

SUSTAINABLE FINANCE FRAMEWORK- A STEP TOWARDS RESPONSIBLE INVESTING

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Abstract

This research study examines sustainable finance frameworks and their significance in responsible investing, with a focus on the United States market. The study's goal is to improve investor insight into responsible investing and to construct diverse sustainable portfolios for Type A investors. The data analysis compares the predicted rate of return of Type A portfolios to inflation and GDP growth rates in the United States. The data show that Type A portfolios exceed inflation and GDP on a consistent basis, indicating the financial sustainability of responsible investing. In portfolio development, the study addresses the necessity of considering ESG concerns, carbon footprints, and eliminating SIN industries. It uncovers that responsible investing is not only ethically responsible but also economically profitable, offering the opportunity for increased profitability while prioritising environmental and social responsibility.

Keywords: Sustainable Finance Framework, ESG, Investors, CAPM, ROI, EPS, Sin Industries

Introduction: In recent years, investors are increasingly seeking out businesses that place a high priority on environmental, social, and governance (ESG) challenges, such as climate change. Many investors are searching for companies that are actively decreasing their carbon footprint by setting science-based goals, utilizing renewable energy sources, and minimizing waste. Businesses with a reputation for being pioneers in sustainability and climate action may draw more investors and command greater market valuations. It is believed that the portfolio manager should have a holistic approach and also consider the company's commitment to –

- Balance economic success with environmental and social responsibility

- Foster business that enables sustainable growth, which is guided by internationally recognized principles and standards.
- Ensure that the sustainability strategy is grounded in strong governance, policy and process.
- Provide insights into their transition plans and the steps and strategies that the companies have in place to move towards a more sustainable and low-carbon business model.
- And lastly, companies should encourage transparent communication and open dialogue with stakeholders.

Sustainable Finance Framework: A sustainable finance framework is a set of principles and standards that guide financial institutions and investors in incorporating environmental, social, and governance (ESG) factors into their investment decisions and operations. It involves assessing the impact of investments on the environment and society and aims to promote sustainable economic growth. ESG integration, risk management, stakeholder engagement, and transparency and disclosure are some of the key components of a sustainable finance framework. There are 3 frameworks that are developed as per the type of investors in the market.

- **Sustainable Framework 1 (SF1) (Type U investors)** – Investors under this framework are known as the Type U investors who are ESG Unaware investors. Here the investors focus only on the profit aspect and not on the responsible investing factors.
- **Sustainable Framework 2 (SF2) (Type A investors)**– Investors under this framework are known as the Type A investors who are ESG Aware investors. Here investors focus not just on profit but also on the environment, when selecting stocks for their portfolio they consider Profit, ESG Score and ensure they exclude Sin Industries. Here, ESG, carbon emission Scope 1, 2 and 3 are considered equally with the companies EPS, PE and Beta. Our world currently stands with SF2 type of investors.
- **Sustainable Framework 3 (SF3) (Type M investors)**– Investors under this framework are known as the Type M investors who are ESG Motivated investors. Here investors focus just on the environment. They focus only on ESG scores and only invest in those companies which actively are working towards ESG, even if those companies are not high returns companies, they will forgo their additional returns. Here, ESG, carbon emission Scope 1, 2 and 3 are considered more than the companies' EPS, PE and Beta. Currently, there are not many investors in this area but is considered to be the futuristic type of investors.

To have a responsible portfolio one needs to consider Companies ESG score, Carbon Footprint from Scope 1, Scope 2 and Scope 3 emissions and also exclude the Sin Industry/Stocks which

are stocks of Companies which are considered as a part of the Sin industry in the respective country.

Review of Literature

1. **Dirk Schoenmaker (2017)** wrote the book on ***‘INVESTING FOR THE COMMON GOOD: A SUSTAINABLE FINANCE FRAMEWORK’***. Dirk Schoenmaker's research delves into finance's potential to promote the common good and sustainable development. He highlights the limitations of traditional finance, emphasizing its tendency to prioritize shareholder value over societal and environmental concerns. Schoenmaker suggests a sustainable finance framework for informed investment decisions, advancing the discourse on aligning financial activities with broader objectives. His work forms a valuable foundation for future research and policymaking in sustainable finance.
2. **Migliorelli, Marco. (2021)**, wrote a journal on ***‘What do we mean by sustainable finance? Assessing existing frameworks and policy risks.’*** Migliorelli examines the current state of the sustainable finance landscape, highlighting challenges arising from diverse concepts, classifications, and standards. This variability hinders the development of a cohesive conceptual framework, posing risks to the market's legitimacy. Proposing "finance for sustainability" over "sustainable finance," Migliorelli emphasizes active financial support for sustainability. He suggests explicit incorporation of key sustainability components, aligning with the UN's Sustainable Development Goals and the Paris Agreement, for a focused and impactful approach to finance for sustainability.
3. **Kempf, A., & Osthoff, P. (2007)**, wrote an article ***‘The effect of socially responsible investing on portfolio performance’*** This paper explores the impact of socially responsible investing (SRI) on portfolio performance, emphasizing the rising trend of incorporating SRI screening into stock portfolio construction. Employing a trading method based on KLD Research & Analytics' ratings, the study suggests that investors utilizing best-in-class screening and targeting high socially responsible-rated stocks may generate abnormal returns, indicating the profitability and viability of socially responsible investing as a strategy.

