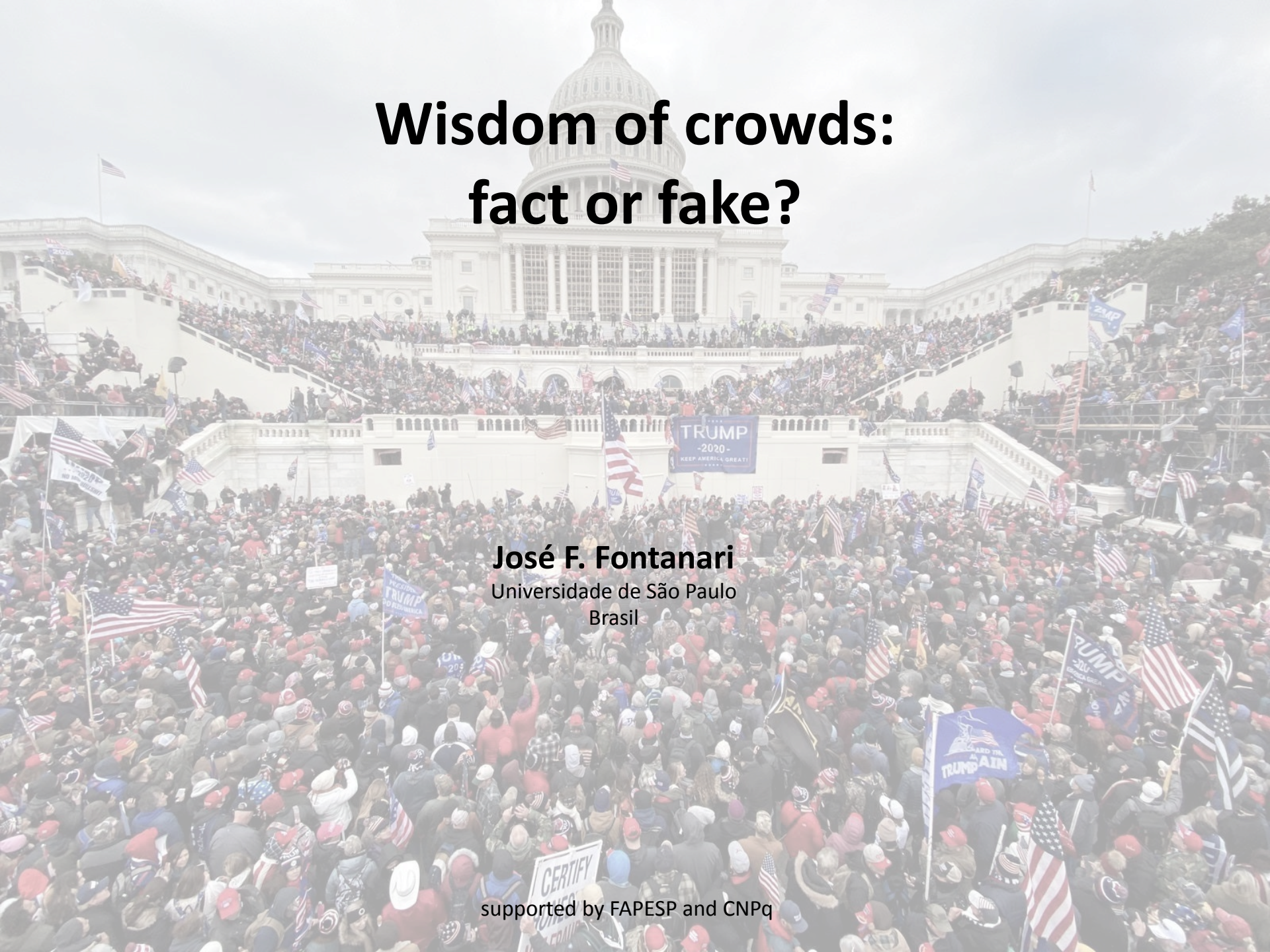
Wisdom of crowds: fact or fake?



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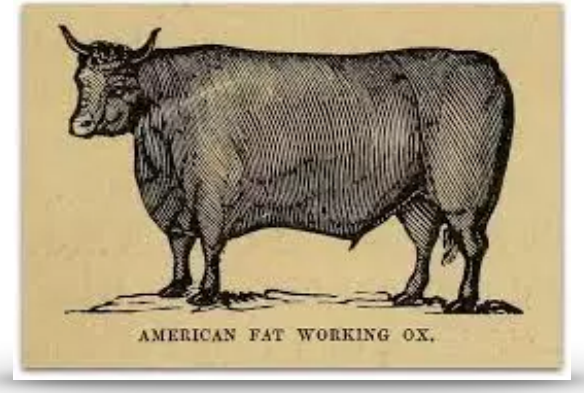
Vox populi

"In these democratic days, any investigation into the trustworthiness and peculiarities of popular judgments is of interest. The material about to be discussed refers to a small matter, but is much to the point."

