

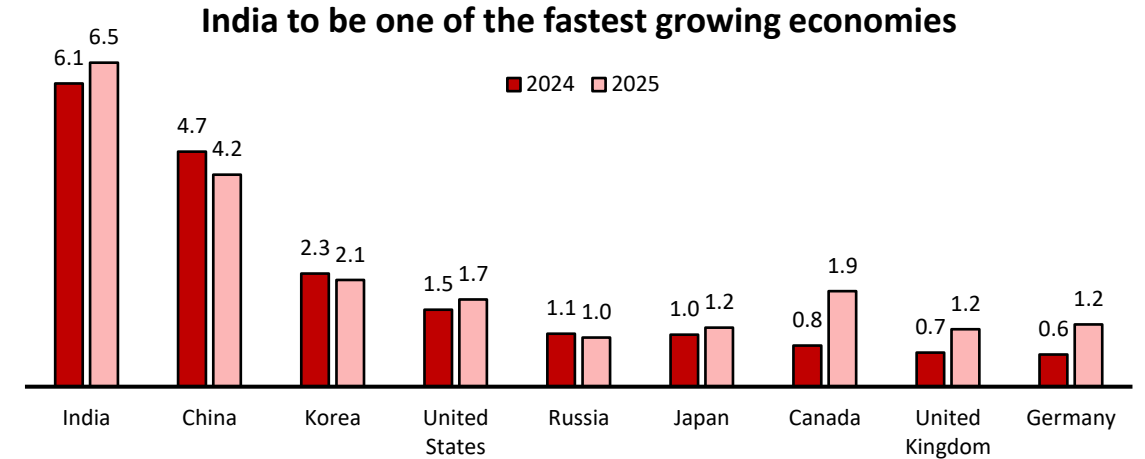
## Introduction to Quant Strategy – GQV A quantitative strategy with focus on long-only equity investing

## India Growth Story

It is widely acknowledged that India is expected to be one of the fastest growing economies.

But the pertinent question is, how can an individual participate and benefit from this promising growth story?

Is there a strategic way for individuals to position themselves to harness the opportunities inherent in India's growth?



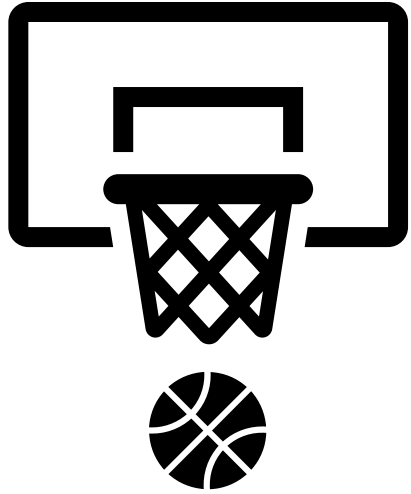
Source: OCED, Keynote Capitals Ltd.

Reflecting on a poignant quote by Malcolm X, "If you do not stand for something, you will fall for everything," one avenue to partake in India's growth story is through capital market investments. Successful navigation in capital markets demands stock-picking acumen, a robust risk management framework, and, most crucially, the ability & temperament to adeptly navigate market trends.

In the face of constrained time and resources, coupled with inherent human biases, harnessing the potential of India's growth can prove to be a formidable challenge. Therefore, a compelling solution is the introduction of a Quantitative model. By eliminating human intervention and, consequently, human biases, this model efficiently manages both stock selection and risk, facilitating a systematic approach to capturing growth.

This approach not only addresses the complexities associated with limited time and resources but also mitigates the impact of subjective biases, ensuring a more objective and disciplined pursuit of investment opportunities in the dynamic Indian capital markets.

## Objective of the quantitative strategy



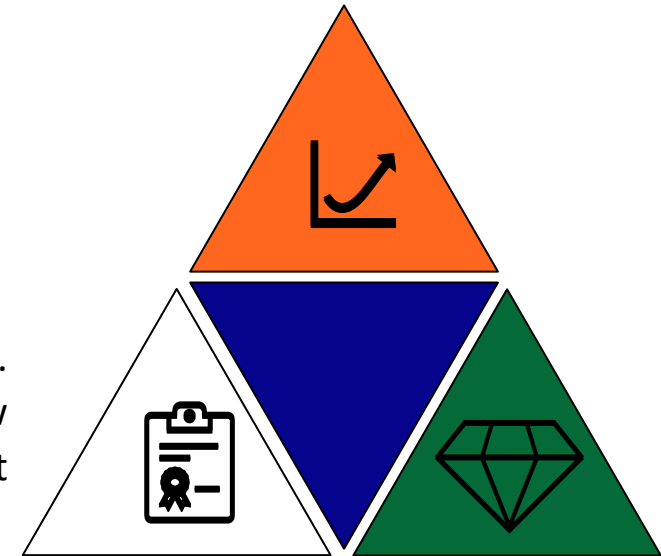
When scouting for a basketball team, we seek players with specific attributes:

- Height
- Long arm span
- Excellent hand-eye coordination
- Speed & agility
- Strength & stamina

Similarly when we scout for new investment ideas, we prioritize:

- Business Growth (**G**)
- Quality of the business (**Q**)
- Valuations (**V**)

We inherently want to invest in a companies demonstrating Quality Growth at a reasonable Valuation. Every business we invest in, we try to balance these three parameters. Some businesses have slow growth but good quality and valuation; others might have very exceptional growth potential but compromise on quality and carry unrealistic valuations.



## Objective of the quantitative strategy

*The objective was to create a strategy that outperforms the market consistently and generates attractive risk adjusted returns purely based on quants, without any human intervention.*

### What

We created a quantitative strategy to identify stocks with right balance of **G**rowth, **Q**uality and **V**aluation

