

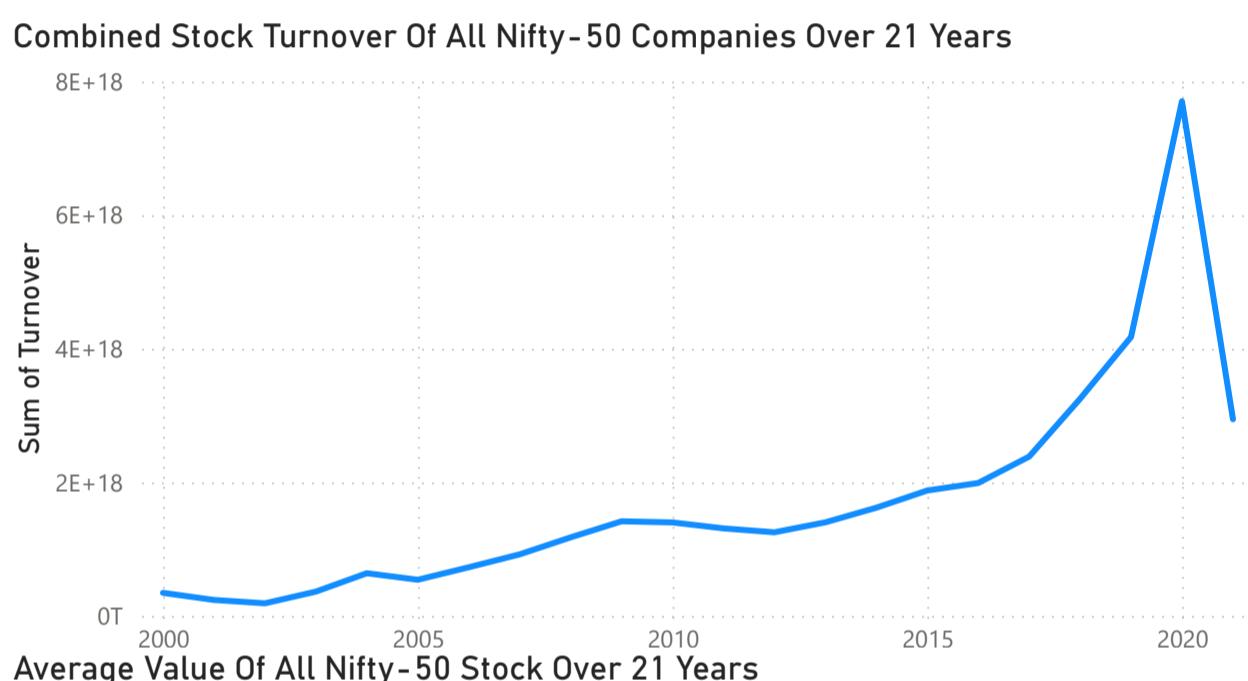
# **Analysis Of NIFTY-50 Stock Market**

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## Introduction

This project involved performing an analysis of firms within the NIFTY-50 over the years 2000-2021, and using this sample dataset to provide insights into how the Indian economy performed as a whole. The performance was measured not only of the individual stock market company's but also of the industries and overall market. The metrics used to measure performance included change in stock value overtime, change in revenue overtime and volatility.

## Overall Market Trends



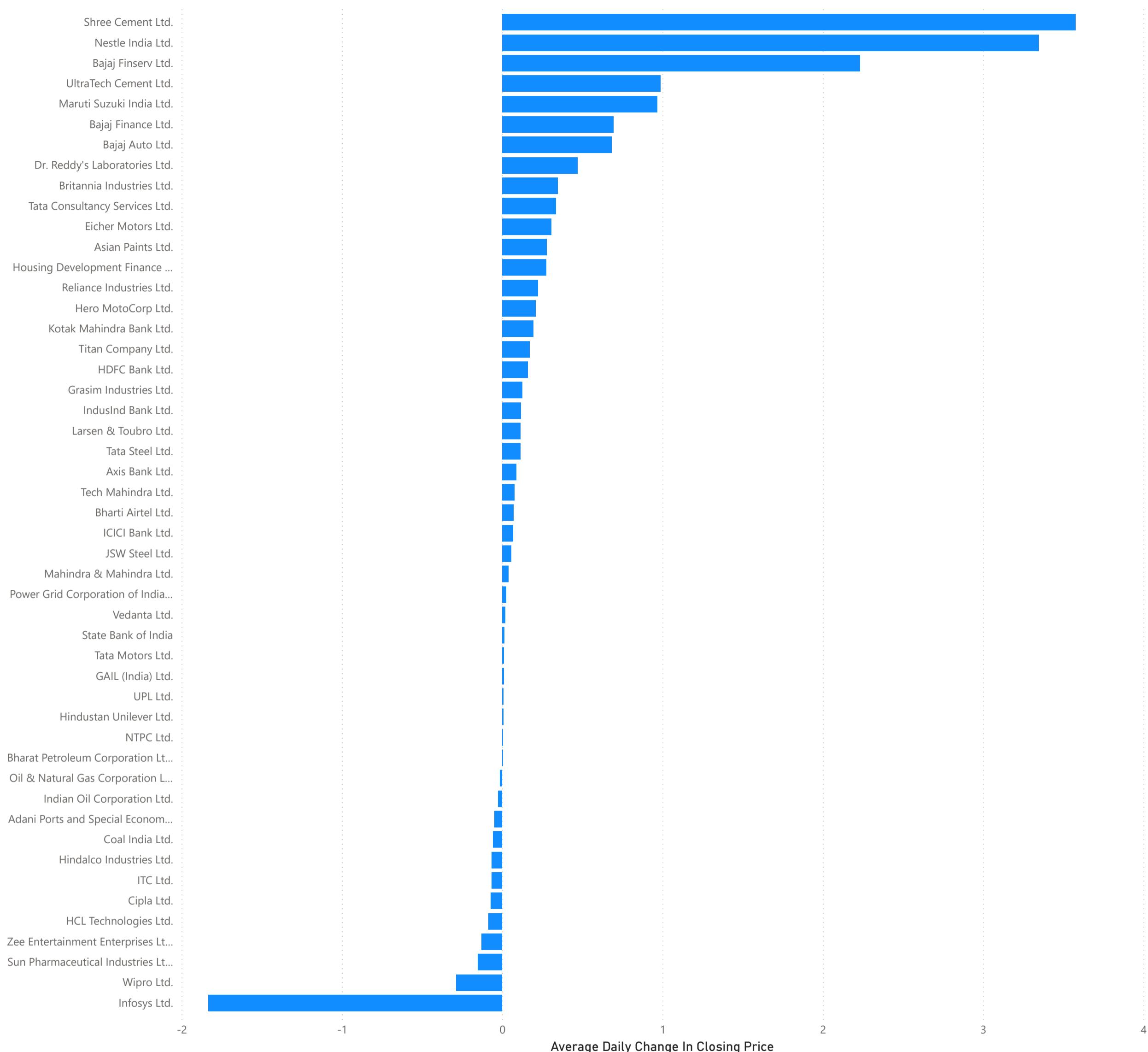
The charts show that the performance across companies within the NIFTY-50 generally increased in the time period from 2000-2021. The stock values (measured by their daily closing prices) rose, as shown by the fact that by 2021 the average stock closing price was above 2K Rupees, whereas up until 2005 the average stock closing price was often below 1K Rupees.

