of successful projects and relationship along with someone's direct verification contributed to the confidence in investing with this developer.

5 LIMITATIONS

This is a preliminary fact finding mission on 3 different investment projects. There are limitations in that the 2 successful projects are in real estate and the unsuccessful one was in a new venture. The findings can not be generalized but do serve as a starting point to look at other investment projects. Another limitation is that since these are private deals, a lack of transparency is always present. Unlike publicly traded securities, these developers do not need to disclose information to investors and thus poses a risk to the investor.

6 CONCLUSIONS

If one is going to participate in private investments, the key is to gather as much information as possible and to find someone who has taken the risk in the past and the result was successful. If the track record is successful, a potential investor should seek to develop a relationship with the entrepreneur or developer. There is much time devoted to doing so but the returns are above average and can get you to a place where the risks are lower than those of the capital markets. If the investment goes awry, an investor needs to accept that there was always a risk present. After all, there was a possibility of a loss all along. Dwelling on the past is not constructive but learning from it is.

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The More, The Better? – The Many Effects of Product Variety on Consumers´ Buying Behavior

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ABSTRACT
It may appear reasonable that more product choice is better. Reasons may be related to a welcome change for sophisticated consumers, limitless choice, optimal fulfillment of needs and related positive emotions like joy and happiness. One would expect a positive correlation between product variety and purchase probability. But the idea about the advantageousness of high product variety must be questioned, as several studies show. Using the phrase "customer confusion", the downside of a high product variety is discussed in this paper. Using a survey, this paper investigates the relationship between the level of product variety and consumer perception. The paper finds an increase in indecisiveness and overstraining on the customer with increasing product range and this behavior patterns was observed to apply to convenience, shopping as well as luxury goods. The paper equally finds that luxury goods seem to behave differently from convenience and shopping goods. The investigation further indicates a different situation in the online and offline purchase of products. Since a broad product variety is *en vogue,* the findings of this study should help company´s portfolio manager reconsider existing product portfolios regarding the size.

Keywords
Product assortment, range of goods, purchasing, customer behavior

1 INTRODUCTION

There is a striking trend for companies to expand the range of product offered. While the variety of products has almost doubled since 2015 (Berger, 2012, p.5), the companies with a greater variety of products are often among the less successful companies (Coenenberg et al., 1995, p. 1242). Therefore, it is worthwhile to deal with the downside of a broad product range.

A significant number of studies emphasize the importance of product variety, presenting its impact on a company´s profitability. Due to the heterogeneity of consumer tastes, one would expect satisfied customers and a substantial impact on revenues (Heitmann et al., 2007, p. 112). Iyengar and Lepper (2000, p. 1003) were surprised to learn the negative effects of a high number of product variants and raise the question: "How can there be so much dissatisfaction in the face of so much opportunity?".

A comparatively low number of research deal with the downside of product variety, e.g. customer confusion and related delays or refusal to buy. Costumer confusion can have a negative effect on consumer´s decision making. In using the phrase "a plethora of choice" (Walsh et al., 2007, p. 697), it becomes clear that the high product variety is something exceptional and important for consumers and providers.

Compared to traditional shopping, online shoppers are variety seekers (Donthu et al., 1999), which results in frequent product changes. The variety of products that is available online is in no way comparable to that in the offline world (Gupta, 2015, p. 7) and it is expected that people tend to move where they find more product variants.

This paper aims to analyze the relationship between product variety and product purchase behavior. An important research objective is also to identify possible different consumer expectations regarding product variety for the different product categories, namely for convenience, shopping, and luxury goods. Kahn et al. (1986) examined the variety-seeking behavior (this can be understood as a reduction in the repeat purchase probability) and found out that the need for variety is big for fast moving consumer goods.

In addition, this research activities aim to highlight and explain possible differences in expectations regarding an offline- and online product range.

2 LITERATURE REVIEW

Leek and Chansawatkit (2006) and Mitchell and Papavassiliou (1999) discuss customer confusion caused by high product variety as causative for adverse consumer behavior such as delays and refusal to buy. The consumer dissatisfaction, reduced repeated sales, weakened customer loyalty, and damaged brand image resulting from customer confusion can cause great damage to the

supplying company (Mitchell et al., 1999, p, 320). The question to be asked here is how one can expose consumers to a wide variety of products without this leading to information overload. The scientific works of Mitchell, Walsh and Yamin (2005), Schweizer, Kotouc and Wagner (2006), Walsh, Hennig-Thurau and Mitchell (2007) describe customer confusion as an emotional state that makes it difficult for consumers to select and grasp alternatives. Customer confusion can be interpreted as a function of the degree of involvement. Therefore, customer confusion is less likely to occur in the case of a low involvement purchase (Mitchell et al., 2005, p. 147). It is assumed that variety seeking is more probable with low-involvement products, i.e. products in which the consumer is less interested (Hoyer et al., 1984*)*. For example, consumers try to eliminate the state of confusion by postponing the decision to buy. It seems that customer confusion is not corresponding to each level of product variety. Some authors (Desmeules 2002; Dhar, Hoch, and Kumar 2001, Shah and Wolford 2007) assume an inverted U-shaped relation between product variety and purchase probability, where people reward small and medium assortments with purchases and punish large assortments with rejection. They show a positive effect of small product ranges and a negative effect for larger product ranges. Shah and Wolford (2007) tried to investigate purchase decisions in a more parametric fashion. This means that not only a small and a large selection of products was available, but also something in between. The results show that more is not always better. The authors justify this with the fact that products increasingly resemble each other with large product choice, leading to difficult decision making. In his research Desmeules (2002) asserts that the positiveness of the consumption experience decreases with increasing product variety, which is due to stress, frustration, and disengagement from the process. Walsh, Hennig-Thurau and Mitchell (2007) differentiate between different types of confusion and cites the negative word-of-mouth associated with customer confusion.

3 DATA DESCRIPTION AND RESEARCH METHODOOGY

To help answer the research questions, a questionnaire was designed, containing questions on the perception of the shown products. A five-point Likert scale was used. The respondents were confronted with different levels of product variety regarding convenience, shopping, and luxury goods. Starting with casual t-shirts of the category shopping goods, the interviewees saw a picture of 4 casual t-shirts (small product variety) and afterwards 18 different casual t-shirts (broader product variety). Questions that were asked included "I find it difficult to make a clear choice", "I find it pleasant to choose a T-shirt from the product line", "I would buy one of these shirts", "I would recommend this line of products to a good friend who asks me for advice", "I can choose one of these t-shirts very quickly", "My purchase decision would be the same, regardless of whether I was shown the offer in the online shop or in the shop on the shopping street". Participants were asked to rate on a scale of "fully applies,", "largely applies," "partially applies," "does rather not apply" and "does not apply at all. This type of questioning was repeated for the products coffee (convenience good) and watch (luxury good). The questions were the same but compared to before the respondents were shown 4 or later 9 different types of coffees and 4 or later 30 different watches.

An online panel, consisting of qualified people that were willing to participate in this survey, was used. All purchasers, except children, were the target group of this survey. Attention checks were included to trap individuals who do not pay full attention as they take the survey. The data was coded and inserted into the statistical tool SPSS.

The research started out with the following **hypotheses**:
Hypothesis 1: The higher the level of product variety offered, the lower the shopping pleasure for the customer.
Hypothesis 2: The higher the level of product variety offered, the lower the customer´s purchase probability.
Hypothesis 3: The customer perception of product variety is the same in the online and offline world.
Hypothesis 4: The perceived product variety is independent of the product category, therefore regardless of whether shopping, luxury or convenience goods are concerned.

The Sample

The study is based on a qualified convenience sample of male and female consumers of different ages. A total of 80 people agreed to fill out the online questionnaire. Children were excluded from the survey, otherwise anyone who participates in shopping life could take part in the study. The average processing time of the questionnaire survey was 12 minutes. Respondents of the female sex, participants in the 21-30 age bracket and people with a monthly net income between 1 and 999 Euro were over-represented.

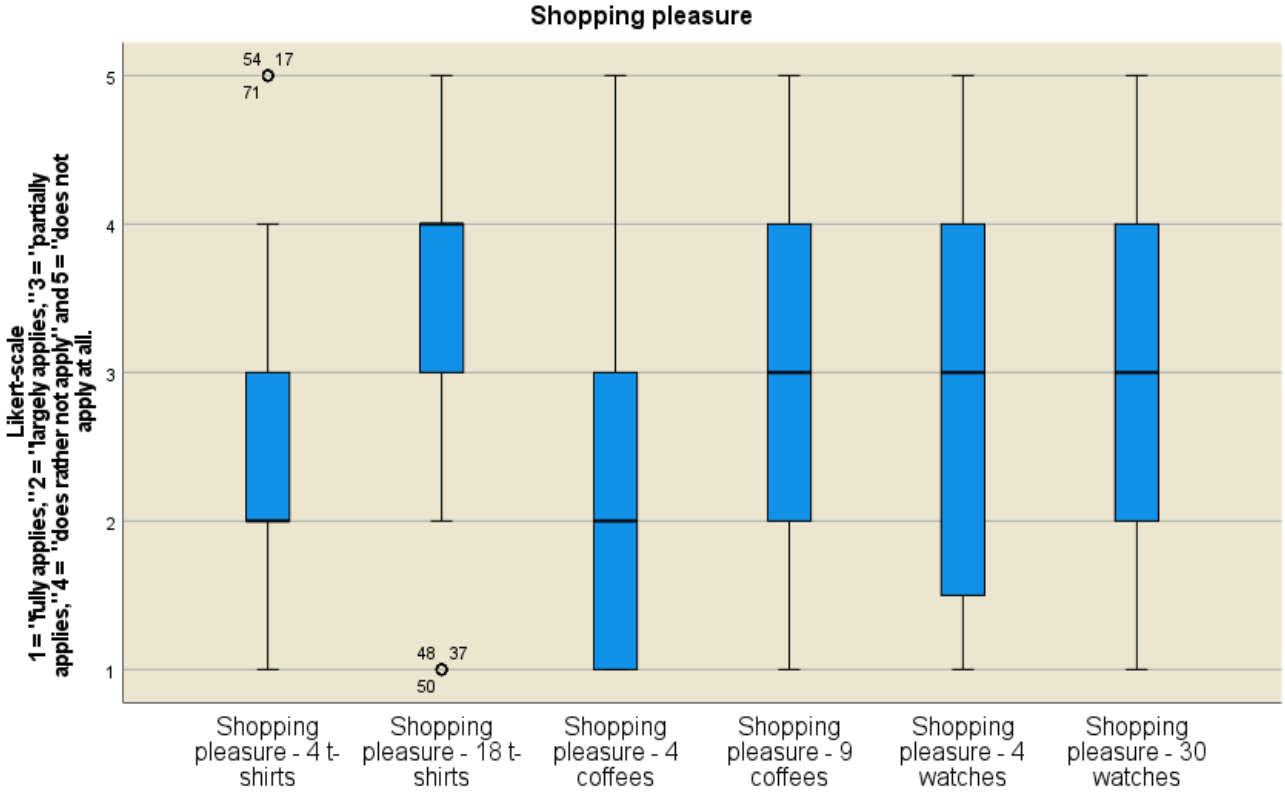
4 DISCUSSION OF EMPIRICAL ANALYSIS RESULTS

Since different questions with the same scaling (Likert scale) should be visualized graphically in a diagram, the Boxplot in SPSS is used. This is well-suited to get a feeling of the data and shows the questions on the x-axis and the scaling 1 = "fully applies", 2 = "largely applies," 3 = "partially applies," 4 = "does rather not apply" and 5 = "does not apply at all" on the y-axis.

People were asked to refer to the manufacturer's offer shown (4 and 18 casual t-shirts, 4 and 9 coffees, 4 and 30 watches) and had to answer the question "I experience the selection of a T-shirt / coffee / watch from the product line as pleasant." The five points of interest in the boxplot are the minimum, the lower quartile, the median, the upper quartile and the maximum. The

median is shown by the horizontal line in the box. There are also outliers outside the boxes (see the first two boxplots in figure 1). If one places the focus on the third boxplot in figure 1, namely the shopping pleasure with a choice of 4 coffees, the median is 2. As a result, 50% of the values of the distribution are less than or equal to 2 and 50% are greater than or equal to 2.

Figure 1: Boxplot Shopping Pleasure



What becomes clear when looking at the boxplot is that the shopping pleasure obviously decreases with increasing product variety. This is evidently the case with t-shirts and coffee. In the case of watches, i.e. luxury goods, there is not such a clear observation. Therefore, a brief reference is made to the frequencies that are not shown graphically here for reasons of space: Based on the offer with four watches, the respondents experienced the offer as pleasant (25% answered "fully applies", 23.75% answered "largely applies", 18.75% answered "partially applies"). Based on the offer with thirty watches, the answers are distributed as follows: 18.75% answered "fully applies", 28.75% answered "largely applies" and 15% answered "partially applies".

Now the question of customer confusion is of interest. People were asked to refer to the manufacturer's offer shown and had to answer the question "I find it difficult to make a clear choice." As expected, the customer confusion and thus the difficulty of deciding seems to be bigger with a broader variety of products. As figure 2 shows, the median in the first boxplot (customer confusion with 4 t-shirts) is 3, while the median in the second boxplot (customer confusion with 18 t-shirts) is 2. The same picture emerges in all boxplots: For the offer with less variety, the values are placed higher on the y-axis (and remember 5 = "does not apply at all").