Research Methodology: This research paper employs an exploratory research design to investigate the various stages of the Sustainable Finance Framework and Responsible Investing, with a focus on the United States market. This design was chosen based on the nature of the challenge and attempts to get a thorough understanding of the subject. The study focuses only on the US market due to its significant expansion in the ESG sector, which has been fueled

by recent government regulations and increased awareness among investors, corporations, and consulting firms.

The study intends to delve into the unique dynamics and trends within this environment by focusing on the US market. The findings will add to the existing body of information on the Sustainable Finance Framework and Responsible Investing, providing significant insights for investors, businesses, and governments. Overall, the exploratory approach and emphasis on the US market provide a solid platform for further research into these themes.

Data Sources: This study is based on secondary data. The required data have been collected from various sources i.e., U. S Department of the Treasury to collect the Daily Treasury Bill rates for calculating the risk-free rate (R_f), yahoo finance and Refinitiv Eikon is used to collect 10-year data of various companies. It is a time series data and the relevant data have been collected from **2013 to 2022**. For the purpose of data analysis along with the above data, 10 years of U.S Inflation and GDP is also collected.

Objectives of the study

- a) To examine the different stages of the Sustainable Finance Framework and raise investor awareness about responsible investing.
- b) To develop diverse sustainable portfolios that prioritize both sustainability and profitability, catering to the needs of framework 2 (type A) investors.
- c) To evaluate the expected rate of return for assets or investments using the CAPM wherein the Beta was calculated using regression analysis, considering both market conditions and risk-free assets.
- d) To create a responsible portfolio that can outperform the U.S. inflation and GDP Growth.

Limitations of the study: The study is based on secondary data and hence it may be affected by the limitations inherited in the secondary data.

- a) At various stages, the basic objective of the study is suffered due to the inadequacy of data from related sources. There has also been a problem with sufficient homogenous data from different sources.
- b) As the topic has recently gained momentum there is lacking of empirical evidence which makes validation of data analysis problematic, as the researcher has to make interpretations and draw her own conclusions from the data obtained. Here, different academics interpret the same analysis in different ways.
- c) With respect to Carbon Emissions the researcher came across a limitation of no sufficient and regular disclosure and reduction of Carbon Emissions Scope 2 and 3

d) As the researcher has relied on the secondary data, data might be biased in some cases.

Hypothesis for this research work

H0-A Responsible Investing Portfolio does not have a better rate of return as compared to Inflation and GDP

OR

H1- A Responsible Investing Portfolio has a better rate of return as compared to Inflation and GDP

Data Analysis and Interpretation

Type of investing strategy: As researchers strive to identify an optimal strategy for constructing portfolios, the exclusionary investing strategy emerges as the oldest and most popular approach.

Our portfolio construction focuses on the top 50 high market-cap companies from the S&P 500 market. By tailoring this strategy to different investor categories, the researcher has meticulously planned and outlined the relevant factors.

Types of Investors and their portfolio:

1. *Type U investors:* ESG Unaware investors focus only on the profit aspect, so the criteria for these investors under the exclusionary method are:

Criteria 1: Beta Benchmark

A company's beta indicates its volatility in the relevant market. A beta greater than 0.8 indicates high volatility. Companies with such betas are deemed volatile, value profit over all else, and are included in portfolios to entice investors. With a benchmark of 0.8, beta becomes the initial exclusionary criterion for this investor group.

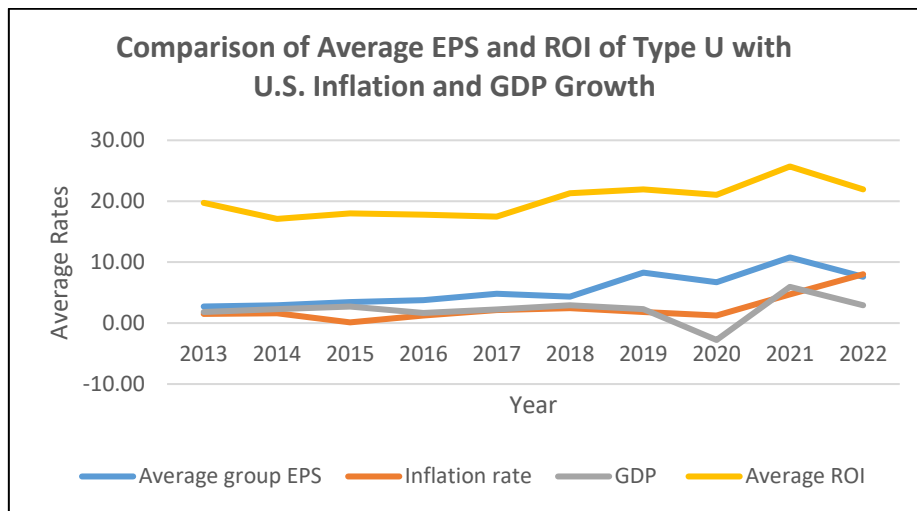
Criteria 2: Range of PE ratios

A PE ratio of 15 or above is an intriguing aim for investors. As a result, this criterion requires a PE ratio ranging from 15 to 25. Companies with PE ratios greater than 25 or less than 15 are excluded, resulting in the final portfolio for this specific set of investors.