With regards to the combined turnover generated by all NIFTY-50 stocks, this steadily rose up until around 2017, but thereafter it shot up. The combined turnover reached its peak in 2020, after which it rapidly fell due to the Coronavirus and its negative impact on the global economy.

It's worth noting that NIFTY-50 firms generally weren't too negatively impacted by the 2008 Financial Crisis. Combined turnover across NIFTY-50 stocks remained stable throughout this period, and although the average stock value had a dip, it bounced back and reached pre-2008 levels by 2010.

## Stock Value Growth

Change In Stock Value Over 21 Years



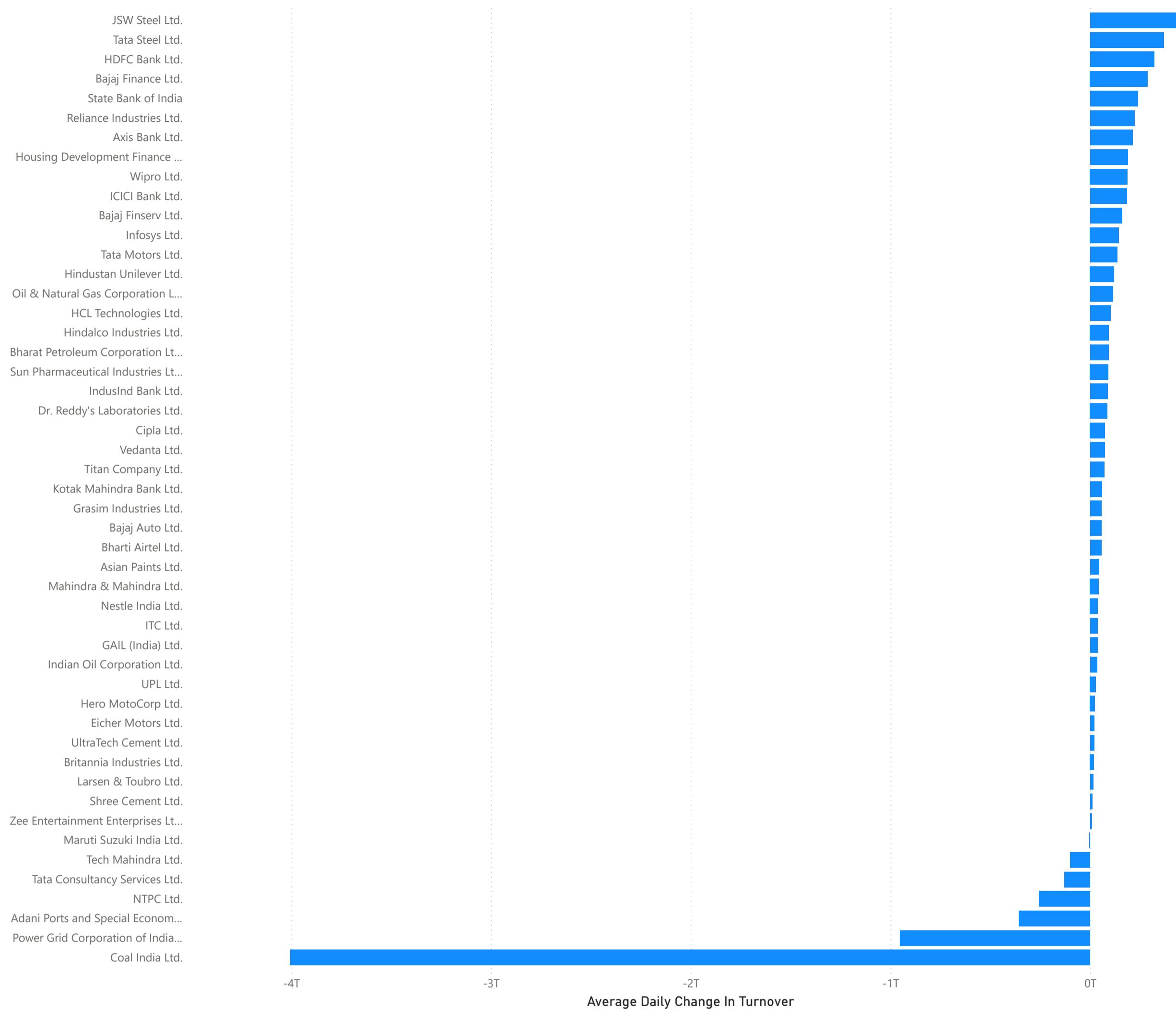
The growth in value of NIFTY-50 stocks was measured using the average change in daily closing price. This was calculated by subtracting the first closing price from the last closing price for each stock, then dividing this by the number of days in which the stock was on the market.

