

Is Sustainable Assessment a Good Indicator of Investing? ——Examples from China, CASVI's "SV99" List

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Abstract: Ever since the concept of sustainable development was developed, the increase of social concern on the relevant topic has never stopped. And nowadays, people, especially those professional investors are trying to build a connection between the company's sustainable development capacity and its market performance. Therefore, different systems and methodologies were developed to assess the possible relationship. However, it is still not clear that whether these assessments are accurate enough for investing. To examine whether a specific sustainability assessment can be used as a guide for investing, CASVI's assessment report and the relevant financial data are used to examine the relevance between each other by OLS regressions and correlation tests. The test shows that while there is a relationship between positive sustainability assessment and favourable stock performance over a specific period, this relationship is time-dependent. Which suggests that it is necessary to check the effectiveness of assessments regularly if they are needed as an instruction for investing.

1. Introduction

The concept of sustainable development can be traced back to the *World Conservation Framework* published in 1980 by the World Conservation Union (IUCN), the United Nations Environment Programme (UNEP), and the Wildlife Fund (WWF) [1]. And in the report *Our Common Future* published in 1987 by the World Commission on Environment and Development (WCED), a widely accepted definition of sustainable development was proposed: "development that meets the needs of the present without jeopardizing the ability of future generations to meet their needs" [2]. As the international community has an increasing concern about environmental problems such as climate change, resource depletion, and pollution emissions, the concept of sustainable development has received more and more attention and is gradually becoming an important part of government governance and corporate development [3]. Specifically in terms of corporate development, attempts are being made to incorporate sustainable capabilities into a comprehensive assessment system of corporate performance, and the establishment of ESG scoring systems is an important part of this attempt. The moniker ESG was first introduced in a 2005 study called *Who Cares Wins*, which aimed to explore how to link environmental, social, and corporate governance (the combination of initials is ESG) issues to asset management, securities services, and related economic activities [4]. As the sustainability assessment system continues to evolve, there is a growing understanding of the role of sustainability assessment. Previous study inferred that companies with satisfying ESG practices or reputations should be able to perform better in competitive markets [5]. And companies that seek ESG development will benefit in terms of reputation, investor attractiveness, employee satisfaction and innovation [6-8], which may positively affect stock market performance [9]. Due to the existence of those possible relationships, institutional investors, asset managers, financial institutions and other stakeholders are increasingly relying on sustainability assessments to measure the performance of companies and to invest based on them. However, some research showed that scores on sustainability are correlated with the quantity of voluntary disclosures but not with company's compliance records or actual carbon emissions [10], exaggerations and falsifications also exist in disclosures [11]. These

problems will make the effectiveness of the assessment questionable, and the divergence between institutions makes the situation worse. Research has showed that different raters measure the performance of the same firm in the same category differently, different preferences, values, and ethical perspectives will result in diverging interpretations of the same underlying facts [12]. With inconsistent methodologies, the different assessments are inconsistent in both distribution and risk. Therefore, all stakeholders are encouraged to critically evaluate the validity of a specific assessment [13]. Based on this concept, we will examine a certain evaluation system, which is CASVI's evaluation system, and check how effective it can be when instructing the investment behavior.

2. Data and Model

This part will introduce the source of data and give a description of variables and model used in the research.

2.1 Database

In our study, we selected the sustainability assessment report *Discovering "SV 99" in China* from the China Alliance of Social Value Investment (CASVI). CASVI is the first international platform in China focused on promoting sustainable finance and public interest. CASVI is also one of the few registered professional organizations in China that conducts systematic assessments of company's ESG performance. *Discovering "SV 99" in China* is a sustainability assessment report published by CASVI annually, which lists 99 companies with the top sustainability scores among the CSI 300 constituent stocks. The report also assesses the balance of the company's data disclosure in E, S, G aspects, and the company's attribute of sustainable development [14]. The ESG evaluation systems mentioned below all refer specifically to the ESG evaluation system of CASVI

Secondly, the data of company's stock performance are obtained from the WIND database, which is the main source of financial data for Chinese listed companies. We selected the data corresponding to two time period, 2019-07-01 to 2020-06-30, and 2020-07-01 and 2021-06-30, name as P2020 and P2021, the ESG assessment in each year's *Discovering "SV 99" in China* is also based on the same time period.