Sl no	Name	RIC	Beta	PE Ratio
1	Alphabet Inc - Class A	GOOGL	1.08	22.33
2	Berkshire Hathaway Inc	BRK.A	0.88	21.02
3	Meta Platforms Inc	META	1.15	19.92
4	Home Depot Inc	HD	0.94	17.29
5	Broadcom Inc	AVGO	1.1	17.03
6	Oracle Corp	ORCL	0.99	21.16
7	Cisco Systems Inc	CSCO	0.97	16.46
8	Danaher Corp	DHR	0.81	22.19
9	Accenture PLC	ACN	1.24	22.71
10	Texas Instruments Inc	TXN	1.01	18.73

Table 1 – Portfolio of Type ‘U’ Investors- Data collected from Refinitiv Eikon

Year	Average EPS	Average ROI	Inflation rate	GDP
2013	2.73	19.76	1.50	1.84
2014	2.91	17.10	1.62	2.29
2015	3.48	18.02	0.12	2.71
2016	3.77	17.81	1.26	1.67
2017	4.82	17.50	2.13	2.24
2018	4.35	21.31	2.44	2.95
2019	8.31	21.93	1.81	2.29
2020	6.71	21.06	1.23	-2.77
2021	10.78	25.70	4.70	5.95
2022	7.62	21.93	8.02	2.90

Table 2 – Average rates of Type ‘U’ Investor's portfolio for the last 10 years- Data collected from Refinitiv Eikon**Figure 1: Comparison of Average EPS and ROI of Type U with U.S. Inflation and GDP Growth**

Interpretation: The average group EPS fluctuated, beginning at 2.73 in 2013 and peaking at 10.78 in 2021 before falling to 7.62 in 2022. This illustrates that earnings have increased overall over the years, with an enormous rise in 2021.

The average ROI, on the other hand, remained very consistent, ranging from 17.10% to 25.70% during this time period. The ROI remained higher than the average group EPS, demonstrating that the companies may create profitable returns on investments.

In terms of market GDP in the United States, it has typically ascended over the years, with a decline in 2020 owing to the COVID-19 pandemic. Inflation rates varied as well, with some years having higher rates than others. Overall, average group EPS and ROI increased and stabilised, surpassing inflation rates in most years while being influenced by variations in US market GDP.

2. Type A investors: ESG Aware investors focus not just on profit but also on the environment so the criteria for these investors under the exclusionary method are:

Criteria 1: Exclusion of SIN stocks: SIN equities are stocks of corporations engaging in businesses that are considered sinful in the United States. Companies that manufacture or sell alcohol, gambling, birth control pills, firearms, or promote and advertise pornography are deemed sin industries in the United States and are therefore excluded from the portfolio first.

Criteria 2: ESG Score Benchmark: Environment Social Governance score is assigned to all organisations based on how well they address the risk of these three concerns in their business operations. The score is given on a scale of 0 to 100, with a score of 50 deemed adequate for a firm; for this portfolio, we used 50 as a benchmark. As a result, organisations with ESG scores lower than 50 are excluded second under this plan.

Criteria 3 & 4: Beta Benchmark & PE Range: These requirements correspond to type U investors, who have a beta value of 0.8 or higher and a PE ratio between 15 and 25. We have our final list of companies after excluding any companies that do not meet the set benchmark and range.

Sl no	Name	RIC	Sin industry	ESG Score	Beta	PE Ratio	CO2 Equivalent Emissions Direct, Scope 1 (2021)
1	Home Depot Inc	HD	No	72.53	0.94	17.29	6,42,000
2	Broadcom Inc	AVGO.O	No	51.45	1.1	17.03	1,27,714
3	Cisco Systems Inc	CSCO.O	No	85.31	0.97	16.46	34,264
4	Danaher Corp	DHR	No	82.25	0.81	22.19	1,55,974
5	Accenture PLC	ACN	No	79.87	1.24	22.71	17,804
6	Texas Instruments Inc	TXN.O	No	82.94	1.01	18.73	10,40,450

Table 3: Portfolio of Type ‘A’ Investors- Data collected from Refinitiv Eikon

Year	Average EPS	Average ROI	Inflation rate	GDP
2013	2.77	24.35	1.50	1.84
2014	2.85	20.21	1.62	2.29
2015	3.44	22.72	0.12	2.71
2016	3.81	20.96	1.26	1.67
2017	3.70	20.12	2.13	2.24
2018	5.11	26.76	2.44	2.95
2019	6.33	25.12	1.81	2.29
2020	6.06	24.07	1.23	-2.77
2021	8.01	27.04	4.70	5.95
2022	10.99	28.53	8.02	2.90

Table 4 – Average rates of Type ‘A’ Investors portfolio for the last 10 years- Data collected from Refinitiv Eikon