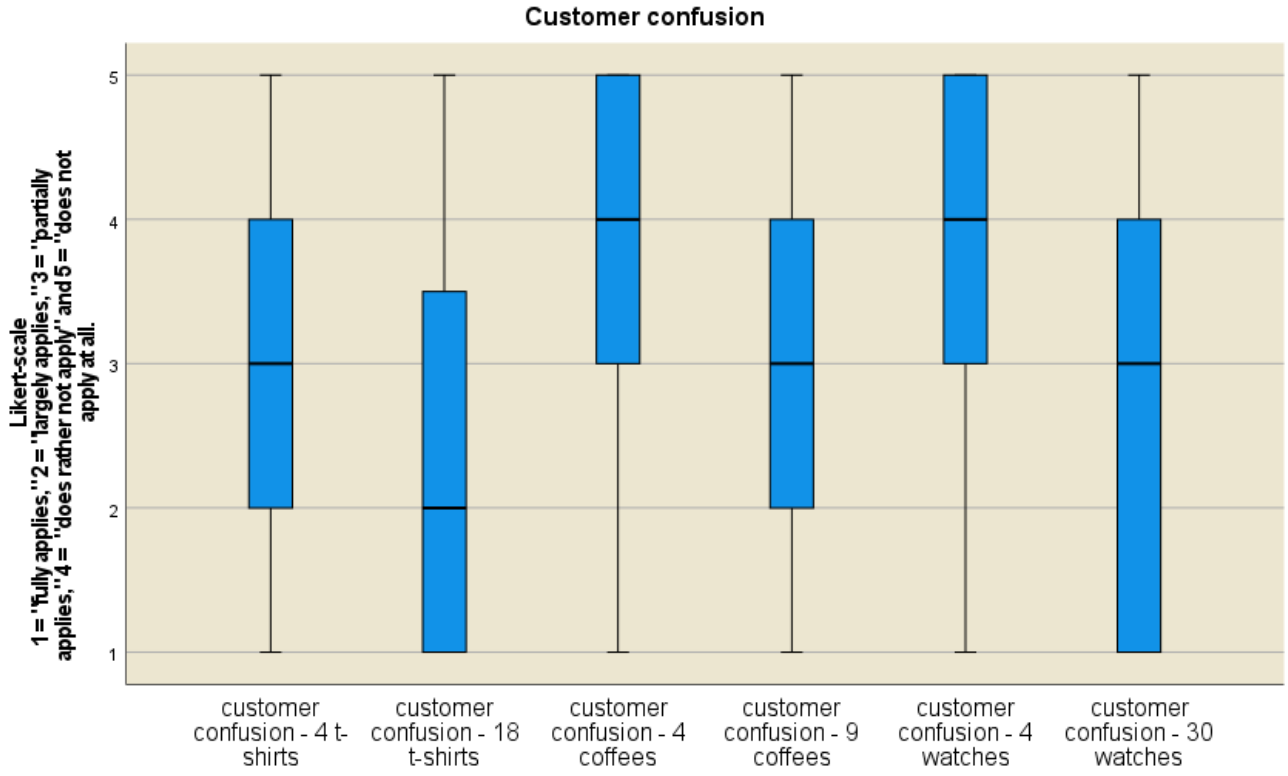


Figure 2: Boxplot Customer Confusion

What is still outstanding is the analysis of the probability of purchase. People were asked to refer to the manufacturer's offer shown and had to answer the question “I would buy one of these products.”

What stands out is that luxury goods, in this case the watches, behave differently. More people would make a purchase decision with the 4 watch offer than with the 30 watch offer (Figure 3). Respondents 4 watches: 12.5% answered “fully applies”, 22.50% answered “largely applies” and 7.50% answered “partially applies”. Respondents 30 watches: 27.5% answered “fully applies”, 26.25% answered “largely applies” and 12.50% answered “partially applies”. Does the statement "the more, the better" apply for the luxury product segment?

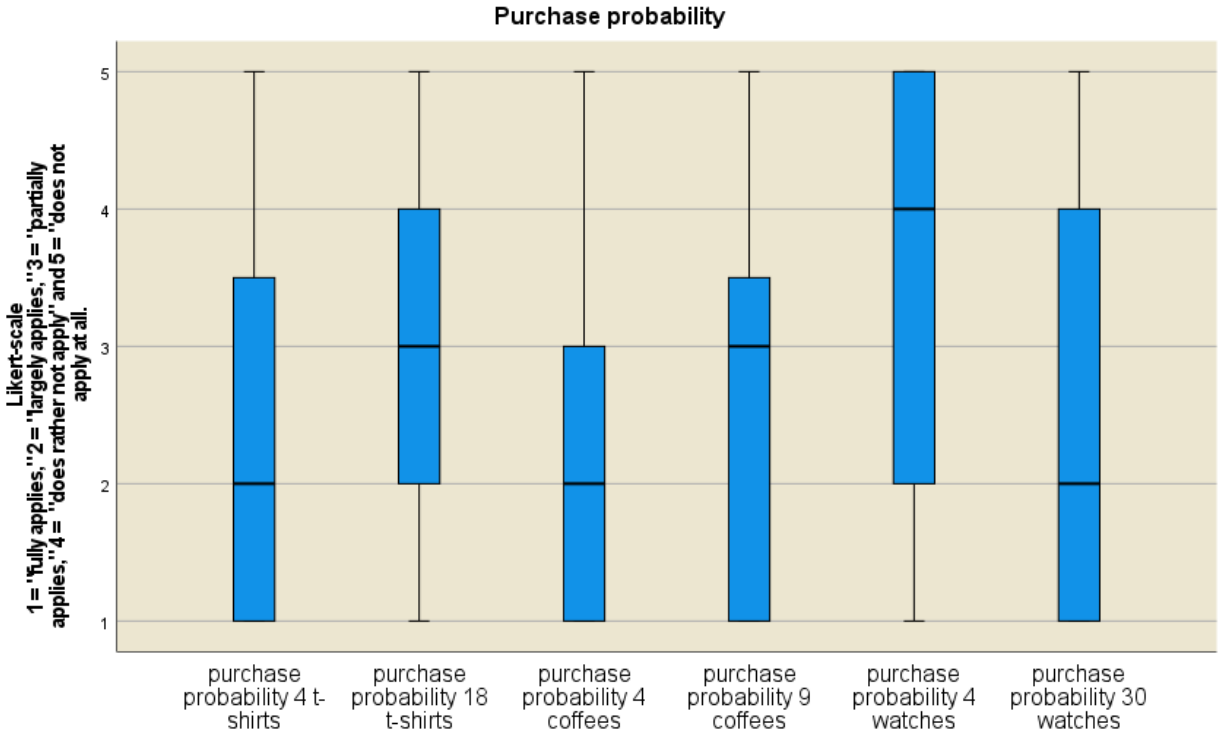


Figure 3: Boxplot Purchase probability

Regarding the online and offline shopping, the respondents had the following sensations. They were asked the question "My purchase decision would be the same, regardless of whether I was shown the offer in the online shop or in the shop on the shopping street."

The Compare means procedure in SPSS was used to get the results as shown in Figure 4. The values tend to move toward "more or less applies" or "partly applies." Customers therefore seem to have different expectations regarding the variety of products when shopping online and offline.

"My purchase decision would be the same, regardless of whether I was shown the offer in the online shop or in the shop on the shopping street."

Mean values

4 casual t-shirts	18 casual t-shirts	4 coffees	9 coffees	4 watches	30 watches
2,65	2,90	2,21	2,64	2,36	2,49

Figure 4: Mean values – online versus offline shopping

5 SUMMARY AND OUTLOOK

The study fulfilled the initial expectations regarding the relationship between product diversity and customer perception as well as buying behavior. A broader variety of products was associated with a lower willingness to buy. This is the case for all product categories examined, except for luxury products. It is necessary to find out the exact reasons for this. The subsequent research uses finer parameters in terms of product variety and considers levels such as "very small product variety", "small product variety", "medium product variety", "large product variety" and "very large product variety". The hypothesis "the higher the customer´s product know-how, the lower the customer confusion" is also to be examined in the next research.

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Improving Care for Neurocognitively Impaired Nursing Home Residents with the Non-Pharmacologic Intervention, Chair Ballet

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Keywords
Non-pharmacologic intervention, chair ballet

1 BACKGROUND

The Centers for Medicare & Medicaid Services (CMS) gave nursing homes the goal of decreasing use of antipsychotic medications for nursing home residents by 45 percent by the end of 2019 (CMS.gov, 2017 (2), 2015 and 2014). About 70 percent of the 1.3 million 65+ Americans living in nursing homes rely on Medicaid to cover the average annual cost of about $70,000 (Face The Facts USA, 2015). A significant component of these costs are the antipsychotics that many nursing homes use to placate neurocognitively impaired residents (includes dementia and Alzheimer's disease) (Reiger, Kuhl and Kupfer, 2013). This practice not only increases expenses but also compromises the quality of care these residents receive and jeopardizes whether a resident can remain in a nursing home (Rau, 2017; Kocot, 2011).

Consequently, many non-profit nursing homes, which only receive support from Medicaid for the five basic activities of daily living (Shimshak, Lenard and Klimberg, 2009), are in a dilemma about how to move from medication-based intervention for their neurocognitively impaired residents.

2 PRIOR NON-PHARMACOLOGIC RESEARCH

Several studies in nursing homes have shown that non-pharmacologic interventions offer an alternative. Sillup, Sullivan and Klimberg (2018, 2015 and 2014) and other studies showed how the non-pharmacologic intervention, TimeSlips™, decreased agitation/anxiety in neurocognitively impaired residents (Millan-Calenti et. al., 2016; Houser and Chinchilli, 2014; George et. al., 2011; Teri, Logsdon and McCurry 2002). Other non-pharmacologic based on music and music-related activities have had encouraging results (Bergland, 2018; Abraha et. al., 2017; Millan-Calenti et. al., 2016; Narme et.al., 2014; McLaren, Ridder et.al., 2013; Lamantia and Callahan, 2013; Sakamoto and Tsutou, 2013; Vink et.al., 2013; Lin et.al., 2011; Svansdottir and Snaedal, 2006).

3 CHAIR BALLET PILOT AT THE ST. IGNATIUS NURSING HOME & REHAB CENTER (STINRC)

One such non-profit nursing home that consistently finds ways to provide quality interventions for their neurocognitively impaired residents is the STINRC, which agreed to implement the non-pharmacologic intervention, chair ballet. Chair ballet, the dynamic collaboration of music and dance, has been successfully implemented in nursing homes for the past decade but assessed for the first time in a study to determine whether it decreased the adverse outcomes associated with neurocognitive impairment and helped to determine the appropriate amount of antipsychotic medications (Robin Goodfellow Web Designs, 2019).

4 STUDY DESIGN/IMPLEMENTATION

Institutional Review Boards (IRB) approvals (STINRC and Saint Joseph's University) were attained for 30 neurocognitively impaired, full-time residents to implement the study protocol of 16 sessions with assessment of agitation and anxiety measured by the Overt Agitation Severity Scale (OASS), which was validated to assess residents with neurocognitive impairment (Sullivan, Sillup and Klimberg, 2014; Kopecky, Kopecky and Yudofsky, 1998). All residents meeting inclusion criteria were study participants; there was no control group. Due to disease-related conditions, five residents did not begin to attend the chair ballet sessions until December and two of the sessions were cancelled due to the COVID-19 pandemic. Each session was approximately 45 minutes long; participants were observed pre- and post- intervention symptoms were measured by the OASS for each participant. Descriptive statistics were applied to summarize the data. Additionally, matched-paired hypothesis testing and multivariate analysis techniques were utilized to measure the effectiveness of chair ballet.

5 RESULTS

Twenty-seven residents (22 females and 5 males) were observed in the sessions in which they participated and scored to measure their behavioral attributes to include Vocalizations/Oral/Facial Movements, Upper Extremity Motion and Lower Extremity Motion. The average pre-score was 2.5 and average post-score was 1.61(average difference was 0.84). Twenty-five had a zero or negative average change (decrease in post score). Matched pair differences showed post score averages significantly lower for vocal/oral/facial movements and upper extremity motion. In a regression model to predict the differences in pre- and post-scores, the only negative influencer was gender; females had lower scores than males by -0.49.

6 DISCUSSION

The favorable OASS results of study participants' responses to chair ballet as a non-pharmacologic intervention are encouraging. They indicate improvement in participants' psychologic well-being as well as physical improvement. The 45-minute chair ballet session is the longest single block of exercise study most participants get during a week. Preliminary assessment of medications indicates appropriate use; no overuse of PRN drugs.

7 CONCLUSIONS/RECOMMENDATIONS

This research indicates that the non-pharmacologic intervention, chair ballet, provides better care and is consistent with the CMS' Partnership to Improve Dementia Care's larger mission of enhancing the use of non-pharmacologic approaches and person-centered dementia care practices (CMS.gov, 2017). We anticipate expanding this study to other non-profit nursing homes with a profile similar to STINRC so we can attempt to replicate the results.

8 ACKNOWLEDGEMENTS

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The Opioid Crisis Isn't Trumped by the COVID-19 Pandemic

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ABSTRACT
The COVID-19 pandemic has certainly made its presence felt in virtually every aspect of our lives but, despite its intrusion, it hasn't diminished the opioid crisis in the U.S. – about a billion opioids have saturated the market over the last nine years (Rich, Higham and Horwitz, 2020; CDC, 2020). While media coverage about COVID is taking center stage, the required confinement is actually increasing the intensity of the opioid crisis (Silva and Kelly, 2020). The vast majority of research continues to vilify the pharmaceutical industry, deservedly so for some companies, such as Ensys, Cephalon and Purdue Pharma, maker of the drug everyone knows by name, OxyContin® (oxycodone hydrochloride). However, a longitudinal review of the FDA and its involvement with the opioid crisis had not been assessed previously. Using a proprietary, long-term database constructed by one of the authors, FDA approvals for opioid products were tracked by monitoring *FDA: FDA-Approved Drugs* and the bulleted segment entitled *Original NDA and Original BLA Approvals by Month* since August 2006 (FDA, 2006). These opioid and opioid-related medications (e.g., buprenorphine) will be combined with evaluations of FDA's 160 pronouncements /policies about opioids over the same time period to assess the FDA's behavior when dealing with opioids. Using a normative ethics approach, evaluation of what the FDA did with regard to their approval of opioids and issuance of opioid-related policies was conducted using a causal web (Russo, 2011; Porta, 2016). Results indicated that the FDA generally acted in a manner consistent with their obligation to protect the interests of individual patients as measured by their approval of at least 60 opioids over the study period (2 new molecular entities (Category 1); 41 new dosage forms and/or new combinations (Category 3, 4, and 3 and 4); 9 new manufactures (Category 5); and 8 previously marketed before an approved NDA (Category 7). Furthermore, assessment using a utilitarian approach indicated that FDA's policies/decisions did not always yield greater public welfare or protect the rights of the most critical stakeholders, the patients. Over 40 percent (40.6%; 65 of 166) of FDA's opioid-related policies were negative or neutral instead of being assessed as positive or ensuring safe and effective treatments (FDA, 2006-present). These results suggest that FDA gives greater consideration to the opioid crisis and adopts a more careful approach to the approvals of opioids and the policies it issues about them.

