Predicting Company Performance With Company Benefit Plans

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In this research note, I explore the information content of employee benefit plans (Form 5500 filings) for predicting company stock returns. Leveraging a dataset from a data analytics firm tracking these filings in real time, I show that simple indicators of company growth derived from benefit plans predict company stock returns. The returns to this strategy exceed compensation for market risk. Companies scoring well on employee benefits outperform especially well during the Covid 19 pandemic.

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Overview

In this research note, I explore the applications of Axiomatic Data's Form 5500 dataset for predicting company stock returns. Form 5500 is collected by the US Department of Labor as part of the disclosure framework set by the Employee Retirement Income Security Act (ERISA) of 1974. The Form collects, among other things, information on the different employee benefits offered by the firm, such as dental, medical, 401K, etc., the number of employees receiving benefits, and the funding status, total assets and employer and employee contributions of any defined contribution or defined benefit plan sponsored by the company. The vast majority of firms in the United States are required to file and submit the full-length Form 5500, and it reflects the largest store of public information on company's employment practices in the United States.

Prior academic research gives ample reason to believe this data may be value-relevant to investors. First, academic researchers have demonstrated using various datasets that employees' behavior may signal their confidence in a company's prospects, and that these signals are leading indicators of firms' performance. Babenko and Sen (2011), for example, argue that employee's stock purchases predict company stock returns. While Babenko and Sen (2011) do not use Form 5500, Form 5500 more comprehensively captures employers and employee contributions to benefit plans (both defined benefit and defined contribution) in addition to many other aspects of employee benefits.

Second, various recent works on the costs and benefits of corporate social responsibility suggest that companies which treat their employees well – or which more generally behave in a socially responsible way - tend to outperform. Research also shows that socially responsible stocks continued to strongly outperform during the recent pandemic. [2]

Back-test

I conduct a back-test examining two intentionally simple signals based on Axiomatic's dataset. In my baseline test, I use Axiomatic Data's flagship ThriveScore™, which is a score of a company's growth in the benefits provided by the firm. The ThriveScore™ combines eighteen different growth rates (growth rate of employees, growth rate of employees in pension plans, employer contributions per employee, participant contributions per employee, growth rate of employer contributions in total, growth rate of participant contributions in total) using Axiomatic Data's proprietary formula. The score can be interpreted as a growth rate of development in human capital at the firm.

Second, I combine the ThriveScore™ with an amalgam of other data points from Form 5500, which I call the Composite Score. The main purpose of doing this is to provide a simple, alternative formulation of the same components of the ThriveScore™, as well as some alternative data points not included. In particular, I form a cross-sectional z-score of various metrics:

$$Z(\#\ of\ Employee\ Benefits) + Z\left(\frac{EmployeeContributions}{Total\ Contributions}\right) + Z\left(\frac{EmployerContributions^{active}}{TotalContributions^{active}}\right) + Z(\#\ of\ Problems\ (e.g.cancelledplans))$$

That is, every month, I form a score that scales each variable to have a mean of 0 and a standard deviation of 1, such that a one standard deviation movement in each variable is equally weighted. This parsimonious method reduces concerns of data-mining or data-fitting. The intuition for this score is simple: more benefits are a signal of company strength. Employee contributions (relative to the total) suggests employees believe in the future prospects of the company.

Table 1 shows that the correlation of these features is not extremely high, giving some inkling that we may benefit from adding more variables. Employer contributions are subtracted because employers' contributions to employees' benefit plans are profits not distributed to shareholders.

Implementation details:

- Sample – I receive data for the Russell 3000, which I connected to CRSP, a stock database widely used by academics for research on US stocks. Additionally, I remove Russell 3000 stocks that the prior month (1) had a share price below $5, (2) were in the bottom decile of market capitalization or dollar volume the prior month in the entire cross-section of US stocks. These back-test conventions are widely used to minimize concerns that paper back-tests target stocks with limited liquidity and therefore high transaction costs.
- Sample period – This study uses Axiomatic data covers filings of Form 5500 filed between January 2014 to Sep 2020.

[2] Edmans (2011) is the first of this line of research, showing that firms on Fortune's 100 top employers list tend to have excellent stock returns. During the recent pandemic, Ding, Levine, Lin and Xie (2020) show firms with great ESG scores continued to outperform.

- I rebalance at a monthly frequency. Every month, I split stocks into bins (low to high) based on the signal. Even though Form 5500 is an annual filing, firms occasionally file material updates throughout the year. I require at least a 1 month lag difference between the "datarun_date" in the Axiomatic dataset and the CRSP stock return.[3]

Table 1: Summary statistics

	Contributions to Benefit Plans by Employee	Contributions to Benefit Plans by Employer	Failed Plans	Benefits	ThriveScore
Contributions to Benefit Plans by Employee	100	96.136	-1.922	2.237	-7.892
Contributions to Benefit Plans by Employer	96.136	100	-0.872	4.550	-7.693
Failed Plans	-1.922	-0.872	100	13.302	5.532
Benefits	2.237	4.550	13.302	100	-6.291
ThriveScore	-7.892	-7.693	5.532	-6.291	100

Results

I report three sets of tests. First, I present a portfolio sort splitting stocks each month into quintiles of scores. We expect that on average, the stocks in quintile 1 underperform stocks in quintile 2, quintile 2 stocks underperform those in quintile 3, and so on. Each datapoint in the figure below is the average across my sample period of stocks in a given portfolio in a given month.