2.2 Variables and Model

Table 1. Descriptive statistics in 2020Q2

Variables	Obs	Mean	Std.	Min	Q1	Median	Q3	Max
RANK	99	50	28.723	1	25	50	75	99
ESG	99	3.495	1.181	2	2	3	4	6
DYR	96	2.806	2.406	0	1.155	2.42	3.91	17.58
EPS	99	1.4	1.356	-0.08	0.49	1.08	1.69	7.11
PE	98	29.7	67.126	-85.76	8.51	16.53	27.23	612.41
ALR	99	60.845	20.051	0.37	47.69	61.9	75.95	92.39
ROA	99	2.52	3.012	-2.68	0.63	1.38	4.11	16.65
LS	99	38.766	17.682	4.08	24.69	36.6	51.13	80.25
DD	99	28.473	8.145	12.06	21.32	28.38	33.09	49.61
VOL	99	2.035	0.643	0.71	1.62	1.98	2.4	3.73
CON	99	87.917	5.756	69.9	83.74	88.25	92.21	98.38
DW	99	0.091	0.289	0	0	0	0	1
DG	99	0.576	0.497	0	0	1	1	1
BAL	99	0.192	0.396	0	0	0	0	1
EXCEL	99	0.141	0.35	0	0	0	0	1

Note: Some variables are missing, this is related to the actual operating conditions of companies, such as paying no dividends during the period.

Table 2. Descriptive statistics in 2021Q2

Variables	Obs	Mean	Std.	Min	Q1	Median	Q3	Max
RANK	99	50	28.723	1	25	50	75	99
ESG	99	3.424	1.031	2	3	3	4	5
DYR	99	1.967	1.895	0	0.51	1.45	2.85	9.06
EPS	99	1.726	1.545	0.19	0.74	1.20	2.06	7.89
PE	99	35.501	43.867	4.03	11.77	17.68	42.54	236.07
ALR	99	57.669	20.136	9.30	42.55	56.47	72.52	93.86
ROA	99	3.901	3.702	-2.72	1.16	3.01	5.47	16.53
LS	99	38.302	18.454	4.08	22.22	36.40	53.95	80.25
DD	99	32.426	12.232	10.40	22.58	32.12	40.86	67.35
VOL	99	2.559	0.746	0.86	1.98	2.620	3.07	4.52
CON	99	85.947	6.857	71.51	80.43	86.53	91.09	99.27
DW	99	0.293	0.457	0	0	0	1	1
DG	99	0.354	0.480	0	0	0	1	1
BAL	99	0.111	0.316	0	0	0	0	1
EXCEL	99	0.242	0.431	0	0	0	0	1

To investigate whether the ESG assessment reports are consistent with the performance of the company's stock, we will construct regression models and use correlation tests to assess its performance. The linear regression model is designed to measure the influence that sustainable development indicators have on the return of company's stock. The correlation test is designed to measure the relevance between the characteristic of sustainable development and risk resistance capacity of the company's stock performance, especially for the risk resistance capacity. **Table. 1** and **Table. 2** contains the variables we selected to design the test. *DYR*, *EPS*, *PE*, *DD* and *VOL* are calculated by the data through whole period, other variables are based on *Discovering "SV 99" in China* and related interim statements.

For the linear regression model: *RANK* and *ESG* are independent variables used as indicators of each company's sustainable development capacity. *RANK* is derived from the actual ranking of the companies on the *Discovering "SV 99" in China* list, from 1 to 99. And *ESG* is the grades of companies on the list, received by transferring all company's letter grades into numbers, from the lowest 1 to the highest 6.