Keywords
Opioids, COVID, FDA

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Media Coverage of Ethical Issues Affecting the Pharmaceutical Industry - Opioids Dominate Coverage for a Second Consecutive Year

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Keywords
Pharmaceutical industry, healthcare reform, newspaper coverage

ABSTRACT
For the sixteenth consecutive year, we assessed media coverage of ethical issues affecting the pharmaceutical industry; this year its increase was driven by the opioid crisis. Following our standardized review method, audits of the top five U.S. newspapers as defined by circulation, *USA Today, Wall Street Journal, New York Times, Los Angeles Times,* and *Washington Post,* were conducted and identified "hot button" issues attracting media attention during 2018 (Oct 2018 – Sep 2019) and reported the pharmaceutical companies and their products most often cited. Results indicate a cumulative increase in coverage by all newspapers from 2018 (132 to 162) and four of the five newspapers (*USA Today* decreased). That coverage was driven by the top two issues, the opioid crisis (52 of 162) and high drug prices (27), and largely negative – over half (53.1%) were negative while 28.4 percent were neutral and only 17.9 percent were favorable about the pharmaceutical industry. Forty-one pharmaceutical companies and/or their products were mentioned 183 times with 31 of those mentions about Purdue Pharma, the marketer of OxyContin® and a primary drug linked to the opioid crisis. Newspaper findings were also compared to other proxies of media (NBC Nightly News, NPR-All Things Considered, Google Trends) and corroborated by that comparison. Recognizing the media's focus on healthcare reform, analyses were also conducted about how issues related to healthcare reform were reported by the press. Results indicated that coverage about the pharmaceutical industry was virtually the same for all newspapers compared to last year (55 in 2018 and 56 in 2019) and four of the five newspapers except the *New York Times,* which increased 53.9 percent. This year's coverage was negative or neutral (92.4%) with only 7.5 percent of the articles positive. Short-term, the opioid crisis has negative implications for the pharmaceutical but the burgeoning COVID-19 pandemic is offering an opportunity to make tangible contributions and regain some public favor while healthcare reform will gain more attention as part of the run-up to the 2020 presidential election.

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A Classroom Project for Teaching Large-scale Decision Optimization

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ABSTRACT
This paper describes a group project which can be used in a number of management science and decision sciences courses at both advanced undergraduate and graduate levels. This project consists of two tasks: the "Wheat Problem" and the "Cow Problem." This project provides students with the opportunity to solve a complex but manageable problem in resource management using quantitative modeling techniques with real-world applications. The two tasks allow students to explore modeling assumptions of quasi-realistic problems and to layer additional levels of reality in an existing model. Students are required to make decisions related to project scope, model development, parameter selection, and quantitative computer modeling/coding. Additionally, students will face "softer" problems such as dealing with trial and error approaches to model development/testing and potential group conflicts arising from such efforts. While complex, the tasks are sufficiently approachable that groups of MBA students are generally able to succeed at obtaining solutions with minimal professorial intervention. This project has been successfully deployed in over 15 MBA-level Management Science course sections at Monmouth University.

Keywords
Management science, case study, decision sciences, business education, educational methodology, instructional design

1 OVERVIEW

The problem is not original to the lead author of this paper. He found out about it while either a student or a professor at Columbia University more than 40 years ago, and used it for graduate courses that he taught there. To the best of his memory, the problem (with possibly different coefficients) was attributed to Philip Wolfe, although the trail is now cold and there is no way easy way to verify this.

Part of the key to student success in solving this problem is a companion warmup problem which we call the "Wheat Problem." We devised this problem as a very simple analog to the full "Cow Problem." It is very easy to explain and provides a framework to systematically explore multi-period problems in general. As the students grapple with the more difficult problem, they have the methodology of the simple problem available for reference and reorientation if they become lost or confused.

We next describe an outline for the use of this project in the classroom. In one class, the Wheat Problem is explained and solved using Excel Solver for one, two and three periods. The steps that are required are explicitly listed. The homework for the next class requires each student individually to solve the Wheat Problem for four, five, and six periods. The students are given time at the end of this first class to begin the homework while the professor is available for any consultation that the students require. Most students are able to complete this homework successfully at the end of the class in 15-30 minutes. In the following class, the professor goes over the homework and explains the modeling methodology and results. Then, students are placed in groups of three students whose goal it is to solve the "cow problem" over a period of about 3 weeks. They are immediately given time in class to meet as groups and begin their solution of the problem, and to plan how the group will schedule necessary interactions and independent work to complete the solution. In subsequent classes, the students are given time to work in groups, but groups are expected to spend substantial time outside of class on it as well.

The groups are encouraged to interact with the professor (either within or outside of class) only after they have given the problem substantial thought and become "stuck." Before we give any help, we ask questions to see where they are and what effort that they have made to date, and then try to get them "unstuck" with the least amount of help. The students are encouraged to email for necessary help. We try to respond as quickly as possible, often talking with a group on the phone. After the groups have made significant progress, we let the groups know the best possible value of the objective function to four figures (initially we do not require integer constraints) so that they can get immediate closure if their solution is correct.

At the end of the three-week period all groups have solved the basic problem. In the next step each group is tasked to creatively expand the problem in a unique way for their group. Examples that students have chosen in the past include: the effects of foreign trade, adding another set of animals, effects of future problems such as drought or disease, the effect of being able to "store" meat with a freezer, etc.

The project is concluded with in-class oral reports by each group giving their findings for their creative expansion of the problem. The grading for this project is a substantial component of the course grade. We have found that the groups are highly motivated by healthy competition for the appreciation of their classmates. Therefore, we have used a system where all members of the group receive the same grade (in the absence of confidential feedback from the other two members that someone is not pulling their weight) that is based on a blending of their fellow classmates' and the professor's evaluation of their presentation in three areas: 1) the amount that the evaluator learned from the presentation (yes, we still learn from these presentations!), 2) the overall quality of the presentation, and 3) the creativity shown by the group. More specifically, each student provides a spreadsheet to the professor giving her or his ranking of each of the other groups in each of the three areas. There are no ties allowed. Each student's input is their own and confidential to us; they are not supposed to discuss this with any other members of the class. We have a spreadsheet which computes the average of the rankings in each of the three components and re-ranks the groups. The "class" grade in each of the components is a-b ranking, where "a" and "b" are chosen for satisfactory mean and variance. A "professor" grade in each of the three components is obtained by our rankings in each of the three components and the same conversion of rank to grade. The overall grade is the result of an overall average of the six grades, three from the students and three from the professor. Although the grade component from the students is a zero-sum game, we allow ties in our own rankings to reflect the overall quality of all presentations, and thus our grade is not constrained.

Students sometimes question the role that they should be allowed in grading, but we are very comfortable with it for several reasons. Firstly, we always emphasize that as managers they will be (if they are not already), evaluating people and that they need to take this responsibility seriously and carefully. Secondly, we have found that the students' ratings are usually not all that different than our own. Thirdly, it helps the students focus on what their goal is in the presentation. We tell them not to worry about our evaluations (mentioning that we are usually very close to the class), but instead to focus on having their classmates experience a creative, high-quality learning experience. Although this might sound amorphous, these goals are not all that different from the high-level goals that we might have in many business presentations.

2 METHODOLOGY

Solving of either the wheat problem or the cow problem involves the following steps:

1. List the activities in each of the periods (variables),

2. List the constraints in each of the periods,

3. Create the "fundamental" matrix that has the following structure: there is one column for every activity in a period, and there are two blocks of rows (one for the current period and one for the next period) each of which has a row for every constraint of a period. (This assumes that every activity directly only affects one period in the future, otherwise there are multiple blocks for the future effects.) Populate this structured matrix with coefficients that show the impact of one unit of activity in the current period given by the column, on the constraint in the period determined by the constraint and block. By convention, a positive coefficient indicates that the constraint is used up by the activity, and a negative coefficient indicates that is produced by the activity.

4. Use the fundamental matrix in an appropriate repetitive structure, with exogenous flows and an objective function to create a spreadsheet for which Excel Solver will attain a solution.

It is important to note that our approach assumes an exact accounting of all constraints (all constraints will be equalities). This requires that there be activities explicitly defined to make up the difference for inequality constraints (slack variables). Slack variables often have meaningful interpretations.

3 THE WHEAT PROBLEM

Description

You are a consultant to the Minister of Economics of a small developing country. The Minister of Economics is interested in developing a wheat industry. She is interested in the fastest way to grow this industry and what the long-term prospects are.

The country has abundant land (which needs clearing in order to be farmed) for growing wheat, and a plentiful labor force that is willing to be paid in wheat. The Economic Minister wants to start a test project on 100 acres of cleared land using an initial investment of 10 tons of wheat. Clearing an acre of land requires one time period and .3 tons of wheat to pay the labor. Raising 1 ton of wheat during one period requires 2 acres of cleared land and 0.04 tons of wheat (for seed) at the beginning of the period and .2 tons of wheat to pay the labor overseeing the farming during that period.

Objective: Maximize the amount of wheat at the end of the third period.

List of Activities

Two of the activities each period are obviously clearing land and farming. Another two variables that are required are slack variables allowing exact accounting in every constraint. For example, you are not required to farm all of your cleared land (as a variable this can be described as "fallowing"), and you are not required to use all of your wheat as seed for farming every period (this can be described as "storing wheat"). Thus, every period you need to make 4 decisions that we will more simply refer to as:

1. Clear,
2. Farm,
3. Fallow, and
4. Store

List of Constraints

In every period we need to have an exact accounting of cleared land (which will drop the qualifier and call this "Land" and an exact accounting of wheat.

1. Land
2. Wheat

The Fundamental Matrix

The fundamental matrix (along with other information in the first two columns needed to set up Excel Solver for one period) is given below as copied from an Excel spreadsheet). Note that a blank cell is interpreted by Excel as a 0.

OBJECTIVE				Period 1			
				Clear	Farm	Fallow	Store
REQUIRED	TOTAL		AMOUNT	0.0	0.0	0.0	0.0
100	0.0	Period 1	Land		2	1	
10	0.0		Wheat	0.3	0.24		1
	0.0	Period 2	Land	-1	-2	-1	
	0.0		Wheat		-1		-1

We first interpret the coefficients. Note that "clearing" an acre of land in period 1 requires .3 tons of wheat in the first period and yields one acre of cleared land in period 2. "Farming" can be a little tricky in that it requires 2 acres of cleared land and .24 tons of wheat in the first period, but yields 1 ton of wheat in period 2, but also yields back the two acres of land in the next period. If the coefficient -2 did not appear, it would imply that cleared land could be farmed only once. Fallowing and storing essentially require one unit of the resource in one period and give it back in the next period. The row labeled "AMOUNT" is a placeholder for the amounts of these activities. The column labeled total is the excel function "sumproduct" of the amounts of activities with the coefficients in the appropriate row, and represents the required usage (if positive) or net yield (if negative) of the values chosen for the activities.

The column "REQUIRED" results from the exogenous flows, that is amounts of the constraints that are supplied (if positive) or yielded independent of activities. Thus, we are given 100 acres of cleared land in period 1, and 10 tons of wheat. However, in period 2, there are no stated exogenous flows, so that these cells are blank (interpreted by Excel as 0). Anything we use in period 2 needs to be supplied through appropriate activities in period 1. If the problem were changed so that we had a contract to ship out 1 ton of wheat in period 2, then the coefficient in the column "REQUIRED" and row "Period 2 Wheat should be -1.

Solution of the Wheat Problem for One Period

If we have the above matrix with the described calculations in an Excel spreadsheet, it is trivial to solve the single period wheat problem. Firstly, we can see that any set of decisions in period 1 is feasible if and only if the usage of wheat and cleared land

are equal to the stated amounts of 100 acres of cleared land and 10 tons of wheat available (the first two rows of "required"). Furthermore, the amount of wheat available in period 2 is the negative of the quantity calculated in the cell of column "Total" and row "period 2 Wheat. Thus, we need to place in our objective cell (next to the cell "OBJECTIVE) the negative of the total wheat in period 2, we are ready to quickly solve using Excel Solver. Maximize the objective cell, by changing the amounts in Period 1, subject to the constraints that the TOTALS (of land and wheat) in period 1 equal the respective numbers.

OBJECTIVE	41.7			**Period 1**			
				Clear	**Farm**	**Fallow**	**Store**
REQUIRED	**TOTAL**		**AMOUNT**	**0.0**	**41.7**	**16.7**	**0.0**
100	100.0	**Period 1**	**Land**		2	1	
10	10.0		**Wheat**	0.3	0.24		1
	-100.0	**Period 2**	**Land**	-1	-2	-1	
	-41.7		**Wheat**		-1		-1

Solution of the Two Period Problem

Solution of two periods and beyond is almost trivial once the period one problem has been solved. We only illustrate the solution of the two-period problem in this paper since further period extensions should be trivial. The Excel setup is shown below.