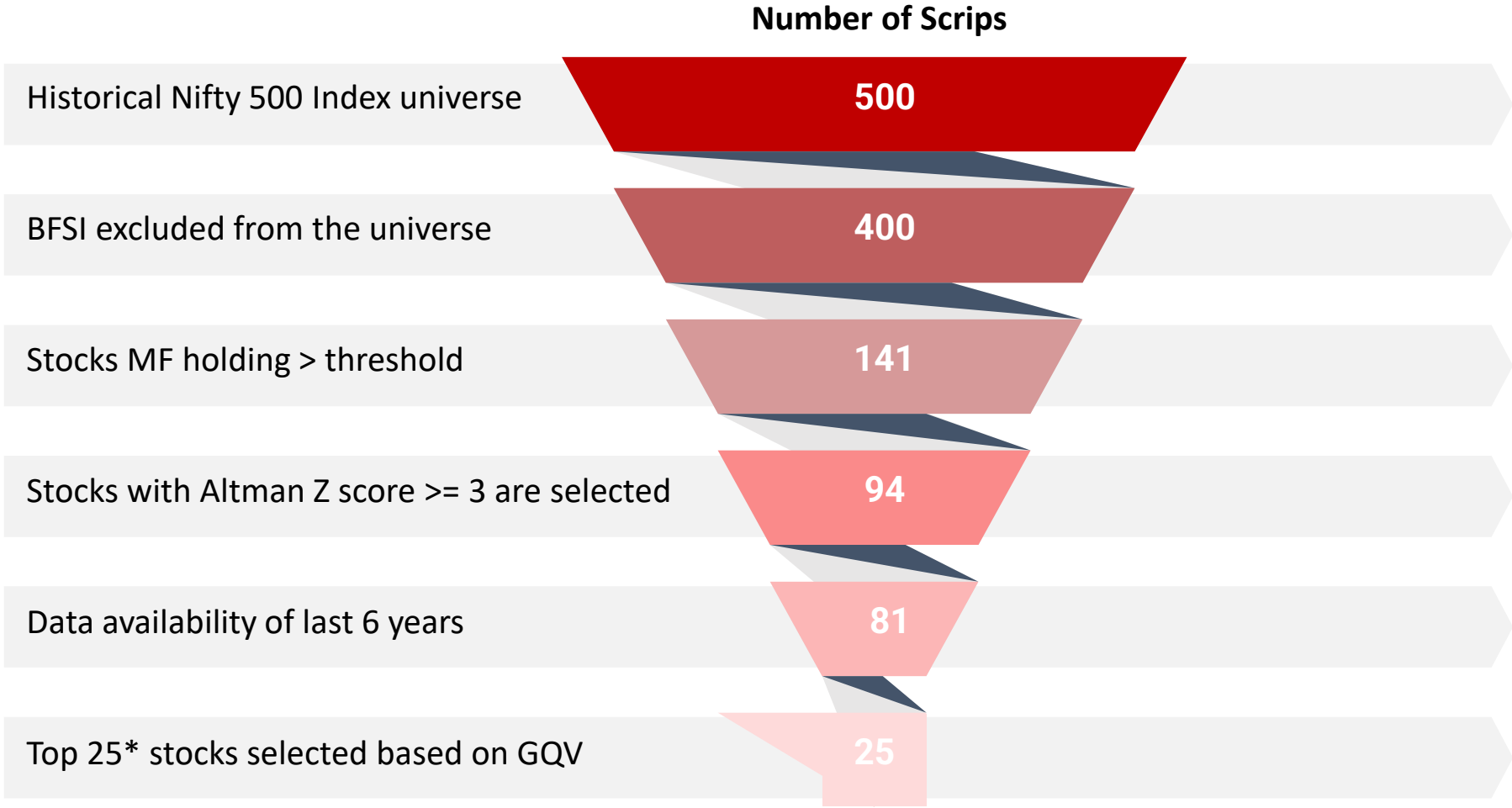
### Why

In today's data-rich environment, sifting through the constant streams of information has become crucial to discern what's truly valuable and cut out the noise. However, due to inherent human biases, distinguishing between relevant and irrelevant information has become exceedingly challenging. Ultimately, only a handful of factors significantly impact stock returns, and by focusing on key factors, achieving substantial outperformance becomes plausible.

### How

We created a Quantitative strategy and Backtested the portfolio of stocks with reasonable growth, quality and valuation from Apr 2013 - Dec 2023 (~11 Years) by taking Historical Nifty 500 as our starting universe.

## Selection & Filtration Criteria



\*Stock once enters the universe, it will exit once rank is more than 30

## Starting Universe Performance

We have excluded BFSI from our starting universe of Nifty 500 Index since BFSI are evaluated on different financial metrics compared to traditional companies.

	Nifty 500 Index	Nifty 500 (excl BFSI)
# of Stocks	500	400
CAGR	14.8%	16.4%
Drawdown %	-27.2%	-47.6%
Standard Deviation	16.1%	22.4%
Sharpe	0.67	0.46
Calmar	0.55	0.34

### Return Computation Methodology

- We have considered Nifty 500 as of April of each year
- In return computation, monthly rebalance is assumed. And at every rebalance, portfolio weight is reset to equal weight.
- Return computation does not include dividends
- **Performance is for the period Apr 2013 – Dec 2023 in this report**

### Explanation

- **Drawdown %:** It is maximum % fall in portfolio value from highest value to lowest value during certain period. Lower the number, better it is.
- **Standard Deviation:** It measures the volatility of portfolio returns, as to how much the returns of a portfolio can vary from its average over time. It is also called measure of risk in the portfolio. Lower the number, better it is.
- **Sharpe Ratio:** It tells you how much excess of risk free returns (CAGR) have been generated for every unit of risk (Standard Deviation). Higher the number, better it is.
- **Calmar Ratio:** It tell you how much returns (CAGR) has been generated for every unit of risk (Drawdown). Higher the number, better it is.

## Top and bottom performers of Nifty 500 (excl BFSI)

### Top 20 Losers

Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	Cox & Kings Ltd.	Apr-13	Apr-20	-99.4
2.	Jaiprakash Associates Ltd.	Apr-13	Apr-20	-98.1
3.	Jet Airways (India) Ltd.	Apr-16	Apr-20	-97.0
4.	Rasoya Proteins Ltd.	Apr-14	Apr-15	-96.8
5.	IL&FS Transportation Networks Ltd.	Apr-13	Apr-19	-96.7
6.	Reliance Communications Ltd.	Apr-13	Apr-19	-96.7
7.	Shilpi Cable Technologies Ltd.	Apr-17	Apr-18	-95.6
8.	Gayatri Projects Ltd.	Apr-19	Apr-20	-95.0
9.	Unitech Ltd.	Apr-13	Apr-19	-94.9
10.	Kwality Ltd.	Apr-16	Apr-19	-93.8
11.	Castex Technologies Ltd.	Apr-13	Apr-16	-93.7
12.	Gitanjali Gems Ltd.	Apr-13	Apr-16	-93.7
13.	Reliance Power Ltd.	Apr-13	Apr-21	-93.4
14.	Future Retail Ltd.	Apr-19	Apr-22	-93.3
15.	PC Jeweller Ltd.	Apr-16	Apr-20	-93.2
16.	Jain Irrigation Systems Ltd.	Apr-13	Apr-20	-92.6
17.	Suven Life Sciences Ltd.	Apr-15	Apr-20	-91.8
18.	Rei Agro Ltd.	Apr-13	Apr-15	-91.6
19.	Coffee Day Enterprises Ltd.	Apr-17	Apr-20	-91.4
20.	Inox Wind Ltd.	Apr-16	Apr-20	-91.2

### Top 20 Winners

Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	Tata Elsi Ltd.	Apr-13	Open	9299.0
2.	Sonata Software Ltd.	Apr-13	Open	8445.6
3.	SRF Ltd.	Apr-13	Open	6924.9
4.	Escorts Kubota Ltd.	Apr-13	Open	5654.0
5.	TVS Motor Company Ltd.	Apr-13	Open	5602.1
6.	JB Chemicals & Pharmaceuticals Ltd.	Apr-13	Open	3474.2
7.	Sundram Fasteners Ltd.	Apr-13	Open	3080.9
8.	Trent Ltd.	Apr-13	Open	2916.1
9.	Persistent Systems Ltd.	Apr-13	Open	2601.1
10.	Welspun Living Ltd.	Apr-13	Open	2258.0
11.	Finolex Cables Ltd.	Apr-13	Open	2240.1
12.	Coforge Ltd.	Apr-13	Open	2200.8
13.	Trident Ltd.	Apr-14	Open	2156.1
14.	Atul Ltd.	Apr-13	Open	2151.8
15.	Aarti Industries Ltd.	Apr-13	Apr-19	1832.8
16.	Britannia Industries Ltd.	Apr-13	Open	1767.2
17.	DCM Shriram Ltd.	Apr-13	Open	1669.3
18.	Firstsource Solutions Ltd.	Apr-13	Open	1647.9
19.	BEML Ltd.	Apr-13	Open	1521.5
20.	Mindtree Ltd. - (Amalgamated)	Apr-13	Dec-22	1514.6

We have tried to identify common traits that would help us eliminate losers but at the same time maintain winners.

