SEEING PRIZE STRUCTURES

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Scratch tickets are the merchandise face of the lottery. That face, that appearance, is developed with care. No doubt the "faces," singly and collectively, have a big role in getting the player ready to play. An attractive graphic theme can support the market success of a game. Subtle changes in presentation may have a significant impact on how players respond when they first see a game.

However, it is hard to imagine that an attractive face could make a game successful if the game does not also deliver prizes. Subtle changes in the prize structure may also have a significant impact on how a game fares in the market. Lots of people are involved in the design of the instant scratch-off games that our lotteries sell. Many of them are skilled in building and appreciating visual presentations. A quantitative concept like "the prize structure" may not draw their attention. Even if it does draw their attention, it may be difficult for them to consider making changes, subtle or large, in something that cannot be seen.

Here is where I think I can help. I can translate from numbers to shapes. I have worked out a way of taking the quantitative specifications of a scratch game and making it into a picture that is not hard to interpret. The picture represents the Likely Win Experience provided by a game to its players.

For the Likely Win concept, I am indebted to my friend M., the lottery-playing economist. It was M. who pointed out that, if we know the kind and number of prizes in a Scratch game and the total number of tickets printed, it is possible to make good predictions about the wins that the typical player will experience in that game. In particular, it is possible to appreciate how the kind and amount of prizes won will be related to the amount the player spends.

M., however, was content to communicate this concept just to me. I had to stretch a little to get the full implications of it.

I am a visual person, and in order to really master the concept I had to use it to build a graph. I was successful in that, and in the balance of this article I will explain how to interpret my visual representation of the Likely Win Experience.
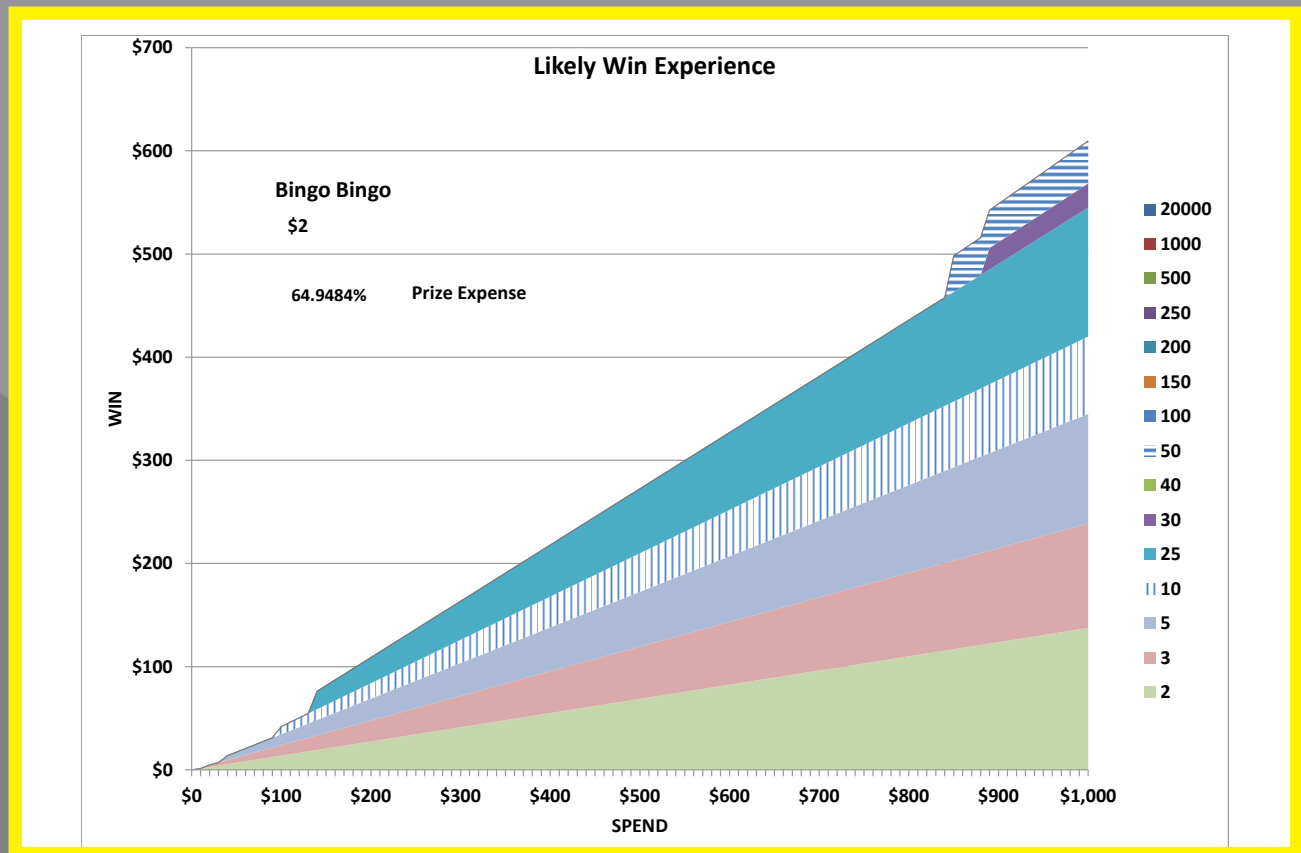
Of course, I implemented the conversion from numbers to pictures within a spreadsheet, and I am happy to share that too. For now, please assume that we have located a table representing the prizes in a $2 scratch game called "Bingo Bingo," and have pasted that into a workbook I have provided. The workbook returns a graph that represents the Likely Win Experience of a typical player as that player spends up to $1000 in the game.

