ENGINEERING INSTANT GAME PRIZE STRUCTURES:

RESULTS FROM WASHINGTON STATE

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I t is always clear to outside reviewers, who look at a lottery's balance sheet, that the amount we can give to our beneficiaries depends on the difference between the value of money wagered and the value of prizes paid. The prize expense (PE, prize cost as a percentage of sales) is always the major operating cost of any lottery. Instant games generally have a higher PE than draw games. Almost any outside review or performance audit will question whether that major cost needs to be so high.

It is seldom clear to outsiders that money wagered in instant games depends in part on the players' winning experience. The winning experience is entirely determined by the number and value of the prizes paid by the game – that is, the prize structure of the game. While the PE can be expressed simply as a percentage, the prize structure usually appears as a table of values. We can do a little algebra on the prize structure table to calculate the PE, but in doing so we lose the essence of why the prizes work to sustain sales.

We do not help our outside reviewers, or ourselves, when we speak as if PE directly determines sales. Different prize structures, each having the same PE, can result in very different winning experiences, some of which support sales better than others.

This article is about optimizing instant game prize structures. Optimize is a verb that justly arouses skepticism. This is partly because we tend to confuse optimize with perfect. Perfect implies conforming to some absolute standard. It is a word for people who deal in absolutes. Optimize implies balancing trade-offs. It is a word for engineers.

"Optimized for what?" is and should be the first question we ask. Because optimization is a process of making trade-offs, useful answers tend to be complicated. Still, we need to know what progress looks like.

A step that supports more play, and better sales, without increasing the PE, would clearly be a step toward an optimized prize structure. It is also possible that a step that supports more play, even though it increases the PE, would be a step toward optimization –

whether it is in fact depends on whether it results in more money to the bottom line (net win, or gross gaming revenue). Increased net win is the result we are looking for. The best sort of optimization increases sales, while reducing PE. This report documents that Washington's Lottery did that, for some important categories of games.

Washington's Lottery took a portfolio-wide view of winning experience and prize structures. Starting in FY2015, they began improving the winning experience on all their games, with the intent to better support players without increasing PE. They used a graphical analytic method described in an earlier *Insights* (Nov/Dec 2013, pp10-12) to understand the winning experience of the games currently on the market, and to gain improvements by reallocating prize funds. They found that in the entry-level games selling for $1 or $2, meaningful improvement required higher PE. They also found that at the $5 and $20 price points, they could improve the winning experience while reducing PE. Knowing that the $1 and $2 games are the biggest

opportunity to recruit new players, they chose to use some of the potential savings from the $5 and $20 games to improve the experience for entry-level players. They hope for a long-term payoff by retaining more beginners as players, who gain experience that eventually gives them confidence to use more parts of the product portfolio.

The team responsible for this work was gratified that their executive management backed this effort, despite some advice to the contrary from vendors.

Games built following the "new plan" launched in FY2016. Among the first to reach the market was Washington's first $30 game. This game delivered a winning experience distinct from that of the $20 games that had been sold for many years, at the same prize expense (76 percent). Meanwhile, "new plan" $20 games were built with a PE of less than 75 percent. Similarly, "new plan" $5 games were built with a PE of not more than 68.5 percent, about 1 percent lower than the standard in use for several years. The PE of $2 games rose from about 63 percent to 64.5 percent, and that of $1 games from about 59 percent to 61.3 percent. At the other price points, prize structures were engineered for better winning experiences without changing PE.

By the end of FY2017, all the games facing players were "new plan" and we have two years' worth of results representing the transition period.

The charts to the right and on the next page are from the business intelligence developed and maintained by the Lottery's Research and Development section.

The red line in the first chart represents Washington's quarter-to-quarter expectation for instant consumption. Please note that this expectation is not flat or smooth. Rather, it includes a growth trend, periods of decline, and seasonality. The growth and decline are driven by a macroeconomic model sensitive to population growth, general price inflation, the rate of unemployment, and the prize expense of the games sold. The model that produces the red line of expectation is based on 15 years' worth of history (FY2001 through FY2015), and thus reflects the impact of expanding the role of higher-priced games in the portfolio, as well as Washington's economy and population growth.

The blue line in the first chart represents actual consumption of instant tickets. Note
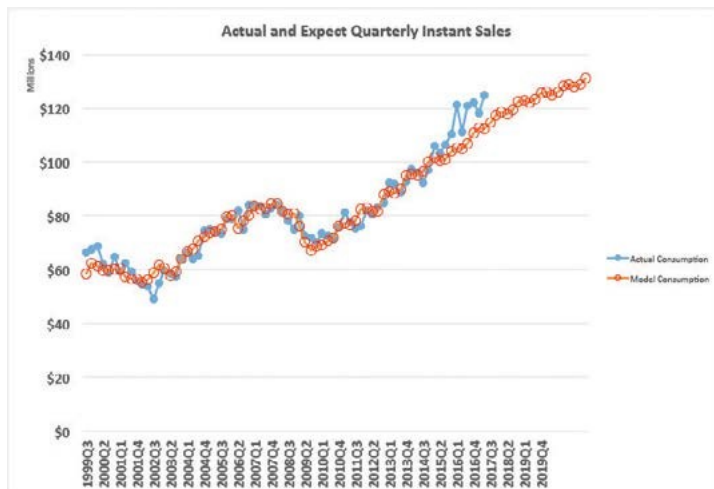
Chart 1

Actual and Expect Quarterly Instant Sales

Chart 2

Actual and Expect Quarterly Instant Net Win

that while the fit during the period modeled is very close, actual sales since FY2016 are substantially higher than the previous 15 years' experience lead us to expect. The value of the departure over eight quarters is about 9 percent ($77 million).