One such trait is Mutual Fund holding.

## Mutual Fund Holding Rule

**Purpose:** We aim to exclude those companies from the universe exhibiting poor governance or facing specific challenges initially identified through qualitative assessments

**Rationale:** Mutual Funds are smart money, and they exit at the first sign of trouble; taking a clue from the smart money; we have created a model that can dynamically react on softer aspects which gets captured in numbers later, but smart money exits first.

**Specifics:** We exclude those companies that have low mutual Fund holding in their shareholding pattern

We examined the outcomes at various Mutual Fund holding levels before selecting relevant threshold.

*Companies with MF holding in Top 80 percentile are included in the universe*

Rules	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 80 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 70 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 60 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 50 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 40 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 20 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 10 Percentile included
# of Stocks	346	304	262	222	180	141	98	56
CAGR	18.3%	18.5%	19.0%	19.3%	19.7%	20.5%	21.8%	23.4%
Drawdown %	-42.3%	-41.5%	-40.4%	-41.6%	-40.6%	-41.0%	-42.6%	-44.8%
Std Dev	21.4%	20.8%	20.6%	20.8%	20.7%	21.1%	21.2%	22.6%
Sharpe Ratio	0.58	0.60	0.63	0.64	0.66	0.69	0.75	0.77
Calmar Ratio	0.43	0.45	0.47	0.46	0.48	0.50	0.51	0.52
Average Mcap	30,087	30,082	27,884	23,465	21,910	19,301	17,357	14,311

As we tighten our criteria, the number of stocks within our universe naturally decreases. Interestingly, we observe that risk-adjusted returns, measured by Sharpe ratio, is higher at higher stringency levels. To strike a balance between risk-adjusted returns and the quantity of stocks for further analysis, we opted for the top 30 percentile threshold. This threshold allows us to maintain a reasonable number of stocks while optimizing for risk-adjusted returns.



## Statistics post Mutual Fund Holding rule

	Nifty 500 Index	Nifty 500 (excl BFSI)	Post MF Rule
# of Stocks	500	400	141
CAGR	14.8%	16.4%	20.5%
Drawdown %	-27.2%	-47.6%	-41.0%
Standard Deviation	16.1%	22.4%	21.1%
Sharpe	0.67	0.46	0.69
Calmar	0.55	0.34	0.50
Average Mcap		27,233	19,301

← Significant improvement in returns

← Slight improvement in risk metrics but further scope for improvement compared to Nifty 500 (ex BFSI)

## Top and bottom performers of Universe post MF Rule

### Top 20 Losers

Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	KSK Energy Ventures Ltd.	Aug-14	Apr-17	-90.3
2.	CG Power and Industrial Solutions Ltd.	Apr-17	Apr-20	-90
3.	Thomas Cook (India) Ltd.	Nov-15	Apr-20	-84.1
4.	Innoventive Industries Ltd.	May-13	Apr-14	-83.9
5.	Navkar Corporation Ltd.	Apr-16	Apr-19	-80.2
6.	63 Moons Technologies Ltd.	Apr-13	Nov-13	-74.5
7.	Manpasand Beverages Ltd.	Oct-17	Apr-19	-73
8.	Raymond Ltd.	May-17	May-20	-71.4
9.	McLeod Russel India Ltd.	Jun-14	Apr-19	-70.7
10.	Jindal Stainless Ltd.	Apr-13	Apr-16	-69.5
11.	Ramco Systems Ltd.	Apr-16	Apr-19	-69
12.	AJR Infra and Tolling Ltd.	Apr-15	Apr-16	-67.4
13.	Arvind Ltd.	Apr-16	Apr-19	-67.4
14.	VA Tech Wabag Ltd.	Apr-15	May-19	-66.6
15.	Jyoti Structures Ltd.	Apr-13	Apr-16	-62.8
16.	Sharda Cropchem Ltd.	Apr-19	Apr-20	-61.5
17.	Sterlite Technologies Ltd.	Nov-18	Aug-19	-61.2
18.	National Aluminium Company Ltd.	May-18	May-20	-60.6
19.	ITD Cementation India Ltd.	Apr-17	Apr-21	-58.3
20.	Nava Ltd.	Aug-17	Aug-20	-57.8

### Top 20 Winners

Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	SRF Ltd.	Apr-13	Jun-22	6499.9
2.	TVS Motor Company Ltd.	Apr-13	Open	5602.1
3.	Sundram Fasteners Ltd.	Apr-13	Open	3080.9
4.	Persistent Systems Ltd.	Apr-13	Open	2601.1
5.	Finolex Cables Ltd.	Sep-13	Open	2075.1
6.	Aarti Industries Ltd.	Apr-13	Apr-19	1832.8
7.	Honeywell Automation India Ltd.	Apr-13	Aug-23	1569.9
8.	BEML Ltd.	Apr-13	Open	1521.5
9.	Info Edge (India) Ltd.	Apr-13	Open	1380.7
10.	K.P.R. Mill Ltd.	May-15	Open	1304
11.	PI Industries Ltd.	Apr-14	Open	1223.7
12.	Bharat Electronics Ltd.	May-14	Open	1157.2
13.	KEC International Ltd.	Apr-13	Open	1118.2
14.	Blue Star Ltd.	Apr-13	Open	1113
15.	Aurobindo Pharma Ltd.	Apr-13	May-21	1037.7
16.	Schaeffler India Ltd.	Apr-13	Open	1009.6
17.	Solar Industries India Ltd.	Apr-16	Open	898.2
18.	Voltas Ltd.	Nov-13	Open	855.9
19.	Tube Investments of India Ltd.	Apr-19	Nov-23	747.1
20.	JB Chemicals & Pharmaceuticals Ltd.	Sep-18	Open	744.8

We have again tried to identify common traits that would help us eliminate losers but at the same time maintain winners.

Another such trait is Altman Z Score

## Altman Z Score Rule

**Purpose:** To reduce risk and remove companies with high leverage or under financial stress

**Rationale:** Despite implementing MF rule, there might still be instances of companies facing challenges such as high leverage coupled with poor earnings or financial stress. To address this issue, we incorporated Altman’s Z score, a metric that gauges the likelihood of a business facing bankruptcy within the next two years.

**Specifics:** We exclude those companies that have Altman’s Z score below 3, as a score equal to & above 3 is considered within the safe zone according to Altman’s Z Score model.

To confirm this hypothesis, let’s look at the stats of portfolio at different Z score level.