DYR and *EPS* are dependent variables for they have a positive relationship with stock returns [15], therefore we use them to represent the possible return on investing the stocks. *DYR* is the dividend yield ratio, the higher this ratio is, the greater the return on investment received by investors. *EPS* is the earnings per share, suggests the company's ability to generate profit. *PE*, *ALR* [16], *ROA* [17] and *LS* [18] are the control variables. *PE* represents the stock price divided by earnings per share, and this is one of the most commonly used indexes to assess the price level of a stock is reasonable or not. *ALR* represents the ratio of assets and liabilities, reflecting that what percentage of total assets are financed by borrowing. *ROA* is the return on assets, measuring how many net profits are produced by each unit of assets. *LS* is the percentage of shares held by the biggest shareholders among all shares in circulation. The control variables were selected based on previous research work in order to overcome the problems on missing variables and to effectively constrain the regression model.

For the correlation test: *DD* and *VOL* are used as the indicators of stock's stability. *DD* represent the maximum drawdown of stock price, and lower *DD* suggests the stock is more risk-resistant. *VOL* means the volatility of stock's daily change, and lower *VOL* suggests the stock price changes in a less drastic way. *CON*, *DW*, *DG*, *BAL* and *EXCEL* are variables used to describe the characteristic of the company in terms of sustainability. *CON* represents the score on the degree of balance of the company's sustainable development, a higher *CON* indicates a more balanced development in the three aspects of environment, society and governance. *DW*, *DG*, *BAL* and *EXCEL* are a set of dummy variables, used to describe the attribute of company's sustainable development. According to *Discovering "SV 99" in China*, there are four sustainability attributes: making-more-profit, taking-

more-responsibility, balanced-on-both and be-excel-on-both. Each company will only have one sustainability attribute. Therefore, *DW*, *DG*, *BAL* and *EXCEL* respectively correspond to four attributes mentioned above. If the company was recorded as having one certain attribute, the corresponding variable will be set as 1, and all the remaining variables will be set as 0.

Based on the previous description, we developed the following models. The corner marks *i* and *t* denote to the performance of firm *i* in period *t*.

$$DYR_{i,t} = \beta RANK_{i,t} + \gamma ALR_{i,t} + \delta ROA_{i,t} + \mu LS_{i,t} \quad (1)$$

$$EPS_{i,t} = \beta RANK_{i,t} + \alpha PE_{i,t} + \gamma ALR_{i,t} + \delta ROA_{i,t} + \mu LS_{i,t} \quad (2)$$

$$DYR_{i,t} = \beta ESG_{i,t} + \gamma ALR_{i,t} + \delta ROA_{i,t} + \mu LS_{i,t} \quad (3)$$

$$EPS_{i,t} = \beta ESG_{i,t} + \alpha PE_{i,t} + \gamma ALR_{i,t} + \delta ROA_{i,t} + \mu LS_{i,t} \quad (4)$$

For the correlation test, we use Spearman's correlation coefficient to calculate since multiple variables are not normally distributed [19]:

$$r_s = 1 - \frac{6\sum(x_i - y_i)^2}{n(n^2 - 1)} \quad (5)$$

3. Empirical Analysis

This part will present the results of regression and correlation tests then provide empirical analysis.

3.1 Regression Analysis

We conducted OLS regression tests on the data of two time periods respectively based on the four models in the previous part. After obtaining the regression results, we also performed the Kolmogorov-Smirnov's normality test on the residuals of the above eight regressions [20]. The results were not strictly normally distributed, but the kurtosis (absolute value is less than 10) and skewness (absolute value is less than 3) suggest that these residuals can be accepted as normally distributed basically, so the results of the regressions are acceptable. **Table. 3** represents the results of the OLS regressions.