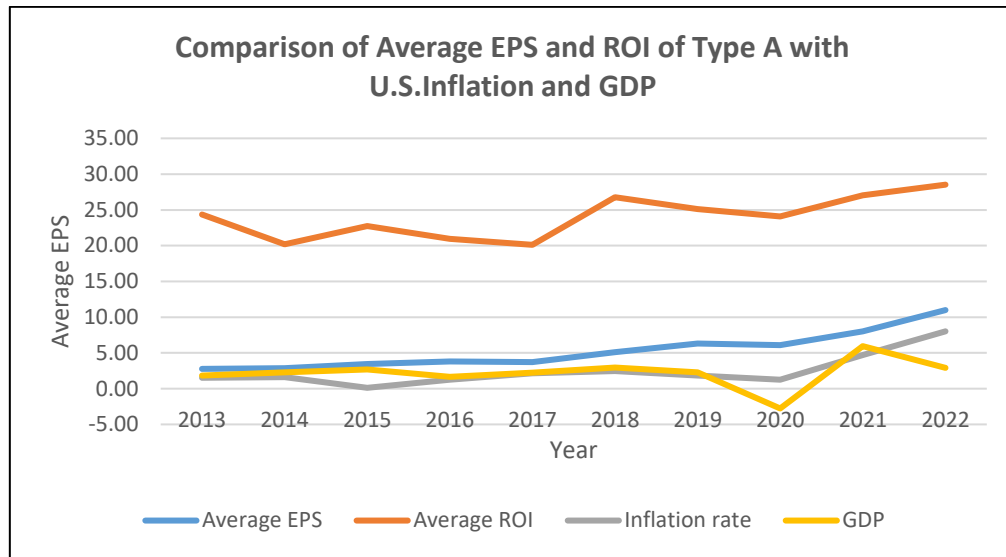


Figure 2: Comparison of Average EPS and ROI of Type A with U.S. Inflation and GDP

Interpretation: The average EPS increased steadily from 2.77 in 2013 to 10.99 in 2022, indicating growing profitability for the market as a whole. However, the ROI fluctuated within a relatively narrow range, ranging from 20.12% to 28.53%, suggesting consistent but not substantial returns on investment. Regarding ROI, Type A investors consistently outperformed Type U investors. In 2013, Type A had an ROI of 24.35, whereas Type U had an ROI of 19.76. This trend persisted over the years, with Type A maintaining a higher ROI than Type U investors. In 2022, Type A investors achieved an ROI of 28.53, while Type U investors had an ROI of 21.93. In terms of their relationship with inflation and GDP, both Type U and Type A investors experienced fluctuations in EPS and ROI in response to changes in these economic indicators. However, it is worth noting that Type U investors seemed to be more influenced by inflation and GDP growth, as their EPS and ROI displayed greater variations.

Based on the data provided, Type U investors had higher average EPS compared to Type A investors, indicating potentially better performance in terms of earnings. However, Type A investors consistently achieved higher average ROI, suggesting better overall returns on investment. Overall, the average EPS showed consistent growth, indicating increased profitability, while the ROI remained stable. The market performance was influenced by fluctuations in both inflation and GDP, reflecting the broader economic conditions during the given period.

3. Type M investors: ESG Motivated investors focus just on the environmental aspect, so the criteria for these investors under the exclusionary method are:

- a) **Criteria 1 & 2 Exclusion of SIN Stocks & ESG Score benchmark-** These criteria correspond to type A investors. In this case, SIN stocks are first removed from the portfolio, and ESG Scores of 50 or higher are assessed, leaving us with 21 firms.
- b) **Criteria 3 Average scope 1 emission-** As no precise benchmark for scope 1 emissions has been set, the researcher calculates the average emissions of the other 21 companies, which totals 4049465.14. Companies with emissions exceeding this figure are further removed using this benchmark, resulting in a final portfolio of 18 companies. Thus, after filtering out the companies based on the above criteria, the portfolio looks like this:

Sl no	Name	RIC	Sin industry	ESG Score	CO2 Equivalent Emissions Direct, Scope 1 (2021)
1	NVIDIA Corp	NVDA.O	No	52.67	2,692
2	UnitedHealth Group Inc	UNH	No	54.25	97,537
3	Home Depot Inc	HD	No	72.53	6,42,000
4	Broadcom Inc	AVGO.O	No	51.45	1,27,714
5	Costco Wholesale Corp	COST.O	No	72.93	12,18,381
6	Thermo Fisher Scientific Inc	TMO	No	77.21	2,98,043
7	Cisco Systems Inc	CSCO.O	No	85.31	34,264
8	Nike Inc	NKE	No	68.87	42,720
9	Salesforce Inc	CRM	No	68.23	6,000
10	Danaher Corp	DHR	No	82.25	1,55,974
11	Abbott Laboratories	ABT	No	50.67	5,33,000
12	Accenture PLC	ACN	No	79.87	17,804
13	Texas Instruments Inc	TXN.O	No	82.94	10,40,450
14	Comcast Corp	CMCSA.O	No	66.31	5,19,288
15	Adobe Inc	ADBE.O	No	77.49	4,923
16	Coca-Cola Co	KO	No	57.73	16,10,000
17	PepsiCo Inc	PEP	No	63.82	35,96,712
18	Wells Fargo & Co	WFC	No	50.32	75,111

Table 5: Portfolio of Type ‘M’ Investors- Data collected from Refinitiv Eikon

Year	Average EPS	Average ROI	Inflation rate	GDP
2013	2.53	14.22	1.50	1.84
2014	2.57	13.04	1.62	2.29
2015	2.92	14.78	0.12	2.71
2016	3.11	14.85	1.26	1.67
2017	3.35	15.48	2.13	2.24
2018	4.24	19.06	2.44	2.95
2019	5.36	17.98	1.81	2.29
2020	5.32	17.87	1.23	-2.77
2021	7.15	20.12	4.70	5.95
2022	8.67	18.91	8.02	2.90

Table 6 – Average rates of Type ‘M’ Investors portfolio for the last 10 years- Data collected from Refinitiv Eikon

