



# Stock vs Music Sentiment

# Introduction

In this presentation, we will explore the impact of music sentiment on the stock market, how music influences investor behavior and market sentiment, and the potential implications of these findings for businesses and investors.

We will examine the key factors that contribute to this relationship, including market trends, and the power of music to evoke emotions and drive decision-making.



# Case Study by Harvard :



Harvard  
Business  
Review

Financial Markets

| When People Listen to Happy Songs, the Market ...

Financial Markets

## When People Listen to Happy Songs, the Market Outperforms

by Scott Berinato

From the Magazine (January–February 2022)

Source : [Harvard Business Review](#)



# Investors Sentiments

## Events like Terrorist Attack and Stock Fall Down

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- In the case of terrorist attacks, initial reactions to negative sentiment can be due to concerns over safety and stability.
- Popular music sentiment can play a role in shaping investor behavior during market turbulence in the Indian stock market.
- Positive or optimistic music sentiment may help investors stay the course during a market downturn, while negative sentiment could exacerbate panic and lead to more selling.



# Investors Sentiments

## Events like Terrorist Attack and Stock Fall Down

- When it comes to the relationship between investor sentiment and popular music sentiment, it's possible that the music played during this period could have influenced investor behavior. Positive or patriotic songs may have helped to boost sentiment and encourage investors to stay the course during the market downturn, while negative or mournful music could have exacerbated panic and led to more selling. [1]

Ex : Adani Stock Fall Down (Hindenburg Report)

## 'Human Decisions are Emotionally Driven'

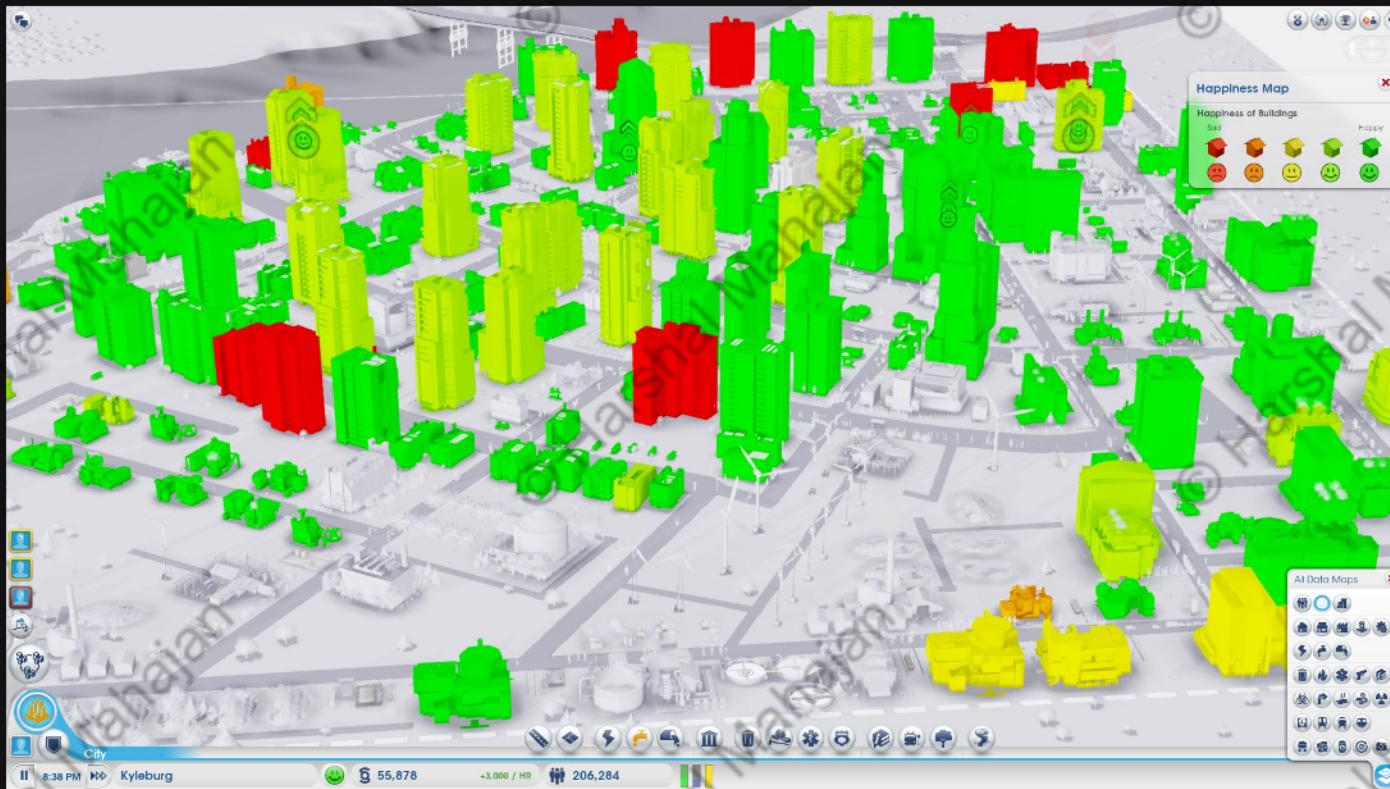


Image Source : [SimCity](#)