The second chart, similar in format to the first, tells the more important story of gross gaming revenue, or net win. The increase here, over and above what the economy drove, is about 7 percent ($19 million).

These charts suggest an immediate benefit to the lottery from engineering the instant game prize structures. These charts do not speak to the hoped-for long term benefit of increasing the

player base.

The third chart provides detail about how the increase in sales came about, from FY2015 forward. Consumption of games priced at $3 and below stayed fairly consistent, and showed a regular lift around the holiday turn of the year. The introduction of the $30 game in FY2016 took some sales away from the $20 and $10, but the aggregate of the three higher price points increased substantially. In FY2017, there was very little further growth in these premium-priced games, and consumption of the $5 games grew.

The fourth chart shows gross profit (net win minus direct costs of sales, such as retailer commission and vendor
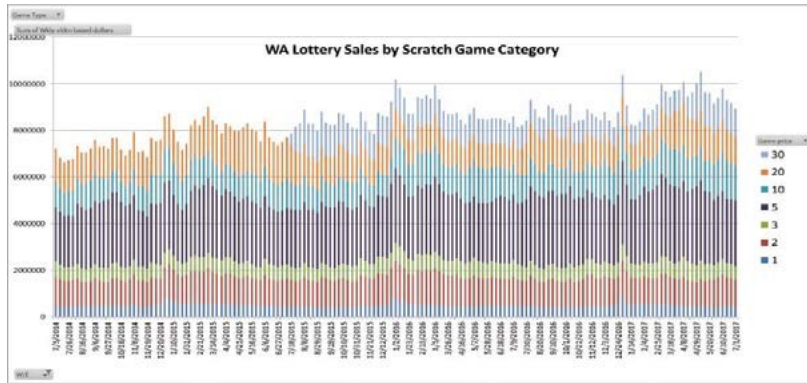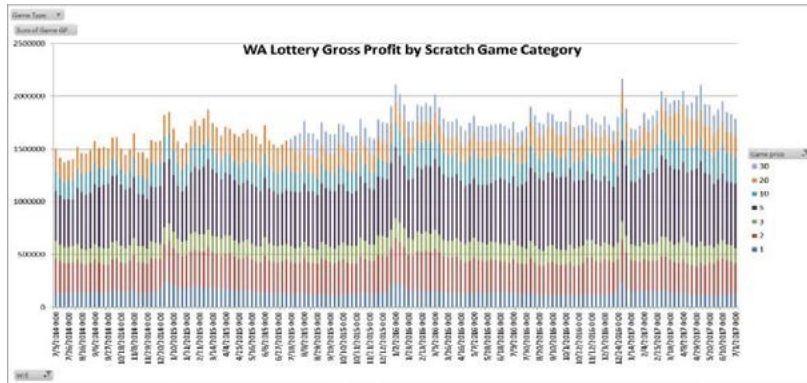
Chart 3

Chart 4

Table 1
Changes in Consumption and Gross Profit between FY2015 and FY2017

Ratio FY17/FY15	$1-$3	$5	$10-$30	All
Consumption	100%	114%	137%	118%
Gross Profit	96%	120%	138%	115%

costs). This chart documents the steady growth in profit, and emphasizes the growing importance of the $5 games as well as the continued importance of the lower-priced games.

Comparing consumption and gross profit between FY2015 (before introduction of "new-plan" games) and FY2017 (during which most consumption was of "new-plan" games) shows some important trends. These are summarized in Table 1 as the ratio of FY2017 results to FY2015 results (100 percent is "no change").

Overall, consumption increased at a lower rate than profit because players greatly expanded their use of the premium-priced ($10 -$30) games. However, within this premium category, profit increased slightly more than sales, because of lower PE of the "new plan" $20 games and better winning experience in both the $10 and the $20. Within the $5 games, profit increased significantly faster than consumption, likewise because of more efficient prize structures. And within the games priced $1 - $3, raising the PE in order to provide more wins probably helped to maintain steady consumption.

The $5 games have become the center of the instant business for Washington's Lottery (and most others). Consequently, we were reassured to see that as the new-plan prize structures permeated the market in FY2017, we saw great expansion of consumption in the $5 games, even while the premium-priced games maintained the level of consumption that grew earlier in FY2016 (as shown in the first chart). While our success in FY2016 was largely due to expanding consumption of our higher-priced games, our success in FY2017 depended on the broader part of the population that buys the $5 games. This is reassuring from the standpoint of sustainability and potential for further growth.

Of course, during FY2016 and FY2017, not only prize structures but other things were changing. The way players use retail shops is changing, and the way the Lottery presents itself at retail is changing too. However, this has been true in past years as well, particularly during the fifteen-year period that is the basis for our macroeconomic model of consumption. The departures from this model suggest that something different started happening in FY2016, and I think that the engineering of prize structures was the main driver in this change.

The financial results described above do not convey other benefits that have been gained by optimizing prize structures. The "new plan" games tend to have bigger print runs, and are meant to last longer in the market than the games they replaced. Portfolio-wide, there is more reliance on winning experience and less on novelty to sustain interest. Consequently, the number of games launched in a year has decreased. Between FY2015 and FY2017, the number of games with transactions in any week dropped from 70 to 50. This has relieved some pressure on the distribution system.

In summary, Washington's Lottery found it could change instant game prize structures to support more consumption at a lower prize expense, and has seen both financial and operational benefits from doing so. The team's process of understanding and improving the players' winning experience depended on using the graphical analysis described in the *Insights* article referenced above, which (along with other valuable material) is available through the NASPL Matrix. ■