Figure 1A: The Composite Strategy

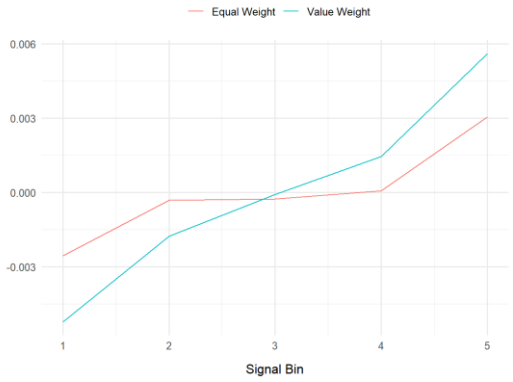
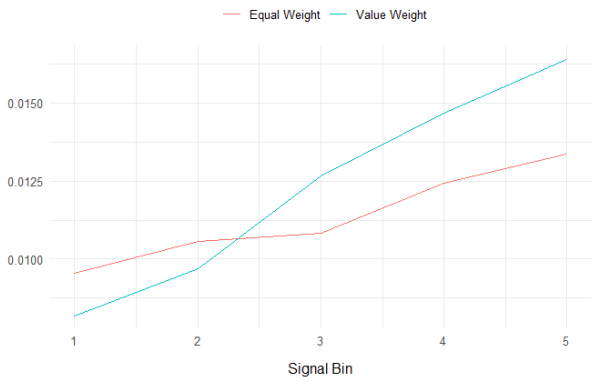


Figure 1A: The Thrive Strategy



Second, examining a hypothetical long-short strategy over time, firms with positive scores (both the Composite Strategy and the ThriveScores) tend to outperform, especially in the prior year. If one interprets the ThriveScore and Composite Score as measures of employee well-being, this finding may help explain recent academic research by Ding, Levine, Levine and Xie (2020) which finds stocks with positive Environment, Social and Governance (ESG) records outperformed during the pandemic.[4] One interpretation of this finding is that during the pandemic, firms who treated their employees better were equipped to function more effectively during the pandemic.

[3] It turns out that 2-3 month lags actually perform slightly better, although this could be attributable to random chance.
[4] Specifically, benefit plans would connect to the "S" component which covers social stakeholders (customers, employees, the surrounding community).

Figure 1B: The Composite Strategy

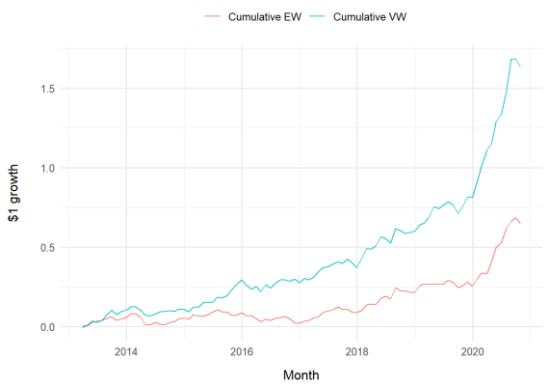
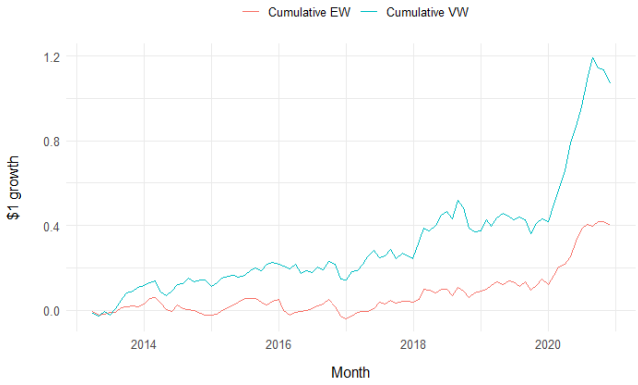


Figure 1B: The Thrive Strategy



Third, I examine the extent of whether these stock returns are attributable to market performance. I select two benchmarks: the simple market portfolio and the Fama and French (2015) five factor portfolio. The five factors represent the five factors which best summarize asset pricing factors from prior research. Here, I present regressions and associated portfolio alphas. All strategies which are based on Axiomatic data 'beat the market'. The statistical significance in some specifications is limited, but that is not unexpected because the sample is short. Applying a tougher benchmark, the value-weighted composite signal that I constructed beats the five-factor benchmark. However, this back-test is preliminary and several strategy modifications can be applied.