OBJECTIVE	**79.7**			**Period 1**				**Period 2**			
				Clear	**Farm**	**Fallow**	**Store**	**Clear**	**Farm**	**Fallow**	**Store**
REQUIRED	**TOTAL**		**AMOUNT**	**0.0**	**41.7**	**16.7**	**0.0**	**0.0**	**50.0**	**0.0**	**29.7**
100	100.0	**Period 1**	**Land**		2	1					
10	10.0		**Wheat**	0.3	0.24		1				
0	0.0	**Period 2**	**Land**	-1	-2	-1			2	1	
0	0.0		**Wheat**		-1		-1	0.3	0.24		1
	-100.0	**Period 3**	**Land**					-1	-2	-1	
	-79.7		**Wheat**						-1		-1

Note that there is an additional block of columns (for period 2) and an additional block of rows (period 3). These are easy to do in Excel. For example, highlight the period 1 block and grab the lower left corner and drag it across to put in the period 2 columns. The period 3 rows can be automatically inserted in a similar fashion. The coefficients in the period 2 columns are exactly the ones for the period 1 columns but lowered one period block. The "TOTAL" column is the "sumproduct" of all activities for two periods with the coefficients of the corresponding rows. The objective function is now the negative of the TOTAL wheat from period 2.

Checking to see if the activity levels are feasible is as follows. The activities in period 1 must have TOTALs equal to the quantities suppled. In other words, on the spreadsheet the TOTALs for period 1 must equal the REQUIREDs for period 1. Similarly, the activities in period 2 are feasible if the usage in period 2 equals what is supplied through the activities of period. In other words, if the REQUIRED (from both periods 1 and 2) is zero. Similar reasoning shows that the objective function is appropriate and the Excel Solution shown is optimal.

Larger Number of Periods

Larger numbers of periods are done in a straightforward manner. The optimal number of cows (without integer constraints) for a given number of periods is given below.

1. 41.7
2. 79.7
3. 125.6
4. 208.1
5. 334.2
6. 547.4
7. 885.4
8. 1443.5
9. 2341.7
10. 3810.9

OPTIMAL POLICY FOR LARGE NUMBER OF PERIODS
• Asymptotic growth rate 62.5%
• In the last period, farm all the land and store the excess wheat (boundary effects, investment in additional capital will not pay off immediately).

4 THE "COW PROBLEM"

Description
You are a consultant to the Minister of Economics of a small developing country. The Minister of Economics is interested in developing a cattle industry. She is interested in exploring the fastest way to grow this industry and what the long-term prospects are. For purposes of the class project, the details of the problem have been oversimplified. The country does not currently have a cattle industry, although the climate and other factors indicate that one could be successful. The country has abundant land (which needs clearing in order to be farmed) for growing wheat, and plentiful labor that is willing to be paid in food. The Economic Minister wants to start a test project on 100 acres of cleared land using an initial investment of 12 tons of wheat and 20 cows.

Clearing an acre of land requires one time period and 0.11 worker. Raising 1 ton of wheat during one period requires 1.9 acres of cleared land and 0.038 tons of wheat (for seed) at the beginning of the period and 0.33 workers during the period. A cow consumes 0.61 tons of wheat during a period; it yields 0.4 tons of meat when slaughtered. If a cow is bred now, it bears a female calf after one period; during the next period, the calf eats like a cow and becomes a cow at the end of the period. You may not slaughter or breed a bred cow or its calf until its calf is grown. One employed worker is paid 0.1 tons of bread and 0.04 tons of meat during a period. Unused wheat can be stored, but unused meat and bread are destroyed. Making 1 ton of wheat into 1 ton of bread requires 1 person-periods of labor; slaughtering a cow requires .1 person-periods of labor; the bread and the meat are available the same period.

Initial objective: Maximize the size of the herd (total cows and calves) at the end of the third period without assuming integer (whole number) constraints.

List of Constraints
In this case it is easiest to think of the constraints per period before the list of activities. It should be noted that there are other lists possible that will work.

1. Land
2. Wheat
3. Labor
4. Cows
5. Cow-Calf's
6. Meat
7. Bread

NOTES ON THE LIST OF CONSTRAINTS
• The statement that "You may not slaughter or breed a bred cow or its calf until its calf is grown." requires some thought when compiling the list of constraints. The list given creates a new entity a "cow-calf" which is the Mom and her infant offspring. The only activity allowed with this entity is to feed both to yield two cows in the following period. An alternative formulation without this entity would require matrix that extends two periods in the future. In this alternative formulation breeding a cow requires one cow and her food in one period, requires the food for two animals in the next period, and yields two cows in the period beyond that.
• It is also possible to eliminate the Labor constraint, by converting labor requirements into meat and bread requirements. However, these intermediate calculations sometimes trip students up.

List of Activities

1. Clear
2. Farm
3. Fallow
4. Breed
5. Hire
6. Bake
7. Slaughter
8. Store Wheat
9. Destroy Meat
10. Feed Cows
11. Feed Cow-Calf

NOTES ON THE LIST OF ACTIVITIES

• The throwing away of meat is a very important slack variable, since without it there is no way to thin the herd other than to slaughter the cows and hire labor to eat them (remember that we have an exact accounting of all constraints). This sounds "dumb," but if there is a surplus of cows (as there happens to be in this problem) infeasibilities result unnecessarily. The requirement to throw away meat may also reflect regulatory requirements for discarding expired (i.e. "dead") meat.

• Some activities (hiring, baking, and slaughtering) must assume that their output is available in the same period. This should be made clear to students.

The Fundamental Matrix

For ease of visibility with a large number of activities, the matrix is split in two. The matrix for the problem as stated is given below. It is recommended that minimally, some of the numbers in the stated problem be changed. This would at least avoid the problem of re-use of past groups' results. Some slight variation in the activities themselves is also recommended, particularly after the publication of this case. If this is done, even if the students have access to this paper, they will still need to carefully think through the formulation.

	Clear	Farm	Fallow	Breed	Pay Labor	Bake Bread	Slaughter	Store Wheat	Destroy Meat	Feed Cows	Feed Cow-calf
AMOUNT											
Land		1.9	1								
Wheat		0.038		0.61		1		1		0.61	1.22
Labor	0.11	0.33			-1	1	0.1				
Cows				1			1			1	
Cow-calf											1
Meat					0.04		-0.4		1		
Bread					0.1	-1					
Land	-1	-1.9	-1								
Wheat		-1						-1			
Labor											
Cows										-1	-2
Cow-calf				-1							
Meat											
Bread											

The Objective Function

Students need to be careful with the objective function since there are two constraints that contribute to the total size of the herd, each "cow" is one animal, and each "cow-calf" is two animals.

Solution

The optimal solution (without integer constraints) is 65.07844. It is recommended that the students check this number to this level of precision for debugging purposes, even if the instructor later requires integer constraints to be placed on the solution. The optimal activity levels are given to two decimal places in the table below.

Period 1										
Clear	Farm	Fallow	Breed	Pay Labor	Bake Bread	Slaughter	Store Wheat	Destroy Meat	Feed Cows	Feed Cow-calf
0.00	21.34	59.46	16.27	8.16	0.82	2.99	0.00	0.87	0.74	0.00

Period 2										
Clear	Farm	Fallow	Breed	Pay Labor	Bake Bread	Slaughter	Store Wheat	Destroy Meat	Feed Cows	Feed Cow-calf
0.00	19.85	62.29	0.00	7.36	0.74	0.74	0.00	0.00	0.00	16.27

Period 3										
Clear	Farm	Fallow	Breed	Pay Labor	Bake Bread	Slaughter	Store Wheat	Destroy Meat	Feed Cows	Feed Cow-calf
0.00	0.00	100.00	32.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Some Analysis of the Solution

It turns out that as the problem is stated in this paper, the manager of this "economy" is "dealt a bad hand" in terms of the initial amounts of cows and wheat. Some clever students will notice that the initial herd requires 12.6 tons of wheat per period to survive, and the manager is only given an initial supply of 12 tons of wheat. Examination of the optimal solution shows that the first period activities result in thinning the herd by excessive slaughtering and throwing away the meat. This is an interesting example of counterintuitive results of optimization, and leads to interesting discussions about whether there is a model flaw or not. Of course, this phenomenon depends solely on the initial allocation of resources, which could be modified by the instructor if desired.

Pre-Breeding

If one wishes to introduce the complexity of an additional activity that is not repeatable every period, you may add the following statement to the problem definition: "You are allowed to have bred some cows one period before the plan gets underway so that they are calving now." As the problem is currently stated, there is no advantage in doing this, and Excel will set this activity level to 0. If one wants to give the students a richer problem, this statement may be added, and if desired, the amount of initial wheat and cows changed so that there might be advantage in doing so. Of course this results in only one activity which might be called "pre-breeding" only in period 1, which has a coefficient of 1 for cows and a coefficient of -1 for the cow-calves in the same period.

5 SUMMARY

This paper presents and explores a twin-pair of models that can be useful in teaching many of the complexities of real-world modeling in a controlled classroom environment. The simple model is easily explained and understood by students and provides a confidence-building experience and a reference for more complex modeling. The more advanced model predictably can be handled by MBA students working in groups with the important guidance of the instructor, who can get a group moving again with minimal, but extremely important intervention. Both models provide the foundation for a group to creatively go another step further in a creative way. Peer competition and the knowledge that all groups are succeeding leads to learning that surprises the students as it occurs. Although this model is now published and potentially accessible to students, slight modifications in the coefficients or modeling assumptions can require students to essentially learn the concepts without blind copying of previous results.

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Running Business Schools as Businesses

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ABSTRACT
College administrators at many business schools have failed to create value for consumers. The results of this are being witnessed as schools suffer financial distress and closures.

The financial pressures that are now being faced can be attributed to well-reported, obvious causes including underperforming personnel and programs, a proliferation of expanded (and expensive) student services that appeal to millennial students, enhanced student support for students who are not college-ready, outdated curricula, fiduciary negligence, a shrinking target demographic, and the heavy debt burden that many students have amassed which has tainted the public's perception of college worth.

A less obvious contributor to financial distress that needs to be acknowledged and addressed is the lack of differentiation between schools that often occurs because of isomorphism.

Keywords
Management education, Institutionalism

1 INTRODUCTION

Successful business leaders strive to differentiate their products and services in order to achieve better returns than their competitors. The lack of differentiation that we witness among colleges and universities can largely be attributed to institutionalism. Institutionalism finds that organizations actively copy one another's practices, resulting in substantial isomorphism. According to neoinstitutional theorists, meaning is socially constructed among large numbers of organizations through the creation of shared practices and the collective attribution of rationality or justice to those practices (DiMaggio & Powell, 1991;1983; Meyer & Rowan, 1977; Scott, 1995). Institutions of higher learning have adapted similar practices, and their programs tend to resemble each other. The accrediting standards that schools seek from their accrediting bodies serve to make them quite similar to one another. The lack of differentiation that has arisen coupled with prices that have risen sharply in recent years are leading consumers to new alternatives, including online programs, vocational programs and toward work at companies that will provide training and education.

Business programs can learn from businesses in that they must develop their offerings to be distinct and by providing value for consumers that other institutions may not have the competencies to provide. The proposed strategies below represent some steps that might be applied so that business programs can better respond to the changing needs of their target audiences.

2 STRATEGIES TO BECOME MORE BUSINESS-ORIENTED

After many years of replicating programs and business models, some colleges and universities have begun to respond to the competitive environment with changes to their offerings. The same is true for business programs that remained largely unchanged since the 1950s (Porter & McKibbon, 1988). Porter & McKibbon's (1988) report noted business school complacency regarding strategy shifts in the future. They also found that business executives were concerned that college business students were being too narrowly educated. Structural features of MBA programs, including academic calendars, business function orientation seat-time, semester courses, and grade point average evaluation have remained largely unchanged through even though Leavitt (1989) noted their static nature in 1989. As Laponsky (2018), a Personal Finance reporter for Forbes writes, "Historically, many of us advised institutions to 'stay in their lane' meaning that they should stick with their mission no matter how narrowly defined. The advice was just to execute better on what you were good at doing. Today, I think most colleges with narrowly defined mission statements, especially those which are primarily undergraduate liberal arts institutions, need to think very seriously about moving outside their lanes." This advice is true for specific programs, as well, especially in management education. Reynolds (2012) warns that colleges need to think about curriculum reform and changes in instructional methods. He warns that the there is a

"bubble" that is going to burst and post-bubble, "students are likely to be far more concerned about getting actual value for their educational dollars (Reynolds, 2012)."

Assessment Programs for College Administrators that are tied to performance

High paid and marginally performing administrators have driven up tuition costs at colleges. Performance metrics used to measure administrative achievement at colleges are much vaguer than in the private sector and information regarding administrative salaries and benefits is not as transparent as in the private sector. Between 1993 and 2007 the number of full-time administrators per 100 students at America's leading universities grew by 39 percent, while the number of employees engaged in teaching, research or service grew only by 18% (Bennett, 2013). Schools and programs have hired people to administrative posts that are very loosely related to the college or program's core missions. Many programs that do not appear to help students with career preparation skills are being run with huge administrative costs. Bennett (2013) suggests that "colleges should think hard about eliminating trendy majors that consistently do not demonstrate their intellectual rigor, fiduciary worth, or ability to produce employable graduates.

Administrator performance should be assessed both quantitatively and qualitatively as is done in the private sector. Oftentimes in academic programs, assessment comes in less formal ways, and administrators stay in their positions for years, despite failing programs and revenue losses. In addition to profitability metrics that can be tied to programs, assessment measures should be tied to graduate performance, and perhaps to alumni donations and feedback.

The administration of business schools is often undertaken by faculty seeking promotions to advanced ranks or to advanced faculty who wish to scale back on teaching. The administrative abilities of these faculty, even if their motivations are pure, may not be suitable to achieve innovation and advancement. Careful consideration must be given to both internal and external candidates who possess the credentials that best suit the program. The positions cannot be viewed as part-time and peripheral to teaching but as critically important functions that can guide the programs to higher levels of performance.