The horizontal axis of the graph represents the money spent by the player, increasing from left to right. The vertical axis represents the amount that is likely to be won.

Each prize tier that is likely to be won is represented by a wedge of distinctive color or pattern. The sharp edge of the wedge lies at the level of spending where winning that prize first becomes more likely than not. The thickness of the wedge represents the dollar amount that is likely to be won. The wedge grows thicker as the likelihood of winning, and winning multiple times, increases.

Bingo Bingo has 15 different prize tiers, representing prize amounts from $2 to $20,000. Each of these is identified in the legend of the graph. However, there are only seven colored

BINGO BINGO

Likely Win Experience

Bingo Bingo
$2

64.9484%   Prize Expense

Legend: 20000, 1000, 500, 250, 200, 150, 100, 50, 40, 30, 25, 10, 5, 3, 2

Y-axis: WIN — $0 to $700
X-axis: SPEND — $0 to $1,000

wedges in the chart. This is because for seven of the 15 prize tiers, the number of winning tickets in the tier is high enough that a person spending $1000 is more likely than not to win one or more of these prizes. That is, the probability of winning at least one of these prizes is greater than or equal to 0.5. For the other eight prize tiers, the number of winning tickets in the tier is so low that a person spending $1000 is more likely than not to miss seeing that particular prize.

Of course, the horizontal axis of the graph could be extended to show the spending level at which seeing one of those rarer prizes becomes likely. But the message of the chart is: the experience of playing up to $1000 in this game has little or nothing to do with those prizes. Or in other words: the experience of playing up to $1000 in this game involves winning the prizes that are shown on the graph.

Two of the prize tiers ($50 and $30) are represented by shapes that appear only above $800 in spending. The $30 wedge is inserted under the $50 wedge, lifting it up. This represents the fact that prizes of $30 are even rarer than prizes of $50 in this game. A $40 prize is among those appearing in the legend but (because it is too rare) not appearing on the chart.