Table 3. Regression indicators

	2020Q2				2021Q2			
	DYR		EPS		DYR		EPS	
	(1)	(3)	(2)	(4)	(1)	(3)	(2)	(4)
RANK	-0.013* (-1.926)		-0.007 (-1.116)		-0.008 (-1.418)		-0.008 (-1.417)	
ESG		0.361** (2.010)		0.188 (1.455)		0.258 (1.522)		0.228 (1.354)
PE			-0.003** (-2.113)	-0.003** (-2.005)			-0.005 (-1.552)	-0.005 (-1.480)
ALR	-0.001 (-0.077)	-0.002 (-0.108)	0.019* (1.783)	0.019* (1.773)	0.027** (2.170)	0.027** (2.306)	0.013 (1.087)	0.014 (1.130)
ROA	-0.084 (-1.242)	-0.086 (-1.272)	0.215*** (2.754)	0.213*** (2.700)	-0.077* (-1.828)	-0.075* (-1.787)	0.228*** (4.592)	0.229*** (4.610)
LS	0.009 (0.870)	0.009 (0.836)	-0.010* (-1.867)	-0.010** (-1.981)	0.040*** (3.899)	0.040*** (3.936)	-0.007 (-1.169)	-0.007 (-1.174)
Constant	3.242** (2.527)	1.387 (1.197)	0.394 (0.427)	-0.555 (-0.660)	-0.392 (-0.427)	-1.708** (-2.465)	0.922 (1.004)	-0.289 (-0.240)
Adj-R ²	0.034	0.046	0.151	0.158	0.271	0.277	0.194	0.196
N	96	96	99	99	99	99	99	99

Note: *, **, *** indicate a notable level of significance at respectively 10%, 5% and 1%, and the values in parentheses are robust standard errors.

3.2 Correlation Test

Firstly, we conducted a correlation test between the variables with significance in the regression results and the dependent variable to further determine the presence of the effect, and the results are presented in **Table 4**. Secondly, we conducted a correlation test on variables that describes the company's characteristic and stock performance, and **Table 5** shows the results. Thirdly, we conducted a correlation test on ESG ratings and assessments between different time periods to investigate whether the high-rating are continuable, and **Table 6** shows the results.

Table 4. Correlation between dependent variables and significant indicators

	2020Q2		2021Q2	
	DYR	EPS	DYR	EPS
RANK	-0.205**			
ESG	0.203**			
PE		-0.335***		
ALR		0.064	0.471***	
ROA		0.292***	-0.472***	0.288***
LS		-0.139	0.304***	

Note: **, *** indicate a notable level of significance at respectively 5% and 1%

Table 5. Correlation between characteristic variable and stock performance

	2020Q2				2021Q2			
	DD	VOL	DYR	EPS	DD	VOL	DYR	EPS
RANK	0.343***	0.329***	-0.205**	-0.131	0.073	0.086	-0.154	-0.178*
DW	0.009	-0.059	0.237**	0.321***	0.122	0.132	-0.182*	0.143
DG	0.117	0.132	-0.136	-0.314***	-0.008	-0.071	0.136	-0.135
BAL	0.049	0.112	-0.235**	-0.061	-0.286***	-0.152	0.073	-0.155
EXCEL	-0.229**	-0.265***	0.256**	0.250**	0.089	0.051	-0.012	0.113
CON	-0.073	-0.153	0.217**	0.300***	0.145	0.042	-0.161	-0.045

Note: *, **, *** indicate a notable level of significance at respectively 10% 5% and 1%

Table 6. Correlation between ESG and RANK from different period

2021Q2 2020Q2	ESG	RANK
ESG	0.404***	
RANK		0.405***

Note: *** indicate a notable level of significance at respectively 1%

3.3 Results and Discussion

By the contents in **Table 3** and **Table 4**, in P2020, if *DYR* is used as an indicator to evaluate the return on stocks, then *RANK* has a negative effect on *DYR*, and *ESG* has a significant positive effect on *DYR*, suggesting that a higher score (or a higher rank) could enhances the financial performance of stocks. The subsequent correlation test further strengthens the credibility of this inference. In contrast, if *EPS* is used as an indicator to evaluate the return on stocks, the effect of *ESG* and *RANK* are not significant, while *ROA* has a significant positive effect on *EPS* and *PE* has a significant negative effect on *EPS*. The reason for this could be the differences between *DYR* and *EPS*. *DYR* calculates the portion of profits paid to shareholders, while *EPS* calculates the profitability of the company per share of stock. A satisfying ESG assessment may have a relationship with a company's ability to pay the shareholders, but can not significantly enhance its profitability. In period P2021, the influences of *ESG* and *RANK* were neither significant regardless of whether *DYR* or *EPS* was used as the evaluation metric. In this period, the correlation between ESG assessment and stock's financial performance decreased compared to period P2020, and stock performance was more related to more financial-related factors such as *ALR*, *ROA*, and *LS*.