The bar chart shows that most stocks grew in valuation over the 21 year period. Shree Cement Ltd and Nestle India Ltd saw especially large growth in their stock value, with an average growth above 3 Rupees per day, while stocks of Bajaj Group, Maruti Suzuki Ltd and UltraTech Cement did notably well too. Companies such as Tata Steel Ltd, ICICI Bank Ltd and Titan Company Ltd saw moderate growth in their stock value.

On the flipside, some companies fared very poorly with regards to stock value growth. Infosys Ltd stock showed notably bad performance, falling by over 1 Rupee per day on average. Other companies that lost value of the 21 year period were Wipro Ltd, Sun Pharmaceutical Industries Ltd and Zee Entertainment Enterprises Ltd.

## Stock Turnover Growth

Change In Stock Turnover Over 21 Years



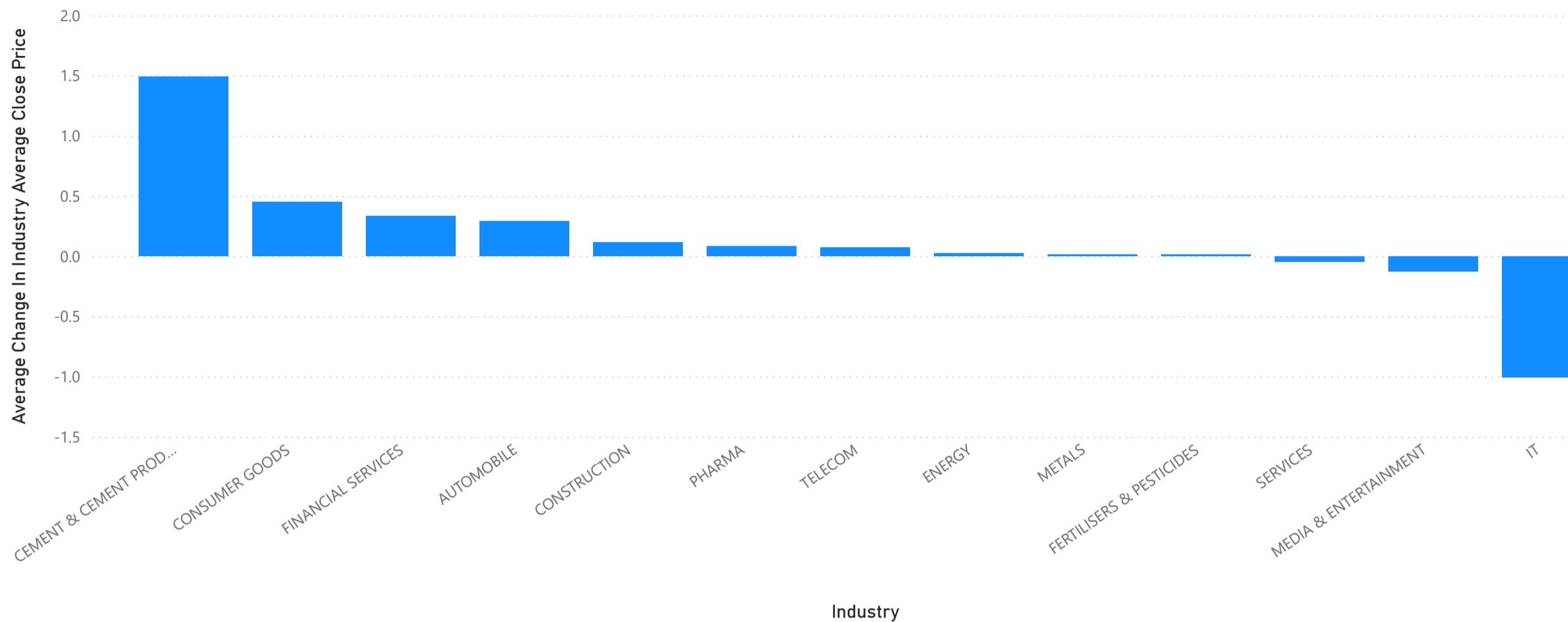
The change in NIFTY-50 stock turnover over the 21 year period was measured in a similar way to the change in stock value - subtracting the first recorded turnover from the last and dividing this by the number of days on the stock market.

Similar to the stock value chart, most firms grew in stock turnover, with JSW Steel Ltd, Tata Steel Ltd and HDFC Bank growing the most. Power Grid Corp Ltd, Adani Ports Ltd and Coal India Ltd saw large losses over the time period, with Coal India Ltd standing out with a average turnover loss of 4,000 Rupees per day. Unlike Coal India, other energy firms such as Hindalco and Oil and Natural Gas Corp Ltd saw gains in stock turnover over the 21 years, suggesting India has a declining coal industry but a booming oil and gas industry.