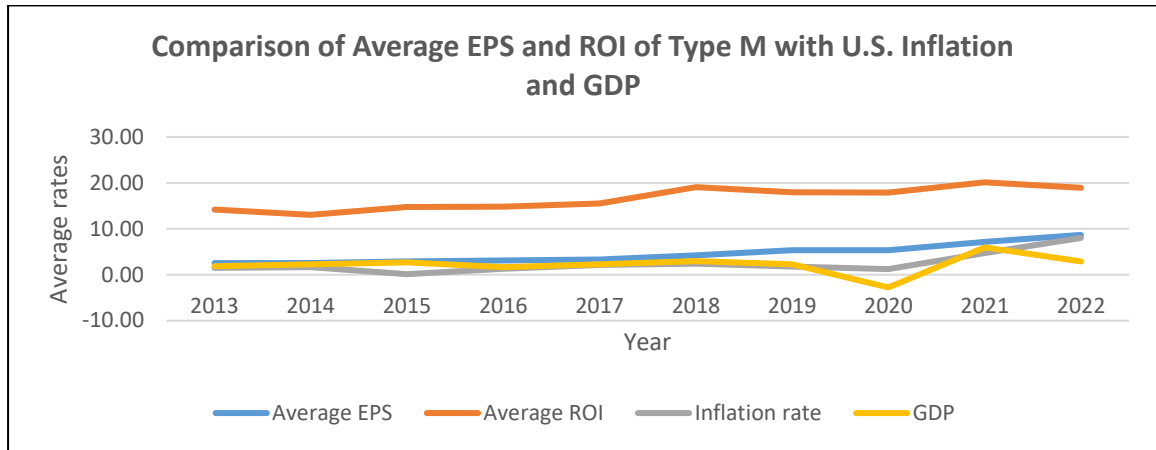


Figure 3: Comparison of Average EPS and ROI of Type M with U.S. Inflation and GDP

Interpretation: EPS increased steadily from 2.53 in 2013 to 8.67 in 2022, demonstrating better company profitability. EPS growth, on the other hand, surpassed GDP growth, indicating that corporations were able to create higher earnings despite economic headwinds.

Similarly, ROI climbed from 14.22% in 2013 to 18.91% in 2022, indicating favourable investment returns. Although ROI increased, it remained lower than GDP growth, indicating a potential mismatch between investment success and overall economic growth. Inflation rates have varied over the years, according to the data. Notably, the 2022 high inflation rate may have impacted both EPS and ROI, thereby diminishing their true worth.

4. Comparison of Expected return of Type A investor's portfolio with the U.S. inflation and GDP growth: *Calculation of expected rate of return using regression analysis:*

Once we have calculated the EPS of the following companies it is important to calculate the rate of expected return. We shall calculate the expected return (CAPM) of only SF2 group as they are current Socially responsible investors.

Sl no	Name	RIC	Sin industry	ESG Score	Beta	PE Ratio	CO2 Equivalent Emissions Direct, Scope 1 (2021)
1	Home Depot Inc	HD	No	72.53	0.94	17.29	6,42,000
2	Broadcom Inc	AVGO.O	No	51.45	1.1	17.03	1,27,714
3	Cisco Systems Inc	CSCO.O	No	85.31	0.97	16.46	34,264
4	Danaher Corp	DHR	No	82.25	0.81	22.19	1,55,974
5	Accenture PLC	ACN	No	79.87	1.24	22.71	17,804
6	Texas Instruments Inc	TXN.O	No	82.94	1.01	18.73	10,40,450

Table 7– SRI Portfolio- Data collected from Refinitiv Eikon

Process: To understand whether our rate of return is more than our Inflation and GDP it is important that we 1st calculate Beta using Regression analysis once our Beta, R-square and slope have been derived we then can calculate rate of return using the CAPM formula:

$$\text{Expected Return (Ke)} = r_f + \beta (r_m - r_f)$$

Post calculation of CAPM for 10 years from 1st January 2013– 31st December 2022 we then compare it with Inflation and GDP of years. Since our main goal is to create sustainable portfolios for type A investors we shall calculate and compare Average CAPM, Inflation and GDP for Sustainable Framework 2 group. For this we shall 1st calculate Beta

1. **Calculation of Beta:** Beta is a backward-looking constant variable used in Capital asset Pricing Model. Historical Prices is used to calculate Beta as it tries to estimate the future changes with the help of such historical prices. The Historical prices were collected from yahoo finance. For beta calculation of these 6 companies, market price is required and so, S&P 500 historical data has been considered. Since beta is calculated using returns, returns on market(r_m) and return on respective company is calculated using annual continuous returns of daily price i.e., a natural log of current day adjusted price (CD)/ previous day adjusted price (PD)

Formula- [=LN(CD/PD)] (column C&F)