Programs that are Academically Enriching and Prepare for Diverse Careers

We are repeatedly told that employers are looking for two primary features in those that they will hire; excellent communication skills and sound ethical ideals. These skills and character development have often been neglected or glossed over in the cookie-cutter business programs.

A summary of the challenges facing management education that was developed by Dumas (2002) is presented in the chart below. This summary recognizes that management educators must make wide-reaching institutional changes as well as encourage individual development in ways that are not currently being done.

These goals present difficult challenges to business school practitioners, but if addressed and dealt with in a financially astute manner, that can better position the business program and the college in which it operates. Some of Dumas' suggestions can be addressed through collaborative activities among institutions and with new partners, public and private.

Summary of challenges facing management educators

Develop integrated learning and eliminate silos of knowledge. Make connections between classroom learning, personal life, public issues, and involvement in the wider world.

Help students actively construct knowledge and understand the importance of learning in complex contexts.

Develop cooperative learning, using tools, addressing genuine problems in complex settings, involving knowledge applied to specific contexts.

Reduce the gap between curricular content and development of new competencies.

Target the appropriate level of instruction to meet needs of a wide range of knowledge levels.

Integrate social and technical lessons to allow students to develop the higher-level cognitive skills they will need in practice.

Enable students to become reflective practitioners by applying knowledge and principles used in classroom to real-life problems and by using the experience to revise theories in use, and develop knowledge in use.

Develop in students interpersonal effectiveness (people skills), creativity, negotiation skills, aptitude for teamwork, ability to speak and write with clarity, responsibility and accountability, ethical values, time management, and decision-making and analytical ability.

(derived from Dumas, 2002, p. 253)

A Return to Teaching about Capitalist Virtues

Business students should be enthralled with the study of business and its many productive functions in a free-market economy. Unfortunately, there is often a critical view of capitalism coming from academic institutions, including from the business schools. It has become standard practice to discuss corporate social responsibility without properly addressing financial responsibility. This type of philosophical bent is counter to the values that a business school should be promoting. Management educators must excite students about the prospect of enhancing the lives of those they manage, those they generate a profit for, and those whose lives may be enriched by the beneficence of those who share their wealth. In order to do this, capitalism must be promoted rather than insulted. Novak (1996) recognizes that although capitalism has its problems, it is by far the best economic system when compared with all others. He notes that "It is not a system much celebrated by poets, philosophers, and priests. From time to time, it has seemed romantic to the young, but not very often. Capitalism is a system that commends itself best to the middle-aged, after they have gained some experience of the way history treats the plans of men." It is for these reasons that young people are often suspicious of the system. Business schools should therefore work harder to link capitalist principles with moral reasoning, enlightening young people to the promising consequences of the system (Tolan & Niemotko, 2017).

Schools should work to provide a greater focus on the benefits that capitalism can bring if practiced with moral certitude. Business programs at faith-based institutions should strive to provide students with an awareness of how the particular faith views business matters. Core principles and dogmas of specific faiths have been ignored in business schools in an attempt to appeal to a "mass-market" audience.

Third-Party Alliances

Some colleges have begun partnering with third party providers using revenue share agreements that minimize risk to the institution. These types of strategic alliances had formerly been thought to go too far outside of a college's mission but are

becoming more frequent. An example is provided by Marist College in its partnership with Health Quest Medical for a Marist Health Quest Medical School.

Acknowledgement of a Business Program's Value to the College

Business faculty find themselves defending their discipline as more than pre-professional training. Faculty from the liberal arts often disparage the academic content of a business program. Strong business programs should be rooted heavily in the liberal arts disciplines including mathematics, psychology, and English. The liberal arts need to be wedded to the pre-professional discipline in meaningful ways that are recognized campus-wide. At a time when colleges are facing financial austerity, business programs typically offer an area of the college that can be run profitably because of the low overhead.

3 CONCLUSION

As Senator Ben Sasse recently wrote, it is "Because of the uncertainty over the job futures (job insecurity) of college graduates and income instability and technological uncertainties ahead, we should be asking "harder questions of those who would lead effectiveness, about technology and place, and about human capital, both inside and outside the school. The time to tolerate complacency has long since passed, and everyone who cares about the future of this critical sector and about helping our students navigate a change that's every bit as big as industrialization and urbanization should be demanding more" (Sasse, 2019).

Business programs, and the larger colleges in which they reside should continually assess the environments for opportunities and work to modify or divest of unproductive assets. For many years, the market supported the similarity of programs and rapidly increasing prices were tolerated. These increases were funded in a large part by student loans and the default ratio on these is gargantuan. Students and parents will continue to seek value that colleges must strive to provide.

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Grade Inflation at the University Level: The New Reality

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ABSTRACT
Average grades in high school, colleges and universities have steadily risen since the 1960s. Critics express concern that grade inflation erodes incentives for students to learn; gives students, employers, and graduate schools poor information on absolute and relative skills; and reflects the quid pro quo of grades for better student evaluations of professors. Employers provide feedback that the quality of new hires is not reflective of their GPA, lacking the skills 'developed' in academia. This paper presents several viewpoints on the issue, including alternative views, possible regulatory measures and trends. (Butcher, McEwan, & Weerapana, Summer 2014)

Keywords
Academia, integrity

1 INTRODUCTION

- The National Association of Colleges and Employers reported in 2013 that 66 percent of employers screen candidates by grade point average (GPA) (Lindsay, 2019).
- In a 2018 analysis by RippleMatch, Brown University was found to have the highest average GPA of 3.73, followed by Stanford, Harvard, and Columbia. (Winston, 2019)
- "Grades are not like temperatures or weights," he said. "What constitutes an A or a B has changed, both in high school and in college." (Arenson, 2019)
- Stuart Rojstaczer, a geology professor at Duke who runs the Web site www.Gradeinflation.com, says that higher grades are the result of a culture where the student-consumer is king. "We don't want to offend students or parents," he said. "They are customers and the customer is always right."

According to statistics presented on www.gradeinflation.com, the average college GPA in 1950 was 2.52 while in 2002 it was 3.26. However, there is no evidence to suggest the increase in GPA was due to an increase in intelligence or an increase in the amount of time college students are studying. If knowledge is not increasing, and the number of hours studying is not increasing, what accounts for this escalation in grade point average (Courts, 2010)?

A 50-plus-year nationwide study of the history of college grading finds that, in the early 1960s, an A grade was awarded in colleges nationwide 15 percent of the time. But in 2019, an A is the most common grade given in college; the percentage of A grades has tripled, to 45 percent nationwide. Seventy-five percent of all grades awarded now are either A's and B's. (Lindsay, 2019) One argument is that these inflated grades are necessary to help students get ahead in a competitive job market. (Slavov, 2019)

2 RESEARCH

Many university level students feel they are entitled to good grades because they are paying for them. This belief does not address grade inflation at the high school level though. Educators and administrators need to work together to ensure instructors are issuing grades actually earned by students. A common practice in all levels of academia is to appeal grades to a higher level, director, Chair, Dean. A fundamental shift needs to occur to put the onus on the students to prove that they deserved a higher grade than they received, not on the instructor to prove they did not. Many times a director, chair or Dean will ask a professor to justify a particular grade. The new mentality of the college student always being right may help admission and retention numbers, but it does benefit academic integrity. With increasing pressures on administrators to maintain or increase enrollments levels, the trend is clear. Students need to assume responsibility for their education and view the instructors as a facilitator of learning.

Instructors need to increase their expectations of students and promote a learning environment that demands student commitment, ethics and integrity. (Courts, 2010)

In 2004, Wellsley implemented a new policy on grades that instituted a stipulation that median grades for introductory level courses be no higher than a B+ (3.33) (www.wellsley.edu). Wellesley's GPA for 2007-2008 was 3.31. Other universities have demonstrated some concern about what they perceive as grade inflation and have instituted policies in order to try to stem rising grades. Policies such as allowing no more than 25 percent of the class to receive A's, or reintroducing grading on a curve have reduced grade inflation in some instances. The deck is stacked against those instructors who are trying to correct grade inflation on their own. For example, new PhDs trained to high levels of professionalism discover that their efforts to raise standards are met with hostility by students. (Courts, 2010)

This problem exists even at the most prestigious Universities. Harvard professor Harvey Mansfield stirred up controversy recently by publicly criticizing the grade inflation at his institution. As reported by the Harvard Crimson, Mansfield asked the Dean of Undergraduate Education about the college's grade distribution, stating, "A little bird has told me that the most frequently given grade at Harvard College right now is an A-." The Dean corrected him: "The median grade in Harvard College is indeed an A-. The most frequently awarded grade in Harvard College is actually a straight A." (Slavov, 2019)

3 FINDINGS

Untenured professors may believe low grades will harm their student evaluation scores. Even professors who have tenure are concerned that handing out low grades puts their students at a disadvantage relative to their peers at other universities. And there's no doubt that some professors hand out inflated grades in order to save time on grading. Arguing with students about grades is a growing time consumption issue (Slavov, 2019).

Employers have known about grade inflation for years, which is why a common complaint is that college transcripts have become less and less meaningful. Virtually all new college graduates have nothing but A's and B's on their transcripts. For the same reason, grade inflation also hinders the ability of graduate school admissions boards to differentiate meaningfully among student transcripts. (Lindsay, 2019)

The Woodrow Wilson National Fellowship Foundation confirms the findings discussed above. It found that in 1969, only 7 percent of students at two- and four-year colleges reported that their grade point average was A-minus or higher. Yet in 2009, 41 percent of students reported as same. During the same period, the percentage of C grades given dropped from 25 to five percent. (Lindsay, 2019)

But is it really the fault of millennials, or of the older generation which has been in charge and which was supposed to act like adults? Students are paying for our moral and educational lapse. "As monetary inflation devalues the dollar", so grade inflation devalues the currency of education—student grades. (Lindsay, 2019)

A report on measuring academic rigor from the Boulder Faculty Assembly has been provided to CU's regents to help guide the board's ongoing conversation about grade inflation. Vietnam-era grade inflation, driven by interest among faculty to protect students from the draft, has now become part of the norm. (Anas, 2019)

Is it possible that the A students deserve their A's? Getting into colleges like Princeton is far more difficult than it used to be. And increasing numbers of students are being trained primarily for standardized tests and are loading up on Advanced Placement courses. The College Board found that the number taking 10 or more such courses in high school is more than 10 times what it was a decade ago. Courses aimed at helping them do better on the SAT exams are booming.

"In 1977, less than 25,000 students nationally spent more than $100 on preparing for the SAT," said John Katzman, founder and chief executive of The Princeton Review, which tutors about 60,000 students a year for the SAT's. "It was the C students who prepped, not the A students," he added. "Now it's got to be circa 200,000 or 250,000 students who are going to spend more than $400 to prepare for the SAT."

4 CONCLUSION

So is there any solution to Grade inflation? Columbia, Dartmouth, Indiana, and Eastern Kentucky now "contextualize" grades on transcripts. "They provide the number of students in each class as well as the average grade of the class on the students' transcripts. Indiana University places on transcripts the grade distribution for each course, the class grade point average, and the average student grade point average for each course," according to Forbes.

Under legislation proposed in the House of Representatives, the Texas "Contextualized Transcript" bill calls for adding to transcripts the average grade given to the entire class for each of the courses on a student's transcript. This would apply to all Texas public, two-year and four-year colleges and universities. Here is an example of what it would look like:

"Geology: Individual Student's Grade: A (Average grade for the class: C+)"

This transparency requirement can provide big dividends. Employers, as well as graduate admissions committees, would welcome the better information that comes with grade contextualization. Students would get a truer sense of what their abilities are and where they truly stand. Transcripts would again be the indicators of accomplishment they were intended to be. (Lindsay, 2019)

College students need to learn to cope with grades that are aren't As. Receiving a lower grade on an assignment teaches students what they need to improve and how to work on their weaknesses. Learning how to recover from a C in a course is a valuable life lesson on perseverance in the face of disappointment. Such skills are necessary in order to survive the challenges of the outside of college; however, students face increasingly fewer opportunities to overcome failure and therefore are increasingly less prepared to enter the workforce. Grade inflation also becomes a problem for employers seeking talented applicants for job positions.

A parent asked if a college "had grade inflation." The professor said no — to which the parent responded: "That's unfair. My kid goes to your school and gets B's; he goes to the college down the road and gets A's. Which kid do you think employers will hire — the A student or the B one?" (Trowbridge, 2019) A valid point.

Until society returns to the understanding that failure is not a sign of weakness but a learning opportunity, grade inflation will persist in higher education and college students will graduate increasingly unprepared for the struggles of adulthood.

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The Power of Marriage:
The Causal Effect of Parental Marital Status on Child's Earnings

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ABSTRACT
The causal effect of parental marital status on the child's earnings is the earnings gap between the children who grew up in families where their parents remained married and their counterparts reared by divorced or separated parents, holding other factors constant and controlling for endogeneity issues. I identified the causal effect using the following specification strategies. First, I controlled for the parental income and education effects and the child's characteristics. Second, I took into account the unobserved family-specific, descendant-invariant heterogeneity, such as the family tradition and genetic traits, by fitting descendant fixed effects (DFE) models. Third, I used two instrumental variables, the no-fault divorce law and the parent's religious preference, for the endogenous parental marital status to further alleviate the omitted variable bias problem. The parental marriage effect varies with parental household income and education. It is higher and more significant for sons than for daughters. I decomposed the total effect into a direct effect and an indirect effect by mediation analysis, which provides the causal mechanism linking the parental marriage to the child's earnings. A stable parental marriage also has a positive and significant effect on the intergenerational relative earnings improvement.