Rules	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 0.99	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 1.99	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 3.99
# of Stocks	141	136	117	94	79
CAGR	20.5%	21.4%	21.9%	23.0%	23.2%
Drawdown %	-41.0%	-39.9%	-37.2%	-26.4%	-23.0%
Std Dev	21.1%	20.7%	19.7%	18.1%	17.5%
Sharpe Ratio	0.69	0.74	0.81	0.94	0.98
Calmar Ratio	0.50	0.54	0.59	0.87	1.01
Average Mcap	19,301	19,619	18,362	19,181	20,481

Significant improvement in risk metrics

The data clearly demonstrates that both return and standard deviation have improved at a higher Z scores level compared to lower ones. One major improvement in stats by the introduction of Altman’s Z score is the substantial reduction in drawdowns and standard deviation.

## Statistics post Mutual Fund Holding and Altman's Z score rule

	Nifty 500 Index	Nifty 500 (excl BFSI)	Post MF Rule	Post Altman's Z Score Rule
# of Stocks	500	400	141	94
CAGR	14.8%	16.4%	20.5%	23.0%
Drawdown %	-27.2%	-47.6%	-41.0%	-26.4%
Standard Deviation	16.1%	22.4%	21.1%	18.1%
Sharpe	0.67	0.46	0.69	0.94
Calmar	0.55	0.34	0.50	0.87
Average Mcap		27,233	19,301	19,181

Improvement in returns compared to prior two universes

Significant reduction in portfolio drawdowns and standard deviation compared to prior two universes

## Top and bottom performers of Universe post MF Rule and Altman's Z Score

### Top 20 Losers

Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	Shoppers Stop Ltd.	Apr-18	Jul-20	-73.7
2.	Manpasand Beverages Ltd.	Oct-17	Apr-19	-73
3.	J Kumar Infraprojects Ltd.	Jul-15	Aug-16	-72.4
4.	Ramco Systems Ltd.	Apr-16	Apr-19	-69
5.	Sharda Cropchem Ltd.	Apr-19	Apr-20	-61.5
6.	Sterlite Technologies Ltd.	Nov-18	Aug-19	-61.2
7.	National Aluminium Company Ltd.	May-18	May-20	-60.6
8.	Gujarat Mineral Development Corporation Ltd.	Apr-13	Oct-15	-49.7
9.	EIH Ltd.	May-19	Nov-20	-48.8
10.	Texmaco Rail & Engineering Ltd.	Apr-16	Oct-18	-48.7
11.	Time Technoplast Ltd.	Aug-19	Mar-20	-47.4
12.	Suven Life Sciences Ltd.	Apr-15	Feb-16	-46.4
13.	JK Lakshmi Cement Ltd.	Sep-21	May-22	-45.9
14.	Jagran Prakashan Ltd.	Oct-13	Mar-20	-45.5
15.	Mahindra Logistics Ltd.	May-19	May-20	-42.3
16.	Gland Pharma Ltd.	May-22	Open	-41.7
17.	McLeod Russel India Ltd.	Jun-14	Oct-15	-39.7
18.	Thomas Cook (India) Ltd.	Oct-18	Oct-19	-39.7
19.	Rossari Biotech Ltd.	Aug-21	Open	-39.3
20.	Navkar Corporation Ltd.	Apr-16	Jul-18	-38.9

### Top 20 Winners

Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	Persistent Systems Ltd.	Apr-13	Open	2601.1
2.	Finolex Cables Ltd.	Sep-13	Open	2075.1
3.	Honeywell Automation India Ltd.	Apr-13	Aug-23	1569.9
4.	Info Edge (India) Ltd.	Apr-13	Open	1380.7
5.	K.P.R. Mill Ltd.	May-15	Open	1304.0
6.	PI Industries Ltd.	Apr-14	Open	1223.7
7.	Sundram Fasteners Ltd.	Jul-14	Open	1063.3
8.	Schaeffler India Ltd.	Apr-13	Open	1009.6
9.	TVS Motor Company Ltd.	Apr-13	Aug-19	964.4
10.	Solar Industries India Ltd.	Apr-16	Open	898.2
11.	Tube Investments of India Ltd.	Apr-19	Nov-23	747.1
12.	JB Chemicals & Pharmaceuticals Ltd.	Sep-18	Open	744.8
13.	SKF India Ltd.	Apr-13	Open	738.8
14.	Balkrishna Industries Ltd.	Apr-16	Open	713.2
15.	eClerx Services Ltd.	Apr-13	Open	667.2
16.	MRF Ltd.	Apr-13	Feb-21	663.9
17.	Dixon Technologies (India) Ltd.	Apr-18	Nov-21	663.7
18.	KEI Industries Ltd.	Apr-19	Open	640.1
19.	Torrent Pharmaceuticals Ltd.	Apr-13	May-20	623.1
20.	Divi's Laboratories Ltd.	Apr-13	Open	622.6

## Statistics post Mutual Fund Holding, Altman Z score rule and data availability check

We conducted a hygiene check wherein we eliminated companies lacking consistent reporting in the last 6 years. Also, companies financial reporting must either be “Consolidated” or “Standalone” consistently in the last 6 years for like-to-like comparison.

	Nifty 500 Index	Nifty 500 (excl BFSI)	Post MF Rule	Post Altman Z Score Rule	Post Data availability
# of Stocks	500	400	141	94	81
CAGR	14.8%	16.4%	20.5%	23.0%	24.2%
Drawdown %	-27.2%	-47.6%	-41.0%	-26.4%	-23.4%
Standard Deviation	16.1%	22.4%	21.1%	18.1%	17.8%
Sharpe	0.67	0.46	0.69	0.94	1.02
Calmar	0.55	0.34	0.50	0.87	1.03
Average Mcap		27,233	19,301	19,181	23,313

Though there is slight improvement in stats, this is not something we would attribute it to the model or rules.

## ROIC Check

On this universe of 81 companies, we want to rank these companies on three parameters

1. Growth – 5 Year Sales CAGR
2. Quality – Weighted ROIC of last 5 years (Higher Wt. to latest period and lower wt. to older period)
3. Valuation – Price to Earning Ratio

But before that we run an iteration to check if each of these parameters add value to the overall universe.

**Purpose:** To select quality companies with good capital allocation track record

**Rationale:** We want to select high ROIC companies in our universe as it implies that they are more efficient in using their capital to generate profits and cash flows, which ultimately leads to more value creation for shareholders.

**Specifics:** We look at 5 Years weighted average ROIC, with more weight assigned to recent period and less weight to later periods. We check performance at each ROIC threshold levels to confirm the hypothesis that high ROIC companies create more wealth for shareholders compared to low ROIC companies.

## ROIC Check

Rules	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 5%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 7%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 9%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 11%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 13%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 15%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 17%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 19%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 ROIC (1-5) >= 21%
# of Stocks	79	77	75	71	65	58	51	44	38
CAGR	24.4%	24.3%	24.3%	24.4%	23.9%	24.0%	24.2%	24.0%	23.4%
Drawdown %	-22.3%	-22.3%	-21.9%	-21.1%	-21.3%	-22.1%	-20.9%	-18.9%	-19.2%
Std Dev	17.6%	17.6%	17.6%	17.4%	17.2%	17.2%	16.8%	16.3%	16.2%
Sharpe Ratio	1.05	1.04	1.04	1.06	1.04	1.05	1.09	1.10	1.07
Calmar Ratio	1.09	1.09	1.11	1.15	1.12	1.09	1.16	1.27	1.22
Average Mcap	20,838	20,998	21,505	21,872	22,065	22,762	24,057	25,063	26,717

Again, it is clearly evident that, risk adjusted returns improve with stringent ROIC levels.