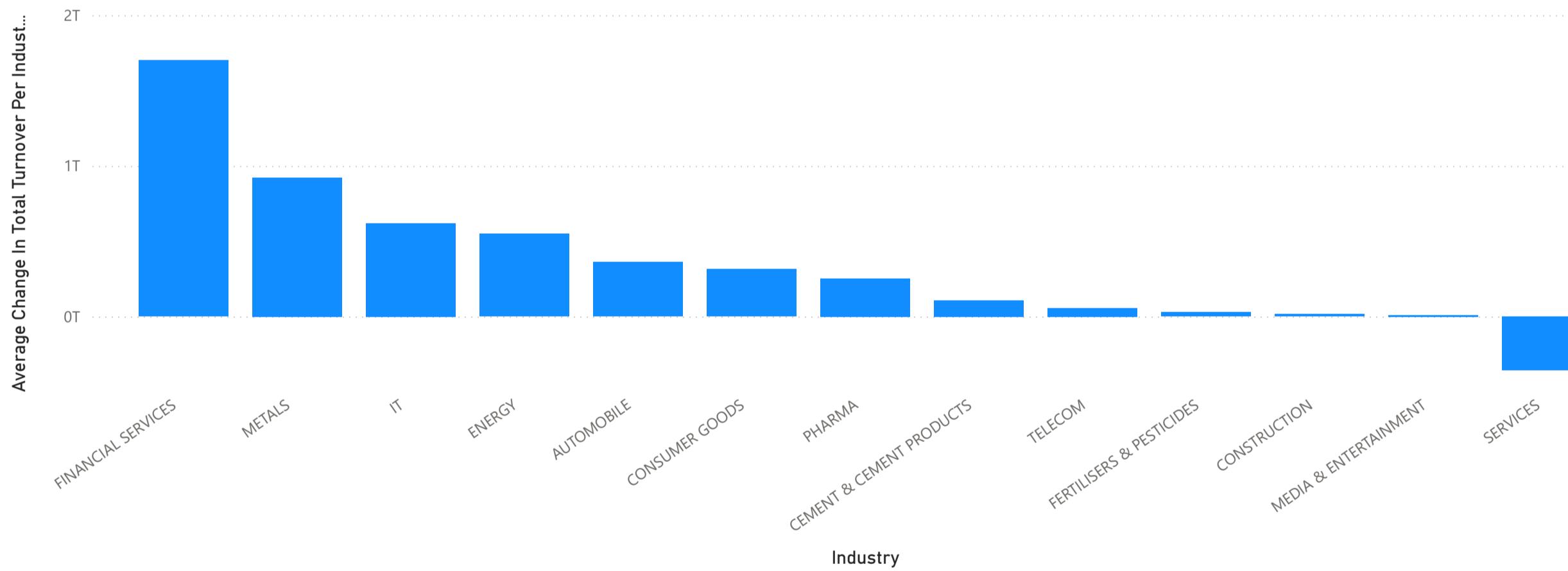
A key insight from this data is that the change in a firm's stock value overtime is not necessarily correlated to the change in its stock turnover. For example, Infosys experienced an average change in value of under -1 Rupee per day over 21 years, whereas its stock turnover increased over the same period. This would indicate that although the stock value has depreciated overtime, the volume of trades has gone up.

## Growth By Sector

Change In Industry Value Over 21 Years



Change In Industry Turnover Over 21 Years

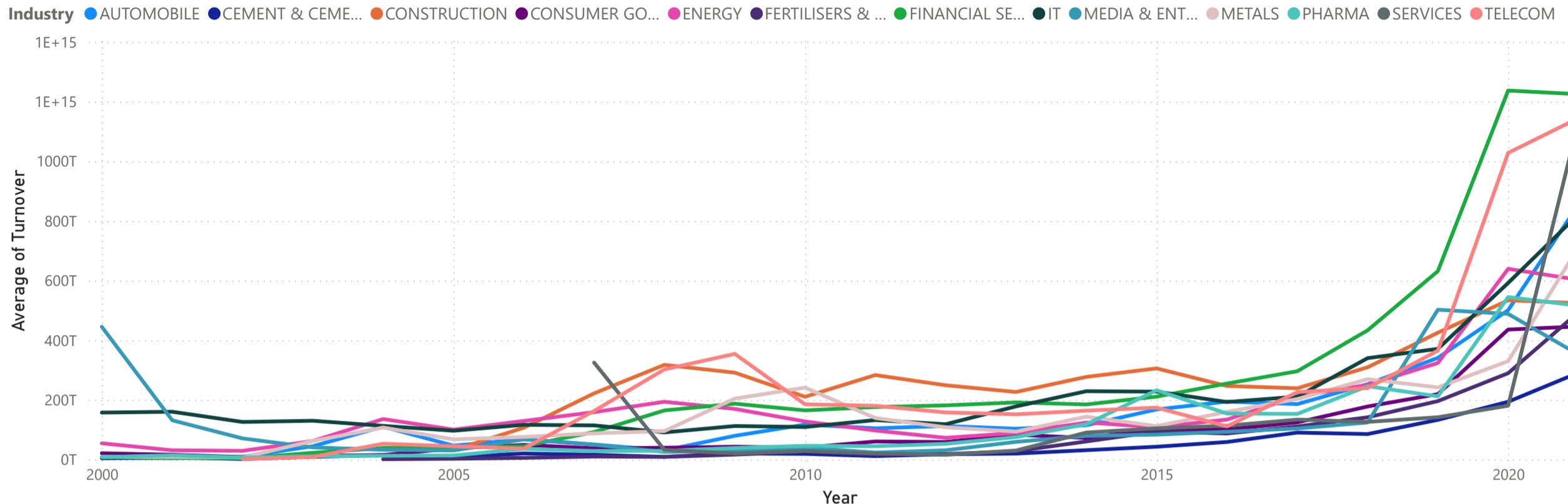


The above charts further emphasize the point that in many cases change in stock turnover and change in its valuation are often correlated, although not always. The Services industry made marginal valuation losses over the 21 year period, although it suffered much more in turnover losses.