Between $140 and $850 of spending, only five prize tiers are

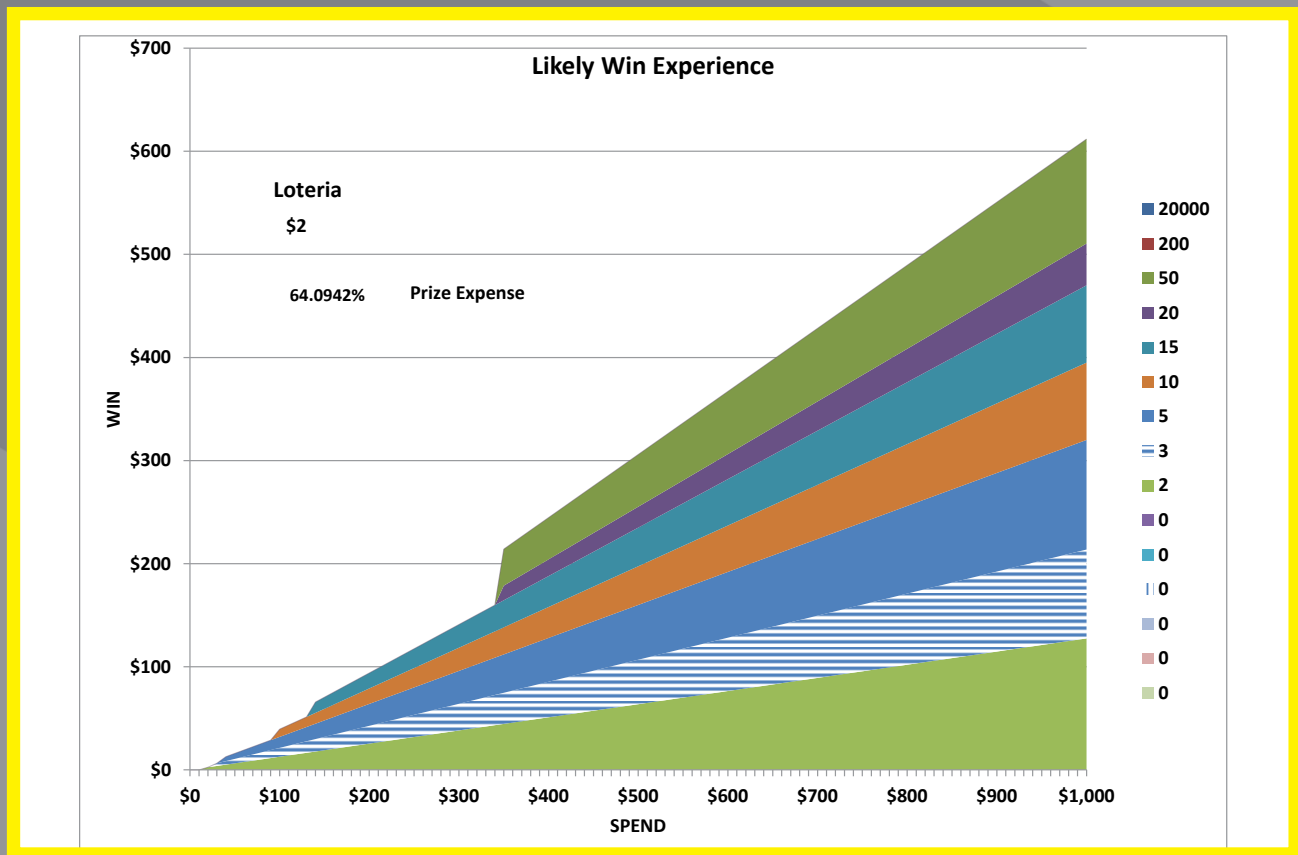part of the likely experience: $2, $3, $5, $10 and $25. The combined value of these wins can be read from the graph for any level of spending, as the point where a horizontal line from the top of the $25 wedge strikes the vertical axis. This lets us see at a glance that for $1000 spent, the player is likely to win about $540 in these prizes. In other words, over most of this chart, the player is winning back about 54% of what is spent. Using the same graph-reading method, we can see that a little less than half of this prize money (half the thickness of the stack of wedges) comes in prizes of $2 and $3.

Players who spend less than $100 are unlikely to win the $10 or $25 prizes. These players are likely to win back only about one-third of what they spend.

Bingo Bingo has had market performance typical of games of its type. It has a prize expense of about 65%. It is reasonable to conclude that the market performance of the game is supported largely by the winning experience described above, corresponding to 54% prize expense. The "lucky" (or very intense) players account for the rest of the prize value.

The shapes in the first chart represent the experience of players playing Bingo Bingo. The shapes in the second chart describe the experience of players playing Loteria, also a $2

LOTERIA

game with 65% prize expense. The particular colors used are not significant, since Loteria defines fewer prize tiers (unused tiers show in the legend as "0"). Comparing the two charts quickly reveals how the players' experience of these two games differs.

First of all, the two graphs are very similar in the lower left corner, for players spending less than $100. These players likely experience no win larger than $5, and win back about one-third of what they spend.

The most distinctive feature of Loteria is the big blunt wedge that comes in at about $350 in spending. This corresponds to a prize of $50. While the $50 prize of Bingo Bingo just made it onto the chart, that of Loteria appears much earlier. Loteria likely returns about 62% of the money spent on it as prizes, to players who spend $340 or more. Only about one-third of this prize money is in prizes of $2 or $3.

Although the games have similar overall prize expense, Loteria reserves very little for prizes that are outside the likely experi-

ence of a player spending $1000.

M. would say the players of Bingo Bingo get "the flavor of the game" at a lower level of spending ($140 vs. about $340). That is to say, Bingo Bingo is a little less "chunky" than Loteria. But, he would say, the flavor of Loteria is richer than that of Bingo Bingo.

Food metaphors are all very well, but I can only translate numbers into pictures, not into soups.

I hope that these charts may prove useful to my readers. I will make a workbook to generate them available at the web site: *lmcbusinessintel.com*.

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