

The Out-of-Sample Alpha of Just Stocks*

Creating Shareholder Value from Just Business Behavior

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Executive Summary

- In first year of live trading following the release of JUST Capital's inaugural rankings of just business behavior, highly-ranked corporations showed significantly higher return and lower risk than low-ranked ones.
- Top JUST score-quintile stocks exhibited 14% higher annualized return over the period, 7% lower volatility, and 11% lower betas than bottom-quintile stocks.
- Controlling for Fama-French exposures, top JUST score-quintile stocks generated 3.5% annual out-of-sample alpha, while bottom-quintile stocks experienced -7.1%; 76% of the Q5-Q1 outperformance can be explained by alpha.
- Strong worker pay & benefits and worker treatment scores significantly reduce stock volatility and drawdowns. Leadership and ethics and lower environmental impact are associated with higher ROE and stock market return.
- The market performance of companies with top JUST scores is consistent with meaningful shareholder value creation from just business behavior. JUST Capital's JULCD index captures these alpha attributes with low tracking error versus the Russell 1000 index (258 bp annualized outperformance with 3.1 information ratio).

1.0 Background and Outline

JUST Capital¹ publicly released its first annual corporate rankings on November 30th, 2016. The rankings provide a quantitative scorecard on the just business behavior of the majority of Russell 1000 index constituents. The methodology² employs polling to identify and weight the business issues that matter most to the U.S. public, and a variety of corporate metrics to score individual companies on those issues. The goal is to provide an assessment of corporations' overall just business behavior, as well as their performance on individual stakeholder issues such as worker pay and benefits, product attributes, community wellbeing, and environmental impact that have been identified as important in nationwide polling.

This article examines the out-of-sample risk and return characteristics of JUST Capital-ranked stocks, segmented by their overall scores, in live trading through the 2017 release of the second annual JUST Capital rankings. The period under study is slightly over a year: November 30, 2016 through December 12, 2017. This analysis builds upon our two previous studies of the historical performance of equities and equity indexes constructed using the JUST Capital rankings (Cortina 2017). While those studies focused on performance prior to the release of JUST Capital's inaugural rankings and could be

*I thank David Vogel (Voloridge Investment Management), Pedro Matos (University of Virginia's Darden School of Business), and my colleagues at JUST Capital for their comments and suggestions. Any errors are my own.

¹www.justcapital.com

²www.justcapital.com/2016methodology and JUST (2016).

subject to look-ahead bias, this study focuses entirely on live performance subsequent the release of the 2016 rankings. The raw data used by JUST Capital in the calculation of its 2016 rankings are all dated no later than September 30th, 2016.

There exists a growing body of research from the Environmental, Social and Governance (ESG) investment community that shows that the stocks of companies with high ESG scores are less exposed to fundamental and market risks that are not typically captured by traditional financial analysis and statistical risk models. For instance, in the U.S., (De and Clayman 2015) there is a significant negative correlation between Thomson Reuters ESG ratings and stock volatility. Globally, AQR (Dunn et al. 2017) show that stocks in the highest quintile of MSCI ESG scores have significantly lower volatility and betas compared with those in the bottom quintile.

As in our previous study, we segment the 894 stocks scored in JUST Capital's 2016 rankings³ by their overall JUST score as well as their 10 driver sub-scores. The driver scores facilitate a more fine-grained understanding of the individual ESG attributes that are empirically most impactful to investors, as measured by return and risk.

Applying a framework similar to AQR's, in sections 2.0–2.3 we find statistically significant evidence that stocks in the top quintile of JUST scores delivered superior return and risk attributes compared with lower-ranked companies. For instance, we find significant differences between quintile 5 (Q5) and quintile 1 (Q1) stocks in all six financial metrics we studied. In particular, Q5 stocks exhibited 14% higher annualized return over the period, 7% lower volatility and 11% lower betas (-0.13 points) than Q1 stocks. Furthermore, Q5 stocks experienced 4% shallower average drawdowns and reported 7% higher 2017 ROE than Q1 companies. While the period under study here is shorter, these findings are directionally consistent with those of a Merrill Lynch study covering U.S. companies over 2005-2015 (Subramanian 2016) and also show a greater degree of risk reduction than AQR's study.

Importantly, Fama-French 3-factor time-series regressions in section 2.4 show that the Q5–Q1 outperformance is the result of alpha, not value or size factors. The alpha term on the Q5 regression is 3.5% on an annual basis and -7.1% in the Q1 regression, based on monthly-rebalanced equal-weight quintile portfolios. Accordingly, there is twice as much benefit from avoiding low-ranked companies as there is from investing in high-ranked ones.

The analysis of individual sub-scores composing the overall JUST score in section 2.5 shows that strong performance on worker treatment and worker pay provide significant risk mitigation through lower volatility and smaller average drawdowns. In addition, the leadership & ethics driver is significantly associated with lower betas and higher ROE. Finally, among the non-financial metrics, strong performance on the environmental impact driver was significantly associated with a higher stock market return. In 21 out of 22 t-tests of individual sub-scores that showed significance, the direction was consistent with more just companies providing better investor outcomes. The only driver that failed to show an effect on the six financial metrics was domestic job creation.

In section 3.0 we evaluate the performance of the JUST U.S. Large Cap Diversified Index (JULCD), an investable index designed by JUST Capital and calculated on its behalf by FTSE Russell. Over the same period, the JULCD index outperformed the Russell 1000 by 258 basis points, with lower volatility and drawdowns than the Russell 1000, and tracking error below 1%. Combined with its compelling social profile, JULCD's attractive out-of-sample financial attributes and high liquidity support investor usage as a core U.S. large capitalization allocation benchmark.

³On Nov 30, 2016 JUST Capital released the rankings of 897 companies. Two of these companies completed acquisitions immediately prior to the release of the rankings, and one on the day following the release of rankings (Lexmark on 11/29/2016, SolarCity on 11/21/2016, and AMSURG on 12/1/2016). Due to the absence of trading history in the period under study these three companies, and no others, were removed from this study.

1.1 Rapid Growth in Sustainable Investment Mandates

The investment resilience of sustainable and just companies supports the recent rapid growth in professionally-managed sustainable investment assets. For instance, the latest biennial review (GSIA 2017) from the Global Sustainable Investment Alliance (GSIA) indicates that in 2016 there were \$23 trillion in assets globally managed under responsible investment guidelines, a 25% increase since 2014. In the United States, the share of sustainable investments relative to total managed assets has grown to 22% from 18% over this period. Nonetheless, while investor appetite is growing, some⁴ have speculated that adoption has been slower than it could be because of the perception of lack of strong association between socially-responsible policies and the companies' financial performance. Accordingly, a better understanding of the returns and relative resilience of stocks selected using JUST Capital's methodology may be of interest to both asset owners and asset managers. In addition, as the pool of sustainable investment mandates grows, identifying the specific aspects of sustainability that contribute most to investment returns would likely be of interest to these investors.

2.0 Study of Market and Fundamental Metrics by Quintiles of JUST Scores

As this study covers a relatively short –approximately one year– period of live trading we focus on daily stock performance metrics over the period, as well as one fundamental metric covering the 2017 reporting year:

1. Total volatility (annualized standard deviation of daily total returns).
2. Beta versus Russell 1000 index (based on regression of daily total returns).
3. Beta-adjusted volatility, a measure of stock-specific volatility which excludes overall market movements (residual after removing beta-adjusted Russell 1000 return from item 1 above).
4. Average drawdown (average depth of drawdowns over the period). Drawdown defined as peak to subsequent trough percent decline, reset from every new peak.
5. Annualized total return over the period.

In addition, we include a measure of profitability:

6. Return on Equity (ROE for calendar year 2017, or latest reported fiscal year end as of March 2018.)

All market and fundamental data are sourced from Bloomberg.

The general approach to the assessment of all metrics is to divide the coverage universe into equal-sized quintiles based on their overall industry-relative JUST⁵ score and compare the within-quintile means of the six metrics.

To analyze the specific aspects of corporate responsibility that are most significant from a market risk/reward perspective, rather than segment by the overall JUST score, we segment by JUST Capital's driver scores. The driver scores are sub-scores quantifying corporate performance in ten categories such as worker pay and benefits, worker treatment, and environmental impact. The full list of drivers is shown on Table 3.

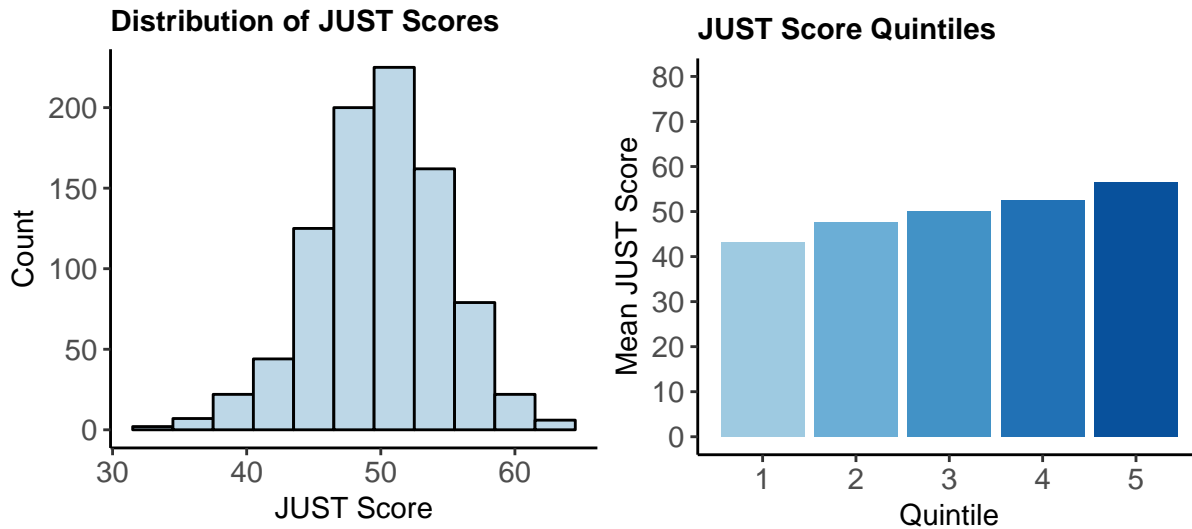
⁴Scepticism persists on 'ETFs for good' by Chris Flood, *Financial Times*. May 13, 2018.

⁵Note: in its second annual rankings released in December 2017 JUST Capital produced an "absolute" score across all companies in addition to the industry-relative score. That change does not affect this study; please see www.justcapital.com/methodology for the latest methodology.

2.1 JUST Capital's Overall Score

The histogram on Exhibit 1 shows the distribution of the overall JUST score. JUST Capital defines 50 as the performance of an average company relative to its industry. Higher scores represent more just performance. The bar chart in the same exhibit shows the quintile mean – top performers are assigned to Q5 while the lowest performers are assigned to Q1.

Exhibit 1: Distribution and Quintiles of JUST Scores



2.2 Metric Means by Quintiles of JUST Scores

Table 1 shows the within-quintile mean values of the six metrics. Overall, the results are consistent with quintile 5 companies exhibiting the lowest risk and highest return in live trading, while quintile 1 companies exhibit the converse.

Table 1: Mean of Overall JUST Capital Score and Six Financial Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	43.2	27.2	1.19	25.7	8.3	12.8	11.7
2	179	47.6	25.3	1.16	23.7	6.6	13.9	33.4
3	178	50.1	23.7	1.13	22.1	5.8	14.4	21.6
4	179	52.5	22.4	1.11	20.8	5.5	19.4	20.2
5	179	56.5	20.3	1.06	18.7	4.6	19.6	25.6

Note: For clarity of presentation, Vol, Adj Vol, Avg Drawdown, ROE, and Return have been multiplied by 100 on Tables 1 and 2.

- Total volatility: The volatility of Q5 companies is 6.9 percentage points, or 25%, lower compared with Q1 stocks. This difference is greater than the 10-15% difference found by AQR. The decrease in volatility moving through the five quintiles Q1 through Q5 is monotonic.
- Beta: The regression beta of Q5 companies is 0.13, or 11%, lower compared with Q1 stocks. This difference is again larger than the 3% gap found by AQR. The progression through the 5 quintiles is similar to the total volatility's.

- Beta-adjusted volatility: This measure is meaningful because it represents the risk that can not be hedged via overall market hedges. Q5 adjusted volatility is 7 percentage-points, or 27% lower, than Q1's, a slightly more pronounced difference than for total volatility.
- Average drawdown: The average drawdown of Q5 stocks is 3.7 percentage points smaller than that of Q1 stocks, a significant reduction in downside exposure. The progression across quintiles is similar to above.
- ROE: While ROE is a measure of financial performance and not typically viewed as a risk metric, it provides a measure of financial health. Q5 companies have an average ROE of 19.6%, 6.8% higher than Q1 companies. Progression across quintiles is monotonic⁶.
- Market return: The mean annualized total return of Q5 stocks is approximately 13.9% higher than for Q1 stocks, though the progression across quintiles is not monotonic, showing the overall highest return for Q2 stocks.

Exhibit 2 illustrates the quintile means of all six metrics and Exhibit 3 shows the improving risk profile of stocks as the JUST scores increases, based on volatility and drawdowns.

2.3 Significance Testing: All Six Metrics Show Significant Investor Benefit

We conduct t-tests of each of the six market metrics to assess the statistical significance of the differences between quintiles 5 and 1. Table 2 indicates that all six measures show significant differences between Q5 stocks and Q1 stocks at the 1% level.

Table 2: Quintile 5 - Quintile 1 t-Tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-6.94	-0.13	-7	-3.71	6.78	13.89
t-stat	-6.76	-2.61	-6.83	-3.96	2.76	4.57
p-value	0	0.01	0	0	0.006	0
Significance	***	***	***	***	***	***

Note: Welch Two Sample t-test. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

2.4 Fama-French Time-Series Regressions by Quintiles of JUST Scores

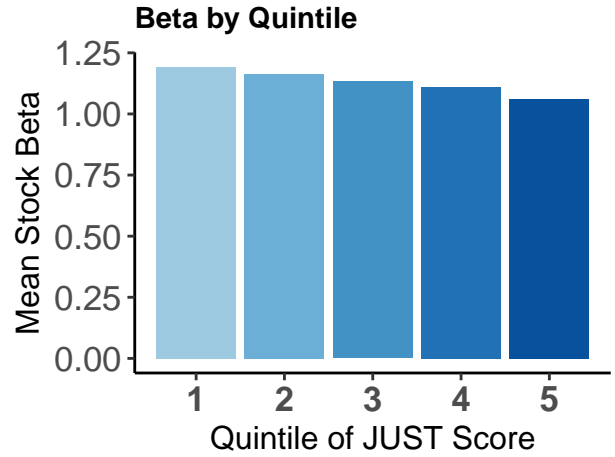
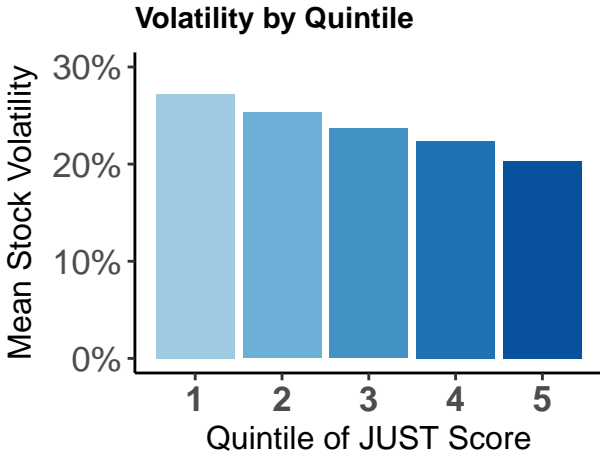
Section 2.3 showed a significant difference between the mean return of stocks in quintiles 5 and 1. In this section we perform a time-series regression of daily returns using the Fama-French (1993) factors. The purpose is to determine if the difference in returns between Q5 and Q1 stocks can be explained by the Fama-French market, size, or value factors, or should be associated with alpha. Exhibit 4 shows the 5 equal-weighted portfolios constructed using the overall JUST scores. The portfolios are rebalanced to equal-weights on a monthly basis, as well as when any stocks that stop trading during the period are removed from the portfolios. No additional stocks are added to the portfolios during the study period. As shown on Exhibit 4, the Q5 portfolio significantly outperforms the Q1 portfolio, while the Q2–Q4 portfolios cluster in between. The regressions are performed using the daily Fama-French 3 research factors downloaded from Kenneth French's data library⁷. Results shown on Table 4.