# Spotify Data

- Collected Daily Top 200 songs (by number of streams) across Country for 968 days.
- Each song can be linked to its audio feature using Spotify Application Programming Interface (API).
- Such as acousticness, loudness, tempo and valence.
- Valence measures musical positivity of a song and **ranges from 0 to 1**.
- We calculated stream weighted valence, SWAV for India.

$$\text{SWAV} = \sum (\text{Valence} \times \text{Stream})$$

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$$\sum \text{Stream}$$

# Spotify daily Top 200 songs streams

© Harshal Mahajan

Spotify Charts

India

India

## Daily Top Songs India

Your daily update of the most played tracks right now.

Daily ▾ January 14 ▾ Select City ▾

#	TRACK	Peak	Prev	Streak	Streams
1	 <b>Maan Meri Jaan</b> King	1	1	95	1,845,682
3	 <b>Kesariya</b> Pritam, Arijit Singh, Amitabh Bhattacharya	1	3	182	993,220

# Spotify API to get Valence of a song

The screenshot shows the Spotify API console interface. On the left, a sidebar lists various endpoints: CONSOLE, Albums, Artists, Audiobooks, Browse, Chapters, Episodes, Follow, Library, Markets, Personalization, Player, Playlists, Search, Shows, Tracks, and Users Profile. The main area displays the details for the 'Get Track's Audio Features' endpoint:

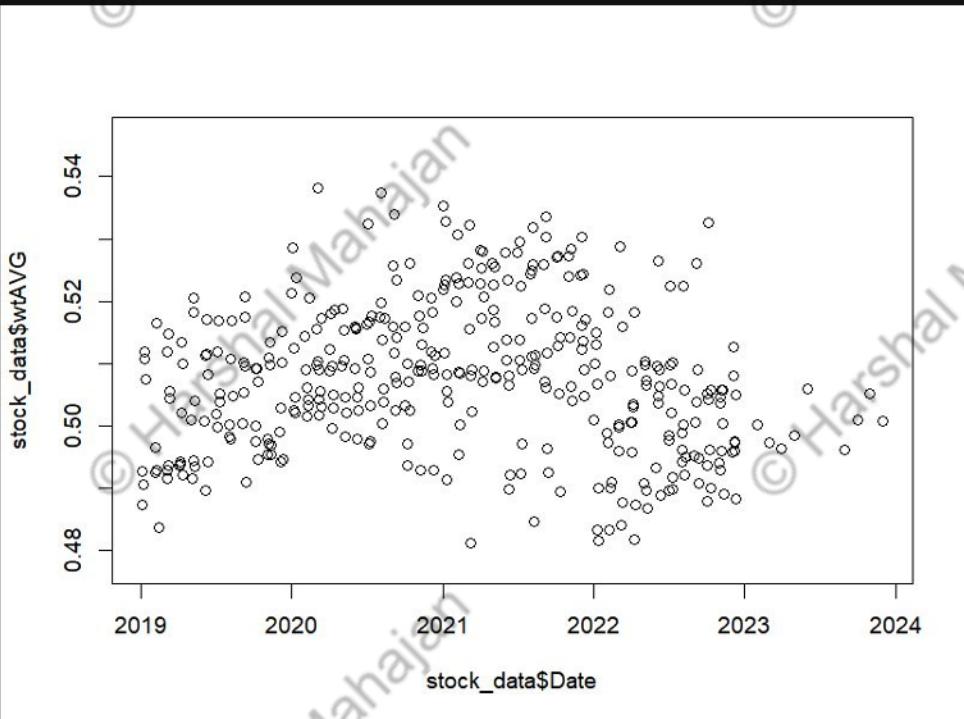
- API Reference:** Get Track's Audio Features
- Endpoint:** <https://api.spotify.com/v1/audio-features/{id}>
- HTTP Method:** GET
- OAuth:** Required

Below this, there is a form field labeled 'id \*' containing the value '11dFghVXANMIKmJxsNCbNI'. To the right of the form is a large green button labeled 'GET TOKEN'. At the bottom of the form area are two buttons: 'TRY IT' (in green) and 'FILL SAMPLE DATA' (in white).