Francis Galton and Karl Pearson (1909)

West of England Fat Stock and Poultry Exhibition Plymouth

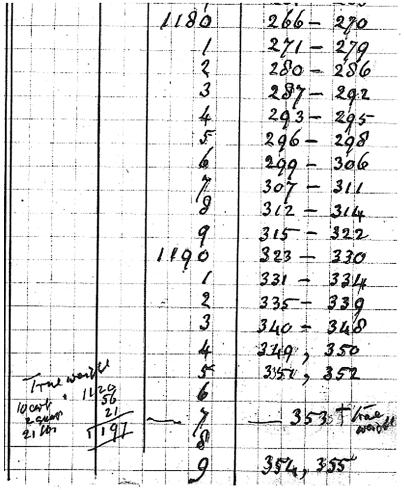


weight?

$G = 545\ kg$

$< g > = 542\ kg$

787 valid tickets



*"the middle-most estimate is 1207 lb., and the weight of the dressed ox proved to be 1198 lb.; so the vox populi was in this case 9 lb., or 0.8 per cent of the whole weight too high." **

"This result is, I think, more creditable to the trustworthiness of a democratic judgment than might have been expected."

* use of the arithmetic mean gives 1196 lb, i.e., an error of 0.2%.

F. Galton (1907) *Nature* **75**: 450-451

It is a mystery!

2004

A NEW YORK TIMES BUSINESS BESTSELLER

"As entertaining and thought-provoking as *The Tipping Point* by Malcolm Gladwell. . . . *The Wisdom of Crowds* ranges far and wide."
—*The Boston Globe*

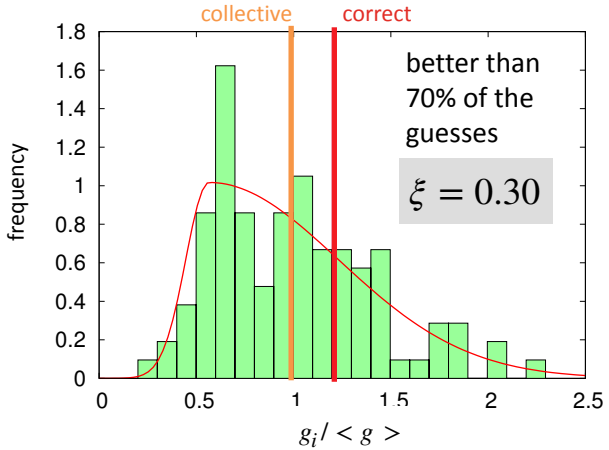
THE WISDOM OF CROWDS

JAMES SUROWIECKI

WITH A NEW AFTERWORD BY THE AUTHOR

The wisdom of crowds is the idea that the collective beats all individuals or, at least, most of them.

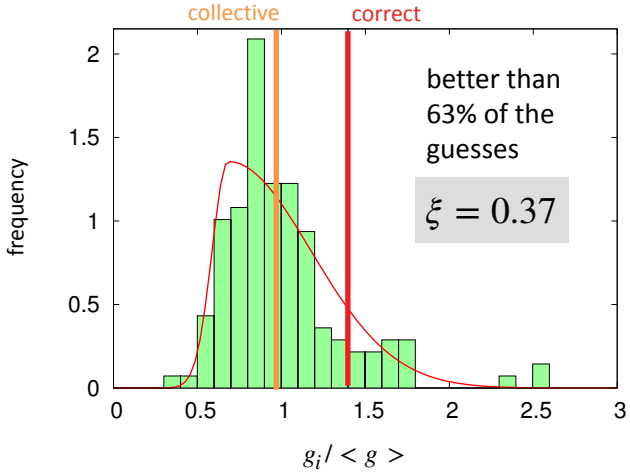
WC experiment = distribution of guesses



how many candies?

$G = 636$

$< g > = 531$



how many pages?

$G = 784$

$< g > = 560$

g_i guess of individual $i = 1, \ldots, N$

G true value

ξ fraction of guesses that are better than the collective's

$\langle g \rangle = \frac{1}{N} \sum_i g_i$ collective guess

Nobre & Fontanari, Complex Systems (2020) 29: 861-875

Database

The wisdom of crowds is the idea that the collective beats all individuals or, at least, most of them.