⁶Outliers were winsorized to 100% and -100%.

⁷http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Research

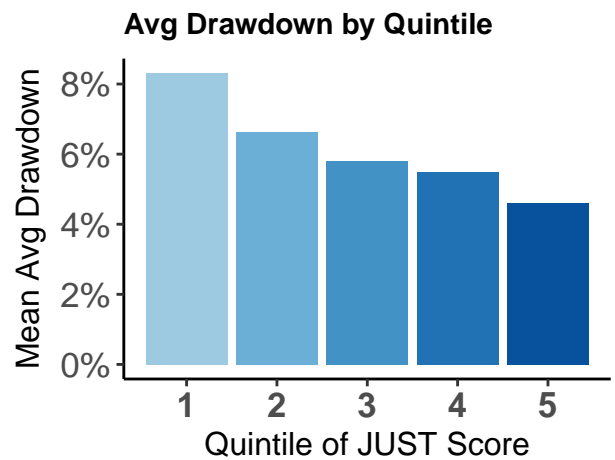
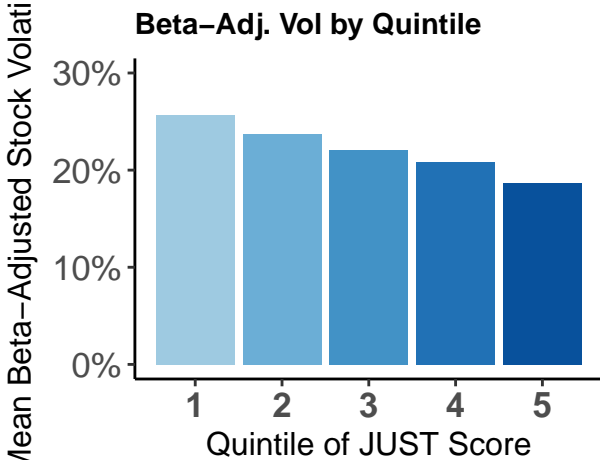
Exhibit 2: Risk/Return Metrics by Quintiles of JUST Scores

The charts below illustrate the variation in the six metrics across the JUST score quintiles.



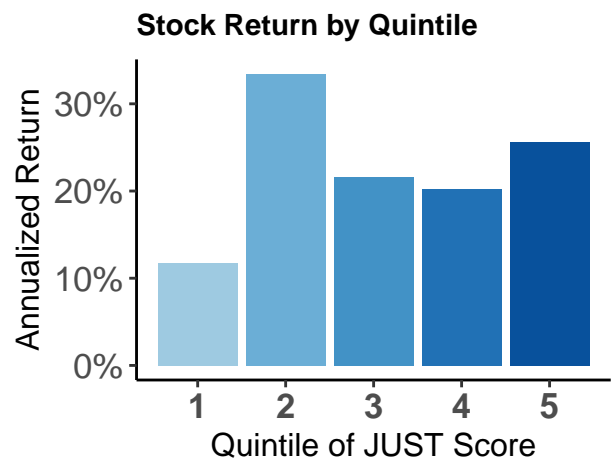
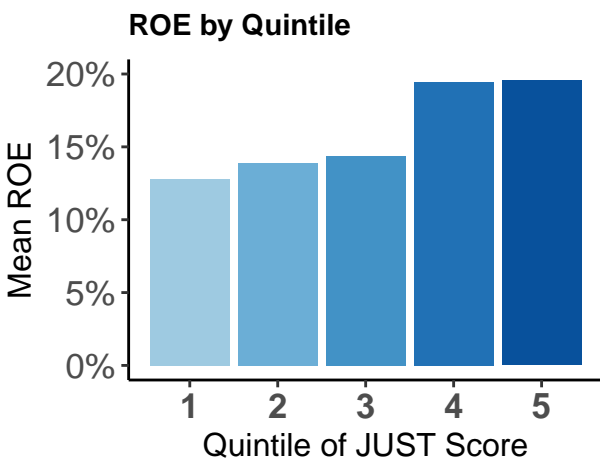
5: highest JUST score; 1: lowest JUST score

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Exhibit 3: Combined Risk Metrics by Quintiles of Overall JUST Score

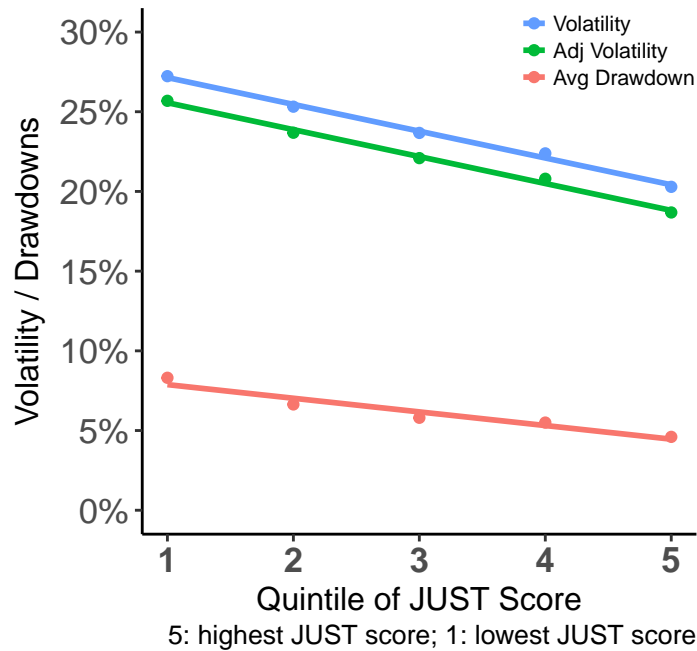


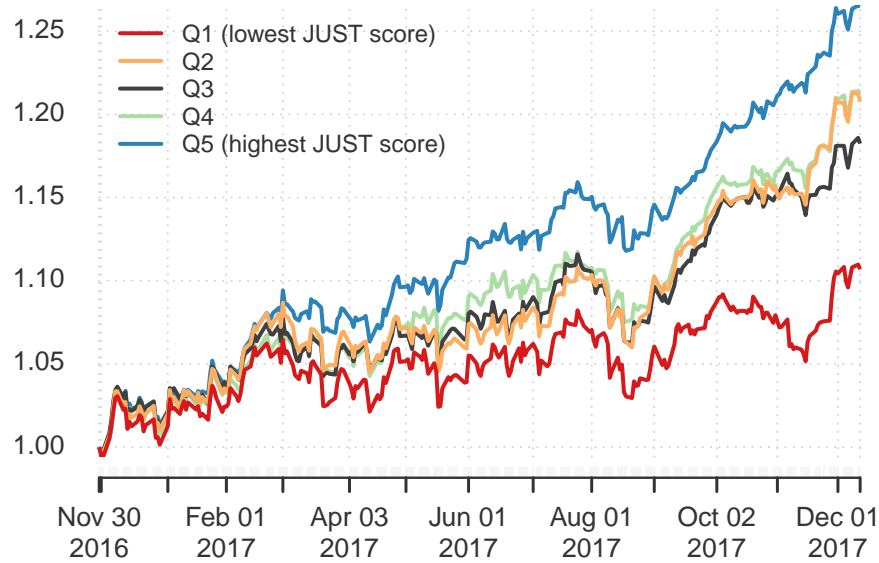
Table 3: Drivers of Just Business Behavior in JUST Capital's 2016 Rankings

Code	Driver	Weight in Overall JUST score (%)
PAY	Worker Pay and Benefits	25.5
TREAT	Worker Treatment	24.0
LEAD	Leadership and Ethics	17.2
CUST	Customer Treatment	7.4
PROD	Product Attributes	5.6
JOBS	Domestic Job Creation	5.6
ENV	Environmental Impact	5.0
SUPPLY	Supply Chain Impact	4.1
INVEST	Investor Alignment	3.9
COMM	Community Wellbeing	1.7

Source: JUST Capital.

Exhibit 4: Out-of-Sample Portfolio Performance by JUST Score Quintiles

2016-11-30 / 2017-12-12



All 3 factors are significant across the 5 quintiles, with positive loadings for the Small minus Big (SML) and High minus Low (HML) value factors. Most importantly, the Q5 portfolio shows a significant positive intercept (alpha) term while the Q1 shows a significant negative alpha term. Note that the alpha values on Table 4 are daily and not annualized. The annualized Q5 alpha is 3.5% outperformance. The annualized size of the negative alpha coefficient in Q1 is more than twice as large, 7.1% of annual underperformance. These coefficients are consistent with the thesis that high-JUST score, high-ESG stocks generate meaningful alpha, while stocks with poor performance on ESG metrics are significant underperformers, after accounting for value and size effects. In other words, approximately 76% of Q5’s outperformance over Q1 can be explained by alpha.

Table 4: Fama-French 3-Factor Model Time Series Regressions by JUST Score Quintile

	Quintile 5	Quintile 4	Quintile 3	Quintile 2	Quintile 1
Intercept (alpha)	0.00014* (0.00008)	0.00002 (0.00010)	-0.00007 (0.00012)	0.00001 (0.00011)	-0.00029** (0.00014)
Mkt-Rf	0.96359*** (0.01919)	0.96411*** (0.02321)	0.96770*** (0.02848)	0.98273*** (0.02724)	0.96394*** (0.03266)
SMB	0.07352*** (0.01894)	0.19193*** (0.02290)	0.21213*** (0.02811)	0.28141*** (0.02689)	0.34547*** (0.03224)
HML	0.05439*** (0.01576)	0.12185*** (0.01906)	0.13611*** (0.02339)	0.13356*** (0.02238)	0.14532*** (0.02683)
R ²	0.93234	0.91706	0.88388	0.90199	0.87035
Adj. R ²	0.93155	0.91609	0.88252	0.90084	0.86883
Num. obs.	260	260	260	260	260
RMSE	0.00127	0.00154	0.00188	0.00180	0.00216

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

2.5 Analyzing the Alpha of Individual Drivers of Just Business Behavior

Having established a supportive relationship between just business behavior and the risk/return metrics consistent –but more pronounced– than prior studies, we now exploit the granularity of the JUST Capital scores to narrow the focus to individual aspects of corporate responsibility. As presented in the 2016 JUST Capital ranking methodology, the overall score is a weighted average of 10 driver scores, shown on Table 3. Each of the drivers incorporates specific corporate responsibility metrics, and can be used to rank companies along that dimension. The weights of each of these drivers in the overall score are derived from JUST Capital’s polling of the American public. In the 2016 polling the drivers with the highest weights were worker pay and benefits (25.5%), worker treatment (24.0%) and leadership and ethics (17.2%). Table 5 shows the out-of-sample statistical significance of each of the driver scores with regard to the same risk/return metrics studied using the overall score. Note that while the “Investor Alignment” driver (3.9% weight in overall JUST score) is based only on data available prior to the start of the analysis period, it does include market performance and profitability metrics. Persistence or momentum in these metrics into the study period could explain their significance, when this driver is studied in isolation.

Table 5 and Exhibit 5 show that volatility and adjusted volatility are significantly reduced by stronger worker pay & benefits, worker treatment, leadership & ethics, product attribute and supply chain scores. Average drawdowns are mitigated most by worker pay & benefits and product attributes. Furthermore, the drivers most positively affecting ROE are worker treatment, leadership & ethics, environmental impact, and investor alignment. Beta was moderately reduced by strong leadership & ethics, while return was most enhanced by the investor alignment and environmental impact drivers. Overall, the market impact of the drivers is most notable for its risk-reduction effect, particularly the worker-focused drivers. In addition, the overall JUST score had the most significant impact across all six metrics.

Examining Table 5 by driver, we find that all but job creation are associated with higher alpha. While corporate performance in all of these drivers might be of interest to investors, worker pay and benefits, worker treatment, as well as leadership & ethics are particularly valuable as sources of alpha. Product attributes as well as environmental impact may also provide somewhat unanticipated portfolio benefits. The Appendix illustrates the impact of each of the ten drivers on the six risk and return metrics. It also identifies the components within each driver. Compared with the previous study of in-sample data, the main difference is that worker pay & benefits appear more significant out of sample.

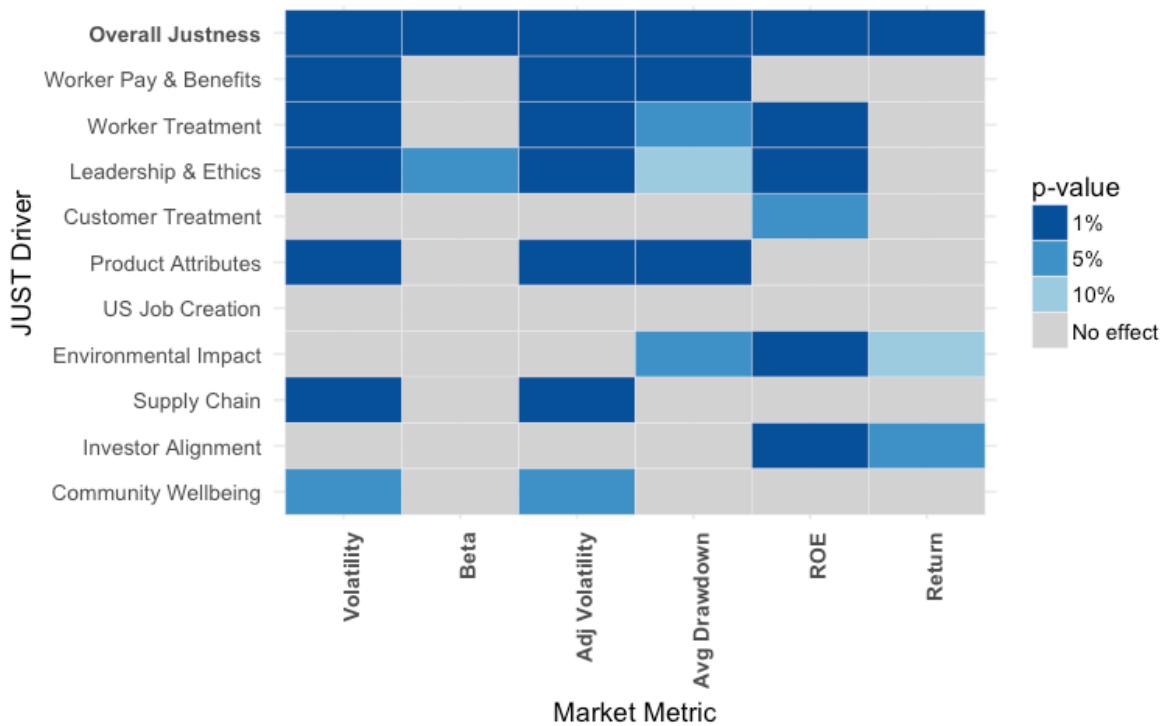
Investment managers wishing to further explore company performance, or change in performance, within each of these drivers can review the JUST Capital methodology to understand the specific metrics that constitute them. Companies identified as strong or improving performers in the highlighted drivers may be candidates for inclusion or overweighting in investor portfolios.