But a similar stat of sales CAGR tells a different story.



## Sales Growth Check

We can clearly observe that at higher sales CAGR, returns have declined, and risk has increased.

The decline in returns and increased risk with higher sales CAGR can be attributed to two primary reasons:

- Elevated Valuation Multiples: High growth often leads to entry at less favorable valuations due to increased market expectations.
- Emphasis on Scaling for Lower Mcap Companies: Higher growth tends to be concentrated in lower market capitalization (Mcap) companies that prioritize scaling their business over achieving optimal return metrics.

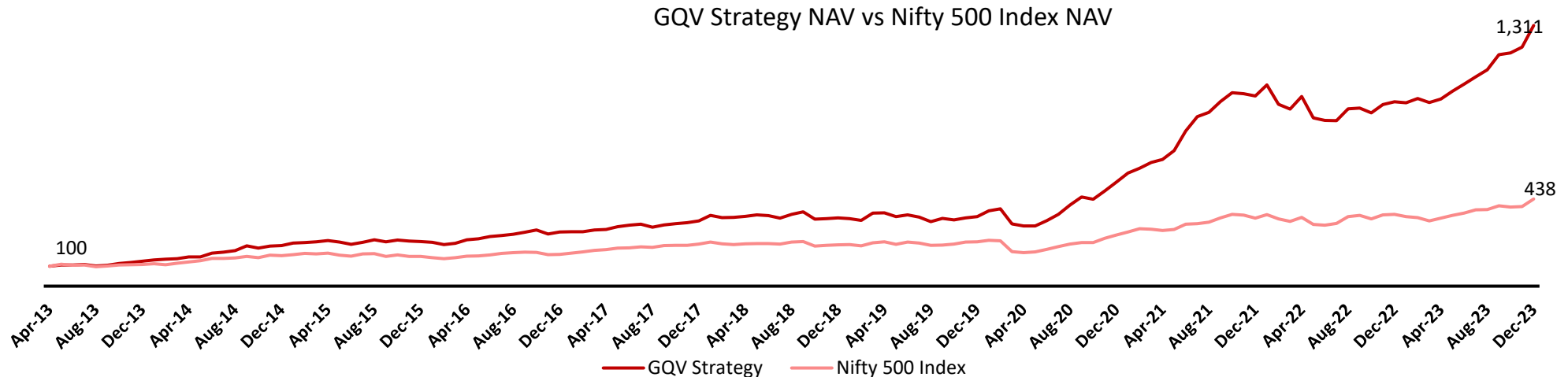
Rules	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 5%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 7%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 10%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 12%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 14%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 16%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 18%	Starting Univ (Nifty 500, excl BFSI) MF Holding Top 30 Percentile included Altman Z score > 2.99 Sales CAGR >= 20%
# of Stocks	70	63	52	43	34	28	22	16
CAGR	24.4%	24.9%	26.1%	25.3%	27.1%	23.5%	25.2%	22.3%
Drawdown %	-21.7%	-21.0%	-19.6%	-20.5%	-17.9%	-34.1%	-32.8%	-32.2%
Std Dev	17.4%	17.4%	17.6%	17.7%	17.7%	19.9%	21.4%	22.1%
Sharpe Ratio	1.06	1.08	1.14	1.09	1.19	0.88	0.90	0.74
Calmar Ratio	1.13	1.19	1.33	1.24	1.51	0.69	0.77	0.69
Average Mcap	21,691	21,960	24,233	24,713	19,348	17,507	15,588	12,256
Average PE of Universe	38.3	38.9	37.7	38.8	39.7	40.4	40.1	42.7
Median PE of Universe	28.0	28.5	28.2	28.2	28.3	27.9	28.6	28.5

But when we balance growth with valuation and quality, results show good improvement.

## GQV Model Performance

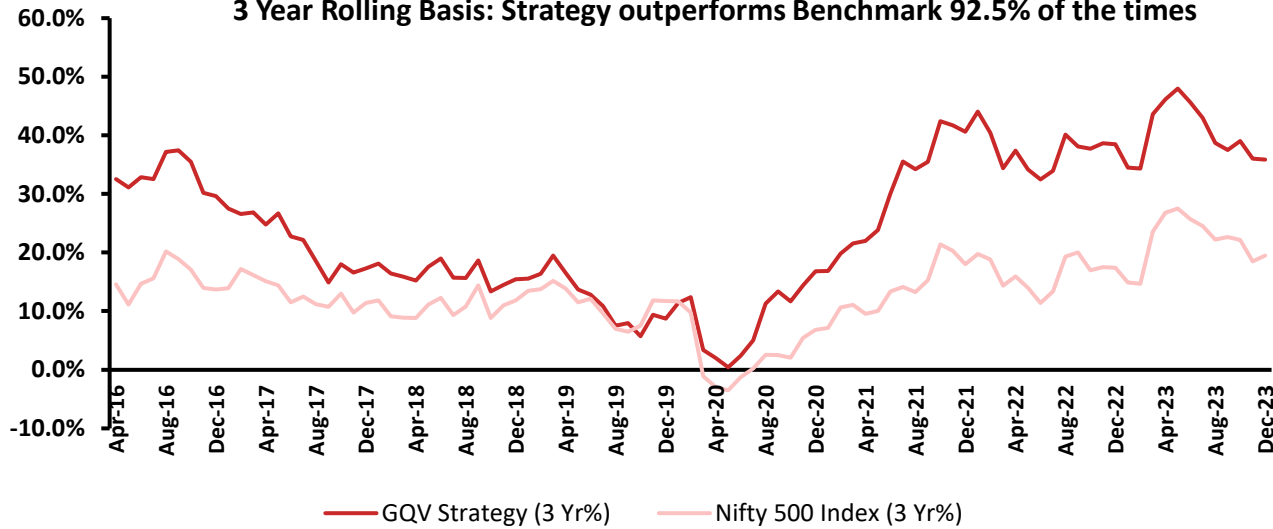
Here on the those 81 stocks, we have ranked stocks based on Sales growth, ROIC and PE, by giving equal weight to all three parameters and selected top 25 stocks based on the combined ranking.