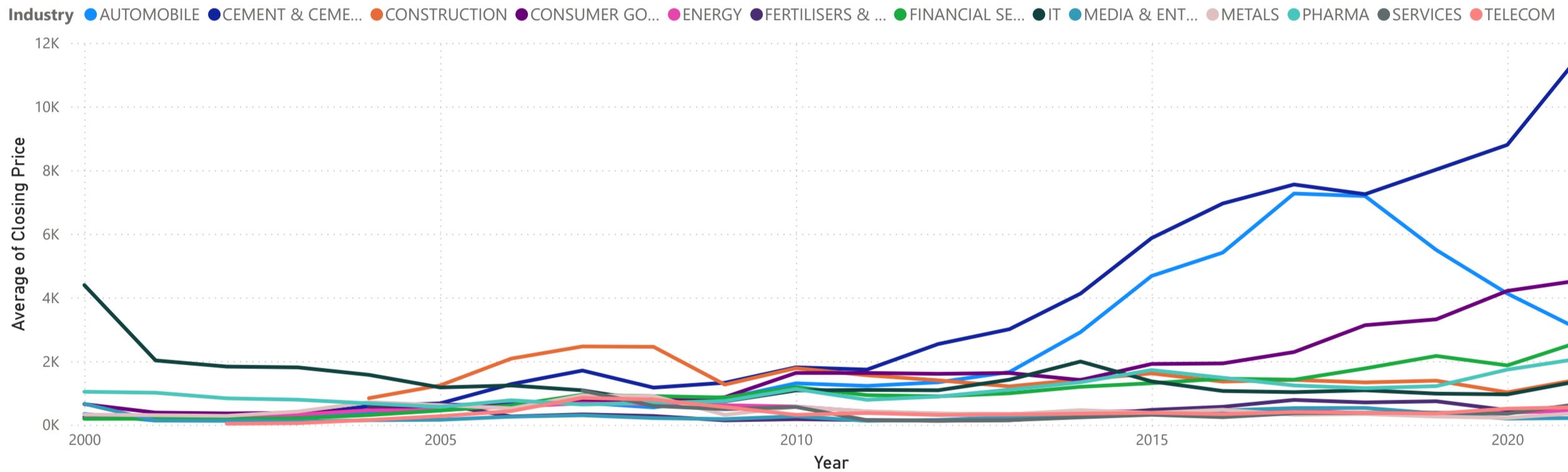
The growth of most industries suggest that the Indian economy has grown and expanded over the time period. Industries in both the secondary and tertiary sector have performed well, such as Cement, Financial Services and Automobile, which implies that India is in the transition from a developing to a developed economy. On the other hand, the results of lesser performing industries such as IT and Services can be explained by the globalisation of India, resulting in higher competition between Indian firms and Foreign Multi-national Corporations.

## Value And Revenue Of Industries Over Time

### Average of Turnover by Year and Industry



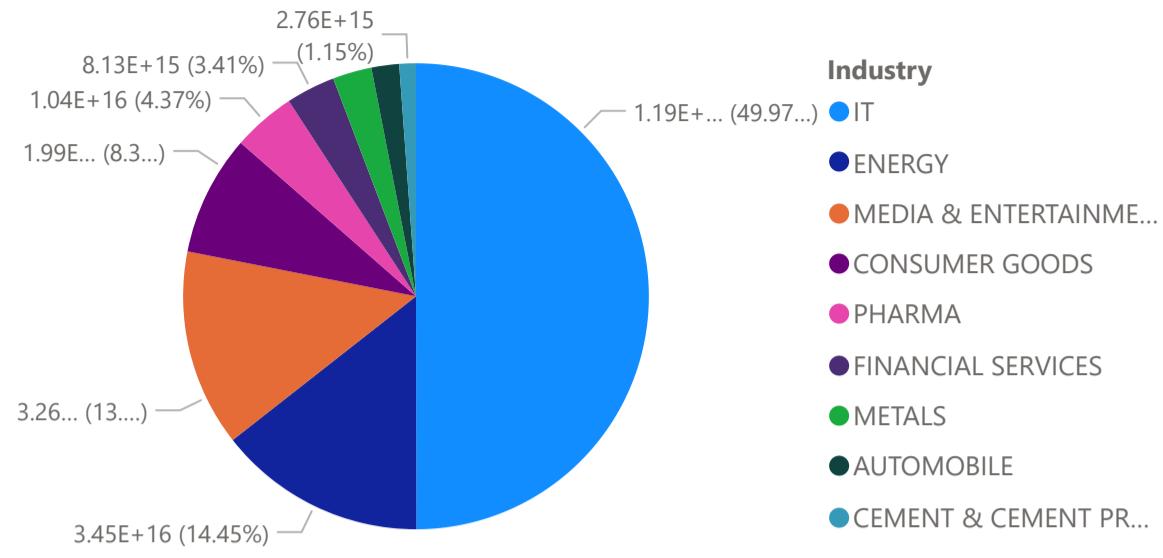
### Average of Close Price by Year and Industry