Keywords
Parental marital status, causal effect, child's earnings, descendant fixed effects (DFE), instrumental variables (IV), endogeneity, intergenerational relative earnings improvement

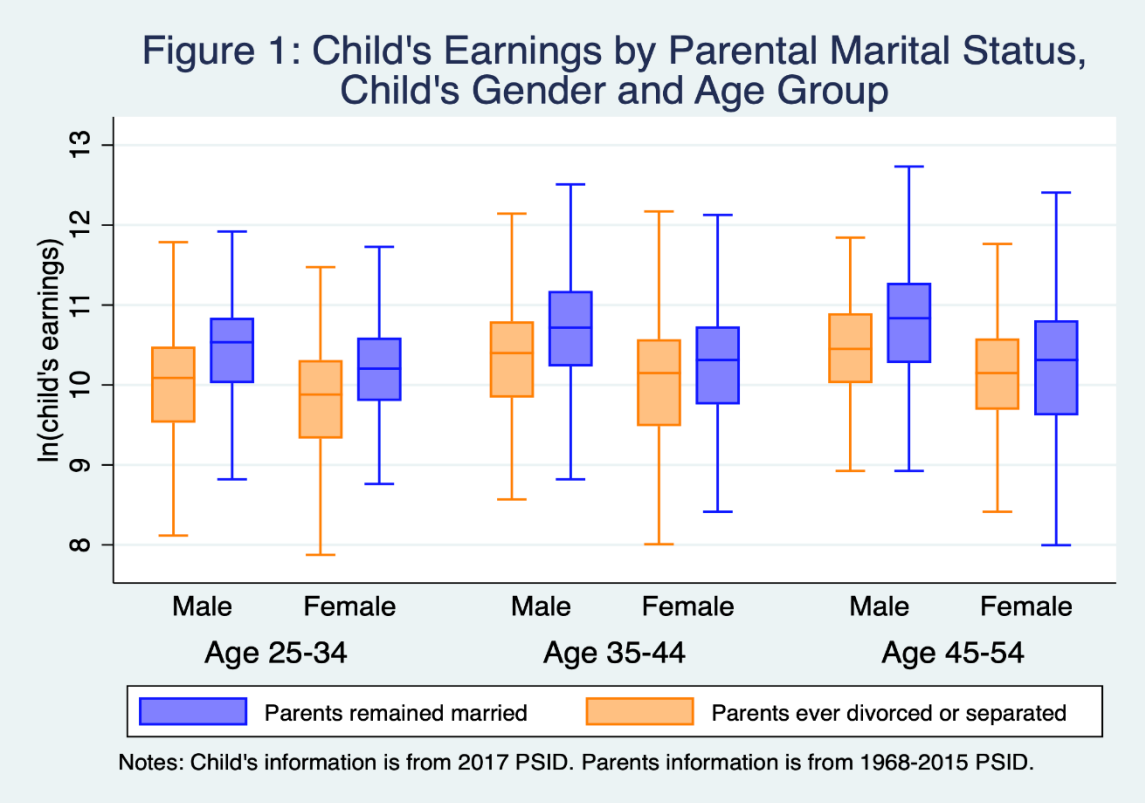
1 INTRODUCTION

The research is related to three areas of studies. The first is the literature on income mobility, which shows that the intergenerational elasticity (IGE) of income is around 0.4 (Lee and Solon, 2009; Corak, 2013; Chetty et al., 2014). The second type of related research emphasizes parental divorce's impact on the child's educational attainment and marital status (Keith and Finlay, 1988; Malison, 2017). They found that parental divorce has a detrimental effect on the child's educational attainment and leads to a higher divorce rate. The third area is about the relationship between divorce and intergenerational earnings mobility. Bratberg et al. (2014) used the quantile transition matrixes to show children of divorced parents tend to move downward in the earnings distribution compared to children from intact families in Norway. Couch and Lillard (1997) found that sons from families whose divorced parents had relatively low earnings have a greater chance of having low earnings themselves in the US. I used data from the Panel Study of Income Dynamics (PSID) to estimate the causal effect of parental marital status on the child's earnings. To the best of my knowledge, this is the first attempt to apply descendant fixed effects (DFE) model and instrument variables (IV) estimation to the individual-level data and directly measure the causal effect of a stable parental marriage on the child's adult earnings. I found a positive and significant impact after controlling for parental income and education effects and accounting for endogeneity problems.

Motivation

I observed that the child's earnings are associated with their parent's marital status. The workers who grew up in intact families earned more than their counterparts raised by divorced or separated parents. The average earnings gap between the two parental marital groups was significantly different from zero (Table 1). Figure 1 shows that in all three age groups and both genders, the median earnings were higher for the workers whose parents remained married during their childhood (from 0 to 16 years of age) than the workers whose parents divorced or separated during that period.

Table 1: Comparison of the means of earnings by parental marital status for male and female workers		
Group: Male(N=1,767)		
	Mean	Std.Err.
Parents remained married(N=1,015)	54914.44	2349.599
Parents ever divorced or separated(N=752)	33549.58	1094.793
Difference	21364.85	2592.139
	t = 8.2422, P-value = 0.0000	
Group: Female(N=2,108)		
	Mean	Std.Err.
Parents remained married(N=1,159)	34835.06	955.643
Parents ever divorced or separated(N=949)	26916.06	727.4122
Difference	7918.999	1200.992
	t = 6.5937, P-value = 0.0000	



Research Question

I answered the following questions:1. Could parental marital status during childhood explain the child's adult earnings? And 2. If yes, through which channels does parental marriage affect the child's earnings? I understand that association or correlation does not necessarily mean causality. I need to tackle three endogeneity problems. First, I should disentangle the parental marital effect from the parental income and education effects on the child's earnings. Second, I should consider the endogeneity problems due to the unobserved omitted variables and family heterogeneity. Third, I should find the mechanism through which the parental marital status influences the child's earnings.

2 THEORETICAL MODEL AND PARENTAL MARRIAGE HYPOTHESIS

Household Utility Maximization and its Predictions

I follow the Becker-Tomes (1979) model. The following utility maximization model considers the parent's marriage-specific investment behavior with parameters related to parental marital status. The decision-making parent cares about her own composite consumption c_t and her child's future income y_{t+1} subject to the household resources constraint.

$$\max_{\{c_t, y_{t+1}\}} \quad U_t = c_t^{1-\alpha} y_{t+1}^{\alpha}$$
$$s.t. \quad c_t + I_t = \theta V_t$$
$$\theta = \theta(m), \quad \alpha = \alpha(m)$$

The vital assumption is that both the accessibility to household resources θ and the relative importance of child's future earnings α are an increasing function of the marital status m. Child's adult earnings are related to the parent's investment as follows: $y_{t+1} = w_{t+1} I_t + e_{t+1} + \mu_{t+1}$, and the intergenerational endowment generating process is: $e_{t+1} = h e_t + v_{t+1}$. The interior solution for the child's adult earnings is: $y_{t+1}^* = \alpha w_{t+1} S_t$, where $S_t = \theta V_t + (h e_t + v_{t+1} + \mu_{t+1})/w_{t+1}$. The equilibrium child's earnings y_{t+1}^* depend on a variety of parameters.

The Marginal Effect of Marital Status m ***on the Child's Earnings*** y_{t+1}^***.**

First, the marginal effect of marital status on the child's earnings is positive:$\partial y_{t+1}^*/\partial m = w_{t+1} S_t(\partial\alpha/\partial m) + w_{t+1}\alpha V_t(\partial\theta/\partial m) > 0$. The children of intact parents earn more than their counterparts.

Second, this marginal marital effect increases with household resources V_t:$\partial(\partial y_{t+1}^*/\partial m)/\partial V_t = w_{t+1}\theta(\partial\alpha/\partial m) + w_{t+1}\alpha(\partial\theta/\partial m) > 0$. For the high-income household, parental marital status has a greater effect on the child's earnings than the low-income household.

Third, it is positively related to the relative importance of the child's well-being α:
$\partial(\partial y_{t+1}^*/\partial m)/\partial\alpha = w_{t+1} V_t(\partial\theta/\partial m) > 0$. If parents care about their son's future well-being more than their daughter's, I should find a more significant parental marriage effect among sons.

Parental Marriage Hypothesis of Child's Earnings

H1. Positivity of the effect. A stable parental marital status has a positive effect on the child's adult earnings, holding other factors constant.

H2. Heterogeneity of the effect. The parental marriage effect on the child's earnings is higher for wealthy parental families and educated parents, and it is more significant for sons than for daughters.

H3. Mechanism of the effect. The influence goes through three channels: 1. Human capital investment channel — through the investment in the child's education; 2. Intergenerational marriage persistence channel — through the attitude towards marriage that is passed down over generations; 3. Endowment transmission channel — through the unobserved factors, such as family tradition and genetic traits, rather than the above two mechanisms.

3 IDENTIFICATION CHALLENGES AND SPECIFICATION STRATEGIES

Identification Challenges and Specification Strategies

I face four endogeneity issues that could lead to biased or inconsistent OLS estimates. I employ instrumental variables (IV) estimation, descendant fixed effects (DFE) model, and sample selection correction to alleviate the endogeneity problems.

Disentangle Parental Marriage Effect from Parental Income and Parental Education Effects

Do childhood family structures causally affect the child's adult earnings, or do the correlations reflect some other parental factors? If parental income and education are omitted from the model, it will lead to biased estimates. I included parental household income and parental educational attainment in the model to isolate the parental marriage effect from the parental income and education effects.

Unobserved Family-Specific Heterogeneity and Descendant Fixed Effects (DFE) Models

There is something in common that runs in the family across generations of descendants. It could be the family tradition or

$$\begin{aligned} ln(child\_earnings_{ijt}) = \beta_0 &+ \beta_1 parent\_marital\_status_{ijt} \\ &+ \beta_2 ln(parent\_family\_income_{ijt}) + \beta_3 parent\_education_{ijt} \\ &+ \beta_4 child\_experience_{ijt} + \beta_5 child\_experience_{ijt}^2 \\ &+ \beta_6 child\_gender_{ijt} + \beta_7 child\_region_{ijt} + \beta_8 child\_race_{ijt} \\ &+ \varepsilon_{ijt} \\ \text{where } \varepsilon_{ijt} &= \mu_i + \nu_t + e_{ijt} \end{aligned}$$

genetic traits. These unobserved characteristics of the descendants are family-specific, i.e., they are identical among all descendants of the same family but different across different families. I ran the descendant fixed effect (DFE) models and obtained the within-estimator by demeaning within families over descendants so that the family heterogeneity could be taken into account. I also include year dummies in the models to control for the unobserved factors that changed over time but had identical impacts on all individuals, like the national policies. Thus, the model allows the parental marital status to be correlated with the descendant fixed effects (DFE) and the time fixed effects. The subscripts indicate the observation is for the "i" family, the "j" descendant, and the "t" survey year. The composite error term ε_{ijt} contains the descendant fixed effect μ_i, the time fixed effect ν_t, and the idiosyncratic component e_{ijt}.

Unobserved Idiosyncratic Factors and Instrumental Variables (IV) Estimation

The unobserved idiosyncratic factors e_{ijt} that affect the child's adult earnings could be correlated with parental marital status. An instance of such unobserved omitted variables could be the child's personality traits, such as the endurance or the adversity quotient (AQ) that is developed from an unhappy home environment. If it is the case, then the parental marriage effect will be underestimated using OLS because the state of parents being married during childhood is negatively related to AQ's formation, and AQ is positively associated with earnings. I found two instrumental variables (IV) for the endogenous parental marital status and performed the two-stage-least-squares (2SLS) estimation. The no-fault divorce law that took effect in different years in different states and the parent's religious preference are the two IVs. Both of them are highly correlated with parental marital status. It can be argued that they do not affect the child's adult earnings except through parental marriage.

Take into Account Endogenous Sample Selection

Children from intact families are more likely to work after they grew up. A lack of consideration of the willingness to work will overestimate the effect of a successful parental marriage on the child's earnings for the whole population. The sample data are for the workers who had earnings, i.e., they were employed. For those who were not employed, they are not in the earnings sample. I followed Heckman's two-step estimation procedure and used the predicted probability of employment from the probit selection regression as a proxy for willingness to work.

4 ESTIMATION RESULTS

OLS and Panel Data Estimates for Binary and Multinomial Parental Marital Status Models

In the binary-parental-marital-status models (Table 3), the OLS estimates of the parental marriage effect on the child's earnings drop as more control variables are added to the model. It is 0.343 when the parental marital status is the only explanatory variable, and it reduces to 0.292 when the parental educational attainment is added. As the parental household income is included in the model, the estimate declines to 0.109. Then I put the child's characteristics into the model, such as years of work experience and its squared term, gender, region, race, and predicted employment probability. The estimate drops to 0.078. The descendant random effects (DRE) model gives an estimate of 0.081, while the descendant fixed effects (DFE) model yields a within-estimate of 0.098. The DFE model not only controls for both parental and child observed factors, but it also takes into account the unobserved family heterogeneity, i.e., the descendant fixed effect μ_i, and the unobserved time-varying factors, i.e., the year fixed effects ν_t. On average, the workers who grew up in households where their parents remained married earn 9.8% more than their

counterparts reared in non-intact families, holding other variables constant. For the multinomial-parental-marital-status models (Table 4), detailed childhood family structures are specified. In the OLS models, the negative divorce effect declines from -0.269 to -0.069 as more and more controls are added to the model. After controlling for both the descendant fixed effects (DFE) and time fixed effects, the estimated divorced effect is -0.094, meaning that the children of divorced parents earn 9.4% less than the children from intact parental households, other things equal.

