

Making Money on Scratch Tickets—The Impact of Prize Structures

Michael Czekanski & Alex Lyford
Middlebury College

January 16, 2020

Motivation



Our Questions:

- ▶ Is a given game worth playing?
- ▶ If not, how likely is it that it will become worth playing?

Instant Tickets

- ▶ Games are played once
- ▶ Each game never resets
- ▶ Randomness is limited to location of tickets

An Example:

SAPPHIRE 7S

CLICK
TO FLIP



TOP PRIZE \$7,777

Game # 1522

Ticket Price \$5

Start Date 08/02/2019

Overall Odds 1: 4.50

UNCLAIMED TOP PRIZES

\$7,777 1

\$1,000 13

\$700 26

Of Tickets 420,000

% of Tickets Sold 70

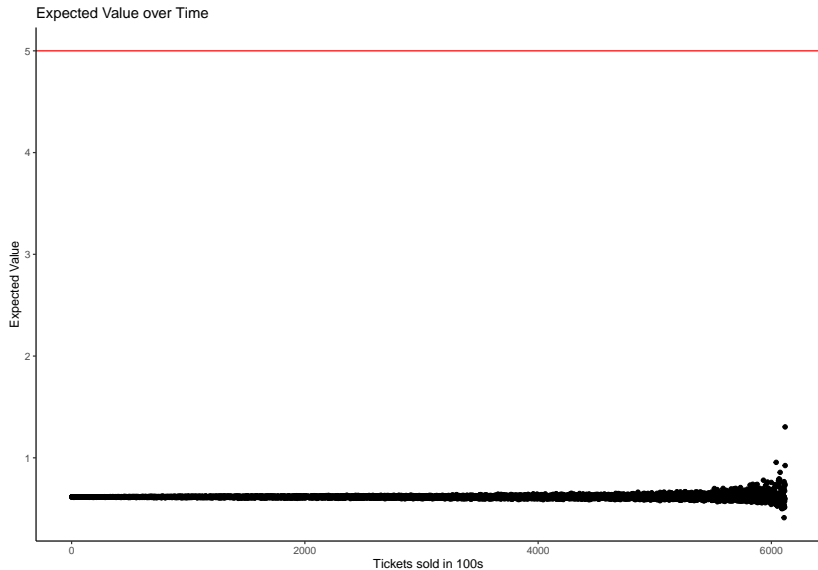
Total Unclaimed \$429,273

Our intuition is correct at the outset

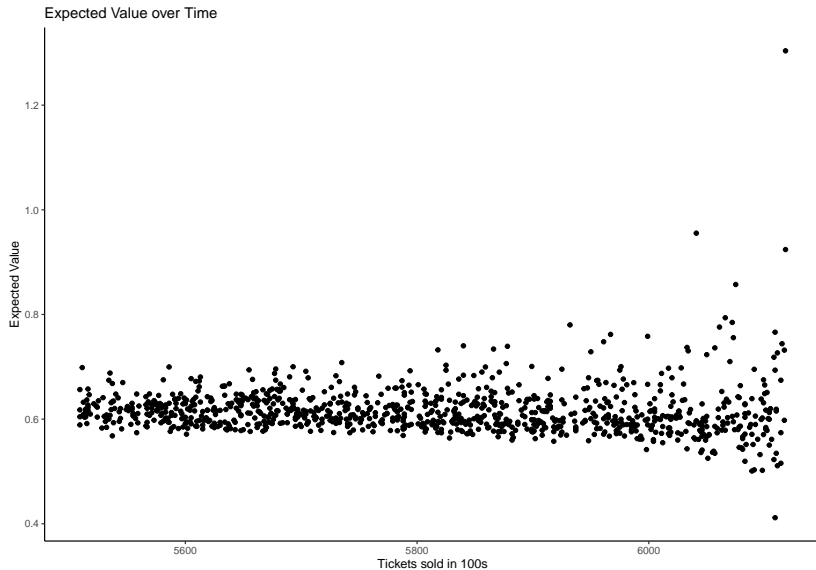
Value	Probability
0	0.78789
7	0.14286
15	0.02632
25	0.0303
70	0.01235
700	0.00019
1000	9e-05
7777	2e-05

Expected Value = $3.365172 < 5$.

