

Music and Money: Exploring Billboard Trends and Inflation Through the Business

Understanding

Business Understanding

Our team decided to analyze Billboard Hot 100 and Inflation data to explore the correlation between music and inflation and how they might influence each other. This data can help answer questions surrounding the economic environment and music industry such as "Do economic factors influence the emotional tone, beat per minute (bpm), and popularity of music on billboard charts?", "Are certain song characteristics, such as bpm, loudness, and energy, correlated with economic trends?", and "Which song characteristics are more likely determinants for a song to go #1?" Linking Billboard data and inflation rates can be valuable to both economists and the music industry to understand and respond to fluctuations in societal trends during periods of economic expansion vs recession. Economists can track trends between inflation and consumer behaviors, relating to the entertainment industry. Similarly, the music industry can derive music release strategies and predict listening behaviors and music performance based on the impacts of inflation.

Data Understanding

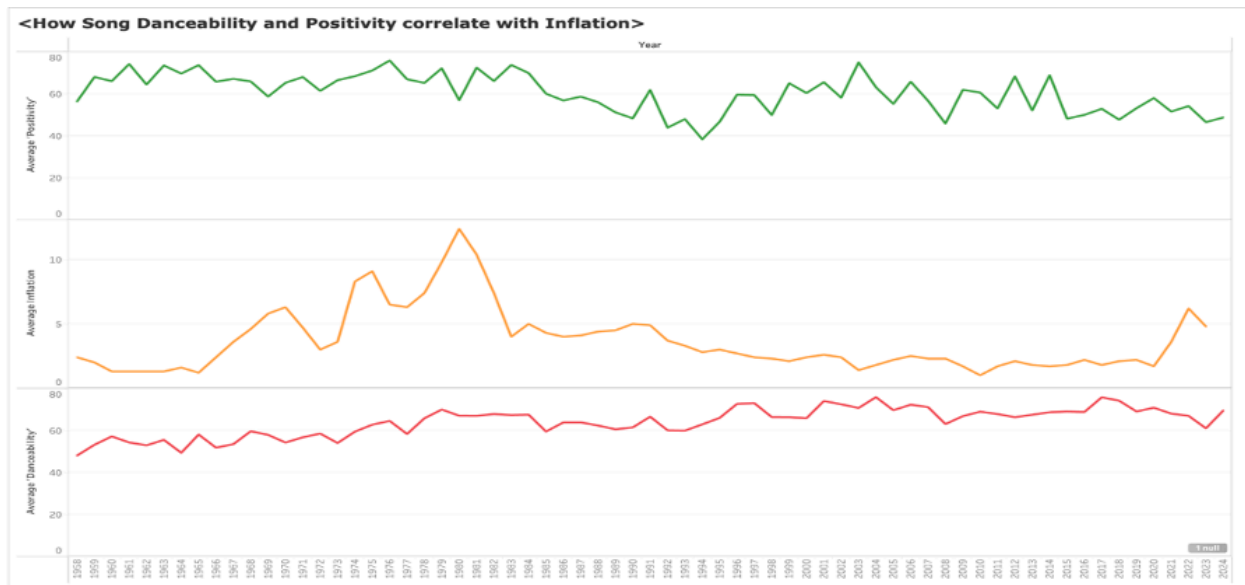
While the combined dataset provided us with a plethora of variables to choose from, our team focused on a select few to answer questions about the correlation between inflation and music. To analyze how inflation influences music characteristics and song popularity we identified inflation rate, danceability, loudness, valence, beats per

Music and Money: Exploring Billboard Trends and Inflation Through the Business

Understanding

minute, energy, and popularity to be key variables, using Tableau to help create visuals in order to see correlations between these key variables. Danceability simply demonstrated how easy a song is to dance to from a value of 1-100; the higher the value, the easier a song is to dance to. Valence categorizes the type of mood evoked by the song, from 1-100. Songs with a lower valence value are categorized as having more positive moods, and vice versa.

As shown below, historically, there has been an inverse relationship between inflation with song positivity and danceability.