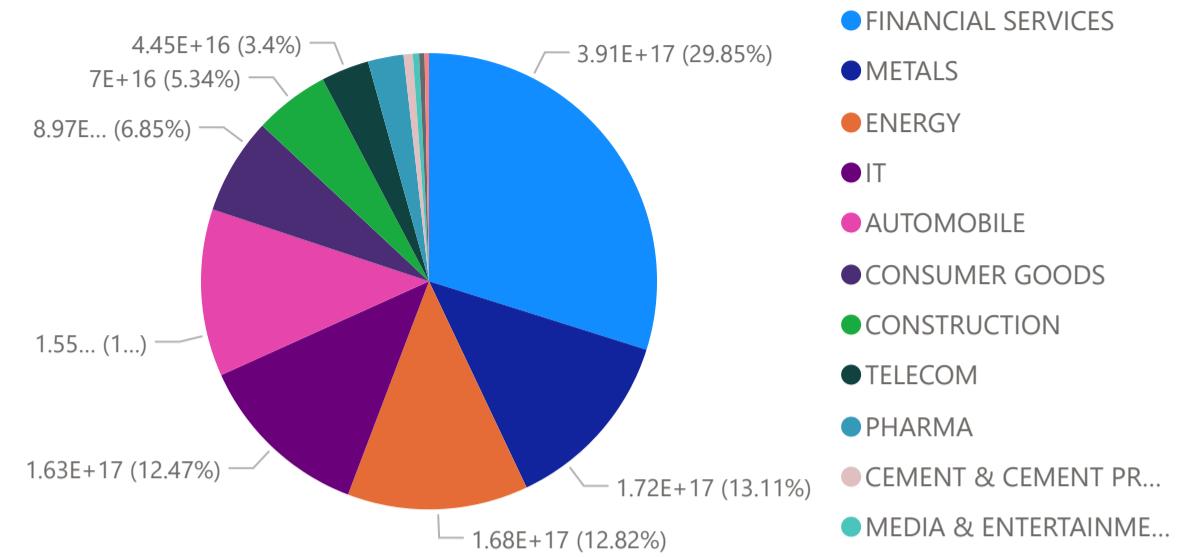
When taking a deeper look at all industries and their individual performance, it can be seen that their growth happened at a more stable rate during the first decade of the century, but during the 2010s the growth happened at a much faster rate. This is perfectly represented by the Financial Sector, which grew steadily from 2000 to around 2017, after which the growth skyrocketed.

## Contribution Of Each Industry To Total NIFTY-50 Turnover Over The Years

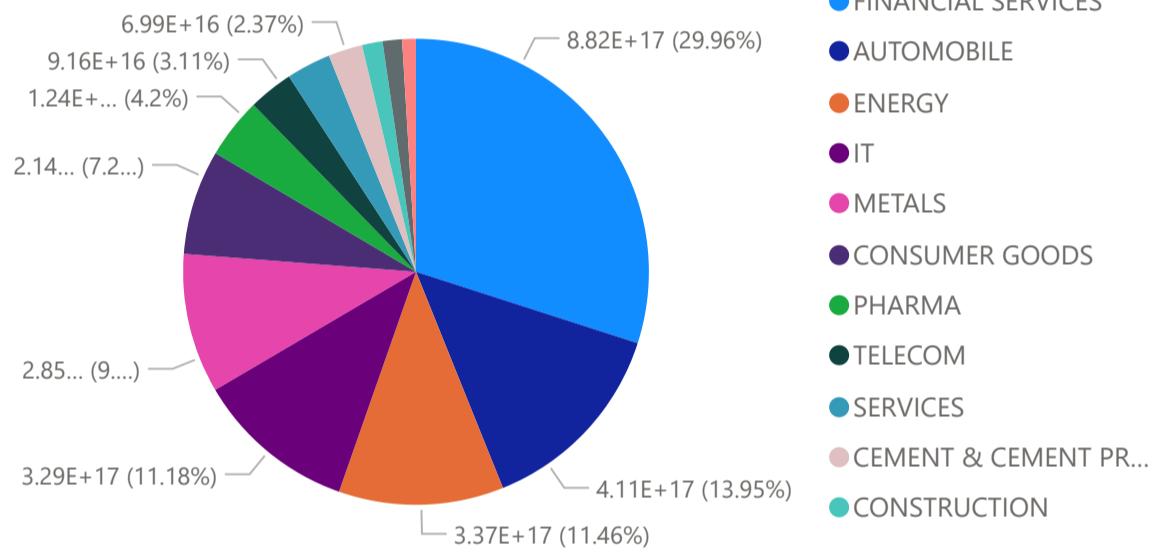
Contribution Of Sector To Total Turnover 2001



Contribution Of Sector To Total Turnover 2011



Contribution Of Sector To Total Turnover 2021



The pie charts indicate that over the 21 year period, India's economy has diversified. During 2001 for example, only a few sector played a major contribution to the total NIFTY-50 turnover, such as IT, Energy and Media and Entertainment, while the contributions of other industries remained small.

However, by 2021, other industries had started contributing more to the total NIFTY-50 turnover. such as Automobile, Financial Services, Metals and Energy. With a more balanced and less one-sided performance across the industries, India's economy is more stable and less reliant on a select few industries.