Table 5: Quintile 5 - Quintile 1 t-Tests for Drivers

Driver	Statistic	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
PAY	Q5 mean - Q1 mean	-3.97	-0.04	-4.02	-2.84	3.23	4.2
	t-stat	-3.66	-0.83	-3.72	-3.1	1.13	0.3
	p-value	0	0.407	0	0.002	0.26	0.761
	Significance	***		***	***		
TREAT	Q5 mean - Q1 mean	-5.3	-0.07	-5.45	-1.8	8.58	2.3
	t-stat	-5.37	-1.46	-5.51	-1.97	2.94	0.49
	p-value	0	0.146	0	0.049	0.004	0.626
	Significance	***		***	**	***	
LEAD	Q5 mean - Q1 mean	-3.48	-0.1	-3.43	-1.65	10.76	16.75
	t-stat	-3.31	-2.04	-3.24	-1.87	3.65	1.26
	p-value	0.001	0.042	0.001	0.062	0	0.209
	Significance	***	**	***	*	***	
CUST	Q5 mean - Q1 mean	0.06	0.04	-0.1	-1.08	6.46	5.03
	t-stat	0.06	0.84	-0.1	-1.31	2.38	1.64
	p-value	0.956	0.401	0.924	0.19	0.018	0.102
	Significance					**	
PROD	Q5 mean - Q1 mean	-4.55	-0.05	-4.72	-2.23	-1.62	3.79
	t-stat	-4.43	-0.88	-4.64	-3.42	-0.56	1.25
	p-value	0	0.381	0	0.001	0.574	0.212
	Significance	***		***	***		
JOBS	Q5 mean - Q1 mean	0.8	0.02	0.84	-1.39	-0.65	3.98
	t-stat	0.69	0.4	0.72	-1.44	-0.22	0.86
	p-value	0.489	0.688	0.472	0.15	0.826	0.391
	Significance						
ENV	Q5 mean - Q1 mean	0.21	0.03	0.14	-1.72	7.16	7.99
	t-stat	0.2	0.66	0.13	-1.97	2.63	1.77
	p-value	0.84	0.512	0.894	0.049	0.009	0.078
	Significance				**	***	*
SUPPLY	Q5 mean - Q1 mean	-2.5	-0.04	-2.52	0.45	2.51	-16.49
	t-stat	-2.6	-0.85	-2.62	0.56	0.83	-1.29
	p-value	0.01	0.394	0.009	0.574	0.41	0.198
	Significance	***		***			
INVEST	Q5 mean - Q1 mean	-0.95	-0.06	-0.84	-0.79	12.49	11.14
	t-stat	-0.93	-1.16	-0.83	-1.08	4.17	2.38
	p-value	0.353	0.246	0.409	0.283	0	0.018
	Significance					***	**
COMM	Q5 mean - Q1 mean	-2.69	-0.08	-2.66	-1.26	2.01	-2.65
	t-stat	-2.45	-1.58	-2.42	-1.53	0.69	-0.58
	p-value	0.015	0.115	0.016	0.127	0.494	0.564
	Significance	**		**			

Note: Welch Two Sample t-test. Significance: *** p < 0.01, ** p < 0.05, * p < 0.1

Exhibit 5: Out-of-Sample Impact of Driver Performance on Market Metrics



3.0 Live Performance of the JUST U.S. Large Cap Diversified Index (JULCD)

In conjunction with the release of its rankings, JUST Capital created the JUST U.S. Large Cap Diversified Index (JULCD). JULCD, shown on Exhibit 6, is an investable index designed to track the performance of U.S. large-capitalization companies that most closely align with the public’s definition of just business behavior. The index is rebalanced annually based on JUST Capital’s rankings, and includes the top 50% of ranked companies by industry. JULCD’s objective is to track the Russell 1000 index’s broad market exposure –making JULCD suitable for a core U.S. equity allocation– while including only the companies that rank highly on just behavior. The JULCD index is industry-neutral: constituents are reweighted so that, on its reconstitution date, the weight of each industry matches that of the Russell 1000, based on the ICB classification. Each JULCD constituent’s weight within its ICB industry is proportional to its market capitalization. The Index was launched on November 30th, 2016 with a base value of 1,000 and 438 constituent securities. The full index methodology is available on the JUST Capital website.

Tables 6 and 7 below show JULCD’s performance and risk metrics compared with the Russell 1000 over JULCD’s first year. Key highlights include:

- Annualized total return of 25.0%, 258 bp ahead of the 22.4% Russell 1000 return over the period.
- Annualized volatility of 6.8%, slightly lower than the Russell 1000’s.
- Very low tracking error (T.E.) of 0.8%.
- Compelling returns per unit of risk and tracking error (3.7 Sharpe and 3.1 Information Ratio)
- Better downside risk characteristics as measured by drawdowns and value-at-risk.

Exhibit 6: JULCD Out-of-Sample Total Return vs Russell 1000: Nov 30, 2016 - Dec 12, 2017

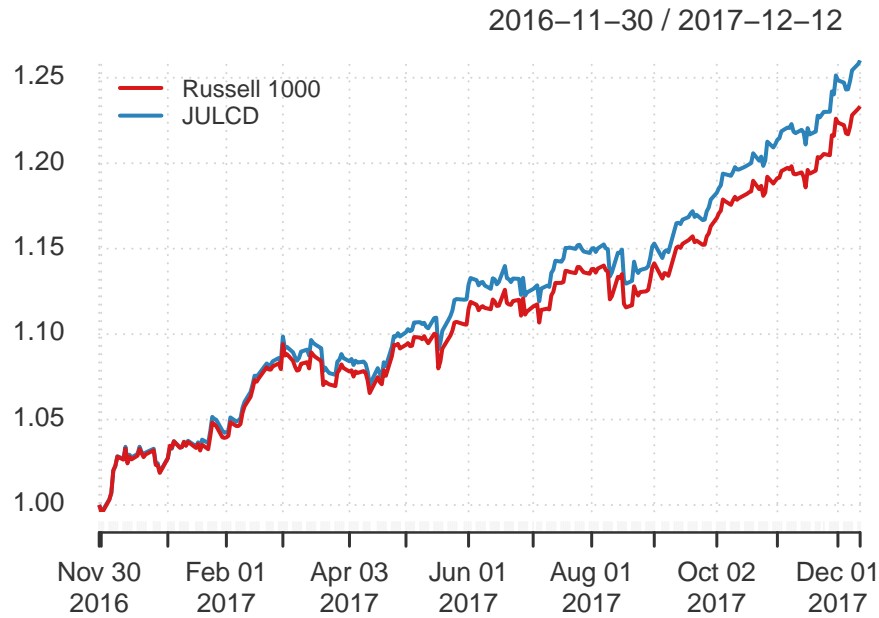


Table 6: JULCD Live Performance, Tracking Error, and Risk-Adjusted Ratios (%)

	JULCD	Russell 1000
Annualized Return	25.02	22.44
Annualized Std Dev	6.81	6.91
Annualized Tracking Error	0.82	0.00
Annualized Sharpe (Rf=0%)	3.67	3.25
Information Ratio	3.14	
Sortino Ratio (MAR = 0.081%)	0.01	

Table 7: JULCD Live Downside Risk Performance Data (%)

	JULCD	Russell 1000
Average Drawdown	0.51	0.54
Maximum Drawdown	2.58	2.62
Semi Deviation	0.31	0.31
Gain Deviation	0.30	0.30
Loss Deviation	0.31	0.32
Downside Deviation (MAR = 0.669%)	0.72	0.73
Historical VaR (95%)	-0.60	-0.62
Historical ES (95%)	-0.96	-0.98

MAR: Monthly Minimum Acceptable Return; VaR: Value-at-Risk; ES: Expected Shortfall.

JULCD’s out-of-sample financial attributes shown on Tables 6 and 7 are consistent with –and support– the conclusions of the analysis by JUST score quintile of section 2.0. Indeed, JULCD is mainly composed of stocks in quintiles 4 and 5 and has shown above-market return with lower risk than the Russell 1000, with tracking error below 1%. JULCD completed its first reconstitution on December 15, 2017 and is available on the Bloomberg and Thomson Reuters platforms.

In addition to its market performance metrics, JUST Capital has highlighted JULCD's social metrics. For example, compared with Russell 1000 companies excluded from the Index, 2017-18 JULCD constituents on average:

- Include twice as many companies that pay nearly every worker a living wage.
- Create U.S. jobs at a 20% greater rate.
- Employ twice as many workers in the U.S.
- Produce 45% lower greenhouse gas emissions per dollar of revenue.
- Paid 71% less in fines for consumer sales-terms violations.
- Give 2.3x more to charity.
- Paid 94% less in Equal Employment Opportunity Commission Fines.

4.0 Conclusion: Higher JUST Scores Add Alpha; Worker Pay, Worker Treatment, Leadership & Ethics Are Key Drivers of Risk Reduction

Supported by nationwide polling, JUST Capital's methodology scores companies on the issues that matter most to the American public. Not surprisingly, this public-opinion based approach encompasses a wider breadth of issues and places a greater importance on worker pay and benefits, worker treatment, leadership and ethics, and customer treatment, than most other ESG data providers. The analysis of the first year of out-of-sample performance of JUST Capital-ranked Russell 1000 constituents finds significant evidence that stocks in the top-quintile of JUST scores have superior risk/return characteristics compared with lower-ranked companies. In addition, the magnitude of the reduction in risk for more just companies is greater than that found by other studies using traditional ESG metrics. These results are consistent with meaningful shareholder value creation from just business behavior. We find significant economic value from long-only portfolios of high JUST score stocks or hedged portfolios long high JUST score and short low JUST score quintiles.

Segmenting by quintiles, top-ranked companies on overall JUST score show 14% higher annualized returns, 7% lower volatility, 11% lower beta, 4% shallower drawdowns, and 7% higher ROE than Q5 companies. Using Fama-French regressions to control for size and value effects we find 3.5% annualized alpha for Q5 companies and -7.1% for Q1 companies.

The analysis of individual drivers of just business behavior identifies pay & benefits, worker treatment, and leadership & ethics as focal points of risk reduction. A company's impact in the communities in which it operates and its product attributes are also associated with desirable investor outcomes. Note that the importance of a driver to society is not diminished even if it is not significantly associated with investment alpha in this analysis. This analysis was based on approximately one year of live trading performance and will be updated annually to explore the robustness of the results over time.

Appendix: Risk/Return Metrics for Ten JUST Drivers

Driver 1: Worker Pay & Benefits (PAY)

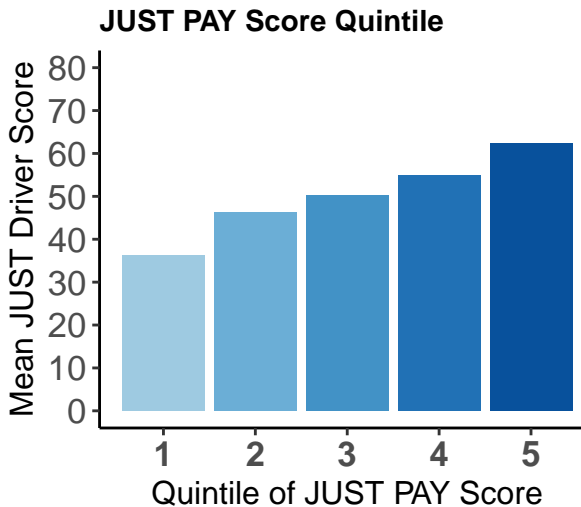
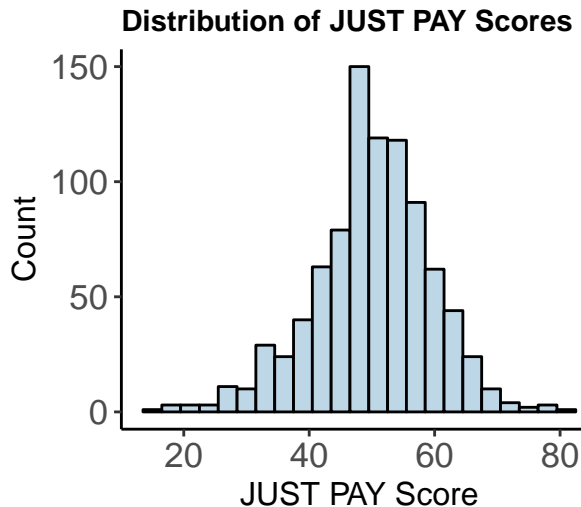
Components: Sponsors health insurance; Pays a fair wage for the industry and job level; Pays workers fairly compared to CEO; Pays a living wage; Helps workers prepare for retirement; Provides paid time off; Does not discriminate in pay.

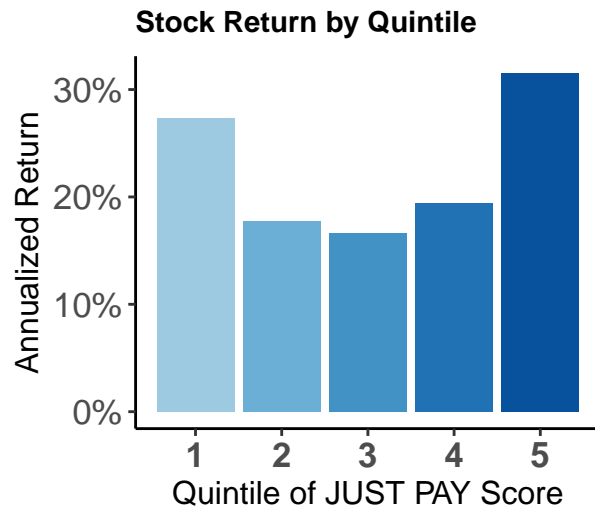
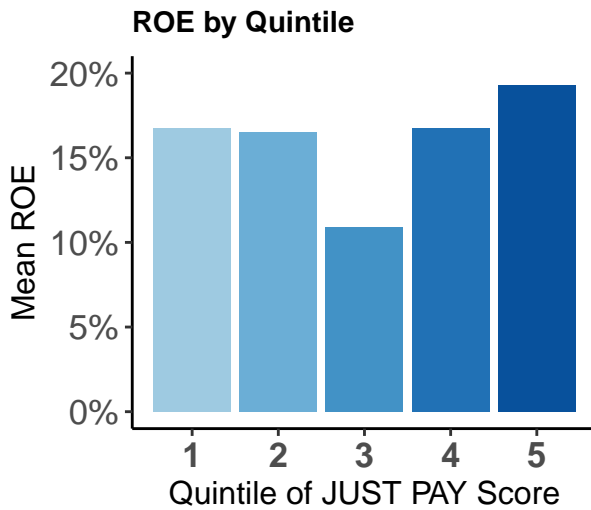
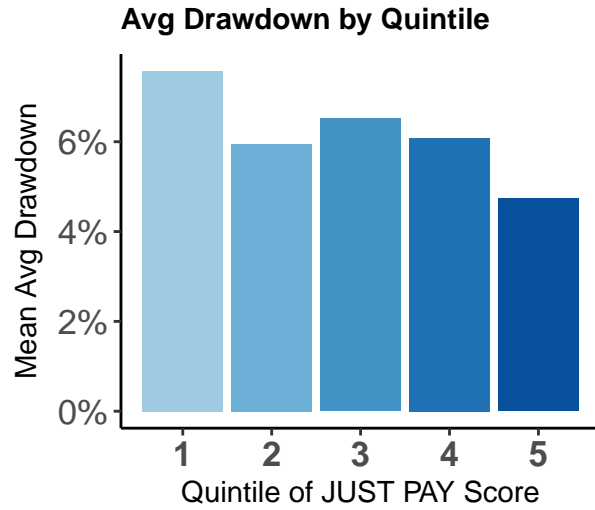
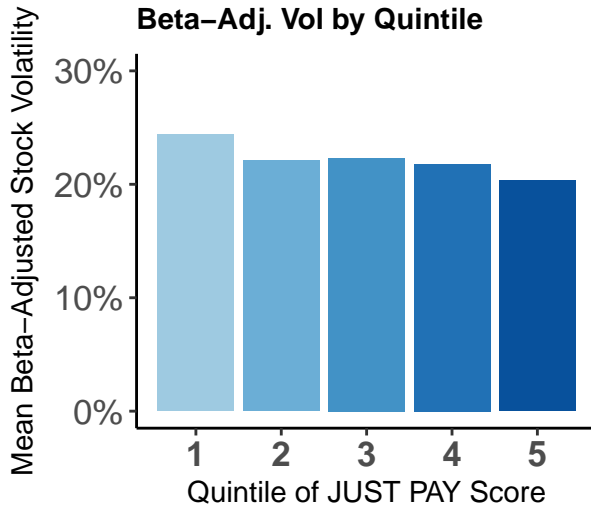
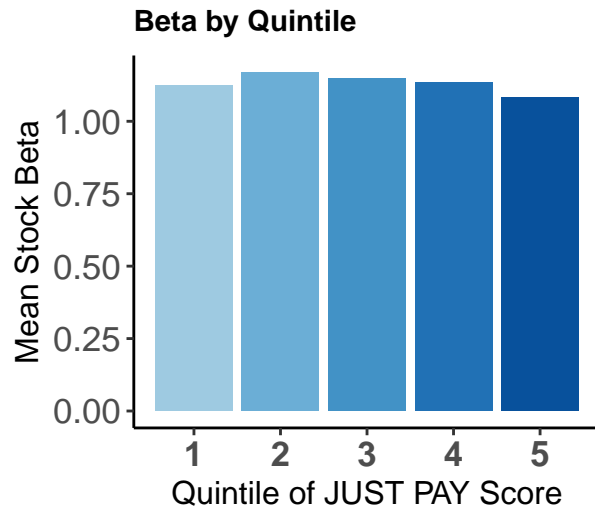
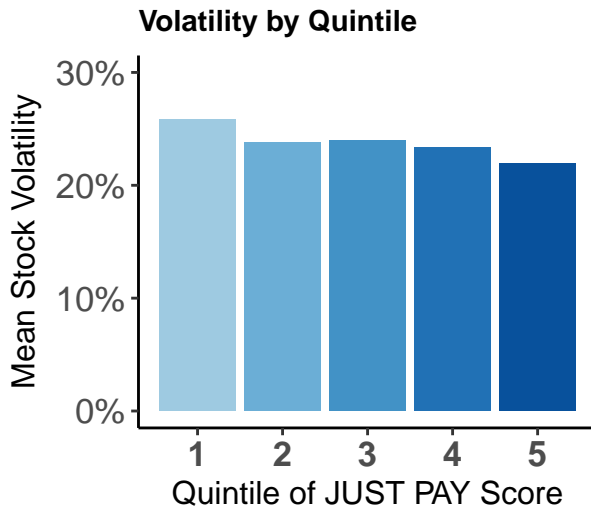
Table 8: Mean of PAY JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	36.2	25.9	1.13	24.4	7.6	16.7	27.33
2	179	46.2	23.8	1.17	22.1	5.9	16.5	17.71
3	178	50.3	23.9	1.15	22.3	6.5	10.9	16.62
4	179	54.9	23.4	1.13	21.8	6.1	16.7	19.41
5	179	62.4	21.9	1.08	20.3	4.7	19.3	31.53