	Nifty 500 Index	Nifty 500 (excl BFSI)	Post MF Rule	Post Altman Z Score Rule	Post Data availability	GQV Model	Alpha over Nifty 500 Index
# of Stocks	500	400	141	94	81	25	
CAGR	14.8%	16.4%	20.5%	23.0%	24.2%	27.2%	+12.4%
Drawdown %	-27.2%	-47.6%	-41.0%	-26.4%	-23.4%	-22.2%	+5.0%
Standard Deviation	16.1%	22.4%	21.1%	17.5%	17.8%	17.9%	-1.8%
Sharpe	0.67	0.46	0.69	0.98	1.02	1.19	+0.52
Calmar	0.55	0.34	0.50	1.01	1.03	1.23	+0.68
Average Mcap		27,233	19,301	19,181	23,313	29,096	



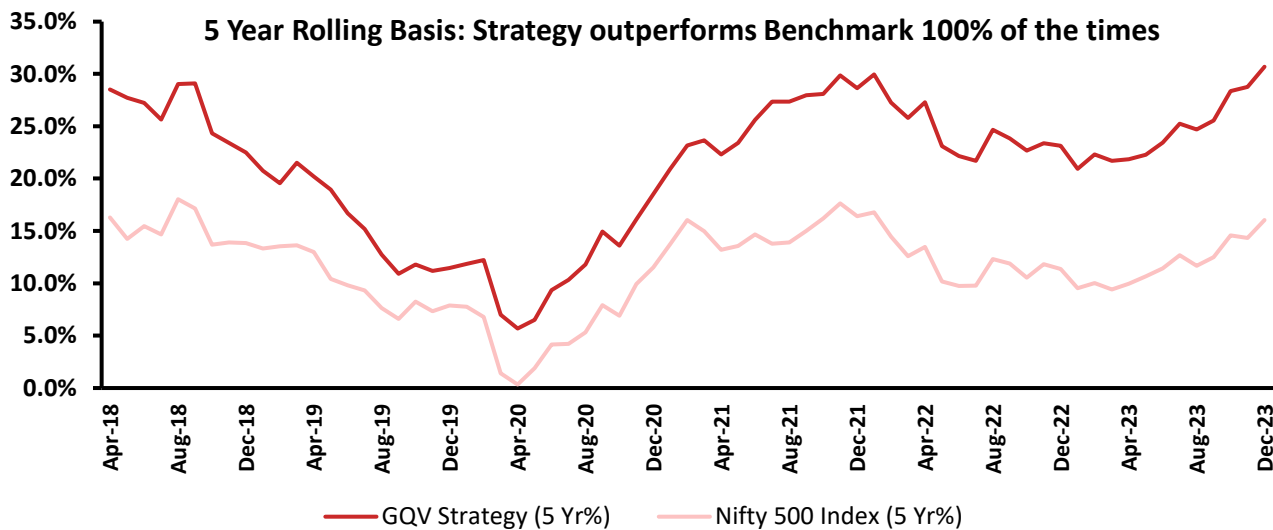
## Rolling Performance

3 Year Rolling Basis: Strategy outperforms Benchmark 92.5% of the times



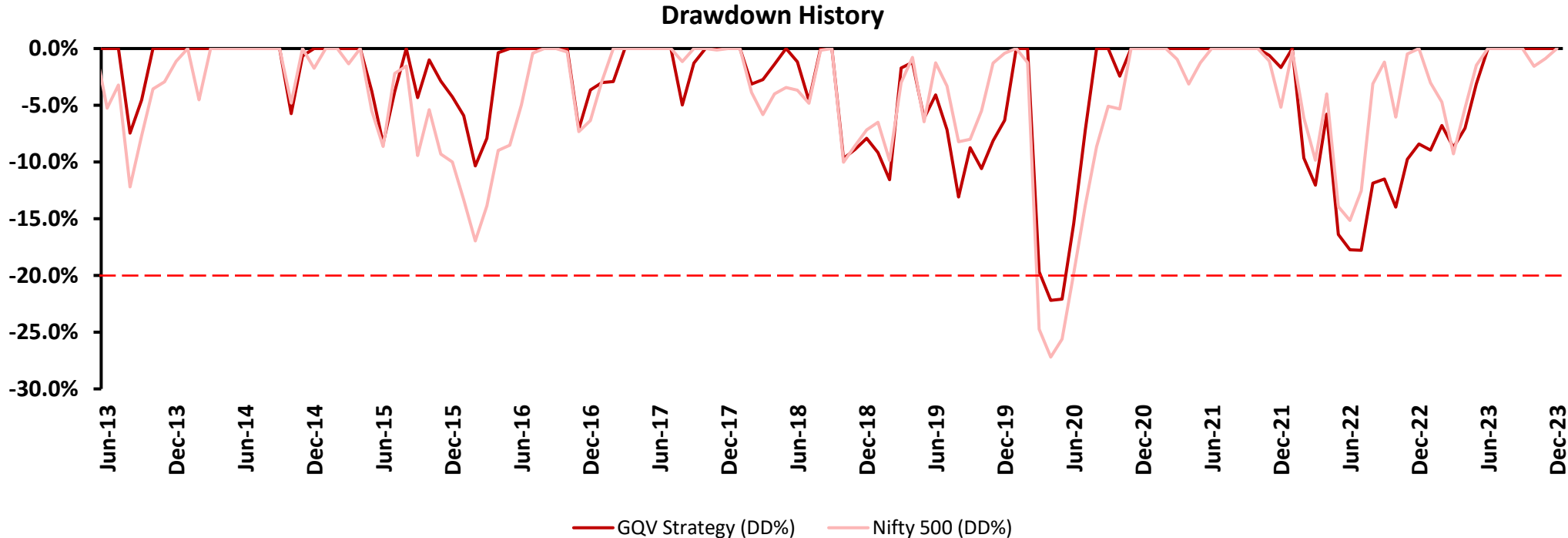
If you had invested in this strategy at any point in time, at the end of **three years** from your date of investment, you would have **outperformed the market ~96% of the times**.

5 Year Rolling Basis: Strategy outperforms Benchmark 100% of the times



If you had invested in this strategy at any point in time, at the end of **five years** from your date of investment, you would have **outperformed the market 100% of the times**.

