

# Warsaw Econometric Challenge 2021

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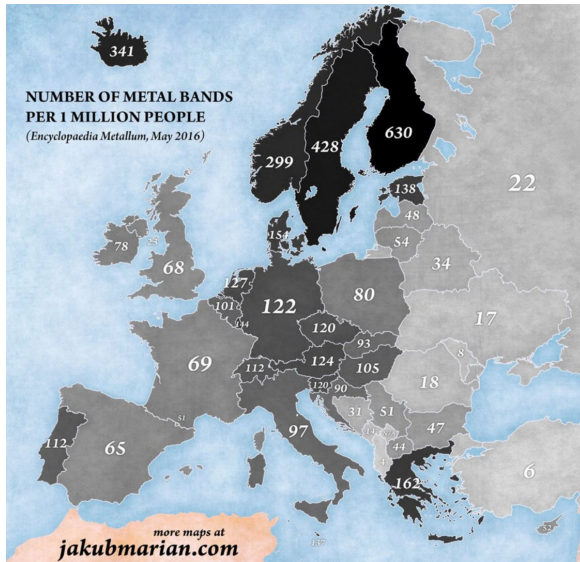
$$b = (X'X)^{-1} X'y$$

# WARSAW econometric CHALLENGE

First edition

$$\hat{\theta} = \underset{\theta}{\operatorname{argmin}} M_T'(\theta) W_T^{-1} M_T(\theta)$$

But this one is not the topic



Sad songs say so much

# Data from Spotify suggest that listeners are gloomiest in February

Around the world, the most popular tunes this month will be  
depressing ones

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FEB 8TH 2020

# The topic

- The Economist, Feb 8th 2020 edition
- Residents of the northern hemisphere might think that their moods are worst in January.
- Christmas is over, the nights are long and summer is a distant prospect.
- Newspapers often claim that “Blue Monday”, in the third week of January, is the most depressing day.
- To create a quantitative measure of seasonal misery, The Economist has analysed music consumption.
- **And so have we**
- **And you are about to!**

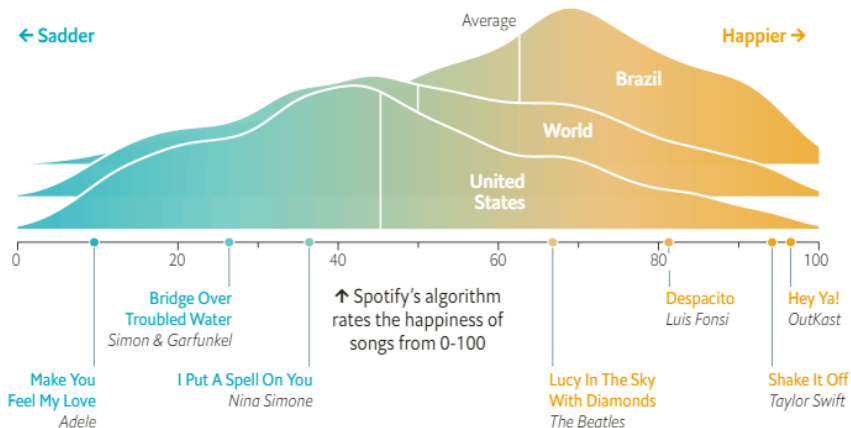
# Spotify data – valence and other measures

- **Valence:** “A measure from 0.0 to 1.0 describing the musical positiveness conveyed by a track.
- Tracks with high valence sound more positive (e.g. happy, cheerful, euphoric), while tracks with low valence sound more negative (e.g. sad, depressed, angry)”.
- **Speechiness:** “Speechiness detects the presence of spoken words in a track”. If the speechiness of a song is above 0.66, it is probably made of spoken words, a score between 0.33 and 0.66 is a song that may contain both music and words, and a score below 0.33 means the song does not have any speech.
- **Energy:** “(energy) represents a perceptual measure of intensity and activity. Typically, energetic tracks feel fast, loud, and noisy”.
- **Danceability:** “Danceability describes how suitable a track is for dancing based on a combination of musical elements including tempo, rhythm stability, beat strength, and overall regularity. A value of 0.0 is least danceable and 1.0 is most danceable”.