Table 9: quintile 5 - quintile 1 PAY t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-3.97	-0.04	-4.02	-2.84	2.54	4.2
t-stat	-3.66	-0.83	-3.72	-3.1	1	0.3
p-value	0	0.407	0	0.002	0.318	0.761
Significance	***		***	***		





Driver 2: Worker Treatment (TREAT)

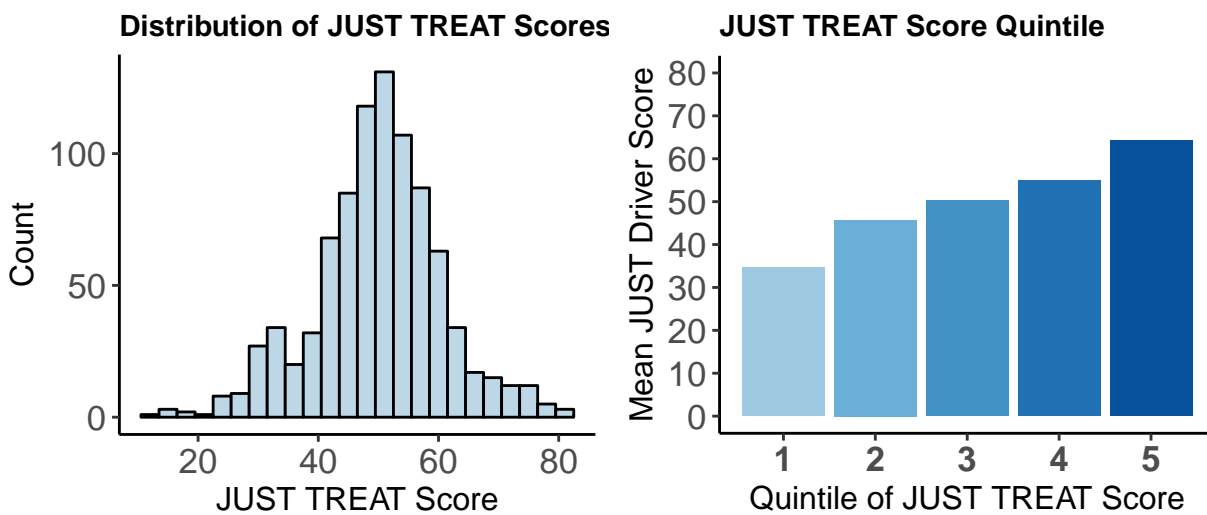
Components: Provides a safe workplace; Promotes work-life balance; Provides education and training; Does not discriminate in hiring, firing, and promotion practices; Handles grievances and layoffs fairly; Respects workers.

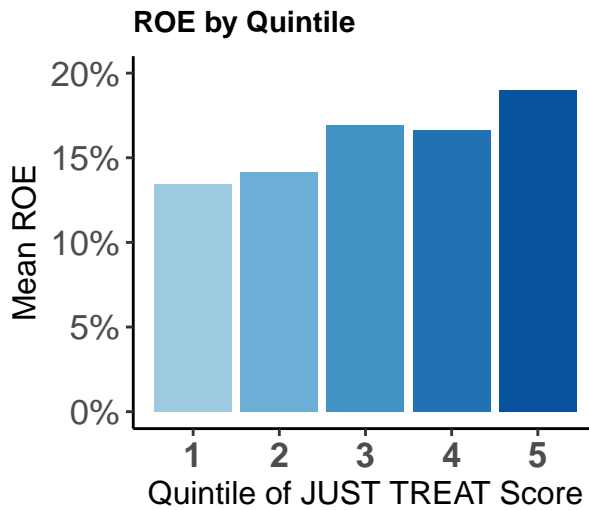
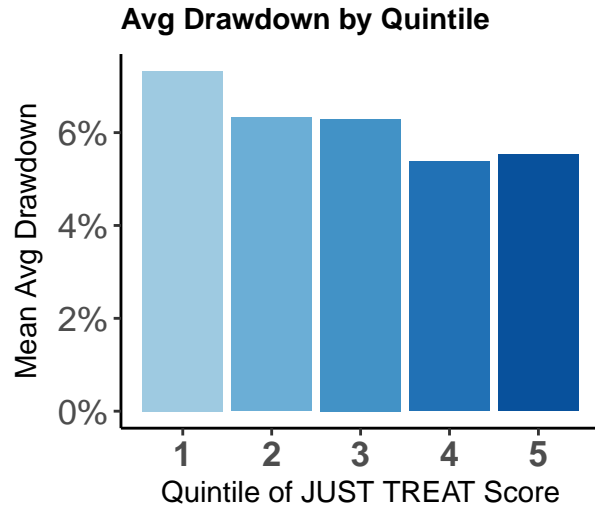
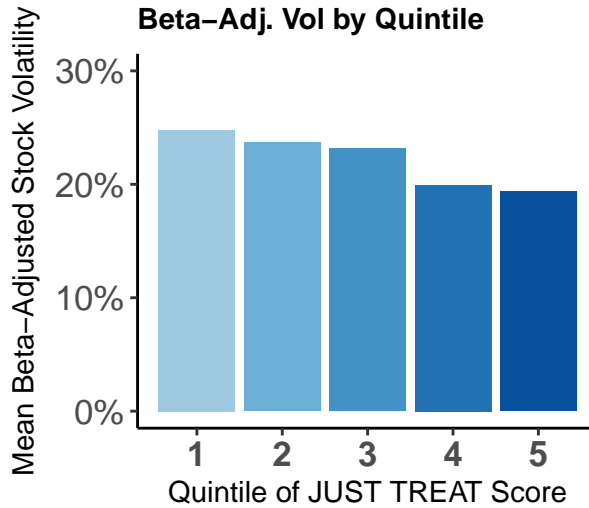
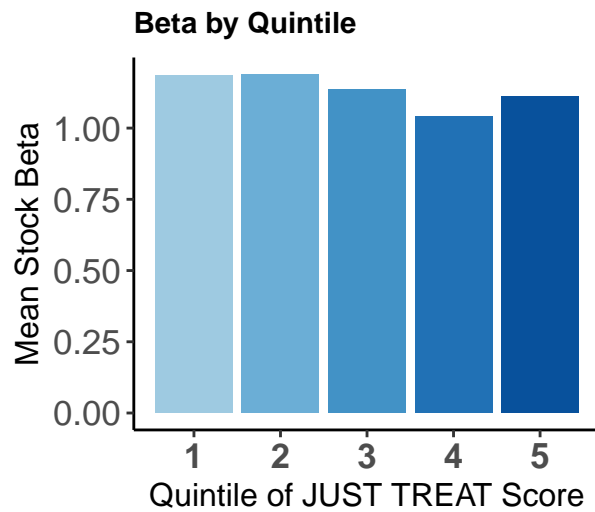
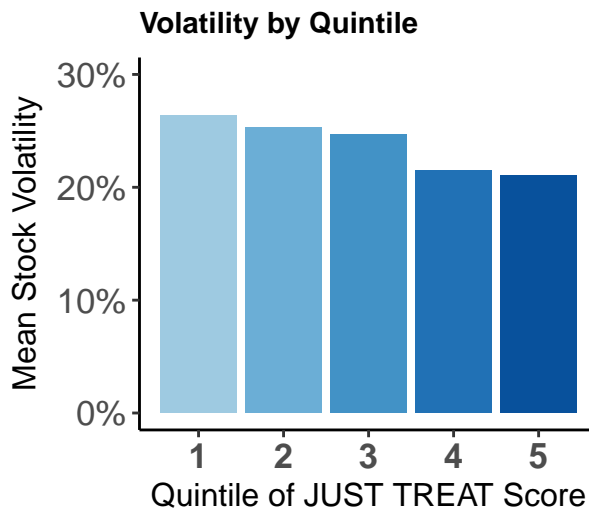
Table 10: Mean of TREAT JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	34.7	26.4	1.18	24.8	7.3	13.5	21.30
2	179	45.7	25.3	1.19	23.7	6.3	14.2	17.98
3	178	50.3	24.7	1.13	23.2	6.3	16.9	30.94
4	179	54.9	21.5	1.04	19.9	5.4	16.6	18.88
5	179	64.3	21.1	1.11	19.3	5.5	19.0	23.60

Table 11: quintile 5 - quintile 1 TREAT t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-5.3	-0.07	-5.45	-1.8	5.52	2.3
t-stat	-5.37	-1.46	-5.51	-1.97	2.21	0.49
p-value	0	0.146	0	0.049	0.028	0.626
Significance	***		***	**	**	





Driver 3: Leadership & Ethics (LEAD)

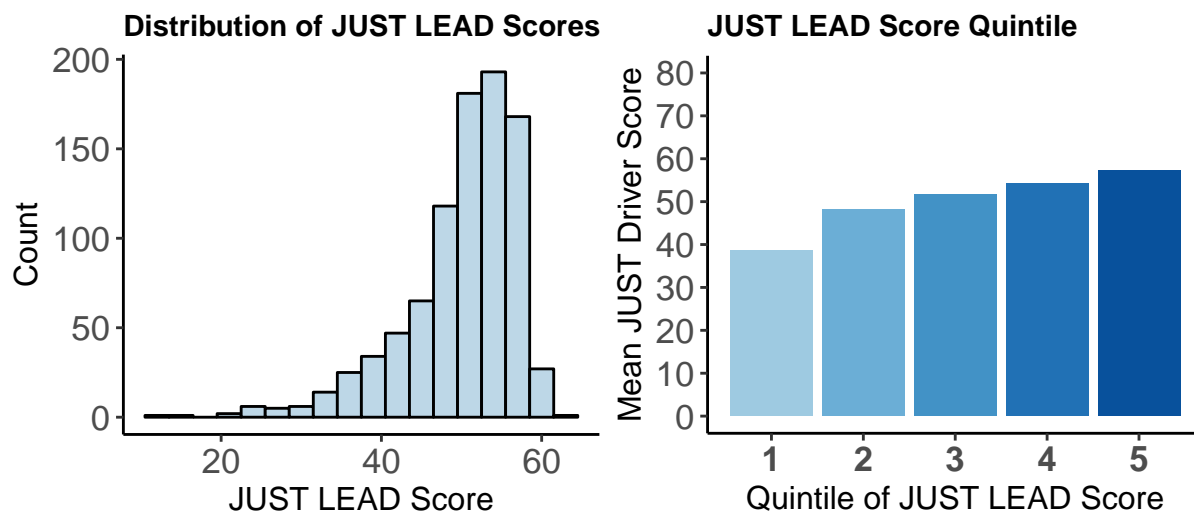
Components: Follows laws and regulations; Has leaders with integrity; Is truthful in advertising and labeling; Pays fair share of taxes; Minimizes political spending.