GQV Strategy Drawdown



## Top Winners and Losers

### Top 20 Losers

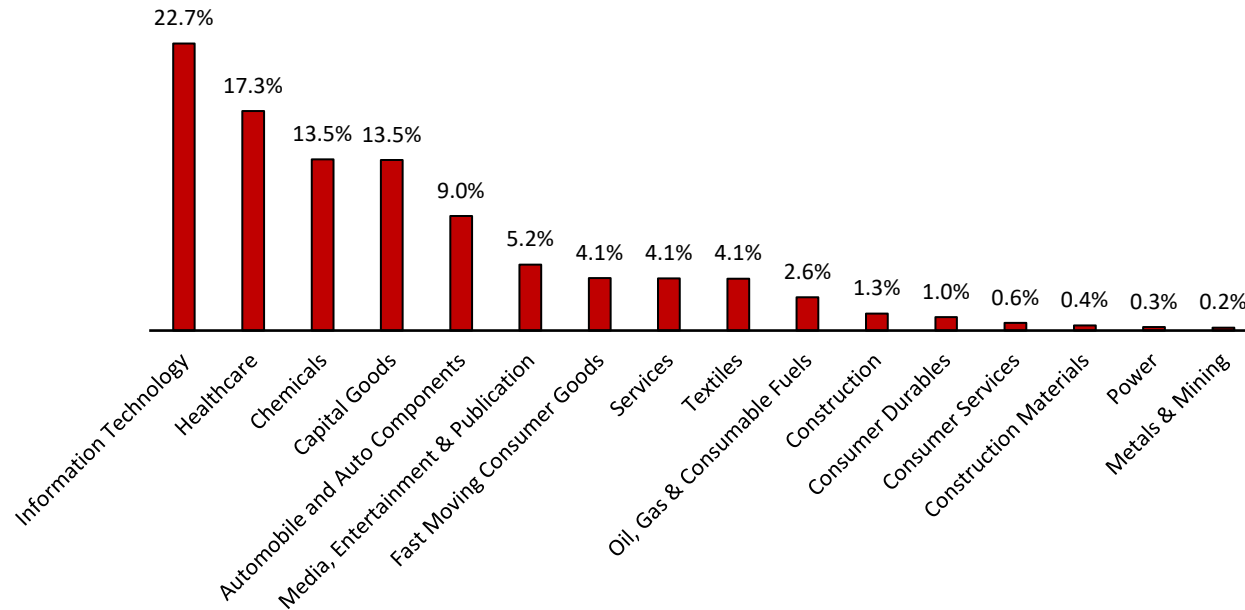
Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	Jagran Prakashan Ltd.	Oct-16	Mar-20	-77.3
2.	Sharda Cropchem Ltd.	Apr-19	Apr-20	-61.5
3.	Heritage Foods Ltd.	Feb-19	May-20	-47.0
4.	Metropolis Healthcare Ltd.	Jan-22	May-22	-35.1
5.	Bajaj Consumer Care Ltd.	Feb-20	May-20	-32.8
6.	Vardhman Textiles Ltd.	Mar-18	Aug-19	-28.8
7.	Ipca Laboratories Ltd.	Oct-21	Jan-23	-28.3
8.	Fine Organic Industries Ltd.	Nov-22	Open	-26.1
9.	Divi's Laboratories Ltd.	Nov-21	Aug-23	-24.4
10.	Manpasand Beverages Ltd.	Jun-18	Apr-19	-23.0
11.	Finolex Industries Ltd.	Oct-21	Feb-23	-22.0
12.	Chambal Fertilisers and Chemicals Ltd.	Oct-21	Nov-23	-21.0
13.	Dhanuka Agritech Ltd.	Aug-17	Apr-18	-18.9
14.	Supreme Industries Ltd.	Aug-18	May-19	-18.6
15.	VRL Logistics Ltd.	Aug-18	May-19	-18.3
16.	Schaeffler India Ltd.	Feb-18	Feb-20	-17.1
17.	Cochin Shipyard Ltd.	Apr-18	Aug-18	-16.1
18.	McLeod Russel India Ltd.	Jun-14	Nov-14	-16.0
19.	Atul Ltd.	Apr-22	May-22	-15.7
20.	Igarashi Motors India Ltd.	Jul-17	Nov-17	-15.5

### Top 20 Winners

Sr. No.	Company Name	Buy Date	Exit Date	Abs Ret%
1.	Persistent Systems Ltd.	Apr-13	Oct-21	1443.5
2.	K.P.R. Mill Ltd.	Oct-15	Jan-22	882.9
3.	Sonata Software Ltd.	Nov-19	Open	573.1
4.	Torrent Pharmaceuticals Ltd.	Apr-13	Aug-18	399.5
5.	KEI Industries Ltd.	Oct-20	Sep-22	356.6
6.	Infosys Ltd.	Dec-13	Open	265.8
7.	AIA Engineering Ltd.	Apr-13	Jun-16	235.6
8.	eClerx Services Ltd.	Oct-13	Nov-21	224.8
9.	MRF Ltd.	Apr-14	Jan-18	204.9
10.	Amara Raja Energy & Mobility Ltd.	Apr-13	Nov-18	202.5
11.	PI Industries Ltd.	Apr-14	Aug-18	201.1
12.	UPL Ltd.	Jul-14	May-19	194.9
13.	Cyient Ltd.	Apr-13	Aug-17	194.7
14.	Supreme Industries Ltd.	Apr-13	Oct-16	194.7
15.	Coforge Ltd.	May-17	Nov-19	185.3
16.	Just dial Ltd.	May-20	Sep-21	182.1
17.	Swaraj Engines Ltd.	Apr-13	Apr-16	179.6
18.	APL Apollo Tubes Ltd.	Apr-17	Nov-20	174.9
19.	Grindwell Norton Ltd.	Apr-20	May-21	167.8
20.	Sheela Foam Ltd.	Aug-20	Jan-22	162.8

## Sector and Mcap Breakup

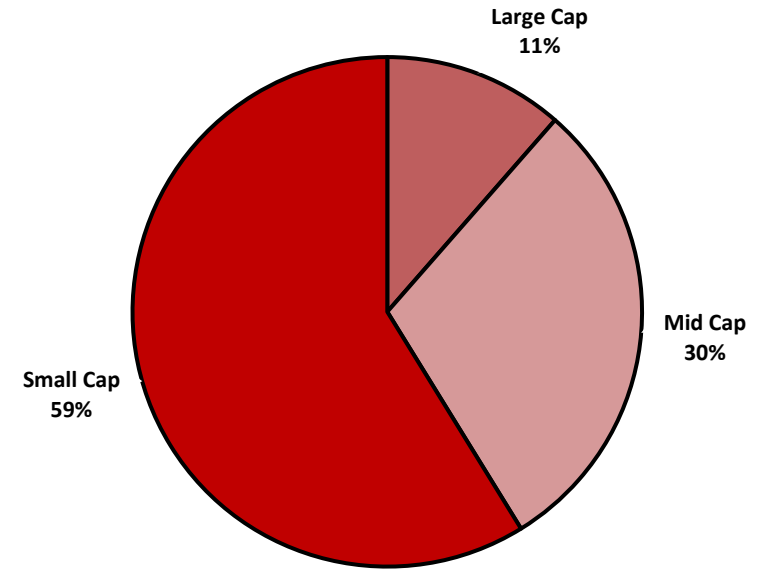
Sector Allocation



Sector allocation is average allocation for last 10 years

Top 5 sectors are namely, Information Technology, Healthcare, Chemicals, Capital Goods, and Automobiles representing 76% of overall portfolio allocation historically.