A large arrow points from the right side of the 'TRY IT' button towards a sample JSON response on the right. The response is as follows:

```
{  
    "danceability": 0.696,  
    "energy": 0.905,  
    "key": 2,  
    "loudness": -2.743,  
    "mode": 1,  
    "speechiness": 0.103,  
    "acousticness": 0.011,  
    "instrumentalness": 0.000905,  
    "liveness": 0.302,  
    "valence": 0.625,  
    "tempo": 114.944,  
    "type": "audio_features",  
    "id": "11dFghVXANMIKmJxsNCbNI",  
    "uri": "spotify:track:11dFghVXANMIKmJxsNCbNI",  
    "track_href":  
        "https://api.spotify.com/v1/tracks/11dFghVXANMIKmJxsNCbNI",  
    "analysis_url": "https://api.spotify.com/v1/audio-  
}
```

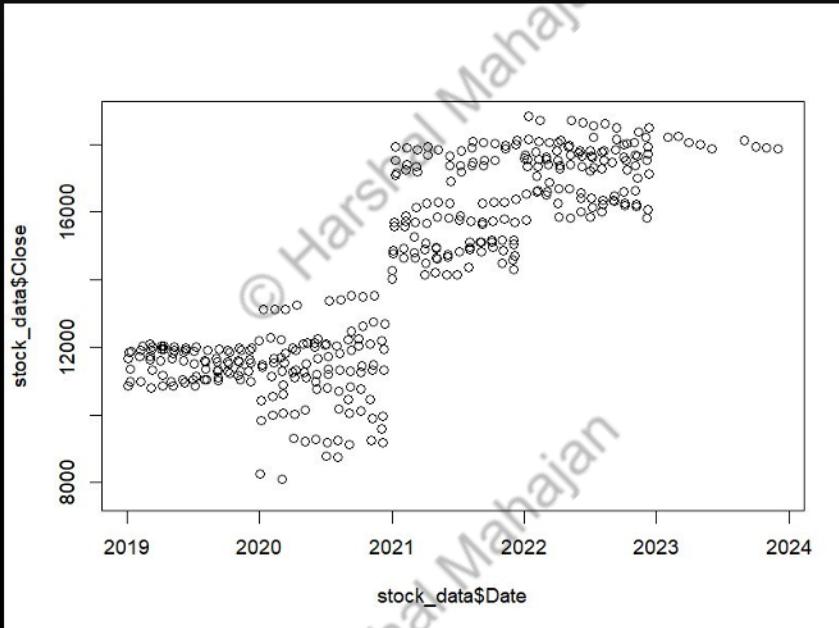
## Calculated SWAV of an each day

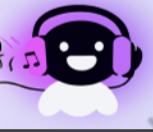


A	B	C	D	E	F	G	H	I	J
1	spotify:trac	benny blan	I Can't Get I	NEON16/Fr	1	27	2	51645	0.69
2	spotify:trac	Ariana Gra	7 rings	Republic Re	1	1	3	34812	0.327
3	spotify:trac	Lady Gaga,	Shallow	A Star is Bo	2	2	3	32129	0.323
4	spotify:trac	Post Malon	Sunflower - Republic Re	4	4	3	30280	0.912	
5	spotify:trac	Jonas Broth	Sucker	Jonas Broth	5	-1	1	29915	0.952
6	spotify:trac	Daddy Yank	Con Calma	El Cartel Re	4	5	3	26771	0.656
7	spotify:trac	Ariana Gra	break up w	Republic Re	3	3	3	26721	0.335
8	spotify:trac	Akhil, Dhv	Duniyaa (Fr	T-Series	8	8	3	26399	0.524
9	spotify:trac	Post Malon	Wow.	Republic Re	6	6	3	24782	0.385
10	spotify:trac	Lauv, Troye	i'm so tired	Lauv	9	10	3	24238	0.534
11	spotify:trac	Khalid, Disc	Talk	Right Hand	6	7	3	24138	0.338

# Stock Data

- Collected Daily NSEI data from 01 March 2019 to 31 Jan 2023 (Source : [Yahoo](#))
- We processed 966 CSV file, perform operation and merge it into one csv file, calculating SWAV date wise and fetch data from Spotify API.