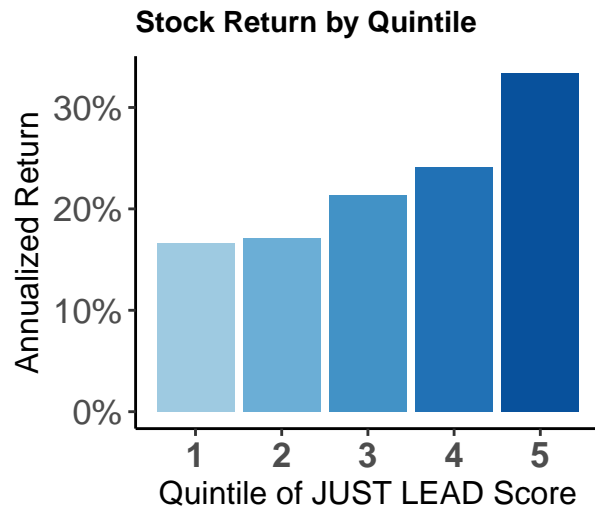
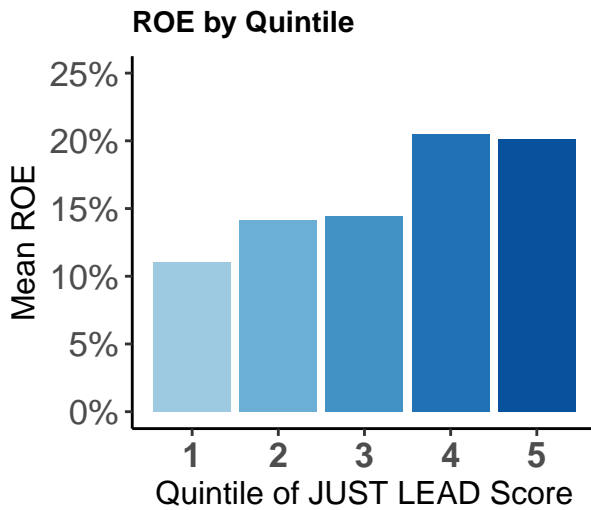
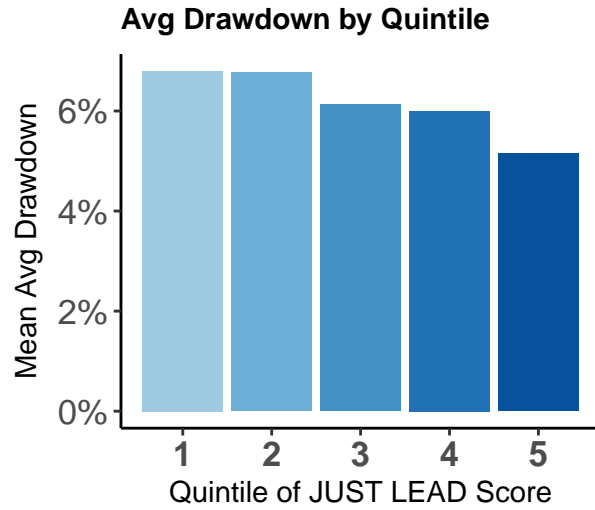
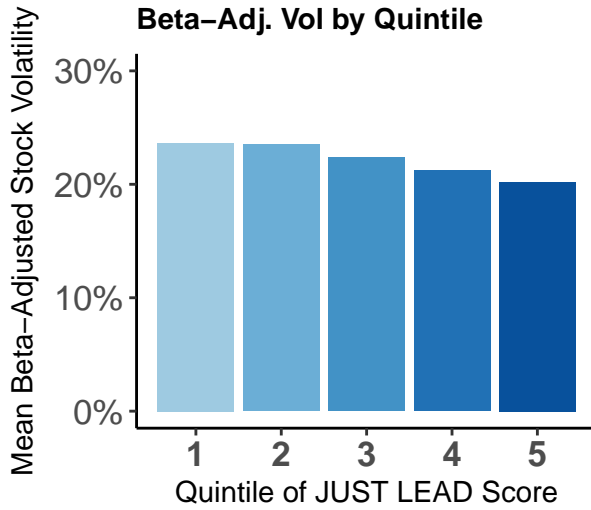
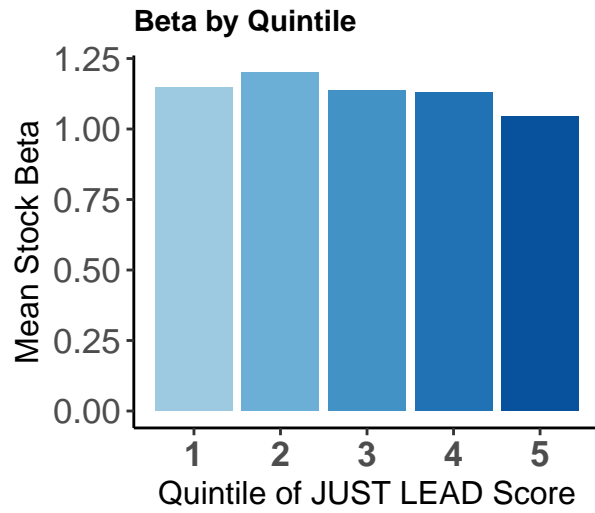
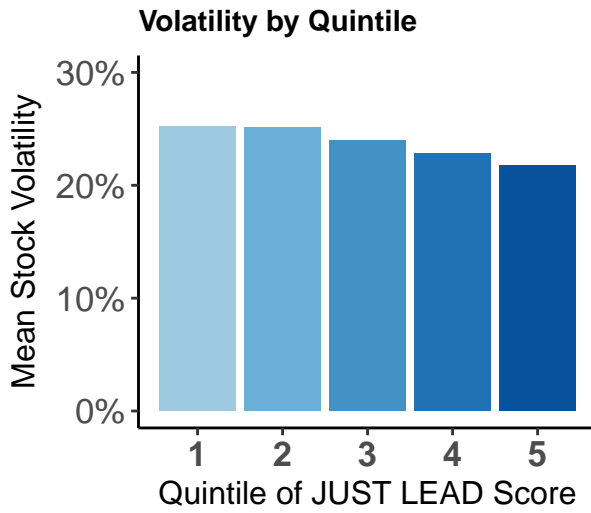
Table 12: Mean of LEAD JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	38.5	25.2	1.15	23.6	6.8	11.0	16.64
2	179	48.1	25.1	1.20	23.5	6.8	14.1	17.13
3	178	51.7	24.0	1.14	22.4	6.1	14.4	21.31
4	179	54.3	22.8	1.13	21.2	6.0	20.5	24.16
5	179	57.3	21.7	1.04	20.2	5.1	20.2	33.39

Table 13: quintile 5 - quintile 1 LEAD t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-3.48	-0.1	-3.43	-1.65	9.13	16.75
t-stat	-3.31	-2.04	-3.24	-1.87	3.62	1.26
p-value	0.001	0.042	0.001	0.062	0	0.209
Significance	***	**	***	*	***	





Driver 4: Customer Treatment (CUST)

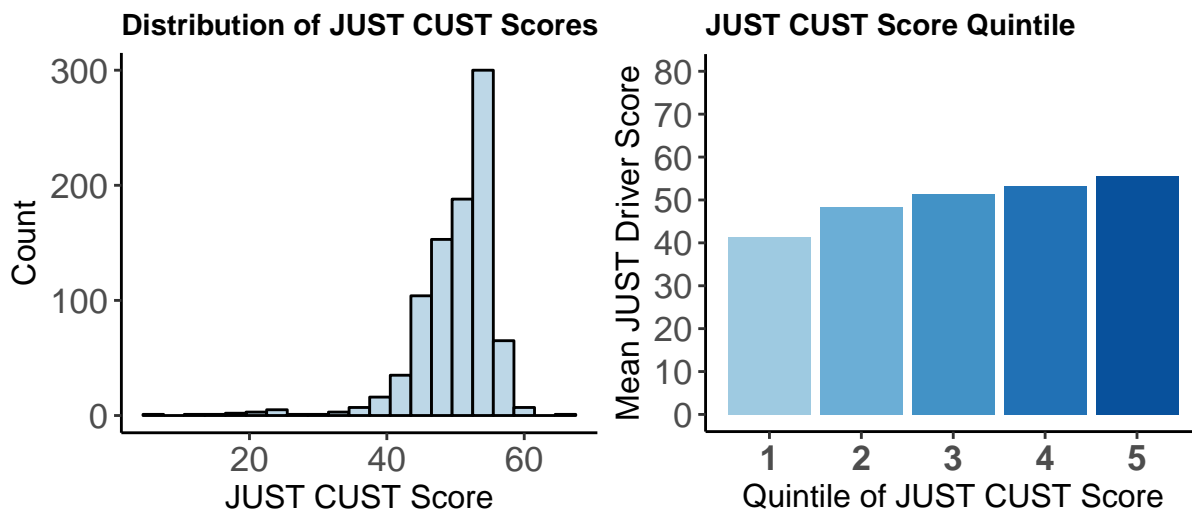
Components: Provides fair pricing and sales terms; Protects customer privacy; Maintains strong relationships with customers; Does not discriminate in customer treatment.

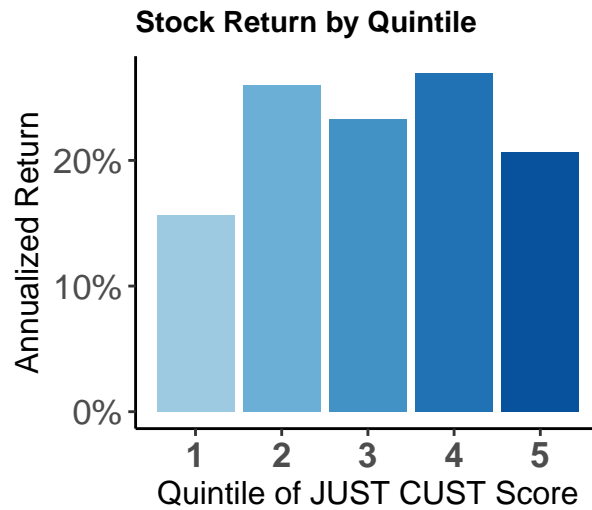
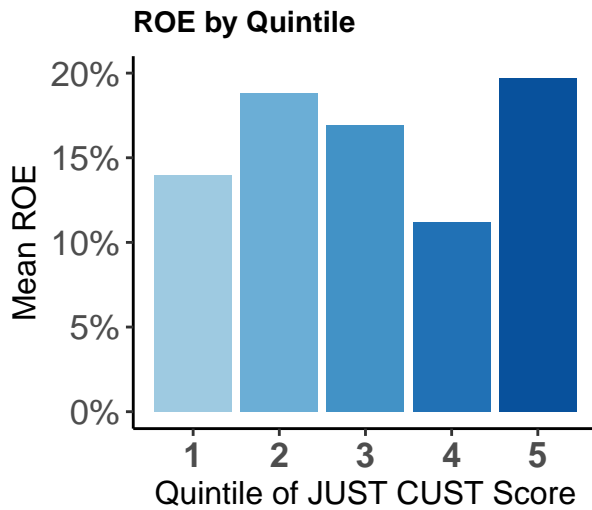
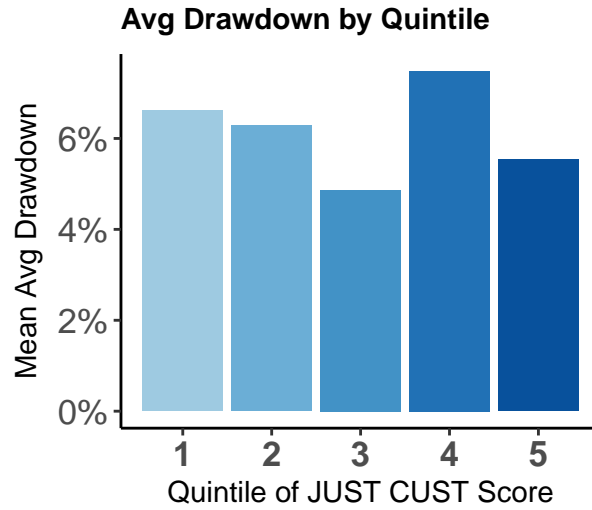
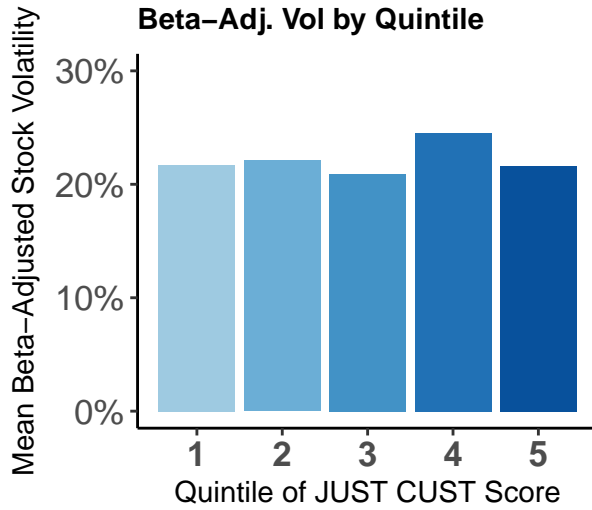
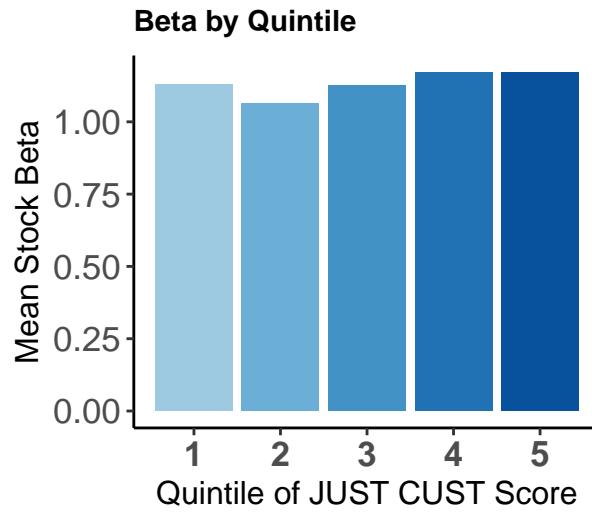
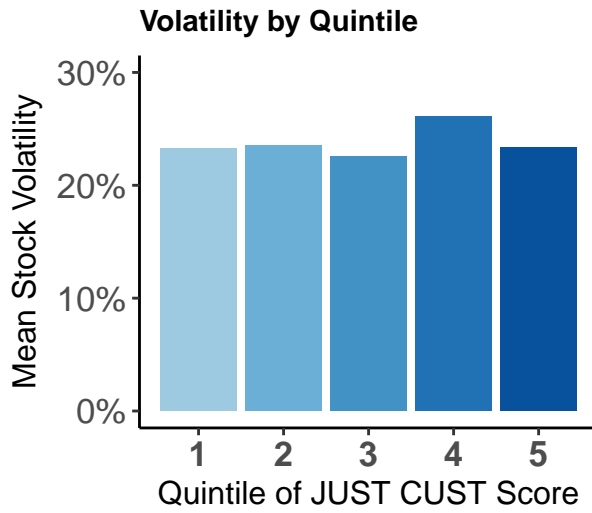
Table 14: Mean of CUST JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	41.4	23.3	1.13	21.7	6.6	14.0	15.61
2	179	48.4	23.6	1.06	22.1	6.3	18.8	25.97
3	178	51.4	22.6	1.12	20.9	4.9	16.9	23.27
4	185	53.3	26.1	1.17	24.5	7.5	11.2	26.95
5	173	55.6	23.3	1.17	21.6	5.5	19.7	20.64

Table 15: quintile 5 - quintile 1 CUST t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	0.06	0.04	-0.1	-1.08	5.68	5.03
t-stat	0.06	0.84	-0.1	-1.31	2.43	1.64
p-value	0.956	0.401	0.924	0.19	0.015	0.102
Significance					**	





Driver 5: Product Attributes (PROD)

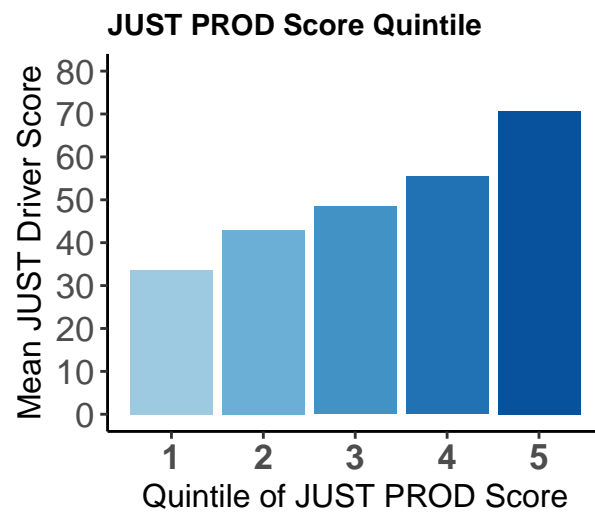
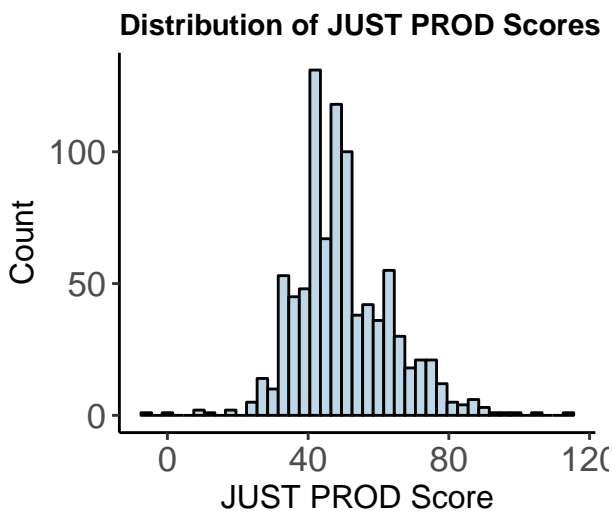
Components: Makes quality products; Makes products that are beneficial to health, environment, or society.