By the contents in **Table. 5** and **Table. 6**, we find that under this ESG evaluation system, the ESG assessment between two continuous periods, both in terms of letter grade and rankings, are correlated. Companies that performed well in the P2020 have a tendency to maintain their position to P2021. Secondly, for the characteristic indicators provided by this evaluation system, *CON* has a significant positive correlation with both *DYR* and *EPS* in P2020, representing that companies with high degree of balance on sustainability are more likely to have good financial performance. *RANK* has a significant positive correlation with *DD*, *VOL*, and a significant negative correlation with *DYR*, representing that top-ranked companies are more likely to have a higher risk resistance and a higher ability to pay dividends. Combined with the findings in the regression analysis, the rankings under this evaluation system can reflect the performance of stocks to a certain extent in P2020, including both performance on getting returns and risk resistance. However, in P2021, *RANK* only has a correlation with *EPS* the significance of this correlation has also decreased.

For the four sustainability attribute indicators which are *DW*, *DG*, *BAL*, and *EXCEL*, there is a significant positive correlation between *DW* and *EPS*, and a significant negative correlation between *DG* and *EPS* in P2020, representing that companies evaluated as making-more-profit are more likely to have higher profitability, and vice versa. And *EXCEL* has a significant correlation with all four stock performance indicators, it has a significant negative correlation with *DD* and *VOL*, and a significant negative correlation with *DYR* and *EPS*, representing that companies evaluated as be-excel-on-both are more likely to have good performance on both returns and risk resistance. However, in P2021, this significance decreases and only *BAL* and *DD* have a relatively more significant negative correlation, and in P2021, sustainability attributes can no longer match the stock performance of the company.

Combining the findings in the regression analysis and correlation analysis, we have a reason to infer that in P2020, this evaluation system is relatively accurate, sustainability assessment can match the company's stock performance to a certain extent, especially for the characteristic indicators such as *EXCEL*. However, in P2021, the consistency between sustainability assessment and stock performance decreases. The possible reasons could be changes in people's perceptions on ESG assessment, or changes in information disclosure which will affect the accuracy of ESG assessment, or changes in the market that render the original ESG evaluation system useless.

4. Conclusion

4.1 Findings

In this paper, using the lists given by *Discovering "SV 99" in China* in 2019 and 2020, and the financial data of all the listed companies between 2019-07-01 and 2021-06-30 as a sample, the empirical tests on the relationship between CASVI's sustainable assessments and company's stock performance are performed. While the tests illustrate how sustainability assessments can be correlated with company's stock performance, this correlation is proved to be time-limited and the significance of the correlation varies widely across time. Therefore, it is difficult to judge whether a sustainability assessment can be used to instruct investment decision especially when the investors are exposed to it for the first time.

It is critical to understand one's risk appetite and goal of investment when participating in the sustainable investment. For those who just want to take responsibility such as supporting social equity or environmental improvement, a sustainable assessment could be satisfying and meaningful. However, for those who want also want actual economic returns or lower the risk of their investment portfolio, a sustainable assessment could be useless unless they do research on the effectiveness of the report.

4.2 Reflections and Suggestions

Our study is still inadequate to really determine the value of sustainable assessments. Firstly, indicators of each company's performance in the tests are limited. Only the datasets of company's stock performance are used as dependent variables. The result of assessment is not consistent with the stock performance does not necessarily mean that this assessment is unreasonable. There should be more criteria to exam the effectiveness of a sustainable assessment. Secondly, the choices on

assessments are limited. CASVI is not the only assessment provider, institutions such IIGF and SynTao Green Finance also provide sustainable assessment base on their own methodology. And the previous study has proved that different assessment provider can have significant divergence even on the same company. When the similar research is being performed, understanding the methodology of the assessment provider and using a more relevant using to examine the effectiveness of the assessment will be more helpful and precise. Thirdly, the sample and dataset are limited too. As the sample is based on *Discovering "SV 99" in China* which only has 99 companies on the list, the result could be biased. If different assessment data is used and the sample size is expanded, then the result of the empirical analysis might be different. Also, choose another dataset instead of WIND might change the result too.

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