## Volatility Measures Of NIFTY-50

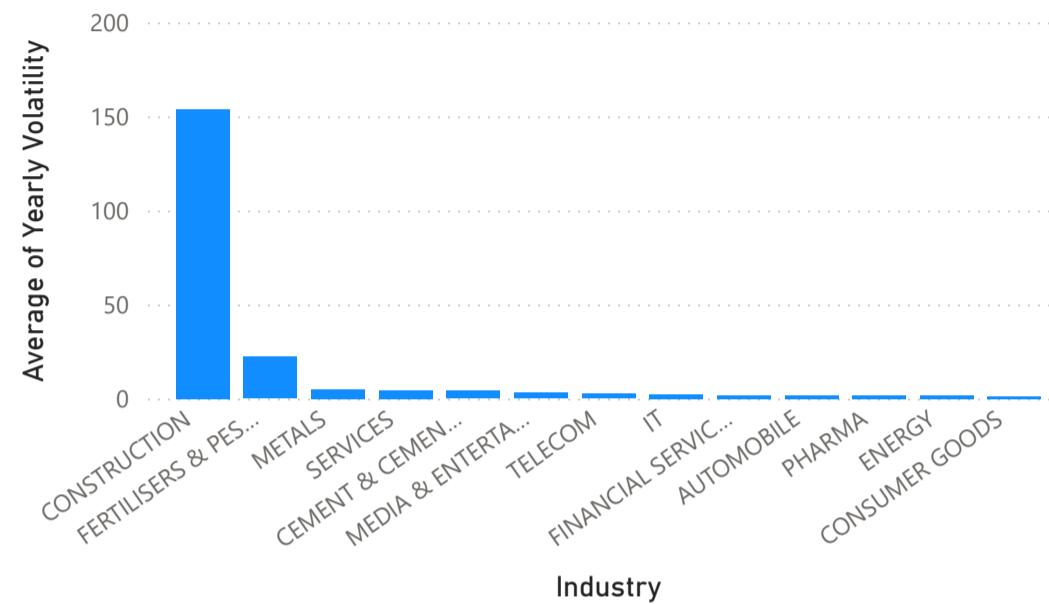
### Least Volatile Stocks At Any Given Year 2000-2001

| Year | Company                   | Yearly Volatility |
|------|---------------------------|-------------------|
| 2017 | HDFC Bank Ltd.            | 0.84              |
| 2002 | Britannia Industries Ltd. | 0.91              |
| 2016 | HDFC Bank Ltd.            | 0.99              |
| 2018 | HDFC Bank Ltd.            | 1.03              |
| 2017 | Bajaj Auto Ltd.           | 1.11              |

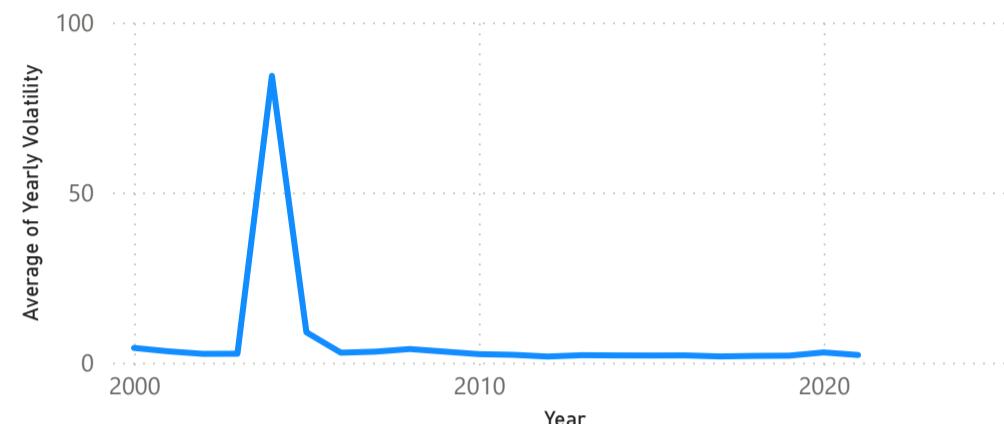
### Most Volatile Stocks At Any Given Year 2000-2021

| Year | Company                                    | Yearly Volatility |
|------|--|-------------------|
| 2004 | Larsen & Toubro Ltd.                       | 2,728.06          |
| 2004 | UPL Ltd.                                   | 352.49            |
| 2005 | JSW Steel Ltd.                             | 271.56            |
| 2004 | UltraTech Cement Ltd.                      | 262.26            |
| 2007 | Adani Ports and Special Economic Zone Ltd. | 24.85             |

### Average of Yearly Volatility by Industry



### Average Yearly Volatility By Company



Yearly/monthly volatility was calculated by taking the standard deviation of the rate of return for each stock/industry across each year/month.

The construction industry was notably unpredictable; Larsen and Toubro had the highest volatility by both monthly and yearly measures in the year 2004. This contributed to the overall volatility of the NIFTY-50 being very high, as seen by the peak in 2004. However, all industries other than Construction and Fertilisers had low volatility over the years, meaning that generally the Indian stock market was stable and investors would have had confidence.