Mcap Distribution



Mcap distribution is as per AMFI classification for last 3 years

The portfolio is largely tilted towards small and mid caps

## Latest Portfolio as of Dec 2023

Rank	Company Name	NSE Sector	Market Cap (Rs. Cr)	MF Holding	Altman Z Score	5Yr Sales CAGR	5Yr Wt. ROIC	PE Ratio
1.	Fine Organic Industries Ltd.	Chemicals	14,227	11.8	37.5	28.7%	53.2%	29.9
2.	Archean Chemical Industries Ltd.	Chemicals	7,143	13.6	16.9	26.8%	26.9%	19.7
3.	Gujarat State Petronet Ltd.	Oil, Gas & Consumable Fuels	15,997	22.5	3.6	20.1%	25.3%	10.7
4.	Infosys Ltd.	Information Technology	594,536	18.5	11.2	15.8%	44.6%	26.3
5.	GR Infraprojects Ltd.	Construction	11,773	15.6	3.2	24.4%	20.4%	9.6
6.	Coromandel International Ltd.	Chemicals	32,449	17.4	7.4	21.7%	23.1%	18.1
7.	eClerx Services Ltd.	Services	9,821	19.2	18.2	14.2%	65.3%	24.6
8.	Mphasis Ltd.	Information Technology	43,969	13.2	11.9	16.1%	40.4%	31.3
9.	Sonata Software Ltd.	Information Technology	16,315	15.7	6.3	24.9%	33.4%	45.3
10.	Krishna Institute of Medical Sciences Ltd	Healthcare	15,428	27.0	9.8	27.1%	30.0%	45.5
11.	Persistent Systems Ltd.	Information Technology	44,304	24.1	16.1	22.4%	36.8%	55.0
12.	AIA Engineering Ltd.	Capital Goods	33,365	17.4	10.3	15.0%	24.4%	27.9
13.	Eris Lifesciences Ltd.	Healthcare	11,421	13.9	7.5	14.5%	28.0%	30.8
14.	K.P.R. Mill Ltd.	Textiles	25,576	13.6	12.2	15.4%	25.6%	36.3
15.	Rossari Biotech Ltd.	Chemicals	4,473	14.5	6.6	41.5%	19.7%	38.7
16.	Birlasoft Ltd.	Information Technology	14,473	20.3	22.9	16.3%	32.7%	52.4
17.	Ratnamani Metals & Tubes Ltd.	Capital Goods	20,146	16.3	15.8	20.4%	22.3%	39.3
18.	PI Industries Ltd.	Chemicals	54,710	17.3	14.0	23.3%	19.4%	34.5
19.	Firstsource Solutions Ltd.	Information Technology	11,124	14.5	6.1	11.2%	26.3%	23.9
20.	Coforge Ltd.	Information Technology	32,340	42.3	9.0	21.8%	25.5%	53.5
21.	Zensar Technologies Ltd.	Information Technology	11,574	15.2	10.7	9.3%	31.2%	25.6
22.	Balkrishna Industries Ltd.	Automobile and Auto Components	48,198	12.7	8.3	17.0%	24.6%	47.5
23.	JB Chemicals & Pharmaceuticals Ltd.	Healthcare	21,606	15.6	10.5	17.4%	23.1%	45.2
24.	The Great Eastern Shipping Company Ltd.	Services	11,828	15.2	3.9	13.4%	16.1%	5.1
25.	Finolex Industries Ltd.	Capital Goods	12,915	11.5	8.0	9.9%	29.6%	28.5
	<b>Median</b>		<b>15,997</b>	<b>15.6</b>	<b>10.3</b>	<b>17.4%</b>	<b>26.3%</b>	<b>30.8</b>

## Latest Portfolio as of Dec 2023 (Operational Metrics)

Rank	Company Name	NSE Sector	Market Cap (Rs. Cr)	5Yr EPS CAGR	5 Yr Median PE	5Yr Wt. Asset Turn	5Yr Avg. OPM	Debt to Equity (Latest)
1.	Fine Organic Industries Ltd.	Chemicals	14,227	45.3%	41.2	2.36	21.9%	0.02
2.	Archean Chemical Industries Ltd.	Chemicals	7,143	Loss to Profit	17.3	0.78	31.6%	0.02
3.	Gujarat State Petronet Ltd.	Oil, Gas & Consumable Fuels	15,997	17.2%	9.4	1.28	24.9%	0.00
4.	Infosys Ltd.	Information Technology	594,536	9.6%	25.7	1.82	25.0%	0.00
5.	GR Infraprojects Ltd.	Construction	11,773	29.1%	11.6	0.93	23.8%	0.91
6.	Coromandel International Ltd.	Chemicals	32,449	23.7%	17.0	2.11	11.8%	0.00
7.	eClerx Services Ltd.	Services	9,821	15.0%	16.0	2.59	26.2%	0.00
8.	Mphasis Ltd.	Information Technology	43,969	14.9%	23.8	2.38	17.9%	0.03
9.	Sonata Software Ltd.	Information Technology	16,315	18.6%	18.8	3.64	9.3%	0.38
10.	Krishna Institute of Medical Sciences Ltd	Healthcare	15,428	Loss to Profit	39.0	1.30	23.7%	0.32
11.	Persistent Systems Ltd.	Information Technology	44,304	24.4%	36.5	2.42	16.2%	0.11
12.	AIA Engineering Ltd.	Capital Goods	33,365	19.0%	30.5	0.96	22.7%	0.09
13.	Eris Lifesciences Ltd.	Healthcare	11,421	5.6%	24.0	0.91	34.6%	0.38
14.	K.P.R. Mill Ltd.	Textiles	25,576	24.8%	20.4	1.28	21.2%	0.36
15.	Rossari Biotech Ltd.	Chemicals	4,473	26.5%	50.7	1.63	14.9%	0.08
16.	Birlasoft Ltd.	Information Technology	14,473	-2.0%	21.0	2.72	12.9%	0.00
17.	Ratnamani Metals & Tubes Ltd.	Capital Goods	20,146	27.5%	32.3	1.42	16.3%	0.09
18.	PI Industries Ltd.	Chemicals	54,710	24.9%	47.0	0.92	21.8%	0.00
19.	Firstsource Solutions Ltd.	Information Technology	11,124	9.2%	15.2	2.22	15.2%	0.25
20.	Coforge Ltd.	Information Technology	32,340	20.0%	33.0	1.81	17.0%	0.11
21.	Zensar Technologies Ltd.	Information Technology	11,574	6.1%	18.1	2.60	12.7%	0.00
22.	Balkrishna Industries Ltd.	Automobile and Auto Components	48,198	7.5%	29.5	1.13	24.5%	0.44
23.	JB Chemicals & Pharmaceuticals Ltd.	Healthcare	21,606	26.2%	28.9	1.05	22.3%	0.22
24.	The Great Eastern Shipping Company Ltd.	Services	11,828	Loss to Profit	8.5	0.42	38.7%	0.35
25.	Finolex Industries Ltd.	Capital Goods	12,915	-3.9%	17.7	1.76	18.3%	0.11
	<b>Median</b>		<b>15,997</b>	<b>18.8%</b>	<b>23.8</b>	<b>1.63</b>	<b>21.8%</b>	<b>0.09</b>



## Methodology, Assumptions and Data sources used

- **Nifty 500:** Nifty 500 as the starting universe has been considered. This universe includes de-listed, amalgamated companies as well to remove survivorship bias in the universe. Further Nifty 500 as of April of every month is considered for entire year.
- **Lag Effect:** Bakes in a 7-month lag to the Financial Year ending and 2 months lag to Quarter ending. For example, Mar 2022 year-ending numbers are announced somewhere by May 2022 end, but is incorporated in our model (just for the purpose of backtesting) until Oct'22.
- **Return Computation:** In return computation, monthly rebalance is assumed. And at every rebalance, portfolio wt. is reset to equal wt.
- **Data cleaning:** Companies that have not reported their year ending for more than 2 years have been removed from the backtest, checked at the end every month
- **Data Source:** Ace Equity, NSE

## Limitations and potential improvements

- IPO or demerged companies will not make part of the universe because they will not have latest 5-6 years of financials and latest 8 quarters of reporting
- Turnaround companies will not make part of the universe or we will be late entrant into a turnaround company since model requires 5 years of good ROIC and sales growth.

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