# Happiest Song and Saddest Song played in India

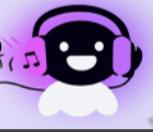
During period 01th March 2019 to 31th March 2023

Happiest Song was 'Running Over' streamed 25902 times  
on 14th Feb 2020 (Valence : 0.977)

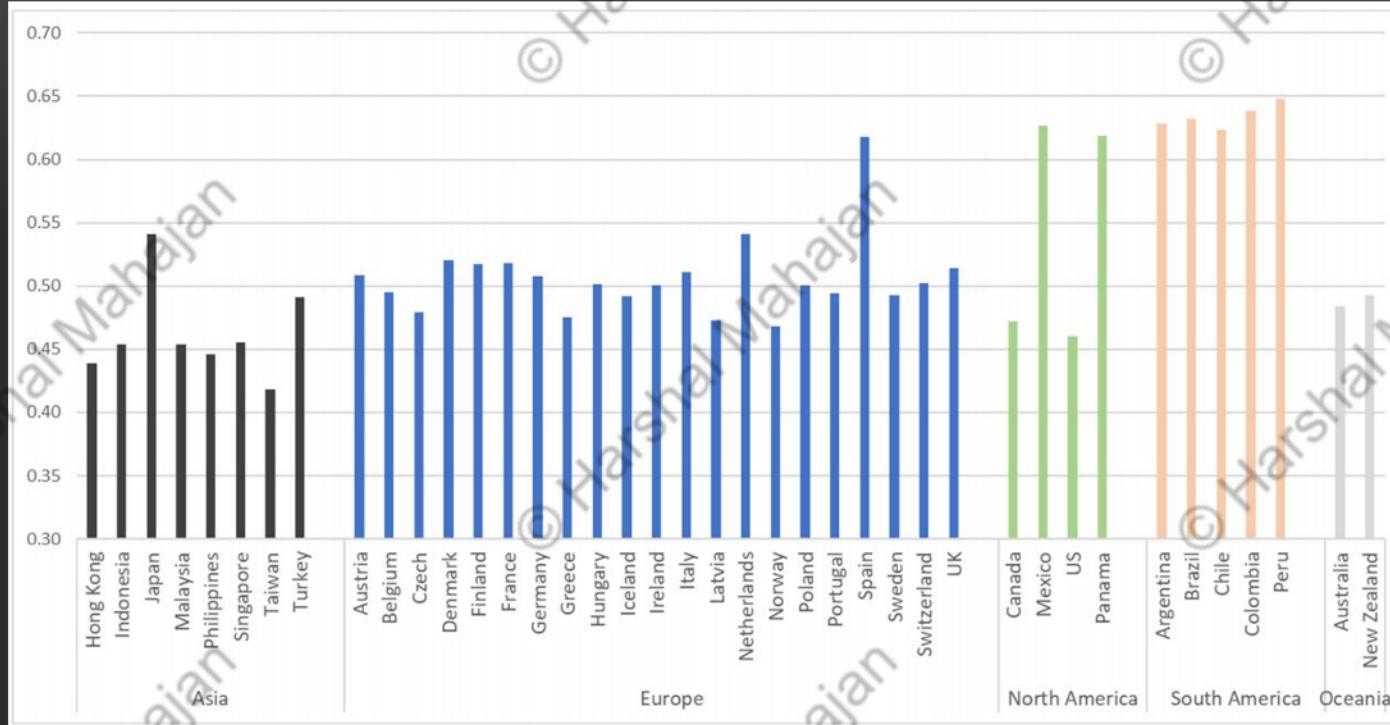


Saddest Song was 'LO Vas A Olvidar'  
streamed 56389 times on 22th Jan 2021  
(Valence : 0.032)





# Region wise Analysis



Stream-weighted average valence of top-200 songs by geographical regions and country. This figure plots the average daily stream-weighted average valence (SWAV) per country over our sample period from January 1, 2017, to December 31, 2020. The 40 countries in our sample are grouped by geographical regions. (We analysed 48,000 songs)

# Analysis: Music Sentiments and Stock Market

```
Call:  
lm(formula = ChangeStock ~ wtAVG, data = stock_data)
```

Residuals:

Min	1Q	Median	3Q	Max
-603.89	-68.12	8.39	72.26	862.34

Coefficients:

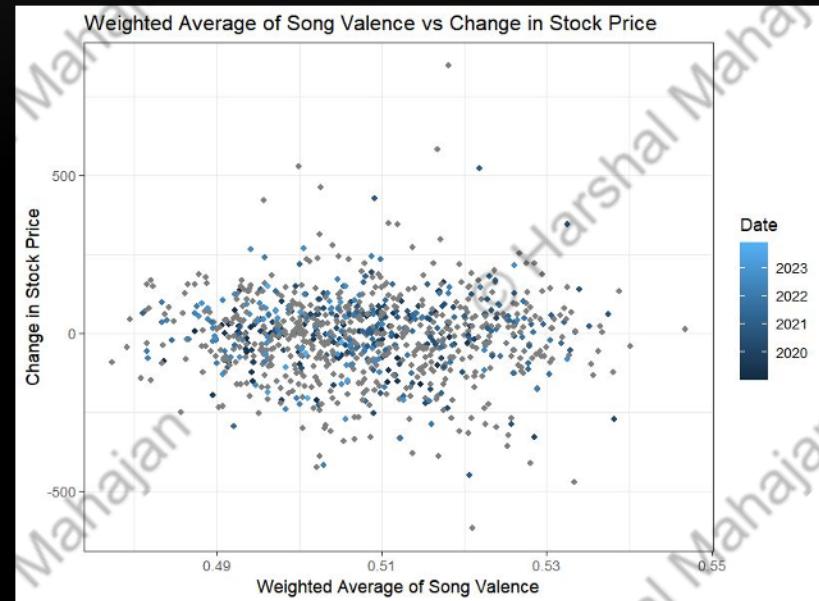
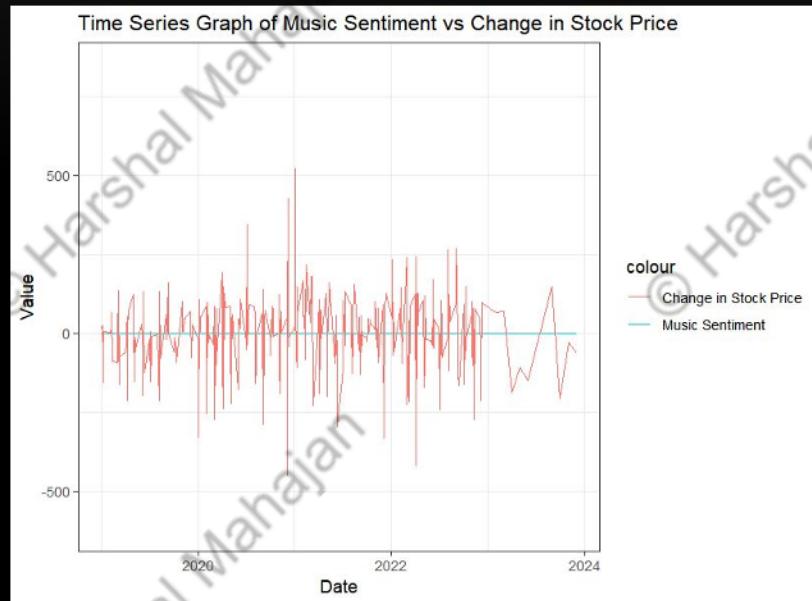
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	169.2	172.9	0.979	0.328
wtAVG	-355.1	340.3	-1.044	0.297

Residual standard error: 130.3 on 964 degrees of freedom

Multiple R-squared: 0.001129, Adjusted R-squared: 9.253e-05

F-statistic: 1.089 on 1 and 964 DF, p-value: 0.2969

# Analysis: Music Sentiments and Stock Market



# Analysis: Music Sentiments and Stock Market

- Based on the analysis performed, there does not seem to be a significant correlation between the weighted average of song valence and change in stock price. This is evident from the low R-squared value of 0.001129 and the high p-value of 0.2969 in the linear model summary. The time series graph also showed a weak correlation between music sentiment and change in stock price. Thus, it can be concluded that the sentiment of songs does not have a significant effect on the stock prices of NSEI/ Indian Stock Market.

# Conclusion

- Music Data is linked to big data more research need to be done.
- Music sentiment as a measure of investor sentiment maybe for different countries [2].
- High-frequency, available globally, is not affected by linguistic factors.

"Music is a universal language"

- Based on the analysis performed, it can be concluded that the sentiment of songs does not have a significant effect on the stock prices of NSEI. This result is not in line with other case studies and research on the european and western market, which have found a positive correlation between music sentiment and stock prices. This suggests that music sentiment is not a reliable indicator of stock market performance in the Indian market.

# Reference

- When People Listen to Happy Songs, the Market Outperforms by Scott Berinato
- [1] Wang, A. Y., Young, M., 2020. Terrorist attacks and investor risk preference: Evidence from mutual fund flows. *J. Financ. Econ.* 137, 491–514.
- [2] Alex Edmans, Adrian Fernandez-Perez, Alexandre Garel, Ivan Indriawan, Music sentiment and stock returns around the world,*Journal of Financial Economics*, Volume 145, Issue 2, Part A, 2022, Pages 234-254, ISSN 0304-405X.

# Thank You!

#NoAdsFinally



Despacito

Luis Fonsi, Daddy Yankee ❤

0:23



-3:25