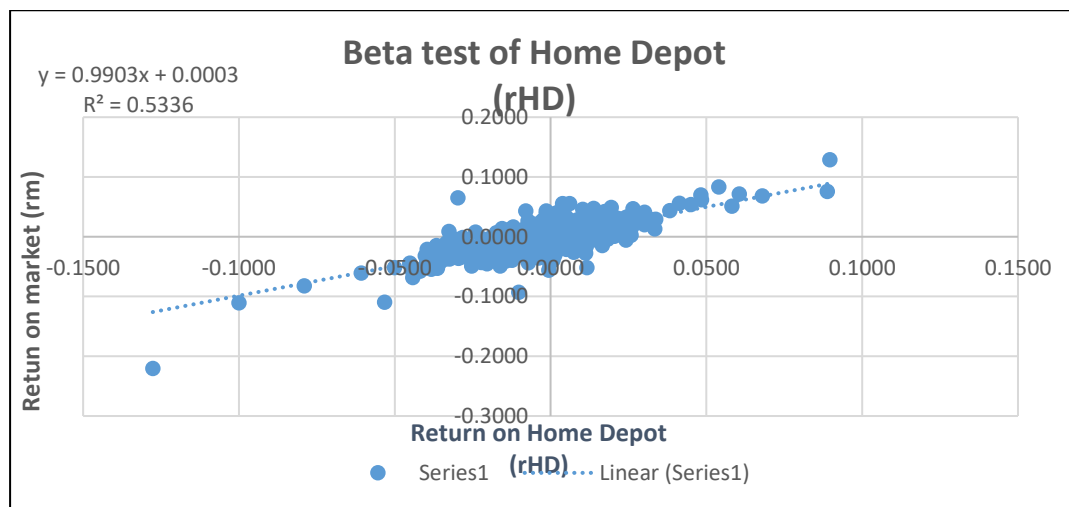
TIME							
=LN(B4/B5)							
	A	B	C	D	E	F	
1	Date	S&P 500 (Market)	r _m	Date	HD	r _{HD}	
2	30-Dec-22	\$ 3,839.50	-0.0025	30-Dec-22	\$ 311.35	-0.0143	
3	29-Dec-22	\$ 3,849.28	0.0173	29-Dec-22	\$ 315.83	0.0147	
4	28-Dec-22	\$ 3,783.22	=LN(B4/B5)	28-Dec-22	\$ 311.22	-0.0120	
5	27-Dec-22	\$ 3,829.25	-0.0041	27-Dec-22	\$ 314.98	0.0026	
6	23-Dec-22	\$ 3,844.82	0.0059	23-Dec-22	\$ 314.18	0.0082	
7	22-Dec-22	\$ 3,822.39	-0.0146	22-Dec-22	\$ 311.60	-0.0102	
8	21-Dec-22	\$ 3,878.44	0.0148	21-Dec-22	\$ 314.80	0.0143	
9	20-Dec-22	\$ 3,821.62	0.0010	20-Dec-22	\$ 310.34	-0.0079	
10	19-Dec-22	\$ 3,817.66	-0.0090	19-Dec-22	\$ 312.80	-0.0188	
11	16-Dec-22	\$ 3,852.36	-0.0112	16-Dec-22	\$ 318.72	-0.0131	
12	15-Dec-22	\$ 3,895.75	-0.0252	15-Dec-22	\$ 322.92	-0.0176	
13	14-Dec-22	\$ 3,995.32	-0.0061	14-Dec-22	\$ 328.67	0.0016	
14	13-Dec-22	\$ 4,019.65	0.0073	13-Dec-22	\$ 328.13	0.0149	
15	12-Dec-22	\$ 3,990.56	0.0142	12-Dec-22	\$ 323.29	0.0231	
16	09-Dec-22	\$ 3,934.38	-0.0074	09-Dec-22	\$ 315.90	-0.0112	
17	08-Dec-22	\$ 3,963.51	0.0075	08-Dec-22	\$ 319.46	0.0122	
18	07-Dec-22	\$ 3,933.92	-0.0019	07-Dec-22	\$ 315.58	0.0085	
19	06-Dec-22	\$ 3,941.26	-0.0145	06-Dec-22	\$ 312.91	-0.0083	
20	05-Dec-22	\$ 3,998.84	-0.0181	05-Dec-22	\$ 315.51	-0.0244	
21	02-Dec-22	\$ 4,071.70	-0.0012	02-Dec-22	\$ 323.30	0.0028	
22	01-Dec-22	\$ 4,076.57	-0.0009	01-Dec-22	\$ 322.40	0.0095	
23	30-Nov-22	\$ 4,080.11	0.0305	30-Nov-22	\$ 319.36	0.0311	
24	29-Nov-22	\$ 3,957.63	-0.0016	29-Nov-22	\$ 309.57	-0.0093	

Figure 4 - Market return

TIME							
=LN(E4/E5)							
	A	B	C	D	E	F	G
1	Date	S&P 500 (Market)	rm	Date	HD	rHD	
2	30-Dec-22	\$ 3,839.50	-0.0025	30-Dec-22	\$ 311.35	-0.0143	
3	29-Dec-22	\$ 3,849.28	0.0173	29-Dec-22	\$ 315.83	0.0147	
4	28-Dec-22	\$ 3,783.22	-0.0121	28-Dec-22	\$ 311.22	=LN(E4/E5)	
5	27-Dec-22	\$ 3,829.25	-0.0041	27-Dec-22	\$ 314.98	0.0026	
6	23-Dec-22	\$ 3,844.82	0.0059	23-Dec-22	\$ 314.18	0.0082	
7	22-Dec-22	\$ 3,822.39	-0.0146	22-Dec-22	\$ 311.60	-0.0102	
8	21-Dec-22	\$ 3,878.44	0.0148	21-Dec-22	\$ 314.80	0.0143	
9	20-Dec-22	\$ 3,821.62	0.0010	20-Dec-22	\$ 310.34	-0.0079	
10	19-Dec-22	\$ 3,817.66	-0.0090	19-Dec-22	\$ 312.80	-0.0188	
11	16-Dec-22	\$ 3,852.36	-0.0112	16-Dec-22	\$ 318.72	-0.0131	
12	15-Dec-22	\$ 3,895.75	-0.0252	15-Dec-22	\$ 322.92	-0.0176	
13	14-Dec-22	\$ 3,995.32	-0.0061	14-Dec-22	\$ 328.67	0.0016	
14	13-Dec-22	\$ 4,019.65	0.0073	13-Dec-22	\$ 328.13	0.0149	
15	12-Dec-22	\$ 3,990.56	0.0142	12-Dec-22	\$ 323.29	0.0231	
16	09-Dec-22	\$ 3,934.38	-0.0074	09-Dec-22	\$ 315.90	-0.0112	
17	08-Dec-22	\$ 3,963.51	0.0075	08-Dec-22	\$ 319.46	0.0122	
18	07-Dec-22	\$ 3,933.92	-0.0019	07-Dec-22	\$ 315.58	0.0085	
19	06-Dec-22	\$ 3,941.26	-0.0145	06-Dec-22	\$ 312.91	-0.0083	
20	05-Dec-22	\$ 3,998.84	-0.0181	05-Dec-22	\$ 315.51	-0.0244	
21	02-Dec-22	\$ 4,071.70	-0.0012	02-Dec-22	\$ 323.30	0.0028	
22	01-Dec-22	\$ 4,076.57	-0.0009	01-Dec-22	\$ 322.40	0.0095	
23	30-Nov-22	\$ 4,080.11	0.0305	30-Nov-22	\$ 319.36	0.0311	
24	29-Nov-22	\$ 3,957.63	-0.0016	29-Nov-22	\$ 309.57	-0.0093	