Table 3: OLS and Panel Data Estimates (Binary Parental Marital Status)

Dependent variable	Ln(Child's earnings)					
Specifications	**OLS_1**	**OLS_2**	**OLS_3**	**OLS_4**	**DRE**	**DFE**
Explanatory variables						
Key variable of interest						
Parental marital status						
remained married	0.343*** (0.034)	0.292*** (0.032)	0.109*** (0.034)	0.078** (0.034)	0.081** (0.035)	0.098** (0.046)
otherwise	base	base	base	base	base	base
Parent's control variables in childhood						
Parental education						
less than high school	X	base	base	base	base	base
high school	X	0.138** (0.059)	0.058 (0.058)	-0.011 (0.061)	-0.025 (0.060)	-0.084 (0.069)
some college	X	0.343*** (0.063)	0.190*** (0.063)	0.148** (0.068)	0.119* (0.067)	0.015 (0.077)
college or above	X	0.525*** (0.061)	0.239*** (0.065)	0.207*** (0.068)	0.138** (0.067)	-0.123 (0.080)
Ln(Parental household income)	X	X	0.350*** (0.032)	0.260*** (0.038)	0.218*** (0.037)	0.036 (0.045)
Child's control variables in adulthood						
Years of child's work experience	X	X	X	0.019*** (0.007)	0.021*** (0.007)	0.019** (0.008)
Square of years of child's work experience	X	X	X	✓	✓	✓
Child's gender						
female	X	X	X	base	base	base
male	X	X	X	0.348*** (0.033)	0.343*** (0.034)	0.300*** (0.040)
Child's region	X	X	X	✓	✓	✓
Child's race	X	X	X	✓	✓	✓
Pr(Child employed)	X	X	X	✓	✓	✓
Year dummies	X	X	X	✓	✓	✓
Descendant FE	X	X	X	X	X	✓
Number of obs.	5,055	5,055	5,055	5,055	5,055	5,055
R-squared	0.025	0.054	0.089	0.152	0.151	0.075

Notes: ***p-value<0.01; **p-value<0.05; *p-value<0.1.
Clustering in family standard errors in parentheses.
✓ : variable included in model; X: variable not included in model.

Table 4: OLS and Panel Data Estimates (Multinomial Parental Marital Status)

Dependent variable	Ln(Child's earnings)					
Specifications	**OLS_1**	**OLS_2**	**OLS_3**	**OLS_4**	**DRE**	**DFE**
Explanatory variables						
Key variable of interest						
Parental marital status						
remained married	base	base	base	base	base	base
ever divorced	-0.269*** (0.040)	-0.240*** (0.039)	-0.093** (0.039)	-0.069* (0.039)	-0.076* (0.040)	-0.094* (0.053)
ever separated	-0.332*** (0.047)	-0.266*** (0.047)	-0.080* (0.048)	-0.044 (0.049)	-0.036 (0.049)	-0.056 (0.065)
ever single parent	-0.674*** (0.073)	-0.585*** (0.072)	-0.202*** (0.077)	-0.109 (0.074)	-0.098 (0.076)	-0.134 (0.096)
ever widowed	-0.465*** (0.094)	-0.380*** (0.092)	-0.266*** (0.090)	-0.249*** (0.092)	-0.244*** (0.093)	-0.218* (0.112)
Parent's control variables in childhood						
Parental education						
less than high school	X	base	base	base	base	base
high school	X	0.139** (0.059)	0.056 (0.058)	-0.016 (0.061)	-0.031 (0.060)	-0.088 (0.069)
some college	X	0.339*** (0.063)	0.189*** (0.063)	0.144** (0.068)	0.115* (0.067)	0.012 (0.077)
college or above	X	0.515*** (0.061)	0.237*** (0.066)	0.201*** (0.069)	0.133** (0.067)	-0.128 (0.081)
Ln(Parental household income)	X	X	0.344*** (0.033)	0.259*** (0.039)	0.218*** (0.038)	0.034 (0.045)
Child's control variables in adulthood						
Years of child's work experience	X	X	X	0.018** (0.007)	0.020*** (0.007)	0.018** (0.008)
Square of years of child's work experience	X	X	X	✓	✓	✓
Child's gender						
female	X	X	X	base	base	base
male	X	X	X	0.348*** (0.033)	0.343*** (0.033)	0.299*** (0.040)
Child's region	X	X	X	✓	✓	✓
Child's race	X	X	X	✓	✓	✓
Pr(Child employed)	X	X	X	✓	✓	✓
Year dummies	X	X	X	✓	✓	✓
Descendant FE	X	X	X	X	X	✓
Number of obs.	5,055	5,055	5,055	5,055	5,055	5,055
R-squared	0.031	0.058	0.091	0.153	0.152	0.072

IV Estimates for Binary and Multinomial Parental Marital Status Models

I use two IVs for the endogenous explanatory variable, parental marital status. The first IV is the no-fault divorce law that took effect in different years in different states. The first stage regression of the 2SLS verifies a strong correlation between the law and the parental marital status. The divorce law is not likely to directly or indirectly affect the child's earnings except through parental marital status. In other words, the IV satisfies both the instrument relevance and the instrument exogeneity. The second IV is the parent's religious preference, which also meets the two requirements for a valid IV. In the binary-parental-marital-status models (Table 5), the IV estimate of the parental marriage effect is 0.487, substantially greater than the OLS or DFE estimates. It implies the presence of omitted variables in OLS and DFE models, and it agrees with the AQ story. An ideal specification is the combination of descendant fixed effects (DFE) and instrumental variables (IV) methods because it controls for both the descendant fixed effects (DFE) and the time fixed effects, and it also allows the unobserved factors in the idiosyncratic error term to be correlated with parental marital status. Therefore, it identifies the causal effect of a stable parental marriage on the child's adult earnings. This causal effect is 0.652, suggesting that the children of intact families earn 65.2% more than those raised by divorced or separated parents. The DFE+IV estimate is economically sizable and statistically significant. The models with detailed childhood family structures give consistent results (Table 6). The IV and DFE+IV methods lead to estimated divorce effects of -0.576 and -0.663, respectively. The above results are evidence of Hypothesis H1.

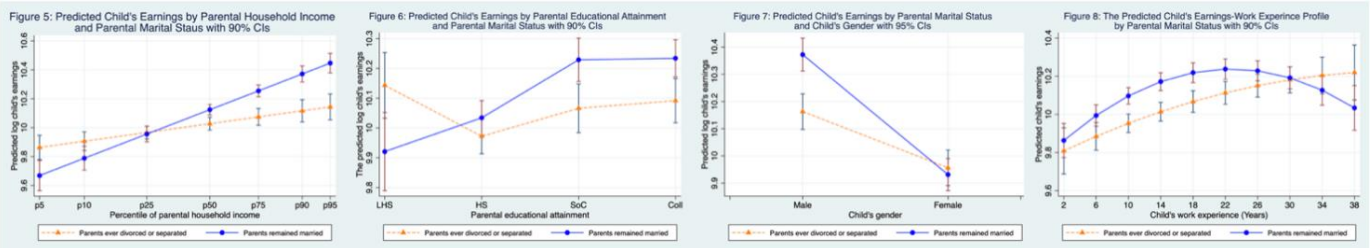
Table 6: IV Estimates (Multinomial Parental Marital Status)					
Dependent variable	Ln(Child's earnings)				
Specifications	OLS	IV_1	IV_2	IV_3	DFE+IV
Explanatory variables					
Key variable of interest					
Parental marital status					
remained married	base	base	base	base	base
ever divorced	-0.084** (0.041)	-0.625** (0.246)	-0.408 (0.481)	-0.576*** (0.207)	-0.663** (0.311)
ever separated	-0.069 (0.054)	-0.307*** (0.118)	-0.212 (0.221)	-0.286*** (0.104)	-0.339** (0.169)
ever single parent	-0.126 (0.078)	-0.433*** (0.156)	-0.310 (0.284)	-0.406*** (0.137)	-0.431** (0.206)
ever widowed	-0.256** (0.115)	-0.469*** (0.147)	-0.384* (0.221)	-0.450*** (0.138)	-0.345* (0.201)
Parent's control variables in childhood					
Parental education					
less than high school	base	base	base	base	base
high school	-0.001 (0.074)	0.019 (0.077)	0.011 (0.078)	0.018 (0.077)	-0.076 (0.089)
some college	0.166** (0.080)	0.204** (0.083)	0.189** (0.089)	0.200** (0.083)	0.034 (0.095)
college or above	0.206** (0.080)	0.233*** (0.083)	0.222*** (0.085)	0.231*** (0.082)	-0.104 (0.100)
Ln(Parental household income)	0.270*** (0.040)	0.175*** (0.056)	0.213** (0.094)	0.183*** (0.051)	-0.005 (0.071)
Child's control variables in adulthood					
Years of child's work experience	0.020** (0.009)	0.014 (0.009)	0.016 (0.010)	0.015 (0.009)	0.022* (0.012)
Square of years of child's work experience	✓	✓	✓	✓	✓
Child's gender					
female	base	base	base	base	base
male	0.328*** (0.035)	0.336*** (0.036)	0.333*** (0.037)	0.336*** (0.036)	0.305*** (0.045)
Child's region	✓	✓	✓	✓	✓
Child's race	✓	✓	✓	✓	✓
Pr(Child employed)	✓	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓	✓
Descendant FE	X	X	X	X	✓
Number of obs.	4,054	4,054	4,054	4,054	4,054
R-squared	0.160	0.118	0.145	0.126	0.034

Table 5: IV Estimates (Binary Parental Marital Status)					
Dependent variable	Ln(Child's earnings)				
Specifications	OLS	IV_1	IV_2	IV_3	DFE+IV
Explanatory variables					
Key variable of interest					
Parental marital status					
remained married	0.093** (0.037)	0.545** (0.219)	0.278 (0.413)	0.487*** (0.184)	0.652** (0.286)
otherwise	base	base	base	base	base
Parent's control variables in childhood					
Parental education					
less than high school	base	base	base	base	base
high school	0.003 (0.074)	0.026 (0.077)	0.013 (0.078)	0.023 (0.076)	-0.073 (0.091)
some college	0.171** (0.080)	0.200** (0.083)	0.183** (0.086)	0.196** (0.082)	0.033 (0.096)
college or above	0.211*** (0.080)	0.235*** (0.082)	0.221*** (0.083)	0.232*** (0.081)	-0.097 (0.100)
Ln(Parental household income)	0.273*** (0.038)	0.166*** (0.061)	0.229** (0.105)	0.180*** (0.055)	-0.026 (0.077)
Child's control variables in adulthood					
Years of child's work experience	0.020** (0.009)	0.014 (0.009)	0.018* (0.010)	0.015 (0.009)	0.020 (0.012)
Square of years of child's work experience	✓	✓	✓	✓	✓
Child's gender					
female	base	base	base	base	base
male	0.328*** (0.035)	0.343*** (0.036)	0.334*** (0.039)	0.341*** (0.036)	0.320*** (0.047)
Child's region	✓	✓	✓	✓	✓
Child's race	✓	✓	✓	✓	✓
Pr(Child employed)	✓	✓	✓	✓	✓
Year dummies	✓	✓	✓	✓	✓
Descendant FE	X	X	X	X	✓
Number of obs.	4,054	4,054	4,054	4,054	4,054
R-squared	0.159	0.123	0.153	0.131	0.038

Notes: ***p-value<0.01; **p-value<0.05; *p-value<0.1.
Clustering in family standard errors in parentheses.
✓ : variable included in model; X: variable not included in model.
IV_1: using no fault divorce law as IV.
IV_2: using parent's religious preference as IV.
IV_3: using both as IVs.

5 HETEROGENEITY OF PARENTAL MARRIAGE EFFECT

The parental marriage effect is neither identical for all parental families nor for all children. It varies with different parental factors and child characteristics. The theoretical model predicts that it increases with parental income, and it is different between sons and daughters. In this part, I tested the predictions and investigated the heterogeneous properties of the parental marriage effect by including the interaction terms of parental marital status and other variables in the model. It turned out that the pattern of heterogeneity of the parental marriage effect is in agreement with the theoretical model and Hypothesis H2. The earnings gap becomes larger and more significant as parental income increases (Figure 5). As is shown in Figure 6, the earnings gap is larger and more significant for workers who have highly educated parents. Figure 7 shows that the parental marriage effect on the child's earnings is only substantial and statistically significant for the sons. The child's earnings-work experience profile is significantly different between the two parental marital groups at the range from 7 to 22 years of experience (Figure 8).



6 MECHANISM: DECOMPOSITION OF PARENTAL MARRIAGE EFFECT

The child's educational attainment and marital status are the endogenous mediator variables that explain the mechanism through which parental marital status affects the child's earnings. I decomposed the total parental marriage effect into the direct effect and the indirect effect using mediation analysis. The indirect effect through the "investment in child's education" channel is 0.049.

The indirect effect through the "intergenerational marriage persistence" channel is 0.011. The total indirect parental marriage effects are 0.060, which accounts for 76.9% of the total effects.