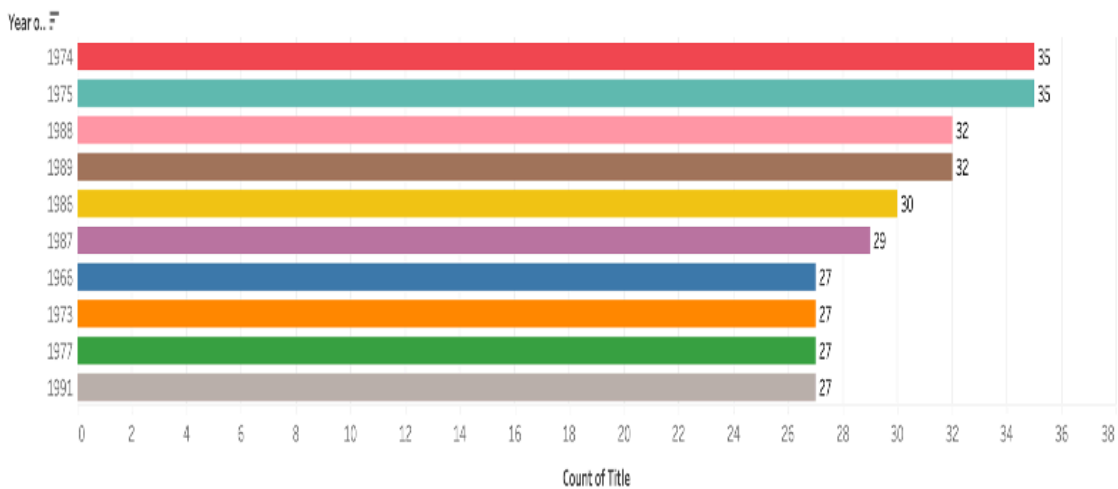
To take this a step further, we analyzed annual music performance. We wanted to see which years' had more songs reach #1 and which years' did not. This information provided us with a range of years to focus on the inflation rate and see if there were any correlations. In the following two visuals, the mid-to-late 20th century seemed to have higher charting performances. Conversely, the early 21st century had the least

Music and Money: Exploring Billboard Trends and Inflation Through the Business

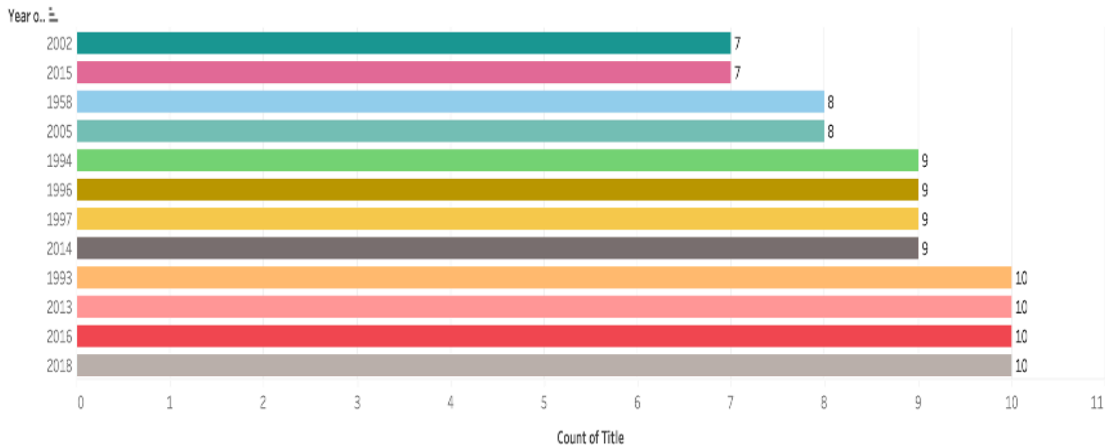
Understanding

amount of songs chart #1. When comparing that to the economic landscape of those periods, we noticed the volatility in inflation rates. During the mid-20th century, inflation rates grew exponentially due to post-war efforts and stabilized in the late 20th century. Throughout the early 2000s, inflation was generally stable until the global financial crisis in 2008.

Top 10 Count of #1 Songs by Year



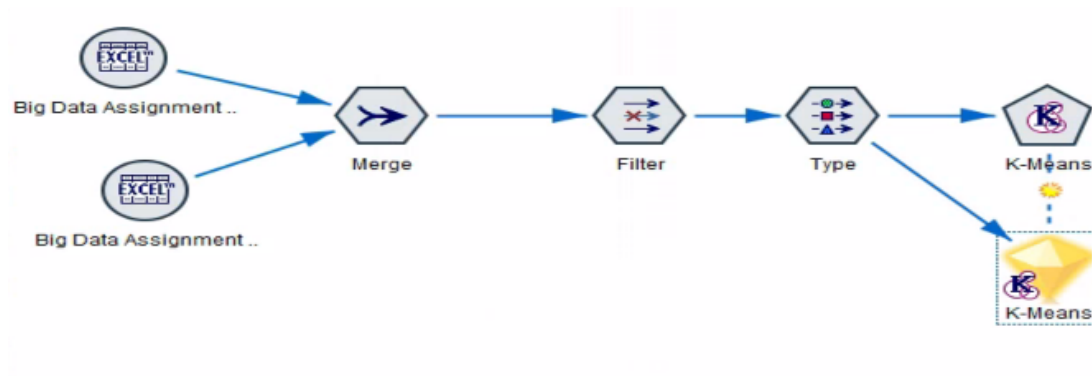
Bottom 10 Count of #1 Songs by Year



Music and Money: Exploring Billboard Trends and Inflation Through the Business

Understanding

To see how these characteristics influence and relate together we used K-means clustering. The first cluster conveys that happy, energetic tracks are more popular during periods of low inflation. The other notable cluster is the third cluster showcasing that upbeat and danceable songs still maintained prevalence in periods of high inflation.