Figure 5 - Return of Home Depot

After calculating the returns, the researcher has graphed this using a scatter plot, it shows that beta is the slope of the least square regression line also called as the regression line which in the graph is the trendline.

**Figure 6 - Beta test Danaher Corp**

2. An alternate way to calculate beta and trendline (slope and R-square) of graph is through the formula shown below

Beta									
G	H	I	J	K	L	M	N	O	
Calculation of Beta, Expected return, CAPM and security market line									
Used in calculation of CAPM									
Beta		0.990	=COVARIANCE.P(C2:C2518,rHD)/VAR.P(C2:C2518)						
Slope		0.990	=SLOPE(rHD,rma)						
R^2		0.534	=RSQ(rHD,rma)						
Alternatively,	Beta		0.990	=SLOPE(rHD,rma)					
Expected Market Return E(r _m)									
E(r _m)Daily		0.04%	=AVERAGE(rma)						
E(r _m)yearly		10.14%	=(1+J10)^252-1						
Expected Return E(r _{HD})									
E(r _{HD})Daily		0.000726399	=AVERAGE(rHD)						
E(r _{HD})yearly		20.08%	=(1+J14)^252-1						
rf		79.47%	=RF(H4)						

Figure 7 Sample Beta

3. Another way to calculate Beta is using regression analysis via the Excel Data analysis tool pack

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.730502569
R Square	0.533634003
Adjusted R Square	0.533448569
Standard Error	0.010292863
Observations	2517

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.304878616	0.30488	2877.760223	0
Residual	2515	0.266446702	0.00011		
Total	2516	0.571325318			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.000	0.000205283	1.68861	9.14%	-5.5899E-05	0.00075	-5.5899E-05	0.00075
X Variable 1	0.990	0.018459598	53.6448	0.00%	0.954063142	1.02646	0.954063142	1.02646

Alternatively 2,

Intercept	0.000
X Variable 1- BETA	0.990

Shows 91% confidence
Shows 100% confidence

Figure 8 – Calculation of Beta using regression analysis

In this alternative method too, the X variable, i.e., Beta is 0.990 which is similar to the other methods used for calculation of Beta. The p- value for the X variable, i.e., Beta shows 100% confidence level. Thus, proving the accuracy of the researcher's analysis.

4. In order to find out the CAPM we need to calculate the expected market return which is done using expected market return of the year.

(To get more accurate expected market return of the year we have taken 252 days instead of 365 as there are only 252 observations per year.)

5. The risk-free(r_f) rate is calculated by taking the average of daily treasury bill rates of the last 10 years (**1st January 2013 – 31st December 2022**) collected from U.S Department of the Treasury

	A	B	C	D	E	F	G	H	I	J	K
1		COUPON EQUIVALENT									
2	11/8/2017	1.23									
3	11/9/2017	1.24									
4	11/10/2017	1.23									
5	11/13/2017	1.24									
6	11/14/2017	1.26									
7	11/15/2017	1.25									
8	11/16/2017	1.27									
9	11/17/2017	1.28									
10	11/20/2017	1.3									
11	11/21/2017	1.3									
12	11/22/2017	1.29									
13	11/24/2017	1.28									
14	11/27/2017	1.27									
15	11/28/2017	1.3									
16	11/29/2017	1.29									
17	11/30/2017	1.27									
18	12/1/2017	1.27									

Figure 9 - U.S Department of the Treasury

6. We then Calculate our CAPM using this formula

$$\text{Expected Return (Ke)} = r_f + \beta (r_m - r_f)$$

Calculation of CAPM Formula	
Expected Return (Ke)	$= r_f + \beta (r_m - r_f)$
Expected Return (Ke)	10.82% $= 16 + 7 * (11 - 16)$

Figure 10: Calculation of CAPM is done using the formula

Here,

(Ke)= Expected return on a particular security, portfolio, stock, etc. Used the same average return of the same period as beta

Rf= Expected risk-free rate (90-day T-Bill) Used the same average return of the same period as beta

B= Beta of a particular security, portfolio, stock, etc.