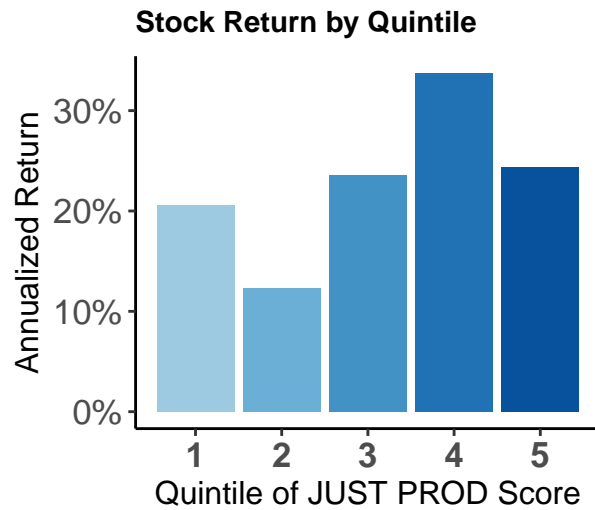
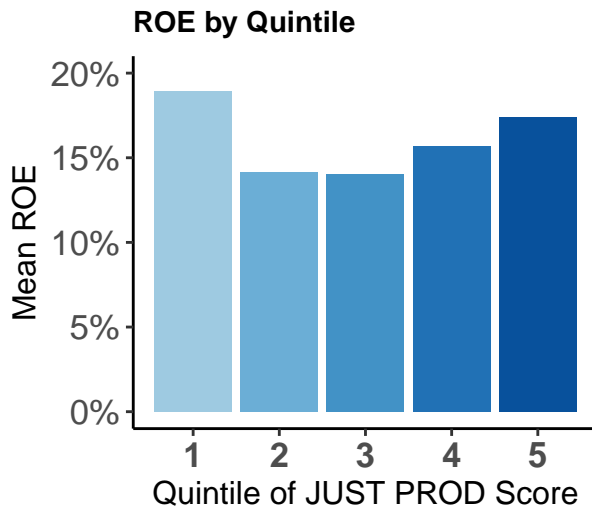
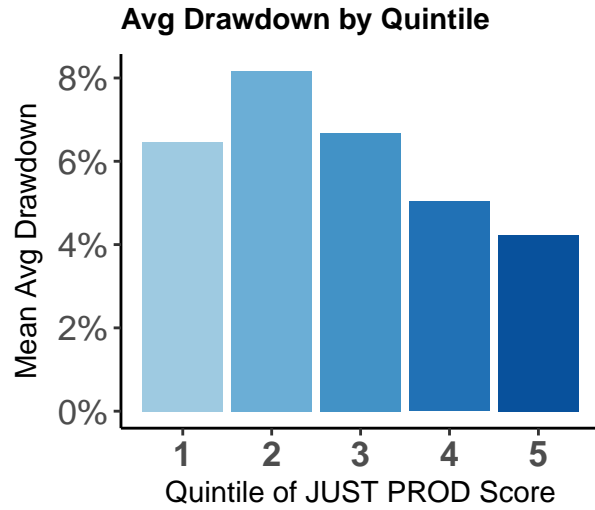
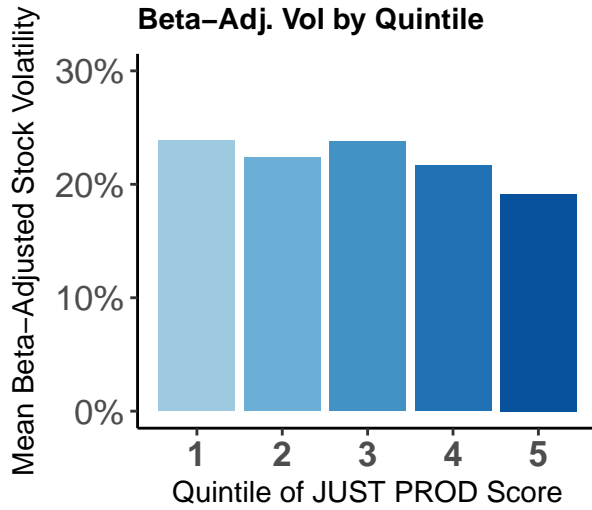
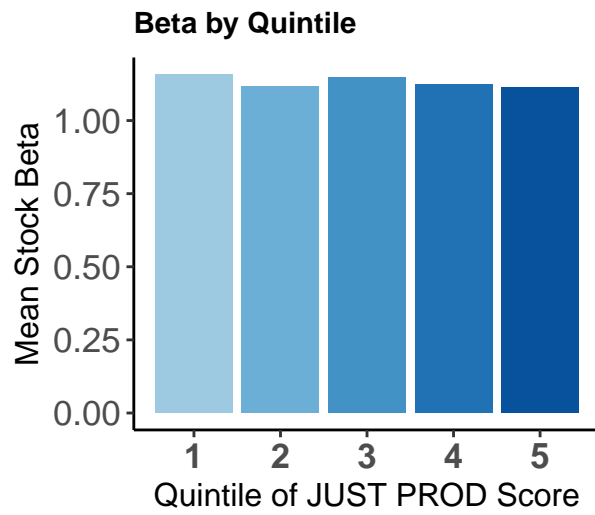
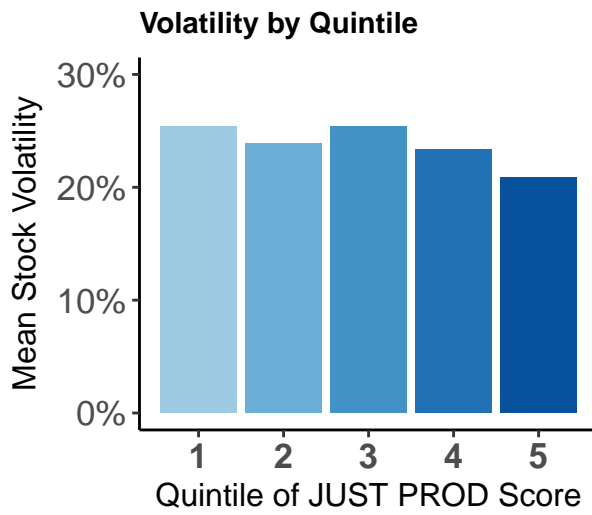
Table 16: Mean of PROD JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	33.6	25.4	1.16	23.9	6.5	18.9	20.54
2	194	42.9	23.9	1.12	22.4	8.2	14.2	12.35
3	180	48.4	25.4	1.15	23.8	6.7	14.0	23.60
4	162	55.5	23.3	1.12	21.7	5.0	15.7	33.74
5	179	70.6	20.9	1.11	19.2	4.2	17.4	24.33

Table 17: quintile 5 - quintile 1 PROD t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-4.55	-0.05	-4.72	-2.23	-1.55	3.79
t-stat	-4.43	-0.88	-4.64	-3.42	-0.6	1.25
p-value	0	0.381	0	0.001	0.546	0.212
Significance	***		***	***		





Driver 6: U.S. Job Creation (JOBS)

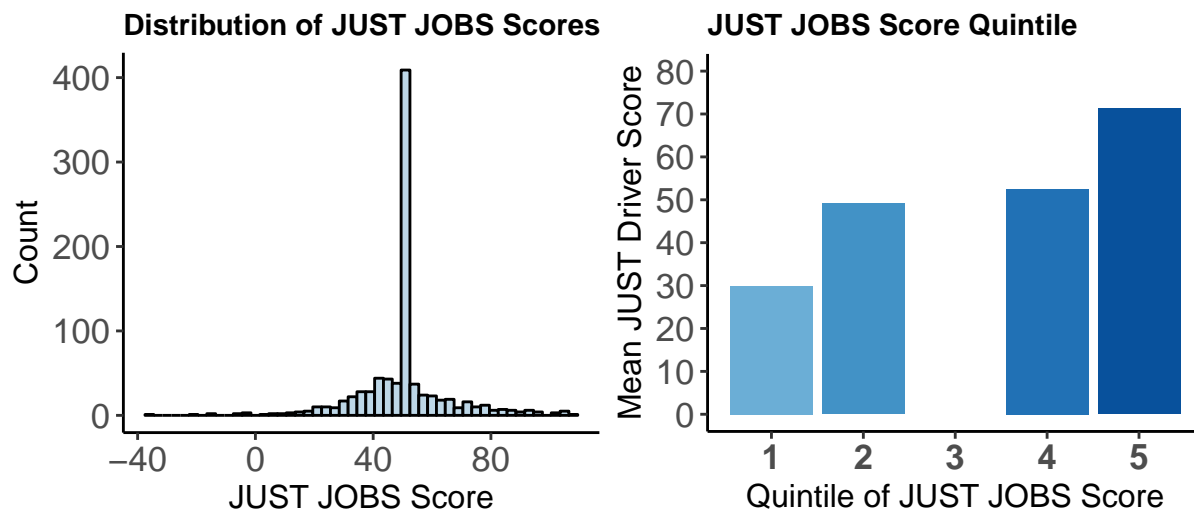
Component: Creates jobs in the U.S. Note: Because a large number of companies score 50 on JOBS due to missing data, these scores can not be evenly divided by quintile. In this case Q1 & Q5 have the usual number of companies while Q2 & Q4 are sized differently and Q3 is removed. This allows the Q5-Q1 t-tests to continue to be performed consistently.

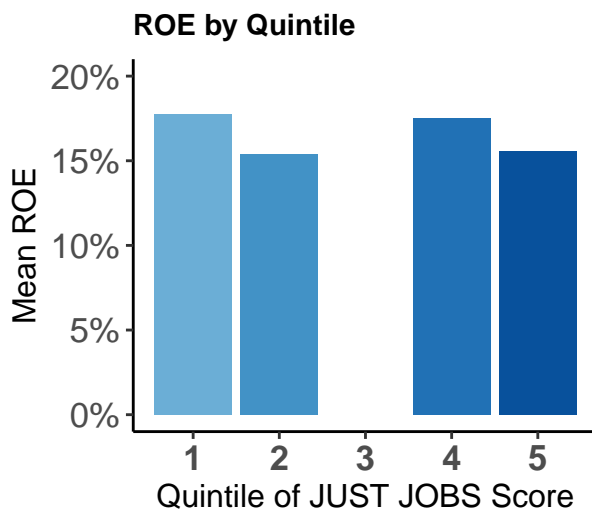
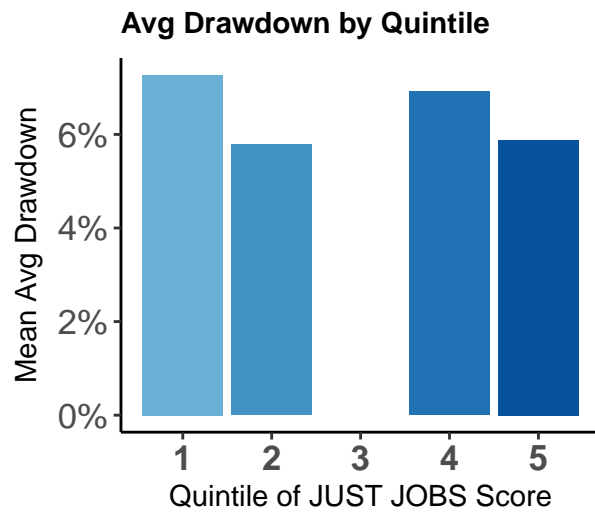
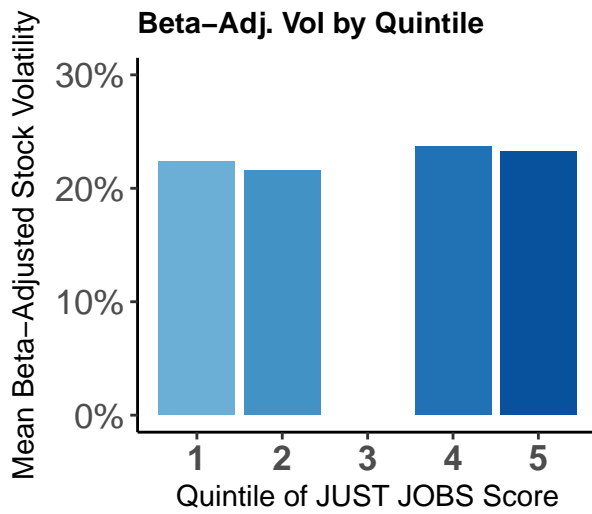
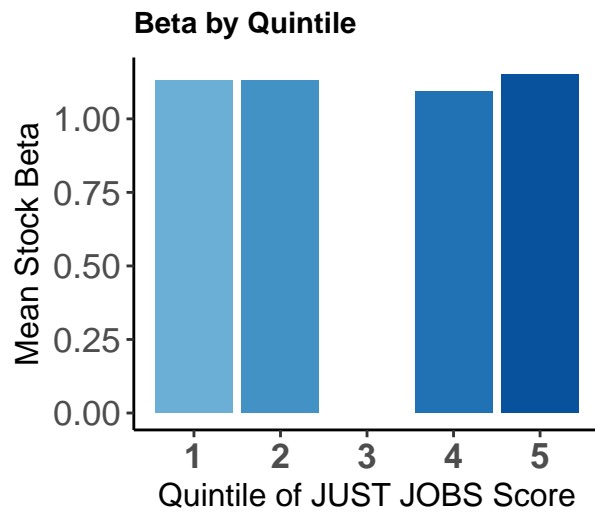
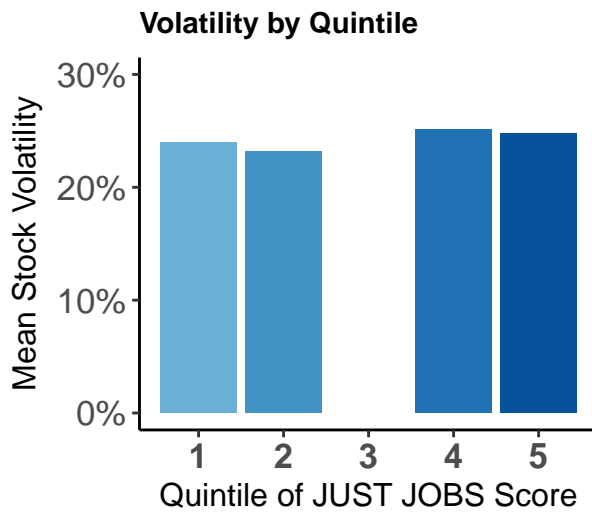
Table 18: Mean of JOBS JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	29.8	24.0	1.13	22.4	7.3	17.8	17.29
2	479	49.2	23.2	1.13	21.6	5.8	15.4	25.79
4	57	52.6	25.1	1.09	23.7	6.9	17.5	15.49
5	179	71.3	24.8	1.15	23.2	5.9	15.6	21.27

Table 19: quintile 5 - quintile 1 JOBS t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	0.8	0.02	0.84	-1.39	-2.23	3.98
t-stat	0.69	0.4	0.72	-1.44	-0.83	0.86
p-value	0.489	0.688	0.472	0.15	0.405	0.391
Significance						





Driver 7: Environmental Impact (ENV)

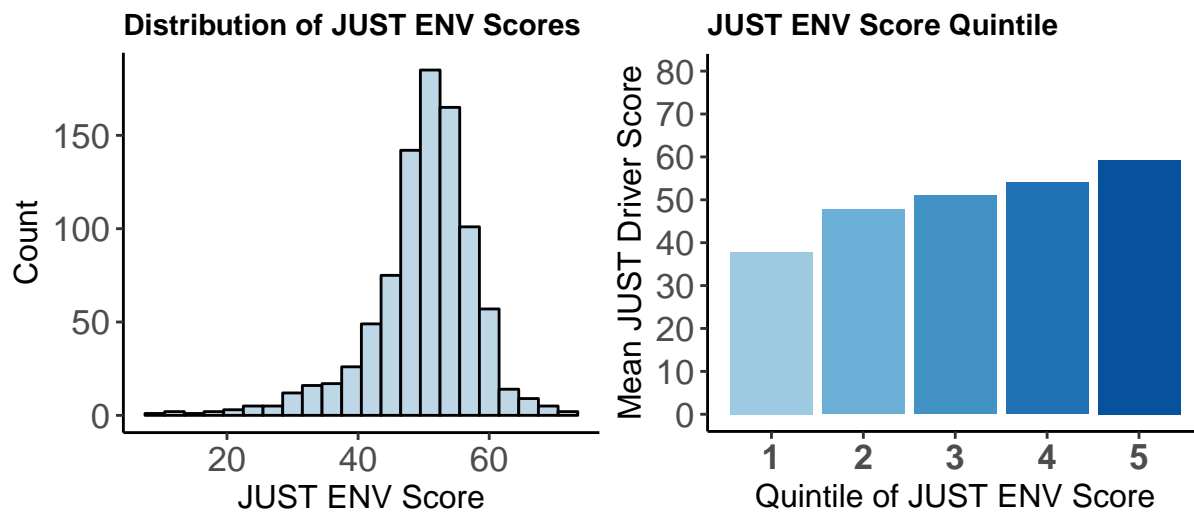
Components: Minimizes pollution; Has environmentally responsible management; Uses resources efficiently.