Size	30.4% (356)	21.2% (248)	18.1% (212)	16.1% (188)	14.3% (167)
Inputs	Valence 83.66	Valence 50.98	Valence 79.50	Valence 35.84	Valence 38.67
	Annual 2.81	Annual 2.85	Annual 7.91	Annual 3.48	Annual 4.50
	Energy 73.38	Energy 66.95	Energy 62.68	Energy 34.54	Energy 53.62
	Dance 67.74	Dance 69.94	Dance 69.76	Dance 51.35	Dance 47.26
	BPM 123.30	BPM 110.31	BPM 112.61	BPM 100.54	BPM 154.03
	Loud -7.11	Loud -6.56	Loud -9.75	Loud -11.91	Loud -8.71

Data Preparation

Music and Money: Exploring Billboard Trends and Inflation Through the Business

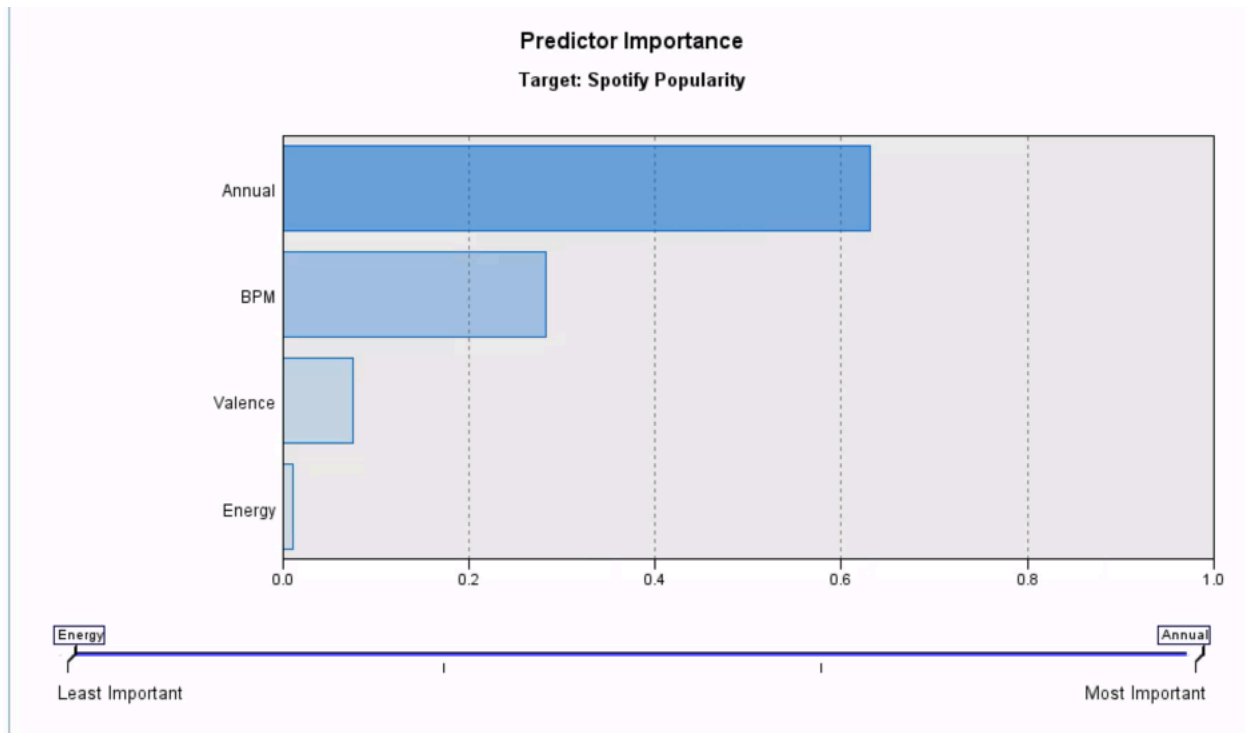
Understanding

We began the data preparation phase by renaming and assigning the proper variable types to each column of both tables utilizing Tableau Prep. There were a few null values in the 'Artist Name' and 'Song Title' columns, but we were able to resolve this with a quick Google search. Because the year 2024 obviously is not over, therefore there was no Annual Inflation data available for that year, so we decided to average the available months to come up with this number. The table we chose also had complete Billboard history data, so songs that spend more than one week at #1 on the chart had more than one entry. To resolve this, we only kept the row from the first week the song hit #1. Once we were sure the data was consistent and accurate, we removed any columns we felt didn't apply to answering our business questions, such as Loudness, Accusing, Length, Spotify Popularity, and Spotify Release Month in the Billboard #1 Song table. Although we wanted to compare month data between the two tables, we were not able to confidently get accurate release month information for every #1 so we removed the month columns along with Half1 and Half2 data from the Inflation table, leaving the Year and Annual Inflation columns.