# Spotify data

→ Some countries listen to happier music than others

Distribution of tracks streamed\*, by mood



\*200 most-streamed songs on each day, January 1st 2017-January 29th 2020

# Valence worldwide






## Mood of music streamed\* globally

Ten-day moving average





Daily data on Top 200 – <https://spotifycharts.com/regional/pl/daily/2018-01-01/>

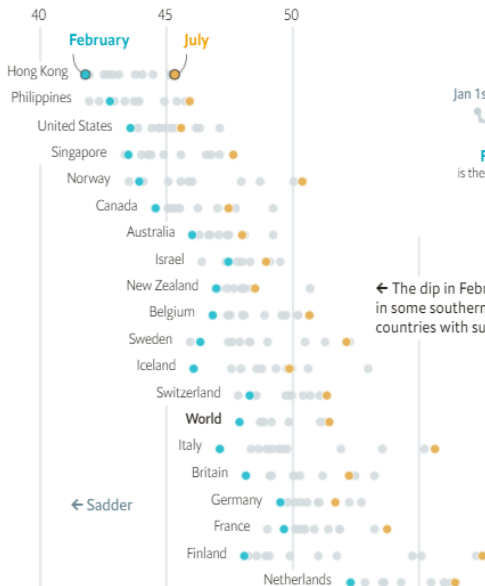
Spotify		Charts		↓ DOWNLOAD TO CSV	
TOP 200		VIRAL 50		Filter by	
		POLAND		DAILY	
				01/01/2018	
		TRACK		STREAMS ?	
	1	▲ <b>rockstar</b> by Post Malone, 21 Savage		38,954	
	2	▲ <b>Havana</b> by Camila Cabello, Young Thug		33,062	
	3	▼ <b>Shape of You</b> by Ed Sheeran		32,170	
	4	▼ <b>More Than You Know</b> by Axwell /\ Ingrosso		29,949	
	5	▼ <b>Feel It Still</b> by Portugal. The Man		28,166	

# Let's get down to business

- Your lecturers decided to repeat the analysis performed by the Economist (weekly magazine). For this reason, data on music listened to in all northern hemisphere OECD countries were downloaded from Spotify.
- Since 2017 Spotify has also published daily tables of the 200 most-streamed songs, both worldwide and in each country.
- The daily data were aggregated to monthly figures. Thus, we end up with a panel data set, with entity dimension defined by a list of all northern hemisphere OECD countries, and time dimension defined by months from January 2018 up to December 2019.
- What we offer to you, is extended with the (possible) covariates consisted of
  - *sky* - cloud amount (percent of the sky hidden behind clouds) and
  - *temperature* - average month temperature in Fahrenheits.

## Mood of music streamed\*

Monthly average



## Mood of music streamed\* globally

Ten-day moving average



← The dip in February also happens in some southern-hemisphere countries with sunny weather

# Get down to business

- We expect you to elaborate on this relationship and to try quantify it.
- To solve the contest problem teams will have 24 hours. The deadline for the papers is 10:30 a.m. on Sunday, April 25th, 2021.
- The papers should be submitted via email [wec@wne.uw.edu.pl](mailto:wec@wne.uw.edu.pl).
- The jury has one week after the deadline to assess submitted papers.
- The jury selects the winning papers. The assessment of papers will be made in the same way the submitted papers are assessed by editors and reviewers at scientific journals. The jury will do its utmost to assess the papers impartially. Having said that, the participants should be reminded that not all decisions can be easily quantified.
- For 3 hours, until 13:30, teams will be allowed to consult their general ideas with the supervisors. The jury reserves the option not to address to some questions.

## Possible extensions...

- Strikingly, this February slump occurs in some countries near the equator, such as Singapore, and far south of it, such as Australia—even though their musical tastes differ.
- A few Latin American countries lack such a dip, perhaps because the algorithm sees Latin music as mostly happy.
- Other ideas???

Good luck!