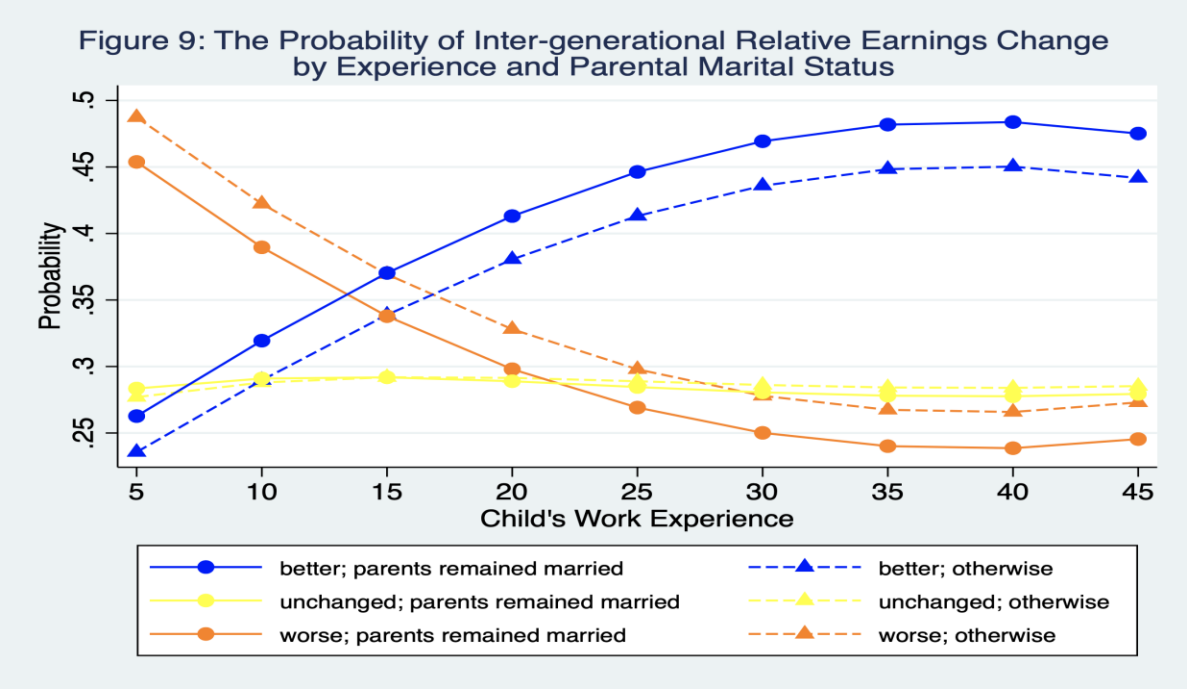
Table 7: The decomposition of the total effects of parental marital status on child's earnings

Direct effect $(\hat{\beta}_1)$	Indirect effect through "Investment in child's education" channel $(\hat{\gamma}_1 \times \hat{\beta}_9)$	Indirect effect through "Marriage attitude transmission" channel $(\hat{\lambda}_1 \times \hat{\beta}_{10})$	Total indirect effects $(\hat{\gamma}_1 \times \hat{\beta}_9 + \hat{\lambda}_1 \times \hat{\beta}_{10})$	Total effects $(\hat{\beta}_1 + \hat{\gamma}_1 \times \hat{\beta}_9 + \hat{\lambda}_1 \times \hat{\beta}_{10})$
0.018 (0.032)	0.049*** (0.011)	0.011*** (0.003)	0.060*** (0.011)	0.078** (0.034)

Notes: ***p-value<0.01; **p-value<0.05; *p-value<0.1.
Clustering in family standard errors in parentheses.

7 PARENTAL MARITAL STATUS AND INTERGENERATIONAL RELATIVE EARNINGS CHANGE

The intergenerational relative earnings change is defined as the change of the earnings quintiles between parents and children. I used the ordered dependent variable regression model to estimate the parental marriage effect on the intergenerational relative earnings change. Figure 9 shows the "parents remained married" group of children always have a higher probability than their counterparts to improve their relative earnings. Children from intact families are also less likely to become worse in the relative earnings position than their parents. Having an intact family in childhood lowers the probability of the relative intergenerational earnings worsening by 3.0% and increases the probability of a relative earnings improvement by 3.1%.



8 CONCLUSION

The parental marriage effect on the child's earnings is 0.343 in simple OLS, 0.078 in multiple OLS, 0.098 in DFE, 0.487 in IV, and 0.652 in DFE+IV. Taking the estimate from DFE+IV as an example, children of the prime working age in the US who grew up in families where their parents remained married earn 65.2% more than their counterparts reared by divorced or separated parents, holding other factors constant. A successful parental marriage not only increases the child's earnings in absolute value, but it also has a positive and significant effect on the intergenerational relative earnings improvement. The disparity and the mobility in the child's earnings demonstrate the power of a successful parental marriage.

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HP's Restructuring Charges of the Past Two Decades

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ABSTRACT
Restructuring charges are the costs a company incurs during corporate restructuring. They are considered one-time expenses and shown as one separate line in the section of income from continuous operations. This study examines HP's annual recurring "one-time nonrecurring" restructuring charges in the past two decades. Evidence strongly suggests that HP abused restructuring charges to manage earnings to conceal its real economic performance and manipulate the market.

Keywords
Restructuring charges, earnings management, big bath, cookie jars, reserve reversal, income shifting, classification shifting

Data Availability
Data are available from public sources identified in the paper.

1 INTRODUCTION

Companies incur costs and take charges when they reorganize. Increasingly, companies take a "big bath" to included normal operating costs in their restructuring charge and "clean up" their balance sheet. What motivates companies to overstate these charges? When earnings take a big hit because of restructuring charges, corporate boards and investors typically looks beyond the one-time loss and focuses on future earnings. Wall Street's reactions are, in general, positive. The later reversal or addback of the reserve will become a new source of "income" to boost future earnings, an additional benefit to management as earnings are often used as a benchmark for performance and executive compensation.

This study investigates HP's reported restructuring charges of the past two decades. Based on HP's financial statements and related notes, HP has turned one-time, non-recurring restructuring charges into an annual, or virtually quarterly to be more exact, recurring practice, making a mockery of the so-called "one-time non-recurring restructuring charges". The timings are suspect, and the magnitude smells "big bath".

Restructuring charges are the costs incurred by a company whey it reorganizes the operations of its business to improve the overall efficiency and effectiveness and to pursue better longer-term profits. These charges included cost to furlough or terminate employees (and related benefits such as pension), costs to close existing plants or relocate, writing off or sale of assets or asset/goodwill impairments, acquiring new machinery or equipment, and/or diversifying existing business. Companies undergo restructuring due to various reasons. The reasons may be mergers and acquisition, selling off a unit, implementing new production technologies or systems, moving into new markets or new locations etc.

Academics have general consensus with practitioners and regulators in regard to the earnings management through restructuring charges by corporate America, and its subsequent reversals and adjustments. Academics differ from practitioners and regulators as to how pervasive and severe that problem is. The overall results from this study on HP's reported restructuring charges are consistent with firms using restructuring accrual reversals to manage earnings, and in an alarming scale.

2 HP'S RESTRUCTURING CHARGES FROM YEAR 2000 TO 2018

HP started to report restructuring charges as a separate line item in the income from operations section of the income statement in 2001, with year 2000 data co-listed for comparison purpose, after the publication of EITF Issue No. 94-3. This study examines HP's restructuring charges from year 2000 to 2018. What are the major components of HP's restructuring charges? Take fiscal year 2001 for example, the charges consist of 1) employee severance and other employee benefits related to the planned termination, 2) costs related to the consolidation of excess facilities, and 3) costs for various site shutdowns resulting from

strategic management decisions. Other common restructuring charges for HP are asset write down and goodwill and intangible assets impairment losses, based on HP's publicly available financial statements.

Table 1 demonstrates how HP reports its "restructuring charges" from 2000 to 2014. Table 2 reports HP's "restructuring charges" from 2012 (when Meg Whitman was hired as CEO) to 2015 (the year HP was split into HP, Inc. and HP Enterprise). Table 3 shows the restructuring charges of HP, Inc. and HP Enterprise after the split, for comparison purpose.

Table 1: HP Restructuring Charges 2000 – 2014 (in millions)

Year	Earnings from operations (before interest and taxes)	Restructuring charges	Earnings from operations before restructuring charges	Restructuring charges/Earnings from operations before restructuring charges
2000	4,025	102	4,127	2%
2001	1,439	384	1,823	21%
2002	(1,012)	1,780	768	232%
2003	2,896	800	3,696	22%
2004	4,287	114	4,401	3%
2005	3,473	1,684	5,157	33%
2006	6,560	158	6,718	2%
2007	8,719	387	9,106	4%
2008	10,473	270	10,743	3%
2009	10,136	640	10,776	6%
2010	11,479	1,144	12,623	9%
2011	9,677	645	10,322	6%
2012	(11,057)	2,266	(8,791)	26%
2013	7,131	990	8,121	12%
2014	7,185	1,619	8,804	18%

(All HP 2000 – 2018 Annual Reports are available at http://h30261.www3.hp.com/financial/annual-reports-and-proxies.aspx)

Three things come to the mind immediately.

1. Look at year 2002, without restructuring charges, HP's earnings from operations is a profit of $768 million dollars; with restructuring charges, HP turned into a loss of $1,012 million. During the five-year period 2001 to 2005, HP's average restructuring charges is 30% of its reported earnings from operations before restructuring charges. What happened during this period 2001 to 2005? In September 2001, HP announced an agreement with Compaq to merge the two companies. In May 2002, HP officially merged with Compaq. For years, the merger did not work as expected. In January 2005, HP's board asked Fiorina to resign as chair and chief executive officer of the company. Mark Hurd of NCR Corporation took over as CEO and president, effective 1 April 2005. It is often reported in the press that companies often purposely take a "big bath" when there are mergers and acquisitions or management changes or the financial results are dismal. By taking a big hit in current year's income statement and cleaning up the balance sheet, management are poised to substantially boost future periods' earnings. What HP did from 2001 to 2005 is, without doubt, another classic example of "big baths".

2. What really is a 'restructuring charge'? Isn't it a one-time cost that must be paid by a company when it reorganizes? HP reported 'restructuring charge' every year and in hundreds of millions of dollars from 2000 to 2014 as shown in the table above. 'Restructuring charges' becomes recurring and permanent, as opposed to one-time noncurrent?

3. Managers have huge leeway in deciding when to recognize restructuring charges, what to include in the restructuring charges, and how much to record as restructuring charges. Companies may deliberately report a smaller or larger restructuring expense to manipulate current and future earnings. HP's practice, as well as that of many other companies, of reporting restructuring charges suggests strongly that corporate America is abusing 'restructuring charge' to manage earnings and manipulate the stock markets, even after the publication of EITF Issue No. 94-3 and SFAS No. 146.

Table 2: HP & HPE (2015) Restructuring Charges 2012 – 2015 (in millions)

Year	Earnings from operations (before interest and taxes)	Restructuring charges	Earnings from operations before restructuring charges	Restructuring charges/Earnings from operations before restructuring charges
2012	(11,057)	2,266	(8,791)	26%
2013	7,131	990	8,121	12%
2014	7,185	1,619	8,804	18%
2015	5,471	2,276	7,747	29%
HPE	1,523	954	2,477	39%
2013-15	10,253	8,105	18,358	44%

From 2012 to 2015 – the four years since Meg Whitman became the CEO of HP on September 22, 2011 till HP's split into HP, Inc. and HP Enterprise, HP's total reported earnings from operations totaled $10,253 million, and its total restructuring charges was $8,105 million, almost as much! These restructuring charges is 44% of the earnings from operations before restructuring charges during the four-year period 2012 to 2015!

On August 6, 2010, CEO Mark Hurd resigned and HP's stock continued to drop by about a further 40% (including 25% on one day, August 19, 2011). On September 22, 2011, the HP Board of Directors appointed Meg Whitman as the CEO of the company. After Meg Whitman took over HP, the first thing that caught people's eyes was that HP announced that it will take a $1.5-$1.7 billion restructuring charge, as compared to the $1 billion it originally disclosed. On top of that HP said that it would take an $8 billion write-down of its $14 billion acquisition of EDS in 2008. Without the write-down and restructuring charges, HP's earnings from operations (before interest and taxes) should be flat, or a small loss. With the write-down and restructuring charges, HP's earnings from operations turned into a big loss of more than $11 billion. Quite a big bath, isn't it?

Table 3: HP & HPE (in bold) Restructuring Charges 2015 – 2018 (in millions)

Year	Earnings from operations (before interest and taxes)	Restructuring charges	Earnings from operations before restructuring charges	Restructuring charges/Earnings from operations before restructuring charges
2015	5,471	2,276	7,747	29%
HPE	**1,523**	**954**	**2,477**	**39%**
2016	3,549	205	3,754	5%
HPE	**3,903**	**417**	**4,320**	**10%**
2017	3,519	362	3,881	9%
HPE	**625**	**417**	**1,042**	**40%**
2018	4,064	132	4,196	3%
HPE	**1,858**	**19**	**1,877**	**1%**

On October 6, 2014, Hewlett-Packard announced it was planning to split into two publicly traded companies: HP Inc. and Hewlett Packard Enterprise. Meg Whitman continued to serve as chairman of HP Inc. and CEO of Hewlett Packard Enterprise. On July 26, 2017, Whitman resigned as Chairwoman of HP Inc.'s board of directors, and remained as CEO of Hewlett Packard Enterprise. For both HP, Inc. and HPE, the game of restructuring charges continues, especially for HPE. Three out the four years since the split, HPE reported 39%, 10%, and 40% of restructuring charges over earnings from operations before restructuring charges!

3 SUMMARY

Arthur Levitt (1998), former Securities and Exchange Commission's Chairman described Earnings Management as "an effort among the issuers of financial reports (managements and boards of directors, who have the authority to specify the contents of the report) to satisfy consensus earnings estimate and project a smooth earnings path". There are incentives for managers to manipulate reported earnings, such as meeting contractual requirements, pumping up stock price, or enhancing performance-

based compensation. Market incentives to manage earnings occur when there is a link between reported earnings and the company's market value. Regulatory incentives to manage earnings occur when managers may influence the actions of regulators and government officials and minimizing political scrutiny and the regulatory costs. Contractual incentives to manage earnings occur when contracts between a company and other parties depend on accounting numbers to protect their exchanges such as debt covenants, management compensation plans, executive job security, and union negotiations.

This study examines HP's reported restructuring charges of the past two decades. HP incurs and recognizes restructuring charges from 2000 to 2018 annually, often in the hundreds of millions, even billions, of dollars. Evidence strongly suggests that HP has turned one-time, non-recurring restructuring charges into a handy tool for earnings management. There are signs of "big bath" and "cookie jar" everywhere.

In such circumstances, financial analysts and investors cannot just brush aside "restructuring charges", as they used to, as one-time nonrecurring, and thus of low or minimal information content. Financial analysts and investors have an enhanced urgency to gather and scrutiny whatever information they can obtain and evaluate the true economic reality of corporate "restructuring charges". The major source remains with the management discussion and analysis (MD&A) and the income statement and its accompanying notes. The reality is, not all restructuring charges are the same. And adjusting and recasting the reported earnings is rightfully called for, to better understand a company's true performance and fair market value.

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