Rm= Expected return of the market (S&P 500) Used the same average return of the same period as beta

(Rm – rf) =Market risk Premium

7. The Beta and expected return using regression analysis for the 6 companies is as follows:

Name	RIC	X Variable 1- BETA	P-value	Expected Return (Ke)
Home Depot Inc	HD	0.990	0.00%	10.82%
Broadcom Inc	AVGO	1.324	0.00%	-12.34%
Cisco Systems Inc	CSCO	0.997	0.00%	10.37%
Danaher Corp	DHR	0.880	0.00%	18.49%
Accenture PLC	CAN	1.075	0.00%	4.97%
Texas Instruments Inc	TXN	1.164	0.00%	-1.23%
Average				5.18%

Table 8: The Beta, p-value and expected return (and its average) using regression analysis for the 6 companies

8. Once our 10 years CAPM has been calculated for each company we then calculate average Inflation and GDP for the year 2013-2022 and show the results to prove our hypothesis

Expected Return Type A portfolio	Inflation rate	GDP
5.18%	2.48%	2.21%

Table 8: The average- expected return, Inflation and GDP

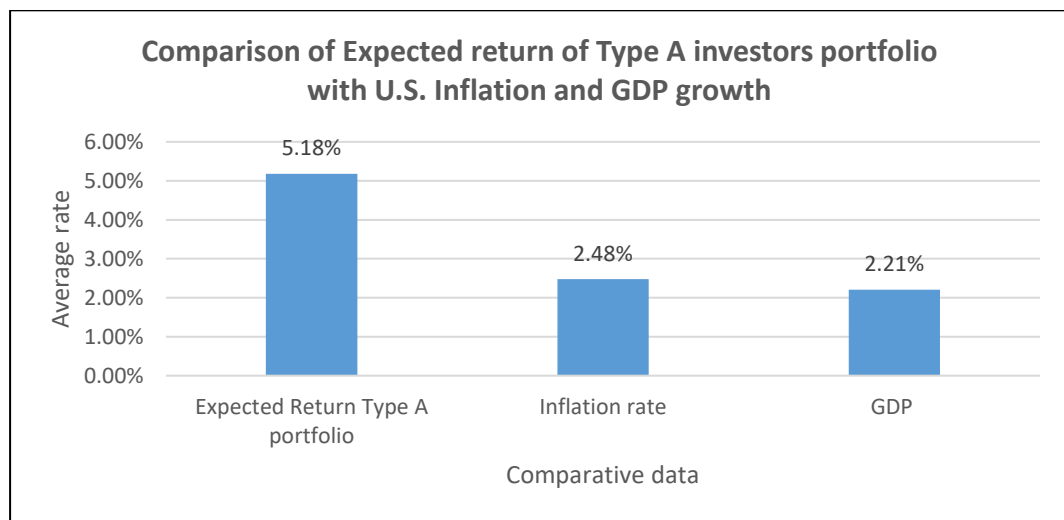


Figure 11- Comparison of Expected return of Type A investors portfolio with U.S. Inflation and GDP growth

Interpretation, Findings: The expected return for the Type A portfolio, estimated using regression analysis and the Capital Asset Pricing Model (CAPM), is 5.18%. When compared to the 2.21% GDP growth rate of the US market and the 2.48% inflation rate, we can conclude that the Type A portfolio is likely to beat both the GDP growth rate and the inflation rate. To back this up, the EPS and ROI of a Type A investor's portfolio have consistently exceeded US inflation and GDP growth over the last ten years.

The CAPM considers the portfolio's systematic risk, which is measured by beta determined by regression analysis. A positive beta suggests that the portfolio is projected to move in lockstep with the market as a whole. Taking into account the positive expected return of the Type A portfolio, it shows that it has the ability to deliver returns greater than the risk-free rate while compensating for the systematic risk.

Conclusion and Suggestions:

This research paper shows how sustainable finance framework has the potential to move from finance as a goal (profit maximization) to finance as a means.

According to the findings, type A investors, who prioritise both profit and the environment, consistently surpass US inflation and GDP growth rates. The Type A portfolio had a higher projected return and earnings per share, showing the possibility of greater profitability while taking into account sustainable practises.

When comparing all 3, Type A investors can construct portfolios that prioritise environmental and social responsibility while aiming for financial success by examining a company's ESG score, carbon footprint, and excluding SIN industries. This holistic strategy enables investors to connect their portfolios with their values while seeking chances for sustained growth over the long run. Thus, demonstrating that the alternative hypothesis is accepted.

The S&P 500 ESG list has acted as an incentive for corporations to prioritise Environmental, Social, and Governance aspects. Investors are now decisively avoiding SIN industries, regardless of their commercial nature. In terms of carbon, the mandatory publication of Scope 1 carbon emission reports has increased transparency and resulted in significant emissions reductions. Ethically, corporations must embrace emission reporting since it improves transparency between stakeholders and the company, ultimately generating economic benefits. Companies can communicate their commitment to sustainability and ethical practises through ESG disclosure, potentially influencing investor and stakeholder behaviour.

In the long run, sensible investing appears to have a bright future. Institutional investors can be enticed to participate in firms by offering loyalty shares if they hold shares in the company for three, five, or 10 years. Finally, we discuss how long-term investors might form effective coalitions in order to connect with and influence the companies in which they invest. Long-term investors can steer enterprises towards sustainable business practises and expedite the transition to sustainable development in this way.

Thus, responsible investing is not only a technique for aligning investment aims with environmental and social principles, but it also has the potential to outperform standard investment approaches. As more investors recognize the value of sustainability and responsible business practices, adopting responsible investment can lead to financial success while also contributing to a more sustainable and inclusive future.

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