



Defend Your Research

When People Listen to Happy Songs, the Market Outperforms

An Interview with Alex Edmans by Scott Berinato



IdeaWatch

Alex Edmans of London Business School and three coauthors gathered data on the average positivity of songs that people in 40 nations listened to on Spotify. The researchers then compared that data with the performance of each country's national stock market over the same period. They wanted to see if there was a correlation between mood, as reflected by the music played, and financial returns. There was. **The conclusion:**

When People Listen to Happy Songs, the Market Outperforms



Professor Edmans, DEFEND YOUR RESEARCH

EDMANS: It's a robust finding based on 500 billion streams of 58,000 songs. When Adrian Fernandez-Perez and Ivan Indriawan of Auckland University of Technology, Alexandre Garel of Audencia Business School, and I looked at the average happiness of the songs played over a week in a country and compared it with what happened in the country's equity markets that week, we found that

more-positive listening choices were significantly correlated with stock price gains. We looked at the United States first and thought that maybe the findings were a fluke. But when we looked at 39 other countries, the results were the same. We then looked at mutual fund flows and found similar effects: Positive music was associated with inflows. We even ran a test with government

bonds, which should go in the opposite direction. Optimistic people should buy fewer bonds, because they're lower risk than equities are, thereby causing bond prices to fall. And in markets that listened to happy songs, they did.

HBR: Why research this? Are you trying to devise a trading strategy? I admit that this sounds like a wacky study, but we're trying to get at a serious economic question: Is the market driven by fundamentals or by emotions? The efficient-markets hypothesis holds that stock returns should reflect only relevant factors, such as interest rates and unemployment figures. It's the irrelevance of music that makes the study interesting. In a rational model, factors that don't affect economic fundamentals—such as investor sentiment—should have no impact on stock returns. We're showing that they do.

It seems obvious to me that mood would affect decisions, including those related to investments. Are there really economists who would say that it doesn't? Yes, there are. Economists acknowledge that some investors are irrational. But they'd say that for every investor whose trades are driven by sentiment, there will be a countervailing force of cold-blooded professional investors that trade the other way and balance things out. So in aggregate, markets are rational. This isn't just the view of academic rationalists—many practitioners believe it too. That's why passive index investing has become so popular recently: It reflects the belief that the market is efficient on average, so you can't beat it.

How do you know that mood—as reflected by music—drives the market rather than the market driving the mood? We tested for this by looking at streaming patterns one day and market returns the next, which rules out reverse causality. We indeed found that happy

music today means higher average share prices tomorrow.

OK, what about controls? We controlled for everything you might imagine could affect national market returns: volatility, macroeconomic policy, world market performance, and so on. Part of our data was collected before the pandemic and part during it, and we used that as an additional test. In some countries short-selling—borrowing a stock you think is overvalued, selling it, buying it back at a lower price before returning it, and pocketing the difference—was banned for periods during the crisis, so hardheaded rationalists couldn't counteract the effect of sentiment. In those cases we expected to see even stronger ties between music and the market, and we did.

Isn't there other research showing that sentiment affects investments?

There is. I've written one of those papers myself, showing that when a country's soccer team is eliminated from the World Cup, its stock market returns decline. Other studies look at weather or seasonal affective disorder. These are shocks to mood. But mood depends on many factors—perhaps your country got knocked out of the World Cup, but consumer confidence is rising and Covid restrictions are easing. So rather than studying a single factor that *affects* mood, we found a measure that *reflects* it. It's a much more comprehensive measure.

But don't perfectly happy people sometimes listen to sad songs? And couldn't someone feeling low listen to a song like "Shiny, Happy People" to snap out of it? A lot of prior research shows that we listen to music that matches how we feel. It's called *emotional congruity*. And we validated that in our data. For example, music choices reflected more negativity when a country implemented stricter Covid restrictions, on cloudier days, and in colder, darker months that

are associated with a gloomier social sentiment.

Who says how positive or negative a song is? A team at Spotify called the Echo Nest actually scores it.

Come on. You made that up. It sounds like a name for some Marvel villain's mountain lair. No! It's real! It was started at the MIT Media Lab about the same time I was a PhD student at MIT Sloan, and now it's part of Spotify's data science group. Every song gets assigned a positivity score between 0 and 1. Human experts scored about 5,000 songs, and that data was used to create a machine-learning algorithm that can be applied to every song. It doesn't take into account lyrics but uses the sound, the beat, and so on. Take a song like "Pumped Up Kicks." It's about a mass shooting, but it's quite happy sounding. In contrast, "Perfect" by Ed Sheeran has positive lyrics but is actually downbeat. Lyrics are also sometimes ambiguous, which is another reason not to factor them in.

And you just averaged the scores of all songs played in a country to measure national mood? Exactly. You multiply the rating by the number of streams and then divide for the weighted average. That alone is fascinating. For example, in our data the United States averaged out at about 0.46—not too positive. Mexico was 0.63. Of course, these scores changed over time.

What's the happiest song on Spotify?

"September" by Earth, Wind & Fire, apparently. "Happy" by Pharrell Williams is up there too. The most negative is "Legion Inoculant" by Tool. The Adele song "Hello" was also down there.

How have those economic rationalists reacted to this research? A small minority have said they don't believe the findings—but not because they've found holes in the analysis. Instead,

they won't even read it, because they believe so deeply in efficient markets that they won't entertain the possibility that our findings are right. Others, who are open to the idea that markets may be irrational, have reacted positively to the creativity of our sentiment measure and the rigor of our analysis. A third common reaction is "Look, Alex, this is a fun, cute paper, but why spend time on this?"

Because you get to hang out in the Echo Nest? I always tell people, "This is a really important issue that we're looking at here. What drives markets: rationality or emotion?" Richard Thaler and Robert Shiller won Nobel Prizes for thinking about this stuff. Most of my research is on behavioral finance, specifically ESG and sustainable investing, and there's a connection here. The rationalists will say ESG doesn't work, because if there was a payoff, the market would factor it into prices. But what if the market is irrational—sentimental? Then the market might be not only factoring in things that shouldn't matter, like national mood, but also ignoring things that should.

Such as? I previously wrote a paper on how the 100 Best Companies to Work For in America—as determined by *Fortune*—beat the market from 1984 through 2011. That study was recently replicated, and the results still hold even a decade after it was published. Efficient-market proponents would say that once investors learned that employee well-being predicts share-price performance, they'd buy the 100 Best Companies as soon as a new list was announced, so those stocks wouldn't subsequently outperform. But they continued to do so, even after my paper was released. If markets *aren't* fully valuing employee well-being but *are* reflecting mood, how can they be anything but inefficient? ☺

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