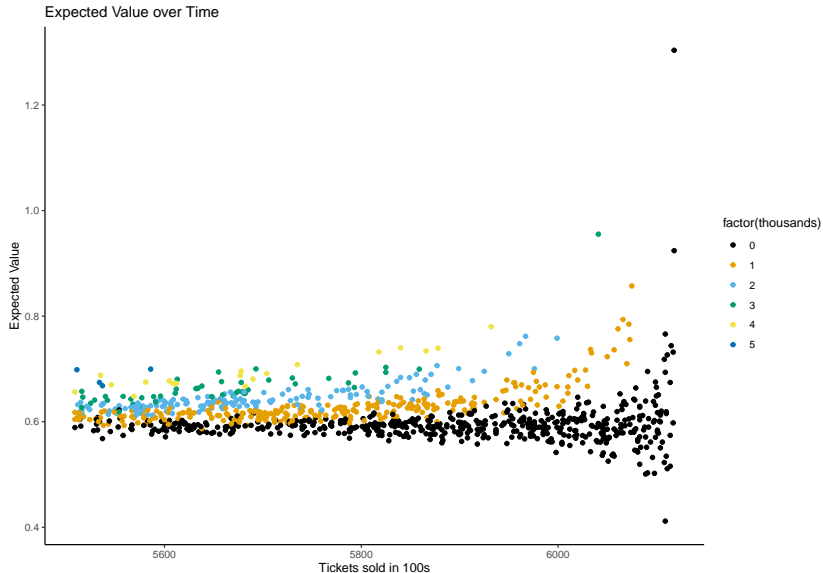
This game is *sometimes* worth playing!



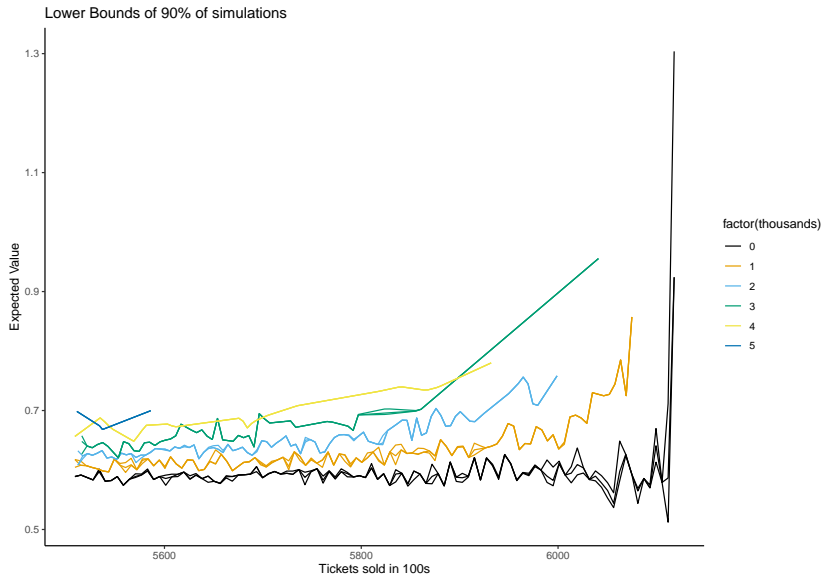
Let's take a closer look:



Then make use of the information available to us:



We have the necessary information to estimate the value of a ticket



Another game:

WIN EITHER \$50 OR \$100

CLICK
TO FLIP



TOP PRIZE \$100

Game # 1494

Ticket Price \$10

Start Date 08/02/2019

Overall Odds 1: 9.78

UNCLAIMED TOP PRIZES

\$100 680

Of Tickets 299,880

% of Tickets Sold 94

Total Unclaimed \$128,300

It's all in the name:

Value	Probability
0	0.89904
50	0.0625
100	0.03846

Expected Value = $6.9711538 < 10$.