Table 2: Factor-benchmarking

	Composite Signal				Thrive Score			
	Value weight		Equal weight		Value weight		Equal weight	
β_{mkt}	0.120**	0.170***	0.120**	0.117***	0.165**	0.204***	0.032	0.013
	(0.059)	(0.053)	(0.048)	(0.043)	(0.071)	(0.058)	(0.049)	(0.037)
β_{smb}		-0.134		0.101		-0.016		0.169***
		(0.088)		(0.072)		(0.097)		(0.062)
β_{hml}		-0.233***		-0.276***		-0.482***		-0.260***
		(0.084)		(0.069)		(0.092)		(0.059)
β_{rmw}		-0.309**		-0.114		-0.012		-0.279***
		(0.137)		(0.112)		(0.151)		(0.096)
β_{cma}		-0.534***		-0.395***		-0.577***		-0.487***
		(0.153)		(0.125)		(0.168)		(0.107)
α	0.010***	0.006***	0.004**	0.002	0.007**	0.002	0.004*	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.001)
Observations	92	92	92	92	92	92	92	92
R^2	0.048	0.410	0.005	0.462	0.059	0.555	0.002	0.606

Real variables

Finally, to build intuition, I correlate the components of these signals against SG&A and profit. By correlating against SG&A and profit, we can verify assumptions we make that underlie our economic hypothesis. In particular, we expect higher SG&A when companies implement more benefit plans, and lower short-run profit when companies implement benefit plans and higher profit when employees contribute to their benefit plans. To test these conjectures, I run regressions of the following

form: $Y_{it} = \alpha_i + \alpha_t + \beta_{signal;} + \epsilon_{it}$. The subscript *i* denotes a firm. By including a dummy variable for each firm, I essentially am making this a within-firm comparison.

In Table 3 (at the end of this document), I show that my findings confirm my conjecture. I run two sets of specifications (the first 4 pertain to SG&A, the second 4 pertain to profit). Turning to column 1, I find that companies whose employers increase contributions yield an increased SG&A line item. Column 5 suggests that correspondingly, the profits of the company fall. Columns 2 and 6 show analogous findings for benefit plans. More benefit plans leads to a higher expenditure on SG&A and a corresponding reduction in profits. Columns 3 of both panels also reveal a similar finding for The ThriveScore, which is sensible as it is a composite score reflecting growth in employer benefit plans. Finally, the last set of columns examines the *ratio* of employee contributions to pension plans relative to the total. It suggests that if anything, the effect is the opposite: when employees contribute more relative to employers, employers spend less on SG&A and as a result retain those profits. This can be interpreted as a signal that employees recognize the impending profitability of the firm and firms substitute employee benefits with proceeds from company profits.

That these scores generally predict positive returns in the future but short-term drops in profitability suggest that the positive effects of benefit plans on firm performance are not short-term but rather likely long-term.

Future research directions

The findings above are preliminary but suggest that firms whose benefit plans are generally growing tend to perform better, and the premium associated with these firms is not explainable by market risk. Rather, it is likely that the returns relate to the buildup of intangible capital at the firm, as increases in benefit plans enter into SG&A but are negatively related to profit the following quarter in the short-term. This finding would be consistent with recent research that suggests firms that build intangible capital tend to outperform in the long run. Another finding is that employee contributions appear positively related to future returns. This has precedent in the literature as well, with Babenko and Sen (2011) and Agarwal, Hacamo and Hu (2020) documenting that employee behavior seems highly predictive of stock returns (with leaving the company serving as a bad signal). Green, Huang, Wen and Zhou (2019) show that employee reviews left on Glassdoor also predict firm performance.

The next steps of this research will be to better understand when exactly the market incorporates this information. For that, I will turn to studying earnings announcements to see whether the market was unaware of the implications of changes to benefit plans for company earnings per share.

References

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Table 3: Implications for SG&A and Profit

	SG&A				Profit			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employer Contrib	0.398***				-0.150***			
	(0.052)				(0.030)			
Participant Contrib	-0.087				-0.017			
	(0.076)				(0.060)			
Benefit Plans		1.102***				-0.360***		
		(0.170)				(0.118)		
Cancelled Plans		0.003				-0.002		
		(0.048)				(0.025)		
Thrive Score			0.416***				-0.196***	
			(0.047)				(0.028)	
Partic. To Emplyr. Contributions				-2.903***				0.595***
				(0.331)				(0.224)
Firm + Quarter FE?	Y	Y	Y	Y	Y	Y	Y	Y
Observations	65,165	65,918	65,918	65,058	76,668	77,531	77,531	76,541
R^2	0.884	0.883	0.883	0.883	0.660	0.658	0.659	0.659
Adjusted R^2	0.878	0.877	0.877	0.877	0.643	0.641	0.642	0.642
Note:								*p<0.1; **p<0.05; ***p<0.01