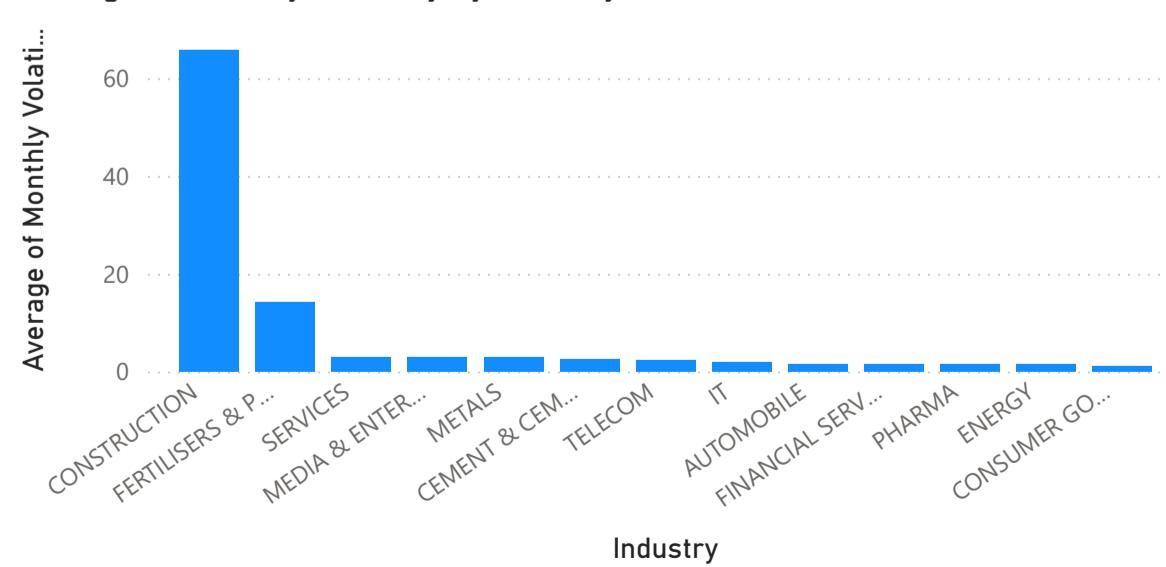
### Least Volatile Stocks In Any Given Month 2000-2021

| Year | Month    | Company                     | Monthly Volatility |
|------|----------|-----------------------------|--------------------|
| 2013 | June     | Hindustan Unilever Ltd.     | 0.38               |
| 2003 | January  | Britannia Industries Ltd.   | 0.42               |
| 2002 | November | Britannia Industries Ltd.   | 0.43               |
| 2002 | October  | State Bank of India         | 0.51               |
| 2005 | June     | Indian Oil Corporation Ltd. | 0.51               |

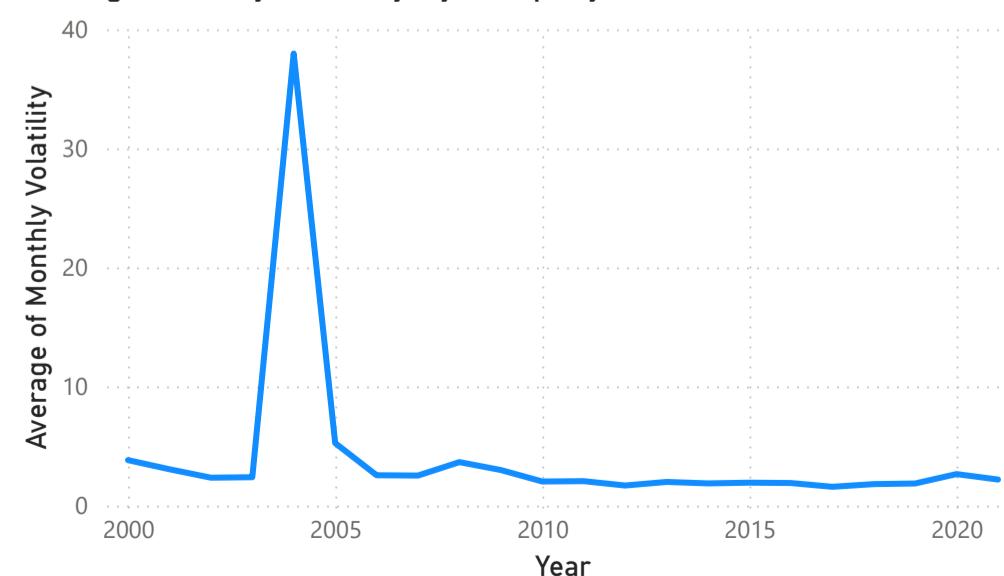
### Most Volatile Stocks In Any Given Month 2000-2021

| Year | Month    | Company                                    | Monthly Volatility |
|------|----------|--|--------------------|
| 2004 | June     | Larsen & Toubro Ltd.                       | 12,939.68          |
| 2004 | January  | UPL Ltd.                                   | 2,433.44           |
| 2005 | March    | JSW Steel Ltd.                             | 1,552.54           |
| 2004 | August   | UltraTech Cement Ltd.                      | 1,021.24           |
| 2007 | November | Adani Ports and Special Economic Zone Ltd. | 60.27              |

### Average of Monthly Volatility by Industry



### Average Monthly Volatility By Company



## **Conclusion**

The analysis of the NIFTY-50 stock market shows that the Indian economy did relatively well over the years from 2000-2021. Although some industries performed worse over years due to foreign competition and globalisation, most industries and firms within the stock market grew both in stock turnover and value. Furthermore, the economy of India has diversified, with growing sectors such as Metals, Financial Services and Automobile contributing a higher proportion to total NIFTY-50 revenue in the latter years.

The stock market generally remained stable throughout the years, although it peaked in the year 2004 due to high volatility of firms such as L&T in the construction industry. The market took a hit in 2020 due to the impact of Covid on the global economy, but remained mostly unfazed during the Financial Crisis of 2008.

Overall, based of the NIFTY-50, the Indian economy looks like it has a bright future ahead. Industries in both the tertiary and secondary economic sectors have grown, suggesting India is on course to eventually become a developed economy.