Survey of

PROFESSIONAL FORECASTERS

Federal Reserve Bank of Philadelphia

https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters

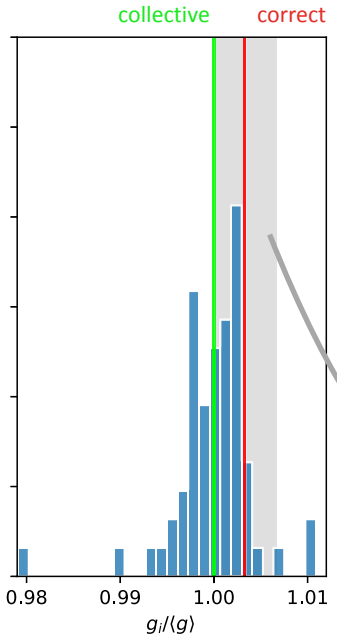
a typical experiment for the NGDP index

g_i guess of individual $i = 1,\ldots,N$

$\langle g \rangle = \frac{1}{N}\sum_i g_i$ collective guess

G true value

ξ fraction of guesses that are better than the collective's



Quarterly projections of a variety of economic indicators since 1968.

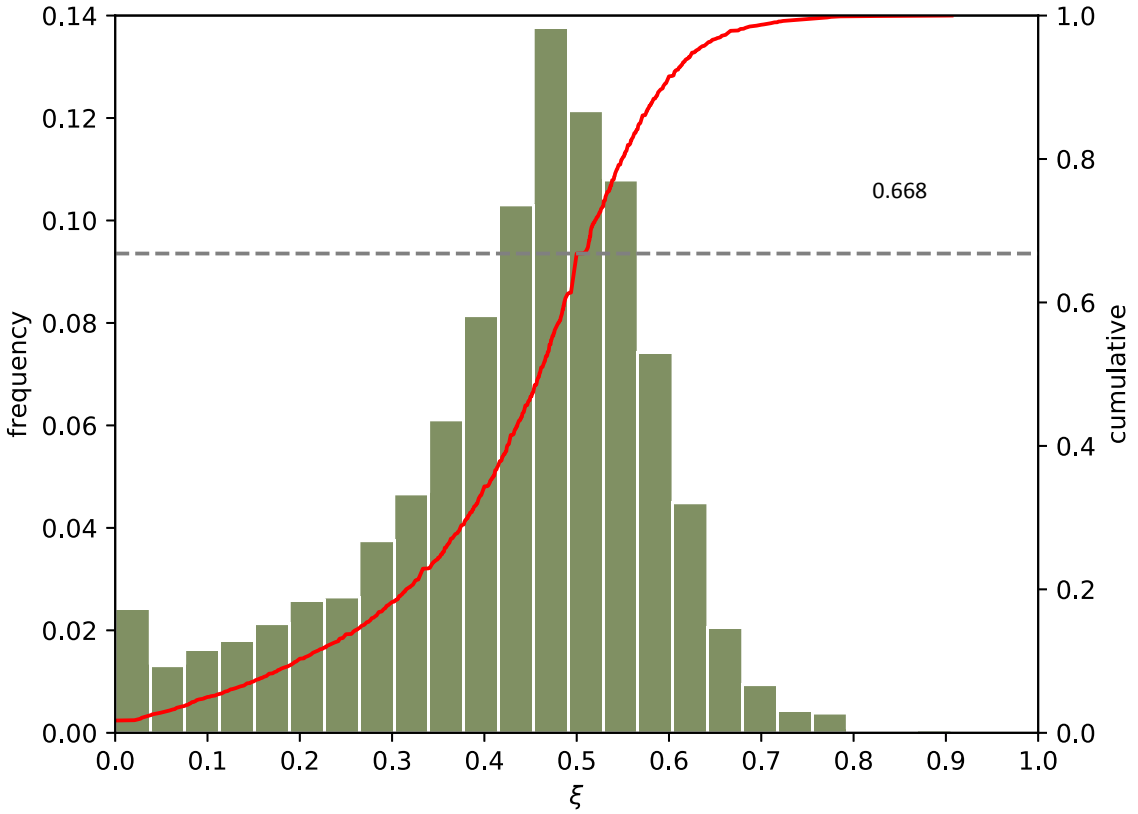
$9 \le N \le 87$

8650 forecast experiments

$\xi = 0.43$

Result

The wisdom of crowds is the idea that the collective beats all individuals or, at least, most of them.



- for each experiment, say k, compute the fraction of guesses that are better than the collective's.

$$\xi_k \in [0,1] \qquad k = 1,\ldots,8650$$

- count the number of experiments for which $\xi_k \in [\xi, \xi + \Delta\xi]$

- frequency is that count divided by the total number of experiments 8650

The collective guess was superior to the guesses of the **majority** of the individuals in 66.8% of the experiments ($\xi \leq 1/2$).

WC is not present in 33% of the experiments!

The collective guess was superior to the guesses of all individuals in 1.7% of the experiments only ($\xi = 0$).

go for the experts!

Conclusion

The wisdom of crowds is the idea that the collective beats all individuals or, at least, most of them.

Wisdom of crowds is most likely a product of the selective attention fallacy.

Sandro M Reia and José F Fontanari, **Wisdom of crowds: much ado about nothing**, J. Stat. Mech. (2021) 053402