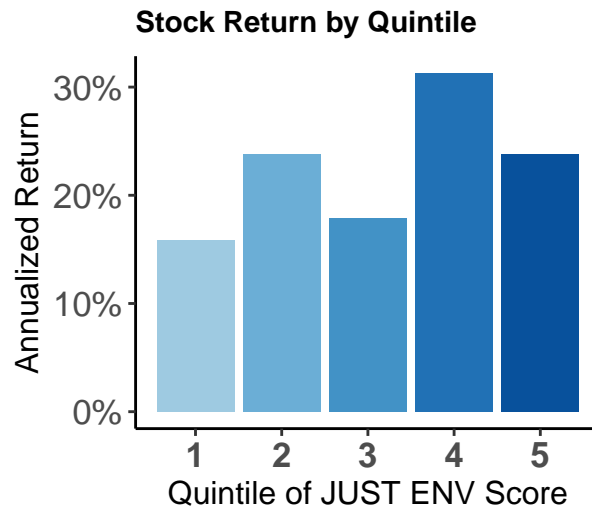
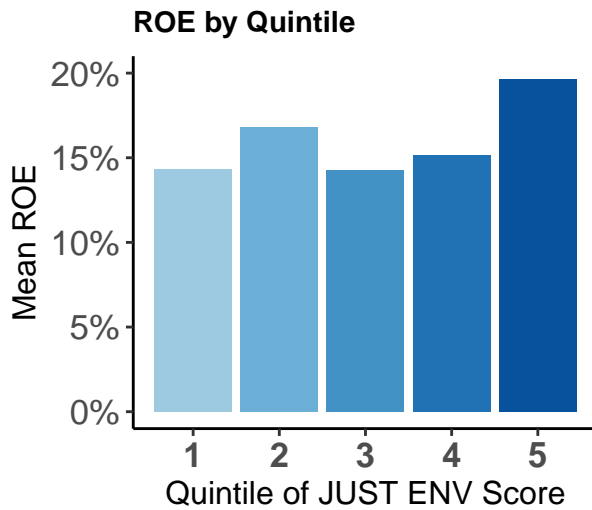
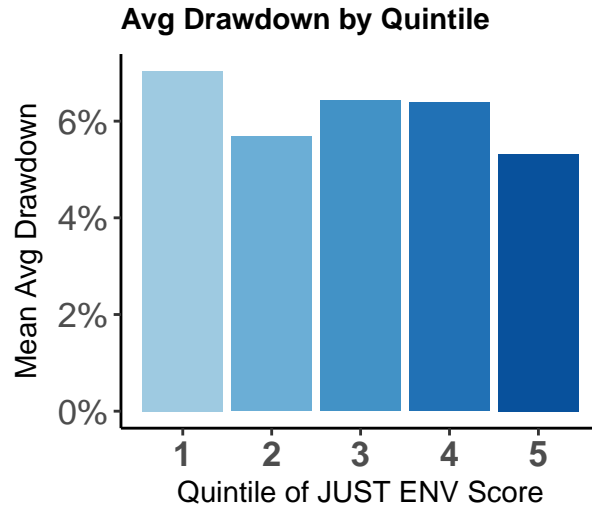
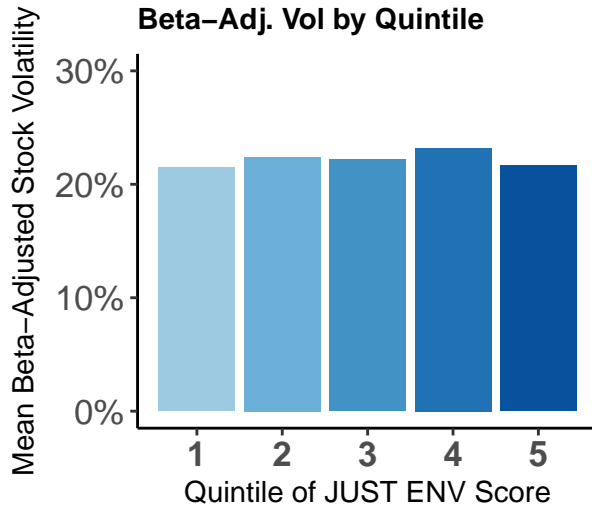
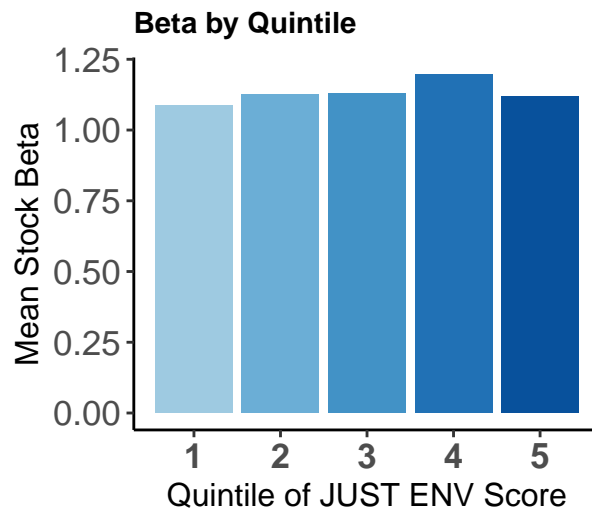
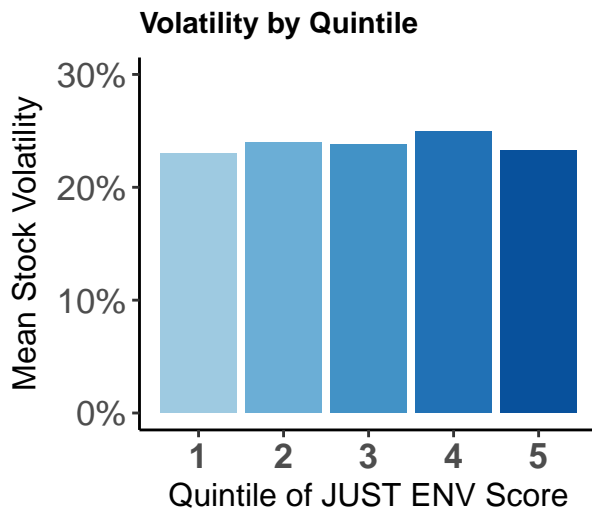
Table 20: Mean of ENV JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	37.8	23.0	1.09	21.5	7.0	14.3	15.81
2	179	47.8	24.0	1.13	22.4	5.7	16.8	23.83
3	178	51.0	23.8	1.13	22.2	6.4	14.2	17.88
4	179	54.1	24.9	1.20	23.2	6.4	15.1	31.29
5	179	59.2	23.2	1.12	21.6	5.3	19.6	23.80

Table 21: quintile 5 - quintile 1 ENV t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	0.21	0.03	0.14	-1.72	5.32	7.99
t-stat	0.2	0.66	0.13	-1.97	2.18	1.77
p-value	0.84	0.512	0.894	0.049	0.03	0.078
Significance				**	**	*





Driver 8: Supply Chain (SUPPLY)

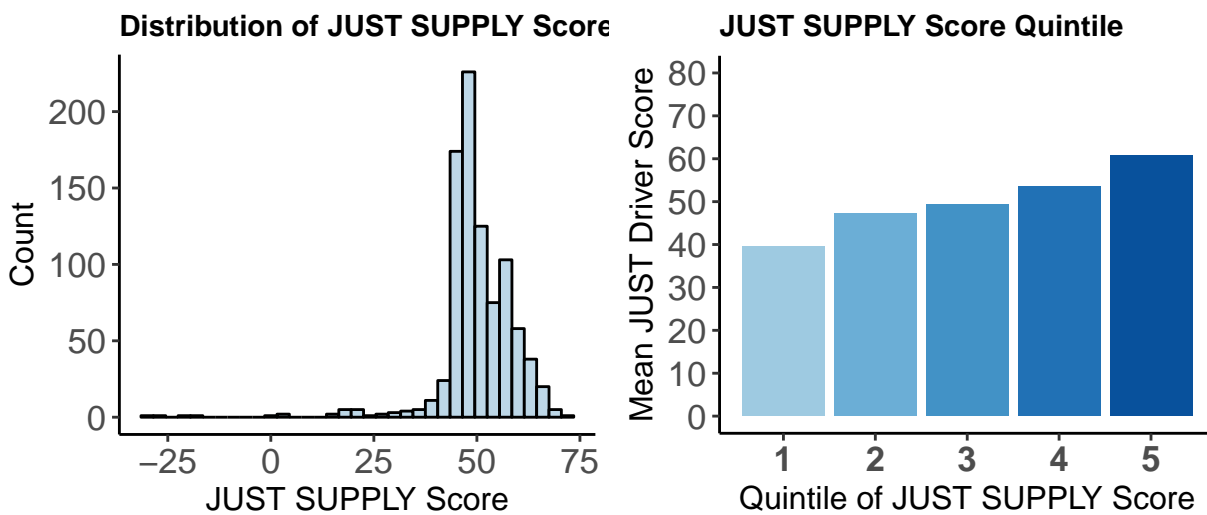
Components: Does not have suppliers with abusive conditions; Does not cause or contribute to conflict abroad; Does not do business with repressive governments.

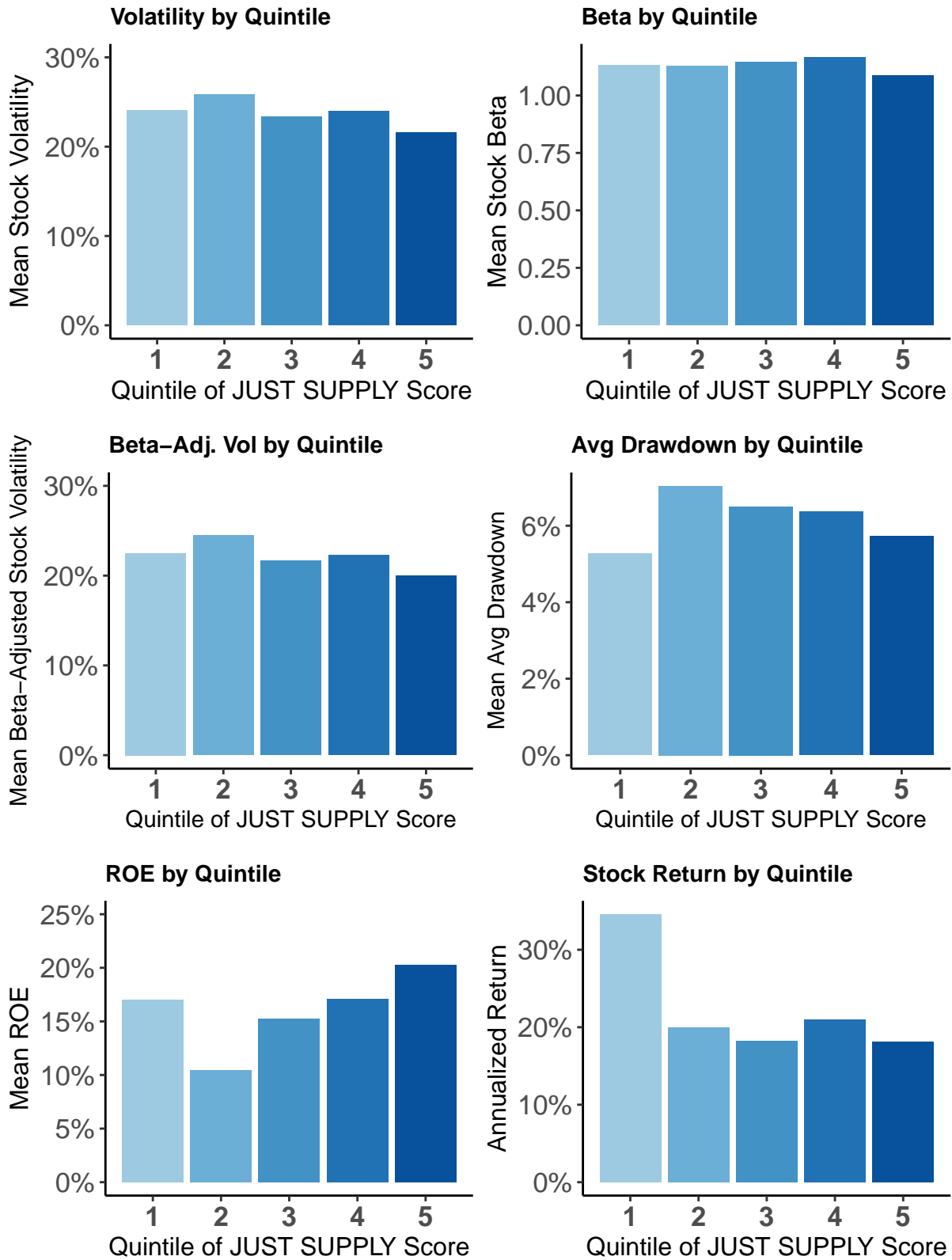
Table 22: Mean of SUPPLY JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	186	39.6	24.1	1.13	22.5	5.3	17.0	34.59
2	181	47.2	25.9	1.13	24.5	7.0	10.5	20.02
3	169	49.2	23.4	1.14	21.7	6.5	15.3	18.25
4	179	53.6	23.9	1.17	22.3	6.4	17.1	21.00
5	179	60.7	21.6	1.09	20.0	5.7	20.2	18.10

Table 23: quintile 5 - quintile 1 SUPPLY t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-2.5	-0.04	-2.52	0.45	3.23	-16.49
t-stat	-2.6	-0.85	-2.62	0.56	1.23	-1.29
p-value	0.01	0.394	0.009	0.574	0.221	0.198
Significance	***		***			





Driver 9: Investor Alignment (INVEST)

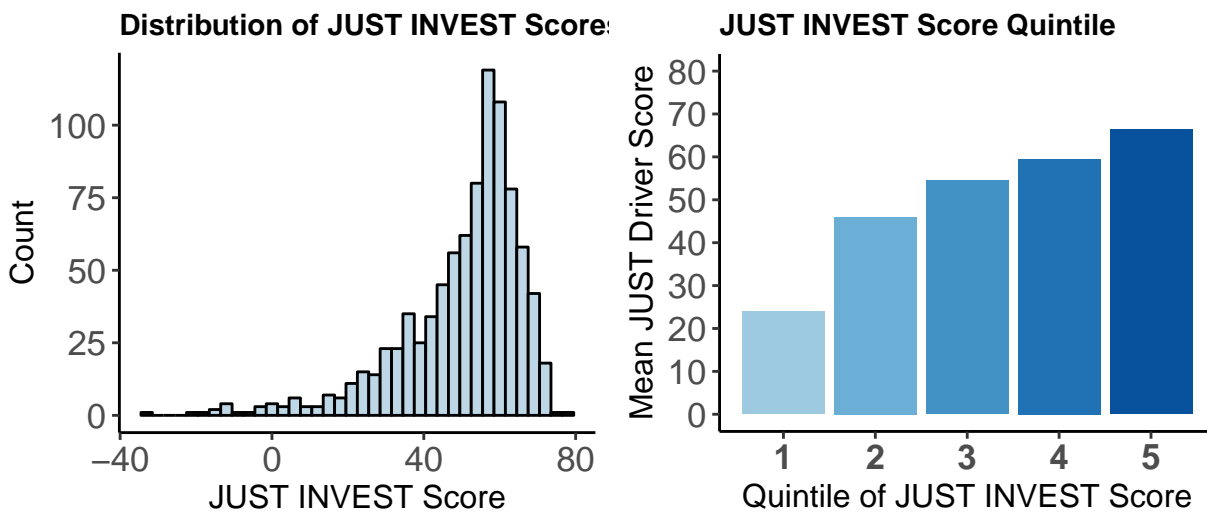
Components: Is transparent & accurate in financial reporting; Is profitable over the long-term; Provides investor return.