Music and Money: Exploring Billboard Trends and Inflation Through the Business

Understanding

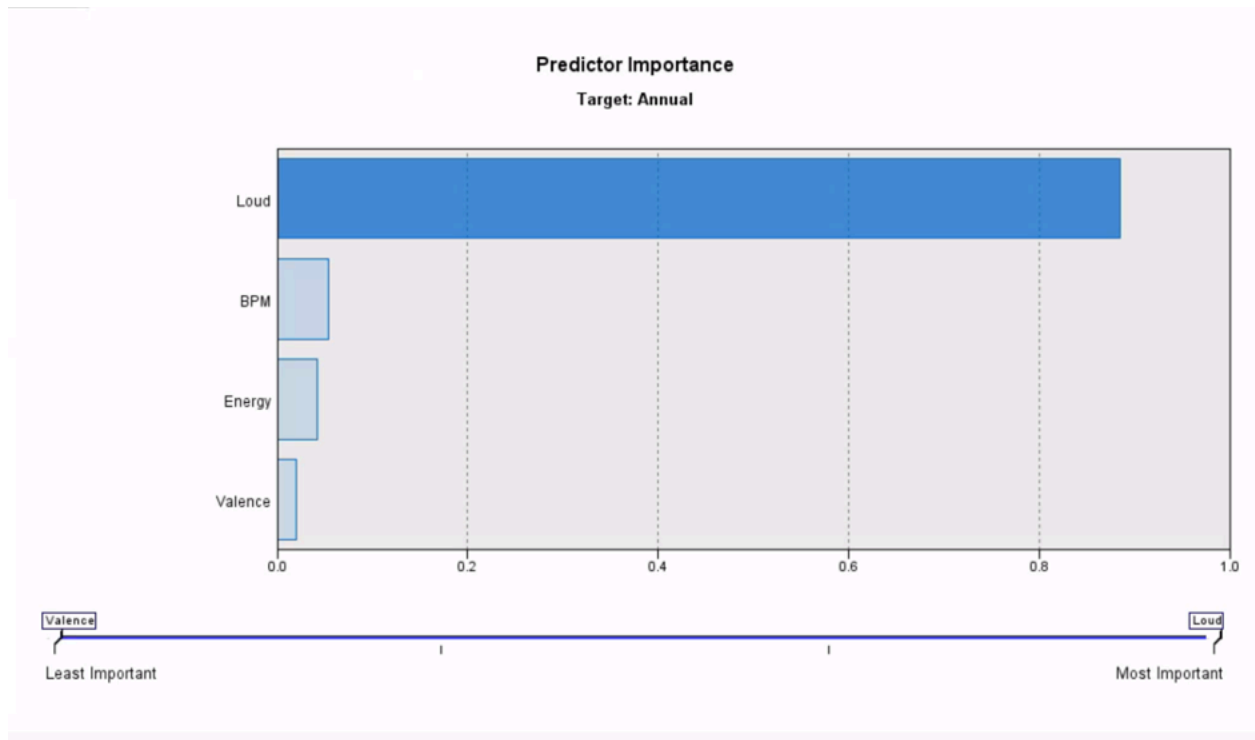
Model Building



- Visual notes that inflation and BPM play an important role in determining a song's popularity, Music industries can see that changes in inflation may influence listener preferences and how artists create music. Songs with higher BPMs are more likely to perform well on charts. Songs with a positive mood (high valence) show a moderate influence on popularity. Energy has minimal influence on popularity compared to other factors.

Music and Money: Exploring Billboard Trends and Inflation Through the Business

Understanding



* Takeaways/conclusion : During High Inflation, music industries should focus on producing either dance-friendly escapist music or calm, reflective tracks. During Low Inflation, emphasize loud, energetic songs with faster tempos from artists. Economists can pay attention to song trends to see whether inflation will remain stable, trend upwards, or decrease..

Music and Money: Billboard Trends and Inflation

Sources and project references

Billboard chart history

<https://www.kaggle.com/datasets/ludmin/billboard>

U.S. inflation data

https://data.bls.gov/timeseries/CUUR0000SA0L1E?output_view=pct_12mths

Music attributes

Sort Your Music / Spotify attributes, as recorded in the academic project.

Working data

The original group spreadsheet is omitted from this public copy.

Academic group project, 2024. Original analysis retained; this final reference page provides a shareable source list.