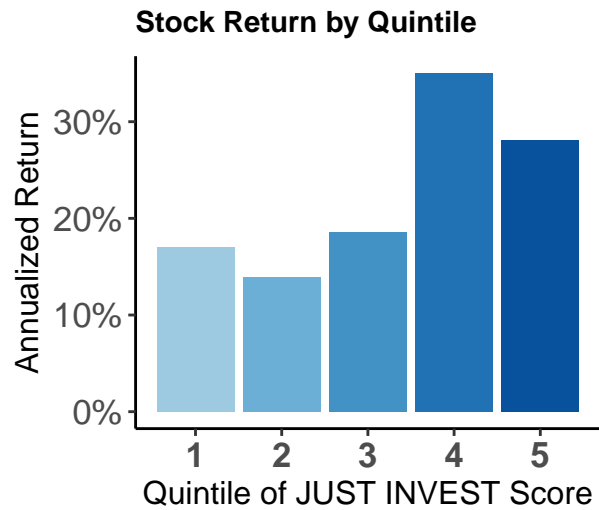
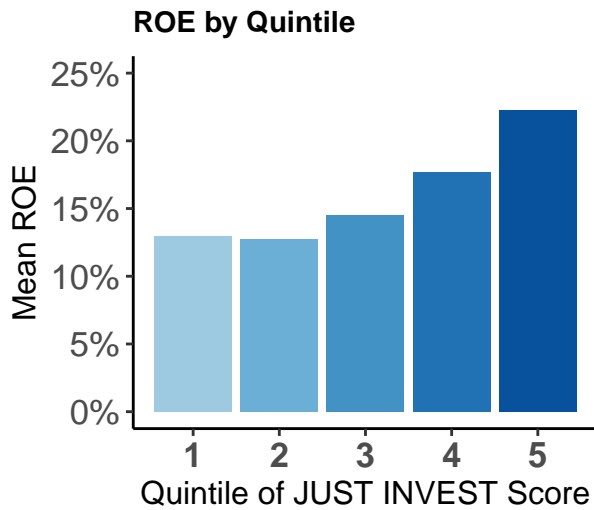
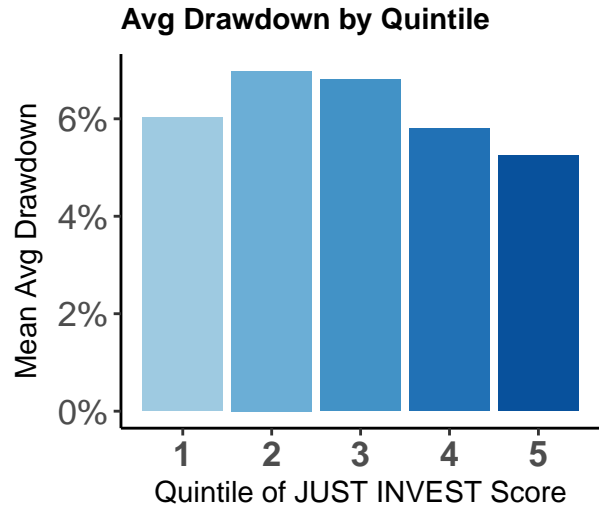
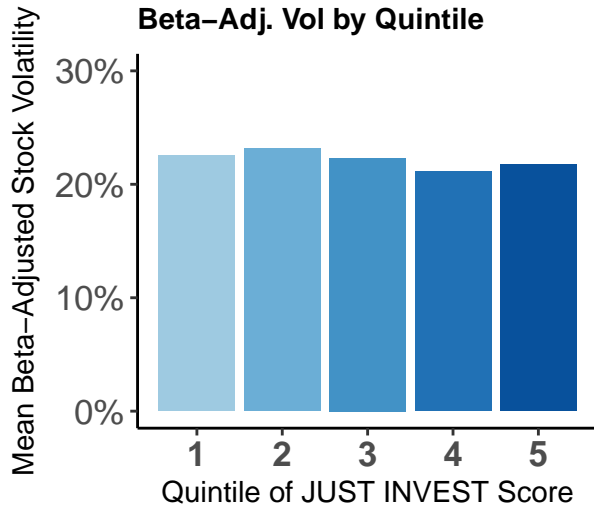
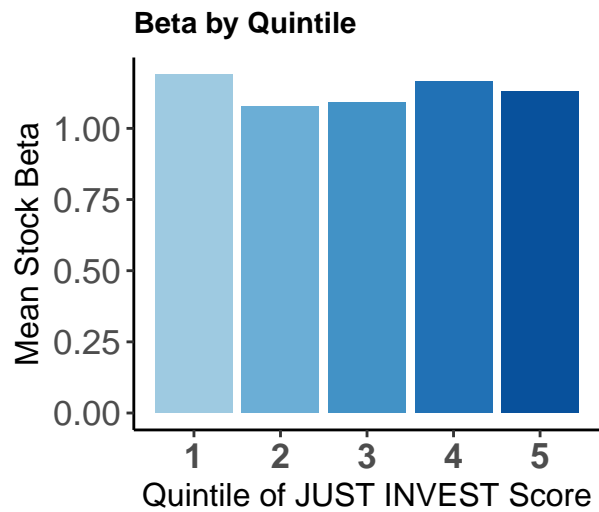
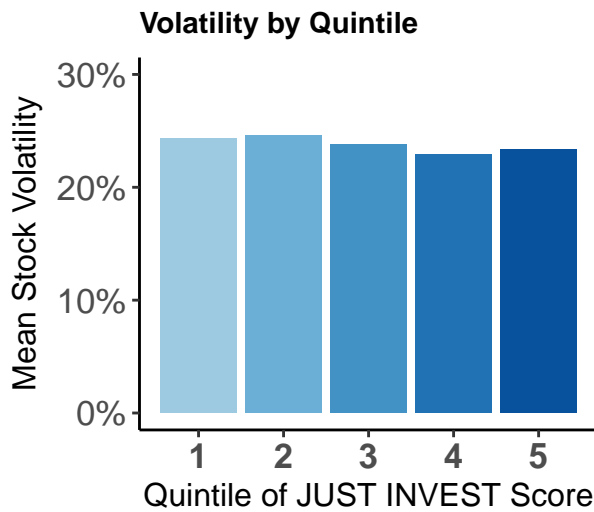
Table 24: Mean of INVEST JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	179	23.9	24.3	1.19	22.6	6.0	12.9	16.97
2	179	46.0	24.6	1.08	23.2	7.0	12.8	13.89
3	178	54.5	23.8	1.09	22.3	6.8	14.5	18.62
4	179	59.5	22.9	1.17	21.1	5.8	17.7	35.03
5	179	66.3	23.3	1.13	21.7	5.2	22.2	28.11

Table 25: quintile 5 - quintile 1 INVEST t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-0.95	-0.06	-0.84	-0.79	9.31	11.14
t-stat	-0.93	-1.16	-0.83	-1.08	3.52	2.38
p-value	0.353	0.246	0.409	0.283	0	0.018
Significance					***	**





Driver 10: Community Wellbeing (COMM)

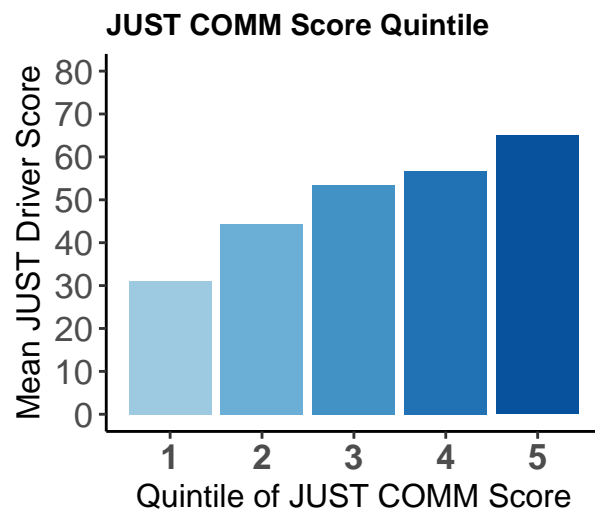
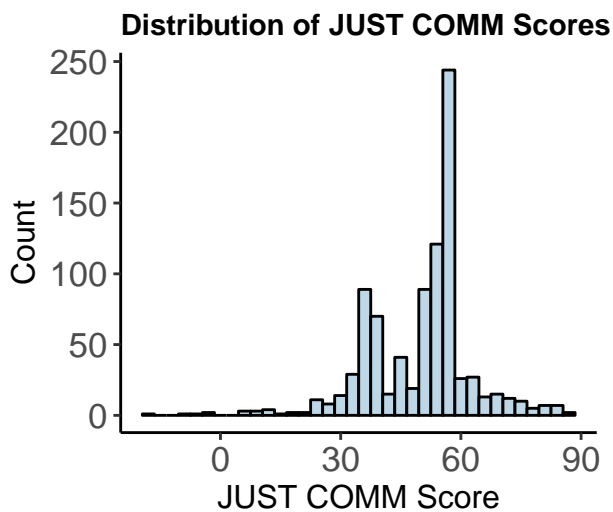
Components: Maintains strong relationships with communities; Contributes to charitable causes.

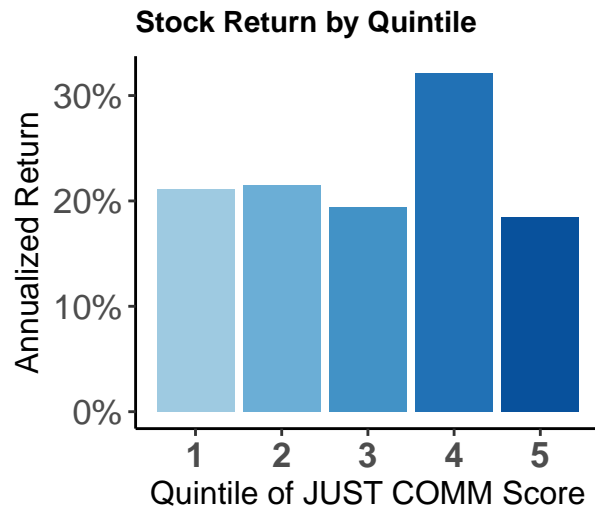
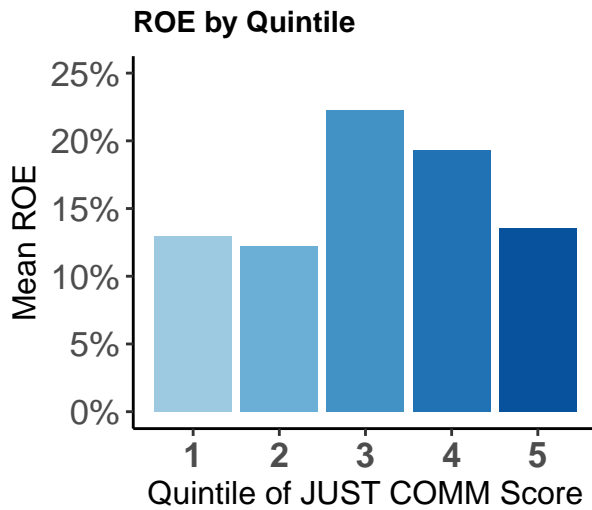
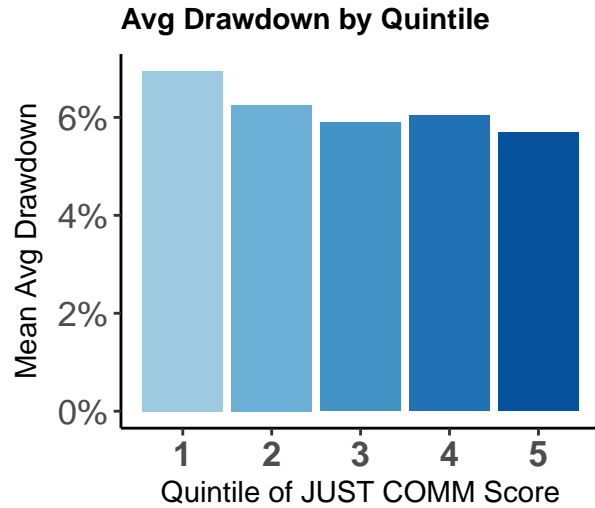
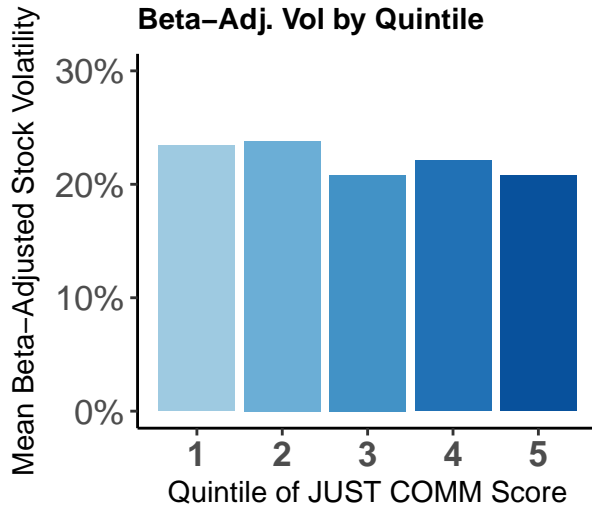
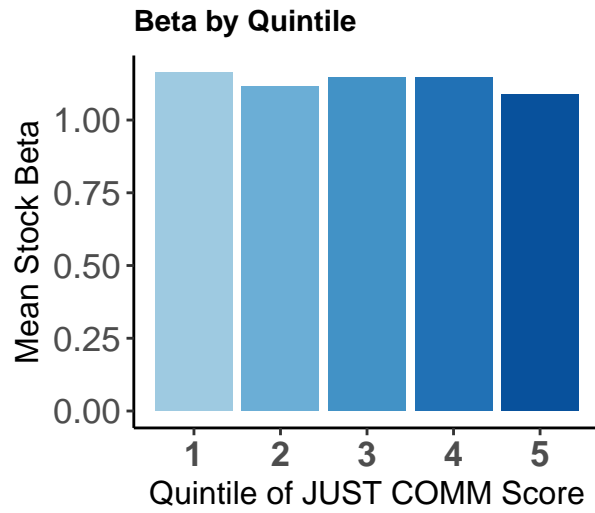
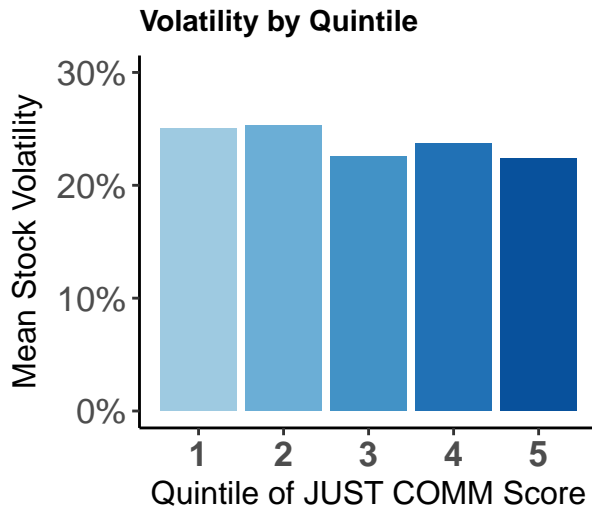
Table 26: Mean of COMM JUST Score and Six Metrics

Quintile	Count	JUST Score	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
1	184	31.0	25.0	1.16	23.4	6.9	13.0	21.12
2	174	44.3	25.3	1.11	23.8	6.3	12.3	21.54
3	178	53.5	22.5	1.15	20.8	5.9	22.3	19.38
4	179	56.8	23.7	1.15	22.1	6.0	19.3	32.13
5	179	65.0	22.3	1.09	20.8	5.7	13.5	18.47

Table 27: quintile 5 - quintile 1 COMM t-tests

	Vol	Beta	Adj Vol	Avg Drawdown	ROE	Return
Q5 mean - Q1 mean	-2.69	-0.08	-2.66	-1.26	0.57	-2.65
t-stat	-2.45	-1.58	-2.42	-1.53	0.23	-0.58
p-value	0.015	0.115	0.016	0.127	0.818	0.564
Significance	**		**			





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